Article

Corporate Strategy for Sustainable Development in the Oil and Gas Industry: Drivers, Agility Mechanisms, and SDG Alignment

Dimitrios Dimitriou, Maria Sartzetaki, Aristi Karagkouni *, Vasiliki Efstratiou

MaGBISE Research Laboratory, Department of Economics, Democritus University of Thrace, Komotini 69100, Greece; ddimitri@econ.duth.gr (DD); msartze@econ.duth.gr (MS); basia.e3@gmail.com (VE)

* Correspondence: Aristi Karagkouni, Email: arkaragk@econ.duth.gr

ABSTRACT

The oil and gas industry is at a critical crossroads, necessitating a re-evaluation of corporate strategies to align with sustainability imperatives. This paper investigates how oil and gas companies formulate and implement corporate strategies aligned with sustainability imperatives. By identifying the factors influencing strategic decisions and analyzing the application of corporate agility mechanisms, this study evaluates the integration of sustainability goals such as the United Nations Sustainable Development Goals (SDGs) and the European Green Deal within strategic frameworks. It also examines alignment with international frameworks like the SDGs. The study highlights the proactive approaches of oil and gas companies to adapt to shifting market and regulatory dynamics, fostering sustainability. Key challenges include balancing trade-offs in pursuing sustainable development and meeting diverse stakeholder expectations. Through case studies and empirical analysis, this research offers actionable insights for policymakers and business leaders, emphasizing the role of corporate agility in navigating the evolving energy landscape. The findings underscore the need for adaptability as companies face unprecedented changes, driving progress toward a more sustainable energy future.

KEYWORDS: sustainable development; oil and gas industry; corporate strategies; agility; strategic planning

Received: 29 Apr 2025
Accepted: 31 Jul 2025
Published: 17 Sep 2025

INTRODUCTION

The oil and gas industry has long been synonymous with economic prosperity, driving industrialization, powering transportation, and fueling modern lifestyles worldwide. However, this vital sector also faces unprecedented challenges in an era characterized by heightened environmental consciousness, climate change concerns, and the imperative for sustainable development [1]. As societies grapple with the urgent need to transition to low-carbon economies and mitigate the

impacts of fossil fuel consumption, the oil and gas industry finds itself at a critical juncture, compelled to reevaluate its corporate strategies through the lens of sustainability.

This paper undertakes a comprehensive examination of agile corporate strategies within the oil and gas industry, those that enable firms to adapt rapidly and effectively to changing sustainability demands. Strategic agility is emphasized as a critical capability, encompassing not only technological adaptation but also shifts in stakeholder engagement, human capital development, and governance practices. The complex interplay between profitability, environmental stewardship, social responsibility, and governance practices in shaping corporate strategies forms the nucleus of this inquiry [2]. By dissecting and evaluating the diverse approaches adopted by oil and gas companies, this study aims to unravel the efficacy, challenges, and implications of these strategies in advancing SDGs.

Against a backdrop of shifting societal expectations, regulatory landscapes, and technological advancements, oil and gas companies face mounting pressure to address a myriad of sustainability issues. From carbon emissions and environmental degradation to social inequalities and human rights violations, the industry grapples with multifaceted challenges that demand innovative and transformative solutions. Moreover, the urgency to decarbonize the global energy system and transition towards renewable sources underscores the imperative for oil and gas companies to pivot towards more sustainable business models. While technology adoption is a key component of this transition, it is analyzed in this paper as a strategic instrument within a broader agility-oriented framework, not as a stand-alone solution.

Key considerations in the evaluation of corporate strategies include the adoption of cleaner technologies and practices, the promotion of stakeholder engagement and community partnerships, the implementation of robust governance structures, and the alignment with international sustainability frameworks such as the SDGs [3,4]. By embracing these principles, oil and gas companies can mitigate risks, enhance resilience, and unlock opportunities for sustainable growth and development.

Furthermore, this paper acknowledges the inherent complexities and trade-offs inherent in the pursuit of sustainable development within the oil and gas industry. It recognizes the need for a nuanced understanding of context-specific challenges, market dynamics, and stakeholder expectations. Through a multi-dimensional analysis that incorporates case studies and empirical data, this study aims to uncover how major oil and gas firms choose and operationalize their corporate strategies in response to sustainability challenges. It investigates the internal and external factors influencing strategy design and implementation and evaluates how these strategies integrate organizational agility and sustainability frameworks such as the UN SDGs. In summary, the evaluation of corporate

strategies towards sustainable development in the oil and gas industry is paramount in navigating the transition towards a more sustainable and equitable energy landscape. By critically examining strategies and their impacts, this paper aims to contribute to the ongoing dialogue on sustainability, offering pragmatic solutions and pathways for the industry to thrive in an era of unprecedented change and uncertainty.

BACKGROUND LITERATURE

Strategic Management and Sustainability: Theoretical Perspectives

The literature pertaining to corporate strategies and sustainable development within the oil and gas industry provides a rich tapestry of insights into the multifaceted challenges and opportunities shaping the sector's journey towards sustainability. One of the foremost environmental challenges confronting the industry revolves around the significant impacts of oil and gas operations on the environment. Extensive research has documented the adverse effects, ranging from habitat destruction and water contamination to air pollution and greenhouse gas emissions. Notably, reports from the Intergovernmental Panel on Climate Change (IPCC) [5] underscore the urgent imperative for decarbonization efforts, emphasizing the pivotal role of fossil fuel consumption, including oil and gas, in driving anthropogenic climate change. Scholarly investigations have delved into various mitigation strategies, including carbon capture and storage (CCS) and the integration of renewable energy sources, aimed at curbing emissions and steering the industry towards a low-carbon trajectory.

To understand the mechanisms by which oil and gas companies make strategic choices in response to sustainability pressures, it is necessary to place this debate in the context of the strategic management literature. A range of theoretical paradigms offers useful insights regarding the choice of corporate strategies. The resource-based view (RBV) highlights the importance of internal competencies and capabilities in defining strategic directions, while institutional theory explains the influence of regulatory frameworks, dominant norms, and stakeholder expectations. Dynamic capabilities theory also explains how companies develop the flexibility to change strategies in response to both external volatility and internal learning experiences. These theoretical underpinnings form the basis for the following analysis of corporate agility and sustainability strategies to be developed later in the manuscript.

Corporate sustainability strategies can be examined using a number of theoretical frameworks. The RBV [6] focuses on the internal capabilities used by firms to attain a comparative advantage, while the dynamic capabilities view [7] is a further extension looking at an organization's ability to adapt in increasingly changing circumstances. Institutional theory [8] helps to explain how corporate strategies are shaped by normative, regulatory, and mimetic pressures in the external

environment. In the context of sustainability, companies often respond to institutional expectations from governments, financial markets, and international frameworks by adapting their practices and disclosures to signal compliance. In parallel, legitimacy theory [9], offers a valuable perspective for analyzing how firms use sustainability disclosures as symbolic tools to maintain social credibility and manage reputational risks.

To comprehensively test the credibility of corporate sustainability reports [10], techniques like shadow accounting [11] and counter-reporting [12] have been suggested. The procedures involve comparing corporate statements with external sources of information in an attempt to find inconsistencies, inaccuracies, or missing information. Further, research by [13,14] examines the extent to which sustainability reports could be used symbolically rather than reflecting actual change. Such studies are part of the broader analysis of the oil and gas industry's conformity with SDGs.

Furthermore, the concept of corporate social responsibility (CSR) has emerged as a cornerstone of sustainable development discourse within the oil and gas sector. Research highlights the importance of proactive engagement with stakeholders, encompassing local communities, indigenous groups, and civil society organizations, to cultivate trust, manage risks, and foster positive socio-environmental outcomes [15,16]. Moreover, scholarly inquiry has scrutinized the effectiveness of CSR initiatives, transparency and accountability mechanisms, and the efficacy of industry partnerships in advancing social and environmental sustainability agendas.

In tandem with CSR considerations, the adoption of sustainable business practices and robust governance frameworks has garnered attention as pivotal drivers of sustainable development within the oil and gas industry [17]. Studies underscore the necessity of integrating sustainability imperatives into corporate strategies, risk management protocols, and decision-making processes. Additionally, research emphasizes the significance of corporate governance mechanisms, such as board diversity, executive remuneration structures, and ethical leadership, in engendering responsible business conduct and augmenting long-term shareholder value [18].

As the industry grapples with the imperatives of sustainability, the transition towards renewable energy sources and the advent of disruptive technologies are reshaping its landscape. Scholars have interrogated the drivers, impediments, and ramifications of this energy transition, spanning renewable energy investments, energy efficiency measures, and digitalization initiatives aimed at enhancing operational efficiencies and ameliorating environmental footprints [19,20]. Furthermore, research on innovation and technological advancements, encompassing blockchain, artificial intelligence, and data analytics, underscores their transformative potential in revolutionizing oil and gas operations and catalyzing sustainable development outcomes.

Through a synthesis and augmentation of this extant literature, this paper endeavors to deepen our comprehension of the intricate nexus between corporate strategies and sustainable development within the oil and gas industry. It aspires to elucidate emergent trends, best practices, and avenues for further scholarly exploration, thereby contributing to the industry's evolutionary journey towards a more sustainable and resilient future.

European Green Deal

As is being proven, environmental degradation and climate change are the most significant threats to the European Union and the whole world. The climate is changing every year, and there is a gradual warming of the atmosphere. While one million of the eight million species on the planet are at risk of extinction, the oceans are polluted, and the forests are destroyed [5,21–23]. These challenges are set to be overcome by the European Green Deal, which is Europe's new growth strategy that will transform the Union into a competitive, resource-efficient economy. Also, it aims to make Europe climate neutral by 2050 and use green technology to help stimulate the economy. In general, the European Commission aims to protect the health and well-being of citizens from the effects of the environment. Because of the substantial change it will bring, the active participation and trust of citizens in the transition to a more sustainable society are important [24].

The new development strategy is the Sustainable Europe Investment Plan, through which the transition to a climate-neutral and green economy will take place. This plan is divided into the following three dimensions. Firstly, in the form of sustainable investments, more than 1 trillion euros will be mobilized throughout the coming decade via the European Union's budget, in which a greater share of public spending will be devoted to climate and the environment than previously. Through the utilization of guarantees in private funding and the Just Transition Mechanism (JTM) socio-economic impacts resulting from the transition can be mitigated. Secondly, the plan enables a framework for private and public sector investors, helping to provide a cost effective, efficient, and socially balanced transition. This framework provides the tools required to properly identify sustainable investments. Thirdly, tailored support will be provided to public administrations and project promoters throughout the identification, structuring, and execution of sustainable projects, which contribute to the implementation of the SDGs [24].

An Industrial Policy for the European Green Deal

For the socio-political acceptance and support of the European Green Deal, the goal of climate neutrality by 2050 is needed to ensure new jobs and a long-term economy that is highly competitive globally. This EU industrial policy towards the European Green Deal is structured with a three-pronged strategy [25,26]. The first priority is to promote disruptive

innovation, which will be motivated by the decarbonization of industry. To achieve climate neutrality, Europe will have to invest more and better. For most investments, Europe's R&D spending remains lower than GDP. Although Europe is considered a world leader in innovation in various sectors (automotive industry, biopharma, etc.) it should also devote itself to its development in digital and electronic technology. This move will further help clean mobility, clean energy and smart building solutions.

Under the European Green Deal, there are two existing EU initiatives that could increase business R&D investment. The first innovation tool of the European Green Deal is the European Innovation Council (EIC), which is inspired by the US Advanced Research Projects Agency (DARPA). The purpose of its design is to financially support, through grants, innovators who develop high-risk innovations. To do this, from 2021 to 2027, the EIC needs to allocate at least €15 billion under Horizon Europe [25].

The second innovation tool of the European Green Deal is the Innovation Fund (IF), established under the EU ETS for the period 2021–2030. The IF is designed to demonstrate various innovative technologies and processes related to low carbon emissions in the context of industry, carbon capture and carbon storage (CCU and CCS). It holds at least 450 million carbon rights, which is equivalent to €11 billion. The second strategy is related to the creation of conditions for the flowering of innovative European markets in a receptive market. DARPA's success and limited budget prove that it is important to create favorable conditions for products with public funding. The EU has three main tools at its disposal in order to create more favorable conditions for companies.

As the first tool, the concept of the integration of the EU internal market is defined. Obstacles to the scaling up of European companies are support measures for clean technologies, energy taxation, etc. The basic action to eliminate these is the creation of a regulatory framework. To achieve this, there should be coordination between national industrial policies. The second tool is public contracts, which, given their scale, are important for promoting innovation, and in the EU, they are estimated at around 16% of GDP [24]. Carbon-based contracts are defined as a third tool [25,26]. The third and final strategy is to export the European Green Deal. The EU's total gas emissions account for 10% of global emissions. Therefore, the European Green Deal should be promoted beyond its borders to equalize global temperature levels. Achieving this strategy requires two key steps.

As a first step, the rapid establishment of the Neighborhood, Development, and International Cooperation Instrument (NDICI) could be considered. For the period 2021–2027, this random enactment has been proposed by the European Commission as part of the discussions on the EU budget, and for the same period, the Commission has proposed a budget of €89.2 billion for NDICI, as 3 billion of euros per year will be allocated to climate actions. In contrast, the European Parliament requested €93 billion. As a second step, the further consolidation and application of the principles of rationality in EU development financing

but also in climate actions outside Europe could be considered. This could be done by developing a single entity, such as the European Bank for Climate and Sustainable Development. This was proposed by the [24] and gave three options:

- building on the European Bank for Reconstruction and Development (EBRD) and the external financing activities of the European Investment Bank (EIB)
- creating a new, well-capitalized institution with mixed ownership (including the European Commission, EIB, EBRD, EU countries and others)
- creating it as an EIB subsidiary.

All these approaches would help the EU achieve its goal. Initially, it would provide funding for climate action and create commitments to reduce gas emissions in most countries. Channels would then be developed for the EU industry to enter new, pioneering markets. Finally, it would provide a foreign policy dividend for the EU, helping the economic development of its countries [25].

Mobilizing Industry for a Clean and Circular Economy

Mainly, 50% of the total gas emissions are attributed to resource extraction but also to the processing of material resources, food, and fuel. These factors also affect biodiversity, as a 90% loss of it is observed. Also, only 12% of EU materials come from recycling. A key parameter is inclusion in the digital and green transformations, as they theoretically go hand in hand and have the potential to expand sustainable economic activity [27]. According to the Industrial Strategy, which was released in March 2020, three key priorities are outlined. The first reflects climate neutrality by 2050; the second outlines maintaining global competitiveness and maintaining a level playing field; and the last is the digitization of Europe [24]. In this context, the main challenge is to develop a series of actions and projects aligned with the European Green Deal.

Climate Action

As mentioned above, climate action is at the heart of the European Green Deal. By 2050, EU aims to be climate neutral and as a result all Member States are required to implement climate policies. In exchange, The European Commission will help the nations design and implement reforms that support their climate ambitions [28].

Environment and Oceans

Europe's main concern is to protect the environment, seas and oceans, which are a source of natural and economic wealth. The European Green Deal prioritizes the protection of biodiversity and ecosystems and reducing air, water and soil pollution [29].

Energy

With the main goal of transitioning to clean energy, this agreement focuses on 3 basic principles that will also contribute to improving the quality of life of citizens. The first basic principle is to ensure a secure and affordable EU energy supply. The second principle is the development of a fully integrated, digitalised and interconnected EU energy market. The last principle is to prioritize energy efficiency [30].

Transport

The percentage of transport emissions corresponds to 25% of the total EU greenhouse gas emissions and has been continuously increasing in recent years. In addition to transport emissions, there is noise, congestion and traffic accidents. The EU's goal by 2050 is to be the first climate-neutral continent, and a 90% reduction in greenhouse gas emissions requires ambitious changes in transport [31].

Agriculture

The sustainability strategy links the health of society and people to a healthy planet and therefore puts sustainable food systems at the heart of the European Green Deal. This design aims to stimulate the economy and improve people's quality of life and health, while at the same time taking care of nature. Therefore, the transition to a sustainable food system can bring socio-economic, environmental and clearly health benefits. A key objective of the EU is to reduce the environmental and climate footprint of the food system and to strengthen the resilience [32].

Finance and Regional Development

To achieve the targets set by the European Green Deal, the Commission should commit at least €1 trillion in sustainable investment over the next decade. At least 37% of the financing EU countries receive, must be dedicated to investments and reforms that support climate goals. Sustainable finance measures will help the European Green Deal by boosting private sector investment in green and sustainable projects. The financing measures include the Classification Regulation for the classification of green investments [33].

Industry

The main goal of the European Green Deal is to achieve climate neutrality by 2050. To make this happen, all industrial value chains will have to play a key role, and global markets will have to tap into the significant potential to produce technologies with lower emissions and more sustainable products and services. Therefore, the full mobilization of industry is needed to achieve a climate-neutral and circular economy [34].

Research and Innovation

The role of research and innovation in the European Green Deal is to drive transformative change. It is an opportunity to turn to a fair and sustainable future, but also to modernize the EU's socio-economic standards. The necessary transitions will be made through research and innovation, while at the same time, de-risking solutions will take place [35].

To enable a holistic analysis of the sustainability disclosures made by oil and gas firms, the current study draws upon an integrated theoretical framework. Institutional theory [10] explains the impact of external pressures, such as regulatory and societal expectations as well as industry norms, on firm behavior and reporting practices. Additionally, legitimacy theory, supported by critical debates on greenwashing [11,14], encourages an examination of whether corporate sustainability disclosures actually mirror performance enhancements or chiefly serve to impart reputational legitimacy through superficial compliance with standards. The combined framework guides the subsequent content analysis of the disclosures and contextual assessments.

ADAPTATION STRATEGIES TOWARDS SUSTAINABLE DEVELOPMENT

Linkage of the UN 2030 Agenda and the Oil and Gas Industry

At the United Nations General Assembly, which took place in September 2015, countries around the world signed the 2030 Agenda for Sustainable Development and the 17 SDGs. Together with the 2030 Agenda, the Paris Agreement on Climate Change forms the foundations of international cooperation for sustainable development and socio-economic and environmental dimensions. Continued progress towards the SDGs is vital. Through this, the EU's promotion and commitment to sustainable development take place [36].

The 2030 agenda includes a political declaration, a set of 17 SDGs, and 169 targets. Key actions are those related to the well-being of people, with the aim of eradicating poverty and hunger, tackling inequalities, and protecting human rights. Also equally important are the actions for the permanent protection of the planet and its natural resources [29,30]. The UN resolution asserts that the successful completion of the SGD is a national responsibility. The EU has a key, active role as a cohesive factor for the implementation of the SDG in development cooperation and provides statistics and indicators that can be used [37,38].

The oil and gas industry, as a cornerstone of global energy production, intersects with the objectives outlined in the United Nations 2030 Agenda for Sustainable Development. Despite its historical association with environmental challenges, the industry holds the potential to contribute positively to sustainable development when aligned with the principles and goals of the Agenda. This section explores the linkage between the UN 2030 Agenda and the oil and gas industry, highlighting key areas of convergence and opportunities for sustainable practices.

Promotion of Affordable and Clean Energy (SDG 7)

The oil and gas industry is central to providing affordable and reliable energy to meet global demand. However, to align with SDG 7, the industry must transition towards cleaner and more sustainable energy sources. This includes investing in renewable energy technologies, improving energy efficiency in operations, and reducing carbon emissions through measures such as CCS. By embracing these strategies, the industry can contribute to expanding access to clean energy while minimizing its environmental impact.

Integration of Climate Action (SDG 13) and Environmental Sustainability

SDG 13 calls for urgent action to combat climate change, presenting significant challenges and opportunities for the oil and gas industry. The industry is a major contributor to greenhouse gas emissions, primarily through the combustion of fossil fuels. To align with SDG 13, the industry must prioritize emissions reduction efforts, adopt cleaner production practices, and support the development of low-carbon technologies. Additionally, enhancing environmental stewardship through measures such as habitat restoration and biodiversity conservation can further contribute to SDGs.

Facilitation of Sustainable Infrastructure and Innovation (SDG 9)

SDG 9 emphasizes the importance of building resilient infrastructure and promoting sustainable industrialization, areas where the oil and gas industry plays a critical role. This industry provides the infrastructure necessary for energy production and distribution, supporting economic development and access to modern energy services. To align with SDG 9, the industry can invest in innovation and research to develop cleaner technologies, improve operational efficiency, and promote sustainable practices throughout the value chain. Additionally, collaboration with governments and stakeholders can facilitate the development of sustainable infrastructure projects that benefit local communities and contribute to inclusive growth.

Cross-Cutting Implications for Sustainable Development

The linkage between the UN 2030 Agenda and the oil and gas industry extends beyond individual goals, with cross-cutting implications for sustainable development. The industry has a responsibility to address social, economic, and environmental challenges associated with its operations, including issues such as human rights, community engagement, and transparency. By integrating sustainability principles into corporate strategies, adopting best practices in governance and accountability, and engaging with stakeholders, the industry can contribute to advancing SDGs and fostering a more equitable and resilient future.

In summary, the UN 2030 Agenda presents both challenges and opportunities for the oil and gas industry to transition towards more sustainable practices. By embracing innovation, promoting environmental stewardship, and fostering collaboration, industry can play a constructive role in advancing SDGs and contributing to a more sustainable energy future.

Corporate Agility Strategies in the Oil and Gas Industry

The oil and gas industry, a cornerstone of global energy production, faces multifaceted challenges in the wake of global crises and market volatility. The fluctuating prices of oil and natural gas, coupled with geopolitical uncertainties and environmental concerns, have compelled oil companies to reevaluate their strategies, enhance competitiveness, and contribute to national development agendas. In this context, the adoption of agility systems emerges as a transformative approach, offering flexibility, responsiveness, and resilience to navigate the complexities of the industry.

Amidst rapid technological advancements and shifting market dynamics, the application of agility systems has gained prominence as a catalyst for sustainable growth and development within the oil and gas sector [39]. These systems encompass a holistic framework that encompasses production strategies, human resources management, technological utilization, and overall management practices. By integrating agility into various facets of operations, oil companies aim to streamline processes, optimize resource utilization, and enhance operational efficiency while mitigating risks and maximizing returns [15,40,41]. The key pillars of corporate agility strategies in oil and gas industry are depicted in Figure 1.

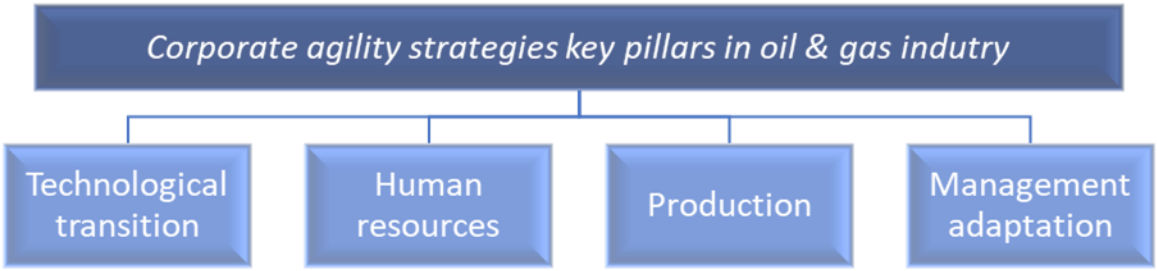

Figure 1. Depiction of corporate agility strategies' key pillars in the oil and gas industry.

Strategies for Technological Transition

The term technology means the knowledge and use of a collection of technological methods, systems, and productive tools that will help solve unforeseen problems and meet various needs [42]. The application of available technology resources is done through the qualified and specially trained human resources of each company. An oil and gas company, in order to increase its productivity, seeks to improve flexibility through its

resources, techniques, tools, and skills [43]. During the implementation of these in the context of the industry, the resolution of many issues is achieved. First, through the use of new technologies, for example, electromagnetic or seismic methods, the time to explore an area is reduced while it is done in a more efficient way. Consequently, the exploitation of the available resources takes place earlier, the processing stage will be carried out earlier, and therefore the time of delivery of the resources to the respective customer will be reduced [44]. A key issue is the implementation of technological achievements to be developed as quickly as possible and at the lowest cost.

Strategies for Human Resources Advancement

Effective utilization of technology hinges upon a skilled and competent workforce. As such, companies prioritize the recruitment of qualified personnel equipped with the requisite technical expertise [45]. Assessing prospective employees' qualifications, capabilities, and adaptability to high-pressure situations is essential to ensuring the successful implementation of agility systems. Continuous training and development initiatives are critical to enriching employees' knowledge, enhancing their skills, and fostering adaptability to evolving technological landscapes. By investing in human capital, oil companies cultivate a culture of innovation, resilience, and operational excellence essential for sustainable growth and development.

Production Strategies

Optimizing production strategies is fundamental to maximizing efficiency and productivity across the oil and gas value chain. A comprehensive analysis of past production methods serves as the foundation for devising future strategies. From exploration and drilling to storage and transportation, companies must meticulously plan and execute each stage of the production process [45,46]. This includes identifying promising geological structures, conducting exploratory drilling, and scaling up operations upon confirmation of economically viable reserves. By meticulously managing each production stage, companies can streamline operations, minimize inefficiencies, and capitalize on market opportunities.

Management Adaptation Strategies

The management environment plays a pivotal role in sustaining and enhancing productivity within oil and gas companies [45]. Effective management involves research into new mining opportunities, optimization of human resource allocation, and strategic application of innovative technologies. Additionally, effective management entails structuring organizational hierarchies, devising strategic plans, and implementing robust control mechanisms to monitor and optimize

management practices [47]. By fostering a conducive management environment, oil companies can foster innovation, adaptability, and operational excellence, thereby driving sustainable growth and development.

In summary, the application of agility strategies in the oil and gas industry represents a paradigm shift towards a more resilient, responsive, and sustainable approach to operations. By embracing agility across production strategies, human resources management, technological utilization, and management practices, oil companies can navigate the dynamic challenges of the industry, capitalize on emerging opportunities, and contribute to sustainable development and growth in the long term.

DEPICTION OF SUSTAINABILITY CORPORATE STRATEGIES IN OIL & GAS INDUSTRY

This section focuses on the analysis of agility strategies within the context of the oil and gas industry, with particular emphasis on four key pillars: (a) strategies for technological transition, (b) strategies for human resources advancement, (c) production strategies, and (d) management adaptation strategies. Drawing inspiration from the global energy market, where sustainability initiatives have been pivotal in shaping green and environmentally friendly infrastructures [4,15], this analysis seeks to elucidate how oil and gas companies can leverage agility strategies to drive sustainable development. It is noteworthy that the oil and gas sector's agility strategies are directed towards navigating a dynamic and evolving landscape characterized by technological advancements, changing market dynamics, and societal expectations. Key to this analysis is the integration of the SDGs into the sustainability strategy of oil and gas companies, highlighting the imperative for aligning corporate objectives with broader societal aspirations.

Methodological Framework

The research applies an integrative empirical method that integrates qualitative and quantitative research traditions for an investigation of the corporate strategies undertaken to cope with sustainability problems. Ten multinational companies were purposefully selected with regard to their size, global presence, and availability of long-standing sustainability information. The authors used thematic analysis of sustainability reports, as well as a comparative analysis of the presence of agility attributes and SDG conformity, to outline the main motivators, procedures, and design for the deployment of corporate strategies. This integrative methodology was employed to address the complex and interdisciplinary nature of sustainability programs, and to verify how strategic management theories, particularly those related to resource-based capabilities, institutional pressures, stakeholder responsiveness, and dynamic adaptation, are manifested in the real-world strategies of multinational oil and gas companies. The methodology ensures a holistic understanding of how top

oil and gas companies are integrating sustainability concepts into strategic management in light of shifting regulatory, technology, and market environments.

The first stage of methodology involved a thorough review of available literature. This involved a review of academic papers, industry reports, policy briefs, as well as international programs, such as the SDGs and European Green Deal, respectively. The purpose of this stage was to provide a theoretical foundation of the research by identifying pertinent themes, success factors, as well as hurdles that are involved with sustainable development in the oil and gas sector. Additionally, the conceptual framework used to inform the empirics was also built from knowledge acquired from studying the literature review.

After conducting a review of the literature, analysis using case methodology was performed, focusing on a carefully selected sample of important multinational oil and gas companies. The selection criteria included factors ascertaining the size of the firm, its operation in international markets, as well as access to detailed sustainability and CSR reports. Ten companies were chosen to represent a diversity of geographic regions and operational environments. Information was obtained from the official statements of said corporations, such as their 2022 sustainability reports and information from corporate websites. The selection of 2022 sustainability reports was intentional to ensure both timeliness and analytical comparability. As the most recent complete reporting cycle available at the time of data collection, 2022 reports reflect firms' post-pandemic adjustments, evolving climate commitments, and responses to shifting geopolitical and regulatory contexts. Using reports from a single year ensures that the strategic and technological disclosures analyzed are aligned temporally, thereby enabling meaningful cross-company comparisons. This temporal consistency enhances the validity of the comparative framework used in the analysis.

Given the limitations inherent in self-disclosed statements—commonly used for reputation-building and communications strategies—other sources were also used, including third-party assessments, academic studies, and green monitoring statistics. The process triangulated enabled a more robust analysis of corporate claims and their relation to actual sustainability effect. Further to support this critical analysis, the methodology of shadow accounting was used in the form of comparing corporate disclosures with other sources of data to identify discrepancies between intentions stated and achievements realized.

This study adopts a critical theory approach in examining corporate sustainability reports in the oil and gas sector. Critical theory as explicated in the context of social and environmental accounting [11,12,48] views corporate reports as skewed rather than objective, thus reinforcing dominant power relations and ideological structures. Such disclosures are interpreted as discursive devices that allow corporations to maintain legitimacy at the expense of hiding their extractive nature. In this

theoretical framework, legitimacy theory [9] and institutional theory [8] are not seen as comprehensive explanations but as interconnected mechanisms within large-scale ideological structures that allow symbolic compliance. Sustainability reports thus undergo intense scrutiny with respect to the stories told, the silences maintained, and the strategic ambiguity created. The use of shadow accounts further strengthens this analysis by revealing counter-data and alternative narratives, thus challenging the credibility and completeness of corporate reports.

To strengthen the critical dimension of this study, the notion of shadow accounting was draw up, involving the evaluation of corporate sustainability disclosures against alternative sources of data in order to reveal discrepancies, omissions, or cases of mere symbolic compliance. Shadow accounting, as developed within the critical accounting literature [12], is particularly relevant in industries with high environmental footprint, like oil and gas, where the gap between declared sustainability commitments and actual business practices is often apparent. To apply this methodological approach, a triangulated set of independent, non-corporate sources, comprising civil society reports and various transparency benchmarks was used. Specifically, the shadow account sources used in this research, include the Carbon Tracker Initiative [49], which provides data on the risks of fossil fuel assets, stranded carbon, and compliance with pathways aligned with keeping global warming within the 1.5 °C limit. The Transition Pathway Initiative (TPI) [50] offers benchmarks to measure corporate carbon performance and alignment with the Paris Agreement's goals, while the Science Based Targets initiative (SBTi) [51] validates the credibility and ambition of climate targets against scientifically determined thresholds. CDP (formerly Carbon Disclosure Project) [52] data were used to check the quality of environmental disclosures, measure emissions performance, and gauge risk assessment transparency.

In addition, the extensive assessments by non-state actors like WWF and Greenpeace [53] were considered since these provide diverse perspectives with a focus on the environmental and social impacts of continuing oil and gas activities. InfluenceMap [54] was also used to determine advocacy and lobbying activities in terms of climate goals. These different sources were used to complement and contrast with the self-reported information gathered from company sustainability reports in order to conduct a critical theory-led analysis of the character of disclosure and alignment with true sustainability performance. This methodological design also adds to the enhanced empirical strength of the study and contributes to alleviating the problems of legitimacy and reliability in the scholastic literature regarding greenwashing and unsubstantiated company behavior [13]. The analysis centered on two broad areas: (i) the strategic implementation of corporate agility across four interconnected dimensions—technological innovation, human capital, production systems, and managerial adaptation—and (ii) the

alignment of these strategic approaches with the SDGs. The technological practices discussed are interpreted as operational expressions of these broader strategic choices. A comparative evaluation approach was adopted, categorically analyzing and examining the range and intensity of initiatives by the chosen firms. The data were presented in tabular form to demonstrate patterns, commonalities, and differences between the firms, hence shedding light on patterns of today as well as best practices in the industry.

The use of a mixed-methodological approach allowed triangulation of results, increasing the credibility and reliability of findings [11,55]. Combining theoretical concepts with empirical evidence, including counter-reporting perspectives, provided a richer understanding of strategic responses in the oil and gas industry. Overall, the methodology used in this research allows a structured and extensive analysis of reactions of firms to sustainability issues, having important implications for scholars, practitioners, and policymakers.

Oil and Gas Companies Review

Sustainability initiatives within oil and gas companies are fundamental components of the industry's transition towards environmental responsibility, particularly as this industry significantly affects climate change implications. Also, the comprehensive review of agility strategies within the oil and gas industry, anchored by the operational contexts of key industry players, offers actionable insights that can inform strategic decision-making and drive sustainable development. By adopting a holistic approach that integrates agility strategies with sustainability objectives, these companies can position themselves as leaders in fostering positive change and contributing to a more sustainable energy future. Based on the above, the results of the analysis regarding actions taken by company's management for the incorporation of the four identified agility pillars as well as the SDGs into their sustainability strategy, are given in the tables below (Tables 1 and 2).

Table 1. Key elements of corporate agility strategies in oil and gas companies *.

Agility Pillar	Oil and Gas Company									
	Sinopec	Phillips 66	Saudi Aram-co	Shell	BP	Exxon Mobil	Total	Chevron	Gazprom	Marathon
Technological transition	X	X	X	X	X	X	X	X	X	X
Human resources	X	X	X	X	X	X	X	X	X	X
Production	X	X	X	X	X	X	X	X	X	X
Management adaptation	X	X	X	X	X	X	X	X	X	X

* Although all companies exhibit engagement across the four agility pillars, this table supports a comparative analysis of the breadth and institutional integration of each pillar, highlighting convergence and variation in strategic orientation.

Table 1 illustrates that each organization is engaging with the four underlying dimensions of agility strategies. However, the significance of the table lies in its presentation of the widespread institutionalization of these underlying elements. This allows for comparisons to be made across various companies. For instance, while organizations might adopt technological innovation, the integration into overarching strategic frameworks—such as the nexus between digital innovation and decarbonization goals or the integration of human resource development within a sustainability-focused culture—differ in method and extent. This structural convergence with depth divergence strengthens our analysis of strategic agility trends within the sector. According to the analysis results, companies across the industry are at the forefront of this transformation, leveraging innovative technologies and strategic initiatives to address pressing environmental concerns while enhancing operational efficiency. From renewable energy investments to carbon capture solutions, these companies are spearheading the transition towards cleaner energy sources and sustainable practices. Moreover, their commitment to talent development and human capital management underscores a holistic approach to sustainability, ensuring that the workforce is equipped with the skills and capabilities needed for a rapidly evolving energy landscape. Figure 2 below visualizes the intensity of implementation for each agility strategy pillar across the ten oil and gas companies.

The strategy map outlined in this research was developed through a qualitative thematic mapping approach. Critical elements of the described corporate strategy were extracted from the sustainability reports of ten organizations, systematically grouped into four strategic pillars, technological transition, production innovation, human resource development, and management adaptation, and evaluated for their prevalence and importance. These elements were combined in a visual matrix to represent the strategic convergence and divergence evident within the sample. This mapping method allows for comparative analysis of how players in the oil and gas industry articulate their commitment to sustainability goals. For the purposes of this research, corporate strategy is conceived as a coherent collection of initiatives and disclosures used by organizations to embed environmental and social factors within their core business model. This includes both operationally oriented strategies (e.g., carbon capture, low-carbon fuels, digital emissions monitoring) and symbolically oriented strategies (e.g., invocation of the SDGs, net-zero ambitions, stakeholder consultation). These strategies are recognized as operating both substantive and reputational functions, and this paper discusses the tensions that arise between these two facets using the lens of legitimacy theory and shadow accounting.

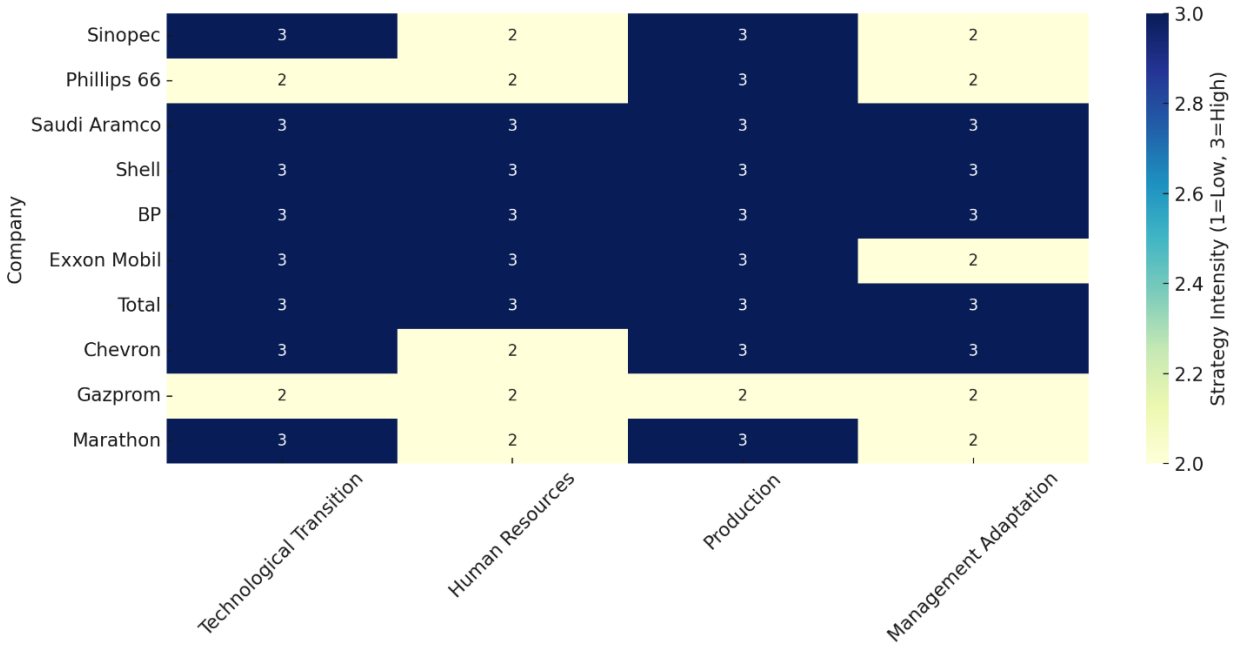

Figure 2. Heatmap of corporate agility strategy intensity by company.

Several of the sample companies report on the deployment of advanced technologies aimed at reducing environmental impact. These include CCS projects, such as ExxonMobil's involvement in the LaBarge facility and Shell's Quest project, and digital methane leak detection programs based on satellites and drones (TotalEnergies, BP), as well as early investments in green hydrogen and biofuels. Although these developments reflect recognition of the need for operational transformation, independent assessments suggest that the reductions in carbon intensity and net emissions achieved to date remain relatively modest. For instance, the International Energy Agency [56] notes that the worldwide deployment of CCS currently targets less than 0.1% of emissions generated by the oil and gas industry. Similarly, CDP scores and Transition Pathway Initiative (TPI) benchmarks demonstrate that many of the companies fail to meet the criteria for alignment with 1.5 °C pathways despite their technological investments. These findings highlight the importance of distinguishing between the potential of technology and environmental performance in practice. Accordingly, caution in taking these developments as definitive measures of successful sustainability performance is recommended, instead casting them as incremental, ongoing efforts within a transition framework.

More specifically, Shell and BP, for instance, have invested significantly in technology-driven solutions such as Shell's CANSOLV CO_2 system and BP's methane detection technologies to address environmental challenges. These initiatives underscore their commitment to mitigating greenhouse gas emissions and transitioning towards cleaner energy sources. Furthermore, both companies prioritize human resources management through programs like the Shell People Survey and BP Pulse, aimed at fostering employee engagement and satisfaction amidst organizational

restructuring and the COVID-19 pandemic. Similarly, Total Energies and ExxonMobil have embraced renewable energy investments and carbon capture solutions as part of their sustainability agendas. Total Energies' focus on biofuels and hydrogen production aligns with its ambitious goal of becoming a major player in global electricity production from renewable sources. ExxonMobil's partnerships with tech giants like Microsoft and IBM reflect its commitment to digital innovation and operational efficiency enhancements. Moreover, these companies emphasize talent development and training initiatives to equip their workforce with the skills needed for the energy transition, demonstrating a holistic approach to human capital management.

Chevron and Gazprom prioritize technology-driven emissions reduction initiatives, such as infrared cameras and methane detection systems, to enhance environmental performance. Chevron's strategic focus on talent development and purposeful human capital management underscores its commitment to building a skilled and adaptable workforce. Gazprom's efforts to raise environmental awareness among employees and local communities highlight its dedication to sustainability and social responsibility, contributing to a more holistic approach to energy production and management. Marathon Oil's investment in technology-based projects, including infrared cameras and Reduced Emissions Completions (RECs), exemplifies its commitment to emissions reduction and operational excellence. The company's emphasis on digital training and leadership programs underscores its proactive approach to human capital development. Moreover, Marathon Oil's commitment to responsible operations management and risk mitigation strategies reflects its dedication to transparency, regulatory compliance, and long-term sustainability in the energy sector.

In conclusion, these oil and gas companies are taking proactive steps to address environmental challenges, enhance operational efficiency, and foster talent development. By leveraging technology, implementing sustainable practices, and prioritizing human capital management, they are driving positive change and contributing to the transition towards a more sustainable energy future. The agility strategy pursued by the reviewed companies is characterized by a proactive approach to addressing emerging challenges and opportunities in the energy sector. These companies have demonstrated a willingness to adapt to changing market dynamics and regulatory landscapes by investing in innovative technologies and sustainable practices. For example, Shell's emphasis on CCS technologies highlights its commitment to reducing emissions and mitigating environmental impact. Similarly, BP's focus on renewable energy research and development reflects its recognition of the growing importance of clean energy sources in the global energy mix.

TotalEnergies' investment in biofuels and renewable electricity generation underscores its agility in responding to evolving consumer preferences and regulatory requirements. ExxonMobil's collaboration

with digital leaders like Microsoft (Redmond, Washington, USA) and IBM (Armonk, New York, USA) showcases its agility in leveraging cutting-edge technologies to optimize operations and drive efficiency gains. Chevron's creation of Chevron New Energies demonstrates its agility in diversifying its energy portfolio and positioning itself for long-term success in a rapidly changing energy landscape. Gazprom's establishment of Gazprom Hydrogen and its efforts to monitor methane emissions using satellite technology highlight its agility in pursuing low-carbon solutions and embracing innovation. Marathon Oil's adoption of infrared cameras and RECs exemplifies its agility in implementing cost-effective solutions to enhance environmental performance while maintaining operational excellence. Overall, the agility strategy adopted by these energy companies enables them to navigate uncertainties and seize opportunities in a dynamic business environment, positioning them for sustainable growth and resilience in the face of future challenges.

As depicted in Table 2, the integration of SDGs into the sustainability strategies of the reviewed companies demonstrates a concerted effort to address global challenges while promoting sustainable development. Each company's approach aligns with specific SDGs, reflecting a commitment to environmental stewardship, social responsibility, and economic prosperity.

Table 2. Reportedelements of SDG's incorporation in oil and gas companies' sustainability strategy *.

SDG	Oil and Gas Company									
	Sinopec	**Phillips 66**	**Saudi Aram-Co**	**Shell**	**BP**	**Exxon Mobil**	**Total**	**Chevron**	**Gazprom**	**Marathon**
1	X	-	-	-	X	X	-	X	X	-
2	X	X	-	-	-	-	-	-	X	X
3	X	X	X	X	X	X	X	X	X	X
4	X	X	X	X	X	X	X	X	X	X
5	X	X	X	X	X	X	X	X	X	X
6	X	-	X	X	X	X	X	X	X	X
7	X	X	X	X	X	X	X	X	X	X
8	X	X	X	X	X	X	X	X	X	X
9	X	X	-	X	X	-	X	X	X	-
10	X	X	X	X	X	X	X	X	X	X
11	X	-	-	-	X	-	X	-	X	-
12	X	X	X	X	X	X	X	X	X	X
13	X	X	X	X	X	X	X	X	X	X
14	X	X	X	X	X	X	X	X	X	X
15	X	X	X	X	X	X	X	X	X	X
16	X	-	-	X	X	X	X	X	X	X
17	X	X	X	X	X	X	X	X	X	X

* Data are based on company disclosures and do not in themselves confirm actual impact performance. Where possible, independent sources are referenced to contrast and contextualize these claims [57–63].

Sinopec's sustainability strategy incorporates SDGs such as Goal 7 (Affordable and Clean Energy), Goal 9 (Industry, Innovation, and Infrastructure), Goal 13 (Climate Action), and Goal 17 (Partnerships for the

Goals). The company focuses on renewable energy investments, technological innovations for emissions reduction, climate mitigation efforts, and partnerships to advance sustainable development. Phillips 66's sustainability initiatives target SDGs related to Goal 7 (Affordable and Clean Energy), Goal 9 (Industry, Innovation, and Infrastructure), Goal 12 (Responsible Consumption and Production), and Goal 13 (Climate Action). The company emphasizes renewable energy projects, innovation in energy infrastructure, responsible resource management, and climate mitigation strategies. Saudi Aramco's sustainability framework aligns with SDGs such as Goal 7 (Affordable and Clean Energy), Goal 9 (Industry, Innovation, and Infrastructure), Goal 13 (Climate Action), and Goal 17 (Partnerships for the Goals). The company invests in renewable energy ventures, fosters innovation in the energy sector, implements climate mitigation measures, and collaborates with stakeholders to promote sustainable development.

Shell plc's sustainability strategy addresses SDGs including Goal 7 (Affordable and Clean Energy), Goal 9 (Industry, Innovation, and Infrastructure), Goal 13 (Climate Action), and Goal 17 (Partnerships for the Goals). The company focuses on renewable energy investments, technological advancements in energy infrastructure, climate change mitigation, and partnerships for sustainable development. BP's sustainability initiatives target SDGs related to Goal 7 (Affordable and Clean Energy), Goal 9 (Industry, Innovation, and Infrastructure), Goal 13 (Climate Action), and Goal 17 (Partnerships for the Goals). The company emphasizes renewable energy projects, innovation in energy infrastructure, climate mitigation efforts, and collaboration with stakeholders to advance sustainable development. ExxonMobil's sustainability framework aligns with SDGs such as Goal 7 (Affordable and Clean Energy), Goal 9 (Industry, Innovation, and Infrastructure), Goal 13 (Climate Action), and Goal 17 (Partnerships for the Goals). The company invests in renewable energy projects, fosters innovation in energy infrastructure, implements climate mitigation measures, and collaborates with stakeholders to promote sustainable development.

TotalEnergies' sustainability strategy addresses SDGs including Goal 7 (Affordable and Clean Energy), Goal 9 (Industry, Innovation, and Infrastructure), Goal 13 (Climate Action), and Goal 17 (Partnerships for the Goals). The company focuses on renewable energy investments, technological advancements in energy infrastructure, climate change mitigation, and partnerships for sustainable development. Chevron's sustainability initiatives target SDGs related to Goal 7 (Affordable and Clean Energy), Goal 9 (Industry, Innovation, and Infrastructure), Goal 13 (Climate Action), and Goal 17 (Partnerships for the Goals). The company emphasizes renewable energy projects, innovation in energy infrastructure, climate mitigation efforts, and collaboration with stakeholders to advance sustainable development. Gazprom integrates SDGs into its sustainability framework, addressing goals such as Goal 2

(Zero Hunger), Goal 3 (Good Health and Well-being), Goal 4 (Quality Education), Goal 5 (Gender Equality), Goal 6 (Clean Water and Sanitation), Goal 8 (Decent Work and Economic Growth), Goal 10 (Reduced Inequality), Goal 12 (Responsible Consumption and Production), Goal 14 (Life Below Water), and Goal 16 (Peace, Justice, and Strong Institutions). The company prioritizes poverty alleviation, healthcare access, education, gender equality, water conservation, workforce development, and responsible resource management.

Marathon Oil's sustainability strategy encompasses SDGs such as Goal 2 (Zero Hunger), Goal 3 (Good Health and Well-being), Goal 4 (Quality Education), Goal 5 (Gender Equality), Goal 6 (Clean Water and Sanitation), Goal 8 (Decent Work and Economic Growth), Goal 10 (Reduced Inequality), Goal 12 (Responsible Consumption and Production), Goal 13 (Climate Action), Goal 14 (Life Below Water), and Goal 16 (Peace, Justice, and Strong Institutions). The company focuses on poverty alleviation, healthcare access, education, gender equality, water conservation, workforce development, climate mitigation, and environmental conservation. Overall, the incorporation of SDGs into the sustainability strategies of these oil and gas companies underscores their commitment to addressing global challenges and advancing sustainable development across environmental, social, and economic dimensions.

DISCUSSION

The outcomes identified by this research are consistent with the strategies pursued by leading oil and gas companies in their pursuit of sustainable development. However, there is a need to differentiate between professed goals and reality. While most of such businesses claim large sustainability goals, external audits often identify mismatches between stated goals and working practices. For instance, many within the cohort under analysis continue to increase upstream oil activity, even though they claim to pursue net-zero targets, which serves to highlight inconsistencies that need further investigation [1,15]. Against the backdrop of a rapidly evolving global energy landscape, these companies have demonstrated a commitment to addressing environmental challenges, enhancing operational efficiency, and fostering talent development. The agility strategy pursued by these companies is characterized by a proactive approach to addressing emerging challenges and opportunities in the energy sector. Leveraging innovative technologies and strategic initiatives, they have shown a willingness to adapt to changing market dynamics and regulatory landscapes [42,45]. For example, Shell's emphasis on CCS technologies underscores its commitment to reducing emissions and mitigating environmental impact. Similarly, BP's focus on renewable energy research and development reflects its recognition of the growing importance of clean energy sources. It is important to clarify that, in spite of many corporate case studies presenting specific technological or operational initiatives, these are

expressed as markers of strategic agility. To wit, these initiatives do not represent final ends; instead, they represent symbols of pieces of overall corporate strategies to improve resilience, responsiveness, and alignment with principles of sustainability. In this context, the concept of strategy encompasses not just governance reforms and public engagement but also redirecting investments and technological improvement.

Those identified strategic responses can be placed in the theoretical context of dynamic capabilities, particularly as organizations go through repeated learning routines, sensing possibilities, and recombining their resources for dealing with sustainability problems. From an institutional theory perspective, such disclosure practices may reflect efforts to conform to dominant expectations from regulatory bodies, financial institutions, and global sustainability benchmarks. Simultaneously, legitimacy theory helps to explain how these disclosures may be used strategically to preserve reputational standing and reduce external scrutiny, even when operational transformation is limited. Institutional pressures, regulatory, normative, or cognitive, are seen in isomorphism of the language about sustainability across organisations, irrespective of differences in performance outcomes. The inclusion of these viewpoints adds analytical depth to this research.

To address, the use of counter-reporting and shadow accounts was employed where possible. This strategy includes the referencing of reports by non-governmental organization watchdogs, emissions data sourced from independent bodies, and investigative journalism related to corporate behavior. These sources are used to place corporate claims in context and to reveal instances where sustainability rhetoric might not align with environmental performance in reality. While this analysis is exploratory, it provides a foundation for further, more detailed counter-accounting studies in future research. Using this framework, evidence arose that many disclosures represent not only strategic change but also attempts to retain or regain legitimacy amidst growing stakeholder scrutiny. For instance, corporations often highlight low-carbon investments and community development programs while presenting less detailed information on their continued upstream fossil fuel activities. From an institutional perspective, this would suggest the existence of mimetic isomorphism, in that firms couple the reporting practices of their peers and the perceived expectations of stakeholders.

To facilitate a more detailed analysis of the factors that affect corporate strategic decision-making, a study was undertaken to examine how corporations respond to salient external factors such as regulatory mandates, stakeholder pressures, and technology developments. Internal factors such as organizational culture, management style, and risk management skills were also examined. Overall, each of these factors plays considerable influence in shaping the respective frameworks of each firm's agility as well as inform the setting of and prioritization of sustainability goals. While Table 1 demonstrates that each firm has had

involvement with the four categories of strategies, this does not necessarily represent uniformity of application or sophistication. Instead, it suggests that large companies comprehend the inherent complexity surrounding the need for agility. The table must therefore not be read as a binary (used/not used) but rather as a structural description to determine the presence of different themes. The qualitative results show differences in priorities, scope of innovation, and implementation regarding sustainability along each axis.

Furthermore, the integration of SDGs into the sustainability strategies of these companies underscores their commitment to addressing global challenges while promoting sustainable development [3,64]. Each company's approach aligns with specific SDGs, reflecting a dedication to environmental stewardship, social responsibility, and economic prosperity. For instance, Sinopec's sustainability strategy incorporates SDGs related to affordable and clean energy, industry innovation and infrastructure, climate action, and partnerships for the goals. The company focuses on renewable energy investments, technological innovations for emissions reduction, climate mitigation efforts, and partnerships to advance sustainable development.

Phillips 66's sustainability initiatives target SDGs related to affordable and clean energy, industry innovation and infrastructure, responsible consumption and production, and climate action. The company emphasizes renewable energy projects, innovation in energy infrastructure, responsible resource management, and climate mitigation strategies. Saudi Aramco's sustainability framework aligns with SDGs such as affordable and clean energy, industry innovation and infrastructure, climate action, and partnerships for the goals. The company invests in renewable energy ventures, fosters innovation in the energy sector, implements climate mitigation measures, and collaborates with stakeholders to promote sustainable development.

Similarly, Shell plc, BP, ExxonMobil, TotalEnergies, Chevron, Gazprom, and Marathon Oil integrate SDGs into their sustainability frameworks, addressing goals such as affordable and clean energy, industry innovation and infrastructure, climate action, responsible consumption and production, good health and well-being, quality education, gender equality, clean water and sanitation, decent work and economic growth, reduced inequality, life below water, and peace, justice, and strong institutions. These companies prioritize poverty alleviation, healthcare access, education, gender equality, water conservation, workforce development, climate mitigation, and environmental conservation as part of their sustainability strategies.

The analysis of sustainability and corporate agility strategies in the ten firms shows trends consistent with classical strategic frameworks. Companies like Shell and TotalEnergies, for example, are models of dynamic capabilities in action, adjusting their portfolios and processes to meet regulatory demands as well as shifts in the market. Institutional

theory is also evident in the companies' conformity to global sustainability standards, such as the SDGs and the European Green Deal. By placing the empirical findings in theoretical contexts, this study deepens the knowledge of how strategy is formed and executed under the constraints of sustainability.

In summary, the incorporation of SDGs into the sustainability strategies of oil and gas companies underscores their commitment to addressing global challenges and advancing sustainable development across environmental, social, and economic dimensions [4,25,65]. Through their agility strategies and alignment with SDGs, these companies are driving positive change and contributing to the transition towards a more sustainable energy future through the lens of critical theory, the strategic use of sustainability disclosures emerges as a form of symbolic action, aimed at preserving institutional legitimacy while limiting structural change. Patterns observed in SDG alignment, carbon intensity metrics, and stakeholder narratives illustrate how firms selectively curate information to construct reputational capital. Shadow accounts reveal these tensions, exposing a disjuncture between reported aspirations and underlying business practices. This reinforces the view that voluntary disclosures often function as ideological mechanisms rather than transparent records of sustainability performance.

Consistent with legitimacy theory and critical sustainability scholarship, of particular importance here is the recognition that corporate sustainability disclosures can play not only informational but also strategic and symbolic purposes. Disclosures from many companies serve to advance stronger ties with currently prevailing societal norms, avoid regulation and oversight, and defuse reputational risks [10,14]. This research identifies cases where the promise of strategic adjustment, technological innovation, and SDG alignment is given prominent visibility in corporate reports; however, there is a significant absence of clear empirical evidence on the actual environmental effectiveness of such measures. This trend illustrates the phenomenon of symbolic legitimation [11,66], where discourses of sustainability are used to signal compliance and responsibility without actually reflecting on true transformative results. Several organizations in our sample have made commitments to carbon neutrality by 2050 while continuing to make upstream investments in oil production; the inconsistency has also already been noted in external assessments by Influence Map and the TPI. These findings highlight the need for a critical approach to sustainability reporting and call for the application of shadow accounting practices as a necessary supplement to narrative-based disclosures.

More specifically, while many oil and gas companies present comprehensive ESG stories, the evidence reveals ongoing patterns of selective disclosure, highlighting low-carbon technologies while downplaying the centrality of fossil fuel expansion. Relying on intensity-based emissions measures, in place of absolute reductions, allows firms to

claim progress while overall carbon emissions continue to increase. In addition, other sources such as Influence Map and CDP present evidence that many firms publicly support net-zero targets while also lobbying against climate legislation, demonstrating a disconnect between symbolic communication and everyday business practices. In addition, SDG alignment tends to be communicated in loose language, accompanied by lacking proof of measurable contributions or independent confirmation. These findings support critical research into sustainability reporting, which proposes it is frequently a legitimacy-seeking and potentially symbolic practice, particularly when used in the absence of robust performance verification. Through the inclusion of shadow accounts, this research discloses the gaps between talk and walk and emphasizes the strategic use of disclosures to shape public opinion rather than achieve meaningful change.

CONCLUSIONS

The oil and gas industry stands at a pivotal juncture, grappling with the imperative to reconcile economic prosperity with environmental sustainability and social responsibility. As societies worldwide confront the urgent need to transition towards low-carbon economies, oil and gas companies are compelled to reassess their corporate strategies through the lens of sustainable development. This comprehensive examination of corporate strategies within the oil and gas industry has shed light on the diverse approaches adopted by leading companies. From renewable energy investments to carbon capture solutions, these companies are leveraging innovative technologies and strategic initiatives to address pressing environmental concerns while enhancing operational efficiency. Moreover, their commitment to talent development and human capital management underscores a holistic approach to sustainability, ensuring that the workforce is equipped with the skills and capabilities needed for a rapidly evolving energy landscape.

The agility strategy pursued by oil and gas companies is characterized by a proactive approach to addressing emerging challenges and opportunities in the energy sector. By investing in innovative technologies, embracing sustainable practices, and fostering talent development, these companies demonstrate a willingness to adapt and evolve in a rapidly changing environment. The incorporation of SDGs into the sustainability strategies of oil and gas companies underscores their dedication to addressing global challenges and promoting sustainable development across environmental, social, and economic dimensions. By aligning their strategies with specific SDGs, these companies are driving positive change and contributing to the transition towards a more sustainable energy future.

However, it is essential to acknowledge the inherent complexities and trade-offs involved in the pursuit of sustainable development within the oil and gas industry. While companies strive to mitigate risks, enhance

resilience, and unlock opportunities for sustainable growth, they must navigate context-specific challenges, market dynamics, and stakeholder expectations. Moving forward, policymakers, businesses, and stakeholders must collaborate to foster a more sustainable energy landscape. By embracing cleaner technologies, promoting stakeholder engagement, implementing robust governance structures, and aligning with international sustainability frameworks, oil and gas companies can chart a course towards a more sustainable and equitable future. In conclusion, the evaluation of corporate strategies towards sustainable development in the oil and gas industry is crucial for navigating the transition towards a more sustainable energy landscape. Through pragmatic solutions and pathways informed by multi-dimensional analysis, this paper aims to contribute to the ongoing dialogue on sustainability, empowering stakeholders to thrive in an era of unprecedented change and uncertainty.

DATA AVAILABILITY

All data generated from the study are available in the manuscript.

AUTHOR CONTRIBUTIONS

Conceptualization, DD and MS; Methodology, DD, MS and AK; Formal Analysis, AK and VE; Investigation VE; Resources, VE; Data Curation, AK and VE; Writing—Original Draft Preparation, MS, AK and VE; Writing—Review & Editing, DD, MS and AK; Visualization, MS and AK; Supervision, DD and AK; Project Administration, DD.

FUNDING

Not applicable.

ACKNOWLEDGMENTS

Not applicable.

CONFLICTS OF INTEREST

The authors declare that there is no conflicts of interest.

REFERENCES

1. Sartzetaki M, Karampini T, Karagkouni A, Drimpetas E, Dimitriou D. Circular economy strategies in supply chain management: An evaluation framework for airport operators. Front Sustain. 2025;6:1558706. doi: 10.3389/frsus.2025.1558706.
2. Dimitriou D, Karagkouni A. Assortment of airports' sustainability strategy: A comprehensiveness analysis framework. Int J Sustain. 2022a;14(7):4217. doi: 10.3390/su14074217.
3. Dimitriou D, Sartzetaki M, Karagkouni A. Managing airport corporate performance: Leveraging business intelligence and sustainable transition.

Amsterdam (Netherlands): Elsevier; 2024. ISBN: 978-0-443-29109-8. doi: 10.1016/C2023-0-51427-2.

4. Dimitriou D, Karagkouni A. Du-dilligence of transport infrastructure operators' sustainability: A circular economy driven approach. Front Sustain Circ Econ. 2022;3:916038. doi: 10.3389/frsus.2022.916038.
5. IPCC. Global warming of 1.5 °C. An IPCC special report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. In: Masson-Delmotte V, Zhai P, Pörtner H-O, Roberts D, Skea J, Shukla P. editors. Cambridge (UK): Cambridge University Press; 2022.
6. Barney J. Firm resources and sustained competitive advantage. J Manag. 1991;17(1):99-120. doi: 10.1177/014920639101700108.
7. Teece DJ, Pisano G, Shuen A. Dynamic capabilities and strategic management. Strategic Manag J. 1998;18(7):509-33. doi: 10.1002/(SICI)1097-0266(199708)18:7<509::AID-SMJ882>3.0.CO;2-Z.
8. DiMaggio PJ, Powell WW. The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. Am Sociol Rev. 1983;48(2):147-60. doi: 10.2307/2095101.
9. Suchman MC. Managing legitimacy: Strategic and institutional approaches. Acad Manag Rev. 1995;20(3):571-610. doi: 10.5465/amr.1995.9508080331.
10. Boiral O. Sustainability reports as simulacra? A counter-account of A and A+ GRI reports. Account Auditing Accountab J. 2013;26(7):1036-71. doi: 10.1108/AAAJ-04-2012-00998.
11. Gray R. The social accounting project and accounting, organizations and society: Privileging engagement, imaginings, new accountings and pragmatism over critique? Account Organ Soc. 2002;27(7):687-708. doi: 10.1016/S0361-3682(00)00003-9.
12. Spence C. Social and environmental reporting and hegemonic discourse. Account Auditing Accountab J. 2007;20(6):855-82. doi: 10.1108/09513570710830272.
13. Flower J. The international integrated reporting council: A story of failure. Crit Perspect Account. 2015;27:1-17. doi: 10.1016/j.cpa.2014.07.002.
14. Cho CH, Laine M, Roberts RW, Rodrigue M. Organized hypocrisy, organizational façades, and sustainability reporting. Account Organ Soc. 2015;40:78-94. doi: 10.1016/j.aos.2014.12.003.
15. Banerjee SB. Corporate social responsibility: The good, the bad and the ugly. Crit Sociol. 2008;34(1):51-79. doi: 10.1177/0896920507084623.
16. Dimitriou D. Evaluation of corporate social responsibility performance in air transport enterprise. J Public Adm Governance. 2020;10(2):262-78. doi: 10.5296/jpag.v10i2.16645.
17. Kolk A. Multinationals and corporate social responsibility. Notizie di Politeia. 2010;26(98):138-52.
18. Maak T, Pless N. Responsible leadership in a stakeholder society—A relational perspective. J Bus Ethics. 2006;66:99-115. doi: 10.1007/s10551-006-9047-z.

19. Abdalla Y, Siti-Nabiha AK. Pressures for sustainability practices in an oil and gas company: Evidence from Sudan. Qual Res Account Manag. 2015;12:256-86. doi: 10.1108/QRAM-04-2014-0038.
20. Schaltegger S, Wagner M. Sustainable entrepreneurship and sustainability innovation: Categories and interactions. Bus Strat Env. 2011;20:222-37. doi: 10.1002/bse.682.
21. IPBES. Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. In: Díaz S, Settele J, Brondízio ES, Ngo H, Guèze M, Agard J, et al., editors. Bonn (Germany): IPBES Secretariat; 2019.
22. IRP. Global Resources Outlook 2019: Natural Resources for the Future We Want. In: Oberle B, Bringezu S, Hatfield-Dodds S, Hellweg S, Schandl H, Clement J, et al., editors. Nairobi (Kenya): United Nations Environment Programme; 2019.
23. European Environment Agency. The European Environment—State and Outlook 2020: Knowledge for Transition to a Sustainable Europe. Copenhagen (Denmark): European Environment Agency; 2019. ISBN: 978-92-9480-090-9.
24. European Commission. Making Europe's businesses future-ready: A new Industrial Strategy for a globally competitive, green and digital Europe. 2020 Mar 10. Available from: https://ec.europa.eu/commission/presscorner/api/files/document/print/en/ip_20_416/IP_20_416_EN.pdf. Accessed on 25 Apr 2025.
25. Claeys G, Tagliapietra S, Zachmann G. How to make the European Green Deal work. Bruegel Policy Contribution. 2019; No. 2019/13. Available from: https://www.jstor.org/stable/resrep28626. Accessed on 20 Apr 2025.
26. Dimitriou D, Sartzetaki M. Modified fuzzy TOPSIS assessment framework for defining large transport enterprises business value. Oper Res. 2022;22:6037-53. doi: 10.1007/s12351-022-00719-9.
27. European Commission. COMMUNICATION FROM THE COMMISSION, The European Green Deal. 2019 Dec 11. Available from: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52019DC0640. Accessed on 20 Apr 2025.
28. Fetting C. The European Green Deal. ESDN Report. 2020 Dec. Available from: https://www.esdn.eu/fileadmin/ESDN_Reports/ESDN_Report_2_2020.pdf. Accessed on 20 Apr 2025.
29. European Commission. Reform Support. 2022f. Available from: https://reform-support.ec.europa.eu/what-we-do/green-transition_en#climate-action-and-emissions-reduction. Accessed on 25 Apr 2025.
30. European Commission. Protecting the environment and oceans with the Green Deal. 2022e. Available from: https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/protecting-environment-and-oceans-green-deal_en. Accessed on 25 Apr 2025.

31. European Commission. Energy and the Green Deal. 2022b. Available from: https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/energy-and-green-deal_en. Accessed on 25 Apr 2025.
32. European Commission. Transport and the Green Deal. 2022h. Available from: https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/transport-and-green-deal_en. Accessed on 25 Apr 2025.
33. European Commission. Agriculture and rural development. 2022a. Available from: https://commission.europa.eu/topics/agriculture-and-rural-development_en Accessed on 25 Apr 2025.
34. European Commission. Finance and the Green Deal. 2022c. Available from: https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/finance-and-green-deal_en#investing-in-a-green-future. Accessed on 25 Apr 2025.
35. European Commission. Industry and the Green Deal. 2022d. Available from: https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/industry-and-green-deal_en. Accessed on 25 Apr 2025.
36. European Commission. Research and innovation for the European Green Deal. 2022g. Available from: https://ec.europa.eu/info/research-and-innovation/strategy/strategy-2020-2024/environment-and-climate/european-green-deal_en. Accessed on 25 Apr 2025.
37. Tsironis G, Karagkouni A, Dimitriou D, Tsagarakis KP. Mapping sustainable practices and concepts in the transportation ecosystem for the EU-27 countries, based on LinkedIn company profiles. Front Sustain. 2023;4:1268575. doi: 10.3389/frsus.2023.1268575.
38. United Nations. Transforming our world: the 2030 Agenda for Sustainable Development. 2015 Oct 21. Available from: https://sdgs.un.org/2030agenda. Accessed on 25 Apr 2025.
39. Karagkouni A, Dimitriou D. Sustainability performance appraisal for airports serving tourist Islands. Sustainability. 2022;14(20):13363. doi: 10.3390/su142013363.
40. Huber S, Mühlroth C, Zagel C, Schwarz S, Bodendorf F. Agile Innovation Management. Nuremberg (Germany): University of Erlangen-Nuremberg; 2016.
41. Garbie I. Implementation of agility concepts into oil industry. J Ser Sci Manag. 2011a;4(2):203-14. doi: 10.4236/jssm.2011.42024.
42. Poul S, Khanlarzadeh F, Samiei V. The impact of organizational culture on knowledge sharing. Int Rev. 2016;526(3-4):9-24. doi: 10.5937/intrev1604009P.
43. Sartzetaki M, Karagkouni A, Dimitriou D. A conceptual framework for developing intelligent services (a Platform) for transport enterprises: The designation of key drivers for action. Electronics. 2023;12(22):4690. doi: 10.3390/electronics12224690.
44. Shams R, Vrontis D, Belyaeva Z, Ferraris A, Czinkota M. Strategic agility in international business: A conceptual framework for “agile” multinationals. J Int Manag. 2021;27(1):100737.

45. Garbie I. Measuring the agility level in petroleum companies. In: IIE Annual Conference. Proceedings (p. 1). Norcross (GA, US): Institute of Industrial and Systems Engineers (IISE); 2011.
46. Fakunmoju S, Arokodare M, Makinde G. Strategic agility and competitive advantage of oil and gas marketing companies: The moderating effect of information technology capability and strategic foresight. J Account Manag. 2020;10(3). Available from: https://dj.univ-danubius.ro/index.php/JAM/article/view/430. Accessed on 25 Apr 2025.
47. Salah A, Çağlar D, Zoubi K. The impact of production and operations management practices in improving organizational performance: The mediating role of supply chain integration. Sustainability. 2023;15:15140. doi: 10.3390/su152015140.
48. Tinker AM. Paper prophets: A social critique of accounting. Westport (CT, US): Praeger; 1985.
49. Carbon Tracker Initiative. Reports and Analysis. 2025. Available from: https://carbontracker.org/reports. Accessed on 20 Apr 2025.
50. Transition Pathway Initiative (TPI). Carbon Performance Assessment of Oil & Gas Producers: Methodology Note. 2023. Available from: https://transitionpathwayinitiative.org/publications/uploads/2023-carbon-performance-assessment-of-oil-gas-producers-note-on-methodology. Accessed on 20 Apr 2025.
51. Science Based Targets initiative (SBTi). Oil and gas sector target validation criteria. 2025. Available from: https://sciencebasedtargets.org/sectors/oil-and-gas. Accessed on 20 Apr 2025.
52. CDP. CDP Scores 2023. Available from: https://dfge.de/cdp-scores-2023/. Accessed on 20 Apr 2025.
53. Greenpeace International. Reports and campaigns. 2025. Available from: https://www.greenpeace.org/international/. Accessed on 20 Apr 2025.
54. InfluenceMap. Big Oil's Real Agenda on Climate Change 2022. Available from: https://influencemap.org/report/Big-Oil-s-Agenda-on-Climate-Change-2022-19585. Accessed on 20 Apr 2025.
55. Creswell JW, Plano Clark VL. Designing and conducting mixed methods research. 2nd ed. Thousand Oaks (CA, US): Sage; 2011.
56. International Energy Agency (IEA). CO_2 Emissions in 2023. Available from: https://www.iea.org/reports/co2-emissions-in-2023. Accessed on 25 Apr 2025.
57. BP. Sustainability Report “Reimagining energy for people and our planet. 2021. Available from: https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/sustainability/group-reports/bp-sustainability-report-2021.pdf. Accessed on 12 Apr 2025.
58. Chevron. Corporate sustainability report, Getting results the right way. 2021. Available from: https://www.chevron.com/-/media/shared-media/documents/chevron-sustainability-report-2021.pdf. Accessed on 12 Apr 2025.
59. ExxonMobil. Sustainability Report. 2022. Available from: https://corporate.exxonmobil.com/-/media/global/files/sustainability-

report/publication/exxonmobil-sustainability-report.pdf. Accessed on 12 Apr 2025.

60. Gazprom. We are the future. 2021. Available from: https://sustainability.gazpromreport.ru/fileadmin/f/2021/sustainability-report-en-2021.pdf. Accessed on 12 Apr 2025.
61. Saudi Aramco. Energy security for a sustainable world. 2021. Available from: https://www.aramco.com/-/media/downloads/sustainability-report/saudi-aramco-sustainability-report-2021-en.pdf?la=en&hash=FBC097ED5D1F646B7847CFA03BEB5B2BF8D33293. Accessed on 12 Apr 2025.
62. Shell plc. Energy Transition Progress Report 2021. Available from: https://reports.shell.com/energy-transition-progress-report/2021/. Accessed on 12 Apr 2025.
63. Sinopec Corp. Annual Report and Accounts 2021. Available from: http://cwgs.sinopec.com/sfc/en/Resource/report/2021AnnualReport.pdf Accessed on 12 Apr 2025.
64. Dimitriou D, Karagkouni A. Airports' sustainability strategy: Evaluation framework upon environmental awareness. Front Sustain. 2022;3:880718. doi: 10.3389/frsus.2022.880718.
65. European Commission. Communication from the Commission to the European parliament, the council, the European economic and social committee and the committee of the regions, Sustainable Europe Investment Plan, European Green Deal Investment Plan. 2020 Jan 14. Available from: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0021. Accessed on 20 Apr 2025.
66. Milne MJ, Gray R. W(h)ither ecology? The triple bottom line, the Global Reporting Initiative, and corporate sustainability reporting. J Bus Ethics. 2013;118(1):13-29. doi: 10.1007/s10551-012-1543-8.

How to cite this article:
Dimitriou D, Sartzetaki M, Karagkouni A, Efstratiou V. Corporate strategy for sustainable development in the oil and gas industry: Drivers, agility mechanisms, and SDG alignment. J Sustain Res. 2025;7(3):e250061. https://doi.org/10.20900/jsr20250061.