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From Black Gold to Green Goals: Navigating Oil and Gas Sustainability

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Abstract

The energy transition in the oil and gas sector is a complex but unavoidable journey. While the challenges faced by this sector are significant, the potential for innovation, collaboration, and sustainable growth remains vast. The urgent need for responsible energy policies is crucial to guarantee that energy production aligns with ecological preservation. This paper aims to critically examine the sustainability initiatives implemented by oil and gas companies within their energy policies, assess the international legal frameworks, and analyze national regulations governing the industry. A comprehensive review of existing literature and case studies of industry practices will be conducted to understand the effectiveness of current sustainability efforts. The findings will reveal successful initiatives and areas needing improvement, highlighting the interplay between regulatory frameworks and corporate practices. The study underscores the importance of strategically adopting sustainability measures in the oil and gas sector to mitigate environmental impact while enhancing economic growth. Recommendations will be provided for enhancing stakeholder collaboration and strengthening policy frameworks to support a more sustainable future in the energy landscape.

Keywords: *Sustainability, oil and gas, energy, legislation, initiatives, corporate social responsibility.*

Introduction

The oil and gas sector, long considered the undeniable pillar of the global economy, is currently facing profound change. Environmental challenges, growing pressures for sustainability, and the need to meet the demands of a rapidly expanding global population have catalyzed a necessary transformation. At the heart of this transformation is the energy transition, an essential imperative to mitigate the impacts of climate change and move towards a more sustainable energy future.

Historically dominated by the exploitation of fossil resources, the oil and gas sector is a significant player in the global economy. However, intensive exploitation of fossil fuels has led to growing concerns about greenhouse gas emissions, environmental degradation, and vulnerability to fluctuations in global energy markets.

Several imperatives arise from the need for an energy transition in the oil and gas sector. First, climate change has become an indisputable reality, requiring substantial reductions in greenhouse gas emissions to limit the harmful consequences on the global climate. Second, volatile oil prices and overreliance on non-renewable resources highlight the urgency of diversifying energy sources. Finally, rising expectations from stakeholders, including consumers, investors, and governments, are increasing pressure on the sector to adopt more sustainable practices.

Oil and gas companies occupy a central place in the global energy landscape, providing most of the resources needed for economic growth and development. However, this significant contribution comes with significant challenges and responsibilities, given the environmental impact often associated with the exploration, extraction, and use of fossil fuels. The choices made by these societies directly influence the long-term sustainability of the planet and its inhabitants (McCaulay et al., 2018).

The central objective of this article is to explore in depth the sustainability initiatives undertaken by oil and gas companies. Through a rigorous legal analysis, we will seek to understand how these major energy industry players integrate sustainable development principles into their energy policies. By examining the international legal framework, national regulations, voluntary business initiatives, and associated legal implications, we hope to shed critical light on the effectiveness and scope of these efforts. In doing so, we

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will contribute to the global conversation about the need for a more sustainable energy transition and examine the challenges and opportunities facing oil and gas companies in this evolving context.

The energy transition in the oil and gas sector faces complex challenges and critical opportunities. How can these industries historically anchored in exploiting fossil fuels make a substantial transformation to meet sustainability imperatives, reduce their carbon footprint, and align with global goals to combat climate change? How can they navigate a rapidly evolving regulatory landscape while ensuring global energy security and the economic viability of their operations? Finally, how can companies reconcile the need to innovate and diversify their energy portfolios with stakeholder expectations and economic pressures linked to constant energy demand? These central questions define the complex issue the oil and gas sector faces in transitioning to a sustainable energy future.

Research Methodology

The article unfolds by examining sustainable development initiatives through several prisms. The following sections focus on specific aspects such as environmental regulation, NGO partnerships, legal risks, and case studies of emblematic companies. The article offers recommendations and perspectives to steer the sector towards a more sustainable energy transition.

The writing of this article is based on an in-depth and multi-dimensional research methodology, integrating varied sources to provide a comprehensive perspective on sustainability initiatives in the oil and gas sector. Here are the main components of the methodology used:

Literature Reviews: An in-depth analysis of academic journals, research articles, and specialist publications was carried out to establish a solid knowledge base on the issues, trends, and advances in sustainability in the oil and gas sector.

Analyzes of Company Reports: The in-depth examination of annual reports, sustainable development reports, and company communications from the oil and gas sector allowed specific data on implementing sustainable energy policies, concrete initiatives, environmental performance, and sustainability commitments to be collected.

Case Studies: Including case studies on specific companies, such as Shell and TotalEnergies, provided an in-depth analysis of best practices, challenges encountered, and results achieved in implementing sustainable development initiatives.

Regulatory Data Analysis: The research included an analysis of national and international regulatory frameworks to understand the impact of laws and regulations on the sustainable energy policies of companies in the oil and gas sector.

Comparative Analysis: To identify general trends and specific variations, a comparative analysis was carried out between different companies, geographic regions, and regulatory frameworks.

By combining these approaches, this research methodology aims to provide a comprehensive, balanced, and evidence-based overview of sustainability initiatives undertaken by oil and gas companies in their energy policies.

Results and Discussion

The international legal framework, national regulations, and global initiatives initially drive sustainability initiatives adopted by oil and gas companies. Furthermore, the concept of corporate social responsibility has also largely contributed to enhancing sustainability. We will simultaneously review each of these sources to analyze their impact on companies' sustainability initiatives and the legal responsibilities and commitments that derive from them.

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Global Standards, Local Impact: The International Legal Framework for Sustainable Oil and Gas

The international legal framework comprises the Paris Climate Agreement, the United Nations' Sustainable Development Goals, and the International Petroleum Law. After examining these sources, it is important to highlight their legal implications for the oil and gas companies.

The Paris Agreement: A Blueprint for Sustainable Oil and Gas Practices

The Paris Agreement, adopted at COP21 in 2015, represents an unprecedented collective response to the threat of climate change. Contracting parties committed to implementing measures to limit the increase in global temperature, recognizing the need to limit this increase to well below 2 degrees Celsius above pre-industrial levels. All Parties to the Climate Convention have agreed on this objective and are contributing to it, supported by all non-state actors, through different types of commitments (nationally determined contributions, long-term strategies) and instruments. The Paris Agreement is a treaty that falls under the Vienna Convention on the Law of Treaties, within the framework of which the Parties bind each other. The binding dimension of the agreement's text is of variable geometry, the obligations being more or less imperative or flexible. A so-called "3rd generation" treaty in environmental governance is progressive and creates temporal implementation dynamics. The procedural mechanisms on which it is based (accounting and transparency rules, in particular, among other elements of the rulebook of the agreement) are, in fact, mutually integrable between the national and international scales. They make it possible to both improve international governance of climate law and, through Nationally Determined Contributions (NDCs) submitted by States, to generate measures at the country level that will be obligatory from the point of view of national law. The constraints are, therefore, legal in the strict sense and of a new type, making it possible to articulate international law and national laws virtuously. In its recent Commune de Grande-Synthe judgment, the Council of State in France clarified its vision of this articulation by indicating that "if the stipulations of the Paris Agreement… are… devoid of direct effect, they must nevertheless be taken into account in the interpretation of positive law", that is to say, European law and national law which are themselves of direct application. In addition to the non-directly legal mechanisms that can be expected from such an architecture (peer pressure, collective learning), how can we characterize its specifically legal effects, particularly on decisive political processes? We are referring here to the impacts on different public policies (tax policies, sectoral policies, infrastructure and land use planning, investments, for example).

In addition, the Paris Agreement is based on two principles integrated into the Climate Convention since 1992: the precautionary principle and the principle of common but differentiated responsibilities. These two principles, notably included, for the first, in numerous national laws, constitute potential levers for creating legal obligations.

The Paris Agreement also puts tension on the one hand, the need for ambition for everyone (see art. 2), but without distributing it, on the other hand, a certain number of mechanisms by which countries will have to individually, gradually, try to align with this level of ambition. The objectives and the tools to achieve them (National Determined Contribution (NDC), long-term strategies (see art. 4.19)) are, therefore, separate and independent elements in the agreement, which "leaves" the play of actors (States, companies, etc.), at international and national levels, provide the necessary coherence between short-term measures and long-term transformations with a view to the ultimate objective, limiting the rise in temperature to +2°C, or even 1.5°C.

Without formally obliging the Parties to ensure this compatibility or validating their commitments (the Parties themselves do them), the Paris Agreement allows different actors to rethink these commitments, given their insufficiency of the overall ambition through a polycentric governance system. This horizontality of governance allows, at different levels, actions and anticipatory alignments consistent with the agreement's objectives.

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Thus, since 2015, specific actors, particularly in international finance, have profoundly modified their speech, now focused on alignment with the Paris Agreement. Suppose the translation into reality of this new paradigm remains to be proven and evaluated. In that case, the transformation induced by the system put in place by the agreement, in a total conceptual break with the "top-down" verticality of the Kyoto Protocol and based on a hoped-for virtuous autonomy of the actors, is already at work.

If climate disputes existed before different national courts and increased over the past few decades, the Paris Agreement offers an additional reference framework, including before the domestic courts. Several cases illustrate this trend, notably in France, "Commune of Grande-Synthe against the French State" mentioned above, "L'Affaire du siècle"(The case of the century), "Urgenda" in the Netherlands or even the affair of the airport of Heathrow in front of the Royal Court in London. These cases brought to court seem capable of exerting a progressive influence on the development of national climate policies and the impetus for more ambitious climate laws at the state level and on an evolving dynamic of international law itself. By relying more and more on the Paris Agreement, thus giving it a particular interpretative force, new climate governance on several scales is being put in place. Therefore, we can observe a growing trend towards an evolution of favorable laws concerning the climate in the countries where climate disputes are developing.

This binding international framework directly impacts the oil and gas sector because these industries significantly contribute to greenhouse gas emissions. We will examine the specific commitments made by energy companies to the Paris Agreement, the operational adjustments required to meet these commitments, and the possible legal consequences for non-compliance.

Energy companies have responded to the Paris Agreement by making specific commitments to reduce their carbon footprint. This may include targets for reducing greenhouse gas emissions, increasing the share of renewable energy in their energy portfolio, and adopting cleaner technologies. We will explore how these commitments are formulated, monitored, and reported, highlighting the importance of increased transparency in the context of environmental accountability.

A central element of many commitments is setting concrete targets for reducing greenhouse gas (GHG) emissions. Companies set specific targets to contain global warming, often aligned with scientific recommendations. These goals may include reducing emissions, increasing the integration of renewable energy into the energy mix, and improving the energy efficiency of operations.

Therefore, after the Dutch State, it is the turn of the company Royal Dutch Shell (RDS) to be ordered by the judge of first instance in The Hague on May 26th, 2021, to reduce its greenhouse gas emissions. The decision is important because, in addition to representing the first conviction of a transnational company in this area, it could be emulated by other judges worldwide.

When reading this particularly dense judgment, it should be noted that ruling following a group action initiated by the Milieudefensie association to defend the individual interests of 17,379 Dutch citizens residing in the Wadden region, the judge of The Hague recognizes at first instance the civil liability of the company RDS established in The Hague, due to its participation in climate change at a global level and the consequences at the local level which result from it for the victims represented. To remedy this, it requires it to reduce greenhouse gas emissions from the direct and indirect activities of the Shell Group (itself made up of more than 1,100 subsidiaries operating around the world) of which it is the parent company, and to the tune of 45% before the end of 2030 compared to 2019. The RDS company is therefore condemned, not to repair the victims' damages, but to prevent them at the end of an action to cease the 'illicit.

The judge bases his decision on Article 6:162 of the Dutch Civil Code, primarily inspired by Article 1240 (formerly 1382) of the French Civil Code. According to this provision, the person who commits an unlawful act against another must compensate for the resulting damage. To characterize the defendant's unlawful act, the judge must assess the defendant's behavior about the law's required behavior. It must then refer, as the judgment recalls, to a "standard," an "unwritten norm" characterizing a "duty" of "prudence" (duty of care) whose content evolves according to the social context. However, given the multiplicity and variety of elements that it takes into account to seek what is "generally" or "universally" accepted (or even what

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constitutes "consensus"), including the IPCC's expertise, the objectives set by the Paris Agreement and soft law standards requiring companies to respect human rights, the judge considers that the RDS company must contribute to the prevention of climate risks through policy that it defines for the group and, concretely, an obligation of result to reduce emissions from the Shell group's activities. After relying on Article 1246 of the Civil Code to condemn the State for repairing and preventing the damage caused to the climate (The case of the century), the French judge could then also tomorrow rely on Article 1240 of the Civil Code to impose an obligation to reduce emissions on a company, and this without going through the more restrictive duty of vigilance provided for in Article L. 225-102-4 of the Commercial Code!

The decision is critical. This is the first conviction in climate litigation against a company. If, on the one hand, this may not be surprising as we know the audacity of the Dutch judge to whom we already owe the first conviction of a State (Urgenda case), on the other hand, it was not of oneself, in the light of global litigation. Indeed, more and more actions are being taken against companies worldwide. However, if some are currently underway, in particular in France, Germany, and the Philippines, on the other hand, the judgments definitively rendered in the United States against the oil companies have never resulted in their conviction. The plaintiffs face significant obstacles: the incompetence of the judge to rule in an area that he considers to fall within the executive power, the lack of interest in acting, and the impossibility of proving the causal link between the behavior of the companies and damages suffered by victims. However, the Dutch judge ignores all these barriers! Suppose he refuses to extend group action to future generations worldwide, on the other hand. In that case, he considers himself competent to judge the behavior of a company in terms of climate change and, above all, he affirms that the fact that the defendant's behavior is not alone the cause of climate change in no way prevents us from recognizing his responsibility in this area! This is not trivial if we recall, as the decision says that the RDS company alone emits more than its own State.

As for the lessons, they are numerous. Mainly, this judgment confirms the winning potential of the duty of prudence/vigilance in climate litigation and the pivotal role of the evidence submitted to the judge to determine its scope and examine its ignorance. The decision shows that the outcome of the trial essentially depends on the judge's assessment of the scientific expertise of the IPCC (to assess the state of climate risks), international and national regulations (to assess the level of reduction greenhouse gas emissions to be required and the objective to be achieved, namely not to exceed 2°C compared to the temperature of the pre-industrial era) as well as soft law and not just hard law (to determine the role that the parent company should play in preventing climate damage, i.e., its power of influence). It is up to the litigants to use it to find something to adjust their legal strategy in one direction or another....

A significant response from oil and gas companies is diversifying their energy portfolio. This involves a transition to cleaner, renewable energy sources. Companies are investing in technologies such as wind, solar, and sometimes nuclear power, seeking to reduce their reliance on fossil fuels and contribute to the decarbonization of the energy sector.

As for the investments in research and sustainable development (Cherepovitsyn et al., 2021), to achieve these goals, many companies have stepped up their research and development efforts in areas such as carbon capture and storage technologies, biofuels, and innovative energy solutions. These investments aim to develop advanced technological solutions capable of minimizing the environmental footprint while maintaining the economic viability of operations.

Furthermore, Companies' commitments often extend beyond their direct operations to supply chains (Ahmad et al., 2016). This involves adopting sustainable practices in supplier selection, waste management, and reducing emissions associated with supply chain activities. These initiatives aim to create a more sustainable business ecosystem and positively influence industrial practices globally.

Meeting Paris Agreement commitments often requires substantial operational adjustments. This may involve closing or converting carbon-intensive operating sites, developing innovative technologies, and implementing emissions management practices. Oil and gas companies are adapting to these new requirements while facing operational and financial challenges.

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Oil and gas companies seek to identify the SDGs relevant to their business (IPIECA, 2017). This involves an in-depth analysis of the social, environmental, and economic issues linked to their operations. Some SDGs, such as the clean energy transition (SDG 7) and climate action (SDG 13), are directly linked to their core activities. In contrast, others, such as poverty reduction (SDG 1) or the promotion of health and well-being (SDG 3), may also be relevant in a broader context.

Therefore, it is crucial to integrate the SDGs into business strategies (Albuainain et al., 2022). Once the SDGs are identified, companies integrate these goals into their business strategies (Menéndez-Sánchez et al., 2021). This may involve formulating specific goals aligned with the SDGs, adapting sustainability policies to include them, and allocating resources to support their implementation. These initiatives are often closely linked to voluntary corporate sustainability commitments (Arena et al., 2023).

Alignment with the SDGs brings legal implications as more and more governments integrate these goals into their legislative framework. Companies may be subject to specific obligations regarding reporting on their contribution to the SDGs, compliance with sector standards aligned with these objectives, and participation in national or international initiatives to promote the SDGs.

It is crucial to explore the legal consequences of non-compliance (Maljean-Dubois, 2022). The Paris Agreement has significantly contributed to the rise of climate litigation for several reasons. Firstly, as a treaty, it provides a clear and accessible legal framework for national courts, making them more inclined to reference it than international customs or court rulings. Secondly, the Agreement is designed for internal adoption, making its provisions essential for national legal systems. The flexibility of nationally determined contributions, allowing parties broad discretion, has inadvertently empowered climate litigants to devise effective legal strategies. Thirdly, the Agreement established a less intrusive and weaker international control mechanism than its predecessor, the Kyoto Protocol. This, coupled with the difficulty of pursuing cases in international courts, has intensified the focus on national enforcement for implementation. Overall, the unique characteristics of the Paris Agreement have amplified climate litigation and increased pressure on nations to address climate change domestically.

The Paris Agreement has become a central focal point in climate litigation, serving as a gateway for international law. While the Agreement's provisions are integral, they often lead to the incorporation of other international legal rules. There is a trend of referencing multiple sources, including customary rules, soft law instruments, and domestic law, in climate trials. Litigants display creativity by urging judges to synergize various legal sources, enhancing the interpretation and application of treaty rules. This often involves merging treaty rules with customary rules, soft law decisions, and general legal principles. Furthermore, a growing trend of invoking international human rights law in conjunction with international climate law, prompting courts to consider states' obligations related to climate and human rights in national and international settings.

The Paris Agreement has given rise to a global judicial influence, where courts draw support from the legal precedents of other nations, particularly evident in climate-related cases. The internet and disseminating foreign decisions have made it easier for courts to access international legal perspectives. The widespread attention and analysis that climate judgments receive globally pressure courts to align with international public opinion. This has prompted some courts to issue press releases and translations of their decisions on the same day they are made public. The interconnectedness of national courts is gradually shifting traditional notions of territoriality and sovereignty, with courts considering the application of international law similarly. While foreign decisions may influence national courts, they selectively adopt judgments that align with their objectives, often without detailed explanations. The evolving dynamics between national and international courts suggest a potential future where national decisions impact litigation before international bodies, bridging the gap between international and domestic law. In these cases, the heightened political sensitivity and public engagement also raise questions about balancing the judiciary and executive branches. Despite challenges like the political question doctrine and the separation of powers, international law is increasingly employed to assess the legality of government policies, resembling the approach of international courts. In some instances, courts may claim a lack of jurisdiction based on these doctrines, exemplified by a recent case in which a federal court in Canada deemed a challenge to the

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country's climate change policy as "beyond the reach of judicial interference," citing the political question doctrine and separation of powers.

The legal consequences of failing to meet Paris Agreement commitments may vary depending on jurisdiction. Businesses may face financial penalties, operational restrictions, or even legal action. Compliance mechanisms and sanctions vary from country to country, highlighting the importance of businesses taking proactive steps to avoid these potential legal consequences.

Many companies are considering closing or converting particularly carbon-intensive facilities to reduce their carbon footprint (Peng &Ji, 2019). These may include older oil refineries, environmentally uneconomic gas extraction sites, or facilities using obsolete technologies. These decisions consider impacts on employment, local communities, and long-term sustainability goals.

The development and adoption of cleaner technologies are at the heart of operational adjustments. This may include massive investments in carbon capture and storage technologies, cleaner fuel research, and exploration of emerging energy solutions (Andreasson, 2019). Oil and gas companies navigate the complex research and development landscape to integrate more sustainable technologies into their daily operations.

Methane, a potent greenhouse gas, is often emitted during oil and gas activities. Companies are adjusting their processes to minimize these emissions through methane capture technologies, improvements in extraction practices, or leak monitoring and reduction programs. Oil companies implement various practices to minimize methane emissions, a potent greenhouse gas. Here are some of the practices adopted:

Concerning leak detection and repair, oil companies use advanced detection technologies, such as infrared cameras, drones, and sensors, to identify methane leaks at their facilities. Once leaks are detected, they are repaired quickly.

As for best operational practices, companies are adopting improved operational procedures to reduce methane emissions during oil and gas drilling, production, processing, and transportation operations.

Regarding gas recovery and utilization technologies, some companies invest in associated gas recovery technologies rather than letting methane escape into the atmosphere. The extracted methane can be used as an energy source or sold on the market.

Furthermore, better reservoir management has become a priority, and oil companies are implementing improved management practices for oil and gas reservoirs to minimize fugitive emissions.

Employee training and awareness stimulate companies to educate their staff about the risks associated with methane emissions and train them on best practices to reduce these emissions.

Collaboration with industry and stakeholders is also remarkable. Oil companies often collaborate with other industry players, governments, and non-governmental organizations to share best practices and develop standards to reduce methane emissions.

In addition, transparent reporting has also been noticed at some companies taking a transparent approach by disclosing their methane emissions, reduction targets, and progress made. This allows for increased accountability.

Last but not least, companies are investing in research into cleaner and more efficient technologies for hydrocarbon extraction, production, and transportation.

Operational adjustments go beyond technical aspects to include adaptations in business models (Bocken et al., 2014). This may manifest through an increased focus on renewable energy, a shift to circular economic models, or the diversification of services to include eco-responsible solutions. Oil and gas companies are fully re-evaluating and adapting their business models to integrate sustainability (Csomos, 2014).

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Energizing Change: How the UN SDGs Drive Sustainability in Oil and Gas

Seventeen Sustainable Development Goals (SDGs) were established to orientate global efforts towards a more sustainable future under the auspices of the United Nations 2030 Agenda (UNDP, IFC, IPIECA, 2017). As a result, companies operating in the oil and gas sector are increasingly being expected to be more socially and environmentally responsible. Many oil and gas companies are aligning with the SDGs and implementation efforts are being made towards more sustainable energy transitions, curbing carbon footprints, and enhancing the sustainability of natural resources. It will also explain the legal avenues used to formalize these commitments to illuminate the legal commitments that emerge from the nexus between economic interests and the requirements of sustainable development. Due to their important position in the global energy landscape, oil and gas companies invest their efforts to contribute to the SDGs (Arena et al., 2023). To meet this alignment, it needs to carefully evaluate the social, economic, and environmental impacts of its operations. They have taken special initiatives for example investment in clean technologies, promotion in renewable energy and some CSR practices. Oil and gas companies need to conduct detailed analysis to identify the SDGs that are critical to their business. This takes into account the stakeholder needs, including the environmental and economic effects associated with their business sector. These firms assess the SDGs against their own operations, determining which are most relevant to them and where they can contribute the most to their advancement. Defining concrete and measurable goals that align with the SDGs is more than just acknowledging them. Oil and gas companies are translating broad commitments into tangible contributions to specific SDGs. Such targets can be related to the reduction of greenhouse gas emissions — but also to biodiversity preservation initiatives or local community life improvement programs. Moreover, SDG alignment needs to be entrenched in corporate policies and processes. This could change their environmental management strategy, the processes by which risks are managed, and/or embedding SDG standards in their corporate codes of conduct. This integration in practice will mean that the SDGs will not be a stand-alone system. Multi-stakeholder partnerships are common among oil and gas companies who want to achieve as much as possible in one partnership. Which could include partnerships with civil society, local governments, and other private sector actors. Such partnerships help in better delivery of the SDGs. It is a non-binding process but is increasingly subject to legal obligations that are even more restrictive than those of the SDGs. Governments are realizing the significance of embedding the SDGs in corporate policies and are regulating these commitments specifically. Those obligations cascade into particular laws and standards and the ways in which companies are required to adhere to them, from periodic reporting, to taking remedial steps after violations have occurred. Companies subject themselves to specific legal obligations by aligning with the SDGs (IEA, 2020). These may be national and international regulations, sectoral agreements, or certain normative frameworks. The precise legal responsibilities applying to oil companies in connection with the SDGs differ from one country, geographical area and legal framework to another. Still, here are some broad principles and duties that might apply: As oil companies are required on a national and international level to abide by laws on the environment, human rights, occupational health and safety, etc., this can be linked to the SDGs to a certain extent. Sustainability Reporting: Many jurisdictions mandate that companies including oil companies publish sustainability reports concerning their social, environmental and economic impacts and how they help achieve the SDGs. There are some countries more than others that have the obligation of transparency and disclosure of extractive industries; this includes how oil companies can help to do the SDGs. Another trend is Corporate Social Responsibility (CSR), as most oil and gas companies have adopted CSR practices directly into their operations, which often are aligned with the SDGs. The SDGs related to environment may see oil companies being mandated to practice environmental management to address the negative impacts environmental management on the environment sector. Of course legal requirements may differ per geographic and political context. In addition, oil companies are also realizing that they need to apply sustainable principles in their operations as these are now laws, and considerations to reduce risks, enhance reputation and most importantly sustain in the long-term. Legal obligations related to SDG implementation must be incorporated into corporate policies (Ponomarenko et al., 2021). It entails a translation of legal obligations, internal policies and procedures, and the alignment of operations with the prescribed standard. This is operated by oil and gas companies to make sure legal commitments embedded to an organizational

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culture and operational practices. Compliance with the SDGs often entails an additional element, namely the requirement to periodically report on progress. Oil and gas companies need to report and disclose their SDG-related actions, interventions, and outcomes. Legal enforceability of the SDGs necessitates such mechanisms within companies. This can include appointing compliance personnel, creating formal sustainability committees, and properly educating employees on legal standards. This brings transparency as an unprecedented need in the context of the SDGs. It urges companies to communicate clearly about how they are relevant to the SDGs and report on their contribution to this space. We find that companies establish communication mechanisms, where annual sustainability reports, KPIs, and commitments to the public become crucial features. Provides more transparency and tends towards public trust regarding the corporate sustainability initiatives. Within the oil and gas industry, companies are now establishing their frameworks for SDG reporting. This can include establishing specific sections in their annual reports. The sections showcase specific steps taken by the company in relation to — e.g., greenhouse gas emissions reduction, access to clean energy, sustainable management of natural resources, etc. Such reports give stakeholders such as investors, employees and regulators, a complete overview of the sustainability pledges and advancement of the organisation through clear, accessible and detailed information. International reporting frameworks are utilised by the oil and gas firms. Frameworks like the Global Reporting Initiative (GRI) or the Sustainability Accounting Standards Board (SASB) offer structured guidelines for ESG performance. As a result, companies harmonize their reporting, allowing stakeholders to compare them more easily. Moreover, oil and gas engage in reporting standardization initiatives in the respective industries. Industry coalitions deliver universal standards + pooled sustainability practices This allows for a unified and coordinated strategy across the industry, which in turn enhances the impact of the efforts toward accomplishing the SDGs. Companies establishes performance indicators that reflect their SDG alignment goal which they use to measure and communicate their progress (UNDP, IFC, IPIECA, 2017). These are normally affected by what companies are trying to achieve. Nevertheless, they are also usually associated with greenhouse gas emissions, water use, diversity and inclusion, and delivering on certain social objectives. The following are some general steps that oil companies can take to select, measure, and embed the indicators: Relevance of SDGs: The oil companies need to first determine which SDGs are relevant to their businesses. For instance, goals like poverty reduction (SDG 1), drinking water access (SDG 6), clean energy (SDG 7), climate change action (SDG 13), etc. Specific indicators definition: After identifying the SDGs, companies need to define specific measurable indicators for SDGs contribution assess. As an example one indicator may be the number of greenhouse gas emissions diverted from being produced with the adoption of clean technologies. Data gathering: While oil companies need to have adequate systems in place to measure their set indicators. It can range from emissions monitoring, water use, CSR, etc. Mandate integration into annual reports: The outcomes of SDG indicators must be integrated into corporates annual reports. A company releases these reports, in the area of sustainability reports, on its environmental, social, and governance (ESG) performance. Only if you are transparent: Companies should transparently communicate results against indicators related to the SDG. Including updates on things like progress made, what obstacles have you hit, what events are next. Outline those SDGs that are relevant for their business Keep stakeholders informed: Oil companies can also engage stakeholders, such as investors, NGOs, local communities, etc., in the process of identifying relevant SDGs and following them through with the results and initiatives. Filtering for compliance of international standards — Some companies may opt to comply with international standards such as the Global Reporting Initiative (GRI) or the Sustainability Accounting Standards Board (SASB). The GRI and SASB provide guidelines for measuring and reporting ESG performance, including relating to the SDGs. To improve the credibility of their SDG reporting, some oil and gas firms have chosen independent verification and certification. There are external organizations that can be commissioned to help determine if a company's actions are in accordance with the SDGs (MSCI,2023). The new transparency in SDG disclosure increases the legal liability of the reporting companies. Litigation and sanctions may occur due to allegations of greenwashing, false claims, or failure to adhere to pledges. This will see us examine how oil and gas firms mitigate this legal risk, the checks to be sure of the correct reporting, and their pushbacks to any prospective action. The core of this legal duty is transparency and material fact disclosure. Oil and gas companies, for example, have to file extensive documentation about their activities, reserves, GHGs emissions, and other environmental impacts. Regulators and stakeholders often use these reports to evaluate how the company complies with the relevant laws and the environmental norms. To maintain the integrity of reporting, these companies

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implement a range of internal controls. Advanced data management systems mine, analyze, and aggregate the data from various company assets. The goal of these systems is to minimize human errors, allow tracking of data, and communicate better in terms of reliability of the reports. Meanwhile, oil and gas companies are adopting strict corporate governance. Boards of directors can also form specialized committees like compliance and sustainability committees to monitor and assess the company on its compliance with the law and on ethical and moral standards. They play a key role in establishing internal policies, tracking legal risks and encouraging best environmental practices.

Fueling Sustainability: The Role of International Petroleum Law in Green Energy Transition

International Petroleum Law is a fundamental pillar of the international legal framework that governs the obligations of oil and gas companies. Therefore, it is necessary to delve into the fundamentals of petroleum law and its objectives to highlight the environmental impacts of oil spills.

Energy resources are significant today, and oil is among the most important. Oil is fundamental to economic growth, industrial production, and transportation. However, due to its nature and environmental, financial, and social impacts, the use and management of this resource require various legal regulations.

International petroleum law deals with legal issues related to the exploration, discovery, extraction, transportation, distribution, and sale of oil and natural gas. This branch of law is shaped by various laws, regulations, conventions, and agreements at the national and international levels, particularly energy law, environmental law, maritime law, and commercial law.

International petroleum law generally addresses issues such as the issuance of licenses and permits for oil and gas exploration and extraction, Control and management of oil and gas resources, Financing of oil and gas projects, Negotiation and pricing of oil and gas, transportation and distribution of oil and gas, environmental and health safety standards, legal issues related to offshore oil and gas extraction, execution and implementation of oil and gas contracts and resolution of international conflicts in the field of energy.

Various laws, regulations, and agreements at the national and international levels shape Petroleum law. It focuses on essential objectives such as ensuring energy security, protecting the environment, and promoting equitable sharing.

The main objectives of the Petroleum Law are:

- Promotion of economic activity and investment: Petroleum law provides an appropriate legal framework to encourage investment in the petroleum industry and promote economic growth. This framework includes allowing companies to conduct oil exploration and extraction activities, protecting investors' rights, and promoting competition.

- Environmental Protection and Sustainability: The petroleum industry is an important sector that can have environmental impacts. Petroleum law aims to set standards for environmental protection and provide the necessary regulations to minimize the impact of petroleum activities on the environment. These may include protection against oil spills, measures to prevent marine pollution, and incentives for renewable energy sources.

- Fair and equitable sharing: Petroleum law guarantees the fair and equitable sharing of oil resources. This includes the management of public oil reserves, tax policies, income distribution, and local communities' use of them. It is also essential to ensure fair and transparent competition between parties involved in the oil industry.

International Petroleum Law was developed to manage the complex relationships between states, oil companies, financial institutions, and other parties. Its objective is to ensure equitable, efficient, and

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sustainable use of oil and gas resources. Thus, it contributes to achieving energy security, environmental protection, and economic development promotion.

Many countries have implemented national petroleum laws to regulate the petroleum industry. These laws govern the ownership and possession of oil reserves, licensing and permitting, environmental protection, taxation, competition policy, safety, and workers' compensation.

Some important international agreements and organizations impact the oil industry. OPEC (Organization of the Petroleum Exporting Countries) is the largest. OPEC ensures cooperation between member countries to regulate oil prices and the quantities produced. Other international agreements include "Oil Sharing Contracts (PSC)" and "Production Sharing Agreements (PSA)," which govern oil exploration and extraction activities.

Oil spills and maritime accidents can severely impact marine and terrestrial ecosystems. There are several international legal provisions regarding these incidents. For example, the International Convention Against Oil Pollution Damage (OPRC) was adopted in 1992. In July 1989, a conference of leading industrial nations in Paris called upon the International Maritime Organization (IMO) to develop further measures to prevent ship pollution. The IMO Assembly endorsed this call in November of the same year, and work began on a draft convention to provide a global framework for international cooperation in combating major incidents or threats of marine pollution.

Parties to the International Convention on Oil Pollution Preparedness, Response, and Cooperation (OPRC) must establish measures for dealing with pollution incidents nationally or in cooperation with other countries.

Ships are required to carry a shipboard oil pollution emergency plan. Operators of offshore units under the jurisdiction of Parties are also required to have oil pollution emergency plans or similar arrangements, which must be coordinated with national systems to respond promptly and effectively to oil pollution incidents.

Ships are required to report pollution incidents to coastal authorities, and the convention details the actions that must be taken. The Convention calls for establishing stockpiles of oil spill combating equipment, holding oil spill combating exercises, and developing detailed plans for dealing with pollution incidents.

Parties to the convention are required to assist others in the event of a pollution emergency, and reimbursement for any assistance provided is provided.
The Convention provides IMO with an essential coordinating role. In 2000, the OPRC adopted a protocol relating to hazardous and noxious substances (OPRC-HNS Protocol).

Furthermore, the International Convention for the Prevention and Control of Marine Pollution (MARPOL) of 1990 plays a vital role in combating oil pollution. Signed in 1973, the MARPOL Convention had not obtained the necessary ratifications to enter force. Threatened with never being applied even though accidental pollution is multiplied, this Convention will acquire, not without a certain originality, a Protocol on February 17, 1978. The adoption of this protocol coincides with that of the protocol to the SOLAS Convention of 1974. It should also be noted that these two Conventions are linked, at least in their spirit. The Convention and its protocol will constitute a single instrument: we are talking about the MARPOL 73/78 Convention. This Convention currently has six annexes, three of which are mandatory. The MARPOL Convention is an original concept in international treaty law. Its system allows excellent efficiency since it circumvents the slowness of classic treaty law. Indeed, the classical system is characterized by a process of acceptances and heavy amendments, the entry into force of which is conditional on a minimum of ratifications to be obtained. Opting for this classic scheme would have had the effect of paralyzing the MARPOL Convention, which must be scalable to follow the technological advances made in the area of sea pollution.

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Therefore, the MARPOL Convention is a convention with an original structure. It is also a strict and binding Convention given its purpose. It has a wide field of applications, which reinforces its effectiveness. It considers pollution of all kinds affecting the sea and the air. Nevertheless, it is an evolving and adaptable convention depending on advanced techniques. This agreement seems effective since, over 9 years (between 1981 and 1989, the period of the first steps of the Convention), oil spills at sea due to ships fell from 1.47 million tons to 570,000 tons, which did not represent more than 12% of discharges at sea.

From Obstacles to Opportunities: Legal Implications for Sustainable Oil and Gas Companies

The legal implications of the Paris Agreement, the SDGs, and the International Petroleum Law vary. From a legislative perspective, many countries have started to adapt their regulatory framework to reflect international sustainability commitments. These regulatory changes impact the day-to-day operations of oil and gas companies, from managing operating permits to the requirement for detailed reporting on greenhouse gas emissions. Additionally, increasing pressure from investors, aware of the risks associated with unsustainable activities, is driving a change in the financial landscape, with potential consequences for legal liability. This section will closely examine these dynamics, providing an in-depth perspective on how the international legal framework shapes and regulates the actions of oil and gas companies regarding sustainability.

Adopting international commitments, such as the Paris Agreement and the SDGs, has often led to substantial changes in national legislative frameworks. This section will examine how these changes impact oil and gas companies, highlighting the new standards, reporting requirements, and compliance mechanisms. These companies are adapting to new laws, ranging from increased emissions monitoring to implementing cleaner technologies.

Legislative changes often aim to revise existing regulatory frameworks to reflect new sustainability standards. This may include updates to environmental requirements, the introduction of stricter emissions quotas, and adopting incentive mechanisms promoting sustainable practices. We will examine how companies adapt to these changes and adjust their internal policies to comply with the new regulations.

Equinor (formerly Statoil) (Energy Transition Plan, Progress Report, 2022): This Norwegian oil company has announced significant sustainability commitments. It will invest more in renewable energy, reduce greenhouse gas emissions, and increase activity transparency.

Shell (Sustainability Report, 2023): Shell has gradually diversified its business to include more clean energy, including wind and solar. It has also implemented initiatives to reduce its carbon footprint, such as investing in carbon capture and storage technologies.

TotalEnergies (Sustainability & Climate 2024 Report): TotalEnergies has announced plans to become a "net zero emissions" company by 2050. It is focused on reducing its dependence on fossil fuels and developing low-carbon solutions, such as solar power and hydrogen.

BP (Press release, 2020): BP has committed to becoming a carbon-neutral company by 2050. It plans to increase its investments in renewable energy and reduce its oil and gas production.

Chevron (Climate change resilience report, 2023): Although Chevron has historically focused on fossil fuels, it has recently announced initiatives to reduce its methane emissions and invest in renewable energy pilot projects.

It is important to note that these efforts vary from company to company. Some critics have pointed out that, despite these initiatives, these oil companies continue to contribute to global greenhouse gas emissions. Progress toward true sustainability will depend on these companies' continually evolving policies and practices.

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Increased reporting requirements are making transparency an essential aspect of legislative changes. Oil and gas companies must often provide detailed reporting on their greenhouse gas emissions, reduction initiatives, and alignment with sustainability goals.

Legislative changes also affect obtaining and maintaining operating permits. Companies must demonstrate increased compliance with environmental standards to obtain these authorizations. Permitting processes are evolving through stricter environmental criteria, increased consultation with local stakeholders, or the inclusion of sustainability objectives in permitting criteria.

Oil and gas companies also face penalties for failing to comply with the new regulations. These can include substantial financial fines, suspension of operating permits, or even legal action. Companies implement internal compliance mechanisms to avoid these sanctions and their potential consequences for their operations.

Transitioning to more sustainable practices exposes businesses to legal risks, including potential litigation. Stakeholders, such as local communities, NGOs, and even investors, may express concerns about operations' environmental and social impacts. To mitigate litigation risks, companies manage these concerns through consultation mechanisms, alternative dispute resolution, or social responsibility policies.

The transformation towards more sustainable practices exposes companies to an increased risk of environmental litigation. Local communities, environmental groups, and other stakeholders can take legal action to challenge operational practices that they believe harm the environment.

Local communities play a crucial role in the legal risk landscape. Oil and gas companies face concerns related to land use, social impacts, and public health issues.

Investors, increasingly sensitive to environmental, social, and governance (ESG) issues, are also expressing concerns. Oil and gas companies may face increasing pressure to report on their sustainability practices.

Faced with these litigation risks, many companies in the oil and gas sector are implementing consultation and dispute-resolution mechanisms. These may include mediation processes, enhanced community consultations, and commitments to corporate social responsibility practices.

Faced with growing legal risks, companies are adopting preventative measures to mitigate potential consequences. This may include establishing sustainability committees, integrating legal impact analyses into strategic decision-making, and investing in technologies to reduce the carbon footprint. We will analyze how these preventive measures not only reduce legal risks but also help strengthen the credibility and sustainability of businesses in a rapidly changing context.

Many companies create dedicated sustainability committees to oversee and guide environmental, social, and governance (ESG) initiatives. These committees are often composed of board members and external experts. Creating such committees strengthens corporate governance, enables more informed decision-making, and demonstrates a commitment to sustainability.

The integration of legal impact analyses is becoming standard practice in strategic decision-making. Companies evaluate the potential legal consequences of their actions, whether in the context of new projects, operational changes, or responses to stakeholder concerns. These analytics help anticipate and mitigate legal risks while fostering a culture of compliance.

Oil and gas companies invest significantly in sustainable technologies to reduce their carbon footprint and mitigate associated legal risks. This may include developing carbon capture solutions, adopting cleaner technologies in extraction operations, and implementing innovative practices to minimize environmental impacts. These investments contribute to legal compliance and risk reduction.

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Oil and gas companies increasingly engage in sector initiatives and partnerships that promote sustainable practices. This may include participating in industry alliances to share best practices, adopting voluntary sector standards, and collaborating with non-governmental organizations. These commitments strengthen business credibility, help establish industry standards, and reduce legal risks.

From Compliance to Commitment: National Regulations Shaping Sustainable Practices in Oil and Gas

We will simultaneously look at the national regulations implemented in the United States of America, the European Union, China and the Kingdom of Saudi Arabia.

Environmental regulations vary considerably from country to country, requiring oil and gas companies to adapt strategically to an often complex regulatory framework. We will explore specific examples of regulations in critical countries, examining how these standards influence companies' operational practices. Whether in emissions monitoring, waste management, or ecosystem protection, these national regulations form the legal basis on which companies establish their environmental policies.

In the United States, environmental regulation is often managed at both the federal and state levels. The National Energy Policy Act (NEPA) requires environmental assessments for large projects, while the Environmental Protection Agency (EPA) establishes standards for air pollutants emissions. Regulations also vary by state, with California pioneering in strict environmental standards.

The National Energy Policy Act (NEPA) is a primary federal law that has significant implications for major projects in the energy sector, including those by oil and gas companies. NEPA requires federal agencies to evaluate the environmental impact of specific projects before undertaking them. This involves conducting in-depth environmental assessments and, in some cases, producing an environmental impact statement. Oil and gas companies must comply with these requirements when undertaking major exploration, extraction, or infrastructure projects.

The Environmental Protection Agency (EPA) is the key federal agency responsible for developing and enforcing environmental standards in the United States. Regarding the oil and gas sector, the EPA establishes standards for air pollutants, including greenhouse gas emissions. Companies operating in this sector must comply with EPA regulations to minimize their impact on air quality and sustainably reduce their emissions.

Environmental regulations also vary by state. California, in particular, often leads the way in strict environmental standards and sustainability initiatives. The California Air Resources Board (CARB) establishes specific regulations to reduce emissions and promote cleaner energy sources. Companies operating in California must comply with CARB's stricter standards, demonstrating a proactive approach to sustainability.

The complexity of the regulatory framework in the United States requires oil and gas companies to take a strategic and proactive approach to comply with federal and state standards while meeting the specific requirements of each jurisdiction. This includes compliance with existing environmental regulations, consideration of potential regulatory developments, and growing sustainability expectations.

In the European Union, companies in the energy sector are subject to rigorous environmental regulations. The Environmental Impact Assessment (EIA) Directive (Directive 2014/52/EU) and the Emissions Trading System (ETS) are emblematic examples. Not only do companies have to meet strict emissions standards, but they are also encouraged to invest in cleaner technologies through financial incentives. The EU has established a set of regulations to regulate the activities of the oil and gas sector from a sustainability perspective. These regulations include the EU Emissions Trading System (EU ETS), which imposes binding emissions caps on industrial installations, including those in the energy sector. Oil and gas

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companies operating in the EU must comply with these caps and can participate in market mechanisms to buy or sell emission allowances. The EU has adopted ambitious strategies to promote sustainability across its economy. The Farm to Fork strategy (European Parliament, 2021) aims to make the entire food chain more sustainable, while the Fit for 55 initiative seeks to reduce EU greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels. These strategies have direct implications for companies in the oil and gas sector, requiring them to actively engage in more sustainable practices to contribute to these goals. The EU has embarked on a significant energy transition to reduce its dependence on fossil fuels and promote cleaner energy sources. EU climate targets aim to achieve carbon neutrality by 2050. Oil and gas companies operating in the EU must adapt to this transition by investing in energy sources and renewables, reducing their carbon footprint, and aligning their activities with the EU climate roadmap. The EU has also implemented specific regulations to promote renewable energy. The Renewable Energy Directive sets binding targets for the share of renewable energy in total energy consumption. Oil and gas companies are encouraged to invest in renewable energy through solar, wind, or other sustainable energy projects. In short, the EU has established an ambitious regulatory framework to promote sustainability in the oil and gas sector. This framework encourages companies to adopt environmentally friendly practices, reduce their greenhouse gas emissions, and actively contribute to Europe's energy transition towards a low-carbon economy. Businesses operating in the EU must be attentive to these ever-changing regulations and adjust their strategies accordingly to remain compliant and competitive in the European market.

This transition may be achieved by setting a target of a low proportion of non-Renewable Energy Certificate (REC) in the energy mix, which would help these economies to control ecological problems. For this purpose, Western Union countries should invest in developing the infrastructure to enhance the production capacity of renewable energy. On the consumption side, the government should give subsidies to promote the REC and should tax the energy consumption from fossil fuels. Moreover, renewable energy standards should be improved. Governments may provide tax incentives and credits for renew-able energy investments. We also find that patents could reduce CO2 emissions in the long run. Thus, Western European economies should invest in R&D activities to generate further patents with environmentally friendly technologies to achieve a green environment. Moreover, governments should encourage collaboration between public and private research organizations for the development of clean technologies. Furthermore, governments should also spend on educational and training pro-grams to develop manpower for high-level research and the application of such research in favor of a pleasant environment. In addition, Western European economies should foster research collaboration within the region to promote environmentally friendly technologies (Haider et al., 2024).

Furthermore, environmental regulations have been strengthened in China, where the energy industry is leading. The Action Plan for the Prevention and Control of Air Pollution, for example, aims to reduce emissions of air pollutants. At the same time, strict standards are established for waste management and the protection of natural resources. China has enhanced its regulatory framework to address environmental challenges, including those posed by the oil and gas sector. Laws such as the Air Pollution Prevention and Control Law and the Environmental Protection Law impose strict standards on air emissions and waste management (Yang & Beyomsoo, 2022). Oil and gas companies in China must comply with these regulations to minimize their environmental impact. China has developed ambitious plans to accelerate its energy transition and reduce its dependence on fossil fuels. The emphasis is placed on increasing the share of renewable energies in the overall energy mix, promoting energy efficiency, and reducing greenhouse gas emissions. Oil and gas companies in China are encouraged to actively participate in this transition by investing in cleaner technologies and diversifying their energy sources. China has committed to peaking its carbon dioxide emissions by 2030 and achieving carbon neutrality by 2060. These targets have significant implications for the oil and gas sector, prompting them to adopt cleaner technologies, reduce methane emissions, and explore more sustainable energy alternatives.

Furthermore, the role of government in drafting laws, rules, policies, and standards is considered important. The Saudi government drafted Vision 2030 and implemented laws and regulations to achieve this vision. For instance, the government adopted and implemented innovation initiatives like the King Salman Renewable Energy Initiative, climate change agreements, a renewable energy program, a sustainable

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building code, and a sustainable farm. To achieve sustainability, the Saudi government established the Sustainable Development Steering Committee (SDSC) and developed 17 policy papers to address various sustainability goals. In introducing more laws and regulations, the government may look at the policy on carbon pricing and tax along with more steps towards better sustainable energy consumption, as the current energy consumption and subsidiaries should be relooked The government may look at more energy efficient measures in the construction, transportation, and industrial sectors, as they are found to be the main consumers of energy (Sarabdeen, 2024).

Collaborative Pathways: The Role of Global Initiatives in Oil and Gas Sustainability

Governments impose legal responsibilities on oil and gas companies to ensure environmental sustainability. This includes reporting requirements, emissions reduction targets, and rigorous compliance mechanisms. We will analyze how these legal obligations define the contours of sustainable development policies adopted by companies. This also includes how sanctions and corrective measures are applied in cases of non-compliance, thus highlighting the importance of obedience to legal standards regarding sustainable development.

We will focus on global initiatives major oil and gas companies adopt by examining commitments to reduce greenhouse gas emissions, global investments in renewable energy, and strategic partnerships with international organizations. Besides UN SDGs, there are several international initiatives related to sustainable development that oil and gas companies are encouraged to join and sometimes even required to join. These initiatives aim to mitigate environmental impacts, promote corporate social responsibility, and foster a transition to more sustainable practices in the energy sector. Here are some examples:

Extractive Industries Transparency Initiative (EITI): The EITI is a global standard encouraging transparency in the oil, gas, and mining sectors. Oil and gas companies are incentivized to publicly disclose government payments, which helps prevent corruption and ensure the responsible use of revenues.

Global Reporting Initiative (GRI): The GRI develops guidelines for reporting on companies' economic, environmental, and social performance. Oil and gas companies can use these guidelines to report their impact on sustainable development transparently.

OECD Guidelines for Multinational Enterprises: These principles provide recommendations to businesses regarding human rights, the environment, anti-corruption, and compliance with labor standards. Oil and gas companies operating globally are encouraged to adhere to these principles.

Business Climate Initiative (CBI): The CBI initiative encourages businesses to commit to reducing greenhouse gas emissions and transitioning to a low-carbon economy. Oil and gas companies can participate by adopting more sustainable practices and investing in renewable energy.

Coalition for Carbon Pricing Leadership (CPLC): The CPLC aims to promote carbon pricing to reduce greenhouse gas emissions. Oil and gas companies can support this initiative by adopting carbon pricing mechanisms and advocating for carbon pricing policies globally.

Major oil and gas companies have made significant commitments to reduce GHG emissions. These commitments can take the form of specific targets, such as lowering a given percentage of emissions by a particular date. These companies set short—and long-term goals and put mechanisms in place to measure and monitor progress towards these goals.

The transition to renewable energy is a critical component of global sector initiatives. Massive investments in solar, wind, hydroelectric, and other renewable sources have made this transition possible.

Some companies actively participate in carbon markets to help reduce global emissions. This may involve buying and selling carbon credits, participating in emissions trading programs, or implementing internal

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carbon pricing mechanisms. Companies integrate carbon markets into their overall emissions reduction strategy.

Initiatives such as the Global Methane Pledge, the Science Based Targets Initiative (SBTi), and other international programs are crucial in guiding corporate actions toward sustainability. Companies participating in such initiatives must abide by specific commitments and integrate these commitments into their sustainable development roadmap.

The Power of Soft Law: Corporate Social Responsibility in the Oil and Gas Industry

Prevention of risks linked to offshore oil and gas activity cannot be limited to international, regional, and local texts. If some authors are concerned about an insufficiency in the legal framework for offshore activities, the effectiveness of the prevention of the activity must not be studied solely from the angle of "traditional" instruments. It is essential to be interested in new forms of normativity that supervise the offshore activity and the "work of articulation with the traditional standards. Faced with the specificity of offshore oil and gas activities and their technical and financial weights, unilateral preventive action from oil and gas companies is essential. For this, oil companies have integrated "soft law" standards of their initiative by complying in particular with official standards and by creating the industry's standards.

Without action by offshore-sector industries, the States would suffer from the weakness of their technical means to develop a relevant legal framework beyond their constitutive delicacy to regulate this type of activity. Run by economic interests, oil and gas companies have gradually been forced to listen to civilian concerns related to environmental protection. With the growing demand of populations and non-governmental organizations (NGOs), the oil and gas industries have adopted a process of "corporate social responsibility" (CSR) as part of this CSR, public and private standards were created to complete the legislative framework, sometimes considered imperfect. Essentially derived from "soft law," these optional standards devoid of sanctions allow companies to participate voluntarily to guarantee better prevention linked to offshore activity.

Since the 1950s, some academics and industrialists began to develop the idea that companies should not focus only on their financial interests but also on the impact they can have on society to benefit from it. Corporate Social Responsibility (CSR) was then built according to a voluntary approach by companies to contribute to the sustainable development of their sectors. In the 21st century, CSR has rapidly been imposed as an essential concept within companies. Faced with the pressing emergence of this notion, long considered vague and ambiguous, the legislator has gradually attempted to define the framework of this notion as much as these issues. The offshore oil and gas industry generates numerous health, social, and environmental risks through its activity. The different environmental scandals from this activity led offshore sectors to set up a CSR policy to preserve their economic interests.

Corporate social responsibility is a concept gradually captured by law. According to Kathia Martin-Chenut and René De Quenaudon (Martin-Chenut & De Quenaudon, 2016), corporate social responsibility designates: "above all the academic names given to any approach put in place voluntarily by companies, particularly by the largest of them, transnational companies, in the context of contemporary globalization. This approach is expressed through practices that are good and inspired by ethics. Based on values", characterized by volunteerism, CSR must make it possible to contribute to the sustainable development of an activity, that is to say, "be economically viable, have a positive impact on society, but also better respect the environment." (At the European level, the concept is evolving. If the "Green Paper on the Promotion of a European Framework for CSR" of 2001 defined CSR as "the voluntary integration by companies of social and ecological concerns into their commercial activities and their relations with their stakeholders," a 2011 communication considers it as "the responsibility of companies for their impacts on society."

The International Organization for Standardization (ISO) will establish a complete definition of the concept through the "Guidelines relating to social responsibility," according to which CSR is: "a responsibility of an organization concerning the impacts of its decisions and activities on society and the environment, resulting in ethical and transparent behavior that contributes to sustainable development, including the

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health and well-being of society; take into account the expectations of stakeholders; respects the laws in force while being consistent with international standards of behavior; is integrated throughout the organization and implemented in its relationships."

This definition provides necessary clarifications as it implies a dual approach: this would be legal since it must respect the laws in force, but also moral since the company's behavior must be ethical and transparent while considering stakeholders' expectations. If the definition also reflects the different sectors of interest in sustainable development, under our study theme, CSR will only be discussed in terms of its contribution to preserving the environment. Environmental concerns are integrated into the internal management of companies through CSR. If they must comply with the relevant legislative instruments, CSR makes it possible to go further in environmental protection by allowing companies to voluntarily adopt preventive measures through the adoption of codes of conduct, controls, or certifications from the industrial sector or the public sector. Therefore, based on "soft law" instruments, CSR instills environmental awareness in companies. In this sense, the interest of a flexible law, not yet obligatory nor sanctioned, is to relay the ethical requirement of preventing the risks of significant damage without imposing the legal obligation.

Beyond an ethical awareness of environmental interests, companies find a definite benefit in adopting CSR. Thus, the ecological dimension, generally considered a constraint for many companies, is a quality economic tool that makes it possible to improve the company's image and open the door to new investors (Quyen, 2016). Particularly promising for a company, the absence of CSR can be harmful to the economic development of a company as the development of CSR within companies is present today. The proactive approach could be called into question since it can be seen as pressure from the economic market. Identifying two initiating causes for this voluntary approach to environmental protection is possible. According to the first, the company's strategy could result from pressures exerted by civil society and/or stakeholders. Its environmentally responsible behavior would then be forced and artificial, motivated by a single strategic goal of preserving its brand image. Even more, it would likely be qualified as greenwashing, this marketing effect which presents as "green" what is not with the sole objective of selling. According to the second, more rewarding approach of the company manager, he would be empathetic, frank, and driven by a desire to understand the needs and expectations of his company's stakeholders to create a lasting bond with them.

Mainly constrained by civil society and NGOs' pressure, international oil companies have inevitably taken an interest in this CSR approach. The CSR approach in the oil and gas sector provides a winning combination for manufacturers and the protection of the marine environment.

The oil and gas industry is no stranger to environmental scandals that can affect its image. We can, in particular, cite the consecutive sinking accidents of large oil ships such as the "Exxon Valdez" (1989), the "Erika" (1999), the "Prestige" (2002), or even the pollution linked to offshore platforms such as the "Brent Spar" affair (1995) and recently the "Deepwater Horizon" disaster (2010). These disasters have led to a distrust of civil society and NGOs in the face of oil and gas activities; recently, the NGO "Greenpeace" has led several demonstrations to ban the oil extraction project at the mouth of the river Amazon led by the French oil company Total.

Directly linked to the highly damaging and visible nature of oil spills, as well as operational pollution, the development of the offshore oil and gas industry is particularly vulnerable to environmental concerns (Frynas, 2009, p. 181). It is, therefore, natural that CSR has interfered with transnational oil companies. Some authors draw an interesting parallel between these international oil companies and the development of CSR. The companies most engaged in CSR expand internationally and depend on global financial markets and international reputations. The development of CSR for international oil companies is particularly profitable as it builds loyalty among consumers interested in its ethical approach and opens the doors to new global markets. Thus, an oil company sensitive to this CSR approach could respond more efficiently to calls for tenders concerning areas to explore or exploit by demonstrating its desire to protect the marine environment of the "host" State.

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Generally, it is accepted that offshore industries respond quickly and effectively to pressure from civil society and NGOs (Ives & Utting, 2006, p. 15). Among companies whose head office is in the European Union, BP, SHELL, and TOTAL are ranked among the companies in the oil and gas sector most involved in CSR20 initiatives. For the sake of transparency and as part of this CSR, these European companies publish annual reports on the environmental state of their activities, which is of particular interest to us in determining the effectiveness of the supervision of oil and gas activities.

Thus, by studying these reports, the number of operational and accidental pollution ("oil spills") has stabilized at a relatively low level. These figures are partly explained by the absence of severe oil disasters in recent years for the companies studied, namely BP, SHELL, or TOTAL. However, these figures must be understood carefully; focusing on the volume of releases rather than the number of these releases is essential. For example, the 2016 BP report counts 156 "oil spills" in 2014 compared to 149 in 2017, although the discharge volume was much higher in 2017 (0.7 million tons in 2017 compared to 0.4 million tons in 2014). Despite everything, the trend is towards improvement according to these reports. Although the oil companies studied are certainly European, they are not the only ones active in the waters of the European Union. However, the reports produced by the regional commissions on pollution caused by the offshore sector confirm the trend in industrial reports. This trend must be qualified by specifying that the measurements and reports concerned operational pollution and not accidental pollution in the fortunate absence of any major disaster in the waters of the European Union in recent years.

Indeed, the international and regional legislative frameworks and the community framework contribute to this progressive reduction in pollution. However, the normative densification allowed by the CSR mechanism also improves the prevention of risks linked to this activity.

The corporate social responsibility approach allows the emergence of complementary standards, which are non-legal and adjudicatory. CSR, therefore, encourages companies to adopt codes of conduct, environmental certifications, or mechanisms for evaluating their environmental policy through affiliation with public standards and standards from the private sector.

At the international level, ISO standards constitute one of the main elements of the CSR approach. Published by the International Organization for Standardization (ISO), these standards are intended to create common practices between companies. They allow the voluntary development of standards that complement positive business law, but they are also a "minimum commercial standard," particularly in Europe. If ISO is specifically interested in the CSR approach through its 26000 standard, it has also initiated certification standards concerning the oil and gas sector.

Thus, the 14000 series of standards relating to environmental management is considered one of the most influential for the offshore industries. Within this series of standards, standard 14001 encourages companies to implement risk assessment tools, impact measurements, and even mechanisms for preventing emergencies and the ability to respond. The possible certification within the framework of this environmental standard is of particular interest to oil companies that can display their interest in preserving the environment and thus have an undeniable commercial advantage. However, the certification resulting from standard 14001 is not interested in the effectiveness of environmental management but only in compliance with the standard. That is to say, it does not say that the company has a positive impact on the environment; it only says that it has implemented a set of processes to manage its environmental impacts better. Alongside this series of standards, standard 31000 on risk management allows the establishment of a framework and guidelines for crisis management, which could, for example, arise in the case of an offshore accident. More specifically, more than a hundred ISO standards directly concern the offshore oil and gas industry. The action areas are varied and concern the structure's architecture, pollutant emissions, the drilling fluids used, and even accident management. Indeed, these ISO standards contribute effectively to improving the prevention framework for offshore activities.

The International Finance Corporation (IFC), part of the World Bank, has developed a code of conduct specific to the offshore oil and gas industry. Thus, the Code of Conduct, "Environmental, health, and Safety Guidelines for Offshore Oil and Gas Development" (IFC, 2015), prescribes measures relating to

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exploration and exploitation operations. Among these measures, some are concerned with reducing pollutants and properly using certain fluids, while others focus on accidents and emergency response plans. Concerning accident risks, the prescribed measures fall within the more general code of conduct, "General EHS Guidelines." The World Bank's code of conduct is a comprehensive instrument that establishes relatively precise measures. It states, for example, that oil companies will have to equip themselves with the "BOP" system or even an emergency shutdown system "Emergency Shutdown System." Beyond the precision of these measurements, the IFC code of conduct provides two benefits. First, it considers that pollution is sometimes forgotten by traditional legislative texts, such as air pollution or noise pollution caused by offshore activities. Next, not all oil and gas companies have sufficient financial resources to carry out offshore activities. In this sense, if they want to obtain financing from the IFC, they must comply with the guidelines created by the World Bank group. Through its modernity and potentially restrictive economic force, the code of conduct developed by the IFC appears to be a significant "soft law" instrument for preventing oil and gas activities.

Finally, at the European level, the "Eco-Management and Audit Scheme" (EMAS) system improves the prevention of offshore activities. Operational since 1995, the EMAS system has established a monitoring, transparency, and advisory system for environmental measures at the European level. It allows the certification of companies providing an environmental declaration for each activity site, including the company's environmental policy, as well as an assessment of pollution risks and pollution carried out. This European certification is part of the logic followed by the ISO 14001 standard and may interest offshore industries.

The public sector supplements the "hard law" standards we have studied through certification mechanisms and codes of conduct. These standards, part of a proactive approach by companies, are not isolated. The oil and gas industry is also the instigator of complementary standards that make it possible to develop the prevention of offshore activities. In this sense, we can find 22 international sectoral and professional organizations that create hundreds of standard contracts and standards, most of them technical, drastically regulating offshore activity. Although studying the hundreds of standards resulting from these industrial initiatives could be tedious, addressing the primary standards that allow additional security of offshore activity is necessary.

The International Association of Oil and Gas Producers (IOGP) is at the center of industrial normative development. This association, which follows the "E&P Forum" formed in 1974, brings together seventy-five international and national oil companies. It represents the majority of existing oil companies at the international level. IOGP helps promote environmental issues within offshore oil and gas activities through this representation. The IOGP provides an additional framework for preventing oil and gas activities by implementing studies, group work, and regular evaluation (Amstrong, 1998). In this sense, the association's primary tool is developing relatively varied codes of conduct for companies. Among these codes of conduct, the one relating to "Environmental management in oil and gas exploration and production" is particularly interesting. This document covers the main environmental themes linked to offshore oil exploration and exploitation: the prevention of operational pollution, the management of pollutant discharges, exploitation in ecologically sensitive areas, and even the establishment of an emergency response plan. The code of conduct provides relatively precise measures, including an exciting reminder of the international and regional legislation applicable to discharge. The provisions in this general code of conduct are specified by "guidelines" specific to certain themes: we thus find documents prescribing more comprehensive measures, notably for emergency intervention plans or even specific thresholds for operational releases. The IOGP is also of particular interest to the European Union since it sets up a committee specific to economic, social, and environmental issues for the oil and gas industry in the EU.

Furthermore, at the international level, the "International Petroleum Industry Environmental Conservation Association" (IPIECA) is an association of oil industries specific to environmental issues. As part of its action, it shares and promotes joint action by the oil and gas industries and the stakeholders underlying the activity to improve the environmental conditions linked to the activity. With the help of the United Nations Environment Program, IPIECA is developing guidelines and standards of good practice for offshore industries. The themes are significantly similar to those of the IOGP, and the coordinated action of the two

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specific associations in creating codes of conduct makes it possible to establish a coherent set of best environmental practices and the best available technologies.

These industrial groups also exist at the regional level. Thus, the European Union has an association called "Concawe," which is interested in the same way as these big international sisters in environmental issues linked to offshore activities. The European Association has thirty-nine active members in the European area and participates in developing codes of conduct and scientific reports for these companies and in EU legislative work. Recently, Concawe developed a "Petrotox" tool to effectively calculate the toxicity rate of petroleum products on aquatic organisms. Various associations such as "OilandGasUK" also represent the national level of European countries.

This succinct approach to industrial standards shows that the offshore oil and gas sector, grouped into associations, has many standards that address various themes. Furthermore, industry standards constitute a significant element in preventing offshore accidents.

These industrial standards, like public standards, result from a voluntary approach by companies in the sector. Although the consideration of environmental issues by oil and gas companies is carried out under the effect of economic and public pressure, the latter has the merit of contributing to developing the framework for protecting the marine environment through their activities. Therefore, the "quasi-voluntary" approach of companies in the sector is carried out in a necessary partnership with States. The latter must be considered as important players as the oil companies as they fully control the activity on their territory. The lack of technical and financial resources of States should not be a pretext for limiting preventive action, as cooperation with the oil and gas industry is possible. If this cooperation finds its most potent expression in severe crises, it is also present from the start of operations due to the contractual system that links the "host" State to the oil company. This contractual system must make it possible to impose environmental obligations on the operator. However, these are in the minority within exploration and exploitation contracts. The lack of political will finds an inevitable materialization here, the State being more concerned with these financial interests than with establishing contractual obligations to protect the environment. Nevertheless, through hundreds of industrial and public standards, oil and gas companies compensate for this deficiency in the state's will to take effective contractual measures. This prevention framework must be encouraged as it complements the traditional legislative framework.

Royal Dutch Shell PLC, TotalEnergies S.A., Repsol, and Equinor are the oil companies that have done the most to protect the environment (Ross, 2022).

Shell has aimed to spend $2–$3 billion yearly on its Renewables and New Energy Solutions (formerly New Energies) division, which started in 2016. Shell is looking for ways to create energy by decarbonizing and focusing on electricity. In 2019, Shell started offering its British residential customers 100% renewable electricity. This means that renewable generators place another unit back into the grid for every unit of electricity used. In 2018, Shell invested in the U.S. firm Inspire Energy, which provides clean energy plans in certain states. It also purchased Greenlots, a startup focused on charging solutions for electric vehicles. In 2019, Shell purchased German firm Sonnen, a large home battery manufacturer and the creator of an electric vehicle charging system. Sonnen is also one of Tesla's biggest rivals. In addition to providing clean electricity, Shell has made significant investments in the solar energy sector. It purchased stakes in Sunseap Group, a Singapore-based solar company; Silicon Ranch, a U.S. solar firm; and has Greenfield solar and storage in development.

TotalEnergies, based in France, is one of the world's largest oil and energy companies. TotalEnergies provides access to renewable energy through wind, solar, biomass, and hydropower. Total Qaudran is a subsidiary of TotalEnergies and is at the forefront of developing and operating (and building) renewable energy products in France and worldwide. As of 2021, Total Quadran operates over 340 renewable energy plants (including 224 solar plants) in France that total nearly 1,000 MW, generating 1,765 GWh of renewable electricity per year, according to its website. This is the equivalent of the annual consumption of nearly 1 million people and annual savings of nearly 130,000 tons of CO_2 emissions. Total aims to expand its reach to 100 GW of gross production capacity from renewable sources by 2030.

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Repsol S.A. is an energy and petrochemical company based in Madrid. This Spanish company, a leading producer and primary hydrogen consumer, has 24 million customers worldwide and boasts of a corporate strategy of "ensuring sustainability and moving towards a low-emissions future and the decarbonization of the economy." So far, this company appears to be working towards a greener future. Repsol is exploring utilizing climate-friendly and green methods to override how it produces and uses hydrogen and synthetic fossil fuels. In March 2021, the company bid on "pandemic recovery funds to support projects including new biofuel plants and 'green' hydrogen production made from renewable sources in a pivot away from oil and gas to supplying low-carbon energy," according to Reuters.

Equinor is a broad energy company specializing in developing solar, gas, wind, and oil energy while seeking low-carbon solutions, like wind and solar farming. Headquartered in Stavanger, Norway, the company is present in 30 countries and was founded in 1972. The company services over 170 million customers who benefit from its oil, gas, and wind power. As of 2020, the company began construction at Hywind Tampen, the world's largest floating offshore wind farm (88 MW). This build aims to scale up floating offshore wind and provide power to five platforms, according to its 2020 sustainability report. Equinor aims to cut emissions in Norway towards near zero in 2050 and reduce its net carbon intensity by 50% by 2050.

Furthermore, CSR theory advocates for the extension of organizational responsibilities to include ethical and environmental considerations. CSR initiatives have a moderating effect on the institutionalization of Green Human Resources Management (HRM), reflecting the nuanced role that CSR plays in this process. Although CSR typically supports the institutionalization of Green HRM, its complex interaction with the adoption process highlights the multifaceted challenges organizations face in integrating CSR with operational practices (Zihan et al., 2024).

Future Perspectives and Suggestions: Shaping a Sustainable Future

Expected developments in legislation

Future legislative advances could include more significant financial incentives for sector companies that invest in low-carbon technologies, stricter emissions disclosure requirements, and higher standards for corporate social responsibility.

Opportunities for improving sustainable energy policies

Companies can improve their sustainable energy policies by further exploring the opportunities offered by renewable energy, integrating emerging technologies such as green hydrogen, and strengthening their commitment to ethical practices throughout the value chain.

Recommendations for companies in the sector

Companies must adopt a holistic approach by integrating sustainable practices throughout their operations, from exploration to production to distribution.

Businesses should continue to invest heavily in research and development of clean technologies to remain competitive in a rapidly changing market.

Transparent communication about sustainable initiatives, performance, and goals helps build stakeholder trust and demonstrate a sincere commitment to sustainability.

Conclusion: Towards a Sustainable Energy Transition

By summarizing the key points raised throughout this article, it is clear that the oil and gas sector is at a crucial turning point in its history. Case studies from companies demonstrate that meaningful sustainability initiatives can be undertaken, even in a context where fossil fuels remain a significant component of the global energy portfolio.

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The lessons learned from these examples show that innovation, energy diversification, strategic partnerships, and transparency are crucial elements to successfully transitioning to more sustainable energy. These companies have invested in clean technologies and expanded their portfolio to include renewable energy sources, illustrating the need for a holistic approach.

The time has come for all oil and gas companies to take decisive action towards a sustainable energy transition. This call to action is aimed at industry leaders, policymakers, and stakeholders, encouraging them to:

Scale up innovation by investing heavily in clean technology research and development and exploring innovative solutions to reduce emissions and minimize environmental impact.

Expand energy portfolios to include renewable sources will increase energy diversification, reduce dependence on fossil fuels, and contribute to a more balanced energy transition.

Cultivate collaboration through building strong partnerships with research institutions, governments, NGOs, and other businesses to drive collaboration and accelerate the development of sustainable solutions.

Strengthen transparency by communicating openly on progress made, challenges encountered, and future objectives regarding sustainable development, thereby strengthening stakeholder trust.

Prepare for legislative developments by anticipating and preparing for expected changes in the regulatory framework, proactively committing to meeting stricter standards, and contributing to the development of more sustainable energy policies.

By following these recommendations, oil and gas companies can be crucial in transitioning to cleaner, more sustainable energy. Their commitment today will help shape an energy future that meets society's needs while preserving our planet for future generations. The sustainable energy transition is an imperative and an opportunity for the sector, and collective action is essential to achieve this fundamental change.

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