Adaptation of Oil & Gas Companies to a Net-Zero Emission Future

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Introduction

The global energy landscape has started changing in recent years with an emphasis on environmental protection and preservation. In order to address issues posed by the global climate, the transition of companies towards net-zero and low-carbon energy plays a leading role in steering O&G corporations towards a greener, low-carbon direction. The oil and gas industry, affected by serious greenhouse gas implications, has seen dramatically fluctuating oil and gas prices in recent years, which have posed detrimental and unprecedented difficulties for businesses around the world. Thus, countries have accelerated their efforts to achieve net-zero carbon and greenhouse gas emissions as the Earth and human society experience the adverse impacts of global warming due to the catastrophic activities of the energy industry.

However, the transition to a low-carbon sector encompasses the adoption of sustainable and reliable future-oriented strategic decisions based on renewable energy sources as non-renewables decline substantially. The strategies include the development of storage capacities, electrification of distribution networks and infrastructure, carbon storage, and carbon capture that would maintain the economic and reputational resilience of the O&G industry as a result of transforming towards low-carbon energy (Chiodi et al., 2016). For instance, oil and gas companies can strategically adopt alternative sources of energy such as biofuels and natural gas to diversify their portfolios, integrate operations through joint ventures in the global O&G industry, and execute acquisitions to maintain low-carbon energy resilience in terms of enhancing reputation and economic performance. Building on the diverse impacts of climate change and the need to adopt potential strategies to achieve a low-carbon energy industry, this paper explores ways to foster the economic and reputational resilience of O&G organizations as the world transitions to a “low-carbon” energy future.

Driving Force for Transitioning to a Net-Zero Carbon O&G Sector

The energy transition in the oil and gas sector is an elaborate pathway that has become a development trend seeking a suitable gateway to transform the industry into a “green” and “low-

carbon" energy sector as the world faces significant risks due to dire climate implications. Therefore, downstream businesses and renewable energy are the main focus of oil and gas organizations seeking to lay the foundation for a new organizational model globally. As low-carbon development and emission reduction become global trends in the O&G industry, they present both an opportunity and a challenge to oil and gas firms in the process of transitioning from "fossil-based" sources to "low-carbon energy" sources. This transition aims to reduce energy-related emissions in the O&G sector and mitigate the detrimental impacts of global warming and climate change across the globe (Bento, 2018).

However, this transition also threatens the economic and reputational resilience of companies operating in the oil and gas sector. This threat necessitates the remodeling of the global oil and gas business through the adoption of effective strategies, including investment in alternative energy sources, portfolio expansion, the formation of joint ventures within companies' operational frameworks, and integrated operations that invest substantially in carbon capture and carbon storage. These strategies would create continuous divestment and investment opportunities in new and different energies, such as hydrogen fuels and biofuels for mobility, which can initiate companies' adaptation to operate in the dispensation of new energy sources.

Li, Trencher, and Asuka (2022) corroborate that a significant proportion of mitigation measures for reducing global greenhouse gas emissions recognize human activities in the energy sector, including the burning of fossil fuels and biofuels, as significant causes of climate change and global warming that have substantially implicated the oil and gas industry. Thus, two-thirds of global greenhouse gas and carbon emissions are attributed to the oil and gas sector because of the massive burning of fossil fuels (Li et al., 2022). Moreover, the traditional oil and gas sector is under tremendous pressure due to low oil prices in some countries, which lead organizations to lay off employees in order to reduce costs and may compromise energy security.

With the traditional and current development model of O&G organizations seeking to make "low-carbon" use of oil and gas resources in the context of increasing environmental protection and preservation requirements as well as increasing energy demand, the need to transition the O&G industry to "low-carbon energy" has become imminent in the ever-emerging world. Therefore, the transformation from a fossil-fuel-based sector to a low-carbon energy sector and the decarbonization of economies across the globe cannot be fully realized without a deliberate transition of the fossil-fuel- and biofuel-based global organizational model. In light of these disruptions and circumstances, it is indispensable for corporations in the O&G sector to increasingly focus on the impacts of climate change and embrace the concept of clean and greener energy.

Strategic Plans and Ways by the Oil and Gas

Organizations to Achieve Reputational and Economic Resilience

The “low-carbon” O&G sector, as an imperative foundation of the international economy, merits global attention as the industry undergoes a significant transition to low-carbon, greener, and sustainable energy according to the specific conditions set by every company based on regional, international, and organizational requirements. For instance, BP Amoco is one of the largest and most significant petrochemical and petroleum companies in the world and has faced performance problems in recent years, including an unparalleled and unprecedented “Oil Spill” issue. This accident led BP to transform its traditional status into an integrated low-carbon corporation as it accelerated plans to increase consumption of “low-carbon energy” sources in order to cut carbon emissions (Christiansen, 2002).

In order to balance its chemical assets, the leading O&G company BP gave away its chemical business to technology giant INEOS, which alleviated its financial problems in 2020. This allowed BP to focus on the integration of its business model and the development of an organizational model emphasizing “low-carbon energy” and its potential customers. BP Amoco has increased its investment in clean and “low-carbon energy” to build an integrated portfolio for reducing carbon emissions in order to meet the objective of carbon-footprint neutrality in the future (Vieira et al., 2023). Therefore, companies operating in the oil and gas sector can adopt several effective plans and actions, including investment portfolios and company operating models across the world, which are presented below:

O&G Companies’ Operational Integration

The industry, comprising small as well as large oil and gas corporations, is characterized by numerous operational complexities that adversely affect relationships and stability among O&G organizations. A significant proportion of such operational complexities disrupts the operational relationships between upstream and downstream operators, impeding the functional effectiveness and technical efficiency of the company. The impediment to the progressive enhancement of the organization restricts the ability of that firm to operate in the sector. Moreover, failure to integrate operations hampers the ability of the firm to compete, specialize in organizational segments, and implement its full strategic potential. The operational integration of companies encompasses the blending of activities and unification of tasks to optimize organizational processes while facilitating seamless decision-making within the operational framework. In this regard, oil and gas companies that fail to integrate their operations and implement their strategic potential should assess their economic and reputational performance before and after integrating their upstream and downstream operations in the industry.

For instance, Exxon Mobil is one of the leading companies with some of the largest proven reserves of gas and oil but was excluded from the “Dow Jones Industrial Average” of Wall Street due to falling market value, poor decision-making, declining energy demand due to the pandemic, and, most

importantly, Mobil's negative attitude towards carbon neutrality across the world. In 2021, Exxon Mobil underwent certain strategic adjustments as there was a conflict within the company's operational processes between revenue and profits on the one hand and climate change on the other. It decided to launch a "resilient" oil transition to increase its internal growth momentum, reverse the great loss it had endured in recent years, and accelerate the pace of decarbonization among its competitive oil and gas companies.

In 2022, Mobil adopted operational integration and announced a net-zero emissions goal by 2050. The company not only increased its investment in oil and gas reserves but also invested heavily in innovation and cooperation in the technological realm to shift its focus towards lower costs on the one hand and reduced production costs on the other. Furthermore, Exxon Mobil adopted a low-carbon strategy by optimizing the structure of its chemical business, eliminating ineffective capacity that did not achieve maximum productivity, refining its energy-utilization capabilities, and strengthening the emission-reduction capabilities of the company (CHEN et al., 2022). In a nutshell, Exxon Mobil drives global economic and reputational development while meeting global energy demand and pursuing a "low-carbon" and net-zero future at the same time. The main strategy of Exxon Mobil is to address greenhouse gas and carbon emissions from major oil and gas operations while expanding greener and cleaner renewable energies.

Operationally integrated companies can achieve better execution when they excel in smarter decision-making due to real-time industry information, interdisciplinary expertise, and other strategic benefits that make the oil and gas sector an indispensable component of the transformation to "low-carbon" energy. As the gas and oil industry undergoes business realignment characterized by changes caused by external factors, vertical operational integration and strategic benefits such as market intelligence ensure that a company remains informed about events occurring in the energy ecosystem and maintains direct contact with the energy market.

Moreover, businesses in the O&G industry that focus on only one segment of the supply chain cannot rapidly respond to structural imbalances and intricate developments in a firm's operational environment, exposing the firm to serious cyclical risks and threats. To cope with these impediments and risky eventualities, operational integration and intelligence-driven decision-making improve the economic sustainability and enhance the reputational profitability of the corporation strategically. Therefore, organizations with operational integration and sustainability can effectively maintain their financial and reputational resilience by addressing risks and threats posed to the organization, as effective risk-management strategies reduce firms' vulnerability to losses and threats.

Investment Portfolios Transformation

With the transition towards a low-carbon energy oil and gas sector, operating organizations face uncertainty, volatility, uncertain long-term sustainability, and other transition-related risks that make oil and gas firms reassess their current business strategies. Major oil and gas organizations reorganize

the integrated components of their non-traditional businesses to transform their portfolios in order to ensure long-term sustainability and expand their business strategies. Most oil and gas companies respond to increased electrification by reorganizing and optimizing their portfolios and transitioning into full-energy entities in order to improve financial and reputational resilience. For instance, Shell partnered with “NewMotion,” which is the largest electric vehicle (EV) charging company in Europe, to venture into the new, lucrative, and volatile consumer power market in order to remain relevant in the ever-emerging energy landscape. This gave the company control of an energy-retailing venture that owned and operated 30,000 existing charging points in Europe. This Shell initiative expanded its investment portfolio in 2017 and strengthened its position in the O&G market through low-carbon transport measures (Blondeel and Bradshaw, 2022). Strategic investment by oil and gas corporations in EV systems allows firms to embrace opportunities and measures presented by the energy transition, reflecting the company’s strategic evolution from fossil-based reserves to renewables and green energy while enabling it to secure a “low-carbon” future in the energy sector.

The strategic rationale for portfolio optimization offers a wide range of energy solutions, including diversification of firm revenues and exploitation of emerging opportunities to foster the ability of such organizations to generate strong economic returns (Pickl, 2019). Oil and gas companies, therefore, acquire charging infrastructure in order to expand their investment portfolios and enhance their consumer base in low-carbon transport. For instance, Statoil, a leading Norwegian oil and gas corporation, rebranded itself as Equinor, shifting from an oil-based enterprise towards a broader renewable-energy solution provider, which reflects the strategic evolution of Statoil as a progressive organization in the oil and gas sector. As a result, organizations like Statoil embrace transition opportunities to secure their sustainability and profitability in economic and reputational terms for market development in a low-carbon and net-zero energy future. As the transition of the energy sector to net zero gathers pace, leading firms in the oil and gas sector optimize their organizational portfolios and exploit emerging opportunities in the sector to foster resilience and sustainability at reputational and economic levels.

Joint Ventures in the Oil and Gas Quarter

In the O&G sector, joint ventures are common arrangements and alignments for businesses involved in exploring, developing, and producing oil and gas resources in upstream projects. The joint-venture business model is prevalent for strengthening and diversifying the portfolios of O&G companies in a resource-intensive, volatile market. Joint ventures in the O&G industry enhance the ability of corporations to facilitate the transfer of best practices in large-scale operations. These operations facilitate high-value activities such as managing expenditures, transferring knowledge, distributing risks, accessing funding, and allowing participation in risk-protective measures. Furthermore, strategies such as diversification of the company’s portfolio, the adoption of best technological practices, and pooling of resources protect many aspects of organizational performance in order to facilitate easier entry into new and volatile markets.

In this regard, international joint ventures involving the upstream operations of oil and gas companies, including Chevron, Mobil, Texaco, and Shell in Nigeria under the umbrella of the Nigerian government, improve the operational, economic, and reputational resilience of the organizations involved in the joint ventures through collaboration among firms. For instance, Shell, the leading oil and gas giant, has participated in Nigeria with the Nigerian government because the company has technical and engineering expertise. The political influence and resources of the Nigerian government facilitated Shell's exploration, extraction, and production of gas and oil reserves in Nigeria. Such mergers, ventures, and partnerships intend to leverage operational capabilities, risk management, and resource exploration while improving the economic and reputational resilience of participating entities (Wheeler et al., 2001).

Given challenging O&G market conditions, oil and gas companies seek ways of delivering high-value projects in the most cost-effective way, which requires companies to actively share risks in capital operations. For instance, the partnership and joint venture between MAANA and Chevron was designed to enhance the utilization of technological innovations, including data mining and robotics, in Chevron's oil and gas operations. The information and communication technology company MAANA was involved in the development of an "analytics platform" in collaboration with Chevron that allows energy organizations to adapt their operations alongside emerging technologies (Trevathan, 2020). This partnership provides an appropriate avenue to enhance sustainability, minimize risk, and spread technological costs. Further, joint ventures and operational integration enhance the profitability and sustainability of oil and gas corporations by fostering efficient assets, reducing production costs, addressing prevailing market needs, and improving the flexibility of the operational framework within organizations.

Realignment of O&G Business through Mergers and Acquisitions

The O&G sector is adjusting to the reality of embracing and expanding low-carbon energies while rearranging and realigning its operational framework through mergers and acquisitions across the globe. These mergers and acquisitions rearrange the reserves and assets of firms according to the defined strategic objectives of the corporations involved in the O&G sector. The responsibilities of the corporations include the provision of services and products to enhance the exploration, extraction, production, and distribution capacities of O&G companies. For instance, Shell and Total, two significant and leading giants in the O&G industry, have led many transactions involving mergers and acquisitions to enhance mobility, low-carbon energy segments, and offshore wind generation as they progressively transition into a low-carbon energy system amid declining demand for fossil fuels.

Another significant example is the merger of Exxon and Mobil, which led to the development of Exxon Mobil and provided sufficient economic resources to invest in renewables. Therefore, oil and gas firms seeking investment and production avenues for enhancing financial, economic, and reputational resilience through mergers and acquisitions are primarily driven by the need to invest in cleaner and

greener energy. Moreover, mergers and acquisitions are specifically designed to reinforce economic and reputational resilience within the operational framework of the organization so that companies can continue performing progressively and effectively in the face of the changing O&G and energy business landscape.

Conclusion

As global warming poses a threat through climate change and has serious implications for the Earth and human society, accomplishing a low-carbon energy sector has become a central objective of the O&G industry in order to meet the major goal of net zero while reducing the share of greenhouse gas emissions globally. However, companies face serious economic and reputational risks as the transition of the O&G sector draws near. To cope with transaction and investment risks, oil and gas firms merge with and acquire other businesses based on technology and analytics, operationally integrate their frameworks and processes, transform their portfolios, form joint ventures, and build on efforts to cut fossil-fuel consumption. The implementation of such plans and strategies leads organizations to adapt their operational frameworks in accordance with low-carbon energy strategies. These strategies also cushion companies operating in renewables against declining demand for fossil fuels and enhance profitability, economic sustainability, and economic resilience as they transition into the “low-carbon” energy era.

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