

Sustainability and Resilience in the Oil and Gas Industry: Post-COVID-19 Strategies and Innovations

Ogochukwu C. Nweke^{1,2,*}, Emmanuel Kweku Amoako Appiah³

¹School of Business, Leadership and Legal Studies (SBLL), Regent University College of Science and Technology, Accra, Ghana.

²Faculty of Law, Governance and International Relations, Kings University College (KUC), Accra, Ghana.

³Customs Division, Ghana Revenue Authority, Accra, Ghana.

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***Corresponding author:** Ogochukwu C. Nweke, School of Business, Leadership and Legal Studies (SBLL), Regent University College of Science and Technology, Accra, Ghana; Faculty of Law, Governance and International Relations, Kings University College (KUC), Accra, Ghana.

Abstract

The COVID-19 pandemic has profoundly impacted the oil and gas industry, disrupting supply chains, reducing demand, and exposing vulnerabilities within the sector. This document explores the multifaceted effects of the pandemic on the industry, examining key areas such as operational disruptions, oil price volatility, employment challenges, and financial risks. The study highlights the importance of digital transformation, renewable energy integration, workforce development, and sustainability practices as critical strategies for navigating the post-pandemic landscape. References were made to leading companies like Shell and Equinor to illustrate successful adaptations and innovations that have enhanced resilience and positioned these companies for long-term success. Additionally, the document reviews relevant legal cases, including *Scottish Power UK Plc v BP Exploration Operating Co Ltd* [2015] EWHC 2658 and *DHL Project & Chartering Limited v Gemini Ocean Shipping Co Ltd* [2022] EWHC 181 (Comm), which underscore the necessity of robust contractual provisions and credit risk management. The recommendations provided aim to guide the industry towards a more sustainable and resilient future, balancing short-term recovery with long-term strategic goals.

Keywords

Oil and Gas, COVID-19, Sustainability, Innovation, Laws, Strategies

1. Introduction

Oil and gas used to be considered a safe asset but have now become increasingly unstable as investors and employees stray away from the sector. “With high public scrutiny, a price crash, and severe disruption caused by COVID-19, it comes as no surprise that interest in the sector is declining” [1]. The COVID-19 pandemic has profoundly impacted the oil and gas industry, disrupting supply chains, reducing demand, and exposing previously underestimated vulnerabilities. The pandemic has led to significant financial losses for oil-producing countries and companies, exacerbating existing economic challenges.

According to Baldwin and Di Mauro [2], “COVID-19 is most definitely spreading economic suffering worldwide. The virus may, in fact, be as contagious economically as it is medically. Joining the OECD’s dire growth forecast of 2 March 2020, the European Commission said on 4 March 2020 that both Italy and France are at risk of slipping into recession and the IMF said it sees “more dire” possibilities ahead for the global economy” [3]. The global oil

industry is experiencing major shocks as the COVID-19 pandemic endures. The size and lifespan of the impact on the various dimensions of world economies are still not readily assessable [4].

Akin to a normal healthy person who contracts a seasonal flu and suffers a short period of discomfort albeit tough but bounces back to health and normal life activities, it was expected that the COVID-19 pandemic, which was originally cited as a Chinese problem, would pass before the world would actually notice. However, the impact has become global and has actually changed the times and life as the world had hitherto known it. It has led the world and economic pundits to predict a less likely “V-shaped” outcome [2].

The oil and gas industry, a cornerstone of global economic stability and growth, has faced unprecedented challenges due to the COVID-19 pandemic. The pandemic has not only disrupted supply chains and reduced demand but also exposed vulnerabilities within the sector. As the world grapples with the ongoing effects of COVID-19, the oil and gas industry must adapt to a rapidly changing landscape characterised by volatile markets, regulatory shifts, and a growing emphasis on sustainable energy solutions.

The initial impact of COVID-19 on the oil and gas sector was severe, with lockdowns and travel restrictions leading to a dramatic decline in demand. According to the International Energy Agency (IEA), global oil demand fell by 8.8 million barrels per day in 2020 compared to the previous year, marking an unprecedented drop in consumption [5]. This sudden decrease in demand resulted in significant financial losses for oil-producing countries and companies, exacerbating existing economic challenges.

In 2023, the global oil demand rebounded to pre-pandemic levels, driven by the resurgence of economic activities and increased travel. However, the industry continues to grapple with volatility in oil prices, partly due to geopolitical events such as the ongoing conflict in Ukraine and tensions within OPEC+ over production quotas. The rise of electric vehicles and advancements in battery technology are further reducing the reliance on fossil fuels, presenting both challenges and opportunities for traditional energy companies [6, 7].

In addition to the immediate economic impact, the pandemic has accelerated several long-term trends that are reshaping the energy sector. The shift towards renewable energy sources has gained momentum, driven by both environmental concerns and advancements in technology. Governments and investors are increasingly prioritising sustainability, leading to a reevaluation of energy policies and investment strategies. The International Renewable Energy Agency (IRENA) reported that renewable energy capacity grew by 10.3% in 2023, highlighting the shift towards cleaner energy sources [8].

Furthermore, the geopolitical landscape has also influenced the oil and gas industry. Tensions between major oil-producing nations, such as those within OPEC+, have led to fluctuating oil prices and uncertainty in the market [6]. This document aims to assess the impact of COVID-19 on the oil and gas sector, considering these broader trends and future management strategies. In the course of the discussion, the value of the oil and gas sector to the various economies of the world and the performance of the sector will be addressed to determine if COVID-19 is entirely to blame for the woes of the oil and gas sector. The write-up will also try to answer whether the oil and gas sector is capable of full recovery when the pandemic is over, how long this will take, and what alternatives are available to the world in the face of a fallen and irreparable oil and gas sector.

Particular factors and events whose occurrences raised challenges in the oil and gas sector in the face of the pandemic and the harm they caused will also be cited and considered in this discussion. A systematic process of evaluating the potential risks of COVID-19 on the oil and gas industry will be carried out.

In all, the major focus of this write-up will be on the impact on the oil and gas industry and the future management of the industry.

2. Overview

2.1 COVID-19

The World Health Organization (WHO) describes Coronavirus disease (COVID-19) as an infectious disease caused by the SARS-CoV-2 virus. While the initial waves of the pandemic resulted in widespread illness and significant mortality, advancements in medical research and the global vaccination campaign have since mitigated its most severe impacts. Despite this progress, the virus continues to pose challenges due to the emergence of new variants that occasionally lead to spikes in cases and hospitalisations [9].

Most people infected with the COVID-19 virus now experience mild to moderate respiratory illness and recover without requiring special treatment, particularly if they are vaccinated. However, older people and those with

underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer remain at higher risk of severe illness. Preventative measures, such as vaccination, hand hygiene, and respiratory etiquette, continue to be crucial in managing the spread of the virus [10].

As of early 2024, over 700 million confirmed cases and 6.8 million deaths have been recorded globally. While the acute phase of the pandemic may have subsided, the long-term impacts on global health systems and economies are still being felt [11]. According to the International Monetary Fund (IMF), the global economy is recovering, but unevenly, with significant disparities between advanced economies and developing countries [3]. The pandemic has accelerated several long-term trends reshaping global industries, including the oil and gas sector.

Baldwin and Di Mauro [2] describe the impact of COVID-19 on the world and world economies as follows:

"This pandemic is different economically speaking. Previous post-war pandemics hit nations that were – at the time – far less economically dominant. And those pandemics were far smaller; the number of COVID-19 cases is already eight or nine times larger than the number of SARS cases. At least as important is one sobering fact: this time the hardest-hit nations include the G7 plus China. Medical data changes hourly but as of 5 March 2020, the ten nations hit hardest by COVID-19 are almost identical to the list of the ten largest economies in the world (Iran and India are the exceptions). The US, China, Japan, Germany, Britain, France, and Italy are all in the top ten most affected by the disease. While China is by far the hardest hit, the last few days have seen an exponential growth of cases in the G7 economies. Taking just the US, China, Japan, Germany, Britain, France, and Italy, they account for:

60% of world supply and demand (GDP)

65% of world manufacturing

41% of world manufacturing exports.

To paraphrase an especially apt quip: when these economies sneeze, the rest of the world will catch a cold."

The oil and gas industry, a cornerstone of global economic stability and growth, has faced unprecedented challenges due to the COVID-19 pandemic. The pandemic has not only disrupted supply chains and reduced demand but also exposed vulnerabilities within the sector that were previously underestimated.

2.2 Oil and Gas Industry

The oil and gas industry remains a significant player in the global economy, generating substantial revenue and providing essential energy resources. However, it has faced numerous challenges in recent years, exacerbated by the COVID-19 pandemic. The industry's recovery has been uneven, influenced by fluctuating demand, geopolitical tensions, and the accelerating transition towards renewable energy sources [6].

In 2023, the global oil demand rebounded to pre-pandemic levels, driven by the resurgence of economic activities and increased travel. According to the International Energy Agency (IEA), global oil demand reached 99.7 million barrels per day, up from the significant declines seen during the height of the pandemic [12]. Despite this recovery, the industry continues to grapple with volatility in oil prices, partly due to geopolitical events such as the ongoing conflict in Ukraine and tensions within OPEC+ over production quotas [6, 7].

The pandemic accelerated several long-term trends that are reshaping the energy sector. The shift towards renewable energy sources has gained momentum, driven by both environmental concerns and advancements in technology. Governments and investors are increasingly prioritising sustainability, leading to a reevaluation of energy policies and investment strategies. The International Renewable Energy Agency (IRENA) reported that renewable energy capacity grew by 10.3% in 2023, highlighting the shift towards cleaner energy sources [8].

The energy sector's key areas include:

Upstream: This involves the exploration and production of crude oil and natural gas. The sector has seen a significant increase in investment in digital technologies to enhance exploration and production efficiency. Despite the challenges posed by COVID-19, upstream activities have remained resilient, with companies leveraging technology to mitigate operational disruptions. However, the pandemic led to temporary halts in exploration and development operations due to workforce shortages and logistical challenges, which are gradually being addressed [13].

Midstream: This entails the transportation, storage, and processing of oil and gas. The midstream sector has been affected by logistical challenges and supply chain disruptions. Companies are now focusing on enhancing infrastructure resilience and integrating more sustainable practices in transportation. The suspension of certain projects during the pandemic has had a knock-on effect on joint operation budgets and work programmes, necessitating significant adjustments [14].

Downstream: This involves refining crude oil and purifying natural gas, and the marketing and commercial distribution of these products. The downstream sector has adapted to changing market dynamics by investing in bio-fuels and other alternative energy sources to meet regulatory requirements and consumer preferences for greener products. Operational disruptions during the pandemic, such as reduced workforce and maintenance delays, have highlighted the need for greater flexibility and resilience in operations.

The continued influence of COVID-19 on the oil and gas sector is evident in the ongoing operational adjustments and strategic shifts companies are making to navigate the post-pandemic landscape. The industry's resilience is being tested by the need to balance short-term recovery efforts with long-term sustainability goals. The future management of the oil and gas industry will likely depend on how well it can adapt to these new realities while continuing to provide essential energy resources.

3. Risk

Risk involves uncertainty about the effects/implications of an activity, often focusing on negative, undesirable consequences. Risk assessments are very important as they form an integral part of the management plan. They help to:

- Identify and create awareness of risks.
- Identify stakeholders affected by the risks.
- Determine the control program required for each identified risk.
- Determine if existing control measures are adequate to manage the risks.
- Prevent further negative impacts of the risks.
- Prioritize risks and control measures.
- Meet legal requirements where applicable.

The oil and gas industry has always faced various risks, but the COVID-19 pandemic has introduced unprecedented challenges. This section will explore the key risks faced by the oil and gas industry in the current context and outline potential mitigation strategies.

3.1 Oil Prices

Oil prices largely determine the revenue derived by the oil and gas industry. Historically, global oil prices have been subject to significant volatility due to various factors, including financial crises, geopolitical tensions, and pandemics. The COVID-19 pandemic led to one of the most severe disruptions in oil prices, with a historic drop in demand during the early stages of the pandemic [6, 7].

In April 2020, oil prices fell dramatically due to the uncontrolled COVID-19 crisis worldwide. A global oil price disruption was observed from US\$17 on 19 April 2020 to US\$35 on 20 April 2020, followed by a further decline to US\$6 on 21 April 2020 [5]. The decline in oil demand was partly due to worldwide quarantines and a massive reduction in petroleum-driven products and services consumption. However, by 2023, oil prices had rebounded due to the resumption of economic activities and increased travel, but the market remains volatile. Factors such as the ongoing conflict in Ukraine and production decisions by OPEC+ continue to influence oil prices, leading to uncertainties in revenue for the industry [7].

3.2 Operational Disruption and Supply Chain Risk

The effectiveness of the oil and gas industry's supply chain network, which connects production to the final consumer, is crucial. The COVID-19 pandemic has exposed significant vulnerabilities in this network. Despite being considered essential activities by governments and mostly exempt from lockdown measures, oil and gas operations faced disruptions due to workforce shortages, social distancing requirements, and logistical challenges.

Continued operations became increasingly difficult due to employees contracting the virus and the practical difficulties of social distancing and movement restrictions. Companies had to operate with skeleton crews, impacting planned maintenance, inspection, repair, and replacement of equipment and drilling activities [13]. The industry is now focusing on enhancing supply chain resilience, including greater integration of digital technologies to monitor and manage operations remotely and improving coordination with third-party contractors to ensure compliance with health and safety standards [15].

The case *Scottish Power UK Plc v BP Exploration Operating Co Ltd* [16] is particularly relevant in this context. In this case, the court examined the contractual obligations and the extent to which a supplier can be held liable for

failing to meet supply commitments due to unforeseen circumstances. The ruling emphasised the importance of clear contract terms regarding force majeure and the obligations of parties during operational disruptions, thus prompting a re-evaluation of force majeure clauses in contracts across the oil and gas industry. A more recent case, *DHL Project & Chartering Limited v Gemini Ocean Shipping Co Ltd* [17], further illustrates the complexities involved in determining liability and the applicability of force majeure clauses in the wake of the COVID-19 pandemic. The case involved disputes over delayed shipments and the invocation of force majeure due to pandemic-related disruptions. As a result, companies must now consider the implications of such clauses in the event of future pandemics or similar disruptions.

3.3 Employment

The low demand for oil and gas products brought about by the pandemic led to significant job cuts and wage reductions in the sector. According to Rystad Energy's analysis of data from the United States Bureau of Labor Statistics, over 100,000 oil and gas jobs were lost due to the downturn caused by COVID-19 [13]. The sector's labour market remains fragile, with ongoing adjustments required to match the evolving demand and operational needs.

In response to these challenges, companies are investing in reskilling and upskilling their workforce to adapt to new technologies and changing market dynamics. There is also a growing emphasis on diversity and inclusion to build a more resilient and innovative workforce capable of navigating future disruptions [1].

3.4 Regulatory and Compliance Risks

The oil and gas industry is subject to a complex regulatory environment that varies by region. The pandemic has led to new health and safety regulations, increased scrutiny of environmental compliance, and changes in taxation and subsidy policies. Companies must navigate these evolving regulations while maintaining operational efficiency and profitability.

Regulatory risks also include potential penalties for non-compliance with new health and safety standards introduced to mitigate the spread of COVID-19. Companies need to stay updated with regulatory changes and ensure robust compliance frameworks are in place to avoid disruptions and financial penalties [18].

3.5 Financial Risk

Financial risk in the oil and gas industry has been exacerbated by the pandemic, with many companies facing liquidity challenges due to reduced revenues. The fall in oil prices put many upstream producers at risk of defaulting on their borrowing base facilities. Lenders had to decide whether to waive defaults or enforce security rights, with many opting for debt restructuring to support borrowers through the crisis [15].

As the industry recovers, companies are focusing on strengthening their financial positions through cost-cutting measures, renegotiating loan terms, and exploring alternative financing options such as green bonds and sustainability-linked loans. There is also a shift towards more prudent capital allocation, prioritising projects with higher returns and lower risks.

4. Solutions

The oil and gas industry has faced significant challenges due to the COVID-19 pandemic, requiring innovative and adaptive strategies to navigate the crisis and build resilience for the future. This section outlines the solutions and strategies being employed to mitigate the impact of the pandemic and ensure the industry's long-term sustainability.

4.1 Management of the Sector

Effective management of the oil and gas sector is crucial to mitigating the adverse impacts of COVID-19 and ensuring a robust recovery. Governments and industry leaders must collaborate to implement policies and practices that support the sector while promoting sustainability and innovation.

Governments around the world have implemented various fiscal measures to mitigate the adverse effects of the pandemic and provide relief for businesses and households. For example, the US government introduced the Coronavirus Aid, Relief, and Economic Security (CARES) Act, which provided significant financial support to industries, including oil and gas [19]. Similarly, other countries have rolled out stimulus packages and support measures tailored to the specific needs of their energy sectors [20].

4.2 Stability Agreement

A certain level of value can be achieved through approvals by governments for investments that will help revive the oil and gas sector. Investments that bring the desired transformation, especially as countries begin to relax the ban on transportation and other activities, will boost the demand for oil and gas.

4.3 Counterparty Credit Measure

As the pandemic continues, the industry must brace itself for a renewed focus on credit risk associated with counterparties as financial stress flows through the sector. This suggests that an extension of payment terms and innovative financing structures that leverage stronger balance sheets and help sustain weak counterparties while mitigating creditors' risk may again become prominent [15].

The case of DHL Project & Chartering Limited v Gemini Ocean Shipping Co Ltd highlights the importance of credit risk management in contractual relationships. The ruling, among other things, illustrated the need for clear terms regarding credit obligations and risk mitigation strategies when unforeseen disruptions affect the ability to fulfil contractual duties. As a result, companies should enhance their credit risk management frameworks by incorporating lessons from these cases. This includes setting clear credit terms, implementing robust risk assessment processes, and ensuring that contracts are flexible enough to accommodate adjustments during crises.

4.4 Government Interventions and Support Measures

Given that some sections of society cannot function without the energy from oil and gas they solely rely on, it has become necessary for governments to intervene to ensure continued supply. Energy supply is generally considered a matter of national interest, and measures should increasingly be implemented at a national level to provide some relief to the local oil and gas industry from the adverse impact of COVID-19.

Countries like Canada and Norway have activated measures to support their oil and gas sectors. For instance, Canada's Emissions Reduction Fund provides financial support to oil and gas companies to reduce methane emissions, thereby addressing both economic and environmental goals [21]. Norway has extended tax relief measures to support exploration and production activities in its continental shelf [22]. Similarly, the United Kingdom announced the North Sea Transition Deal in 2021, aiming to support the sector's recovery while promoting net-zero emissions [23].

4.5 Borrowing Base Financing Facilities

The fall in oil prices will put many upstream producers into default under their borrowing base facilities at the next borrowing base redetermination. Producers may be sheltered from the risk of payment default for as long as any commodity price hedges remain in place and are in the money.

This implies lenders will have to decide whether to either:

- 1) Waive the default (typically as part of a debt restructuring on the basis of "amend and extend"); or
- 2) Enforce their security rights.

In light of the 2014/15 price slump and the practical difficulties and risks associated with enforcement, it is expected that lenders would opt for the former in most circumstances. Banks worldwide have strengthened their balance sheets significantly since the 2008 financial crisis, giving them more scope and ability to support borrowers through this period. Conversely, those banks looking to reduce their exposure to the resources sector in response to the emergency and the energy transition may look hard for an exit from distressed loans [18].

4.6 Administrative Control to Curb Further Spread

Administrative controls, when feasible, should be implemented to reduce or eliminate the risk of exposure. For example, in Nigeria, the Central Bank granted leave to Deposit Money Banks (DMB) to consider temporary and time-limited restructuring of the tenor and loan terms for businesses most affected by the pandemic, with particular reference to the oil and gas sector [24]. The Federal Inland Revenue Service also extended the timeline for the remittance of different tax types, including Income Tax, Value-Added Tax (VAT), and Withholding Tax (WHT) [25].

4.7 Workforce Development Initiatives

Training initiatives produce a more skilled and adaptable workforce continue to be an important response to the challenges faced by the workforce in the oil and gas sector during and post-COVID-19. Employees must be groomed to be better equipped to navigate the evolving energy landscape, contributing to the company's growth and innovation. Equinor is one of the companies that has focused on equipping its workforce with the skills needed for the energy transition. The company has launched training initiatives to upskill employees in digital literacy, sustainability practices, and emerging technologies, to ensure its employees are prepared for future industry demands [26].

Oil and gas leaders will be defined by their actions along the three dimensions of managing a crisis: respond, recover, and thrive. Some key next steps include:

- Conducting a detailed evaluation of trading and cash flow by revising key assumptions and remodeling to identify actual financing needs.
- Leveraging government directives in terms of borrowings and initiating engagement with lenders to explore debt restructuring alternatives, including renegotiation of loan terms and tenor, and the grant of a moratorium on interest and/or principal.
- Providing adequate disclosures in interim financial statements in line with guidance from financial reporting councils regarding the impact of the pandemic, principal risks, and uncertainties faced by the company.
- Revising estimated returns and taking advantage of the relaxed tax compliance regime provided by authorities, which could reduce the pressure on cash flows.
- Assessing whether the company has the financing to continue and balancing the trade-off between immediate needs and commitments to the market regarding returns, dividends, and share buy-backs.
- Considering the crisis as a catalyst to rethink work processes, such as accelerating the adoption of digital capabilities.
- Determining what the future of work will look like and aligning talent strategies for the new environment [15].

5. Conclusion

The impact of COVID-19 on the oil and gas sector is not only perceived but is felt directly and indirectly in the difficulties that have arisen due to the pandemic. According to Zizek [27], “the only thing that is clear is that the virus will shatter the very foundations of our lives, causing not only an immense amount of suffering but also economic havoc conceivably worse than the Great Recession. There is no return to normal; the new 'normal' will have to be constructed on the ruins of our old lives, or we will find ourselves in a new barbarism whose signs are already clearly discernible.”

From the outset, this experience gives us the opportunity to review many aspects of our lives and our economies. We must learn new and better ways of doing things to ensure that the impact of events like COVID-19 is considerably ameliorated. This raises the question of whether the world should continue depending on oil and gas when there could be other cheaper and less hazardous methods of generating energy, and how a deviation from oil and gas will affect developing economies like those in Africa and South America.

The initial impact of the pandemic led to a dramatic reduction in demand for oil and gas due to global lockdowns, travel restrictions, and economic slowdowns. This unprecedented drop in demand resulted in significant financial losses and exposed vulnerabilities within the industry. However, as the world begins to recover, the oil and gas sector is demonstrating resilience by adapting to new realities and embracing transformative strategies.

Digital technologies have been crucial in enhancing operational efficiency and resilience. Companies like BP have leveraged artificial intelligence and machine learning to predict equipment failures and optimise maintenance schedules, resulting in significant cost savings and improved productivity [28]. Digital transformation is not just a response to the pandemic but a long-term strategy that will continue to drive efficiency and innovation in the industry [29].

The shift towards renewable energy is gaining momentum, driven by environmental concerns and technological advancements. Companies such as Shell are leading the way by investing heavily in renewable energy projects and committing to net-zero emissions goals. This transition is essential for the industry's sustainability and aligns with global decarbonisation efforts. Diversifying energy portfolios and integrating renewable sources are now critical components of strategic planning for oil and gas companies [30].

Workforce development has also emerged as a crucial area of focus. Equinor's initiatives to upskill employees in digital literacy, sustainability practices, and emerging technologies exemplify the industry's commitment to preparing its workforce for future challenges. Continuous learning and development programs are essential for building a resilient and adaptable workforce capable of navigating the evolving energy landscape.

Government interventions and support measures have played a significant role in stabilising the industry during the pandemic. Fiscal measures, such as the US CARES Act and Canada's Emissions Reduction Fund, have provided much-needed financial support. These interventions have helped companies manage liquidity challenges, maintain operations, and invest in sustainability initiatives.

The oil and gas industry must continue to strengthen supply chain resilience through better risk management, diversification of suppliers, and investment in local production capabilities. The use of digital supply chain management tools can improve visibility and coordination, ensuring continuity of operations during disruptions.

Environmental, social, and governance (ESG) criteria are becoming increasingly important for investors and stakeholders. Companies must prioritise sustainability and environmental responsibility to meet regulatory requirements and maintain their social licence to operate. ExxonMobil's comprehensive sustainability framework demonstrates how integrating ESG principles into business operations can enhance a company's reputation and attract ESG-focused investors.

The oil and gas industry is at a critical juncture. The challenges posed by COVID-19 have accelerated the need for digital transformation, renewable energy integration, workforce development, and robust sustainability practices. By embracing these strategies, the industry can navigate the current landscape and emerge stronger, more resilient, and better prepared for future disruptions. The lessons learned during this period offer valuable insights for building a more sustainable and innovative energy sector.

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