

Group of Twenty

Evaluating the impact of sustainable energy transitions on the petroleum industry



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Issue:	Evaluating the impact of sustainable energy transitions on the petroleum industry
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Introduction

Access to sustainable and reliable energy sources has become a pressing global concern in recent years. As countries strive to meet their climate goals and reduce greenhouse gas emissions, there has been a growing shift towards sustainable energy transitions. This shift has significant implications for the petroleum industry, which has traditionally been a major player in the global energy landscape. Thus, as the world grapples with the challenges of limited resources and the adverse impacts of fossil fuels, evaluating the impact of sustainable energy transitions on the petroleum industry becomes crucial.

Access to reliable energy is a fundamental requirement for social and economic development, and its implications extend beyond the energy sector. Statistics highlight the urgent need for sustainable energy solutions. In many low-income developing countries (LIDCs), the access rate to electricity remains alarmingly low, with figures as low as 4.1% among the general population in countries like Liberia. The consequences of inadequate energy access are far-reaching, particularly for those living in extreme poverty. For individuals in impoverished conditions, a lack of access to energy services has a profound impact on health, education, and overall socio-economic development. It hampers opportunities for education and economic advancement, hindering families' potential to break free from the cycle of poverty. Moreover, the problem of energy access for the poor is exacerbated by climate change, the global financial crisis, and volatile energy prices.



Especially due to world events like the Ukraine Russia war where gas prices have spiked, it has become all the more imperative to find a way for easy transition to renewable energy sources.

Definition of Key Terms

Sustainable Energy

Energy derived from renewable or non-depletable sources, such as solar, wind, hydro, and geothermal energy, which have a lower environmental impact and contribute to reducing greenhouse gas emissions.

Energy Transition:

The process of shifting from reliance on traditional, fossil fuel-based energy sources to cleaner and more sustainable energy alternatives, typically driven by environmental, economic, and social considerations.

Petroleum Industry:

The sector encompassing the exploration, production, refining, distribution, and marketing of petroleum products, including crude oil and natural gas.

Energy Diversification:

The strategy of reducing dependence on a single energy source, such as petroleum, by expanding the use of diverse energy resources, including renewable energy, natural gas, nuclear power, and others.

Paris Agreement:



An international treaty within the United Nations Framework Convention on Climate Change (UNFCCC), aiming to limit global warming and promote climate resilience by mitigating greenhouse gas emissions and supporting sustainable development.

Net-Zero Emissions:

The state in which greenhouse gas emissions released into the atmosphere are balanced by removing an equivalent amount of emissions, effectively resulting in no net increase in atmospheric greenhouse gas concentrations.

Energy Security:

The assurance of uninterrupted access to reliable, affordable, and sustainable energy sources, typically encompassing diversified energy supply, stable energy markets, and robust energy infrastructure.

Carbon Pricing:

The implementation of a financial mechanism, such as carbon taxes or emissions trading systems, to place a cost on carbon dioxide emissions and incentivize the reduction of greenhouse gas emissions.

Kyoto Protocol Enforcement:

The implementation and adherence to the Kyoto Protocol, an international treaty aimed at reducing greenhouse gas emissions to combat global climate change. The enforcement of the Kyoto Protocol places obligations on participating countries to set and meet specific emission reduction targets, influencing energy policies and sustainability measures that impact the petroleum industry's role as a major emitter of greenhouse gases.

General Overview



The transition to sustainable energy sources has become a worldwide essential to address the challenges of climate change and decrease dependency on fossil fuels. As the world shifts towards cleaner and alternative energy options, such as wind, solar, water, and geothermal energy, the crude oil and petroleum industry is facing significant implications. With oil and gas being the main sources of energy, gasoline, and natural materials for many industries, the petroleum industry has long been a dominant player in the global energy sector. Nevertheless, the growing urgency to electrify the business and reduce greenhouse gas emissions has led to a fundamental change in energy objectives. Governments, organizations, and individuals are extremely in favor of adopting sustainable energy technologies and plans to meet climate goals and encourage a more sustainable future.

The shifting power mix is one of the main causes of problems for the petroleum industry. There is a decrease in reliance on fossil fuels, such as oil and gas, as nations work to meet their goals for renewable energy. This change has led to reduced need for petroleum products in sectors like transport, as electric vehicles gain grip, and in energy generation, as renewable sources become more competitive by price, ease of use and availability. This has caused the petroleum industry to be experiencing a decrease in market share and potential income loss.

Green energy transitions have also sparked innovation and technological advancements. Research and development efforts are focused on enhancing the efficiency, value, and flexibility of renewable energy technologies. This has resulted in significant price cuts and increased profitability of renewable energy sources compared to traditional fossil fuel-based power. Purchase flows are shifting towards green energy projects, creating new business opportunities and potentially diverting funds away from the petroleum industry as entrepreneurs look for new ways to advertise their green energy companies.

The conservation objective has also prompted governments and international bodies to implement policy actions that promote renewable power adoption. Incentives, subsidies, and regulatory systems are being designed to accelerate the implementation of sustainable energy technologies and motivate energy diversification. These promotions, coupled with public opinion



favoring clean power, contribute to a challenging business environment for the petroleum industry, which may conform to evolving business dynamics and changing consumer preferences.

However, it is essential to recognize that the petroleum business remains a vital component of the global energy landscape and continues to play a vital role in meeting energy demand, particularly in certain sectors where alternatives are not yet commercially feasible or technologically available. Most large petroleum businesses in the market are investing in research and development of green energy sources, exploring cleaner systems, and embracing lower carbon emission techniques to alleviate their environmental impact.

Green energy transitions are reshaping investment patterns and financial considerations in the petroleum industry in addition to the evolving energy mix and technical advancements. Investors, including institutional funds and asset managers, are increasingly integrating environmental, social, and governmental (ESG) factors into their investment strategies. Investors are allocating capital to renewable energy infrastructure and businesses with strong ESG performance as well as being green energy projects become more well-known and show appealing returns. This change in purchase preferences may present challenges for the crude industry, as it may encounter difficulties in attracting money and investment and may experience a higher loss of revenue compared to sustainable power projects.

Another vital aspect of evaluating the impact of green energy transitions on the petroleum business are the political implications. Previously, the petroleum industry has played a significant role in shaping international politics due to its strategic importance and control over energy sources.

As the world transitions to lasting energy, political dynamics may experience substantial shifts. Countries that rely heavily on oil and gas imports like Saudi-Arabia might experience political and economic difficulties, forcing them to diversify their economies. On the contrary, regions rich in green energy resources will experience increased influence and political relevance. These changes may have implications for global energy security and political relationships.



Finally, the switch to renewable energy sources necessitates a fair and equitable change.

The move away from petroleum centered industries may affect communities and workers employed in the fossil fuel field. Ensuring a fair and equitable transition is important, with measures such as retraining applications, career development in renewable energy industries, and social security traps to support affected communities. The management of labour is crucial if the switch to green energy is to be made.

Major Parties Involved

Shell

Shell is a global power company that works in the exploration, production, processing, and distribution of oil and gas products, among other sectors of the petroleum industry. Shell has a big impact on the world's electricity landscape as one of the biggest publicly traded oil companies. To support the switch to cleaner energy sources, the organization has been actively involved in sustainable energy efforts, investing in renewable energy projects, and diversifying its business investment. Shell's engagement in sustainable energy transitions is essential because its plans and deeds have an impact on how the petroleum sector develops.

International Renewable Energy Agency (IRENA)

IRENA is an intergovernmental organization dedicated to promoting the widespread adoption and sustainable use of renewable energy worldwide. IRENA works to encourage the widespread use of solar energy and its long-term sustainability. It serves as a hub for international cooperation, knowledge exchange, and efficient energy capacity growth. IRENA is a major party which facilitates communication between governments, business associates, and other companies involved in sustainable energy shifts.

United Nations Framework Convention on Climate Change (UNFCCC)

The UNFCCC is an international treaty aimed at addressing climate change by stabilizing greenhouse gas concentrations in the atmosphere. The UNFCCC offers a framework for nations to



work together and discuss climate action agreements, including initiatives to switch to renewable energy sources. Countries can discuss and coordinate climate policies, including those related to the petroleum industry and sustainable energy transitions, at the UNFCCC's annual Conference of the Parties (COP).

Timeline of Key Events

1970s-1980s: First Oil Crisis: The 1970s witnessed the first oil crisis, characterized by oil price shocks and supply disruptions. This event led to increased awareness of the need for energy diversification and exploration of alternative, sustainable energy sources.

1970s-1980s: Rise of Environmental Awareness: Growing concerns about pollution, climate change, and finite fossil fuel resources lead to increased environmental awareness. This prompts discussions and research on the need for sustainable energy transitions.

1990: Intergovernmental Panel on Climate Change (IPCC) Established: The IPCC is established by the United Nations and the World Meteorological Organization to assess scientific research on climate change. It provides policymakers with objective information to evaluate the impacts of human-induced climate change.

1997: Kyoto Protocol: The Kyoto Protocol, an international treaty, is adopted. It sets binding greenhouse gas emission reduction targets for developed countries and promotes the use of renewable energy sources. The protocol highlights the need to transition away from fossil fuels and promotes sustainable energy practices.

2015: Paris Agreement: The Paris Agreement is adopted, aiming to limit global warming to well below 2 degrees Celsius above pre-industrial levels. The agreement recognizes the need for



sustainable energy transitions and calls for a balance between reducing greenhouse gas emissions and adapting to the impacts of climate change.

2020: COVID-19 Pandemic and Oil Price Crash: The COVID-19 pandemic leads to a global economic downturn, coupled with a significant drop in oil demand. The petroleum industry faces unprecedented challenges, raising questions about its long-term viability in the face of sustainable

2023: International Energy Agency (IEA) Net-Zero by 2050 Report: The IEA releases a landmark report outlining a pathway to achieve net-zero emissions by 2050. The report highlights the need for a rapid shift towards sustainable energy and presents potential implications for the petroleum industry.

Previous Attempts to solve the Issue

There have been several previous attempts to address the issue of evaluating the impact of sustainable energy transitions on the petroleum industry- the main attempt being multiple International Agreements such as the Paris Agreement. Other efforts include:

Subsidies and Incentives for Renewable Energy: Governments have implemented various subsidies and incentives to promote the adoption of renewable energy technologies. These can include tax credits, feed-in tariffs, grants, and low-interest loans for renewable energy projects. By providing financial support and reducing the barriers to entry for renewable energy, these measures encourage investment in sustainable alternatives and potentially impact the demand for petroleum-based energy. Such as how The United States provides various federal and state-level incentives for renewable energy, such as the Investment Tax Credit (ITC) and Production Tax Credit (PTC), which offer financial benefits for solar, wind, and other renewable energy projects.

Bans on Fossil Fuel Extraction or Use: Some jurisdictions have implemented partial or complete bans on specific petroleum activities. For example, bans on hydraulic fracturing (fracking)



have been introduced in certain regions due to environmental concerns. In addition, some cities or countries have set targets to ban the use of internal combustion engine vehicles in the future, promoting the transition towards electric vehicles and impacting the demand for petroleum-based transportation fuels. Such as how France has passed legislation to ban the exploration and production of hydrocarbons, including both conventional and unconventional sources like shale gas. The ban aims to promote the transition to renewable energy and reduce dependency on fossil fuels.



Possible Solutions

Research and Development:

Increase investment in research and development (R&D) to enhance the efficiency, scalability, and affordability of renewable energy technologies. This can involve funding R&D initiatives focused on energy storage, grid integration, and the development of advanced materials for renewable energy applications. Continued innovation in the renewable energy sector can accelerate the transition away from petroleum-based energy sources.

Policy Support and Incentives:

Governments can provide policy support and incentives to facilitate the transition from petroleum to renewable energy sources. This can include financial incentives, tax credits, grants, and regulatory frameworks that encourage investment in renewable energy projects.

Further International Cooperation:

Foster international cooperation and knowledge sharing between countries, industry stakeholders, and international organizations. Collaborative efforts can facilitate the exchange of best practices, lessons learned, and policy experiences in sustainable energy transitions. Sharing success stories and challenges can help countries and industries learn from each other and adopt effective strategies to address the issue at a global scale.



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