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The Role of Oil & Gas Industry in Achieving the Sustainable Development Goals (SDGs)

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Abstract: Sustainability is becoming more of a business imperative rather than a corporate philanthropy. In 2015 during the seventeenth session of the United Nations (UN) General Assembly, Head of States and governments adopted the resolution on "Transforming our world: the 2030 Agenda for Sustainable Development", which aims to stimulate action over the next 15 years in areas of critical importance for humanity and the planet. According to the 2021 UN Sustainable Development Goals Report, the world is not on track to achieve the 17 SDGs. The global COVID-19 pandemic further exacerbated the problem as millions of lives have been lost, the human and economic toll has been unprecedented, and recovery efforts so far have been uneven, inequitable and insufficient. The oil and gas industry is essential to the economic development and prosperity of many national economies, especially in developing and emerging countries. It plays a vital role in alleviating poverty, ensuring economic development, providing access to reliable energy, and has the financial and technical capabilities to help address climate change. This can be more achieved by embedding the sustainable development goals into the business strategy and planning; mapping the SDGs relevant to business operations with clear materiality assessment and significant impact opportunities; developing supply chain stewardship by starting with direct and value chain impacts; and integrate the SDGs in sustainability reporting.

Keywords: Sustainable Development Goals, Sustainability, Oil & Gas, Environment

1. Introduction

Sustainability is becoming more of a business imperative rather than a corporate philanthropy. Companies across industries that fail to make sustainability part of their core business strategy struggle to succeed in today's ever-changing and dynamic business environment [9]. Governments convened in 2015 to agree on a plan to promote development, peace and prosperity for all people and the planet, which resulted to the adoption of the 2030 agenda for sustainable development by all United Nations Member States. Since then, the 17 sustainable development goals only progressed a little bit, with some retardation due to the Covid-19 pandemic. Nowadays, corporations are expected to immensely contribute to achieving the sustainable development goals, as they have the necessary means of implementation, including financial, technical, and influential through their supply chain partners. In that regard, the oil and gas industry, with its unique position in the energy market has a significant role to play in the drive to sustainable development [10].

In this article, we briefly explain the historical development of the United Nations Sustainable Development Goals (UNSDGs) and their ambitions. We also illustrate how the oil and gas industry so far has been a major player in enabling economic development and enhancing well-being of many economies. Subsequently, we delve into how the industry can contribute in achieving all of the 17 goals, either directly or indirectly; building on the work of IPIECA - the International Petroleum Industry Environmental Conservation Association's mapping of the SDGs to oil and gas sector (the Atlas), the Roadmap and its recent progress report. At the end, we provide recommendations on how oil and gas companies can better contribute in achieving

sustainable development.

2. The UNSDGs

In 2015 during the seventeenth session of the United Nations (UN) General Assembly, Head of States and governments adopted the resolution on "Transforming our world: the 2030 Agenda for Sustainable Development", which aims to stimulate action over the next 15 years in areas of critical importance for humanity and the planet. The 17 Sustainable Development Goals (SDGs) and 169 targets integrate the three pillars of sustainable development: environment, social and economic; and represents the world's plan of action for overcoming poverty while protecting the planet and ensuring that all people enjoy peace and prosperity [6].

According to the 2021 UN Sustainable Development Goals Report, the world is not on track to achieve the 17 SDGs. The global COVID-19 pandemic further exacerbated the problem as millions of lives have been lost, the human and economic toll has been unprecedented, and recovery efforts so far have been uneven, inequitable and insufficient [7].

Realizing the SDGs will require continuous cooperation and collaboration among governments, non-governmental organizations, the private sector and communities. While governments have the primary responsibility to prioritize and implement approaches to meeting the SDGs, the private sector and civil society will play a critical role in the implementation of national plans. Indeed, governments are likely to rely to a high degree on businesses and investors in support of delivery [4].

The oil and gas industry is essential to the economic development and prosperity of many national economies, especially in developing and emerging countries. It is also central to sustainable development, as oil and gas are key pillars of the global energy system and, as such, are drivers of economic and social development [4].

3. Oil & Gas Industry and Sustainable Development

3.1. O&G Contribution to Economic and Social Development over Past 100 Years

According to the World Economic Forum (WEF), oil accounts for about 3% of global GDP and "is one of the most important commodities in the world – petroleum products can be found in everything from personal protective equipment, plastics, chemicals and fertilizers through to aspirin, clothing, fuel for transportation and even solar panels" [8]. In the United States of America alone, the industry supports over 10 million jobs and accounts for 8% of US GDP [2]. Generally speaking, energy consumption and economic activity are strongly positively correlated; energy consumption tends to increase as gross domestic product (GDP) grows.

To underscore the extent to which petroleum products are embedded in daily lives, see the table below which shows where oil is used as a key component in various aspects of our lives:

Table 1. *The Ubiquitous Oil Uses Our Daily Life.*

Schools: rulers, crayons, ink and cartridges, glue, coverings on books	Office: computer hardware, phones and faxes, diskettes, pens, chairs, printing ink
Health: coatings for pills, binding agent for creams, disposable syringes	Gardening: fertilisers, pesticides, garden furniture
Building: roofing tiles, pipes, insulating material, paint	Shopping: shopping bags, credit cards, egg cartons, plastic milk bottles
Transport: petrol and diesel for cars and lorries, emergency services and trains, asphalt road surfaces	Home: contact lenses, cosmetics, fabrics, nail polish, deodorants, shampoo, paint, detergents for washing up and laundry, dry-cleaning fluids
Cooking: non-stick pans, cling film, storage containers	Leisure: artists' paint, bicycle handlebar grips, tyres, crash helmets, football boots, roller blades

The contributions of the oil and gas sector historically are significant. The sector has supported a network of businesses in manufacturing, services and construction and supports millions of jobs directly and across the world, and indirectly in other industries including electricity generation, manufacturing and transport. The oil and gas sector have also provided stronger than average wages historically.

To give better perspective on the ubiquity of petroleum products (which are taken for granted in modern times), it is instructive to consider how energy has been a critical factor of living standards through the ages. In societies that are primarily agrarian and subsistence farming, communities have burned wood for cooking and warmth. Even in industrialized economies, the use of wood was a common feature for hundreds of years.

The development of the steam engine at the start of the 18th century was the first real catalyst for transformation from agrarian to industrial economies. Although these engines could be powered by wood and coal, coal became the preferred source because of its higher calorific value and relative ease of distribution. These conveniences suddenly opened up new stationary and transport energy opportunities. Coal was also used extensively to fuel municipal lighting across towns. These significant mechanical improvements led to reduced dangers and physical energy demand on human workers.

The discovery and commercialization of oil from the mid-19th century led to further transformation of the industrial economies. By 1870, Standard Oil Company, which was founded by John D. Rockefeller, rose to become the largest oil player in the market.

Although coal was initially the favored fossil fuel, 20th

century technological developments – primarily through the invention of the automobile and the electric light bulb – resulted in oil becoming the energy source of choice. As vehicle ownership and use of electricity grew, so did the demand for oil. Natural gas was now used for home applications (heating, cooking) and oil was used to fuel automobiles.

3.2. O&G Industry Importance to Other Economic Sectors and Industries

The oil and gas sector play an influential role in the global economy as the main source of the world's primary fuel needs. The largest volumes of petroleum products are fuel oil and gasoline (petrol). Petroleum is a key feedstock for numerous chemical products, including pharmaceuticals, fertilizers, solvents and plastics. It is therefore integral to many industries.

4. Commodity Markets

Oil and gas are major commodities in the global trade markets. Oil in particular has become an easily traded commodity globally because of its ease of transportation and relative cheapness. As a result, oil has become a significant internationally traded commodity with a unified market. Natural gas has higher shipping and storage costs and therefore makes up a smaller fraction of internationally traded commodity activities. In any case, the international commodity trade of oil and gas contributes significantly to the balance of payments of many countries.

5. Financials

From a purely economic perspective, the impact of the oil and gas sector can be viewed from 4 angles [1]:

1) Direct impacts from the employment and production within the oil and natural gas industry;
2) Indirect impacts through the industry's purchases of intermediate and capital goods from a variety of other US industries;
3) Induced impacts from the personal purchases of employees and business owners both within the oil and natural gas industry and its supply chain;
4) Economic impact on production in sectors that use oil and natural gas as an input.

This impact can be observed by assessing the US oil and gas industry and the extent of its economic impact throughout all sectors of the US economy. The American Petroleum Institute (API) and PricewaterhouseCoopers (PwC) quantified this economic impact in terms of employment, labour income, and value added at various levels of governance (e.g. national and state) for the year 2019 [1].

Table 2. *The Impact of the Oil and Gas Sector on the U.S. Economy.*

Item	Direct impacts	Indirect and induced impacts		Total impacts	Percent of US total
		Operational impacts	Capital Investment Impacts		
Employment (millions)*	2.5	6.5	2.3	11.3	5.6%
Labour income ($billions) **	318.6	416.7	157.4	892.7	6.8%
Value added ($billions) ***	763.3	678.9	245.4	1687.6	7.9%

* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs

** Labour income is defined as wages and salaries and benefits as well as proprietors' income

*** Value added is a measure of an industry's portion of US gross domestic product ("GDP") and consists of employee compensation, proprietors' income, income to capital owners from property, and indirect business taxes

PwC estimates the following [1]:

1) The US oil and gas industry's impact on employment was 11.3 million full-time and part-time jobs, accounting for 5.6% of total US employment.
2) The associated labour income from jobs directly or indirectly supported by the oil and gas industry through its operations, capital investment and household spending was about $892.7 Billion, representing about 6.8% of US total labour income.
3) The US oil and gas industry's operations directly or indirectly generated $1.4 Trillion of value added in the US economy, and its capital investment added another $245.4 Billion of value added. Combined these accounted for about 7.9% of US GDP.
4) It is also clear that there are numerous sectors that are impacted by the oil and gas sector. For instance, for value added, the oil and gas sector impact at least 10 major sectors with significant operational and capital expenditures as per the table 3.

Table 3. *Oil and Gas Impact on Other Sectors.*

Industry impacted	Indirect and direct impacts	
	Operational	Capital
Total ($ Billions)	$678.9	$245.4
Agriculture, forestry and fishing	0.6%	0.5%
Mining	0.5%	0.4%
Utilities	2.8%	1.3%
Construction	1.9%	11.6%
Manufacturing	6.9%	14.7%
Wholesale and retail trade	9.3%	11.3%
Transportation and warehousing	6.3%	3.4%
Information	4.4%	5.8%
Finance, insurance, real estate, rental and leasing	28.2%	19.7%
Services	37.2%	30.6%
Other	1.9%	0.5%
Total	100%	100%

The importance of the oil and gas sector to other economic sectors and the economics of geopolitical events cannot be

overstated. Pipelines present strategic opportunities to custodian states because they offer significant influence and also enable international trading activities. The unfortunate corollary to this strategic leverage is political uncertainty. It would not be far-fetched to suggest that energy has played a critical role in events unfolding in Ukraine over the last few years; Russia has traditionally supplied nearly 30% of Europe's natural gas (and an even higher proportion of Ukraine's supplies). Economic choices and foreign policies of petroleum exporting and importing countries will continue to have a significant impact on global affairs.

6. Role of Oil & Gas in Achieving the SDGs

The oil and gas industry play a significant role in achieving all 17 SDGs. In that regard, there are direct, more palpable effects, and indirect effects in contributing to the SDGs. A comprehensive and all-encompassing analysis of the 17 SDGs and their mapping to the oil and gas industry, was outlined by IPIECA in the IPIECA 'Mapping the Oil and Gas Industry to the Sustainable Development Goals: An Atlas [4].

Each SDG is material to different companies in different ways. The materiality of each SDG depends on the location, size, type of projects, national/regional laws and prevailing national circumstances. Some SDGs might apply to a company globally, while others might only be relevant at the operational level, or to certain projects, or at certain stages of a project's lifecycle. However, in essence the oil and gas industry contribute to all the 17 SDGS, which are interrelated and dynamically affect each other [4]. Building on the atlas, we summarize the role of the industry in achieving the SDGs.

6.1. The 17 SDGs and the Oil and Gas Industry

Sustainability is only realized upon the harmonious integration of the three pillars of sustainable development, namely: economic, social and environment. Below, we summarize the impact of the industry on the 17 SDGs under five themes: People, Planet, Prosperity, Partnership and Peace.

6.2. People

On the people dimension, the oil and gas industry can contribute to SDG-1 (No Poverty) directly by increasing access to energy, contributing to nations' fiscal sustainability and investing in local development. Furthermore, the sector contributes to SDG-2 (Zero Hunger) by addressing issues of food security, health and education. For example, the oil and gas industry provide the reliable and cost-effective raw material to the manufacturing of fertilizers, which in turn are essential for crop yields and food production. Moreover, the sector provides the reliable and cost-effective raw material for food packaging, which is critical for the longevity and integrity of food supplies, especially to remote and underdeveloped regions.

SDG-3 (Good health and well-being) reflects the importance of health-related issues for a sustainable and vibrant society. The oil and gas industry can contribute to this goal by ensuring the availability of reliable and affordable energy, while ensuring the safety and health of workers, contractors and the communities they operate within. Moreover, oil and gas play a direct role in providing the raw material to producing vital and disposal medical instruments used in all sorts of application, and it played an integral role in fighting the COVID-19 pandemic. Directly allied to good health and well-being is quality education (SDG4). Oil and gas companies invest in their host communities in various different ways, including building schools, designing curricula, and sponsoring educational programs and scholarships.

SDG-5 (Gender equality) upholds gender equality as a foundation for a peaceful, prosperous and sustainable world and seeks to empower women and girls by 2030. The sector can play a significant role in achieving this goal by working with local governments and developing standards and procedures that promote and ensure appropriate female representation and empowerment. Moreover, the industry can finance outreach and awareness programs to motivate girls to pursue education in the STEM fields, with a view to joining industry.

6.3. Planet

Protecting our planet while simultaneously enabling continued economic development is the most pressing challenge in tackling issues such as climate change, biodiversity and pollution. The oil and gas industry have a unique role in addressing SDG-13 (Climate action), especially in the context that its specialist knowledge in petroleum geology, resource extraction, and pipeline transmission can contribute towards carbon capture, utilization and storage (CCUS) opportunities. The Oil and Gas Climate Initiative (OGCI) aims to accelerate the industry response to climate change. The OGCI member companies, represent almost 30% of global operated oil and gas production, explicitly support the Paris Agreement and its aims. Collectively, the oil and gas industry can contribute to SDG13 by investing in carbon removal technologies like CCUS, energy efficiency, natural climate solutions such as forestation and establishing public-private partnerships. The oil and gas industry can develop net-zero emission strategies, invest in research and development for low-emissions fuels and products, as well as other technologies that reduce emissions and increase sustainability. Example of strategies where oil and gas can have significant role to play is the Circular Carbon Economy (CCE) framework, which was endorsed by all G20 members in 2020 as a holistic, integrated, inclusive, and pragmatic approach to managing emissions [3].

The sector is also a major player when it comes to other environment-related SDGs such as SDG-6 (clean water and sanitation), SDG-14 (life under water), and SDG-15 (life on

land). The oil and gas sector is a major consumer of water across its operations. The industry can contribute to clean water and sanitation by further developing water management strategies, increasing water use efficiency, innovating in the area of wastewater treatment, and providing the necessary energy for desalination plants. The sector is also a major player in the marine environment, with more than one-third of oil and gas coming from offshore projects. The industry can respond to these challenges by incorporating environmental impact assessment methodologies into planning, minimizing ocean acidification by investing in coastal ecosystem rehabilitation, and establishing standards and protocols for accident response. Similarly, for SDG-15 (life on land), the sector can protect local ecosystems and wildlife, while promoting biodiversity by establishing designated regions as sanctuaries for endangered animals. Companies can implement the biodiversity mitigation hierarchy to first avoid, then minimize, then restore, and then, when necessary, offset any loss in biodiversity and ecosystems resulting for company's projects and operations.

Growth in population and economic activities is accompanied by growth in demand for resources. SDG-12 (responsible consumption and production) is paramount to sustainable and healthy use of resources. The circular economy and circular carbon economy principles provide a holistic framework for increasing resource efficiency. The issue of responsible consumption and production is important for the oil and gas industry as it can reap value from improved efficiency in highly intensive operations and monetize segments of its product portfolio that have previously received less attention, such as flared gas. Furthermore, product stewardship principles, ensuring effective management of chemicals and waste, developing cleaner fuels, and sharing energy efficiency knowledge while building capacity among consumers and service providers are among the many areas the oil and gas sector can contribute to protecting our planet.

6.4. Prosperity

Access to affordable and clean energy (SDG-7) is essential to achieving all 17 SDGs. The challenge is to ensure reliable, affordable, and sustainable access to energy for all while protecting the environment from the effects of climate change. The oil and gas industry in uniquely positioned to deliver on this target while at the same time addressing the issue of limiting greenhouse gas (GHG) emissions. The industry will play a pivotal role to ensure an orderly passage of the energy transition without volatility in energy prices or deterioration of access to energy. Furthermore, the industry can provide the backup energy needed to supplement the intermittent power generation of alternative energies such as wind and solar. Natural gas for example can be an attractive, cost-effective, reliable, and clean transitory fuel that can be used in that regard. Moreover, with the expected increase in population growth, economic development, and energy demand, oil and gas will continue to play a significant role in the energy mix. Therefore, the industry can ensure this continued role while investing smartly in emission abatement technologies, improving efficiency and collaborating to contribute to sustainable development for all.

The oil and gas industry is critical for "decent work and economic growth" (SDG-8). The industry is one of the most profitable sectors in the global economy and attracts significant amount of foreign investment. Therefore, its continued robustness is important for socio-economic prospects across the globe. Additionally, the industry can promote multiplier effect benefits such as sourcing and partnering opportunities for local suppliers and contractors, thereby developing local content and building capacity.

6.5. Partnership

The oil and gas industry can contribute immensely to SDG-9 (industry innovation and infrastructure) by building shared-use infrastructure, promoting inclusive and sustainable industrialization and fostering innovation. The oil and gas industry can significantly contribute to SDG-10 (reduce inequalities) by providing access to affordable, reliable, sustainable and modern energy and positively impacting economic growth and human well-being. The returns from oil and gas products and investments can be used to reduce poverty and inequality. An example of this can be seen through the provision of more access to health care and education. Moreover, oil and gas projects usually contribute to urbanization in surrounding communities, an issue which companies can address by anticipation and mitigation strategies, promoting sustainable cities and communities (SDG-11).

6.6. Peace

Peace, justice and strong institutions (SDG-16) are a necessary condition for, and an outcome of, all other SDGs. It is the responsibility of governments to maintain peace and security, while companies, play their own role by following and respecting the institutional processes, enshrining anti-bribery and anti-corruption laws and practices into their business, integrating human rights into their business and impact assessment analyses, and regularly engaging in an inclusive manner with stakeholders. This is also necessary to facilitate partnerships for achieving all the sustainable development goals (SDG-17), as global collaboration and coordination between governments, companies, investors, international organizations and civil society is needed.

7. Conclusion and Recommendations

Adopting and incorporating the 17 SDGs into companies' core business strategies and planning are imperative for their social license to operate. Studies demonstrate that organizations embracing sustainability and incorporating it into their business planning and strategic thinking perform better and increase their

revenues [5].

Because the corporate world and the development community operate with different objectives, scale of operations and doctrines, oil and gas companies have an opportunity to accelerate their social impacts by leading with professional management capabilities, technical competence capacity, and organizational networks.

Below we provide some recommendations on how oil and gas companies could contribute to achieving the sustainable development goals:

1) Embed the sustainable development goals into the business strategy and planning; ensure commitments to quantification of impacts and targets and involvement of relevant stakeholders are formalised in the planning phase.
2) Map the SDGs relevant to business operations with clear materiality assessment and significant impact opportunities.
3) Develop supply chain stewardship by starting with direct impacts on the SDGs and encouraging other parties along the value chain to contribute to their own indirect impacts.
4) Build on the existing industry guidance on addressing the SDGs such as the IPIECA Atlas and SDG Roadmap.
5) Enhance reporting on SDGs by incorporating them in sustainability reporting.
6) Use independent third-party verification to verify the implementation of SDG implementation as core part of sustainability strategy.

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