

Role of the Oil and Gas Industry and the Legal Challenges in Achieving Sustainable Development Goals

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Abstract

Sustainable development is a multidimensional concept and one of the most discussed topics. Sustainable development goals (SDGs) were adopted by the United Nations to address the pressing political, economic, and environmental issues that our planet is currently dealing with by replacing the Millennium Development Goals which were launched in 2000 to combat the disgrace of poverty. This study is focused on analyzing the SDGs and to find the relation between the energy source and achievement of SDGs. Although the use of clean energy is one of the goals, future energy mix is highly dependent on the fossil fuel, more specifically on oil and gas. Use of oil and gas as well as their exploration and production causes serious environmental problems. The main argument of this study is that there exists some legal paradox to attain the SDGs. The study finds that the international laws are not good enough to solve the problem. The causes of failure of such laws are also discussed in this paper.

Keywords: Oil and gas, Sustainable development Goals, Petroleum Operation, Environmental problem, Environmental impact

1. Introduction

The Sustainable Development Goals for the period 2015-2030 are part of Agenda 2030 for Sustainable Development, which was endorsed by the UN General Assembly on September 25, 2015. In order to secure a brighter future for the generation of the following fifteen years, the leaders of 193 nations agreed to establish the 17 goals.¹ These Sustainable Development Goals (SDGs) are the successor of the Millennium Development Goals (MDGs) which were launched on 2000 for next fifteen years targeting on

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¹ United Nations Development Programme, "What are the Sustainable Development Goals" Available at

<https://www.undp.org/sustainable-development-goals> Accessed on May 2, 2025.

achievement of eight specific goals of developing nations.² Though the target of the MDGs was not attained, the SDGs are designed for universal development including both developed and developing nations. Apart from assisting the global community in establishing its national development plan in accordance with these sustainable development goals, the goals were set up to address the most urgent socio-economic and environmental issues facing the world. The panellists also acknowledged the commercial sector's contribution to achieving these 17 SDGs. Governments, local communities, non-governmental organizations, and the corporate sector—including the petroleum industry (oil and gas sectors)—all play a crucial role in achieving the SDGs.³ Petroleum industry is well known for its environmental impact and greenhouse gas (GHG) emission. The inclusion of SDGs in oil and gas operation presents a very important role to attain sustainable objectives of this sector.⁴ As the petroleum operation involved economical, physical, political, environmental and social challenges that endanger the sustainable development of this industry.⁵ The petroleum industries are increasingly recognising the necessity of integrating the sustainable development principles in this industry to address the social impacts, economic issues and social factors.

This paper will present a critical analysis how these sustainable development goals can be integrated in the operation of petroleum industry with special consideration on some specific sustainable development goals. It also examines the relevancy of the SDGs in oil and gas industry and the challenges to align with these goals. The study also makes a recommendation as to the incorporation of the various SDGs in the oil and gas operation.

² Diouf, G. 'Millenium Development Goals (Mdgs) and Sustainable Development Goals (SDGs) in Social Welfare' *International Journal of Science and Society*, Volume 1, Issue 4, 2019, Pp 17-24.

³ UNDP, *What are the Sustainable Development Goals*.

⁴ Stella Emeka-Okoli et al, Integrating Sustainable Development Goals Into Oil & Gas Operations: A Comprehensive Review, *International Journal of Management & Entrepreneurship Research*, 6(3), pp.660-677, March 2024.

⁵ Echchelh, A. (2023). Oil and Natural Gas and Sustainability. In: Brinkmann, R. (eds) *The Palgrave Handbook of Global Sustainability*. Springer Nature.

This study first examines the relationship between the SDGs and the energy source i.e. In achieving the SDGs the involvement of the petroleum industry. This study also looks at how the SDGs relate to energy, specifically how the oil and gas sector contributes to the SDGs' achievement. It then goes on to describe the petroleum industry and its detrimental effects on the environment, emphasizing the link between sustainable development and petroleum activities. The study also looks into how the oil and gas sector contributes to reaching the sustainable development goals, both positively and negatively. Additionally examined the function of international law in addressing the SDGs. Qualitative analysis based on the documents survey, related to the laws and policies of sustainable development and petroleum operation as well as case study of some nations, is followed in this study.

2. Relationship between the Sustainable Development Goals and Energy Source

Depletion of natural resources, rising rates of poverty, the negative effects of degradation of the environment, and the rise in the temperature as a consequence of the climate change are just a few of the major global issues that the entire world has been dealing with. These issues are endangering both the planet's and societies' ability to survive.⁶ In this sense, the Sustainable Development Goals of the United Nations represent a bold plan to achieve environmental sustainability, economic growth, and social transformation.⁷ The SDGs⁸ are the followings:

- i. By 2030, eradicate all forms of extreme poverty.

⁶ United Nations, "Transforming our world: the 2030 Agenda for Sustainable Development," Available at <https://sdgs.un.org/2030agenda> Accessed January 10, 2025.

⁷ Energy Law and the Sustainable Development Goals: Host Government Instruments for Sustainability in Oil and Gas Operations, edited By Eduardo G Pereira, Thomas L Muinzer, Patrick R Baker and renewable resources 9 B/W Illustrations, 2024.

⁸ UNDP, *Take Actions for the Sustainable Development Goals*. Available at <https://www.un.org/sustainabledevelopment/sustainable-development-goals/> Accessed January 10, 2025.

- ii. End hunger, achieve food security, improve nutrition, and promote sustainable agriculture methods.
- iii. Make sure everyone, regardless of age, leads healthy lives and fosters wellbeing.
- iv. Make sure that everyone gets a chance to receive inclusive, high-quality education that promotes opportunities for lifelong learning.
- v. Make gender equality and ensure the empowerment of all women and girls.
- vi. Ensure that everyone has access to water and sanitary facilities, as well as in the sustainable management of their resources.
- vii. Ensure that modern, reasonably priced, reliable, and sustainable energy is available to everybody.
- viii. Encourage full as well as productive employment, decent work for all, and consistent, inclusive, and balanced economic growth.
- ix. Build a strong infrastructure, promote inclusive and sustainable industrialization, and foster innovation.
- x. Lessen inequality both domestically and internationally.
- xi. Create inclusive, secure, resilient, and sustainable human settlements and urban areas.
- xii. Make sure that patterns of production and consumption are sustainable.
- xiii. Take prompt action to lessen the consequences of climate change.
- xiv. Protect and exploit the oceans, seas, and aquatic resources for the purpose of sustainable development.
- xv. Preserve, restore, and promote sustainable utilization of terrestrial ecosystems, fight desertification, prevent and reverse land degradation, and halt the loss of biodiversity.
- xvi. Promote harmonious, inclusive communities for continued growth, provide access to the legal system for all, and establish successful, inclusive, and responsible institutions at all levels.
- xvii. Reinvigorate the global cooperation for sustainable development and fortify the implementation tools.

Achieving one of these goals will help to achieve the other SDGs because they are all closely related. Climate change analysis shows that it affects several goals simultaneously such as, SDG 14 that is the exploitation of ocean, seas, and aquatic resources in conservative and sustainable manner and 15 which affirm the promotion, protection and restoration of the ecosystem and management of ecosystem sustainably along with the stopping the desertification and land degradation addition to protection of biodiversity. The adverse effect of climate change influenced the underprivileged group of society, resulting in negative impacts on health and food security, which promotes ultimately extreme poverty. Therefore, the first three goals of SDGs are affected. Furthermore, intergenerational equality, incorporated in SDG 10, will grow as its impact over the globe is not the same. Ultimately, there will be disruption in the social order which goes against SDG 16.⁹

The oil and gas sector has the potential to contribute in a number of ways to attaining the SDGs designed by the UN General Assembly, especially SDG 7 to ensure clean, reliable, and affordable energy. Comparing different fuels, such as coal and oil, natural gas is considered relatively cleaner because it emits lower Green House Gas (GHG).¹⁰ Achieving the aforementioned sustainable development aim is impacted by natural petroleum operations in both positive and negative ways. Even though it hinders the achievement of some SDGs by having detrimental effects on climate change, biodiversity and ecosystem conservation, sustainable water management, and intergenerational equity, if the petroleum industry can adopt and prudently implement a sustainable extraction policy, oil and gas operations can actually help achieve those goals rather than hinder them.

⁹ IPIECA, IFC and UNDP, *Mapping the Oil and Gas industry to the Sustainable Development Goals: An Atlas*, (2017), 4. Available at http://www.ipieca.org/media/3093/mapping_og_to_sdg_atlas_lr_2017.pdf Accessed May 8, 2024.

¹⁰ Natasha Sinclair, "Contributing to the Sustainable Development Goals in Oil and Gas," *Advisian* (September 2017) <https://www.advisian.com/en/global-perspectives/contributing-to-the-sustainable-development-goals-in-oil-and-gas> accessed on January 12, 2020.

3. Petroleum Operation and Its Negative Impact on the Environment

Production of petroleum involves different complex activities and it may cause harm to the environment at different degree. This section briefly discusses the fundamentals of a petroleum production process and its negative impact on the environment at different stages.

3.1 Petroleum Operation: Any naturally occurring hydrocarbon which may be found in a gaseous, liquid or solid state or may be obtained as mixture of hydrocarbons is defined as petroleum.¹¹ In general petroleum is known as oil or gas which is the most used energy source at present and will also be the significant part of the world energy source in the future. Petroleum is not readily available on the earth surface as we consume it in our everyday life. It is being used as fuel for cooking or to produce electricity or to run the car as well as it is converted to produce other essential products like fertilizer etc. Obtaining petroleum for the end users involves a series of operations including, exploration, appraisal, development, production, transportation, refining and abandonment. The production timeline of petroleum is shown in Figure 1. The activities involved in the petroleum operation from exploration to abandonment are broadly divided into upstream and downstream activities. Search of natural gas and oil in the contract area as well as their production from the well is mainly done in the upstream activities and is also known as exploration and production phase. This phase involves huge investment and high risk as oil or gas may not be obtained from all the exploration wells.¹² After obtaining the oil or gas out of the wellhead it is usually taken to the refinery station through pipelines. Later it is taken for marketing and distribution. This phase is termed as downstream activity.¹³ Downstream phase is sometimes divided into midstream and downstream.

¹¹ Model PSC 2012, 10.

¹² Open Oil, *Oil Contracts: How to Read and Understand a Petroleum Contract*, (Australia: Time Up Press, 2012), 217.

¹³ *Ibid*, 201.

Petroleum production is a complex work and it involves major financial and technical challenges especially during the exploration and production stages. Petroleum operations are mainly done through the national or international oil companies and the latter usually dominate the petroleum activities in the world.

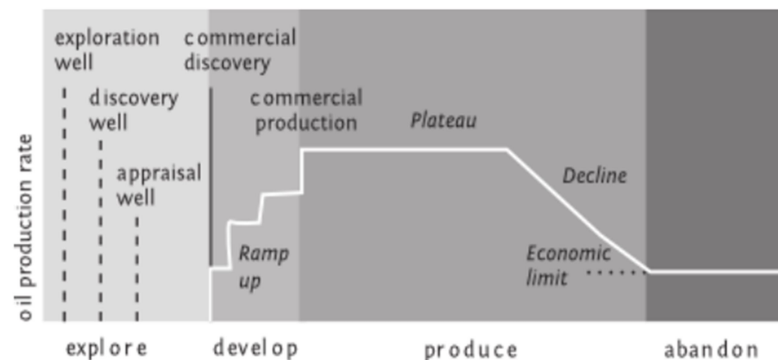


Figure 1. Timeline of a petroleum production project¹⁴

3.2 Negative Impact of Petroleum Operation on the Environment:

Petroleum operation may take place on land or it may take place in the sea or through the seabed. The former is known as onshore and the latter is termed as offshore petroleum operation. Onshore petroleum operations are less expensive than offshore operations because of the requirement of special type of facilities and structures. All phases of petroleum operation, upstream or downstream, and all type of petroleum operation, onshore or offshore, impose direct and indirect threat to the environment and environmental management plan and is therefore very necessary to mitigate the adverse effect of the petroleum operations.¹⁵ However, the upstream operations create the major environmental problems including noise during the drilling, vibration due to seismic surveys,

¹⁴ Open Oil, 13.

¹⁵ Sergei Vinogradov (2005). "Environmental Protection in the Petroleum Industry," In Carlo Amadei (ed.) *Encyclopaedia of Hydrocarbons* (Roma: Eni, 2005): 507-23. Available at http://www.treccani.it/export/sites/default/Portale/sito/altre_aree/Tecnologia_e_Scienze_applicate/enciclopedia/inglese/inglese_vol_4/507-524_x10.3x_ing.pdf (accessed September 2, 2023).

disturbances to vegetation and wild life due to the noise and vibration and clearing off the trees, soil erosion and changes in the surface hydrology, discharge of hazardous fluid and increasing emission through gas flaring.¹⁶ Exposure to petroleum pollutants also creates different health hazards.

Beside the environmental problem during the different stages of a petroleum production project, petroleum-related accidents during extraction are extremely frequent around the world. These accidents cause severe damage to the environment as well to the property. One such tragedy that claimed 167 lives in the North Sea in 1988 was the Piper Alpha Oil Rig Fire. Similarly, in 2012, an explosion at the Amuay Oil Refinery in Venezuela claimed 39 lives. 2010 saw the biggest maritime oil leak in the Gulf of Mexico. Known by another name, the Deepwater Horizon oil leak, thousands of birds, animals, and sea turtles perished as a result of an underwater explosion.¹⁷ Bangladesh also faced a number of blowouts that are responsible for concerning environmental deterioration in the natural gas industry. The first blowout took place at Sylhet-1 in 1955 and the second blowout occurred in 1962 in Sylhet-4 during the East Pakistan regime. On June 14, 1997, a blowout in the Magurchara gas field in Moulvibazar's Kamalganj Upazila seriously damaged the Lawachhara Reserve Forest. The Chatak gas field near Tengratila experienced another blowout on January 7, 2005, and it burned for several months. In addition to causing property loss, the blast seriously harmed the surrounding area's ecosystem.¹⁸

Petroleum is a non-renewable resource and it is permanently lost as it is brought to the earth surface or may be said that it is transformed into financial asset. There is a possibility that this financial capital might not be properly used for the sustainable development of the

¹⁶ Vinogradov, "Environmental Protection in the Petroleum Industry," In Carlo Amadei (ed.) *Encyclopaedia of Hydrocarbons* (Roma: Eni, 2005): 507-23.

¹⁷ Khatun, M. "*Inquest of Sustainable Development: Regulatory Framework of Upstream Operation of Natural Gas in Bangladesh*" Ph.D Thesis, Institute of Bangladesh Studies, University of Rajshahi.(2021).

¹⁸ Khatun, *Inquest of Sustainable Development*. supra note 17

host country. Nigeria¹⁹ may be taken as an example, where the exploitation of petroleum resources added negative impact on the economy and environment of that country.²⁰ Hence, maintaining equilibrium between the state's interests and the goals of multinational oil corporations is one of the main challenges of the petroleum related activities for any country.²¹

Therefore, the regulation related to the exploration of natural gas and oil of a country should cover the various aspects of the petroleum activities e.g. technical, fiscal, health, safety and local and global environment. The upstream regulation should encompass the entire process, from license to abandonment, and not just the exploration and production activities.²² Vinogradov classified the existing petroleum regulations into three main categories namely international, national and corporate self-regulation.²³ Keeping balance among these three regulations is one of the core challenges for any country to make the petroleum operation compatible with the SDGs.

4. Contribution of Oil and Gas Industries in Attaining SDGs

In order to achieve the SDGs, enormous amounts of energy, infrastructure, and resources are needed, all of which are unquestionably influenced by the oil and gas sectors. Although these industries' contributions to achieving the SDGs are frequently predominantly seen through the prism of their environmental

¹⁹ Uwafiokun Idemudia. The Resource Curse and the Decentralization of Oil Revenue: The Case of Nigeria *Journal of Cleaner Production* 35 pp 183-193 (2012).

²⁰ Khatun, *Inquest of Sustainable Development*. supra note 17

²¹ Hunter, T. "Law and Policy Frameworks for Local Content in the Development of Petroleum Resources: Norwegian and Australian Perspectives on Cross-Sectoral Linkages and Economic Diversification", *Miner Econ*, 27(2), 115-126. (2014)

<https://doi.org/10.1007/s13563-014-0051-y>.

²² Myers, K. and Mohammed, A.K. "A Short Guide to Parliamentary Oversight of the Oil & Gas Sector for Parliament of Ghana," Available at <https://www.agora-parl.org/resources/library/short-guide-parliamentary-oversight-oil-and-gas-sector-parliament-ghana> accessed May 2, 2025.

²³ Sergei Vinogradov, 507.

impact, they are nonetheless intricate, multidimensional, and unquestionably significant—albeit balanced by severe hurdles.

4.1 Positive Impact of Petroleum Operation on SDGs: In the view of sustainable development the overarching objective of business is to do business with a responsibility of contribution in the society and minimizing its negative impact.²⁴ The petroleum operation business is not an exception of this view. In achieving the 2030 agenda the influence of the petroleum industry is very crucial. SDG 7 is directly related with the sustainable petroleum operation. The oil and gas industries currently supply 55% of world energy.²⁵ Therefore achievement of a number of SDGs also connected with sustainable petroleum operation.²⁶ By generating revenue, maintaining health and safety precautions throughout operations, fostering employment possibilities, and promoting infrastructure development and industrialization, an environmentally friendly oil and gas operation can make a variety of contributions.²⁷ All of these actions made by the oil firms during their operations help to achieve several SDGs, including SDG 7 on affordable and clean energy, which is closely related to sustainable oil and gas operations, SDG 8 that is decent work and economic growth, SDG 9 industry, innovation and infrastructure, SDG 12 responsible consumption and production and lastly SDG 17 that indicate the partnership for the goals. This paper will analyse the role of these SDGs in the oil and gas operation.

The target of goal 7 is to improve energy efficiency, and ensure access to clean and reliable energy for global people. To this end it is

²⁴ IPIECA, IFC and UNDP, *Mapping the Oil and Gas industry to the Sustainable Development Goals: An Atlas*, (2017),⁴ Available at http://www.ipieca.org/media/3093/mapping_g_to_sdg_atlas_lr_2017.pdf accessed May 8, 2018.

²⁵ WBSCD, *Accelerating action An SDG Roadmap for the oil and gas sector*, April 2021.

²⁶ Titova, N.; Cherepovitsyna, A.; Guseva, T. Meeting the UN's Sustainable Development Goals in the Decarbonization Agenda: A Case of Russian Oil and Gas Companies. *Resources* 2023, 12, 121. <https://doi.org/10.3390/resources12100121>.

²⁷ IPIECA, IFC and UNDP, *Mapping the Oil and Gas industry*.

necessary to reduce the carbon emission and mitigate the negative impact on climate. Energy is the main driver of the sustainable development without which no other SDGs are achievable.²⁸ Sustainable, affordable, reliable and modern energy is very crucial for eradication of poverty, creating employment opportunity, economic improvement and to ensure the global health and education. SDGs include an aim to the government in association with the communities and private sector to ensure the access of clean, reliable and affordable energy, minimise inequality, protect and preserve the natural resources and promote investment through a transparent legal institution. The International Energy Agency has taken some initiatives to foster the access of the clean and affordable energy for all the people by 2030.²⁹

In particular the SDG 7 has two parts; one is the Just Energy Transition (JET) and the other is the international movement and cooperation for climate change.³⁰

The JET concept is a big concept which indicates the transition from fossil fuels to cleaner energy sources in order to create a sustainable and equitable energy system for everyone.³¹ The global primary energy demand in the medium- and long-term by different types of fuel which can also be considered as the energy transition is shown in Table 1. Economic activities around the world are increasing day by day and to support different daily activities of the society energy demand is increasing accordingly. It is evident from Table 1 that a big change in the energy demand is expected to occur from 290.9mboe/d (Million barrels of oil equivalent per day) in 2022 to 359.2mboe/d in 2045. This represents an increase in energy demand

²⁸ IPIECA, IFC and UNDP (2017). *Mapping the Oil and Gas industry to the Sustainable Development Goals: An Atlas*, 37.

²⁹ Access to electricity: Recent progress, available at <https://www.iea.org/reports/sdg7-data-and-projections/access-to-electricity>.

³⁰ Energy Law and the Sustainable Development Goals: Host Government Instruments for Sustainability in Oil and Gas Operations, edited By Eduardo G Pereira, Thomas L Muinzer, Patrick R Baker and renewable resources 9 B/W Illustrations, 2024, p 4.

³¹ Natural Resource Governance Institute. Available at <https://resourcegovernance.org/topics/just-energy-transition>.

of 68.3mboe/d, or about 23%, over the period. The average annual growth rate over the period is estimated as 0.9% p.a. (per annum). It is worth noting that the dependency on the coal, which is considered to be a major source of GHG, is reduced and from 26.1 in 2022 to 15.1 in 2045. On the other hand, it is expected that the renewable energy sources will contribute more to ensure the clean, affordable and modern energy. However, the transition of energy is still dependent on the oil and gas sector.

Table 1 World primary energy demand by fuel type, 2022-2045³²

	Levels mboe/d						Growth mboe/d	Growth % p.a.	Fuel share %	
	2022	2025	2030	2035	2040	2045	2022-2045	2022-2045	2022	2045
Oil	90.7	96.4	102.0	104.3	105.3	106.1	15.4	0.7	31.2	29.5
Coal	75.9	74.6	71.1	65.9	60.0	54.4	-21.5	-1.4	26.1	15.1
Gas	67.1	69.6	75.0	80.2	84.4	87.0	20.0	1.1	23.1	24.2
Nuclear	15.0	15.9	17.4	19.4	21.7	23.8	8.8	2.0	5.2	6.6
Hydro	7.7	8.2	8.9	9.6	10.2	10.5	2.8	1.3	2.7	2.9
Biomass	26.6	27.9	30.2	32.3	34.1	35.2	8.6	1.2	9.1	9.8
Other renewables	7.9	11.2	18.5	26.7	35.8	42.2	34.3	7.5	2.7	11.7
Total	290.9	303.9	322.9	338.3	351.6	359.2	68.3	0.9	100.0	100.0

It is therefore necessary to address the social, economic, environmental issues associated with the transitional period to ensure the renewable energy or decarbonisation of the energy. The success of the SDGs depends on the integral of these factors. Actually, the transition to the low carbon energy is the core of the SDGs but according to International Energy Agency the oil and gas will remain in a significant position in the global energy index.³³ To support this transition this industry can play a role by using cleaner and modern technologies to improve the energy efficiency, minimise the impact on environment and reduce the wastage. To this end the host government initiatives can play a very vital role to ensure the

³² OPEC, 2023 World Oil Outlook 2045 at pp. 49.

³³ Energy Law and the Sustainable Development Goals: Host Government Instruments for Sustainability in Oil and Gas Operations, edited By Eduardo G Pereira, Thomas L Muinzer, Patrick R Baker and renewable resources 9 B/W Illustrations, 2024, p 2.

clean and affordable energy through various legal and institutional tools especially by granting permission to the oil and gas companies to develop and extract these resources, in this regard the host government can ensure the environmental commitments, community's participation, stakeholders' engagement and employment opportunities.³⁴ This SDG 7 put the host government and also the oil companies under an obligation to conduct their petroleum operation in a more sustainable manner. In this case the terms and condition determined by the host government can contribute significantly. On the other hand, the lack of proper monitoring of compliances by the oil and gas companies put a risk on the state to comply with the target of the SDGs. Natural gas is a flexible, abundant, and available widely along with low carbon energy sources which can assist to reduce the emission of GHG. The carbon emission of a proficient and fresh natural gas plant is 50-60% less than a same nature coal plant.³⁵ The natural gas can be a backup for the renewable energy such as solar and wind power plant etc. if the gas field is developed in a sustainable manner it can support the transport, power generation and cooking fuels.

The oil and gas industries are the centre of the global energy system as they supply the considerable portion of the required world energy. These industries are the major employer throughout the world and contribute to economic progress where they operate. The petroleum sector is a global US\$3.2 trillion industry that adds considerable tax and other revenue to governments and contributes to employ more than 4.5 million people.³⁶ These industries also face some challenges to ensure the safe working condition as well to ascertain the sustainable economic growth although these industries are always in front to innovate advanced technology in the exploration and production of this non-renewable resource. It is found that the Asian and European oil and gas companies are

³⁴ *Ibid*

³⁵ IPIECA, IFC and UNDP, *Mapping the Oil and Gas industry to the Sustainable Development Goals: An Atlas*, (2017), p.38.

³⁶ WBSCD, *Accelerating action An SDG Roadmap for the oil and gas sector*, April 2021.

showing interest in low carbon technologies and enhancement of energy transition.³⁷

The SDG 7 that is the ensuring affordable and clean energy, also assist in achieving the SDG 2 that ensure food and nutrition security for all and to improve the agriculture and abolition hunger leading a healthy life. By using clean energy in vehicles, the emission of greenhouse gas can be reduced which contribute to less pollution of air and to help in attaining healthy life. On the contrary the respiratory diseases are increasing due to use of non- clean energy in their daily life.³⁸

4.2 Negative Impact of Petroleum Operation on SDGs: The oil and gas operation has a direct conflict with some of the SDGs. These are the SDG 3 good health and wellbeing, SDG 6 clean water and sanitation, SDG 13 climate change, SDG 14 life below water and SDG 15 life on land. Though the petroleum industry tries to make an alignment with the SDGs, the COVID -19 pandemic put a risk of achieving the SDGs by the year 2030. Even before, the COVID pandemic, there was a consensus that, the world is not in a right track to attain the SDGs. The Report published by the United Nations Global Sustainable Development as *The Future is Now*, clearly mentioned that countries are yet far from achieving most of the 169 targets of SDGs.³⁹ Increasing inequalities, loss of biodiversity, climate change and increasing trend of waste discharge from the human activities are evident that the world movement is not in right direction to achieve these goals.⁴⁰ In a report of 2024 it is estimated that only approximately 16% of the total target of the

³⁷ Titova, N.; Cherepovitsyna, A.; Guseva, T. Meeting the UN's Sustainable Development Goals in the Decarbonization Agenda: A Case of Russian Oil and Gas Companies. *Resources* 2023, 12, 121.
<https://doi.org/10.3390/resources12100121> Accessed on April 2025.

³⁸ Huanyu Zhu Wanglin Ma, Puneet Vatsa, Hongyun Zheng, 'Clean energy use and subjective and objective health outcomes in rural China', *Energy Policy*, Volume 183, December 2023. Available at
<https://www.sciencedirect.com/science/article/pii/S0301421523003828>.

³⁹ The full list of SDG targets can be found at <https://sdgs.un.org/goals>

⁴⁰ WBSCD, Accelerating action An SDG Roadmap for the oil and gas sector, April 2021.

SDGs are in proper track to achieve while remaining 84% are insufficient in progress or in slow progress. In some cases, the progress index is in reversal situation.⁴¹ The target SDGs which are off tracks are regarding biodiversity, land use in a sustainable manner, powerful institution and peace. While five targets are in reverse in progress among them the target of nitrogen management under the SDG 2. The targets of the SDGs which are in a positive track are relating to infrastructure and fundamental access to service among them are the access to electricity, use of broadband in mobile, internet etc.⁴² In 2015 about 1.1 billion people had no access to electricity and about 2.8 billion people which is 41% of the world population were dependant on wood, charcoal and animal dung for their cooking.⁴³ Although the energy crisis and COVID pandemic were in existence, the access of electricity has been increased and the percentage of people without electricity has been decreased by the year 2023.⁴⁴ To attain the SDG 7 it is necessary to connect newly 135 million each year from the year of 2024 which is far from attainable.⁴⁵ Another ingredient of SDG 7 is the access to clean cooking is not yet in a satisfactory stage to meet the global SDGs. In 2023 over 2 billion of global population were remained beyond clean cooking. Therefore, the COVID pandemic and energy instability lead the reduction of economic growth and high costing of the affordable energy. The industries face numerous challenges in mapping with these SDGs particularly its negative impact on environment and biodiversity that put a risk on in achieve the SDG 13 which ensure reduction of carbon dioxide emission from combustion fossil fuel. As the fossil fuel burning is the significant source of CO₂ it increases the global warming that affect the life

⁴¹ Sachs, J.D., Lafortune, G., Fuller, G The SDGs and the UN Summit of the Future. Sustainable Development Report 2024. Paris: SDSN, Dublin: Dublin University Press. doi:10.25546/108572.(2024)

⁴² *Ibid*

⁴³ IPIECA, IFC and UNDP, *Mapping the Oil and Gas industry to the Sustainable Development Goals: An Atlas*, (2017), 37.

⁴⁴ Access to electricity: Recent progress, available at <https://www.iea.org/reports/sdg7-data-and-projections/access-to-electricity>.

⁴⁵ *Ibid*

under water (SDG 14). The exploration and extraction of the petroleum resources related to number of issues like gas flaring, oil spills, noise pollution and dumping that affect SDG 14, that is, life under water; SDG 15, Life on land; and SDG 13, the climate change.⁴⁶

Bangladesh is a developing country in the world. In achieving the targets of the SDGs the ranking of Bangladesh is 107 among 167 countries. To fulfil the SDG 7 the progress of Bangladesh is 50%. In attaining the SDGs, the Scandinavian countries are in the front line than those of the south Asian countries. Though the position of Bangladesh is better than India, Pakistan and Myanmar but not good enough as Sri Lanka, Nepal, and Bhutan are in much progress than Bangladesh.⁴⁷

Many oil and gas companies, however, planned to incorporate certain elements into their planning phase of petroleum operations. For instance, they train the local community to involve them in operating activities, consult with the community for early infrastructure development to meet the needs of the company and the community, ensure a water development plan to ensure sustainable water management, and implement a healthy and safety program to ensure sound productivity.⁴⁸ These actions of the oil and gas companies are helpful in achieving certain SDGs that have been set by the UN General Assembly.

⁴⁶ Stella Emeka-Okol1, TochukwuChinwubaNwankwo, Christiana Adanma Otonnah, &EkeneEzinwaNwankwo, Integrating Sustainable Development Goals into Oil & Gas Operations: A Comprehensive Review,*International Journal of Management & Entrepreneurship Research*, 6(3), March 2024, pp 660-677.

⁴⁷ Sachs et al. The SDGs and the UN Summit of the Future. Sustainable Development Report 2024. Supra note 41

⁴⁸ Kai Eberspaecher, "Sustainable Development in Oil and Gas," *Advisian* (September 2017)
<https://www.advisian.com/en/global-perspectives/sustainable-development-in-oil-and-gas> accessed on January 10, 2020.

5. The Sustainable Development Goals and the Paradox of Legal Issues

The SDGs are a significant global commitment to the eradication of poverty, the protection of the environment, and the assurance of prosperity for all by 2030 (United Nations, 2015). Oil and gas industries are the core of both the global economy and the economies of many nations, both developed and developing. Since oil and gas contribute the major share of the global energy system as well as propel economic and social progress, this is also significant for sustainable development. The relationship between the sustainable development goals and the petroleum operation is very complex. While the global economy and the energy system without the oil and gas is simply unimaginable, extraction and use of oil and gas can negatively impact the environment and social well-being. In fact, all phases⁴⁹, upstream (exploration and production), midstream (transportation and storage) and downstream (refining and distribution), of the petroleum operation adversely affect the environment and human settlements.

Although law is commonly acknowledged as a crucial instrument for achieving the ambitious objectives of SDGs, a complex and frequently confusing contradiction of legal challenges emerges. This contradiction resides in the reality that the legal frameworks essential for attaining the SDGs can concurrently impose considerable obstacles to their fulfillment. e.g. national legislation enshrines pledges to clean water (SDG 6), quality education (SDG 4), or climate action (SDG 13) on the other hand, international law supports cooperation on trans-boundary challenges like biodiversity loss (SDG 15) or marine pollution (SDG 14). Legal systems defend human rights (essential to SDG 16), establish property rights, enforce contracts that are essential for economic progress (SDG 8),

⁴⁹ Pheasant Energy, What is Oil and Gas Production: Stages, Methods and Impact Available at <https://www.pheasantenergy.com/oil-and-gas-production/>

and develop regulatory frameworks for social welfare and environmental protection (French, 2005).⁵⁰

Sovereignty vs. Cooperation Paradox: One of the features of the SDGs framework is that it is not binding in nature that means it is not legally enforceable, unless the state parties incorporated them in their national laws. As the implementation of these SDGs depend on a large scale on public and private sectors it requires to define and interpret these goals in a conventional legal perspective which is very nebulous.⁵¹

While the fundamental idea of state sovereignty in international law gives countries more authority, it can also obstruct international collaboration, which is necessary for SDGs that address planetary limits (such as SDG 13 on climate change). Consensus is necessary to reach legally binding agreements, which frequently results in lowest-common-denominator outcomes or key states' non-participation.⁵² Environmental rules required for SDGs 14 or 15 may be directly at odds with national legislation that prioritize short-term economic interests (SDG 8).

This issue has also been addressed by the General Assembly of the United Nations on 29 March 2023 77/276 and it has requested for an advisory opinion of the International Court of Justice (ICJ) on the obligations of States in respect of climate change.⁵³ The ICJ considered a number of international instrument such as the United Nations Charter, United Nations Framework Convention on

⁵⁰ French, D. *International Law and Policy of Sustainable Development*. Manchester University Press. (2005).

⁵¹ Thomas L Muinzer and Colin Mackie, *The Sustainable Development Goals, Energy Law and the Sustainable Development Goals: Host Government Instruments for Sustainability in Oil and Gas Operations*, edited By Eduardo G Pereira, Thomas L Muinzer, Patrick R Baker and renewable resources 9 B/W Illustrations, 2024. pp15-26.

⁵² Rajamani, L. *The 2015 Paris Agreement: Interplay between Hard, Soft and Non-Obligations*. *Journal of Environmental Law*, (2016). 28(2), 337-358.

⁵³ General Assembly of the United Nations on 29 March 2023 77/276 (77th Session)

Climate Change (UNFCCC), the Paris Agreement, the United Nations Convention on the Law of the Sea (UNCLOS), the International Covenant on Economic, Social, and Cultural Rights, the duty of due diligence, the rights enshrined in the Universal Declaration of Human Rights, the principle of preventing significant environmental harm, and the obligation to protect and preserve the marine environment looked for the opinions on (i) What responsibilities do states have under international law to protect the climate system and other environmental components from human-caused GHG emissions for both current and future generations? (ii) What are the legal implications under these obligations for states that have seriously harmed the climate system and other environmental components through their actions and inactions?

The most discussed international law to achieve the SDGs is the Paris Agreement which has been signed by almost 200 states to fight the climate change which is at the core of creating a sustainable low carbon future. The main advantage (or drawback?) of Paris Agreement is that different sets of rules are applicable to different countries. This agreement promotes development in the underdeveloped or developed countries by setting their own policy to combat climate change. On the contrary the “developed nations” are forced to reduce their greenhouse gas emissions in a different way. The effectiveness of these types international law faces great challenge and threat when any country like the United States withdraws the membership.⁵⁴ Climate change issue is always at top to be addressed at the international level and is considered as core factor of the sustainable development. Although the Kyoto Protocol was considered a well-designed policy to combat climate change, it

⁵⁴ President Donald Trump withdrew U.S from the Paris agreement once in 2017. Later in January 2021 President Joe Biden decided to reenter the agreement. However, President Donald Trump once again signed the executive order to withdraw US from the Paris Agreement. (US withdrawal from the Paris Climate Agreement and from the WHO Available at [https://www.europarl.europa.eu/thinktank/en/document/EPRS_ATA\(2025\)767230](https://www.europarl.europa.eu/thinktank/en/document/EPRS_ATA(2025)767230)).

failed mainly due to institutional design flaws.⁵⁵ The then EU countries were assigned to reduce greenhouse gas emissions by 8 percent against the average target of emission control of 5 percent. Oliver et al. reported that the emission status in Japan and Canada during the period of 1990 to 2012 was increased respectively by 14 percent and 25 percent. A different scenario can be seen in the EU countries who achieved 15 percent reduction against the targeted 8 percent.⁵⁶ This reduction was the average of the fifteen countries. More specifically up to 2013, seven of the EU countries could not accomplish their target emission reduction.⁵⁷ Sustainable development concept is also included in the European Union Charter of Fundamental Rights which affirms that it is the general responsibility of the EU and its member states to consider environmental preservation in their policies.⁵⁸ However, the responsibility is not shared equally by the EU-15 states as it can be seen from the compliance report. Rosen also reported after studying the emission control rate of United States, Canada and Australia that the federal system has some impact on the overall achievement of the countries due to the fact that the individual states can have their

⁵⁵ Rosen, A.M. (2015). "The Wrong Solution at the Right Time: The Failure of the Kyoto Protocol on Climate Change" in *Politics & Policy* 43(1):30–58.

⁵⁶ Olivier, Joss G. J., Greet Janssens-Maenhout, Marilena Muntean, and Jeroen A. H. W. Peters. (2013). "Trends in Global CO₂ Emissions: 2013 Report." PBL Netherlands Environmental Assessment Agency. Accessed on November 15, 2014. Available online at http://edgar.jrc.ec.europa.eu/news_docs/pbl-2013-trends-in-global-co2-emissions-2013-report-1148.pdf

⁵⁷ European Environment Agency, Trends and projections in Europe 2013 Tracking progress towards Europe's climate and energy targets until 2020. EEA Report 10/2013. Available at <https://www.eea.europa.eu/en/analysis/publications/trends-and-projections-2013>.

⁵⁸ Kerschner, F. and Wagner, E. (2016). "Sustainability – A Long, Hard Road" in V. Mauerhofer (ed.) *Legal Aspects of Sustainable Development - Horizontal and Sectorial Policy Issues*. Switzerland: Springer. pp. 57- 78.

own policy and some states were reluctant to adopt the global policy.⁵⁹

6. Conclusion

Sustainable development is an ever-growing concern for the academics, policy makers as well as the world leaders and the 17 sustainable development goals are set so that sustainable development of a certain level can be achieved by the year 2030. These SDGs are somehow linked to the environmental issues or climate change i.e. the environment is given a great importance. After analyzing the SDGs and its achievement pathways, it represents that energy plays a vital role to accomplish the development goals. Reduction of the greenhouse gas or the use of clean energy is always promoted and the future energy mix indicates that use of coal which produces the most carbon dioxide compared to other fossil fuels like oil or gas are decreasing gradually which is shown in Table 1. Oil and gas will also be in the leading role to meet the world energy demand as they remain in the present days. Although various activities related to the exploration and production of oil and gas causes serious harm to the environment but human civilization without these non-renewable resources are unthinkable and achieving the SDGs is far away of our reach. So, the petroleum operations must be done in such a way that it causes less harm in the present as well as to the future environment. At the same time the petroleum resource should be extracted in such a way that it produces maximum positive impact to the present generation of the host nation and it will also meet the demand of the future generations. This is only possible if the oil and gas producing country adopt a well-designed petroleum policy and associated laws. Since environmental problems cross national boundaries, the idea of sustainable development began to take

⁵⁹ Rosen, A.M. "The Wrong Solution at the Right Time: The Failure of the Kyoto Protocol on Climate Change".

shape in the area of international law as a result of the realization that no nation can fix the world's problems on its own. On the other hand, some international laws have also been framed to achieve the sustainable development goals. Recent activities of the “developed countries”, which are supposed to take their responsibilities regarding the SDGs and play the key role from the front, are very alarming and are threat to achieve the goals of sustainable development. They should realize that they are not supporting the developing nations however they are paying for their harmful activities to the global environment at present and in the past. It is also very clear from the content of this study that there exists a legal paradox between the petroleum operation and the attainment of SDGs. This can only be resolved through the cooperation among the member countries.