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| Research Article |

Utilization of Petroleum and Natural Gas on the Sustainable Development of Indonesian Economy

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Abstract: Throughout the history of national development, petroleum and natural gas have played a vital and strategic role, serving as essential energy sources for various economic activities. The petroleum and gas sector also contributes significantly to state revenue through the management of these resources. The author aims to discuss the appropriate utilization of petroleum and natural gas and its potential to enhance economic income in Indonesia. Petroleum and natural gas, as valuable resources, exist in liquid and solid forms within the earth's reservoirs. Indonesia possesses vast reserves of petroleum and gas, with numerous untapped fields remaining. Utilizing these resources effectively can lead to increased state revenue. Given their significance as essential commodities in the national economy, managing petroleum and natural gas is crucial for optimizing prosperity and welfare for the population.

Keywords: petroleum and natural gas, sustainable development, Indonesian economy

INTRODUCTION

Petroleum and natural gas are natural resources found in both liquid and solid forms, stored within reservoirs deep within the Earth. These reservoirs consist of rock pores, akin to ponds, situated in the Earth's depths. Globally, petroleum and gas play a pivotal role as the primary sources of energy. As crucial commodities, petroleum and gas significantly influence the lives of many individuals. Consequently, the management of petroleum and gas falls under the purview of the petroleum and gas industry.[1]

The petroleum and gas industry encompasses various institutions, including petroleum and gas companies responsible for the extraction, processing, manufacturing, and drilling of petroleum-derived fuel. Key stakeholders involved in the business activities associated with petroleum and gas include the government, petroleum and gas companies, their employees, as well as individuals engaged in petroleum and gas-related endeavors. It is imperative that these parties possess a stake and rights over the exploitation activities conducted within their respective territories.[2]

One of the key activities within the petroleum and gas industry is exploration and exploitation. According to Article 1, Point 8 of Law Number 22 of 2001 concerning Petroleum and Gas, exploration refers to the process of gathering geological

[1] Hasan Dinçer and others, 'CO2 Emissions Integrated Fuzzy Model: A Case of Seven Emerging Economies', *Energy Reports*, 9 (2023), 5741–51 https://doi.org/10.1016/j.egyr.2023.05.008
[2] Firly Rachmaditya Baskoro and others, 'System Dynamics Approach in Determining Coal Utilization Scenario in Indonesia', *Resources Policy*, 73 (2021) https://doi.org/10.1016/j.resourpol.2021.102209

information with the objective of locating and estimating the reserves of petroleum and gas within a designated work area. On the other hand, exploitation, as defined in Article 1, Point 9 of the same law, encompasses a series of activities aimed at extracting petroleum and gas from a specific working area. These activities include drilling and completing wells, constructing transportation, storage, and processing facilities for the separation and refining of petroleum and gas in the field, as well as other supportive operations.[3]

Throughout the history of national development, petroleum and natural gas have played a vital and strategic role, serving as essential energy sources for various economic activities. The petroleum and gas sector also contributes significantly to state revenue through the management of these resources. Petroleum and gas serve as both a source of income for the state budget and a crucial energy source, particularly as fuel. In Indonesia, petroleum and gas drive numerous sectors of life, highlighting the industry's importance for the community.[4]

The Government of the Republic of Indonesia has implemented a comprehensive regulatory framework to govern the management of the petroleum and gas industry. These regulations encompass a wide range of business activities, including both upstream and downstream operations. In Indonesia, the management of petroleum and gas is primarily regulated by Law Number 22 of 2001 concerning Petroleum and Gas. This law serves as the cornerstone for overseeing and regulating the industry. It provides the legal foundation for the exploration, exploitation, production, transportation, storage, and distribution of petroleum and gas resources in the country. The implementation instruments associated with this law further detail the specific guidelines, procedures, and requirements for conducting activities within the industry. Together, these regulations establish a governance framework that governs and guides all aspects of the petroleum and gas sector in Indonesia.[5]

METHOD

This study adopts normative legal research techniques in conjunction with a conceptual approach. The conceptual approach is employed to comprehend the underlying concepts associated with the implementation of tax incentives aimed at enhancing domestic revenues through foreign direct investment. The research proposal is descriptive in nature. The primary source of data is derived from secondary sources, specifically through an extensive review of pertinent literature. The collected data are subjected to qualitative descriptive analysis. Moreover, the investigation relies on the examination of Tax Allowance provisions outlined in Indonesian laws and regulations. Other methods, such as historical and legal analysis, are also utilized to gather accurate data. During the literature review phase, the

[3] Abdul Kadir Jaelani, Resti Dian Luthviati, and Muhammad Jihadul Hayat, 'Permits for the Transfer of Agricultural Land Functions to Non-Agriculture in the Land Purchasing and Sale Process', in *International Conference on Environmental and Energy Policy (ICEEP 2021)* (Atlantis Press, 2021), pp. 216–19 https://doi.org/10.2991/assehr.k.211014.046

[4] Syaifuddin Yana and others, 'Biomass Waste as a Renewable Energy in Developing Bio-Based Economies in Indonesia: A Review', *Renewable and Sustainable Energy Reviews*, 160 (2022) https://doi.org/10.1016/j.rser.2022.112268

[5] Djoni Hartono and others, 'Effect of COVID-19 on Energy Consumption and Carbon Dioxide Emissions in Indonesia', *Sustainable Production and Consumption*, 28 (2021), 391–404 https://doi.org/10.1016/j.spc.2021.06.003

researchers conduct a qualitative analysis of the gathered data using techniques of interpretation, thereby presenting the results in an analytical and critical manner.

RESULT AND DISCUSSION

Use of Petroleum and Gas in Indonesia

Indonesia heavily relies on the utilization of petroleum and natural gas resources due to their significant role in human life. These resources offer numerous benefits that support various daily activities. However, given their non-renewable nature, it is crucial to exercise wisdom in their usage. While petroleum and gas provide substantial advantages, their limited availability necessitates responsible and sustainable management.

Petroleum and gas deposits require thousands, or even millions, of years to form, rendering them non-renewable resources. Despite their limited nature, Indonesia benefits greatly from these resources. A wide range of products can be derived from petroleum and natural gas, with many serving as fuel sources. This includes fuel for household consumption, industrial processes, and transportation. Kerosene, obtained through the refinement of crude petroleum, is commonly used as a household fuel, alongside LPG gas. LPG gas, on the other hand, is derived from gas processing. Furthermore, petroleum-based fuels are extensively utilized in various modes of transportation. Motorcycles, cars, airplanes, and other vehicles predominantly rely on petroleum-based fuels. Gasoline and diesel are among the primary petroleum products employed as vehicle fuels. Gasoline consists of numerous hydrocarbon compounds, with higher carbon chain lengths. Diesel petroleum, on the other hand, is specifically designed for certain types of diesel engines.

According to data from Pertamina in 2013, the total national demand for crude petroleum reached 77.00 million KL. However, the production capacity of national refineries was only 38.10 million KL during that year. Consequently, there was a deficit of approximately 38.9 million KL, accounting for approximately 51% of the total demand.[6]

Petroleum plays a vital role in various industrial activities and is closely linked to the development of human life. The industry relies on petroleum and natural gas as raw materials for the production of a wide range of materials and products. Numerous products derived from petroleum can be categorized into several groups, including plastics, synthetic fibers, synthetic rubber, pesticides, detergents, solvents, fertilizers, drugs, and certain vitamins, all of which utilize petroleum as a key component. Furthermore, natural gas holds significant benefits for human life, serving as a crucial raw material in the manufacturing processes of fertilizer, petrochemical, methanol, and plastic factories. Its versatile nature and applications contribute to the production of essential products that enhance various aspects of human life.[7]

In addition to its role as a fuel source, petroleum offers various benefits in the production of construction materials. Petroleum contains compounds that are utilized in the manufacturing of construction tools, including roofing materials, paints, pipes,

[6] Ukar Wijaya Soelistijo, Aryo Prawoto Wibowo, and Makmun Abdullah, 'The Contribution of Low Rank Coal Liquefaction in Indonesian Economy in 2025', *Procedia Earth and Planetary Science*, 6 (2013), 301–10 https://doi.org/10.1016/j.proeps.2013.01.040

[7] Michael Jakob and others, 'Actors, Objectives, Context: A Framework of the Political Economy of Energy and Climate Policy Applied to India, Indonesia, and Vietnam', *Energy Research and Social Science*, 70 (2020) https://doi.org/10.1016/j.erss.2020.101775

asphalt, and more. Furthermore, petroleum finds application in the medical field. Crude petroleum is often incorporated into cleaning products, medications, protective equipment, and safety gear for medical professionals. Medical objects, such as syringes that meet specific standards and aspirin containing petroleum hydrocarbon components, rely on petroleum in their production processes. Petroleum also finds its place in the creation of beauty products. It is used in the formulation of perfumes, nail polish, makeup, and hair dye. Additionally, petroleum serves as an ingredient in various personal care products, including soap, toothbrushes, and shampoo.[8]

Indonesian Legal Policy on the Exploration and Exploitation of Petroleum and Natural Gas

Considering Indonesia's substantial natural mining resources compared to other countries, it is essential to establish strict regulations to safeguard the utilization of these resources. Such arrangements are necessary to ensure the sustainable use of mining products, as they are non-renewable natural resources. Exploration activities play a crucial role in gathering comprehensive data and information regarding the presence of petroleum, gas, and other energy sources in specific locations. Exploitation activities, on the other hand, are part of the upstream petroleum and gas sector, focused on extracting crude petroleum from underground reservoirs to the surface. These activities encompass drilling supported by offshore platforms, well completion, construction of transportation and storage facilities, and processing of natural gas, including the conversion of natural gas to liquid form known as liquefied natural gas (LNG).[9]

In accordance with the Government Regulation of the Republic of Indonesia Number 55 of 2009, which amends the Government Regulation Number 35 of 2004 regarding Upstream Petroleum and Gas Business Activities, entities engaging in petroleum exploitation must establish a legally recognized business entity. This entity should operate on a permanent and ongoing basis, comply with applicable laws and regulations, and be domiciled within the territory of the Republic of Indonesia. Furthermore, it should hold a production sharing contract or other forms of cooperation contract for exploration and exploitation activities that provide maximum benefits to the state and contribute to the prosperity of the people. An implementing agency is established to oversee upstream business activities in the petroleum and gas sector.[10]

Indonesia regulates quite high prison sentences for perpetrators of the crime of petroleum and gas exploration and/or exploitation without a permit in Article 52 of Law Number 11 of 2020 concerning Job Creation in the Energy and Mineral Resources section. Imprisonment that can be imposed on perpetrators of the Crime of Petroleum and Gas Exploration and/or Exploitation without a permit or cooperation contract is a maximum of 6 (six) years and a maximum fine of Rp. 60,000,000,000.00 (sixty billion rupiah). This provision is a change from Law Number 22 of 2001 concerning Petroleum and Gas. According to Mudzakir a criminal law expert said that Illegal

[8] Dino Rimantho and others, 'The Strategy for Developing Wood Pellets as Sustainable Renewable Energy in Indonesia', *Heliyon*, 9.3 (2023) https://doi.org/10.1016/j.heliyon.2023.e14217

[9] Rimantho and others.

[10] Farhan Surury, Ahmad Syauqi, and Widodo Wahyu Purwanto, 'Multi-Objective Optimization of Petroleum Product Logistics in Eastern Indonesia Region', *Asian Journal of Shipping and Logistics*, 37.3 (2021), 220–30 https://doi.org/10.1016/j.ajsl.2021.05.003

drilling can be categorized as an extraordinary crime, therefore illegal drilling law enforcement must be carried out without having to wait for reports from the public.[11]

Influence of petroleum and gas on the economy of Indonesia

According to the Law of the Republic of Indonesia Number 22 of 2001, petroleum and gas is a vital commodity that plays an important role as a foreign exchange earner, fulfills the need for domestic workers, and is the main industrial material.[12] And until now, natural gas has a fairly high economic value so that it is included in the types of mining products that are favored by Indonesia to spur economic growth apart from petroleum. The government defines the petroleum and gas industry as a strategic industry. Indonesia is the eighth largest natural gas exporter in the world (EIA, 2011).[13]

Petroleum and natural gas have high economic value, making them one of the leading commodities in Indonesia. In an effort to advance the Indonesian economy, trade activities between countries are carried out, namely exports. The resources exported by Indonesia are petroleum and gas and non-petroleum and gas resources.[14]

Indonesia is a major actor and is well known in the international petroleum and gas industry. Since the discovery of petroleum sources in 1885, the petroleum and natural gas sector has continued to grow in Indonesia. Indonesia achieved its heyday in producing petroleum in the period 1977 to 1991 with a total product of 1.7 million barrels of petroleum per day. In the gas commodity, Indonesia was once the largest LNG (Liquid Natural Gas) exporter in the world in 2005 (EIA, 2013).[15]

Indonesia exports a lot of petroleum and gas commodities to various countries with the aim of driving Indonesia's economic growth as well expanding domestic and foreign markets. The petroleum and gas sector still has a major influence on the economy, even though the contribution of the industry or the petroleum and gas sector to the Indonesian economy has decreased compared to the glorious period of 1973-1983. Nearly a quarter of Indonesia's export value is in the form of petroleum and gas exports. The petroleum and gas sector is still the main contributor to state revenues.[16]

Table 1.1 Economic Growth, Petroleum and Gas Exports, Non-Petroleum and Gas Exports 2015-2019.

[11] Joni Jupesta and others, 'Managing the Transition to Sustainability in an Emerging Economy: Evaluating Green Growth Policies in Indonesia', *Environmental Innovation and Societal Transitions*, 1.2 (2011), 187–91 https://doi.org/10.1016/j.eist.2011.08.001

[12] Kertayuga, D., Santoso, E., & Hidayat, N. (2021). Prediksi Nilai Ekspor Impor Migas Dan Non-Migas Indonesia Menggunakan Extreme Learning Machine (ELM). Jurnal Pengembangan Teknologi Informasi dan Ilmu Komputer Vol. 5, No. 6.

[13] EIA. U.S Energy Information and Administration. USA. Annual Energy Review 2011.

[14] Lego Karjoko and others, 'Indonesia's Sustainable Development Goals Resolving Waste Problem: Informal to Formal Policy', *International Journal of Sustainable Development and Planning*, 17.2 (2022), 649–58 https://doi.org/10.18280/ijsdp.170230

[15] Andrea Gatto, Wilhelm Loewenstein, and Elkhan Richard Sadik-Zada, 'An Extensive Data Set on Energy, Economy, Environmental Pollution and Institutional Quality in the Petroleum-Reliant Developing and Transition Economies', *Data in Brief*, 35 (2021) https://doi.org/10.1016/j.dib.2021.106766

[16] Amin Jan and others, 'Islamic Corporate Sustainability Practices Index Aligned with SDGs towards Better Financial Performance: Evidence from the Malaysian and Indonesian Islamic Banking Industry', *Journal of Cleaner Production*, 405 (2023), 136860 https://doi.org/10.1016/J.JCLEPRO.2023.136860

Years	Economic Growth (%)	Petroleum and Gas Export (Million US$)	Non-Petroleum and Gas Exports (Million US$)
2014	5.02	30018.8	145960.7
2015	4.79	18574.4	131723.4
2016	5.02	13105.5	131384.4
2017	5.07	15744.4	153083.8
2018	5.06	17171.7	162841.0
2019	5.20	11789.3	155893.7

Source: Central Bureau of Statistics of Indonesia and Bank Indonesia.

Indonesia's economic growth decreased in 2014-2015 with rates of 5.02 percent in 2014 and 4.79 percent in 2015. This was due to falling household consumption and the purchasing power of people who were still very vulnerable to rising food prices. However, in 2016-2019 Indonesia's economic growth has increased every year so that this increase has become a reference and the development of Indonesia's economic growth is getting better.[17] And in 2020, Indonesia's petroleum and gas and non-petroleum trade for exports amounted to 163,306.3 Million USD. Exports have a positive influence on economic growth, meaning that the higher the export value, the economic growth will also increase.[18] So Petroleum and Gas is very influential in the condition of the Indonesian economy.[19]

CONCLUSION

Petroleum and gas offer numerous benefits that facilitate various daily activities. They serve as a primary source of fuel for households, industries, and vehicles. Additionally, petroleum contributes to the production of a wide range of products, including plastics, synthetic fibers, synthetic rubber, pesticides, detergents, solvents, fertilizers, medicines, and certain vitamins. Natural gas, on the other hand, plays a significant role as a raw material for fertilizer, petrochemical, methanol, and plastic factories.

It is crucial to emphasize the importance of obtaining proper permits for petroleum and gas exploration and exploitation due to the non-renewable nature of these resources. Unauthorized exploitation, such as illegal drilling, poses a significant threat to our country's interests. Illegal drilling is considered a serious offense, warranting dedicated law enforcement efforts. Given the substantial economic value of petroleum and gas, these resources have become leading commodities in Indonesia. Trade activities, particularly exports, play a vital role in advancing the Indonesian economy and leveraging the wealth of natural resources. Indonesia engages in both petroleum and gas exports, as well as trade involving non-petroleum and gas resources. Petroleum and gas exports account for nearly a quarter of Indonesia's total export value. The petroleum and gas sector remains a significant contributor to state revenues.

[17] SIHOMBING, M. (2021). Analisis Pengaruh Ekspor Migas, Ekspor Non Migas Dan Penanaman Modal Asing Terhadap Pertumbuhan Ekonomi Indonesia Tahun 2000-2019.

[18] Fitriani, E. (2019). Analisis Pengaruh Perdagangan Internasional terhadap Pertumbuhan Ekonomi Indonesia. JURISMA: Jurnal Riset Bisnis & Manajemen, Vol.9, No.1.

[19] Marissa Malahayati and Toshihiko Masui, 'Potential Impact of the Adoption of Food Loss Reduction Technologies in Indonesia', *Journal of Environmental Management*, 319 (2022) https://doi.org/10.1016/j.jenvman.2022.115633

Notably, exports have a positive impact on economic growth, as higher export values correlate with increased economic growth.

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