

# **Policy Analysis Of Exploitation Of Natural Oil Gas And Implementation Of Alternative Energy Resources Exploration Policies To Improve Community Welfare In Natuna Island Riau Province**

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## **ABSTRACT**

The energy sector is an important sector in Indonesia because apart from being a driving force for domestic economic growth it is also a leading export commodity by the government. Exploitation and use of energy which is a necessity for every industry and household at this time can have a negative impact on natural resources such as water, air and land. The negative impact can be in the form of environmental pollution as a result of energy use. Exploration of alternative energy policies as a strategic goal of long-term energy security, to strengthen strategic reserves of oil and gas, and to avoid a long-term energy crisis.

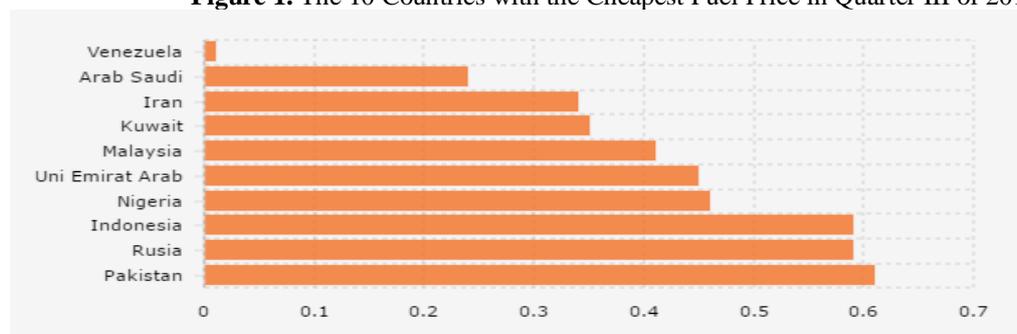
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## **I. BACKGROUND**

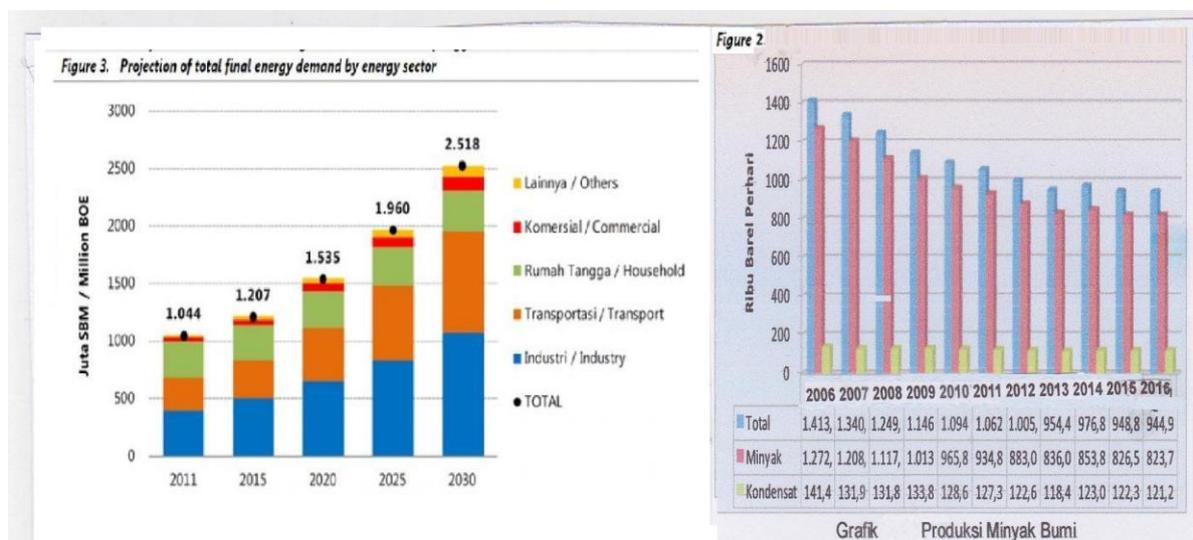
Since the monetary crisis in mid-1997, Indonesia has been facing the issue of energy shortage crisis of Fuel Oil (Bahan Bakar Minyak/ BBM). Price increase of Fuel Oil (BBM) reached 88.63 US \$ / Barrel (Kompas, 2019) and the Government reduces the subsidy of fuel oil (BBM) 27.7% (Kompas, 2019). The rise in world oil prices touched \$ 80 a barrel after supply disruptions and rising global demand (BBC Indonesia, 2019). Although Indonesia raised the cheapest price of Fuel Oil (BBM) compared to 9 other countries in the third quarter of 2019 (figure 1). The rise in oil prices is a special disaster for the Indonesian government. In fact, Indonesia, now known as one of the world's oil producers, is now one of the oil importing countries (OPEC, 2019). Crude oil imports in 2019 reach 290-350 thousand barrels per day (bpd) or 50% of crude oil needs. Crude oil price increase of USD 1 / barrel, increasing the burden of post budget subsidy of Rp. 3.95 Trillion, the Oil and Gas Profit Share Fund increased by Rp. 1.49 Trillion (Ministry of Energy Human Resources, 2019). It will increase the deficit (APBN) from around 2.7% of Gross Domestic Product (GDP) to 2.3% of GDP (ISA, 2019), whereas BBM is the breath of life, and the turn of the economy. For policy makers, businessmen and scientists, this big event becomes a moment of economic turmoil that will shake great political stability so that an effort to make energy savings, improvement of state management system that remove inefficiency or high cost economy.

**Figure 1.** The 10 Countries with the Cheapest Fuel Price in Quarter III of 2019



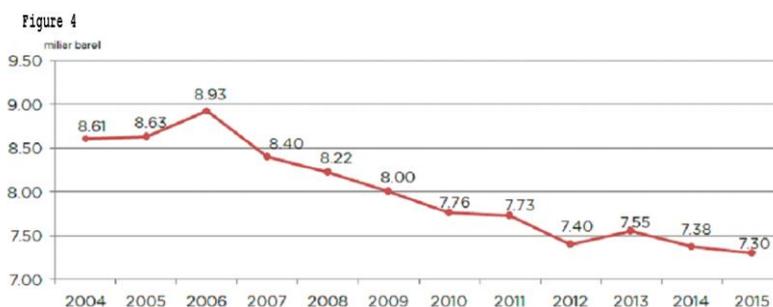
The impact of world oil price fluctuations indicates that the aspect of energy security (energy security) requires serious attention. Energy management requires a new paradigm oriented to the fulfillment of domestic needs, the creation of value-added domestic energy use, the emphasis on the use of energy more efficient, and price regulation that more reflects the value of economics, exploitation and regional economic growth, including the utilization of energy sources local primary.

Energy has an important role in the achievement of human life on earth. The general condition of energy use in Indonesia is still dependent on petroleum by 61.66%, natural gas 38.57%, coal 16.34%, water power 4.11% and geothermal 2.42%. (Ministry of Energy Human Resources, 2019). Petroleum as the main energy source for industry, transportation and household and foreign exchange for the country (figure 3). The need for fuel oil every year has increased and Indonesia's oil reserves have decreased. Over the last five years (2015-2020) petroleum production is likely to continue to decline with an average decrease of 2% per annum (figure 2 graph of petroleum production) (Ministry of Energy, 2020). The decline in the trend of petroleum production is actually also happening globally. World petroleum production has been replaced with other fossil energy such as coal, natural gas and unconventional gas such as CBM, shale gas, gas hydrates and renewable energy. The petroleum reserves decreased annually in Indonesia's oil reserves chart (figure.4 data of Indonesian Oil Reserves ) and in 2019 amounted to 7,764.48 MMSTB, consisting of proven reserves of 4,230.17 MMSTB and potential reserves of 3,534.31MMSTB (Ministry of Energy and Human Resources , 2019). With current production levels, based on the comparison between total oil reserves and current oil production levels, it is estimated that petroleum reserves can last about 23 years (assuming no new reserves are found) (Ministry of Energy, 2019).



Source: Ministry of Energy Human Resources, 2019

Figure 4. Data of Indonesian Oil Reserves



The decline in crude oil production is mainly due to the age of the petroleum industry which has been over 100 years old, the existing wells are old and the disposable properties of petroleum cause natural production decline, the technology used is behind and the investment climate in the oil mining sector is less conducive so that not many foreign companies and national investment in the oil sector.. While on the side of consumption, consumption of oil or fuel oil products continues to increase along with population growth and economic growth in Indonesia. Since 2004, if Indonesia's oil production in all refineries is calculated, the results

still can not meet domestic demand. Since 2004, Indonesia has experienced a deficit of 58.3 thousand barrels / day (Kompas, 2019). This needs to be balanced with the discovery of reserves through the exploration of oil and gas exploration. The policy of the Indonesian government by suppressing the decline in lifting or petroleum production at an 9% rate should be naturally about 19% for 2015-2019. (Ministry of Energy Human Resources, 2019). Therefore the government sets a target of 2025 national energy composition to face the decline of petroleum reserves and the exploration of new energy and renewable energy. Petroleum becomes less than 30%, natural gas becomes more than 40%, Coal becomes more 43%, Vegetable Fuel becomes more than 7%, Geothermal becomes More than 6%, New Energy and Renewable Energy becomes more than 6% and Liquid Coal becomes more than 3% (Source: Ministry of Energy Human Resources, 2019, Presidential Regulation No. 5 of 2006).

Increasing the demand for petroleum that is not offset by increased production causes Indonesia to be threatened by the energy crisis. The decline in oil reserves is caused by two main factors: oil exploitation over the years and lack of exploration or geological surveys to find new oil reserves and lack of oil fuel(Fuel oil/BBM) exploration. Without focusing on exploration and exploitation of oil and natural gas, especially in the oil-rich Natuna Sea region, it is estimated that in  $\pm$  14 years Indonesia becomes the country's total importer of oil. To slow Indonesia into a net oil importer country, it is necessary to increase the amount of oil reserves stored in the oil basin at a depth of several thousand meters below the subsurface, upstream oil activity, which consists of general investigation, research, mapping, exploration and exploitation, conducted either onshore or offshore, and exploration of other alternative energy sources as oil and gas depleting reserves.

In order to increase the role of oil and gas sub sector in the effort to restore the economy, Law Number 22 Year 2001 regarding Oil and Natural Gas which is the legal basis for the arrangement of the implementation of the supervision, supervision, arrangement and implementation of oil and natural gas exploitation activities in Indonesia, so as to create an independent, transparent, competitive, efficient and environmentally sound petroleum and natural gas business activities, and encourage the development of national potential and role. In line with the Reformation process in Indonesia, Law No. 22. In 1999 there is one of the articles governing regional authority in the management of territorial waters. Article 10 states that "Provincial areas have the authority to manage the sea area as far as 12 miles measured from the coastline, while the Regency and Municipal Authorities are authorized to manage one third of the territory of the province or within 4 nautical miles". Thus it is perceived that beyond the 12 miles is the authority of the Central Government.

Government policies in optimizing the use of energy resources that include policies on diversification, intensification, conservation, energy and environmental prices, including energy policies for the exploitation of natural gas and exploration of environmentally friendly alternative energy resources. Energy policy as an effort to ensure domestic energy supply. This energy policy is stated in Presidential Decree no. 5 of 2006 on National Energy Policy (Kebijakan Energy Nasional/ KEN), as a guide for national energy management. One of them is to diversify energy by utilizing the source of biological material of Indonesia through the development of biofuel (Bahan Bakar Nabati/ BBN) as an alternative energy source. Several types of biofuel known to the public are biodiesel, bioethanol, biooil (pure vegetable oil). Biofuel (Bahan Bakar Nabati/ BBN) which is included in energy mix program Blue Print National Energy Management (BP-PEN) is bio-diesel and bio-ethanol. Biodiesel is a diesel / diesel substitution fuel derived from the processing (esterification and transesterification) vegetable oil. Bioethanol is a gasoline substitution fuel (gasoline) derived from the processing (fermentation and hydrolysis) of glucose and carbohydrates. The biofuel exploration policy is expected to reduce the use of Fuel Oil.

The islands of Natuna are the northernmost islands in the Karimata strait. The Natuna Islands is an island located at the northern tip of Indonesia with a distance of over 1,250 km from Jakarta. in the islands located on the front porch of the Unitary State of the Republic of Indonesia is like a pearl scales on the equator (Regent of Riau Islands, 1996). The Natuna Islands are famous for producing oil and gas. The Natuna Islands has the largest natural gas reserves in the Asia Pacific region and even the largest in the World. In the belly of the earth also petroleum petroleum. This refers to one of the D-Alpha gas fields located 225 kilometers (km) north of Natuna Island (in ZEEI). The Natuna Islands have total reserves of 112,356,680 barrels of natural gas, with a volume of 222 trillion cubic feet (TCT). In addition, hydrocarbon gas that can be mined to 46 TCT is one of the largest sources in Asia. That number does not include natural gas reserves in the western part of Natuna, which is managed by world-class giant oil skipper. Not just triumphant in the natural gas sector. Natuna is also covered with petroleum that seems never ending. The off shore wells in the eastern part of Natuna continue to emit the oil. Natuna's petroleum reserves are estimated at 14,386,470 barrels. oil and gas sector in Natuna Regency is the largest contributor to the economy in Riau Islands Province. Oil and gas derived from the weathering of fossils of marine animals over the past millions of years contributed about 10.11 percent of the economy of the Riau Islands.

Currently exploration and exploitation of oil and gas mining is still not optimal. Natuna regency in particular is believed to have a petroleum gas deposit in the northern region of the ocean of national jurisdiction

that has not been utilized significantly. The local government has not been fully exploring the potential of oil and natural gas resources in the Natuna Sea region. This is due to the limitations of oil and gas mining and technology, human resources and upstream business. Migas is still dominated by foreign investors such as J. Ray McDermott, or at the economic right level, through the mechanism of cooperation contract between the Government and oil and gas investors to conduct upstream oil and gas activities in one of Mining Working Area (WKP/Wilayah Kerja Pertambangan) based on revenue sharing from oil and gas production commonly known as Production Sharing Contract (KPS) or other contracts that benefit the local government in particular and the Indonesian government generally. Since the largest oil and gas field in Southeast Asia was discovered in 1970 by Agip company, the Italian investor of this project other than Pertamina State-Owned Enterprise (SOE) of Indonesian oil is Exxon Mobil, Premier Oil, and Conoco.

In the oil and gas sector (oil and gas) is placed as a quarry (A) valuable vital and strategic. To provide energy commodities based on fuel oil (BBM), industrial raw materials, sources of state revenue from export. Exploration activity is a field investigation to collect data / information as complete as possible about the existence of oil and gas and other energy in a precise. Exploitation activities are part of upstream oil and gas activities aimed at removing crude oil from reservoirs in the earth to the surface. The overall exploitation of petroleum and natural gas mining includes primary and supporting activities, namely drilling supported by offshore platform facilities, well completion, construction of crude oil transportation facilities, storage and processing in the field including natural gas processing ( natural gas) is converted into liquid, known as Liquid Natural Gas (LNG).

The Natuna Sea region is the northern part of the National Jurisdiction Sea. Sea of national jurisdiction, in accordance with the United Nations (UN) Sea Law Convention (1982) territorial sea under national jurisdiction is divided into sections under the full sovereignty of a state, and the parts in which the state may exercise the powers and privileges set forth by the Convention. Those under national jurisdiction are under the full sovereignty of Indonesia including internal waters, archipelagic waters, territorial sea, contiguous zone, exclusive economic zone, and the continental shelf. The entire ocean area under Indonesian jurisdiction reaches about 5.8 million km<sup>2</sup> or more than 70% of the total area of Indonesia.

The increase of oil and gas mining exploitation activities in the Natuna Sea region of northern sea of national jurisdiction is the operationalization of maritime insight, the implementation of archipelagic state and strategic value. Since the upstream activities (exploration and exploitation) to the downstream output (output) increase the oil and gas production, especially the Natuna Islands, the domestic energy providers, increase the supply of raw materials for industry, increase the source of local revenue from regional equity funds ie revenue sharing fund set in Law (Undang-Undang) No. 25 of 1999 and government Law (Peraturan Pemerintah) No. 104 of 2000 will increase regional development and improve the welfare of the people of the Natuna Islands. Which in turn can slow Indonesia into a net oil importer country, as well as improve the security of border areas, as well as security of oil and gas supply (oil and gas supply security) both now, and for future generations. Optimization of exploration and exploitation of oil and gas mining in the Natuna Sea, northern part of the national jurisdiction of some archipelago state systems that ultimately can improve the welfare of coastal communities living around the Natuna Islands oil and gas activities. Increased exploration activities of alternative energy availability 21st Century to maintain and improve the welfare of the community as part of human civilization in the Millennium III.

### **Approach Method**

Exploratory method with integrated integral and naturalistic-holistic approach (Lee, 1999), to describe the strategic aspects of the overall system of resource-based economic development of oil and gas sub-sector and technical aspects related to the exploration and exploitation of oil and gas mining for the welfare community of the Natuna Islands.

### **Geography of the Natuna Islands and the Socio-Political Pattern of the Post-Autonomous Region Border Area**

The Natuna Islands is a border area, geographically located directly adjacent to neighboring countries. Natuna Islands, is one of the islands in Riau Islands Province, Indonesia. To the north, Natuna is bordered by Vietnam and Cambodia, in the south by South Sumatra and Jambi, in the west by Singapore, Malaysia, Riau and the east with East Malaysia and West Kalimantan. Natuna is on international shipping line Hongkong, Japan, Korea and Taiwan. The hierarchy of government is "the unity of the legal community" (article 1 letter e Law No. 5 of 1974). The Natuna Islands, whose border area is rich in oil and gas, contains geopolitical, economic, security and socio-cultural significance. The implications for the government in the border area have a greater responsibility than other regions.

History of Natuna Regency can not be separated from the history of Riau Islands Regency, because before standing alone as an autonomous region, Natuna Regency is part of Riau Islands Region. Natuna

Regency was established based on Law no. 53 of 1999 from the expansion of the Regency of Riau Islands consisting of 6 Subdistricts of East Bunguran District, West Bunguran, Jemaja, Siantan, Midai and Serasan and one District Assistant Tebang Ladan. Along with the authority of regional autonomy, Natuna Regency then expanded the sub-districts up to 2004 into 10 sub-districts with the addition of Kecamatan Pal Matak, Subi, Bunguran Utara and Pulau Laut with 53 villages / villages. Until 2007 Natuna Regency has 16 Districts. 6 new division districts include Pulau Tiga District, Northeast Bunguran, Central Bunguran, South Siantan, East Siantan and East Jemaja with total number of (kelurahan) village as many as 75.

The socioeconomic style of politics is the consequence of its status as a border area rich in oil and gas resources post-regional autonomy. First, the political interests of the central government are still very large in this area. This makes the embedded state penetration. Its location adjacent to neighboring countries make the Natuna Islands strategically located in the defense of Republic of Indonesia security. Second, Central economic interests are still large even though the regional autonomy has been implemented. The economy of the Natuna Islands is an asset to fuel the growth of the national economy. Especially for the needs of foreign capital and foreign exchange. Viewed from a regional economic perspective, its economy has been integrated into Singapore's economy. Trade relations and economic traffic that runs every day still reflects its dependence on Singapore. For example, in the case of export-import and participation of Singaporean businessmen's capital unofficially manage the business fields undertaken by the Natuna Islands community. Such economic integration makes the dominance of the economy and trade in the ethnic Chinese. The economic interests of the central government bind the region and the influence of neighboring countries into centripetal powers (for some people who are still dependent on Singapore which is predominantly ethnic Chinese. Third, globalization, commercialization, liberalization have implications for socio-cultural resilience of society. The entry of foreign values makes the joints of local customs values shift. In the assimilation of social delegation often occurs delegitimized. Fourth, the exploitation of natural resources and industrialization in the Natuna Islands are questionable implications for improving the welfare of local communities. The abundance of natural resources does not necessarily improve the welfare of the local people. Production factors have not been maximally owned by the Natuna Islands. The opportunities for manpower that should be supplied by the local community more use of outsiders. The entry of investors makes the community's inhumanity in their own homeland.

#### **Policy on Exploitation of Mining Oil and Gas of Natuna Island**

The production of oil, especially the Natuna Islands, is not only owned by the Government of Indonesia, but the production of oil production must be shared with the contractors of Sharing Contracts (KPS) which operate mainly in the Natuna Islands. The profit sharing scheme is 85% Central Government and 15% contractor. 85% and 15% division is not a gross production, but the result of oil production means that production value is reduced by exploitation, tax, land-rent, royalty, etc. So the crude oil share between government and KPS can be 60% and 40% In Natuna Islands, crude oil production is 637,120 barrels per day (BPS Natuna, 2008) divided into Government and Pertamina Section 375,774 barrels or 58.9% and Production Sharing Contractor (KPS) of 261,346 barrels or 41.02% Law No.25 of 1999 and Law No.33 of 2004 on Fiscal Balance of Central and Regional, the results of the oil in the the central government should be divided by producing regions by proportion of 85% and 15%. Under the revenue-sharing scheme, the central government receives an oil portion of 277,773 barrels / day and the rest is owned by the local government producing the Natuna Islands. The share of producing regions is not provided in the form of oil but is provided in cash at the price of the oil set forth in the State Revenue and Expenditure Budget (APBN). So basically the central government imports oil from local government. Although the current regional autonomy is indeed a component of the policy of DBH (Dana Bagi Hasil Migas) received by the Regional Government. The portion of the DBH allocated in the State Budget (The State Revenue and Expenditure Budget/ Anggaran Pendapatan dan Belanja Negara/ APBN) is considered to be able to make the community prosperous, but that is quite surprising every year the problem of DBH has always been a polemic, especially the percentage of oil and gas DBH the welfare of the people of this area has not been maximized.

Revenue from oil and gas mining in all exploration wells in Natuna is very tempting. In 2009, the value reached 26.8 trillion rupiah. But the results of oil exploration Natuna Sea until now still controlled by foreign private companies. Because the capital, experts, and equipment are almost entirely supplied by Exxon Mobil, Conoco Philips, Star Energy, and Primer Oil. Profit sharing of the business is mostly enjoyed by foreigners. Of the total revenue that reached tens of trillions of rupiah, Natuna Regency only the remaining Rp 225 billion. Meanwhile, the central government gets about Rp 525 billion. While trillions of other dollars into the property of foreign companies alias evaporate to other countries. This causes the socio-economic conditions of people in Natuna not to prosper. value of Human Development Index (HDI)/ Indeks Pengembangan Manusia (IPM) as measured by survival, knowledge, and purchasing power. The higher the HDI, the level of prosperity of the people's lives is increasingly prosperous. However, the oil and gas Natuna Islands have the lowest HDI compared to the other five districts / cities. This means that life expectancy, educational level, and real per capita

expenditure in Natuna are at the bottom of the list.

Output of exploitation of oil and gas mining of Natuna Islands is expected to be able to support community needs on oil-based energy either to maintain its life, or to improve its standard of living. The realization of increasing community welfare is basically an inseparable part of the regional development goals and national development which should always be pursued. Although not yet optimal, the contribution of the exploitation of oil and gas mining in the Natuna Islands to some of the regional development targets is the welfare of the community: (1) to open the isolation of the Natuna Islands area, due to the location of activities in remote areas. As an implication triggering the mobility of people to coastal areas around the location of oil and gas exploitation activities to seek a better livelihood; (2) providing employment means reducing unemployment which is a serious problem because economic growth is only about 4%; (3) improvement of social life with the existence of community empowerment program (Community Development); (4) community participation to mobilize the populist economy that is as a supplier of basic needs around the activities; and (5) the building of infrastructure, an important part to trigger the wheels of the economy based on democracy.

On the one hand, exploitation as a dual effect of oil and gas contribution to welfare is quantitatively related as input of Regional Budget (The Local Revenue and Expenditure Budget/ APBD) of Natuna Regency.

The Natuna Islands has the largest reserves of Asia Pacific and even the world. the world's largest reserves that will not be exhausted are explored 30 years into the future. The recoverable gas potential is 46 tcf (46,000 bcf), equivalent to 8.383 billion barrels of oil (1 boe, barrel oil equivalent = 5,487 cf) (Natuna Profile, 2016). With that potential, and the average oil price assumption of US \$ 75 / barrel during the exploitation period, the potential value of gas economy Natuna is US \$ 628.725 billion or around Rp 6,287.25 trillion (US \$ / Rp = Rp 13,000). Compared with APBN 2016 which only Rp 1,047.7 trillion (APBN, 2016). As of November 2, 2016 to March 2, 2017, Premier Oil has detected oil and gas content in the D Alpa Natuna Block area. Related to oil and gas exploitation by using tool equipment for oil drilling process in Natuna. "Premier Oil, a UK-based oil and gas drilling company, will be drilling for 30 years under a working contract with the Indonesian government beginning in 2007. gradually implementing a potential 10-year exploration period if it does not find oil and gas potential that is economically viable , then drilling is stopped "(Regent Natuna, 2016). Furthermore. Government Affairs, Manager of Premier Oil PT, 2016) stated "it took until March 2, 2016 to detect the oil and gas content of blocks located in the north Natuna sea." "To support the implementation of oil and gas exploitation process, Premier Oil to Natuna local government to prepare the completeness. Like customs offices, legit cities, quarantine and immigration officers, logistic and other logistics carriers begin operations in Natuna "(Upstream Oil and Gas Executing Agency/ Badan Pelaksana Kegiatan Usaha Hulu Migas, 2016).

### **Energy Alternative Resources Exploration Policy**

Implementation of environmentally friendly alternative energy resource exploration policy is a future alternative energy as a replacement for Fuel Oil (Bahan Bakar Minyak/ BBM). Prospects for the development and utilization of potential new oil and gas resources through exploration and exploitation of oil and gas basins are still possible due to the availability of oil and gas exploitation technology. With the discovery of new reserves or the boost of oil and gas production, the estimate that oil and gas reserves will be exhausted in the near future will automatically increase again (Lubis, 2008).

Along with technological developments, geochemical knowledge is able to provide an explanation of paleoenvironment and ecological conditions (paleoecological) and maturity of sediment, coal and oil (Didyk, et al., 1988; Philp, 1990; Amijaya , et al., 2006). This organic geochemistry studies the organic elements contained in the rock by understanding its composition, its origin, its forming mechanism, its sedimentation model and its distribution, as it relates to each other with minerals on earth (Durand, 2003).

An alternative energy source that drew the attention of the first researchers and industry, was "Hydrate Gas". Hydrate gas is considered to have many advantages over other energy resource options. The advantages are: 1. the volume is very large on earth, 2. its relatively not too deep so it makes it easy to be explored and explored and 3. easy enough to be utilized (Mallik Research Groups, 2003). Hydrate gas is estimated to have a reserve of 1015 - 1017 m<sup>3</sup>, equivalent to twice the size of conventional gas reserves (2.5x10<sup>14</sup> m<sup>3</sup>) and almost 2x greater than fossil-derived energy sources such as coal, oil and natural gas (Kvenvolden, KA, 1998 ). Hydrate gas is naturally formed in solid ice-shaped crystalline bonds. Therefore, gas hydrate is also often referred to as "The Burning Ice" (Satoh, M., 2000). The structure is formed in the bonds of hydrogen molecules. There are many types of gas molecules that can be bound to form hydrates. But most of the natural hydrate gas encountered on earth is Methan. Therefore, gas hydrate is also more commonly referred to as methane hydrate. Methane gas is widely used for all types of activities today. Areas that have been observed from the calculation of the amount of gas hydrate reserve enough to provide hope that is encouraging. The rough estimate of the amount of hydrate gas in the waters south of South Sumatra, the Sunda Strait and south of West Java waters is approximately 17.9 x 10<sup>12</sup> m<sup>3</sup> (625.7 trillion cubic feet), while the reserves in Sulawesi sea are approximately 6.6 x 10<sup>12</sup> m<sup>3</sup> 233.4 trillion cubic feet). For comparison, the amount of gas reserves in Natuna is 223tcf

(Research team BPPT, unpublished, 2016)

The second alternative energy source is the production of raw materials (Bahan Bakar Nabati-Biofuel Mikroalga / biofuel Mikroalga) such as Crude Palm Oil (CPO) for bio-diesel and sugarcane, cassava and sago for bio-ethanol. Current Crude Palm Oil (CPO) production reaches 23.5 million tons with cultivated plant area reaching 9 million hectares, and about 30% or about 5.6 million KL, potentially used for biofuel.

Therefore, the utilization of these alternative energy resources, does not seem to require much modification or research that is too difficult. When gas hydrate and CPO (Crude Palm Oil) exploration technologies are already under control, so gas hydrate and CPO exploration for bio-diesel and bio-ethanol becomes quite economical, so there will be a big impact on the world's industrial, economic and political world.

## **II. CONCLUSIONS AND RECOMMENDATIONS**

The policy on oil and gas exploitation in the Natuna sea area in the future will be improved by taking into account four pillars: first, increasing energy security to extend as net importer through exploration of alternative energy such as gas hydrate; secondly, improving the regional economy for sustainable regional development; third, to provide added value (added value) and benefits (benefit) as much as possible, especially for coastal communities around the location of oil and gas exploitation activities. Some of the expected benefits are: (1) to open the isolation of the Natuna Islands region, which is in the geopolitical concept (empty space or frontier) and geographic security of the border area; (2) increasing local revenues to improve the community's economy; (3) infrastructure development of the Natuna Islands; (3) local employment; (4) the economic dual effects through the mechanism of Community Development (CD) and Fourth community empowerment program implementation, supporting the security of offshore activities as a fixed point of possible defensive and security defects in the border areas.

Oil and gas sector policy, the government still uses investors, most of the exploitation is dominated by foreign private companies. The Production Sharing Contract (KPS) operating in the Natuna Islands region is a foreign investor with the form of a Permanent Business Entity (Badan Usaha Tetap/ BUT), while state-owned (Badan Usaha Milik Negara/ BUMN) Pertamina and other private national companies have not been able to play the role of the main player. Thus, the challenge in the future is how to improve the regional and national capability in order to be able to host specially in their own region and the general state at the same time can compete with foreign investor which has competitive advantage in input system system such as human resources, science and technology, information, institutional, regulatory, investment, environment and security as well as long experiences on oil and gas exploitation offshore Natuna Sea and the most strategic is a strong funding capability. Increasing oil and gas production in order to optimize the contribution of Regional Budget (APBD) of Natuna Archipelago in particular and the State Budget (APBN) in general, and to provide added value to the community surrounding the activities implemented by increasing the number of development wells and the implementation of EOR(*enhance oil recovery*) technology. Economic empowerment of the Natuna Islands community from oil and gas, State-owned (BUMN) Pertamina is encouraged to become a first class company in order to compete with the Production Sharing Contract (KPS) in the upstream oil and gas offshore of Natuna Sea.

An alternative energy exploration policy for the future is gas and Crude Palm Oil (CPO) as alternative energy needs to be done to avoid energy crisis Seismic is a technology to detect the presence of hydrate gas Its unique characteristics make it easy to see on seismic cross-section, and still can be found free gas under gas hydrate layers which can also be utilized as alternative energy source to obtain more accurate information, direct measurements are made using sonic technology Measurement at some point based on information obtained from seismic cross section, then compared to the appearance of seismic data, in order to obtain three-dimensional information data such as heatflow, or gravity can also be used to obtain information on the presence of gas hydrate at the appropriate depth.

## **REFERENCE**

- [1]. Riau Islands Central Statistics Agency ( Badan Pusat Statistik), 2020
- [2]. BBC Indonesia, May, 26, 2019. First Time in 2019 Oil Prices Touch US \$ 90 per barrel.
- [3]. <http://www.djpk.depkeu.go.id/regulation/27/tahun/2011/bulan/02/tanggal/17/id/590/>. Retrieved 23 May 2020
- [4]. Energy Strategy Review Division. 2018. Natuna Island Saves The Largest Natural Gas Reserves In The World. Riau Islamic University.
- [5]. Ikhsan, Dartanto, Usman, and Herman, 2018, Impact Assessment of Fuel Price Increase Against Poverty, Working Paper: LPEM FEUI.
- [6]. Katadata. News and Research, december 13, 2019. Oil Price Implication, Pertamina Calculates Increase in Solar Price.
- [7]. Kompas, 2019. Impact of Fuel oil (Bahan Bakar Minyak/ BBM) Post-Reform Fuel Price Hike. November

- 20, 2017
- [8]. Kompas, February 23, 2019. Control of BBM Price Increase.
  - [9]. Kvenvolden, K.A, 1998, *A primer on The Geological Occurrence of Gas Hydrate*, in Henriot, J.P., and Mienert, J., eds., Gas hydrates: relevance to world margin stability and climate change, Volume 137: Special Publications: London, Geological Society, p. 9-30. 1999, Potential effects of gas hydrate on human welfare, National Academy of Sciences, Volume 96: Irvine, CA., National Academy of Sciences, p.3420-3426.
  - [10]. Leo Suryadinata, Evi Nurvidya Arifin, Aris Anan; *Indonesia's Population: Ethnicity and Religion in a Changing Political Landscape*, 2003, p.146
  - [11]. Ministry of Energy and Human Resources , 2020. Performance Reports.
  - [12]. Mallik Research Groups, 2003, *Gas Hydrates Research Well- Mallik NWT*, Mallik Research project symposium, 2003.
  - [13]. OPEC, 2019, Annual Statistic Bulletin.
  - [14]. Presidential Regulation no. 6 Year 2011 ". February 17, 2019.
  - [15]. Satoh, M., 2000, *Distribution and Researches of Marine Natural Gas Hydrates Around Japan*, 2000 Western Pacific Geophysics Meeting, Volume 81 : Eos, Transaction: Tokyo, Japan, American Geophysical Union, p.63.

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