

Economy in Times of Crisis: An Economic Analysis of the Energy Policy during COVID-19 Pandemic

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Abstract — The oil and natural gas industry plays an important role in the Indonesian economy, as a source of revenue for the state budget and a source of energy (particularly fuel) to power various sectors of life throughout Indonesia. Lockdown and restrictions on human movement have led to a direct reduction in demand for fuel. In addition to a decline in consumption, Covid-19 also resulted in a decrease in the price and production of oil and gas energy, including the cessation of upstream activities and the reduction of refining activities (refinery). The recommendations put forward include the establishment of strategic petroleum reserves, reviewing oil refinery projects and green fuel, and not reducing the selling price of fuel.

Keywords — *Covid-19; Oil and Gas Industry; Lockdown, Human Behaviour; Strategic Petroleum Reserves.*

1. Introduction

The oil and gas energy industry plays an important role for Indonesia, as a source of revenue for the state budget and contributing to the local economy in areas where oil and gas energy exploration, production, refining and distribution activities take place. In addition, the biggest role of industry, oil and gas energy is a supply of energy (especially oil) that is used to drive the various sectors of life in Indonesia (Wildan, 2021). The impact of Covid-19 has hit various aspects of human life, including the oil and gas energy industry. Restrictions on human movement have led to a direct reduction in demand for fuel. The impact of Covid-19 also concerns various other matters in the oil and gas energy industry. This research examines the impact of Covid-19 on the global oil and gas energy industry, and for the case of Indonesia. After studying the problems faced, a number of recommendations were proposed to mitigate the impact of Covid-19 on the Indonesian oil and gas energy industry.

2. Literature Review

2.1 International Trade

International trade is an activity that occurs when a country has a comparative advantage or has an absolute advantage. Comparative advantage is the advantages of a state where it is able to produce goods and services with more quantity at a lower cost and efficient than any other country. Absolute advantage is an advantage possessed by a country that produces goods and / or services that cannot be produced by other countries (Amir, 2014). Whereas in another sense, international trade is a form of cooperation

between two or more countries in the economic field that directly benefits between countries, namely by meeting the needs of each country, which cannot be fulfilled solely by relying on domestic production. So these international trade activities have the aim of increasing the standard of living in that country (Schumacher, 2013).

2.2 Export

Boediono (2015) describes that the export means an activity which involves the production of goods and services produced by a country, but it is consumed by consumers outside the state boundaries are. According to the Customs Law no. 10 of 1995 explains that export is an activity of removing goods from the customs area (Indonesian territory which includes land, land and air space above it), as well as certain places in the EEZ (Economy Exclusive Zone) and continental bases in which it applies customs law.

2.3 Energy Production

Production is making, producing and creating. A production can be done if there are materials that can be used for the production process. To be able to carry out the production process there are elements called the production factor, such as capital in all its forms, natural resources, and labor. Factors of production can also be referred to as elements that help value creation efforts or efforts to increase the value or price of an item. Another definition of production is execution which utilizes several inputs from several economic activities. Production activities can be defined as activities to produce output by using certain production techniques to process inputs in such a way (Sukirno, 2019).

2.4 Gross Domestic Product

Gross Domestic Product (GDP) is used to measure the performance of a country's economy, from GDP it can be concluded whether a country is experiencing progress or decline. GDP is an economic indicator to measure the total value of the final goods and services that are expressed as national production in an economy and national production is also the national income of the country concerned (Mankiw N, 2019)

GDP shows the size of the economy in a country's ability, in which the larger the GDP generated in a region of the country will increasingly, also the ability of these countries to conduct trade. GDP is defined as the money value of goods and services. In measuring the value of money, benchmarks are used to measure market prices for different goods and services. However, the prices of goods keep changing all the time, because inflation usually pushes the prices of goods and services up from year to year (Samuleson& Nordhaus, 2017).

2.5 Exchange Rate

The exchange rate between two countries is the price level agreed upon by the residents of the two countries to trade with each other (Mankiw N, 2019). The exchange rate can be divided into two, namely the nominal exchange rate and the real exchange rate. Each of these means the nominal exchange rate is the relative price of the currencies of the two countries, while the real exchange rate is the relative price of goods between the two countries. The real exchange rate states the rate at which a person can trade goods from one country for goods from another country, so the real exchange rate is often called the terms of trade.

3. Impact on the Global Oil and Gas Energy Industry

During the Covid-19 pandemic in 2020 the oil and gas energy industry experienced a decline in demand, lower prices and excess production (even though production decreased).

Millions of people stay at home; study at home; work, shop from home, don't travel inside or outside the country. Office activities, hotels and conference venues are reduced, as are the manufacturing industry and micro, small and medium enterprises (MSMEs). This all means that the demand for fuel for transportation is reduced. Likewise, the demand in the industrial sector, both in the small and medium industries that use fuel is not much or in large industries that are hungry for fuel. The demand for fuel in the transportation sector has decreased the most (Inkpen, 2017).

The lockdown policy that is practiced toward Covid-19 in many countries have a direct impact on the decrease in the demand for implementation of policies BBM. The lockdown in a large country like India resulting impact on fuel demand decline is more pronounced.

The United States Department of Energy (DOE) shows a decline in world demand for petroleum (and the accompanying supply) as a result of Covid-19 as shown in Figure 1. The DOE forecast shows that demand for crude oil, which has started to occur in the first quarter of 2020, will continue to decline until it reaches its lowest point at the end of the second quarter, then is expected to increase again and reach a balance point with petroleum supply at the end of the third quarter in 2020. During this period of decreasing demand, the oil consumed will decrease to more than 10 million barrels per day, or even 15-20 million barrels per day or about 20%-30% according to several analyzes.

Because crude oil production cannot be reduced immediately, during a period of sharp decline in demand, a sizeable oil stock will be formed, which has the potential to make oil prices fall. Oil storage capacity that is in a certain area or controlled by certain companies is limited, and the stock must be moved to another place. This is also a problem because in other places the storage for storing the oil (both crude oil and oil products such as fuel oil) is also full.

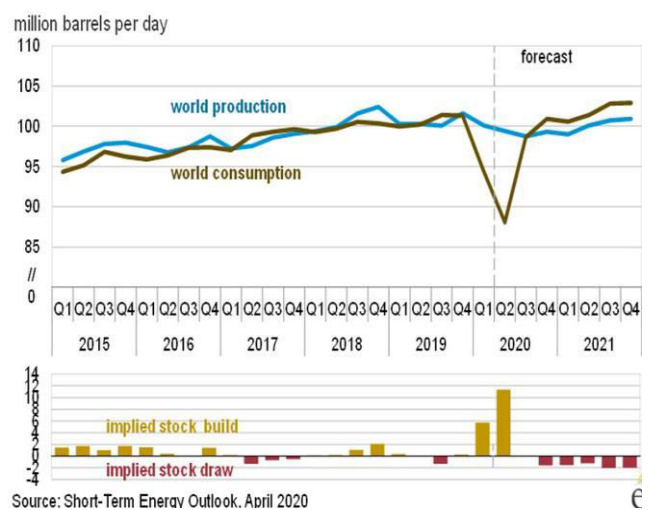


Fig.1: World oil supply-demand development

However, the problem with oil (crude and fuel) is not only that demand has fallen steeply, but also its price has fallen, even reaching the lowest experienced by the world oil industry. The price of WTI (West Texas Intermediate) crude oil, which is the benchmark for oil prices in North America, is even sold on the futures market for below US\$ -36.67 for delivery in May 2020.

Figure 1 shows the development of world crude oil prices, which are represented by 3 reference crude oils that are being discussed on the oil exchange, namely WTI, Brent, and the OPEC “oil basket”. All three have shown a sharp decline since 2019, and WTI took a sharp dive in April 2020.

Although the world crude oil price has experienced frequent increases and decreases, even in large ranges, the phenomenon of oil prices selling below US\$ 0 as in the case of WTI is the first to occur. It can also be seen in the picture that oil prices throughout 2020 continue to slide down. The price of oil, which was sold at minus US\$ 37.63, is a new phenomenon that is difficult for many to understand.

However, the decline in oil prices is not only due to the impact Covid-19, but is also driven by "infighting" (conflict) in the oil industry itself. The dispute, particularly within the producer group, started by Saudi Arabia and Russia, over an agreement on how much crude oil should be produced (Khamis, 2018).

Since 2014, the United States' shale oil and gas energy production has continued to grow. But other oil producers in the world continue to produce oil, "disturbing" the United States which is trying to increase its independence in energy supply through the implementation of projects (oil and gas energy) Shale Revolution. 10 As a result, oil prices fell from an average of US\$ 114 per barrel in 2014 to US\$ 27 in 2016, reducing the economics of shale oil & gas projects (Cheema, 2019).

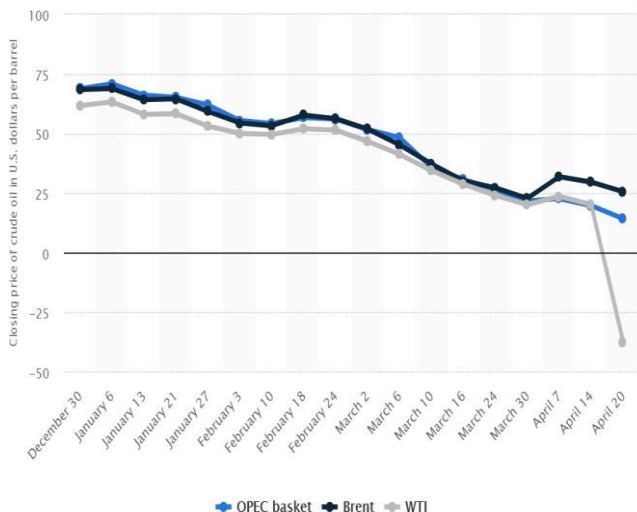


Fig.2: Crude oil prices

In September 2016, Saudi Arabia and Russia agreed to cooperate in managing oil prices, creating an informal

alliance of OPEC and non-OPEC producers (dubbed OPEC+). In January 2020, anticipating the impact of Covid-19, OPEC + has cut oil production by 2.1 million barrels per day, with Saudi Arabia making the largest reduction in production (Shahad, 2020).

OPEC resume high-level conference March 5, 2020, decided to cut production by an additional 1.5 million barrels per day, and ask Russia and the members of OPEC and more follow the decision of the production cuts. However, March 6, 2020, Russia rejected the decision. The announcement of Russia's rejection was met with a drop in oil prices down by about 10%. On March 8, 2020, Saudi Arabia announced discounts of US\$6-8 per barrel for customers in Europe, Asia and the United States. The announcement triggered a free fall in oil prices.

It can be summarized that during the Covid-19 pandemic in 2020 the oil industry experienced a decline in demand, falling prices, and excess production (because production cannot be stopped immediately even though the oil price is too low). From the producer side, the extremely low crude oil price is certainly disappointing. Several oil companies have reduced exploration activities, including cancelling drilling for new oil fields. According to consultant Wood Mackenzie, with the price of Brent crude oil at US\$ 25 per barrel, about 10 percent of world oil production cannot afford to finance its production activities which are more expensive than the normal sell price of oil. In the United States, Whiting Petroleum Corporation, which produces 120,000 barrels per day, was the first producer to declare bankruptcy (April 2, 2020) as a result of falling oil prices.

It is feared that the already occurring bankruptcy of oil producers will have a Domino effect. "At the price level of US\$ 30/barrel, 170 US oil exploration and exploitation companies will go bankrupt in 2021. At the US\$ 20/barrel price level, the number of such companies will increase to 393, and at a price level of US\$ 10/barrel, the number of these companies' increases to 730".

Not only oil producers, oil refinery (oil refinery) were hit by a decline in crude prices this time. Typically, a fall in crude oil prices will provide an opportunity for oil refineries to obtain a larger margin because fuel prices do not immediately fall and demand is constant. However the situation this time was different. Crude oil prices fell and demand for fuel also fell (Levaldi, 2020).

Lower demand for fuel has put pressure on the fuel inventory and distribution system. Refineries are affected, the amount of fuel in storage increases with the fuel that has been produced and must be distributed. Many companies have considered shutting down their oil

refineries once their storage tanks become full (Hasanudin, 2020). Limited storage in conditions of abundant oil supply has resulted in oil and fuel sellers looking for other storage alternatives, because onshore depot facilities, even petrol stations on land are full of oil stocks which are slow to reduce. Efforts to find storage have found a way, among others, with the phenomenon of the accumulation of tanker fleets full of oil for storage in the Malacca Strait approaching Singapore.

The closure or termination of oil refinery operations as a result of Covid-19 has already occurred. "Come by Chance" (130,000 bpd) in Canada has ceased operations last March. The Anonima PetroliItaliana (fire) refinery in Ancona, Italy was the first to be closed in Europe, due to plunging oil demand due to the Covid-19 pandemic and the Italian government's lock down policy. A number of other refineries including the IOC in India, Phillips 66 and PBF Energy in the United States, as well as several units in Brazil and Venezuela have made production cuts. 17 Oil refineries in Indonesia have also done this.

Apart from oil, the natural gas industry is also affected by the Covid-19 Pandemic. The price of natural gas, whether sold in transmission pipelines or as LNG (liquefied natural gas) is often linked to the price of oil (in the Gas Sales & Purchase Agreement drawn up between the producer and the natural gas offtaker), especially for sale and purchase agreements. in the past (but still true today). This means that the global trend of falling oil prices has an impact on the decline in global gas prices (Seon, 2019).

Covid-19 caused demand for petroleum to fall sharply, but not badly for natural gas demand. This can be explained as follows. First, the very sharp decline in fuel consumption is for transportation activities (gasoline, diesel oil for passenger vehicles, avtur for airplane engines) while the use of natural gas for transportation is very small compared to fuel. On the other hand, the use of natural gas for households (for cooking and heating) is greater than the use of fuel, while during the social distancing or lock - down period, the use of natural gas in households' increases. Second, because it is not as easy to stop the production and distribution of natural gas as doing these things for petroleum.

Natural gas distribution requires special infrastructure (pipelines, LNG ships, etc.) which is inflexible compared to transportation of crude oil and BBM which is easier to do. Third, in the Gas Sales & Purchase Agreement, there is usually an agreement regarding the TOP (take or pay): consumers will still get their natural gas shipments, or have to keep paying for them even though the gas is not delivered (Nugroho, 2018).

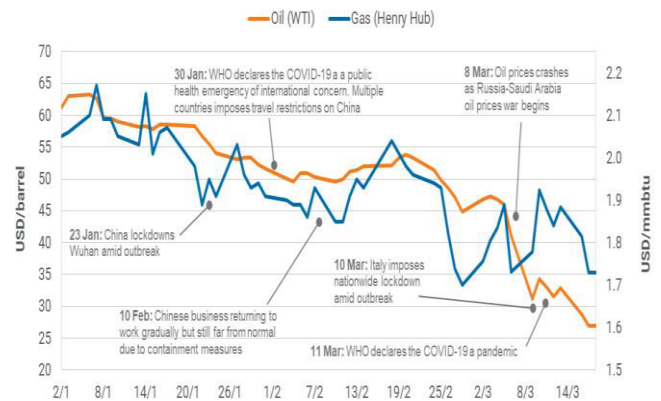


Fig.3: Development of oil and gas energy prices as a result of Covid-19

4. Impact on Indonesia's oil and gas energy industry

The impact of Covid-19 on industry and global oil and gas energy also applies in Indonesia. With the implementation of the LSSR (large-scale social restrictions) policy in various regions in Indonesia, the trips made by the community have decreased drastically. As a result, demand for fuel in the country fell by 35%, with avtur experiencing the highest decline, namely 45%. This is the decline in demand for fuel until it reaches its lowest point in Indonesia's petroleum history. 18 Tourism and transportation were the sectors hardest hit. The paralysis of the tourism and transportation sectors has stifled demand for fuel in Indonesia (Wildan, 2021).

Oil and gas energy production in the first quarter of 2020 is still going well, the oil and gas energy production targets for this period are relatively achievable. In the first quarter of 2020, national oil and gas energy lifting reached 1.749 million barrels of oil equivalent per day (BOEPD) or 90.4% of the national lifting target of 1.946 BOEPD. For oil, production was recorded at 701 thousand barrels per day (BPD) or 93% of the APBN target, 755 bpd. Meanwhile, natural gas lifting is 5.86 million standard cubic feet per day (BOECFPD) or 88% of the APBN target of 6.67 BOECFPD. Even, the production of energy- oil and gas in the next quarter will be guaranteed not meet the targets as set out in State Budgeting. Future production activities face various problems. "Apart from taking longer to transport materials, especially shipping materials from abroad, the mobilization of workers to locations is more difficult due to licensing, quarantine, and potential overstay; oil and gas energy equipment manufacturing activities for projects are delayed or longer, licensing approval takes longer, and engineering and construction productivity is lower." 21 The impact of the Covid-19 pandemic has even reached several upstream oil and gas energy companies

applying for force majeure for their exploration and production activities. Indonesia's recent crude oil production in the range of slightly above 700,000 barrels per day is actually much lower than when it reached its peak in 1977 with production of 1.7 million bpd - when domestic fuel demand was still very low. However, until now the government is still relying on revenue from petroleum, and has used the amount of production and the price of Indonesian oil as a reference in making the APBN. Decline in production and lower oil prices still have a significant impact on the APBN profile.

The gap between the decline in domestic oil production and the increase in consumption that has occurred so far has been resolved by increasing imports of both crude oil and petroleum products. The continued expansion of oil imports (in addition to the weakening of the rupiah against the dollar) continues to widen Indonesia's balance of payments deficit. Imports are still growing because "the government is expanding the premium fuel market into assignment fuels in Java, Madura and Bali as well as increasing the Premium quota in 2018. Fuel consumption in 2018 suddenly increased by 13.5 percent, and reached 80.5 million kiloliters. In fact, during 2010-2017, the national fuel consumption did not grow, the average was around 70 million kiloliters". Since 2008, Indonesia has actually started efforts to develop biofuel from palm oil, known as the Biodiesel program (BS, where S indicates the level of biodiesel mixed with diesel oil). The target volume and content of biodiesel (produced as FAME: Fatty Acid Methyl Esters) in the biodiesel-diesel mixture continues to be increased based on the mandatory set by the government, the last one that has been implemented is the B-20 program.

One of the benefits or objectives of the bio-diesel program is to reduce diesel imports. "Currently, there are 25 BBN BUs that are actively producing with a total installed capacity of 12.06 million KL/year. Domestic use of biodiesel in 2018 of 3.75 million KL has succeeded in reducing diesel imports by 466,902 KL and saving foreign exchange of US\$ 1.89 billion USD or Rp.26.27 trillion. Utilization of biodiesel in 2018 has also succeeded in reducing emissions of 5.61 million tons of CO₂. 25.

Although the import of diesel has decreased, even recently, there is no need to import diesel (and aviation fuel), but gasoline imports are still high. The decline in imports was also achieved due to the implementation of a government policy on foreign Cooperation Contractors to sell part of their production to Pertamina for processing at Pertamina's domestic oil refineries (Wildan, 2021). On the downstream or "middle" (mid-downstream) side, oil refining activities have started to be affected. Pertamina has started to stop oil refinery activities, with a capacity and number of units that could increase in the future. The

discontinuation was carried out at the Sungai Pakning Refinery and the Balikpapan Refinery for the crude distillation unit (CDU) in turn, while the Plaju refinery began to gradually reduce production.

Reduction in activities or even cessation of refinery operations can continue if the LSSR policy continues because the Covid-19 pandemic has not yet ended. Storage at refineries, avtur depots near the airport and gas stations everywhere are still full of fuel. Where the refinery products should be distributed if the refinery must continue to operate? In the 2020 state budget, crude oil prices are assumed to be US\$ 63 per barrel. In fact, the Indonesian Crude Price (ICP) has fallen far below the APBN assumptions. Referring to the Indonesian Oil Price Team, the March 2020 ICP price fell by about 40 percent to US\$ 34.23/barrel, or a drop of US\$ 22.38/barrel compared to the previous month's US\$ 56.61/barrel. 28 It is clear that the decline in production volume as well as the decline in oil prices will have a gloomy shadow on the side of oil and gas energy revenues in the 2020 State Budget. Although in many countries the price of fuel has gone down because of the effect of the pandemic Covid - 19 and oil production disputes between Saudi Arabia and Russia, but until now the Pertamina's fuel price that sold to consumers at the pump (fuel filling station general) has not experienced change, or haven't been passed down. Pertamina provides a limited 50 percent discount only for online ojeg drivers. 30 There is also a plan for Pertamina to provide a 30% discount on fuel prices to the public for purchases during the month of Ramadan 2020 (Wildan, 2021).

Other fuel selling companies such as Shell in Indonesia have not lowered their retail price for their fuel sales either. In comparison, since the Covid-19 pandemic broke out, in Malaysia there have been several reductions in fuel prices, 32 making the country have the lowest selling price of fuel in all ASEAN countries (Varian, 2015). Not lowered fuel sales price of course does not necessarily mean "revenue growth" for the company selling the fuel (in the case of Indonesia is Pertamina as the main players), because at sa't the same decline in sales volume is large enough, and in addition the company also still have to maintain assets (including manpower) from activities on the upstream side and refining whose productivity has decreased. However, to answer the demands of some people who want to reduce fuel prices, the question of transparency regarding revenues and costs incurred by state oil SOEs as a result of the Covid -19 pandemic needs to be put forward to the wider community.

5. Conclusion and Policy Recommendations

Based on an understanding of the impact of Covid-19 on the conditions of the oil and gas energy industry globally, and the problems that have developed in the oil

and gas energy industry in Indonesia as a result of the same, we propose several policy recommendations as below.

5.1 Upstream

Starting to focus production activities on fields with the economic value is in very low oil price conditions. Although this action will have an impact on reducing production targets as previously set (in the RPJMN, State Budgeting, and Company Work Plan), this action is economically justified, also considering that at the same time there is a decline in demand for fuel. very big in the country.

Exploration projects and preparation of production facilities can be considered to be postponed first, given the supply chain (supply chain) of these activities is experiencing disruption which hinders the achievement of project delivery targets. Taking advantage of low world oil prices, build "strategic reserves" in Indonesia. This can be done by utilizing old field wells that are not producing as storage for imported crude oil. Tanks that are in refineries or depots, or other facilities in Indonesia, can be used to accommodate fuel stocks which are used to extend BBM reserves in Indonesia. The development of strategic reserves aims to increase Indonesia's energy security (Nugroho, 2018).

5.2 Downstream

Oil refinery operations can be adjusted according to the level of decreasing fuel demand. If necessary, some refineries, particularly inefficient, halted operations for a while is used for maintenance. Activities to support the Major Project for Refinery Development and Development in the 2021-2024 RPJMN are still being carried out, but are limited to the preparation of various kinds of agreements needed, negotiations, etc., and postponing procurement & construction activities first. Recalculating the economics of the Major Project for the Development of Renewable Energy, Green Fuel is based on Palm Oil, in the 2021-2024 RPJMN.

5.3 The selling price of fuel

The selling price of fuel should not be lowered. This is due to the fact that falling demand has contributed to lowering oil revenues (both to companies and the Government's share) while a number of funds are still needed to finance the overheads of decreased production and refining activities. Discounts can be given to small consumers such as online drivers and small industry players. Also consider that, if there is a surplus from fuel sales, it can be donated to the Government, because during the Covid-19 pandemic the Government needed very large funds, especially for the social safety network program.

Transparency and good communication are urgently needed in making public policies regarding fuel prices.

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