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ENERGY SECURITY IN PANDEMIC ERA: INDONESIA CONTEXT

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Abstract - The COVID 19 pandemic is changing the global and local social and economic order. This drastic change shook the energy security of various countries in the world as well as in Indonesia. This study explores energy security in the dimensions of accessibility, availability, and affordability when a pandemic occurs. The research method uses a desk study and literature review. The results of the study show a contradiction in the situation between consumers and producers. The dimension of accessibility is constrained by restrictions on supply chain and infrastructure development. Accelerating improvements in the national logistics system is the key to energy security in the Indonesian context.

Keywords: COVID 19 pandemic, energy security, infrastructure development

I. INTRODUCTION

The pandemic related crises have been associated with enormous negative impacts on the health, economy, society, and security of national and global communities [1]. There have been many significant disease outbreaks and pandemics recorded in history, including Spanish Flu, smallpox, Hong Kong Flu, SARS, H7N9, Ebola, Zika, and COVID 19 [2]. Infectious disease outbreaks can easily cross borders to threaten economic and regional stability, as has been demonstrated by the HIV, H1N1, H5N1, and SARS epidemics and pandemics [3]. The Covid 19 pandemic that started in Wuhan has stunned the world. The pandemic of COVID-19 has entered a new stage with a rapid spread in countries outside China. All members of society must understand and practice measures for self-protection and prevent transmission of infection to others [4].

The number of patients infected with Corona, November 1, 2020, 1,201,927 died, with a total of 46,632,558 cases occurring in the world with the highest claims in the US [5]. Based on the task force, there were 415,402 cases in Indonesia and 14,044 infected cases [6]. To reduce the spread rate, the Indonesian government has implemented various policies, including implementing a ban on going home and prohibiting commercial and charter aircraft from operating. Other approaches to reduce the virus's spread, starting from Large-Scale Social Restrictions (PSBB), limiting public transportation modes, conducted a mass Rapid Test, and added health facilities needed to treat Covid-19 patients [7].

Some policies dealing with COVID-19 have an impact on energy security. The closure of inter-state flight routes and human traffic between countries affects hampering energy supply from producing countries to consuming countries. Meanwhile, many of the energy infrastructure programs and works were hindered due to the stoppage of material supplies and the prohibition of foreign workers' entry into Indonesia. The Ministry of Energy and Mineral Resources (ESDM) estimates that there are several electricity projects whose operational schedules are at risk of missing the target due to being affected by Corona [8]. It is possible to postpone the operating plan for some power plants, given that developers carry out many projects from China. Delays occur along with delays in delivery of generating materials or components, production, and people constraints. Project disruptions and delays in operating schedules will be difficult to predict. The disruption level will vary depending on the project's type and stage and will be worked on. Delays in the development of energy infrastructure projects, of course, will have an impact on the energy production capacity needed in Indonesia [8].

Pandemic is disturbing energy security in Indonesia. Energy security is an essential component in the production of goods and services. Any form of disturbance that can hinder the availability of energy supply in primary fuel or electricity can reduce a region's economic productivity. If the magnitude of the disruption reaches the national level, it can make the financial growth target miss from the set one. Previous researchers have conducted studies on energy security in Indonesia. Assessment of sustainable energy security in Indonesia by [9], comparing Indonesia's energy security index with other countries by [10], geopolitical/foreign policy the under-developed Australia-Indonesia trade relationship for energy security by [11], measurement of energy security in the world [12], energy security from the perspective of the private sector in Indonesia [13], the energy mix scenario in Indonesia by [14] and indicator-based

analysis of energy security by [15]. These studies look at the context of normal conditions, without a pandemic. This study focuses more on the dimensions of energy security in the context of pandemic and Indonesia.

II. METHODS

The research used a descriptive qualitative method with a desk study and literature review. The research seeks to explore the dimensions of energy security. There are various definitions and different dimensions from multiple institutions such as the International Energy Agency (IEA), the World Energy Council with the World Energy Trilemma Index [16], the Global Energy Institute with the Energy Security Index [17] and the Energy Security Council. National. Energy security is the continuous availability of energy sources at affordable prices [18]. This study focuses on the National Energy Security Council's dimensions, such as affordability, accessibility, availability, and acceptability [19].

III. RESULT AND DISCUSSION

Based on the [17] report, Indonesia became a country with a 2018 Energy Security Risk Score of 932, which decreased compared to last year. Indonesia's risk of energy shortages is caused by dependence on petroleum by 45% and reliance on providing power generation on coal, seen in the table below.

Figure 1. Energy and Generation Mix: Indonesia [17]

Dependence on petroleum causes Indonesia's Energy Transition Index (ETI) in 2020 to be ranked 70 with a value of 52.4 below ASEAN countries such as Malaysia (38), Thailand (53), Philippines (57), and Vietnam (65) [20]. The World Economic Forum categorizes Indonesia as a country with potential challenges. Energy Trilemma Index data shows that the assessment is still low. Indonesia is ranked 56 with a value of Energy Security 57 (A), Energy Equity 76 (C), and Environmental sustainability 64 (C), which are still below other ASEAN countries [16].

These various assessments describe Indonesia as performing well in energy security but are lagging in environmental sustainability and energy equity. In the conditions before the pandemic, energy security was resistant (6.4 points) [19]. The presence of COVID19 decreases energy security. The table below shows the comparison before and during the pandemic. Tabel is describing the dimensions of affordability, accessibility, availability, and acceptability.

Table 1. Energy Security: before and pandemic in Indonesia Context

Dimension of energy security	Indicator	Before Pandemic	Pandemic
Affordability	• Energy productivity • Fuel and LPG prices • Electricity prices • Natural gas prices	• In 2018, the growth of energy supply was around 1.76 times that of the economy, with energy productivity of about 7.1 million rupiahs per Barrel of Oil.	• Energy demand will decline in 2021, so that energy prices will fall. • The government reduced subsidies due to lower demand during the COVID-19 pandemic. • The government subsidizes the price of electricity for poor households. • The price of fuel and LPG during the pandemic tends to decline

Accessibility	• Provision of petroleum and LPG • Provision of electricity • Electrical services • Provision of natural gas • Natural gas distribution services	• Primary energy supply increased to 9.06% in 2018. • Petroleum is currently still the main energy source for the transportation sector, while the household sector mainly uses LPG. • The government still provides price subsidies for several types of energy, such as diesel and 3 kg LPG. • Government approval is required in regulating the selling price of natural gas to all consumers, natural gas trading companies • In 2018, petroleum storage capacity can save around 41.96 days of consumption	• Energy supply is disrupted due to PSBB • Household electricity consumption increased during the PSBB, but the demand for fuel for transportation was significantly limited. • Termination of energy program due to refocusing on the government budget. • Energy enterprises suffer losses such as Pertamina, Partagas, PLN due to high operational costs
Availability	• Fuel and LPG reserves • Energy buffer reserves • Imports of Petroleum and LPG • Petroleum imports • DMO gas and coal • Achieved energy mix • Oil and gas reserves and resources • Coal reserves and resources	• The primary fuel used by the power plant dominated by fossil energy. • The total national primary energy mix reached 205.30 MTOE. • Indonesia's fuel imports reached 34.4% of the national fuel demand. • Domestic demand for natural gas is still fulfilled by domestic production, while imports meet 66% of LPG needs.	• Domestic energy reserves are sufficient. • The power plant project did not reach the target • Oil and gas projects, especially exploration, postponed during the pandemic • Fuel import barriers are due to a downturn in exporting countries.
Acceptability	• Energy efficiency • The role of renewable energy • Reduction of greenhouse gas emissions	• In 2018, primary energy elasticity was around 1.76, with a direct energy intensity of 1.40 BOE / IDR million. • In 2018, the total GHG emission reduction reached 40.0 million tons.	• Use of energy more efficiently during a pandemic. • There has been a decrease in greenhouse gases during the pandemic due to reduced use of vehicles.

IV. CONCLUSIONS

Energy security in Indonesia uses four dimensions, are Availability, Accessibility, Affordability, and Acceptability. Before the pandemic, energy security in Indonesia was at the resistant stage. When a pandemic occurs, energy security decreases. The dimension with the highest impact is the accessibility

dimension due to large-scale restrictions, shaken supply chains, and underdeveloped infrastructure. The next sequence is the Affordability dimension, the acceptability dimension, and finally, the availability dimension is affected by the presence of Covid19. The acceleration of the national logistics system will increase energy security and efficiency.

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