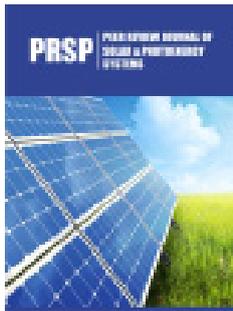


Renewable Energy Challenges and Opportunities in the COVID-19 Pandemic

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Introduction

Nowadays, the world is starting to enter a new normal era which requires people to change new habits and behaviors based on adaptation to cultivate clean living behavior according to health protocols to continue carrying out normal activities to prevent the transmission of Covid-19. The Covid-19 pandemic, followed by changes to the rules, certainly has a broad impact on many sectors. In fact, the changing community activities have made the business world quiet, such as in the tourism sector, online transportation, retail sales and of course in the energy sector. The Covid-19 pandemic has had a significant impact on the country's energy conditions, including renewable energy, not only in developing countries but also in developed countries, globally. Referring to international studies, currently there is a decrease in electrical energy consumption by 10% or even more in various countries.

Data reported by the International Energy Agency (IEA), revealed that CO₂ emissions continued to increase, the largest sourced from coal and oil. However, after the Covid-19 pandemic came around the world, the government advised people to stay at home if their interests were not urgent, resulting in reduced consumption of petroleum resources, especially as fuel. This phenomenon has effected in an increase in air quality in various big cities. Furthermore, the demand for the use of clean energy is growing rapidly. On the other hand, renewable energy has also become the cheapest energy source. The International Renewable Energy Agency (IRENA), has reported that costs for solar power development have fallen by 82 percent over the past 10 years.

At the time of facing a pandemic, an energy crisis occurred suddenly when the world was trying to reduce its dependence on fossil energy. Disruption of energy availability in China and Europe could trigger a global energy crisis, which has the potential to threaten the wheels of the economy moving up from the sluggishness caused by the pandemic. The scheduled power outage in China will disrupt the flow of goods in the global supply chain due to the large number of multinational companies operating their factories in the country. The Chinese government imposed strict regulations to reduce coal-fired power generation as electricity demand declined. According to the International Energy Agency (IEA), China's electricity demand fell during the lockdown policy in January 2020, and the decline was deeper in February 2020 (-13% compared to February 2019). The progressive easing of the lockdown strategy that began around the second week of March 2020, followed by electricity demand showing the first signs of recovery. Since April 2020, the condition of electricity demand in China has fully recovered and returned to the pre-Covid-19 trend. The coal requirement for fuel in power generation is growing rapidly while renewable energy maintains a high share in the mix of power generation sources (fossil fuel and alternative energy).

The demand for electrical energy incomparable to its availability in China, creates a scarcity of fossil energy supply, even though, the dynamics of increasing economic activity urgently require additional energy supplies to run the economy, which was stalled due to the pandemic. This condition eventually triggers shortages and increases in energy prices. However, a significant increase in coal and oil prices could pose a dilemma for investors due to agreements of restrictions on investment in the fossil energy sector, divestment actions by global financial institutions and cessation of funding from international banks. Such conditions could backfire for the renewable energy industry, when many people realize the burden that each country must bear to achieve its carbon neutral targets.

Fossil fuels have been reliable in producing energy because they can be stored for a long time. The application of digitalization in various sectors of life has not only resulted in an escalation in the amount of energy but also the degree of reliability of its supply. Reliability of renewable energy in supplying global energy requirement is also a matter of concern. Since the past decade there has been an increase in the value of investment for the development

of renewable energy technologies from sunlight and wind. Although the news gives great hope, the two renewable energy sources have a relatively lower level of reliability compared to fossil energy. Accordingly, at certain times the production of electricity from sunlight and wind can be disrupted due to bad weather or not too strong wind gusts, included in category of unpredictable energy. This condition makes electricity generated by sunlight and wind threatened not always available at all times. Storing electricity is not as easy as stockpiles coal or oil because electricity is difficult to store in large quantities, thus requiring a balance between supply and demand of electricity at all times. Failure to balance electricity supply and demand has the potential to trigger power outages. Although battery technology is available to solve the problem of storing electricity, it is only able to supply electricity for a few hours.

The opinion above can be concluded, that fossil energy is still dominantly needed to achieve the target of economic growth. Furthermore, the huge investment costs for the installation of renewable energy technologies in the national energy system, will make many countries continue to rely on fossil fuels as the main energy source for the next few decades.

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