COVID-19 and the Energy Sector Development in ASEAN Countries: Assessing the Role of Fiscal Measures for Green Recovery Trajectory

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Abstract. The COVID-19 pandemic has had wide ramifications on many sectors, including energy sector. This draws the interest of numerous scholars who have sought to investigate the impact of the pandemic on the energy sector as well as the prospects for a green recovery trajectory. However, few of these authors have considered the role of fiscal stimulus that governments have provided in the context of green recoveries. This study aims to fill that gap, focusing on the case of ASEAN member states (AMS). For this purpose, we employ both statistical data from official sources and qualitative evidence collected through interviews and Focus Group Discussions (FGD) with officials from ASEAN countries. This study finds that green recovery stimulus in AMS is still limited. Although some of the fiscal supports that ASEAN countries have launched have had indirect effects on energy, policy makers in the region have not prioritized the green recovery at the center of recovery path. A major factor is fiscal limitations that force the governments of ASEAN countries to focus on strengthening the health sector and supporting vulnerable groups. Accordingly, this analysis highlights the importance of exploring other funding opportunities, including grants and concessional financing, to support green recovery in the region.

1. Introduction

Following the spread of COVID-19 from its outbreak in China to other regions, the World Health Organization (WHO) officially declared the virus a global pandemic in March 2020. Accordingly, governments around the world began to introduce nonpharmaceutical interventions, such as restrictions on social and economic activities, to slow the spread of the disease. By April 2020, half of the world’s population was under a COVID-19 lockdown [1]. These restrictions exerted profound impacts on many aspects of life and triggered a worldwide economic shock. International Monetary Fund (IMF) reported that the Global GDP declined by 3.3 % in 2020, with only a handful of countries appearing to be immune to the economic recession [2]. The 2020 global economic recession has been described as the worst economic downturn in post-war history [3]. The decision of governments worldwide to limit their
citizens’ movement had consequences for many sectors, including the energy sector, with energy demand dropping by 3.8% in the first quarter of 2020 [4].

Many scholars have investigated the unprecedented impact of COVID-19 on the energy sector. Some of these researchers have focused on different regions in their case studies, including Europe [5], the US [6], Brazil [7], India [8], and China [9]. At the regional level, some scholars have investigated these effects using the case of a single ASEAN country, such as Malaysia [10] or Indonesia [11]. Furthermore, using the case of ASEAN countries some scholars have examined the impact based on the source of energy: oil and gas [12], and electricity [13]. However, we found that the impact of COVID-19 on the ASEAN energy sector and the prospect of green recovery is lacking. Therefore, this study aims to fill this gap by surveying empirical evidence and literature. To achieve this objective, we use a framework that incorporates various variables such as health variables (the COVID-19 pandemic), economic variables (economic growth, investment, trade, remittances, income), and political variables (governments’ policies). The objective is to understand the multiple factors that shape the impact of COVID-19 on the energy sector in the ASEAN. Both quantitative and qualitative data are used. Given the objective of this study is to see the impact of COVID-19 on the energy sector, we collected data on energy demand and production of various types of energy. In addition to energy data, this study also used economic data such as gross domestic product (GDP), countries’ fiscal stimulus, investment, trade (export-import), industrial production and retail sales. With regards to qualitative evidence, we collected this data through interviews and focus group discussion (FGD) with officials from ASEAN countries.

Following this introduction, the next section provides an overview of the impact of COVID-19 on energy development both globally and within Southeast Asia. Then, the paper discusses the recovery trajectory and the prospects of a green recovery. In particular, we focus on the role of the fiscal and economic stimulus packages launched by ASEAN countries. The paper concludes with a discussion of our findings and policy recommendations for ASEAN countries.

2. Impact of COVID-19 on Energy Sector

2.1. Global Landscape

As a result of COVID-19, the restrictions introduced to curtail the spread of the virus. This led to global economic slowdown that adversely affected the global energy sector. On the demand side, the global consumption of energy has dropped throughout the pandemic. This trend has occurred across all fuels but has especially affected oil. Specifically, the demand for oil in the global market dropped by 9.3% (year on year) [14] and the prices of US oil (West Texas Intermediate) fell below zero for the first time in history on 21st April 2020 [15]. The magnitude of the impact caused by the COVID-19 pandemic is significantly higher compared to the previous economic downturn (2008-09), where the oil demand dropped by less than 1% [16]. This is unsurprising because the current economic downturn hit transportation hardest. For example, the number of scheduled passengers boarded by the global airline industry fell from 4.7 billion in 2019 to only 1.8 billion in 2020 [17]. Given that the transportation sector is the largest consumer of oil, representing 58.4% of total global oil consumption, the mobility restrictions imposed during the pandemic have severely reduced the oil demand during the pandemic [18].

Coal was also negatively affected, as reflected in the International Energy Agency’s (IEA) report that global coal demand dropped 4%, the biggest decrease since World War II. This drop was largely driven by the lower electricity demand in many countries, as well as the closure of factories, particularly those producing steel and cement. The decline in coal was primarily driven by the lower electricity demand in many countries and the factory closure, especially steel and cement factories [19].

In contrast, the natural gas sector was less damaged by the pandemic than the oil and coal sectors. In 2020, natural gas experienced only a 2.3% drop in demand worldwide, following a 6.9% increase in the demand for natural gas in China in 2019 [14]. The strong demand for natural gas in China, which is responsible for 8% of global consumption, softened the adverse effects of the pandemic on this sector. The lower price of natural gas over the last ten years also helped to drive consumption. Lastly, many
countries, including the US and the EU, have switched their electricity generation from coal to gas, which also contributed to the resilience of natural gas throughout the pandemic [19].

While fossil fuels were adversely affected by the pandemic, renewable energy seems relatively resilient. In 2020, the world saw an increase in the demand for renewable energy. Although the pandemic caused delays in the construction of many renewable energy projects, [20] the demand for renewable energy for electricity generation increased by 3% in 2020, with the share of renewables in global electricity generation growing from 27% in 2019 to 29% in 2020 [14]. The investment data also reflect this expansion of renewable energy. While the pandemic has reduced investment in fossil fuels, investment in renewables has remained strong. In 2020, investment in renewables reached USD367 billion, a 6.38% increase compared to the previous year [21]. These figures suggest not only the resilience of this sector but also the strong appetite for investment. Investment in renewable energy is growing in its appeal to investors due to improvements in the cost competitiveness of the sector, as well as the policy supports provided by many governments [22]. Moreover, increased volatility in fossil fuel prices has also created opportunities for renewable energy, causing investors to view investments in renewables more favorably [23].
2.2. Impact on ASEAN Countries
Observing the situation at the global level, the pandemic also caused adverse effects on the energy sector in ASEAN countries. Electricity demand in Southeast Asia dropped by 1% in 2020, after growing an average of more than 6% per year over the past 20 years [18]. Almost all ASEAN countries experienced a drop in electricity consumption. In particular, Indonesia, Thailand, and the Philippines, representing the three biggest economies in ASEAN, experienced a downturn in electricity consumption in 2020, with decreases of 0.79%, 3.06%, and 4.45%, respectively. Conversely, Vietnam saw increased demand for electricity in the first six months of 2020, with electricity consumption rising by 2.24% during this period. Vietnam’s electricity consumption continued to grow as that country managed to effectively contain the COVID-19 pandemic during 2020. This increased electricity consumption can be attributed to Vietnam’s ability to maintain positive GDP growth of 2.9% in 2020, even though the country’s economic activity dropped in April 2020, when the government imposed mobility restrictions.¹

The COVID-19 outbreak also affected fossil fuels in the ASEAN region. From 2019 to 2020, oil and natural gas consumption decreased in most countries. Indonesia had the largest drop in oil consumption, with a decrease of -24.35% in 2020. However, Singapore, which depends on natural gas for energy, saw a 0.40% increase in the consumption of gas in 2020. Meanwhile, coal consumption varied between countries. Indonesia and the Philippines experienced reductions in coal consumption of 4.64% and 0.58%, respectively. Conversely, Malaysia’s coal consumption increased by 19.05%, the highest among the ASEAN countries [14].

¹ The data for Indonesia is from PLN Statistics 2020. The data for Thailand is from www.eppo.go.th. The data for the Philippines is from www.doe.gov.ph. The data for Vietnam and Malaysia is from BP Energy Data 2021.
The impacts of the COVID-19 pandemic also triggered disruptions on the supply side of the energy sector. These disruptions were driven by the limits on labor availability and construction activity (e.g., lockdowns, travel restrictions), as well as blockages in the global supply chain. In addition, uncertainty regarding future energy demand caused sluggish energy production in the region.

In contrast to electricity generation from fossil fuels, which decreased due to COVID-19, renewable energy-based power plants, including biomass, solar, wind, and geothermal plants, increased production during the pandemic. Vietnam, in particular, experienced a strong increase in renewable energy generation. In 2019, Vietnam generated 4,118.11 GWh of renewable energy, and this figure doubled to 9,453.92 GWh in 2020, representing an increase of 129.75%. Malaysia’s renewable energy generation also rose by 19.73% in 2020. The only country that did not follow this trend was Thailand, which saw a 4.21% reduction in renewable energy generation in 2020, decreasing from 21,402 GWh in 2019 to 20,501 GWh in 2020 (see table 1).

### Table 1. Electricity Generation Growth in 2020 (year on year).

| Country       | Coal  | Oil-based | Natural Gas | Hydroelectricity | Renewable Energy | Total  |
|---------------|-------|-----------|-------------|------------------|------------------|--------|
| Indonesia     | -6.95%↓ | -9.48%↓ | -20.29%↓ | 20.98%↑ | 1.87%↑ | -1.47%↓ |
| Thailand      | 2.79%↑ | -35.91%↓ | -6.55%↓ | -28.05%↓ | -4.21%↓ | -2.86%↓ |
| Philippines   | 0.49%↑ | -34.07%↓ | -12.78%↓ | -10.39%↓ | 2.84%↑ | -4.04%↓ |
| Vietnam       | 7.00%↑ | -11.07%↓ | -17.46%↓ | 1.83%↑ | 129.57%↑ | 3.09%↑ |
| Malaysia      | 19.05%↑ | -11.36%↓ | -31.74%↓ | -21.21%↓ | 19.73%↑ | -6.96%↓ |

Source: The data for Indonesia is from PLN Statistics 2020. The data for Thailand is from www.eppo.go.th. The data for the Philippines is from www.doe.gov.ph. The data for Vietnam and Malaysia is from BP Energy Data 2021.

A well-designed and transparent reverse auction scheme helped the renewable energy investment go strong through the pandemic because it gives the investor the certainty of the project development [24]. In 2020, the Ministry of Energy and Natural Resources of Malaysia via the Energy Commission launched the fourth cycle of the Large-Scale Solar (LSS) Program with a total capacity of 1 GW. The auction yielded the offered tariff between USD 0.043/kWh-USD 0.048/kWh, which is very competitive. Attractive feed-in-tariff (FiT) regulation will also support the increasing renewable energy investment in a country [24]. Renewable energy remains the most attractive sector in Vietnam, with an estimated investment potential of USD 24 billion. To support this, the Vietnamese government launched the 20-year FiT at USD 0.085/kWh and USD 0.098/kWh for onshore wind projects and for offshore wind projects, respectively. The projects under this scheme need to achieve the commercial operation date
before 1 November 2021. However, due to the pandemic, the Prime Minister of Vietnam has approved the extension of the scheduled commercial operation date from 1 November 2021 to the end of December 2023 [25].

3. Prospects of a Green Recovery: The Role of Fiscal Policy

As discussed in the previous section, renewable energy has demonstrated relative resilience compared to other types of energy, with renewable energy representing an increasing share of the total energy consumption in many countries. This global trend is also reflected at the regional level in Southeast Asia. During the COVID-19 pandemic, investors have viewed renewable energy as a more attractive and sustainable business investment than fossil fuels. Several oil and gas companies in the ASEAN region have opted to diversify their portfolios to incorporate renewable energy [12]. Focusing on green recovery during this challenging time will also help ASEAN countries to achieve the regional target stated in the ASEAN Plan of Action for Energy Cooperation (APAEC) 2021-2025. This target specifies a 23% share of renewable energy in the total primary energy supply, increasing its share in power capacity to 35% by 2025 from 2005 levels [26].

However, as many scholars argue, the green recovery will lose its momentum without strong policy measures. Demand for ‘dirty energy’ will be back to the pre-pandemic level and will put the energy mix target at risk. Even after accounting for the impact of the COVID-19 pandemic, the region is projected to reach a combined GDP of USD 20 trillion by 2040, and only about 14% share of renewable energy in its energy mix if there are no policy interventions [27]. Therefore, it is important to ensure green recovery through active governments’ interventions. One important instrument of government intervention is fiscal measures, which is considered a prime mover of the economy that shapes economic multiplies and stimulates the economy to grow. The fiscal policy would also affect the speed of the energy sector's recovery that was adversely affected by the COVID-19 pandemic.

Green recovery has been an essential important policy consideration in many countries during the pandemic. A global survey which involved both policymakers and academicians, revealed that green fiscal spending is considered to have a long-term impact on the economy [28]. Unsurprisingly, therefore, some government policy measures have incorporated green recovery. IEA (2021) reported that by Q2 2021, the world’s 50 largest economies had allocated USD380 billion to energy-related sustainable recovery policies, constituting 16% of all economic recovery packages and 2.3% of total fiscal supports provided during the pandemic [29]. For instance, the EU launched a EUR1.824 billion package under the European Green Deal (EGD) to address the economic crisis triggered by COVID-19. The European Commission’s Hydrogen Strategy, published in July 2020, emphasized the importance of renewable energy or the region [30]. China has taken a similar approach, having committed to becoming a carbon-neutral country by 2060 [31].

In the case of ASEAN countries, virtually all governments use fiscal measures to mitigate the devastating effects of the pandemic. Fiscal supports have been allocated to non-health sectors as well as the health sector. On average, ASEAN countries have allocated 0.4% of their GDP to support the health sector. Given that the pandemic has also severely impacted many other sectors, the region’s governments have also allocated fiscal supports of 4.5% of their total GDP on average to non-health sectors, with a focus on supporting the most affected groups (both households and firms) and the hardest-hit sectors, such as tourism and transport [32].

Although these policies are not directed at the energy sector, some have had indirect effects on the sector. For instance, all AMS provide tariff relief for qualified households. This includes tariff exemption, tariff and tariff adjustment for targeted customers, and also payment extension and refund [33]. In Indonesia, a full fee waiver has been provided to customers with 450VA power, while customers with 900VA power have received a 50% electricity cost subsidy [34]. Meanwhile, in Thailand, the government has provided a THB42 billion package, including discounts on electricity bills for qualified households [35]. While most AMS have provided incentives to residential households, Malaysia and Thailand have also offered electricity tariff relief to industrial and commercial customers affected by the pandemic [33].
Beyond these indirect supports, some countries have offered fiscal recovery packages that have a direct impact on the energy sector, including renewable energy. Malaysia, for instance, has provided fiscal recovery packages with a total value of USD2.9 billion, including allocations for energy projects and rooftop solar panels [24]. Thailand also plans to spend THB30 billion (USD 915 million) on its “Energy for All” program, which aims to promote power plant generated from biomass, waste, and solar panel through cooperation between communities and private sectors [37]. Similarly, Indonesia has provided biodiesel incentives of IDR 28.01 trillion (USD 2 billion), which were disbursed to biofuel companies [38]. Indonesia has also issued a fiscal stimulus package, known as the National Economic Recovery, which allocates USD49 billion to recover from the economic damage caused by the pandemic. However, allocations related to the transition to renewable energy represent only 0.9% of the total stimulus package [39]. Finally, Singapore has also launched the Singapore Green Plan 2030, which includes a plan to quadruple solar deployment by 2025 as a part of its recovery strategy [40].

Some ASEAN countries have also provided loans and liquidity supports for energy sector development during the pandemic. In November 2020, the Monetary Authority of Singapore (MAS) launched its Green and Sustainability-Linked Loan Grant Scheme (GSLS) to channel more financing to the green energy transition [41]. Meanwhile, in 2020 and 2021, the Indonesian government provided loans of IDR1.8 trillion (USD 127 million) to state-owned enterprises in the energy sector (i.e., PLN and Pertamina) to support the energy transition [42]. The Indonesia government also provided capital injections to state-owned enterprises in the energy sector, including Pertamina and the state electricity company (PLN), IDR 2.1 trillion (USD 149 million) and 5 trillion (USD 352 million), respectively [36].

In terms of taxation, some ASEAN countries have introduced new policies with implications for the energy sector, including tax exemptions and fee waivers for independent power producer procurement. In Malaysia, for example, the government extended two fiscal incentives that have been successful in driving investment in renewable energy until 2023: the Green Investment Tax Allowance (GITA) and the Green Income Tax Exemption (GITE) [43].

While the role of fiscal policy in stimulating the transition to low-carbon energy and, in particular, renewable energy development has been widely acknowledged by many scholars, the ASEAN countries are facing budgetary space problem. As a result of the pandemic, all ASEAN countries have experienced a decrease in revenues, averaging a drop of 1.7 percentage points [44]. Given that many governments have provided significant fiscal supports during the pandemic, deficits are expected to grow by 2.2 percentage points on average over the next five years. This massive additional fiscal spending, together with limited fiscal space, must be paid for through an increase in public debt, which could threaten countries’ future fiscal sustainability. All ASEAN countries are projected to experience an increase in government debt over the next five years, with an average increase of 12.76 percentage points [44].

However, many emerging markets are experiencing declining market interest rates. The IMF has projected that over the next five years (i.e., 2021–2026), the interest rate in emerging and middle-income countries will decrease by 4.6% [44]. ASEAN countries are likely to share a similar outlook with other emerging economies, with the interest rate decreasing by 4.3% on average. These lower interest rates will provide opportunities for ASEAN countries to enhance the power of their fiscal policy to foster green recovery. Thus, that fiscal policy must be designed to help the most vulnerable, stimulate the economy through fiscal multipliers, create jobs, and achieve sustainable development goals. Moreover, future recovery packages should be directed at achieving energy mix targets along with restoring the economy.
The importance of fiscal stimulus for the energy sector, in particular, and the economy, more broadly, was also observed during the global financial crisis in 2008. During that time, many governments launched green stimulus programs to accelerate the pace of the energy transition and boost economic development. For instance, the US and some European countries allocated fiscal stimulus payments to generate jobs related to renewable energy, including construction, installation, and manufacturing. The impact of such programs was positive, as shown in some studies [45]. The impact of investment in renewable energy on job creation is notably strong in the early stages, meaning that it would be preferable to make such investments during the recession to kickstart the economy faster [46]. Considering all these findings, we can argue that the green recovery packages can bring double dividends - stimulating the economy and promoting the green recovery to achieve sustainable development goals. Hence, the pandemic can be a blessing in disguise for environmental protection in ASEAN countries [47].

4. Conclusion
The COVID-19 pandemic has had a profound impact on the global economy overall and the energy sector in particular. Restrictions on mobility around the world have led to a drop in industrial production and transportation use, especially for airlines. Considering that these two sectors consume significant amounts of energy, such decreases have adversely affected demand for fossil fuels in 2020. Conversely, demand for and investment in renewable energy has remained relatively resilient during the pandemic and even increased in 2020. This trend suggests the possibility of accelerating the low-carbon energy transition. Nevertheless, without strong government interventions, the prospect of green recovery could be threatened. Fiscal measures are crucial policy instrument in this area. Green recovery has been a crucial policy consideration in many developed countries, as reflected in their fiscal stimulus packages. However, in ASEAN countries, due to their limited fiscal budgets, many governments have focused on supporting the health sector and vulnerable groups within society. Despite their budgetary limits, governments across ASEAN have introduced energy-related fiscal stimulus packages, including incentives for renewable energy development, such as the allocation of funds for rooftop solar panels in Malaysia and the provision of biodiesel incentives in Indonesia. However, challenges remain, as expansionist fiscal policies and reductions in government revenues have damaged countries’ fiscal balances, leading to increased government debt. Despite declining market interest rates that enable

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2 Popp et al. (2020) found that every USD1 million spent under the green American Recovery and Reinvestment Act led to the creation of 15 new jobs.
emerging countries to access additional financial resources, access to credit varies across AMS. Thus, it is also critical to mobilize grants and concessional financing to support green recovery in the ASEAN countries. The previous global financial crisis illustrated that maintaining green recovery spending is essential to accelerating the pace of the energy transition and strengthening economic development.

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