Chapter 7

Indonesia Country Report

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Chapter 7
Indonesia Country Report

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1. Background

The coronavirus disease (COVID-19) pandemic disrupted the global energy market, pushing governments to enforce strict lockdown measures that have led to severe economic consequences. In 2020, the hit from COVID-19 tipped Southeast Asia's largest economy—Indonesia—into its first full-year contraction in more than 20 years as its gross domestic product (GDP) shrank by 2% year-to-year. The economy fell into recession in 2020 as it struggled to bring the COVID-19 outbreak under control (World Bank, 2020a). Indonesia recorded the highest number of COVID-19 cases and fatalities in Southeast Asia.

The imposed curfew, mandatory stay-at-home orders, and lockdown of cities reduced energy consumption in all economic sectors. Limiting travel has sharply decreased fuel consumption by transport, especially road transport, and increased residential liquefied petroleum gas and electricity use. Industry and commerce have been consuming less energy with lower production, lower hotel occupancy, closing of malls, work-at-home policies for employees, amongst others.

This chapter analyses the short- and long-term impact of COVID-19 on demand and supply of energy sources and on CO_2 emissions. The COVID-19 scenario was developed based on the business-as-usual (BAU) scenario in the previous Economic Research Institute for ASEAN and East Asia (ERIA) (2020) energy outlook.

2. Macro Assumptions of the COVID-19 Scenario

In April 2020, the World Bank (2020b) produced its Indonesia economic outlook, which assumes 2.1% 2020 GDP growth, much lower than the 5.1% government target in a non-pandemic situation. BAU (ERIA, 2021) adopts 2.1% GDP growth. The current study's BAU adopts GDP growth rates used by ERIA (2021).

The government later revised GDP growth in 2020 to –2.0% and in 2021 to 4.8% (BAPPENAS, 2020), adopted by the current study as the 2020 GDP growth in the COVID-19 scenario. For the rest of the COVID-19 scenario period, the study uses International Monetary Fund GDP growth projections retrieved in 2020 (Table 7.1).

GDP in the COVID-19 scenario improves from 2021 onwards. By 2023, GDP growth reaches 5.2%, slightly lower than in BAU. The long-term GDP growth rate in the COVID-19 scenario is lower than in BAU by about 5% per year. The average annual growth rate of GDP at 5% is in line with the long-term vision of Indonesia becoming a high-income country by 2045 (BAPPENAS, 2019).

Table 7.1. Assumed Gross Domestic Product Annual Growth Rates, Business-as-Usual vs, COVID-19 Scenarios, 2018–2050

	2018	2019	2020	2021	2022	2023	2020–2030	2030–2040	2040–2050	2040–2050
COVID-19	5.2%	5.0%	–2.0%	4.8%	5.3%	5.2%	5.0%	4.8%	4.5%	4.6%
BAU	5.2%	5.0%	2.1%	4.3%	5.3%	5.3%	5.3%	4.9%	4.5%	4.8%

BAU = business as usual, COVID-19 = coronavirus disease.
Source: Author, based on International Monetary Fund (2020) data.

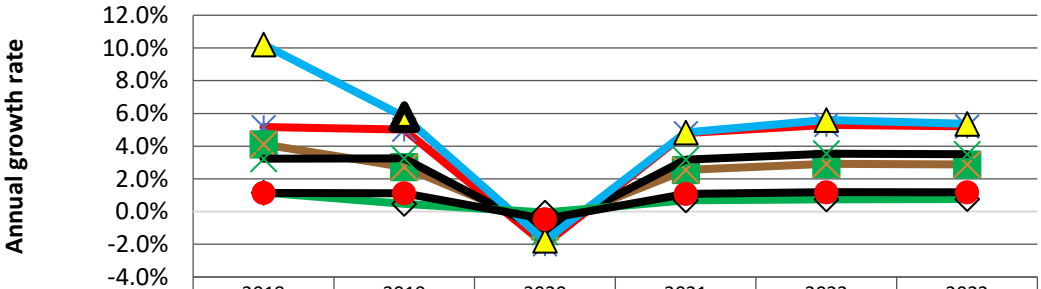
3. Short-term Impact (2018–2023)

3.1. Final Energy Consumption

In 2018–2023, total final energy consumption (TFEC) grow at an average rate of 2.0% per year (3.1% in BAU). In line with GDP contraction in 2020, TFEC declines by 0.4% in 2020, then the economy gradually improves and TFEC growth returns to 3% per year.

An analysis by sector shows that in 2020, transport experiences the lowest growth at –1.8% (Figure 7.1) because of limited travel under the lockdown policy, which forces people to stay home.

Figure 7.1. Annual Growth Rate of Final Energy Consumption, by Sector, 2018–2023



	2018	2019	2020	2021	2022	2023
GDP	5.2%	5.0%	-2.0%	4.8%	5.3%	5.2%
TFEC	4.1%	2.7%	-0.9%	2.5%	2.9%	2.9%
Industry	3.2%	3.3%	-1.3%	3.2%	3.5%	3.5%
Transport	10.2%	5.8%	-1.8%	4.8%	5.6%	5.4%
Others	1.2%	0.5%	-0.1%	0.7%	0.7%	0.8%
Non-energy	1.1%	1.1%	-0.5%	1.1%	1.2%	1.2%

GDP = gross domestic product, TFEC = total final energy consumption.
Source: Author.

In 2020, although COVID-19 significantly reduced transport fuel consumption, conditions improved as the lockdown policy relaxed and focused more on severely affected areas. Businesses and offices that had been closed for almost 6 months in the early part of the pandemic could now operate, although with limited numbers of staff and with strict health protocols in place. By 2021, growth of transport fuel consumption returns to about 4.8% and

reaches 5.4% by 2023 in the COVID-19 scenario. Overall, transport fuel consumption grows by an average of about 3.9% per year in 2018–2023, faster than other final sectors.

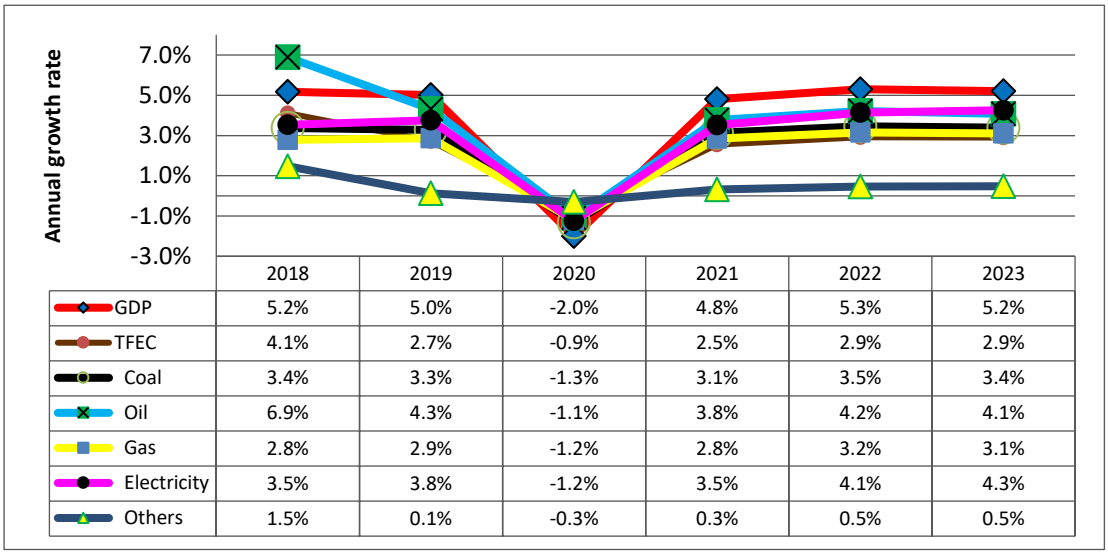
Because people stay home more, residential energy consumption in the COVID-19 scenario grows by 0.2% in 2020 (0.6% in BAU). Households cook more and use air conditioners, lights, and other electrical devices (computers, TVs, amongst others) more. In 2018–2023, residential final energy consumption increases by 0.2% per year (0.7% in BAU).

'Others' consist of the residential, commercial, agriculture, and other sectors. The residential sector's share in TFEC of 'others' is the largest: 86% in the BAU and 87% in the COVID-19 scenarios. The commercial sector share in 2020 reaches 10% and agriculture and non-specified others the rest. 'Others' except the residential sector see growth in energy consumption declining by 1.6% in 2020 in the COVID-19 scenario. Commercial buildings, such as malls, cinemas, and offices, are closed. Hotel occupancy is reduced significantly. Overall energy consumption by 'others' declines by 0.1% in 2020 in the COVID-19 scenario. Although the economy sees some improvement after 2020 and fewer mobility restrictions, the growth of 'others' in 2018–2023 is 0.5%.

The COVID-19 pandemic impacts industry's energy consumption but not as severely as transport's. Industry's final energy consumption declines by 1.3% in 2020 in the COVID-19 scenario. In BAU, industry's final energy consumption is about 4% in 2020, gradually increasing after 2020, and by 2023, its growth reaches 4.2%. Overall, industry's TFEC grows by an average of 2.4% per year in 2018–2023 in the COVID-19 scenario (4% in BAU).

Coal consumption declines by 1.3% in 2020 because of the decrease in construction, resulting in sinking cement and iron and steel production, the top coal consumers. Transport is the largest oil consumer. Combined with the oil consumption by 'others', total oil consumption in the final sector declines by 1.1% yearly. The final sector's natural gas and electricity consumption in 2020 is lower than in 2019. Both natural gas and electricity decline by 1.2%. Other fuels (biomass and biofuel) decline by 0.3% (Figure 7.2).

Figure 7.2. Annual Growth Rate of Final Energy Consumption, by Fuel, 2018–2023



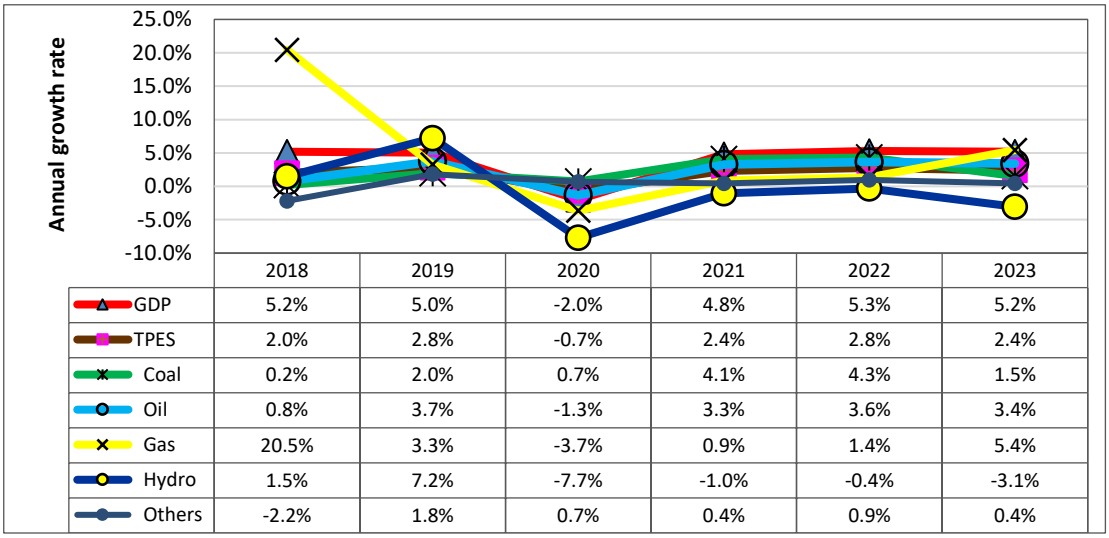
	2018	2019	2020	2021	2022	2023
GDP	5.2%	5.0%	-2.0%	4.8%	5.3%	5.2%
TFEC	4.1%	2.7%	-0.9%	2.5%	2.9%	2.9%
Coal	3.4%	3.3%	-1.3%	3.1%	3.5%	3.4%
Oil	6.9%	4.3%	-1.1%	3.8%	4.2%	4.1%
Gas	2.8%	2.9%	-1.2%	2.8%	3.2%	3.1%
Electricity	3.5%	3.8%	-1.2%	3.5%	4.1%	4.3%
Others	1.5%	0.1%	-0.3%	0.3%	0.5%	0.5%

GDP = gross domestic product, TFEC = total final energy consumption.
Source: Author.

3.2. Primary Energy Supply

Total primary energy supply (TPES) in the COVID-19 scenario declines by 0.7% from 246 million tonnes of oil equivalent (Mtoe) in 2019 to 245 Mtoe in 2020 (Figure 7.3). In BAU, TPES increases by 2.7% to 256 Mtoe in 2020. From 2021 onwards, TPES in the COVID-19 scenario gradually increases to 264 Mtoe by 2023. Although increasing, the average growth of TPES in 2018–2023 is about 2% per year (3% in BAU).

Figure 7.3. Annual Growth Rate of Primary Energy Supply, by Source, 2018–2023



	2018	2019	2020	2021	2022	2023
GDP	5.2%	5.0%	-2.0%	4.8%	5.3%	5.2%
TPES	2.0%	2.8%	-0.7%	2.4%	2.8%	2.4%
Coal	0.2%	2.0%	0.7%	4.1%	4.3%	1.5%
Oil	0.8%	3.7%	-1.3%	3.3%	3.6%	3.4%
Gas	20.5%	3.3%	-3.7%	0.9%	1.4%	5.4%
Hydro	1.5%	7.2%	-7.7%	-1.0%	-0.4%	-3.1%
Others	-2.2%	1.8%	0.7%	0.4%	0.9%	0.4%

GDP = gross domestic product; others = biomass, biofuel, geothermal, solar, and wind; TFEC = total final energy consumption.
Source: Author.

TPES includes fuel input for power generation. Most of the coal supply is used for power generation. Coal input still increases in the COVID-19 scenario because power is generated mainly by coal-fired plants. The increase in 2020 is 1.1% (almost 7% in BAU) since electricity demand in 2020 declines (Figure 7.2). Since coal is consumed by industry and consumption decreases in 2020, total coal supply in 2020 increases by only 0.7%. In 2018–2023, coal supply grows by 2.5% per year (4% in BAU).

Oil supply mainly meets final sector consumption and only a small amount is for power generation. Total oil supply declines by 1.3% in the COVID-19 scenario and grows by 2.5% per year in 2018–2023 (3.5% in BAU).

In the COVID-19 scenario, natural gas supply declines by 3.7% in 2020 and hydro by 7.7%. In BAU, natural gas supply increases by 1.6% in 2020 but hydro decreases by 2.4%. In 2018–2023, natural gas in the COVID-19 scenario reaches 33.0 Mtoe by 2023, growing by an average of 1.4% per year, and hydro declines by 1.1% per year. Natural gas grows by 3.4% per year (37.5 Mtoe in 2023) and hydro by 0.4%.

'Others' include biomass, geothermal, and other renewables (solar, wind, amongst others). They increase by 0.7% in 2020 in the COVID-19 scenario (2.0% in BAU). In the short term, 'others' grow by 0.9% per year in the COVID-19 scenario (1.2% in BAU).

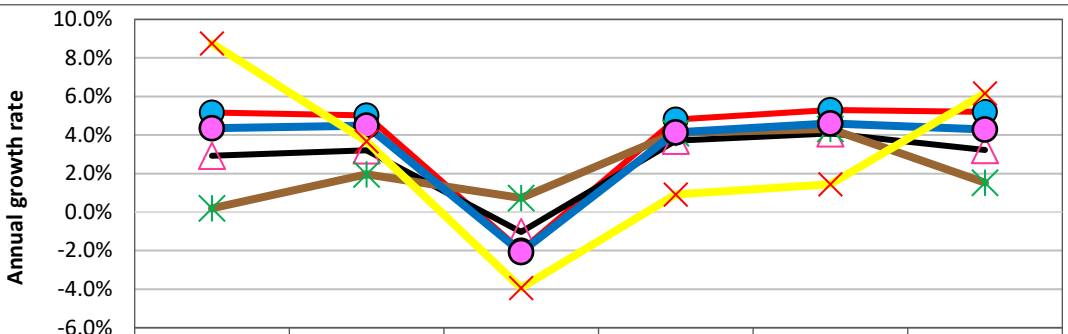
3.3. CO_2 Emissions

Since TPES in the COVID-19 scenario declines in 2020, CO_2 emissions decline, too. CO_2 emissions decline by 1.0% in 2020 in the COVID-19 scenario. CO_2 emissions from oil decline by 3.9% and natural gas by 2.1%. CO_2 emissions from coal increase by 0.7% in line with the increase of coal supply (Figure 7.4).

After 2020, CO_2 emissions increase gradually. In 2018–2023, CO_2 emissions increase by 2.6% per year in the COVID-19 scenario (about 4% in BAU).

CO_2 emissions of coal grow annually by an average of 2.5%, oil by 3.1%, and gas by 0.6%, lower than in BAU. CO_2 emissions in BAU grow by 4% per year for coal and gas and 4.2% for oil.

Figure 7.4. CO_2 Emissions, by Source, COVID-19 Scenario, 2018–2023



	2018	2019	2020	2021	2022	2023
GDP	5.2%	5.0%	-2.0%	4.8%	5.3%	5.2%
CO2	2.9%	3.2%	-1.0%	3.7%	4.1%	3.2%
Coal	0.2%	2.0%	0.7%	4.1%	4.3%	1.5%
Oil	4.4%	4.5%	-2.1%	4.1%	4.6%	4.3%
Gas	8.8%	3.7%	-3.9%	0.9%	1.4%	6.2%

COVID-19 = coronavirus disease, GDP = gross domestic product.
Source: Author.

4. Long-term Impact (2017–2050)

4.1. Final Energy Consumption

In 2020, GDP growth is assumed to reach –0.2%, but long-term average annual growth rate of GDP in the COVID-19 scenario is about 4.6% (4.8% in BAU) (Table 7.2). Similarly, TFEC in the COVID-19 scenario grows more slowly than in BAU. The average annual growth of TFEC is about 3.3% per year in 2017–2019 in the COVID-19 scenario (3.5% in BAU).

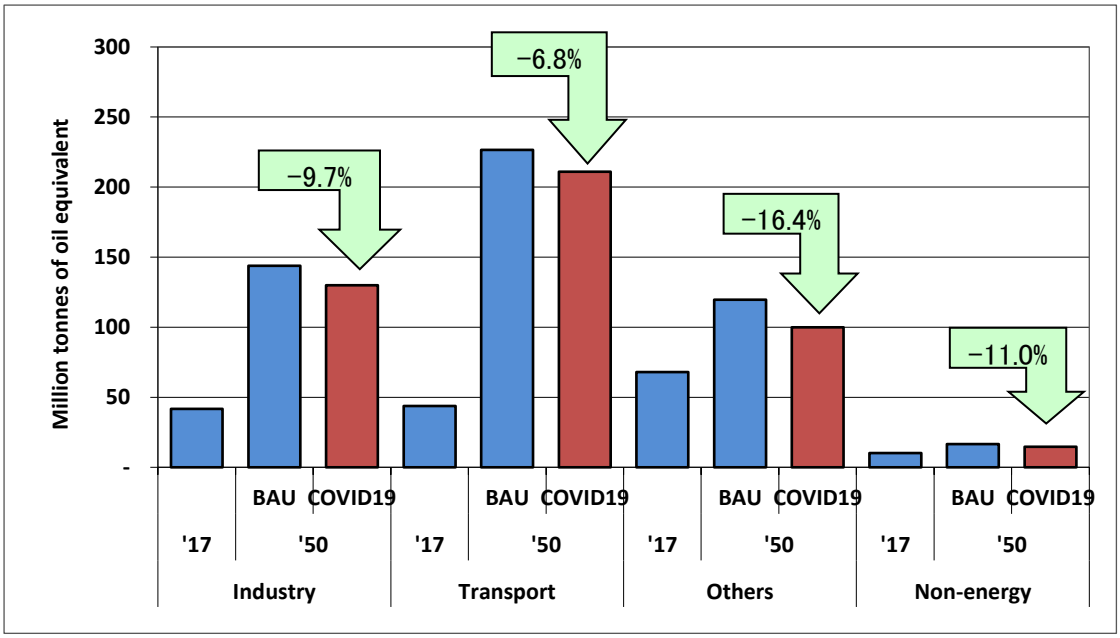
Table 7.2. Gross Domestic Product and Total Final Energy Consumption, Business-as-Usual vs. COVID-19 Scenarios, 2017–2050

Parameter	Scenarios	2017	2020	2030	2040	2050	AAGR (2017–2050)
GDP (US$ billion, 2010)	BAU	1,090	1,220	2,038	3,304	5,131	4.8%
	COVID-19	1,090	1,180	1,932	3,087	4,794	4.6%
	COVID-19 vs. BAU	0	–39	–106	–217	–337	–0.2%
TFEC Mtoe)	BAU	164	180	256	361	506	3.5%
	COVID-19	164	173	233	322	455	3.2%
	COVID-19 vs. BAU	0	–7	–24	–39	–51	–0.3%

AAGR = average annual growth rate, BAU = business as usual, COVID-19 = coronavirus disease, GDP = gross domestic product, Mtoe = million tonnes of oil equivalent, TFEC = total final energy consumption.
Source: Author.

TFEC in 2050 in the COVID-19 scenario is 51 Mtoe lower than in BAU. Thus, the COVID-19 impact in the long term reduces TFEC in 2050 by only 10% compared with BAU. In 2050, the difference in TFEC between the BAU and COVID-19 scenarios is 9.7% for industry, 6.8% for transport, 16.4% for 'others', and 11% for non-energy (Figure 7.5).

Figure 7.5. Total Final Energy Consumption, Business-as-Usual vs. COVID-19 Scenarios, 2017, 2050

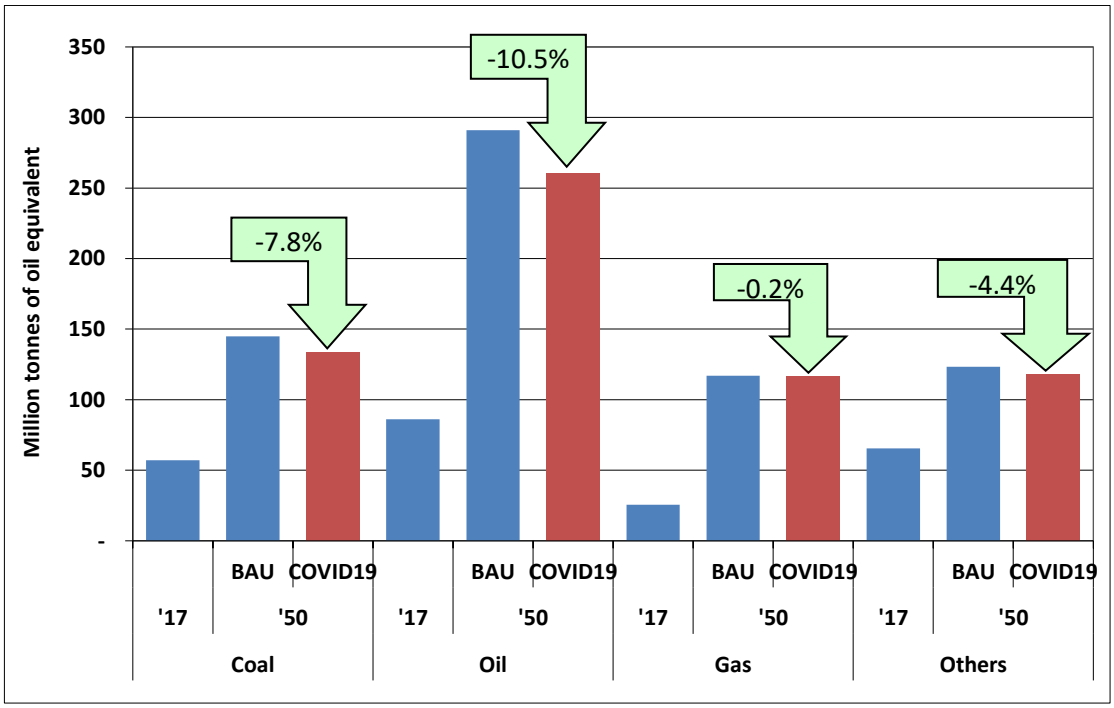


BAU = business as usual, COVID-19 = coronavirus disease.
Source: Author.

4.2. Primary Energy Supply

TPES for both scenarios show a similar trend but at a different scale (Figure 7.6). As expected, the COVID-19 scenario has a lower average growth rate at 3% per year (3.3% in BAU), similar to the short-term impact of COVID-19, indicating that the long-term projection heads in the same direction.

Figure 7.6. Total Primary Energy Consumption, Business-as-Usual vs. COVID-19 Scenarios, 2017, 2050

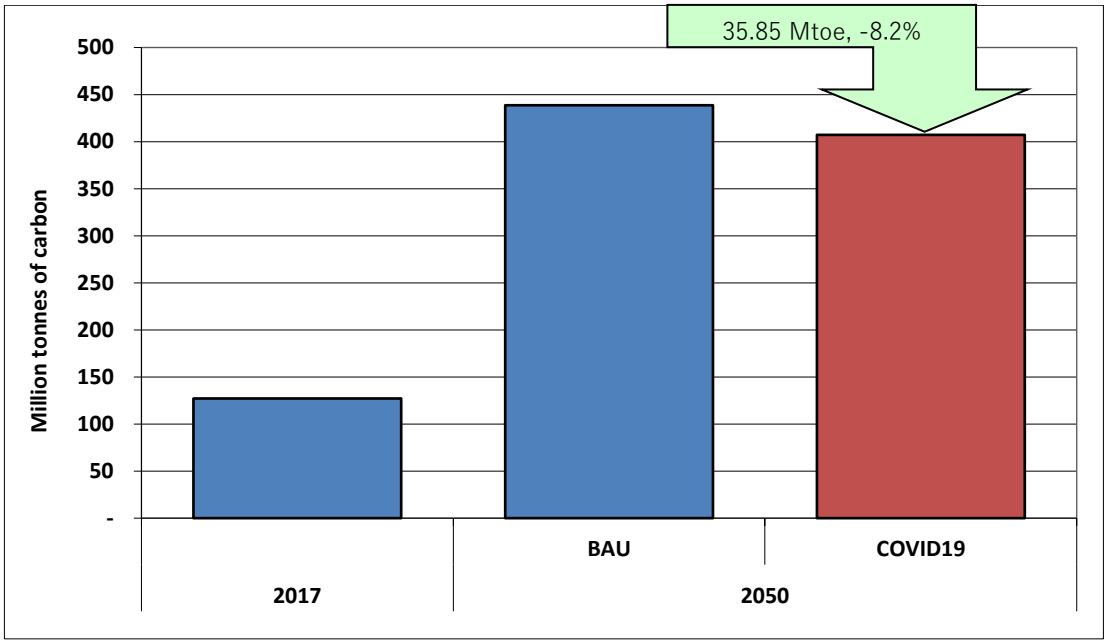


BAU = business as usual, COVID-19 = coronavirus disease.
Source: Author.

4.3. CO_2 Emissions

Total emissions in the COVID-19 scenario increase by an average of 3.6% per year in 2017–2050 (3.8% in BAU) because of lower energy power and industry demand. By 2050, the gap between total emissions in the COVID-19 and BAU scenarios is about 36 Mtoe or 8.2% (Figure 7.7), similar to the short-term outcome of about 8% by 2030.

Figure 7.7. Total CO_2 Emissions, Business-as-Usual vs. COVID-19 Scenarios, 2017–2050



BAU = business as usual, COVID-19 = coronavirus disease.
Source: Author.

5. Implications and Policy Recommendations

The COVID-19 pandemic deflates economic growth to –2.1% in 2020. Policies to slow the spread of the virus—lockdowns, limiting of people's mobility—reduces energy consumption in all sectors. Transport suffers the most, followed by industry. Growing by 4.5% in 2019, transport TFEC is –1.8% in 2020. Growing by 4.1% in 2019, industry TFEC declines by 1.5% in 2020.

The pandemic has a smaller impact on 'others' (residential, commercial, agriculture, and fishing sectors, among others). The pandemic has a positive impact on residential energy consumption because of the work-from-home policy to reduce the spread of COVID-19. The pandemic reduces energy consumption of the remaining 'others', resulting in TFEC much lower than for transport and industry in 2020. Growing by 0.5% in 2019, 'others' TFEC declines by 0.1% in 2020. As GDP growth contracts to –2.1% in 2020, TFEC also declines by 0.9%.

After 2020, the economy starts to improve and the short-term decline in energy demand caused by the virus gradually recovers. By 2023, TFEC grows by about 3%, the same as before the pandemic in 2019. TFEC growth continues as GDP growth reaches projected BAU growth.

These results are based on an econometric approach, which fully depends on the historical correlation between economic growth and energy consumption. The approach is usually appropriate for long-term energy forecasting (more than 15 years). The results should be compared with actual energy consumption after the official publication of energy statistics by the Ministry of Energy and Mineral Resources.

Despite the COVID-19 pandemic, Indonesia will see long-term growth in energy demand. The policies adopted to promote energy efficiency and deployment of renewable energy will continue while Indonesia meets its nationally determined contribution emission targets.

Reduced electricity demand projections induced by the pandemic provide an opening for Indonesia to reassess its capacity expansion plans and existing power plant mix. The country plans much stronger uptake of renewable technologies. In early 2021, the Ministry of Energy and Mineral Resources indicated that it would retire coal-fired power plants that have been operating for more than 20 years and reassess portions of the coal-fired power plant pipeline. These policies and plans are expected to curb future energy demand and CO_2 emissions. To create a more stable and low-risk investment climate for renewable energy, the government should continue to support measures such as tax incentives (exemption from value-added and income taxes for renewable energy developers), deferment of loan repayments, lower increase rates for renewable energy projects, and adjustments to procurement terms (relaxation of the commercial operation date and exemption from penalties).

The pandemic has delayed energy efficiency efforts, particularly in industry. Existing energy efficiency policies include demand-side management, minimum performance standards, and deployment of efficient technology. Despite delays, however, facility and business managers assert that efforts to further increase public and private sector awareness on energy efficiency will still be necessary to support investment, particularly in advanced control systems and digitalization of production processes, such as energy management systems, building automation systems, and virtual desktop infrastructure.

Government support will be required to sustain energy efficiency projects in the post-pandemic era, such as prohibiting procurement and usage of inefficient appliances through regulations that encourage the use of energy-efficient appliances, particularly at the community level. Other support includes bank loan interest reduction and income tax deductions, incentives or disincentives, implementation of more energy efficiency projects in government-owned assets, and optimization of earmarking of the National Economic Recovery fund to be allocated for energy efficiency.

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