Chapter 11

Malaysia Country Report

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Chapter 11
Malaysia Country Report

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1. Background

To control the outbreak of the coronavirus disease (COVID-19) pandemic, Malaysia's government announced a series of lockdowns, which limited business operations and kept people at home, lowering energy consumption.

2. Macro Assumptions of the COVID-19 Scenario

The economy contracted by 8.3% in the first half of 2020 and by 17.1% in the second quarter, but is expected to contract more slowly in the second half of the year because of stimulus packages. The economy is expected to contract by 4.5% in 2020.

In 2017–2020, in the COVID-19 scenario, growth is 1.41% per year (4.05% in BAU). In 2020–2030, gross domestic product (GDP) increases by 4.60% per year (3.76% in BAU). Economic growth is the same as in BAU in 2030–2040 (2.89%) and 2040–2050 (2.43%) (Table 11.1).

Table 11.1. Assumed Gross Domestic Product Annual Growth Rates, Business-as-Usual vs. COVID-19 Scenarios, 2017–2050

	1990–2017	2017–2020	2020–2030	2030–2040	2040–2050	2017–2050
COVID-19	5.69%	1.41%	4.60%	2.89%	2.43%	3.13%
BAU	5.69%	4.05%	3.76%	2.89%	2.43%	3.12%

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

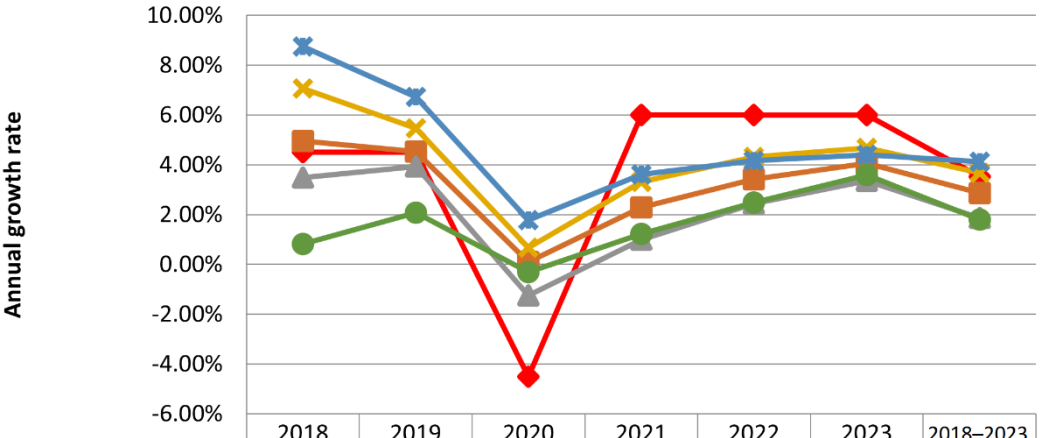
3. Short-term Impact (2018–2023)

3.1. Final Energy Consumption

To observe the impacts of the COVID-19 pandemic on total final energy consumption (TFEC), this chapter applied revised and updated assumptions for GDP growth rates. In 2018–2023, the average annual growth rate (AAGR) of TFEC in the COVID-19 scenario is 2.87% per year (3.93% in BAU) (Figure 11.1).

In 2020, industry experiences the lowest growth, at –1.24%, followed by non-energy, at –0.31%. Transport recorded lower growth (0.66%) than in the previous year (5.46%). 'Others'—the residential, commercial, and agriculture sectors—grow by 1.78% in 2020, lower than in previous year (6.73%).

Figure 11.1 Annual Growth Rate of Total Final Energy Consumption, by Sector, COVID-19 Scenario, 2018–2023



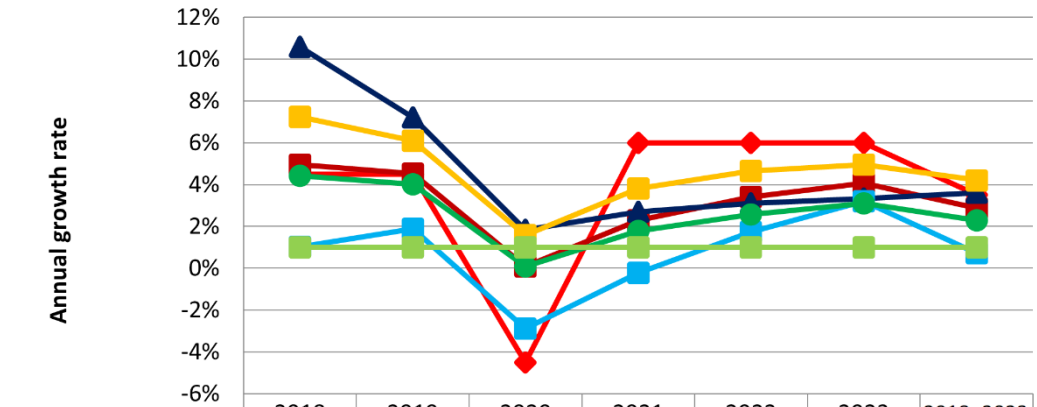
	2018	2019	2020	2021	2022	2023	2018–2023
GDP Assumption	4.50%	4.50%	-4.50%	6.00%	6.00%	6.00%	3.52%
TFEC	4.95%	4.53%	0.09%	2.30%	3.41%	4.06%	2.87%
Industry	3.48%	3.92%	-1.24%	0.99%	2.43%	3.35%	1.87%
Transportation	7.07%	5.46%	0.66%	3.30%	4.31%	4.69%	3.67%
Others	8.74%	6.73%	1.78%	3.62%	4.17%	4.40%	4.13%
Non-energy	0.81%	2.07%	-0.31%	1.23%	2.49%	3.59%	1.81%

COVID-19 = coronavirus disease; GDP = gross domestic product; others = residential, commercial, and agriculture sectors; TFEC = total final energy consumption.
Source: Author.

Although energy consumption growth follows GDP, COVID-19 impacted them differently. Early data show that industry and non-energy are greatly impacted. High-energy–intensive industry was shut down because of lockdowns, which immediately slowed energy use. Lower growth of final energy consumption for transport was mainly caused by negative growth of gasoline consumption in 2020 resulting from fewer vehicles in use as people were required to stay home. However, diesel consumption remained positive even with lower growth in 2020 as it was used mainly to fuel vehicles delivering goods. During the lockdown, the vehicles remained operational to deliver food. 'Others' saw mixed results during the lockdown. In the residential sector, electricity use is expected to increase as people were instructed to work and study at home. In the commercial sector, hospitals' energy consumption remains strong while hotels and retail posted lower growth rates. New energy demand came from delivery services for goods and food. Private vehicle registration saw negative growth, but motorcycles posted high growth rates. Transport, therefore, remains positive despite its lower growth rate.

Analysis of TFEC based on type of fuel shows that only natural gas is expected to register negative growth in 2020 because it is the main fuel for industry and non-energy. Coal consumption, mainly used for cement and steel production, records lower growth in 2020 at 1.8% than in 2019 at 7.2%. Cement manufacturers will reduce production in the absence of additional demand. The growth of electricity demand remains positive, with a lower rate in 2020 as a mixture of impacts were observed across all sectors. For example, electricity demand in industry decreases in 2020 but not in the residential sector (Figure 11.2).

Figure 11.2. Annual Growth Rate of Total Final Energy Consumption, by Fuel, COVID-19 Scenario, 2018–2023



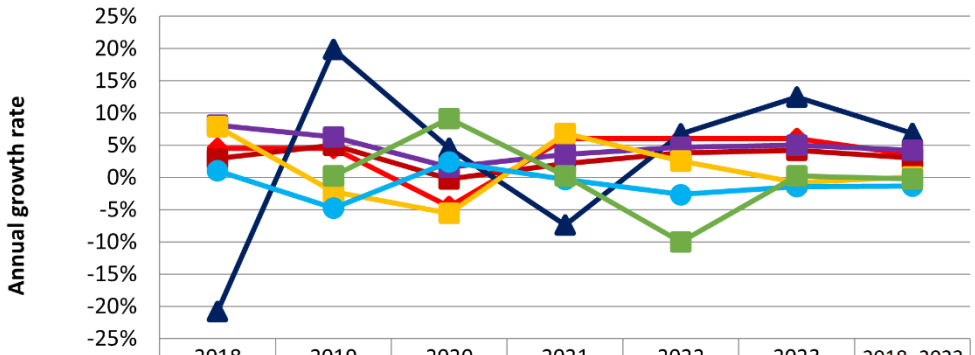
	2018	2019	2020	2021	2022	2023	2018–2023
GDP Assumption	4.5%	4.5%	-4.5%	6.0%	6.0%	6.0%	3.5%
TFEC	5.0%	4.5%	0.1%	2.3%	3.4%	4.1%	2.9%
Coal	10.6%	7.2%	1.8%	2.7%	3.1%	3.3%	3.6%
Oil	7.2%	6.1%	1.6%	3.8%	4.6%	4.9%	4.2%
Gas	1.0%	1.9%	-2.9%	-0.2%	1.7%	3.2%	0.7%
Electricity	4.4%	4.0%	0.1%	1.8%	2.6%	3.1%	2.3%
Others	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%

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

3.2. Primary Energy Supply

In the COVID-19 scenario, total primary energy supply (TPES) in 2020 is expected to decline by 0.2%. The reduction of TPES in 2020 followed GDP, which is expected to decrease by 4.5%. Natural gas contributed the most to the reduction as it is dropped by 5.6% in 2020. Consumption of natural gas is expected to decrease in the transformation process and final energy use. Demand for natural gas is especially lower for power, industry, and non-energy. TPES for oil recorded lower growth in 2020 (1.6%) than in 2019 (6.3%). The lower growth rate for oil resulted from weak demand in transport. As for coal, demand from power and manufacturing remains strong, although with a lower growth rate, despite the pandemic. In the short run, TPES grows by about 3.0% per year in 2018–2023, mainly because of coal (Figure 11.3).

Figure 11.3. Annual Growth Rate of Primary Energy Supply, by Source, COVID-19, 2018–2023



	2018	2019	2020	2021	2022	2023	2018–2023
GDP Assumption	4.5%	4.5%	-4.5%	6.0%	6.0%	6.0%	3.5%
TPES	2.9%	5.0%	-0.2%	2.1%	3.8%	4.2%	3.0%
Coal	-20.8%	19.9%	4.5%	-7.4%	6.7%	12.4%	6.9%
Oil	8.1%	6.3%	1.6%	3.6%	4.7%	5.0%	4.2%
Natural gas	7.9%	-2.3%	-5.6%	6.8%	2.5%	-0.8%	0.0%
Hydro	1.1%	-4.8%	2.4%	-0.3%	-2.7%	-1.4%	-1.4%
Others		0.2%	9.1%	0.2%	-10.0%	0.2%	-0.2%

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

Elasticity between TPES and GDP is less than 1, which shows that energy use is efficient. To recover, Malaysia must maintain a lower energy growth rate while attaining a higher economic growth rate. Malaysia is on track for economic recovery and likely to rebound strongly backed by various policy measures. The government believes the economy can return to 2019 levels by mid-2021, supported by, among others, improving external demand amidst a technology upcycle, more targeted containment measures, a well-structured COVID-19 vaccine rollout, and gradual recovery in labour market conditions.

3.3. CO_2 Emissions

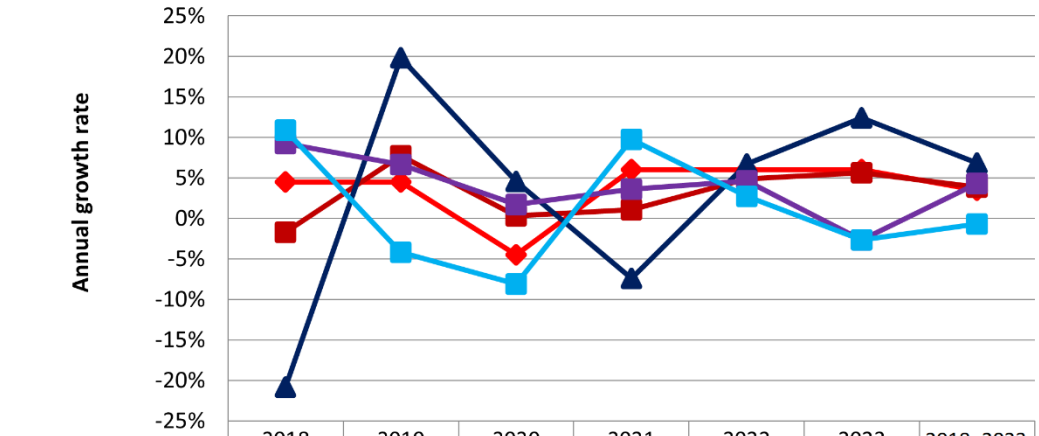
In the Malaysia Third Biennial Update Report to the United Nations Framework Convention on Climate Change, 2016, the energy sector was the largest contributor of greenhouse gas GHG) emissions, accounting for 79.4% of total emissions. Electricity and heat production contributed the most CO2 emissions (39% of the total), followed by road transport (21%) and manufacturing and construction (9%).

The AAGR of CO_2 emissions is about 3.9% per year (Figure 11.4), much higher than that of GDP since natural gas and not coal accounts for most of the reduction. The AAGR of CO_2 from natural gas is expected to decrease by 0.7% per year in 2018–2023. However, the AAGR of coal increases by 6.9% per year and emissions from oil by 4.3% per year in 2018–2023.

Malaysia intends to reduce its GHG emissions intensity of GDP by 45% by 2030 relative to the emissions intensity of GDP in 2005. The reduction consists of 35% on an unconditional basis

and a further 10% is conditional upon receipt of climate finance, technology transfer, and capacity building from developed countries.

Figure 11.4. CO_2 Emissions, by Sources, COVID-19 Scenario, 2018–2023



	2018	2019	2020	2021	2022	2023	2018–2023
GDP Assumption	4.5%	4.5%	-4.5%	6.0%	6.0%	6.0%	3.5%
Total	-1.7%	7.7%	0.3%	1.1%	4.9%	5.6%	3.9%
Coal	-20.8%	19.9%	4.5%	-7.4%	6.7%	12.4%	6.9%
Oil	9.2%	6.7%	1.7%	3.6%	4.7%	-2.6%	4.3%
Natural gas	10.9%	-4.2%	-8.1%	9.8%	2.7%	-2.6%	-0.7%

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

The Ministry of Environment and Water is spearheading efforts towards a sustainable Malaysia by 2030 through 26 initiatives based on four pillars: strengthening of governance, green growth, strategic collaboration, and social inclusion, covering the atmosphere (air), hydrosphere (water), lithosphere (land), and biosphere (living beings).

4. Long-term Impact (2023–2050)

4.1. Final Energy Consumption

The economy, it is hoped, will recover quickly through the government's vaccination programme, which will impact energy supply and demand. The GDP AAGR is the same in the BAU and COVID-19 scenarios in 2017–2050. In BAU, projected GDP increases by 3.12% per year and in the COVID-19 scenario by 3.13%. By 2050, the difference between GDP in the BAU and COVID-19 scenarios is only 0.36%, showing that the pandemic's economic impact is not crucial in the long run (Table 11.2).

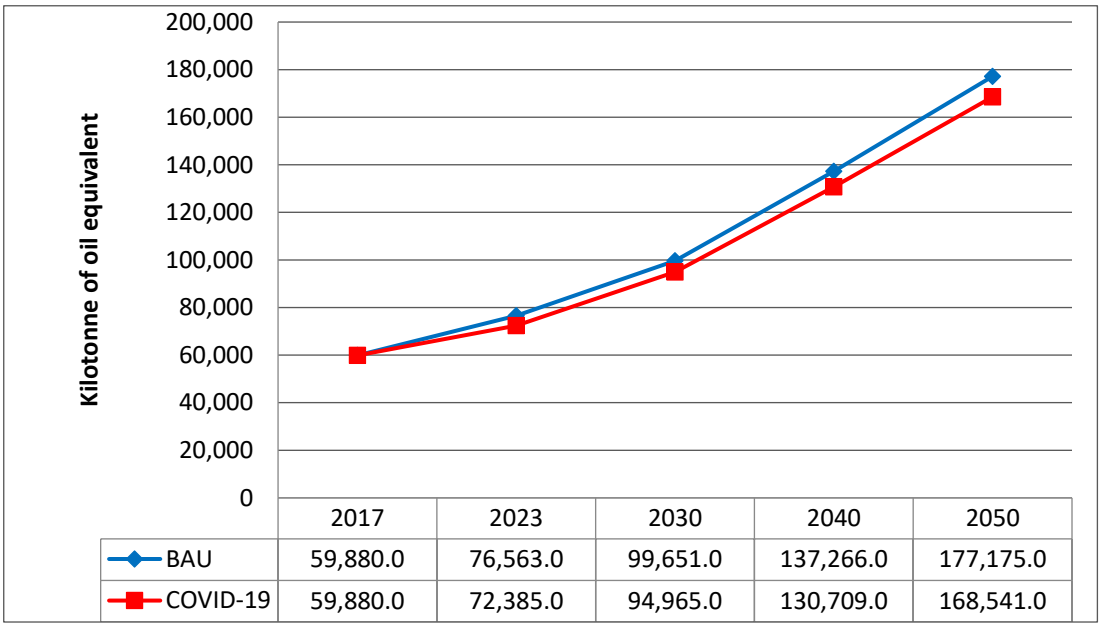
Table 11.2. Gross Domestic Product and Total Final Energy Consumption, Business-as-Usual and COVID-19 Scenarios, 2017–2050

		2017	2023	2030	2040	2050	AAGR (2017–2050)
GDP (constant US$ billion, 2010)	**BAU**	365.57	460.41	593.84	789.49	1,003.74	3.12%
	COVID-19	364.57	452.83	595.99	792.34	1,007.36	3.13%
	COVID-19 vs. BAU	0.00%	-1.65%	0.36%	0.36%	0.36%	
TFEC (Ktoe)	**BAU**	59,880	76,563	99,651	137,266	177,175	3.34%
	COVID-19	59,880	72,385	94,965	130,709	168,541	3.19%
	COVID-19 vs. BAU	0.00%	-5.46%	-4.70%	-4.78%	-4.87%	

BAU = business as usual, COVID-19 = coronavirus disease, GDP = gross domestic product, Ktoe = kilotonne of oil equivalent, TFEC = total final energy consumption.
Source: Author.

The AAGR of TFEC in BAU is 3.34% per year and in the COVID-19 scenario 3.19% per year in 2017–2050. Because of the pandemic, the difference in TFEC in 2050 between the two scenarios is significant at about 4.87%, with TFEC more fragile than GDP in the face of the pandemic because of the use of energy for daily life (Figure 11.5).

Figure 11.5. Total Final Energy Consumption, Business-as-Usual vs. COVID-19 Scenarios, 2017–2050



	2017	2023	2030	2040	2050
BAU	59,880.0	76,563.0	99,651.0	137,266.0	177,175.0
COVID-19	59,880.0	72,385.0	94,965.0	130,709.0	168,541.0

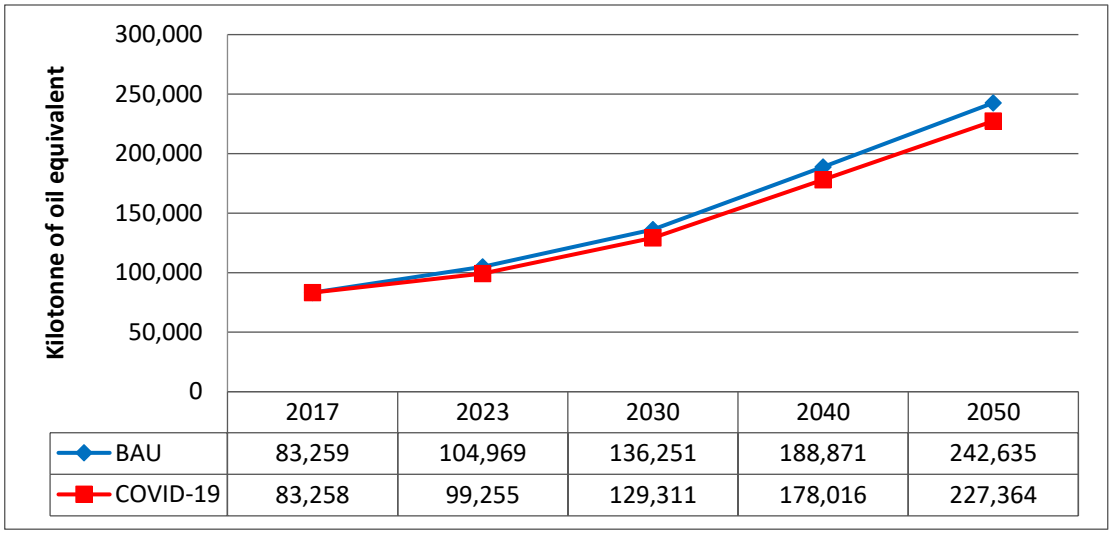
BAU = business as usual, COVID-19 = coronavirus disease.
Source: Author.

Figure 11.5 shows TFEC trends from 2017 to 20250 in the BAU and COVID-19 scenarios. The COVID-19 scenario presented at the lower bound of the graph shows the impact of COVID-19 on TFEC. As a result, AAGR is slightly lower in the COVID-19 scenario than in BAU in the long run.

4.2. Primary Energy Supply

TPES is similar in both scenarios but at a different scale (Figure 11.6). AAGR is lower in the COVID-19 scenario (3.09% per year) than in BAU (3.29%). In 2023–2050, the difference between the COVID-19 and BAU scenarios is only about 5%–6% and can be considered low impact.

Figure 11.6. Total Primary Energy Consumption, Business-as-Usual vs. COVID-19 Scenarios, 2017–2050



	2017	2023	2030	2040	2050
BAU	83,259	104,969	136,251	188,871	242,635
COVID-19	83,258	99,255	129,311	178,016	227,364

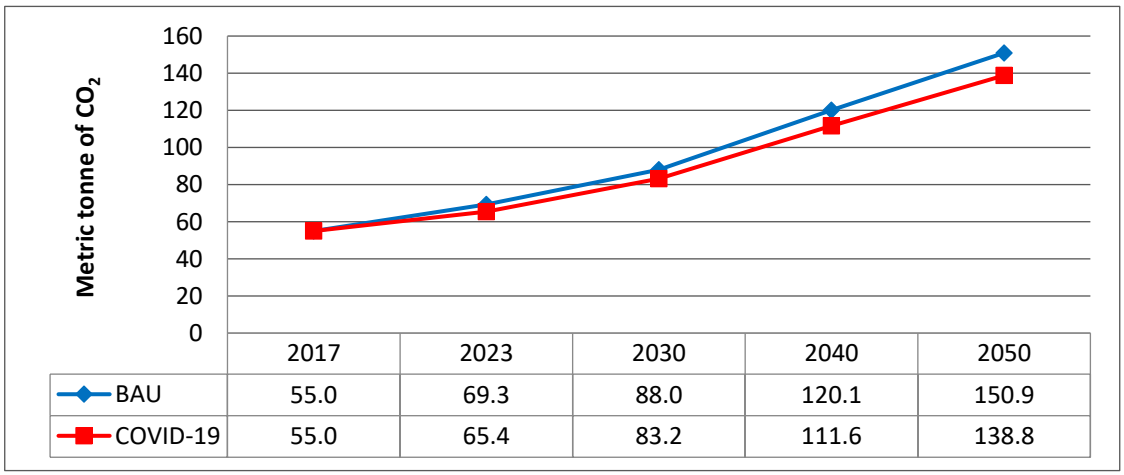
BAU = business as usual, COVID-19 = coronavirus disease.
Source: Author.

4.3. CO_2 Emissions

In the COVID-19 scenario, total emissions are slightly lower than in BAU (Figure 11.7). In 2050, the gap between total emissions of the two scenarios is 8.7% but only 6.0% in 2023.

Total emissions in the COVID-19 scenario increase by 2.85% per year in 2017–2050 (3.11% in BAU) because of lower energy demand from the power and industry sectors, which will indirectly help meet the carbon intensity commitment by 2030.

Figure 11.7. Total CO_2 Emissions, Business-as-Usual vs. COVID-19 Scenarios, 2017–2050



	2017	2023	2030	2040	2050
BAU	55.0	69.3	88.0	120.1	150.9
COVID-19	55.0	65.4	83.2	111.6	138.8

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

5. Implications and Policy Recommendations

The COVID-19 pandemic has undeniably had a large impact on health, society, and the economy. The government needs an economic recovery plan.

According to the model, residential electricity consumption should increase during the pandemic as people are ordered to stay home. However, the model shows a drop as the demand equation only relates to GDP. As GDP is assumed to decline, consumption follows the same trend. In the case of the residential sector, an extra parameter is needed to determine the real impact of energy usage during the pandemic; neither GDP nor income per capita is a significant parameter.

In the commercial sector, tourism is one of the most affected areas. In some countries such as Malaysia, however, hotels are used as quarantine centres so hotel energy usage is not entirely zero. Since not all commercial activities are not operational, commercial energy consumption remains positive despite the lower growth rate.

In transport, the major drop is from gasoline. Despite people staying home and not using their vehicles, high demand for delivery services for goods and food saw gasoline demand rise for two-wheelers. Online shopping is a new trend and creates new energy demand. The result is that transport energy demand that was expected to decline increases but at a lower volume.

Industry is correlated with GDP and is expected to decrease. The mandatory shutdowns of factories saw companies suffer huge losses, unable to pay salaries, and letting some of their workers go. The unemployment rate is increasing and people find it difficult to survive. The government introduced many kinds of stimulus packages. Many people switched from industry to commercial jobs, which will have an impact on energy consumption in the near future.

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