

# Chapter 10

## Lao People's Democratic Republic Country Report

December 2022

**This chapter should be cited as**

ERIA Study team (2022), 'Lao People's Democratic Republic Country Report', in Phaysone Phouthonesy (ed.), *Special Report of COVID-19 Impacts on Energy Demand and Energy-Saving Potential in East Asia, 2021*. ERIA Research Project Report FY2022 No. 17, Jakarta: ERIA, pp.92-101.

# Chapter 10

## Lao People's Democratic Republic Country Report

Phaysone Phouthonesy

*Technical Officer, Department of Energy Policy and Planning, Ministry of Energy and Mines  
(MEM), Lao PDR*

### 1. Background

The COVID-19 pandemic has severely affected economic growth in the Lao People's Democratic Republic (Lao PDR), which declined from about –0.6% to –2.4% in 2020. Services, including travel and tourism, have been hit hard by lockdown measures, while remittances, a vital source of income for many, have dried up. The unemployment rate rose to 25% in May 2020 from 16% at the end of 2019. These negative impacts have affected energy demand and supply in the short and long term. Lao PDR must evaluate the impacts of COVID-19 on energy demand and supply for the medium term (2020–2023) and long term (2020–2050).

### 2. Macro Assumptions of the COVID-19 Scenario

This chapter revises two key assumptions of the COVID-19 scenario: gross domestic product (GDP) growth rate and the crude oil price (Table 10.1). In 2019–2023, the pandemic disrupts the annual growth rate of GDP and the crude oil price. In 2020, GDP grows by 0.2% and the crude oil price by –35%. GDP grows faster than in the business-as-usual (BAU) scenario (by about 0.4%) as does the crude oil price (by about 1%).

**Table 10.1. Assumptions of Gross Domestic Product and Crude Oil Price, Business-as-Usual vs. COVID-19 Scenarios, 2017–2050**

Projection Period	GDP Growth Rate (%)	Japan's Crude Oil Price Growth Rate (%)
<b>BAU Scenario</b>		
<b>2018–2019</b>	7.1	8.4
<b>2019–2020</b>	6.4	7.7
<b>2020–2023</b>	6.4	4.3
<b>2023–2050</b>	5.9	3.4
<b>COVID-19 Scenario</b>		
<b>2018–2019</b>	5.2	–12.6
<b>2019–2020</b>	0.2	–35.2
<b>2020–2023</b>	5.1	13.9
<b>2023–2050</b>	6.3	4.4

BAU = business as usual, COVID-19 = coronavirus disease, GDP = gross domestic product.

Source: Author, based on [International Monetary Fund](#) and The Institute of Energy Economics, Japan 2020 data.

### 3. Short-term Impact (2019–2023)

#### 3.1. Final Energy Consumption

The annual average growth rate (AAGR) of total final energy consumption (TFEC) in BAU from 2019 to 2023 increases by about 4.5% per annum and in the COVID-19 scenario by about 3.2% per annum (Table 10.1). Energy consumption decreases from 3,867.3 kilotonnes of oil equivalent (Ktoe) to 3,681.3 Ktoe in 2023. Solid fuel consumption decreases the most, by 2.8%, followed by petroleum (2.6%), electricity (0.9%), and biomass (0.1%).

**Table 10.2. Annual Growth Rate of Total Final Energy Consumption, by Fuel, Business-as-Usual vs. COVID-19 Scenarios, 2019–2023**

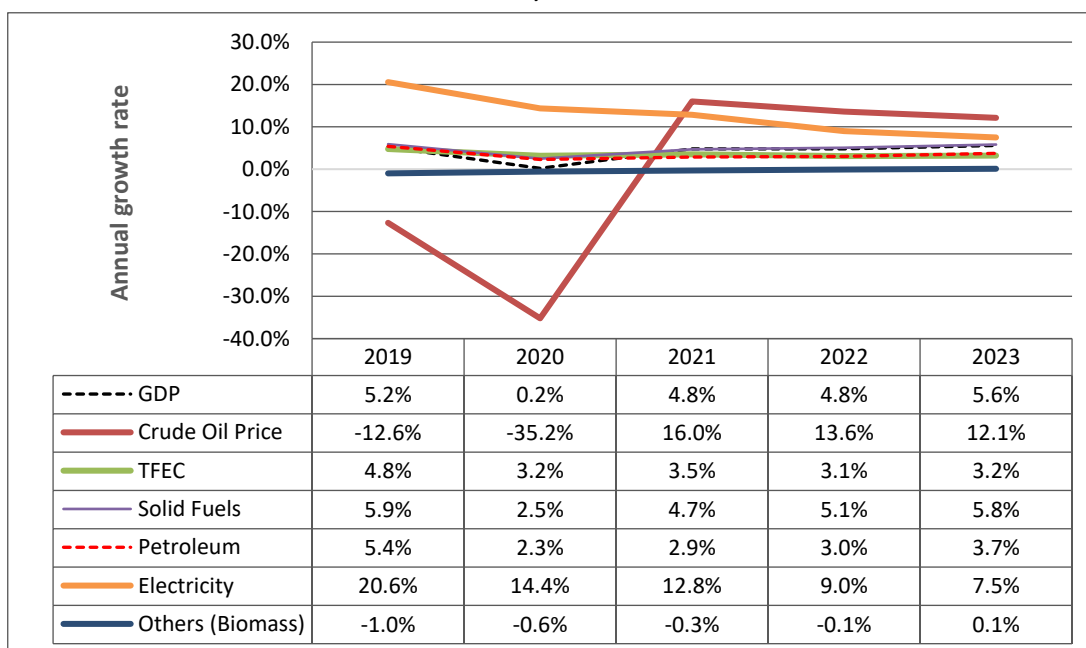
Item	Annual Growth Rate		
	BAU Scenario	COVID-19 Scenario	Reduction
<b>TFEC</b>	4.5%	3.2%	1.3%
<b>Solid Fuels</b>	7.3%	4.5%	2.8%
<b>Petroleum</b>	5.4%	3%	2.4%
<b>Electricity</b>	11.8%	10.9%	0.9%
<b>Others (biomass)</b>	–0.1%	–0.2%	0.1%

BAU = business as usual, COVID-19 = coronavirus disease, TFEC = total final energy consumption.

Source: Author.

Annual growth rates of solid fuels and petroleum have a greater impact than those of other fuels in 2020 because of city lockdowns and less travel (Figure 10.1). Some industries stopped operating at the beginning of the COVID-19 pandemic. However, electricity consumption might not decrease because many people work from home and use electricity.

**Figure 10.1. Annual Growth Rate of Total Final Energy Consumption, by Fuel, COVID-19 Scenario, 2019–2023**



COVID-19 = coronavirus disease, GDP = gross domestic product, TFEC = total final energy consumption.  
Source: Author.

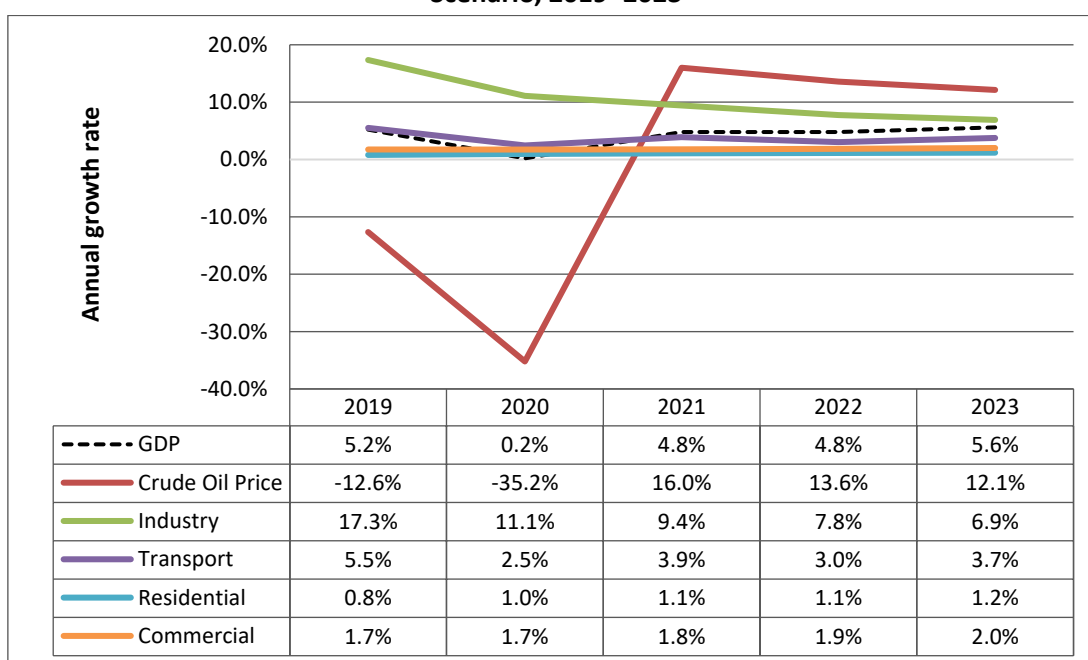
The annual growth rate of transport decreases more than that of other sectors (by about 2.4%), followed by industry (1.7%) and the commercial sector (0.7%) (Table 10.3).

**Table 10.3. Annual Growth Rate of Total Final Energy Consumption, by Sector, Business-as-Usual vs. COVID-19 Scenarios, 2019–2023**

Sector	Annual Growth Rate		
	BAU Scenario	COVID-19 Scenario	Reduction
<b>Industry</b>	10.5%	8.8%	1.7%
<b>Transport</b>	5.7%	3.3%	2.4%
<b>Residential</b>	1.2%	1.1%	0.1%
<b>Commercial</b>	2.6%	1.9%	0.7%

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

**Figure 10.2. Annual Growth Rate of Total Final Energy Consumption, by Sector, COVID-19 Scenario, 2019–2023**



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

Source: Author.

### 3.2. Primary Energy Supply

The annual growth rate of total primary energy supply (TPES) in BAU from 2019 to 2023 increases by about 3.9% per annum and in the COVID-19 scenario by about 3.1%. Primary consumption of petroleum decreases more than for other fuels (by 2.5%), followed by coal (0.3%), hydro (0.2%), and biomass (0.1%) (Table 10.4).

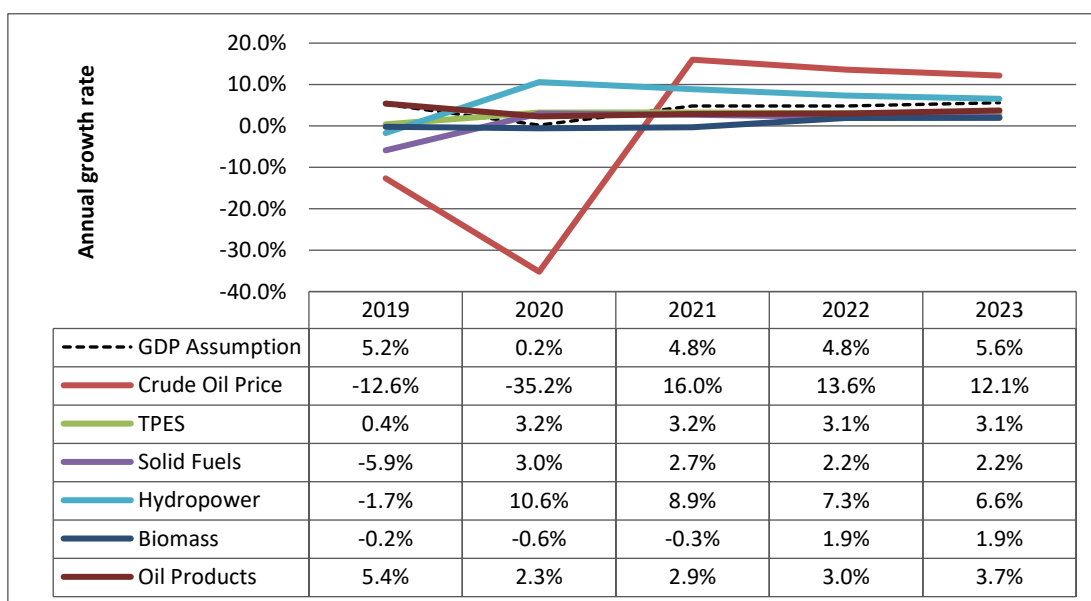
**Table 10.4. Annual Growth Rate of Total Primary Energy Supply, by Fuel, Business-as-Usual vs. COVID-19 Scenarios, 2019–2023**

Item	Annual Growth Rate		
	BAU Scenario	COVID-19 Scenario	Reduction
<b>TPES</b>	3.9%	3.2%	0.8%
<b>Solid fuels</b>	2.8%	2.5%	0.3%
<b>Petroleum</b>	5.4%	3%	2.5%
<b>Hydro</b>	8.6%	8.3%	0.2%
<b>Others (biomass)</b>	0.9%	0.7%	0.1%

BAU = business as usual, COVID-19 = coronavirus disease, TPES = total primary energy supply.

Source: Author.

**Figure 10.3. Annual Growth Rate of Total Primary Energy Supply, by Fuel, COVID-19 Scenario, 2019–2023**



COVID-19 = coronavirus disease, GDP = gross domestic product, TPES = total primary energy supply.  
Source: Author.

The COVID-19 pandemic affects oil supply but not coal and hydro because most coal is domestically supplied to Hongsa Lignite Thermal Power Plant in Xayaburi Province and about 70% of hydropower is exported.

### 3.3. CO<sub>2</sub> Emissions

The annual growth rate of total CO<sub>2</sub> emissions in BAU from 2020 to 2023 increases by about 3.3% per annum and in the COVID-19 scenario by about 2.6% per annum (a difference of 0.17 metric tonnes of CO<sub>2</sub> [Mton-CO<sub>2</sub>] in 2023). CO<sub>2</sub> emissions from oil products decrease by 2.4% (0.11 Mton-CO<sub>2</sub>) in 2023 and from solid fuels by 0.3% (0.06 Mton-CO<sub>2</sub>) in 2023 (Table 10.5).

**Table 10.5. Annual Growth Rate of CO<sub>2</sub> Emissions, Business-as-Usual vs. COVID-19 Scenarios, 2019–2023**

Item	Annual Growth Rate		
	BAU Scenario	COVID-19 Scenario	Reduction
<b>Total</b>	3.3%	2.6%	0.7%
<b>Solid fuels</b>	2.8%	2.5%	0.3%
<b>Petroleum</b>	5.4%	3%	2.4%

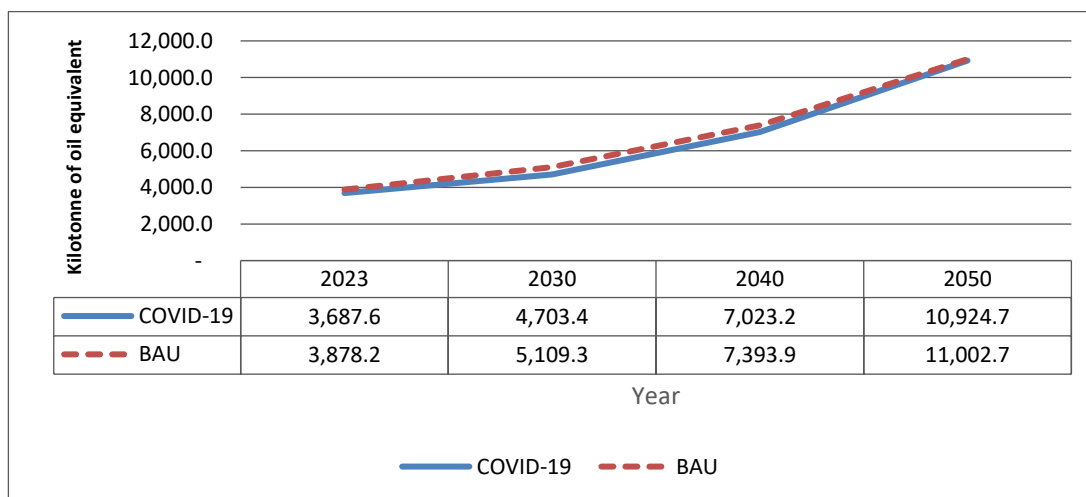
BAU = business as usual, COVID-19 = coronavirus disease.  
Source: Author.

## 4. Long-term Impact (2023–2050)

### 4.1. Final Energy Consumption

In the long term, TPEC in the BAU and COVID-19 scenarios are not much different. In the COVID-19 scenario, TPEC is lower than in BAU by 8% in 2030, 5% in 2040, and 1% in 2050 (Figure 10.4).

**Figure 10.4. Total Final Energy Consumption, Business-as-Usual vs. COVID-19 Scenarios, 2023–2050**



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

The annual GDP growth rate in the COVID-19 scenario in 2019–2023 is lower than in BAU. But in 2023–2050, GDP grows more than in BAU by about 0.4% per annum. Therefore, the AAGR of TFEC in the COVID-19 scenario increases by 4.1%, or by 0.2% more than in BAU. The AAGR in the COVID-19 scenario increases more than in BAU by about 0.4% for solid fuels, 0.4% for petroleum fuels, and 0.1% for electricity fuel (Table 10.6).

**Table 10.6. Annual Growth Rate of Total Final Energy Consumption, by Fuel, Business-as-Usual vs. COVID-19 Scenarios, 2023–2050**

Item	Annual Growth Rate		
	BAU Scenario	COVID-19 Scenario	Reduction
<b>GDP assumption</b>	5.9%	6.3%	−0.4%
<b>Crude oil</b>	3.45%	4.43%	0.98%
<b>TFEC</b>	3.9%	4.1%	−0.2%
<b>Solid fuels</b>	6.4%	6.8%	−0.4%
<b>Petroleum</b>	4.8%	5.2%	−0.4%
<b>Electricity</b>	5.1%	5.2%	−0.1%
<b>Others (biomass)</b>	0.8%	0.8%	0%

BAU = business as usual, COVID-19 = coronavirus disease, GDP = gross domestic product, TFEC = total final energy consumption.

Source: Author.

The AAGR of energy consumption by transport increases rapidly beyond BAU by about 0.4%, followed by industry (0.2%) and the commercial sector (0.1%). The AAGR of energy consumption by the residential and agriculture sectors increases at the same rate as in BAU (Table 10.7).

**Table 10.7. Annual Growth Rate of Total Final Energy Consumption, by Sector, Business-as-Usual vs. COVID-19 Scenarios, 2023–2050**

Sector	Annual Growth Rate		
	BAU Scenario	COVID-19-19 Scenario	Reduction
<b>Industry</b>	5.7%	5.9%	−0.2%
<b>Transport</b>	4.6%	5.0%	−0.4%
<b>Residential</b>	1.3%	1.3%	0.0%
<b>Commercial</b>	3.8%	3.8%	−0.1%
<b>Agriculture</b>	6.0%	6.0%	0.0%

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

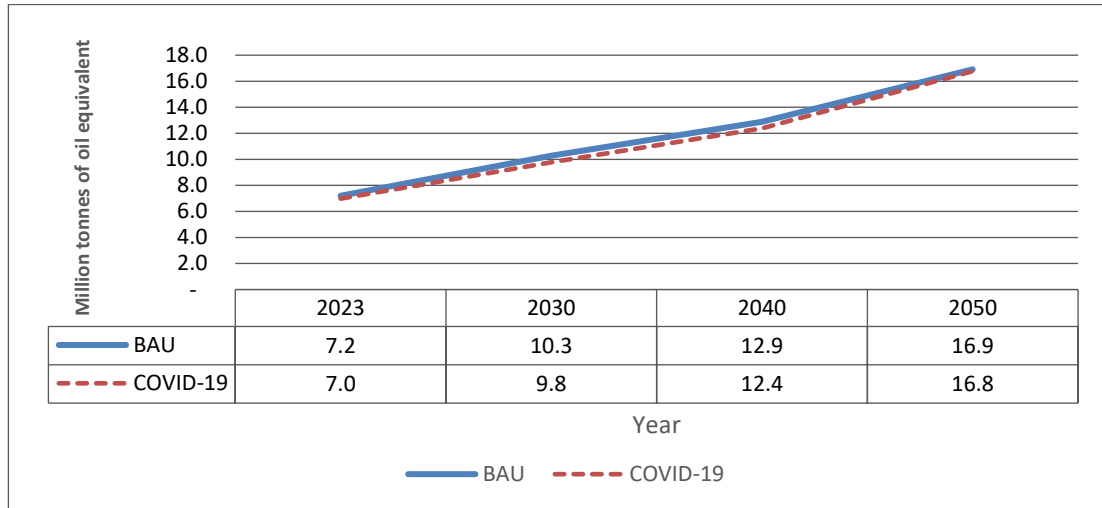
Source: Author.



#### 4.2. Primary Energy Supply

The results of the TPES outlook in 2023–2050 in the BAU and COVID-19 scenarios are not much different. Energy consumption is lower in the COVID-19 scenario than in BAU by 5% (0.51 million tonnes of oil equivalent [Mtoe]) in 2030, 3.9% (0.5 Mtoe) in 2040, and 0.9% (0.15 Mtoe) in 2050 (Figure 10.5).

**Figure 10.5. Total Primary Energy Consumption, Business-as-Usual vs. COVID-19 Scenarios, 2023–2050**



BAU = business as usual, COVID-19 = coronavirus disease, Ktoe = thousand tons of oil equivalent.  
Source: Author.

The annual growth rate of total primary energy consumption in BAU in 2023–2050 increases by about 3.2% per annum or 0.1% less than in the COVID-19 scenario. Petroleum primary supply in BAU is lower than in the COVID-19 scenario. Solid fuel such as coal is 0.1% lower in BAU than in the COVID-19 scenario. Hydropower and biomass grow at the same rate in BAU (Table 10.8).

**Table 10.8. Annual Growth Rate of Total Primary Energy Supply, by Fuel, Business-as-Usual vs. COVID-19 Scenarios, 2023–2050**

Item	Annual Growth Rate		
	BAU Scenario	COVID-19 Scenario	Reduction
<b>GDP assumption</b>	5.9%	6.3%	−0.4%
<b>Crude oil</b>	3.45%	4.43%	0.4%
<b>TPES</b>	3.2%	3.3%	−0.1%
<b>Solid fuels</b>	2.2%	2.3%	−0.1%
<b>Petroleum</b>	4.8%	5.2%	−0.4%
<b>Hydro</b>	1.7%	1.7%	0%
<b>Others (biomass)</b>	1.1%	1.1%	0%

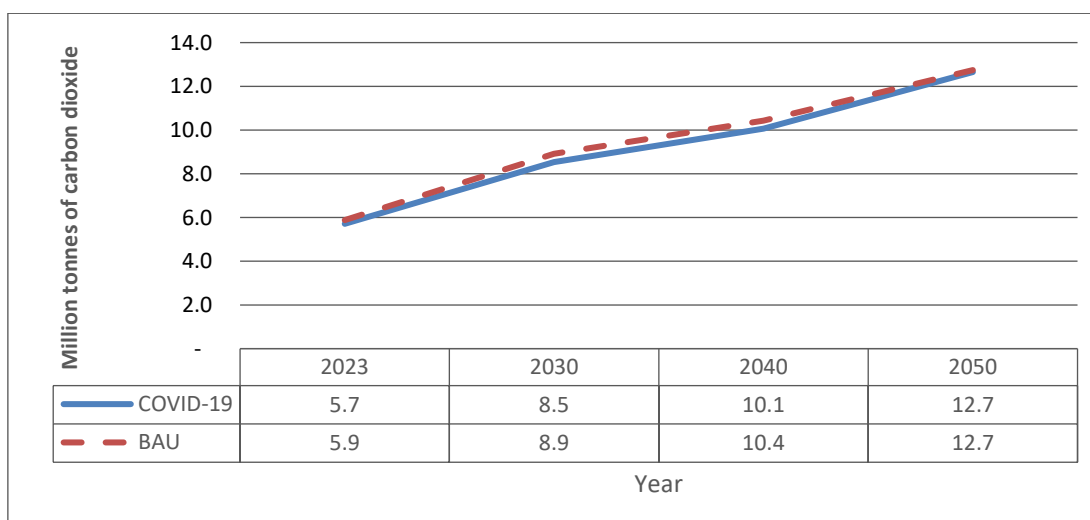
BAU = business as usual, COVID-19 = coronavirus disease, GDP = gross domestic product, TPES = total primary energy supply.

Source: Author.

#### 4.3. CO<sub>2</sub> Emissions

CO<sub>2</sub> emissions in the COVID-19 scenario are lower than in BAU by about 4% (0.38 Mton-CO<sub>2</sub>) in 2030, 4% (0.37 Mton-CO<sub>2</sub>) in 2040, and 1% (0.09 Mton-CO<sub>2</sub>) in 2050. But the annual growth rate of CO<sub>2</sub> emissions in the COVID-19 scenario is higher than in BAU by about 0.1% (Figure 10.6).

**Figure 10.6. Total CO<sub>2</sub> Emissions, Business-as-Usual vs. COVID-19 Scenarios, 2023–2050**



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

Source: Author.

**Table 10.9. Annual Growth Rate of CO<sub>2</sub> Emissions, Business-as-Usual vs. COVID-19 Scenarios, 2023–2050**

Item	Annual Growth Rate		
	BAU Scenario	COVID-19 Scenario	Reduction
<b>Total</b>	2.9%	3%	–0.1%
<b>Solid fuels</b>	2.2%	2.3%	–0.4%
<b>Petroleum</b>	4.8%	5.2%	–0.1%

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

## 5. Implications and Policy Recommendations

The COVID-19 pandemic has severely affected economic growth, which declined by about 0.6% to 2.4% in 2020. Services, including travel and tourism, have been hit hard by lockdown measures, while remittances, a vital source of income for many, have dried up. The unemployment rate rose to 25% in May 2020 from 16% at the end of 2019.

In the COVID-19 scenario, based on GDP and crude oil price assumptions estimated by the International Monetary Fund and The Institute of Energy Economics, Japan (2020), the AAGR of TFEC decreases by 1.3% per annum in 2019–2023. TFEC decreases by 5%, from 3,867 Ktoe to 3,681 Ktoe in 2023. The AAGR of TPES decreases by 0.8% per annum. TPES decreases by 3%, from 7,192 Ktoe to 6,974 Ktoe in 2023. The AAGR of CO<sub>2</sub> emissions decreases by 0.7% per annum. CO<sub>2</sub> emissions decrease by 2.8%, from 5.9 Mt-CO<sub>2</sub> to 5.7 Mt-CO<sub>2</sub>, in 2023. In 2023–2050, the growth rate of GDP rebounds faster than in BAU. Therefore, the AAGR of TFEC increases beyond the BAU scenario of 0.2%. TFEC decreases by 0.9% or 96.57 Ktoe in 2050. The AAGR of TPES increases beyond the BAU scenario of 0.1% per annum. TPES decreases by 0.01% or equivalent to 1 Mtoe in 2050. The AAGR of CO<sub>2</sub> emissions increases beyond the BAU scenario of 0.1%, decreasing to 0.9% or 0.11 Mtoe in 2050.

The COVID-19 pandemic has interrupted TFEC and primary energy supply and contributed significantly to energy saving and CO<sub>2</sub> emission reduction in Lao PDR, where, as in the rest of the world, lockdown measures have reduced travel and resulted in more people working from home. However, Lao PDR still needs to implement measures such as energy efficiency and conservation on the demand side and highly efficient thermal power plants.

The lesson learnt from the COVID-19 pandemic is that Lao PDR must activate economic growth by promoting agricultural production and internal tourism and reduce dependence on imported goods. To continue energy saving and CO<sub>2</sub> emission reduction, Lao PDR must promote remote working, online business, e-learning, and electric vehicles.