

# Chapter 6

## Key Findings and Recommendations

March 2022

**This chapter should be cited as**

ERIA (2022), 'Key Findings and Recommendations', in Kimura, S., Purwanto, A. J., Ueda, K., and Hiruma, T. (eds.), *Assessment of Electric Vehicle Penetration in the Lao People's Democratic Republic*. ERIA Research Project Report FY2021 No. 26, Jakarta: ERIA, pp.123-25.

# Chapter 6

## Key Findings and Recommendations

### 1. Key Findings

#### Chapters 1 and 2

- Economic rationality could not work for penetration of electric vehicles (EV) in the Lao PDR due to less cost competitiveness of EVs, thus policy support is indispensable such as:
  - After 2030, only EVs will be allowed to be imported out of the Lao PDR
  - By 2030, the number of EV charging stations will be more than 10,000 units in the whole Lao PDR as a national target
- In this regard, this study applies three scenarios of EV penetration in the Lao PDR: 10%, 30%, and 50% of EV share per total vehicle stock by 2040. Based on the scenarios, this study forecasts a decrease in gasoline and diesel oil demand by 2040 as well as an increase in electricity demand coming from EVs for analysing impacts to be brought by EV penetration in the Lao PDR:
  - Decrease in oil demand in 2040
    - EV 10%: –284 ktoe
    - EV 30%: –853 ktoe
    - EV 50%: –1,460 ktoe
    - from 2,943 ktoe of petroleum demand in the road transport sector in the business-as-usual (BAU) scenario
  - Increase in electricity demand in 2040
    - EV 10%: +110 ktoe
    - EV 30%: +331 ktoe
    - EV 50%: +551 ktoe
    - from 2,078 ktoe of electricity demand in the total financial energy consumption (TFEC) of BAU
- The penetration of EVs will need EV charging stations and having only a few charging stations will not contribute to EV penetration, leading to the chicken-and-egg dilemma. If the government adopts an EVEV penetration policy, it will face this dilemma.

### Chapter 3

- EV penetration in the Lao PDR will bring a large reduction in oil consumption such as gasoline and diesel oil. On the other hand, it will increase electricity demand for EVs. As a result, the TFEC will decrease 12% from the BAU scenario in the case of the EV 50% scenario. Thus, EV penetration will contribute to energy saving in the Lao PDR.
- EV penetration in the Lao PDR will bring a large reduction in CO<sub>2</sub> emissions due to a large decrease in oil consumption, but CO<sub>2</sub> emissions from additional power generation for EVs will depend on the power generation mix:
  - In the case of 100% hydropower generation: Total emissions will be much lower than the BAU scenario (8.2 Mt-C of EV 50% from 9.4 Mt-C of BAU)
  - In the case of 100% coal-fired power generation: Total emissions will be bigger than in the BAU scenario (10.3 Mt-C of EV 50%)
  - In the case of 50% hydropower and 50% coal-fired power generation: Total emissions will be slightly lower than in the BAU scenario (9.2Mt-C of EV 50%)
- EV penetration will contribute to improve energy supply security of the Lao PDR because the volume of imported transport fuel will decrease. On the other hand, domestic energy such as hydropower and coal will increase.

### Chapter 4

- EV penetration in the Lao PDR will bring several negative impacts to oil companies in the Lao PDR due to the decrease in oil demand:
  - Revenue of the oil companies will decrease compared to BAU
  - In the case of the EV 50% scenario, gasoline and diesel oil demand will saturate around current level (2018) up to 2040, thus an expansion of the transport fuel market in the Lao PDR will not be expected.
  - In other words, existing oil companies will be able to survive because the current market volume will be maintained. But they will face severe competition due to limited oil market volume.
- Looking at the macroeconomic situation, imports of transport fuel will decrease, so that outflow of national welfare will be saved. In the case of the EV 50% scenario, the gross domestic product will be forecast to increase to around 2.4% in 2040 compared to BAU.

## Chapter 5

- EV penetration in the Lao PDR will bring several positive impacts to the electricity sector due to an increase in electricity demand:
  - Investment to additional power plants by Electricité du Laos and independent power producers
  - Capacity of hydropower, coal, solar PV, and wind will be expanded.
  - Around \$2,000 million will be needed for the construction of additional power plants in the case of EV50.
  - Investment to transmission and distribution lines
  - Around \$1,300 million will be needed for strengthening the transmission and distribution networks due to an increase in electricity demand in the case of EV50.
  - As a result, a total of \$3,300 million will be needed to support the increase in electricity demand in the case of EV50.
- EV penetration will also expect the need for additional employees to engage in the electricity sector which are power plants, and transmission and distribution networks:
  - 2,600–3,600 employees per year

### 2. Recommendations

- The penetration of EVs needs government support through setting up appropriate EV policies with the support of the international community.
- EV charging stations will be essential if the Lao PDR increases the number of EVs.
- The penetration of EVs is appropriate for the Lao PDR due to the following expectations:
  - Energy saving
  - CO<sub>2</sub> reduction, with attention to the power generation mix
  - Improvement of energy supply security
  - Moderate negative impact to oil companies but severe competition in the oil market in the Lao PDR
  - Increase of gross domestic product due to oil import saving
  - Huge investment in the power sector (\$3.300 million)
- Application of foreign investment is a wise policy for the Lao PDR because of the need for huge investment for EV penetration but applies to power plants like independent power producers. For transmission and distribution networks, EDL and the Ministry of Energy and Mines should invest separately in order to maintain national security off of power supply.