

# Chapter **1**

## Introduction

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# Chapter 1

## Introduction

The electricity demand of Indonesia will increase significantly about 4.5 times from 2017 to 2040 under a business-as-usual scenario (Malik, 2019). The report mentioned that coal share in power generation will remain dominant in the total power generation of the country. In 2015, coal share in power generation reached almost 56%, higher than that of oil. This share is expected to continue to increase in the future, reaching around 70% in 2040.

At 47%, oil had the largest share in power generation in 1990. By 2015, the share of oil declined to around 8.4% as production from coal and natural gas plants increased rapidly. In the business-as-usual scenario, the share of oil in 2040 will be less than 3%. The use of diesel fuel in the small-scale off-grid diesel-fired and dual-engine (diesel fire and natural gas) power plants currently constitutes most of the electricity generation system in the eastern Indonesian islands.

In the business-as-usual scenario, the Secretariat General National Energy Council (DEN, 2019) foresaw that Indonesian gas supply in 2050 would reach 167.4 Mtoe (million tonnes of oil equivalent), i.e. an increase of three times from 2018 whilst gas production would decline from 75.4 Mtoe in 2018 to 66.3 Mtoe in 2050. Looking at this gap between the needed demand and production capacity, the Government of Indonesia shall prioritise meeting the domestic demand by not making a new contract on gas export with foreign stakeholders and by not extending the existing contracts.

The government has set a strategy to increase the use of natural gas in power generation. The decision of the Ministry of Energy and Mineral Resources (MEMR) Decree 13 K/13/MEM/2020 (MEMR, 2020e) issued in January 2020 mandated the state oil and gas company Pertamina to establish liquefied natural gas (LNG) supply within 2 years to support the conversion of 52 power plants from diesel fuel to natural gas. This conversion concerns a total installed capacity of 1,697 MW and shall need 166.98 billion BTU (British thermal unit) of natural gas per day. In April 2020, the MEMR issued Minister Decision No. 91 K/12/MEM/2020 that set the feed-in-tariffs of natural gas to be used in power plants (MEMR, 2020d).

The study aims to analyse the opportunities to develop LNG-based electric power generation systems in mid-sized and large islands of Indonesia by identifying the possible configuration of small-scale LNG supply chain. This will contribute to stable electric power supply and provide affordable electricity in those islands in a sustainable way in coherence with the national development plan.

The study is also consistent with the strategic theme of the ASEAN Economic Community Blueprint 2025 and its subordinate paper, the ASEAN Plan of Action for Energy Cooperation (APAEC) 2016–2025 phase 1. It shall contribute to the regional energy policy and planning objective, namely, to enhance the integration of energy policy and planning, and that of the ASEAN Council on Petroleum framework.

This report starts with an update of the government’s policies on the development of LNG in chapter 2, followed by a forecast of its demand, assuming the current diesel-fired power generation plants in eastern Indonesia’s small islands will be replaced by gas-fired plants (chapter 3). Chapter 4 discusses how the location of the potential LNG-receiving ports are being determined in eastern Indonesia’s islands, considering the potential LNG demand and port accessibility based on the profile of ports and LNG carrier vessels. This is followed by the estimate of LNG production to meet the demand, especially in Bontang, Donggi, Masela, and Tangguh (chapter 5). Chapters 6 and 7 present the results of static and dynamic simulations of LNG delivery by LNG carrier vessels from the production sites to the receiving ports in eastern Indonesia’s small islands.