

# Chapter **1**

## Introduction

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# Chapter 1

## Introduction

### 1.1 Background

The Association of Southeast Asian Nations (ASEAN) is one of the most dynamic and fastest-growing economic regions globally. According to the Energy Outlook and Energy Saving Potential in East Asia 2019 prepared by the Economic Research Institute for ASEAN and East Asia (ERIA, 2019), the power demand in ASEAN countries will considerably increase in line with the expected economic and population growth by gas and oil. Furthermore, as improving the electricity access rate is an important policy task in some countries such as Myanmar and Cambodia, power demand appears almost certain to increase in the future in line with rising living standards. Meanwhile, as the gross domestic product (GDP) is relatively low in this region, supplying electricity at the minimum possible cost is necessary.

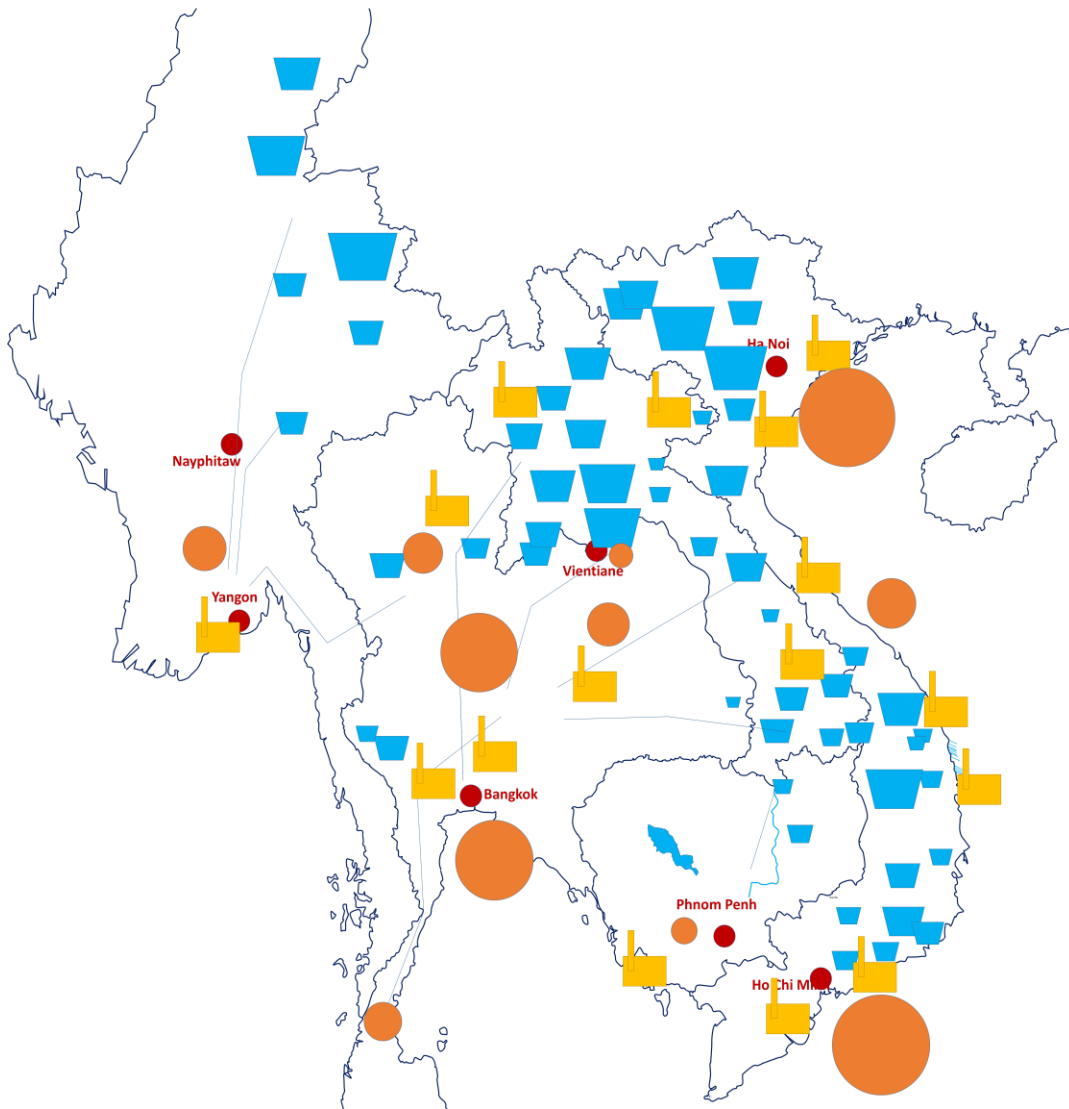
A country formulates a power development plan (PDP) on the premise of self-sufficiency in energy security. However, when power demand growth outstrips the capacity to supply necessary domestic resources such as manufacturing and human and financial resources, or when economically efficient power development is difficult due to some constraints, importing electricity from neighbouring countries should be considered.

In such a situation, energy resources vary in the Indochina region, so-called the Ayeyawady-Chao Phraya-Mekong Economic Cooperation Strategy (ACMECS): huge hydro potential in the Lao PDR and Myanmar, large gas potential in Myanmar, and coal potential in Viet Nam. But the abundant resources, especially hydropower, is underutilised because ACMECS countries have no existing bulk transmission network covering their entire area. Some cross-border interconnections already exist in ACMECS. Most of them are used as dedicated transmission lines for power purchase agreements. System-to-system interconnections also exist, but most are of low voltage; there is no 500 kV cross-border interconnection for mutual power trade.

To date, regional power trade has been limited to a series of uncoordinated bilateral arrangements. To economically use resources, the high-voltage transmission network and multilateral power trade system amongst the ACMECS countries are required. If high-voltage transmission network such as east–west and north–south could connect Cambodia, the Lao PDR, Myanmar, Thailand, and Viet Nam, power generation could be optimised in these five countries. A large amount of power trade through the utilisation of a high-voltage transmission network can bring multiple benefits, including reduced fuel costs of thermal power generation, reduced CO<sub>2</sub> emission, improved electricity access, and the ability to consolidate higher shares of variable renewable energy. In this study, the concept of this high-voltage transmission network through ACMECS countries is from now on called the 'Transmission Highway'.

ASEAN Member States (AMSs) have a long-standing goal of realising the ASEAN Power Grid (APG). The APG is an initiative aimed at constructing a regional cross-border interconnection to link the region, first, on cross-border bilateral terms, then gradually expand subregionally, subsequently leading to a total integrated Southeast Asia power grid system. The Transmission Highway will play a huge role in the APG initiative. In addition, ACMECS can become a pioneer in multilateral power trade in ASEAN.

**Figure 1-1 Energy Resources in the Indochina Region**



Source: Authors.

## **1.2 Objectives**

The Working Group's study, 'Feasibility Study on the Transmission Highway in ACMECS', quantifies the benefits of regional optimisation by utilising the system-to-system high-voltage cross-border interconnections development in the ACMECS region. By doing so, the study provides clues for improving the efficiency of cross-border interconnection. The background of this study was developed by referring to the Greater Mekong Subregion (GMS) program of the Asian Development Bank (ADB), the APG program of the Heads of ASEAN Power Utilities/Authorities (HAPUA), the Study on Power Network System Master Plan in the Lao People's Democratic Republic by the Japan International Cooperation Agency (JICA, 2020b), thus making the study consistent with these existing initiatives.