

# Chapter 1

## Introduction

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# Chapter 1

## Introduction

### 1.1. Introduction

Cambodia, Lao PDR, Myanmar, Thailand, and Viet Nam are neighbouring countries located in the Lower Mekong Basin Region (LMBR), an area with great potential and opportunity for co-operation and development of renewable energy (RE).

In recent years, LMBR countries have achieved remarkable progress in economic development. Together with rapid economic growth and implementation of rural electrification, electricity demand has rapidly increased. In the next decade, electricity demand in the region is expected to continue increasing at a high rate due to economic growth. The use of fossil fuels is not only associated with environmental and health impacts, but the consumption of petroleum and import dependence also greatly impact national budgets, trade balances, and household incomes. Exploitation of RE sources is one option for these countries to meet the expected increase in electricity demand, the desire to have energy security, and to enhance economic competitiveness. Although research and promotion of RE technologies occurred over the previous decades, these were not on a large scale.

Compared to other countries in the region, Thailand has made impressive progress with RE development. At present, alternative energy sources (solar, wind, biofuel, biogas, and mini hydropower) account for only 12% of Thailand's overall energy use, and the government is targeting an increase to 25% by 2021. The main policy and regulatory framework for reaching this target is the Alternative Energy Development Plan (AEDP), announced in 2012. The projected quadrupling of installed alternative energy capacity over the period up to 2021 is expected to derive from dramatic advances in solar and wind power, a doubling in biomass energy, and a multiple-fold increase in mini hydropower. The main support for renewable energies in Thailand is the feed-in tariff premium, differentiated according to technology, capacity, and location. Other mechanisms that support RE investment in Thailand are financial incentives in the form of grants and low-interest loans, fiscal incentives in the form of exemption from import duties, and personal income tax and corporate income tax provisions.

Viet Nam is endowed with RE resources such as hydropower, biomass, wind energy, geothermal energy, and solar energy. So far, these RE sources have not been widely used due to the lack of specific policy initiatives and the absence of a supportive institutional framework.

Viet Nam has ambitious targets for the development of RE technologies. These are described in the National Master Plan for Power Development, which covers the period 2011–2020, with

the vision extended through 2030—also called the Power Development Plan VII. The share of RE in electricity generation is expected to grow from 3.5% in 2010 to 6.5% in 2020, 6.9% in 2025 and 10.7% in 2030. The targets are defined for four RE sources: wind, solar, biomass, and small hydropower.

A feed-in tariff (FIT) for wind power was approved by the Prime Minister's Decision No. 37/2011/QD-TTG in 2011. The fixed price of 7.8 US cents per kilowatt-hour (kWh) is offered for a grid-connected onshore wind project. However, compared to countries in the region and the world, the support price of wind power in Viet Nam is too low and is not attractive to national and international investors.

The other supporting mechanism for grid-connected biomass cogeneration and solid waste power projects were also approved in 2014, which regulated the fixed price at 5.8 US cents/kWh for biomass cogeneration, 10.05 US cents/kWh for incineration technology, and 7.28 US cents/kWh for burial of solid waste. Many additional incentives have been provided by the government to encourage investment in RE. These include, but are not limited to, import duty exemption, incentive rate for corporate income, exemption or reduction of land use fee/rental, and others.

The RE Development Strategy in the Lao PDR (approved in 2011) defined the required capacity to achieve 30% share of RE share in 2025. This is the most ambitious target in the Mekong region. However, large hydro is not included in this target; only installed capacity and generation for small hydropower are specified. In 2011, the total installed capacity of the Lao PDR is 2,566 megawatts (MW). This is installed and operational for both domestic consumption and export, of which 1,987 MW is used for the export market to Thailand and Viet Nam (ADB, 2013). The installed capacity of RE sources is around 28MW. To date, there are no action plans or support measures to achieve this target.

Myanmar has significant RE potential, however, to date, little of the country's solar, wind, and biomass energy potential has been exploited. The focus has been on hydropower investments. Total installed renewable capacity is about 150MW. The Ministry of Energy is targeting an additional 472MW of RE by 2015, which represents 15% of current installed capacity. At present, there are no specific RE incentives. However, the government has recently announced a new foreign investment law that offers foreign investment incentives that include tax exemption, income tax relief, and targeted customs duties for the importation of machinery and equipment, which could be applied for RE promotion.

The development of RE in Cambodia, compared to other countries, is still limited to a demonstration project. Financial incentives for RE development are not yet in place. Some investment incentives under the Investment Law (1994) are available, such as tax exemption and import duty exemption. Cambodia does not have a specific RE development target, but it has the 'Master Plan Study on Rural Electrification by Renewable Energy in the Kingdom of Cambodia' that is linked to the electrification programme to achieve the full electrification of villages by 2020, and 70% household electrification by 2030. One of the main components of this electrification programme is the development of RE (solar, wind, mini and micro hydro, biogas, and biomass) and financial resources are mainly from foreign countries in the form of

donation or grant. Access to finance is considered one of the main barriers to the development and implementation of RE in Cambodia (ACE, 2013).

In summary, Thailand has achieved early success in RE power development, mainly by relying on important support measures that include subsidies and FITs. However, this measure of success is based on RE capacity expansion and does not necessarily capture other indicators, including energy security, innovation, job creation, and environmental impact mitigation (ICEM, 2014). Moreover, an integrated strategy with set priorities for RE technologies to be achieved is still lacking. In the case of Thailand, these additional considerations could be used as lessons learnt, to be shared and to help advance the development and use of green energy throughout the region.

### **1.2. Objectives of the Study**

This study aims to set up the strategy and policies for RE development in LMBR countries; to assess and select the prioritised RE technologies; and to identify the social, economic, and environmental benefits from implementing RE development.

### **1.3. Scope of the Study**

This study will focus on RE technologies for power generation in the countries of Cambodia, the Lao PDR, Myanmar, Thailand, and Viet Nam. The assessment and selection of priority RE technologies was carried out for Viet Nam as a case study for application to other countries in the region later.

The assessment uses data from the energy sector with 2013 as the base year for business as usual (BAU) scenario; and projects energy demand and GHG emissions up to 2040 to establish a foundation for the selection of priority RE technologies, and for setting up the strategy and policies for RE development.

