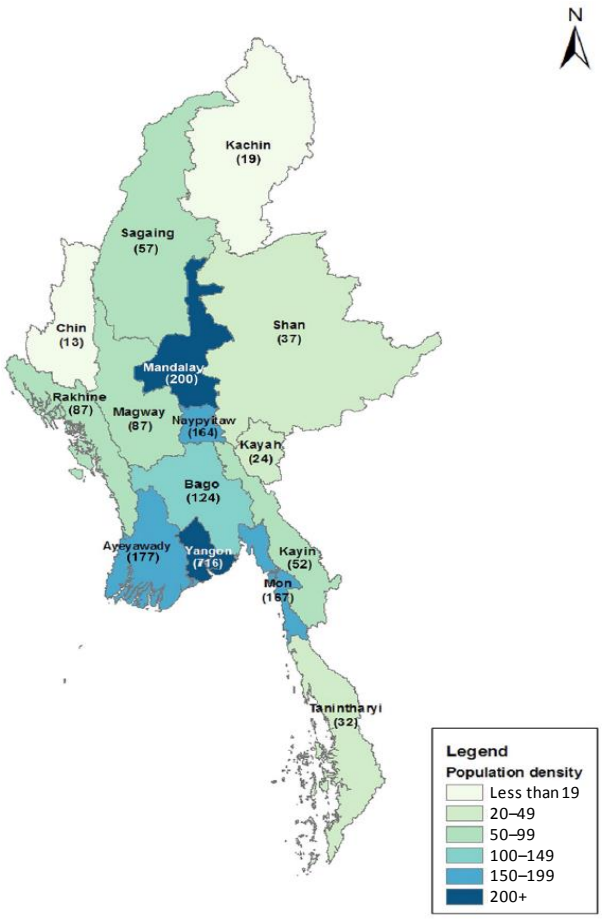
Chapter 1

Introduction

1. Background and Study Objectives

Myanmar is the largest country in mainland Southeast Asia, with 14 states and regions, and a land area of 676,577 square kilometres (Figure 1.1). Bordered by China, Thailand, and India, Myanmar occupies a strategically important position in Southeast Asia. Central states such as Yangon and Mandalay, which contain large cities, have a higher population density, while the northeastern states of Kachin and Shan are more demographically dispersed.

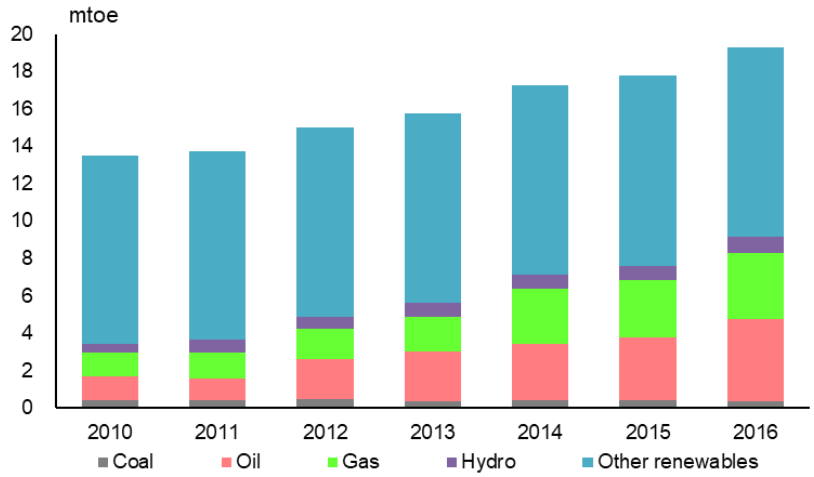
Figure 1.1: Administrative Regions and Population of Myanmar



Source: Myanmar Department of Population (2017b).

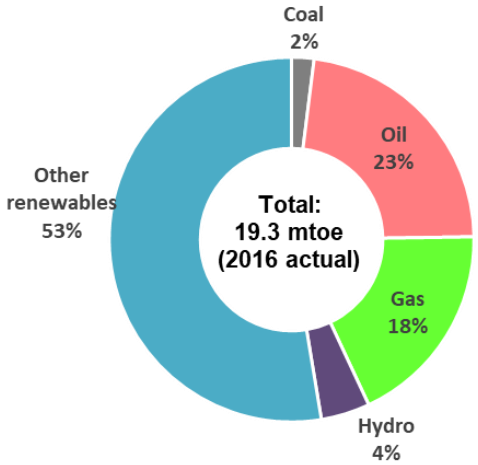
Since the 2011 economic reform, Myanmar's economy has achieved remarkable growth. During 2011–2016, the average annual gross domestic product (GDP) growth rate was 7.0%, much higher than both the global average (3.6%) and the average of the Association of Southeast Asian Nations (ASEAN)-5 countries (Indonesia, Malaysia, the Philippines, Thailand, and Viet Nam) (5.1%) (IMF, 2018). Backed by sustained economic growth, energy demand in Myanmar also increased remarkably. From 2011 to 2016, the country's GDP expanded 1.52 times and energy demand increased 1.43 times. With the current high economic growth likely to continue, Myanmar is in the process of expanding its economic activities significantly and becoming an economic power in Asia.

Figure 1.2: Total Primary Energy Supply of Myanmar (2010–2016)



Hydro = hydropower, mtoe = metric tonnes of oil equivalent.
Source: International Energy Agency (2018).

Figure 1.3: Total Primary Energy Supply of Myanmar (as of 2016)



Hydro = hydropower, mtoe = metric tonnes of oil equivalent.
Source: International Energy Agency (2018).

Whether Myanmar can sustain the level of growth that it has experienced since the 2011 reform largely depends on whether it can ensure a stable energy supply. Myanmar's energy consumption is currently one of the lowest in the world (134th of 143 countries), with a per capita consumption rate of 0.365 tonnes of oil equivalent in 2016 (International Energy Agency, 2018). This suggests that the country will need an immense volume of energy to continue its economic growth.

The importance of natural gas, which currently accounts for only 18% of the country's energy mix, is expected to increase sharply. Demand for gas will rise, particularly from the power generation sector, as building additional hydropower plants becomes more difficult for environmental reasons. Sound economic and social development in Myanmar will be unachievable without a stable energy supply, and the country's socioeconomic future largely hinges on this factor.

Given this energy demand scenario, the major objectives of the Myanmar Natural Gas Master Plan are as follows:

(i) To forecast Myanmar's natural gas demand, supply, and trade balances through 2040;

(ii) To explore the possibility of using gas in large cities in Myanmar;

(iii) To understand what infrastructure must be developed to ensure that the supply of natural gas or liquefied natural gas (LNG) meets future demand; and

(iv) To consider policy options to 'gasify' the country's energy mix.

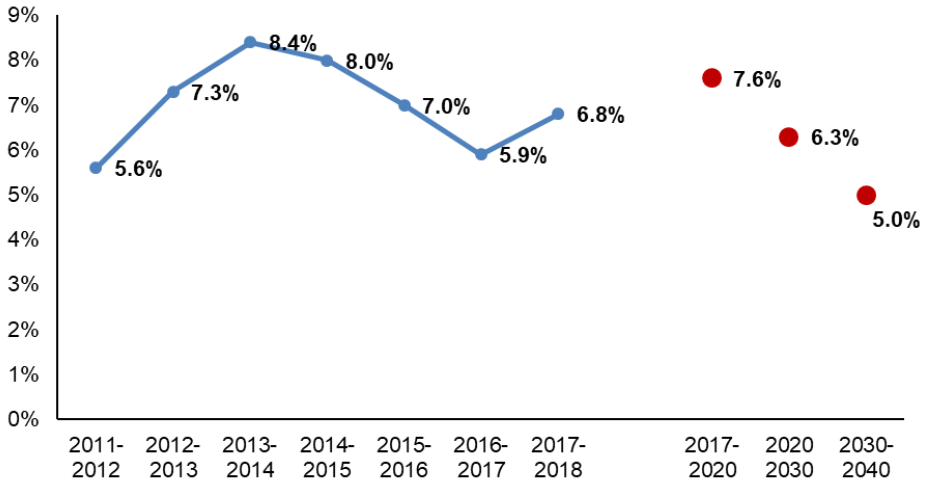
2. Key Assumptions

To prepare a future energy supply and demand outlook, it is critically important to provide appropriate assumptions for several key benchmarks.

2.1. Gross Domestic Product and Macroeconomics

Myanmar has achieved significant economic growth since the 2011-2012 economic reform, with rates as high as 8.4 percent in fiscal year 2013-2014 (Figure 1.4)

Figure 1.4: Gross Domestic Product Growth Rate and its Outlook

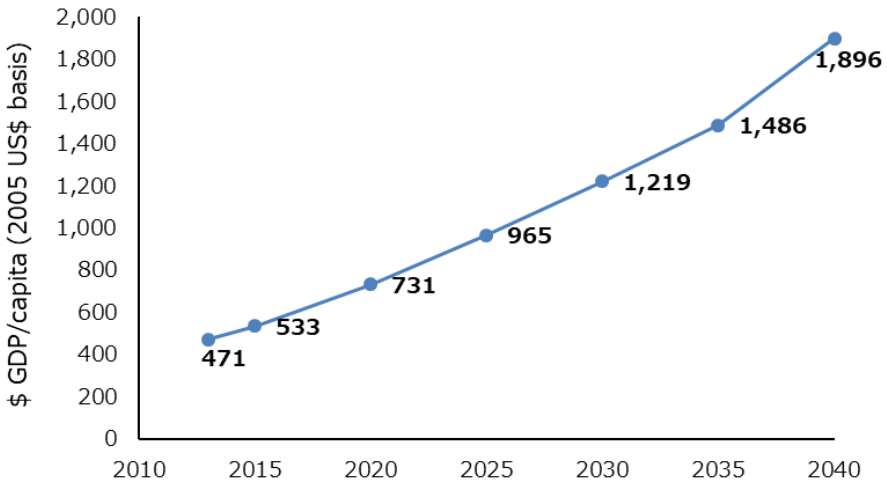


Sources: Data provided by the Government of Myanmar; figures beyond 2017–2018 are based on the Economic Research Institute for ASEAN and East Asia (2016).

In terms of GDP growth, the country is highly likely to sustain its current strong economic performance until 2020 and beyond. Many major institutions project that the country's economy will continue to perform well in the coming years. The Asian Development Bank's Energy Master Plan estimated the GDP growth rate at 7.1% through 2030 (ADB, 2015: 7), and the International Monetary Fund (IMF) estimates that this rate will remain above 7% at least through the mid-2020s (IMF, 2018). In line with the previous energy outlook prepared by the Economic Research Institute for ASEAN and East Asia, this study places the average GDP growth rate during the study period at 6.8%. More specifically, it is estimated that growth will reach 7.6% in 2015–2020, 6.3% in 2020–2030, and 5.0% in 2030–2040 (Figure 1.4) (ERIA, 2016). The growth rate is expected to moderate as the country's economy expands, as seen in many other developing countries.

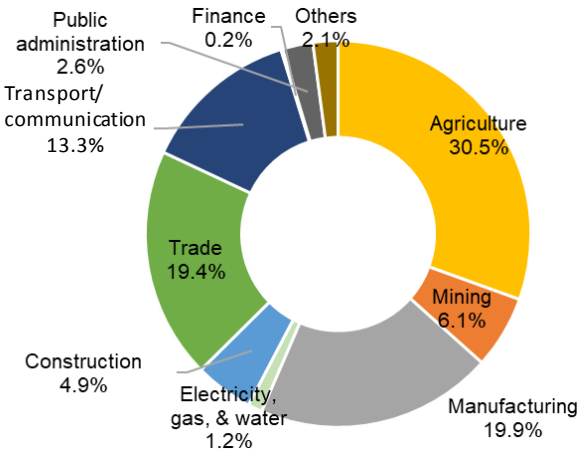
GDP per capita, which affects the level of energy demand, has also increased significantly since 2010, and is forecasted to reach $731 in 2020, $1,219 in 2030, and $1,896 in 2040. However, although this figure is growing steadily, it is not high enough assuming that city gas will be used extensively in the residential and commercial sectors. City gas use in these sectors will be limited to large cities with higher incomes through 2040.

Figure 1.5: Gross Domestic Product per Capita and its Outlook



GDP = gross domestic product.
Sources: Data provided by the Government of Myanmar; figures beyond 2017 are based on the Economic Research Institute of ASEAN and East Asia (2016).

Figure 1.6: Gross Domestic Product Component of Myanmar as of 2012



Source: Asian Development Bank (2015).

The largest economic sector in Myanmar is agriculture, which accounts for more 30% of the country's GDP. Myanmar is known for its fertile soil and delta areas along the Ayeyarwady River. The country has been a major exporter of rice to other Asian countries for many years, and beans and rice are two of the country's primary export products. While

other economic sectors such as manufacturing will grow, agriculture will remain a cornerstone of Myanmar's economy through 2040.

Another important economic sector in Myanmar is that of natural resources. Myanmar for many years has been known for its mining resources, particularly natural gas, which is by far the country's largest export commodity. Myanmar began exporting natural gas to Thailand in 2000, and to China in 2014. Thanks to the discovery of new natural gas fields off the country's northwestern coast and rising international commodity prices since 2011, exports of natural gas to Thailand have increased significantly, bringing Myanmar a sizeable amount of export revenues. Domestic demand for natural gas is growing and industrial users in Myanmar are facing supply shortages (see Chapter 5). However, as natural gas exports are a valuable source of earned foreign currency for the country, and the exports to Thailand and China are based on long-term contracts, it will not be easy to reallocate exported natural gas to domestic needs.

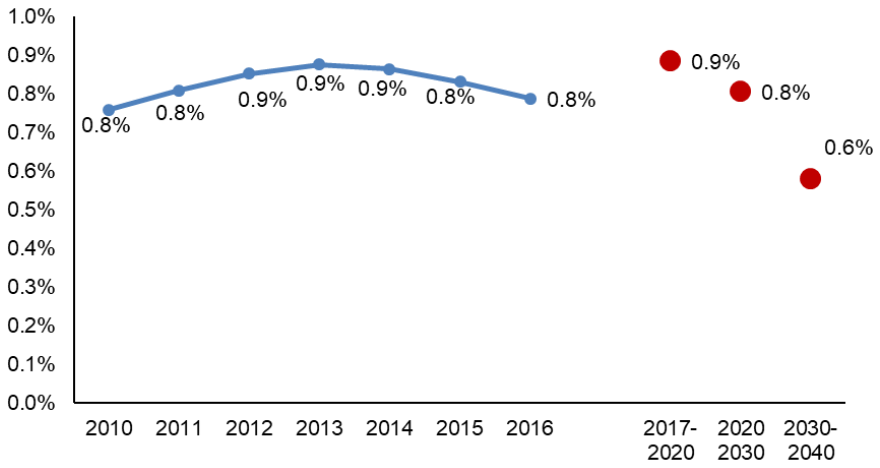
Recent economic growth has been also driven by the expansion of manufacturing activities. Economic reform policies implemented by the Government of Myanmar have played a critical role by allowing more foreign direct investment and the operation of private businesses, including foreign companies. Although there are several manufacturing bases and factories in Yangon and Mandalay, much of the manufacturing in the country is considered 'light industry' in terms of energy consumption such as food processing, the assembly of automobile parts, and textile sewing. The potential natural gas demand from the industrial sector is not currently expected to be very large; however, if large economic zone projects currently planned in Yangon or Mandalay succeed in inviting a number of investors, industrial demand for natural gas could grow significantly.

In the future, manufacturing will likely account for a higher share of Myanmar's GDP, although that of agriculture and mining will also remain high. As the country's economy becomes increasingly weighted towards manufacturing in the coming decades, its energy intensity is expected to rise, and demand growth may also accelerate.

2.2 Population

Since 2010, Myanmar's population has grown at a moderate annual rate (0.8%–0.9%). However, this represents an acceleration from the rate in the mid-2000s (0.6%), and will affect future energy demand levels.

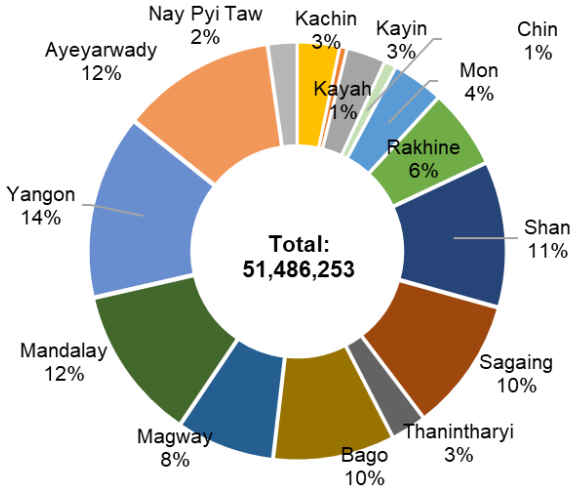
Figure 1.7: Population Growth Rates



Sources: International Monetary Fund (2018); Economic Research Institute of ASEAN and East Asia (2016).

The population census conducted by the Ministry of Planning in 2014 provided a more accurate picture of Myanmar's population dynamics. The country's total population was previously believed to be more than 60 million, but the census revealed that the actual figure was approximately 51 million. The census also revealed that the population is geographically diversified. Yangon, the most heavily populated region, is home to only 14% of the total population, and the number of its inhabitants does not far exceed that of Ayeyarwady, the second most populous region, nor that of Mandalay, the third (Figure 1.8).

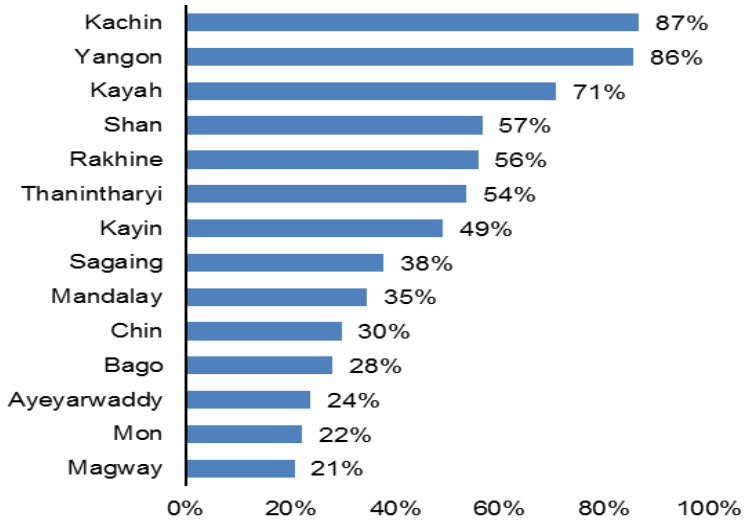
Figure 1.8: Population in Each District as of 2014



Source: Myanmar Department of Population (2017a).

The census also revealed that the northern districts of Kachin, Kayah, and Shan have higher historic rates of growth (1983–2014), while the central and southern districts (other than Yangon) have lower rates.

Figure 1.9: Population Growth Rate by Each District (1983–2014)



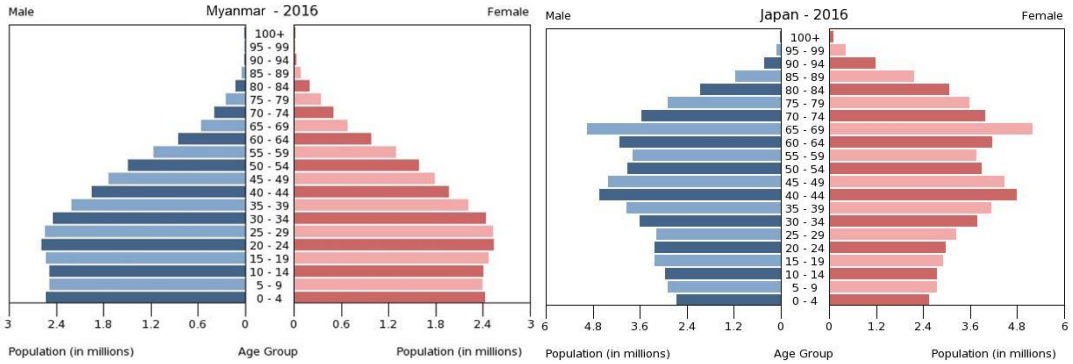
Source: Myanmar Department of Population (2017a).

The census also showed the ratio of urban to rural population in Myanmar, and revealed that 71% of the country's total population still lives in rural areas. Access to commercial energy sources such as natural gas or oil products tends to be limited in rural areas due to logistical difficulties and higher supply costs. Inhabitants of such areas usually use conventional biomass energy including charcoal and firewood as their primary energy sources in daily life. As the country's economy expands, more people will move to urban areas to access employment opportunities, accelerating the process of urbanisation. As the population of urban areas increases and living standards improve, this will generate a greater demand for commercial energy. As observed previously, the country's average per capita GDP will remain moderate, but inhabitants of urban areas such as Yangon or Mandalay may be able to afford to pay for a city gas supply in the future.

Demographically, Myanmar is a relatively young country. In 2017 the median age was estimated at 28.2, the 133rd lowest of 229 surveyed countries (US CIA website). This suggests that the energy demand will increase significantly in the future. This is supported by the population pyramid in Figure 1.10, which indicates that 26.85% of the total population is younger than 14 years old. This percentage appears remarkably high compared

to an ageing country like Japan. This demographic profile means that the number of people of working age in Myanmar is increasing, allowing the country to enjoy the benefits of a 'population bonus', which will contribute to the economy and boost energy demand.

Figure 1.10: Population Pyramid of Myanmar in Comparison with Japan



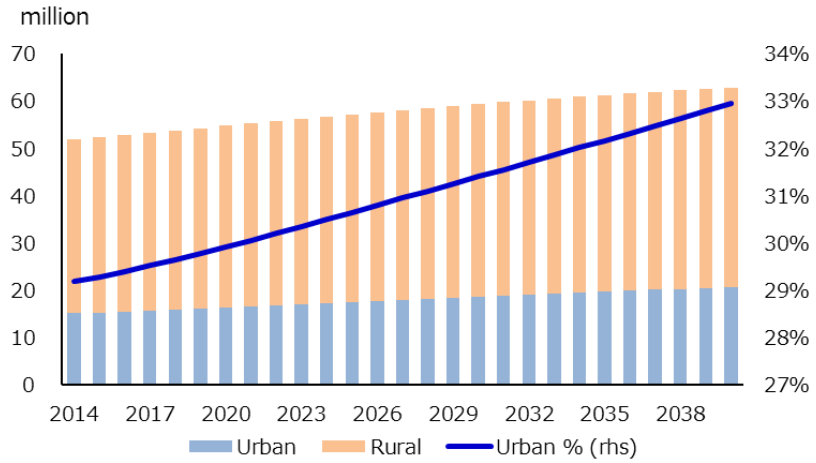
Source: United States Central Intelligence Agency website. Modified by the Institute of Energy Economics, Japan.

The country's population is forecasted to grow from 52.5 million in 2015 to 62.9 million in 2040.[1] Early in the outlook period the population growth rate is expected to be high because a large share of the younger population will have children, and an improved health care system thanks to economic growth will extend life expectancies. Growth is expected to decline in the longer term as the effect of the above factors weakens, and average fertility rates fall as the country's economy and per capita income improves (as observed in many other countries around the world).

Urbanisation, which will influence the demand for commercial energy, will also increase steadily, from 29% in 2015 to 33% in 2040. Although a large percentage of the population still resides in rural areas, urbanisation will positively affect the demand for natural gas in urban areas.

[1] Data provided by the Ministry of Electricity and Energy.

Figure 1.11: Population in Urban and Rural Areas



rhs = right-hand scale.
Source: Data provided by the Ministry of Electricity and Energy.

2.3 Energy Prices

Another important factor affecting the volume of both energy supply and demand is the energy price. This also influences Myanmar's macroeconomic performance as a resource-exporting country. Since the government regulates energy prices, international energy prices do not directly influence the energy demand in Myanmar; however, international prices, particularly the price of LNG, will affect the country's future import demand and energy balance. The price of international crude oil and LNG, as well as supply and demand during the period under study, is examined in Chapter 2.

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