

Country Profile

MYANMAR

GENERAL OVERVIEW

Republic of the Union of Myanmar (also known as Burma) is the second largest country in Southeast Asia. Its population reached 53.38 million¹ in 2017. The GDP of Myanmar was estimated at 65.6 billion¹ USD in 2017. With the abundant amount of natural resources and surplus young demographic, there is an opportunity for economy acceleration in the future. Currently, the most productive economic sectors of Myanmar are power industry as well as oil and gas, that are opened for foreign investment for several sectors. Since August 2016, China has been the largest foreign investor (around 18 billion USD) for Myanmar, followed by Singapore (around 13 billion USD). Nay Pyi Taw (or Naypyidaw) is the official capital city of Myanmar, while Yangon (or Rangoon) is the largest city.

ENERGY SECTOR

ENERGY POLICIES

Myanmar identified four main drivers for its energy policy framework:

- a) to maintain energy independent,
- b) to promote utilization of renewable energy,
- c) to promote energy efficiency,
- d) to promote use of alternative fuels.

There are several ministries that are working on energy sector in Myanmar. Ministry of Energy focuses primarily on exploration and production of oil and gas. Ministry of Forestry is responsible for biomass utilization planning. Parts of renewable energy development are within the scope of Ministry of Science and Technology. Coal mining is regulated by Ministry of Mines. The Electricity Act of 1948 (with amendment in

¹ ASEAN Secretariat. ASEAN Statistical Leaflet 2018

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1967), the Myanmar Electricity Law, and the Electricity Rules (1985) are major regulations for electricity sector in Myanmar. Two ministries are responsible for the power sector: Ministry of Electric Power No. 1 (MOEP1) and Ministry of Electric Power No. 2 (MOEP2). The main responsibility of MOEP1 is the development of hydropower, which is the main source for electricity generation in Myanmar. The MOEP2 focuses on the transmission and distribution of electricity.

Myanmar has developed National Energy Policy (issued in 2014), that aims to systematically explore the available energy resources of the country to meet the demand of the country and to export value added products for surplus resources; thus, ultimately improving the living standard of the people in Myanmar sustainably. This policy aims to electrify 100% of Myanmar's households by 2030, which comprises to connecting more than 7.2 million households within 2014-2030. Therefore, the country has to increase its electricity generation capacity to 16.6 GW. Currently, Myanmar has a total installed capacity of around 4 GW within the grid system which is mostly based on hydropower, natural gas power plant, and coal-fired power plants.

ENERGY MIX

The latest available data on Myanmar's energy sector comes from 2016-2017, as presented in **Figure 1**. It can be clearly seen that majority of primary energy supply comes from waste and biofuels (51%). Therefore, the share of renewable energy sources in Myanmar's primary energy supply is rather high (68%). According to the IEA, although Myanmar is rich in natural gas resources, most of them (79.5%) are exported and only small amount is kept for domestic utilisation in 2016.

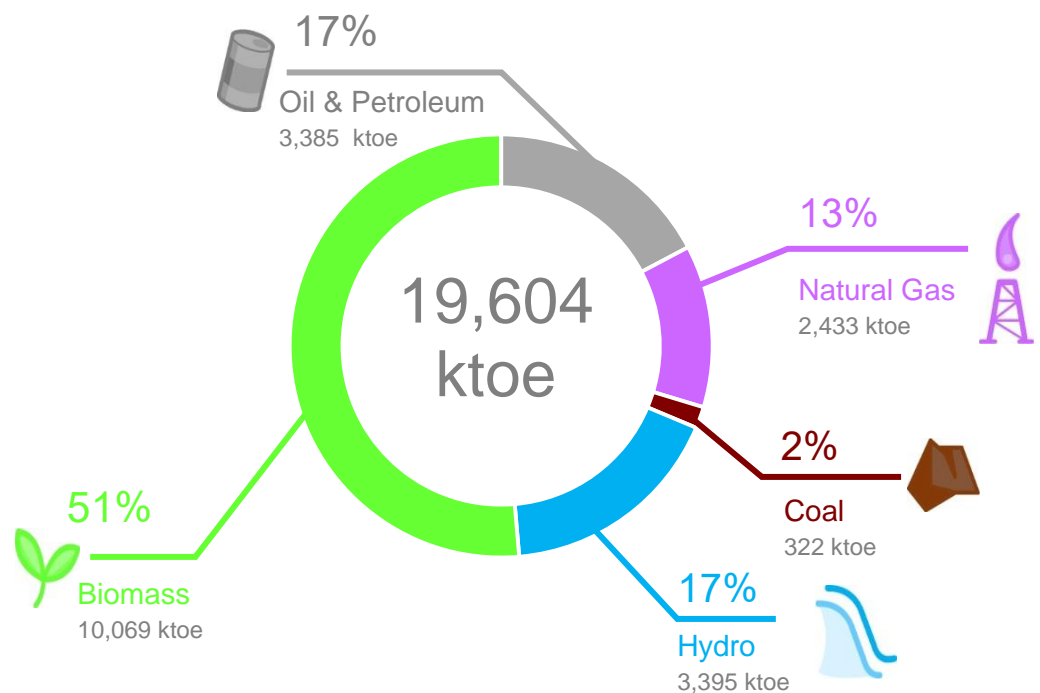


Figure 1: Primary Energy Supply (2016-2017)

Source: Minister of Electricity and Energy Myanmar. Energy Policy (B)

The power generation capacity in 2015-2016 is shown in **Figure 2** that amounted to 15,971 GWh. Hydropower is the dominant source in electricity production (69%), while the remaining 39% are shared between various fossil fuels.

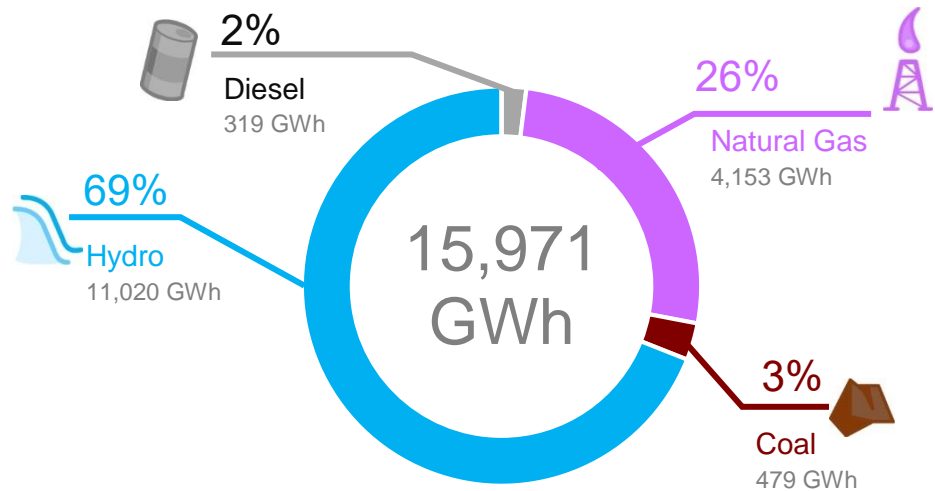


Figure 2: Share of energy sources in Myanmar’s electricity supply (2015-2016)

Source: Ministry of Electricity and Energy 2017 Myanmar. Current Status of Myanmar’s Energy Statistics

ELECTRICITY TARIFF & ELECTRIFICATION RATE

The electricity tariff in Myanmar is distinguished between the residential consumers and the commercial-industrial sector. **Figure 3** presents the electricity tariffs applied by the national grid. The electricity tariffs for residential in Myanmar are generally lower than ASEAN average.

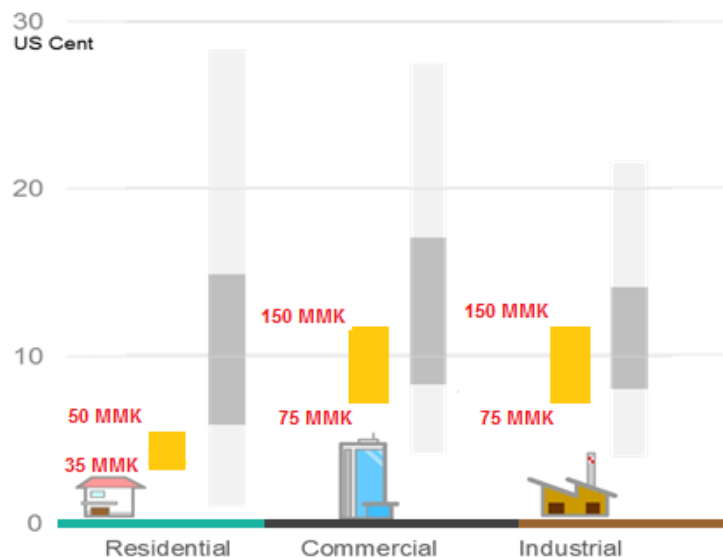


Figure 3: Electricity tariff in Myanmar

Source: Myanmar Electric Power Enterprise

Note: Conversion rate for MMK to USD is 0.00064 (as of September 2018)

The electricity tariffs in both sectors depend on the consumption level. For residential consumers, the tariff increases as the consumption level increases while for the commercial-industrial sector, the tariff increases until 50,000 KWh consumption. For higher consumptions the rate is then reduced.

Electrification in Myanmar is the focus area that requires an urgent development. According to Myanmar Ministry of Energy in 2016, the electrification rate of Myanmar is only at 34%. This implies that around 36 million people remain without access to electricity. Yangon city has the highest electrification ratio of approximately 78%, followed by Kayar (46%), Mandalay (40%), and Nay Pyi Taw (39%) the capital city.

RENEWABLE ENERGY SECTOR

RENEWABLE ENERGY TARGETS

According to the National Electricity Master Plan, Myanmar Ministry of Energy has defined five supply of expansion process from 2014 to 2035. These feed into a national investment strategy in energy sector infrastructure and form the basis for recommendation on institution building for Myanmar's future national renewable energy planning.

Myanmar has set renewable energy target, aiming at 9% share of renewables in the total installed capacity by 2030, most of which will be used to advance rural renewable energy purposes. The overall RE contribution to the newly installed power generation capacity (without large hydro) will be 2,000 MW compared to the total capacity of 23.6 GW in the National Electricity Master Plan in 2030. In addition to this amount, 7,405 MW or 31% from the total capacity is set for middle-small hydro power.

INSTALLED CAPACITY OF RENEWABLE ENERGY

Myanmar's electricity grid has the largest share of renewable sources among the other ASEAN countries. Solar Photovoltaic, wind, mini hydro power, biomass, bio-fuels, and biogas are the renewable sources that are established in Myanmar, as the large hydropower is not considered renewable. Hydropower is the main source of electricity generation in Myanmar with the total resource amounted at 108,000 MW with 46,330.55 MW is the investigated number. From this amount, 231 MW is from small hydro power (<10 MW). However according to the Ministry of electric power, the installed capacity of hydropower in Myanmar reaches 3,251.5 MW and 48,264 kW for small hydropower in 2018. NantKhamKha power station has the largest installed capacity (4.75 MW). Apart from hydropower, solar photovoltaic is the only other RE source existing currently in Myanmar with 5 MW capacity.

RENEWABLE ENERGY GENERATION

The electricity from renewable sources is generated from Photovoltaic, wind turbine and micro hydro with the amount of 10.94 GWh, 0.0016 GWh, and 1.253 GWh respectively in 2015-2016. Traditional biomass is used mainly for thermal energy application such as cooking in households. The final consumption of biomass in 2016 was 9,306 ktoe.

RENEWABLE ENERGY MARKET

International involvement in development of the renewable energy market in Myanmar will continue to focus mainly on feasibility studies, technology assessment, and renewable energy potential evaluation. Myanmar possesses significant renewable energy resources, for example there is a considerable market potential for solar photovoltaic systems. Currently, photovoltaic panels are imported mainly from Singapore, Thailand, China, and Japan. However, there are still many challenges to overcome to encourage higher investment in this sector.

The Government of Myanmar has not published any official selling tariff, however small rural electrification projects are using fixed monthly fees pre-determined based on the expected power consumption which has been applied for several off-grid biogas or biomass gasification project in Myanmar.

Myanmar also has no specific renewable energy incentives but investors can draw on the incentives provided in the new Foreign Investment Law (2012) which includes tax exemption, and customs duties relief.

The off-grid renewable energy based rural electrification projects can have access to soft loans from domestic financing institutions and international donors. The government also provides some grants for the rural electrification projects.

ENERGY EFFICIENCY AND CONSERVATION (EE&C) SECTOR

EE&C TARGET

National Energy Efficiency and Conservation Policy, Strategy and Roadmap has defined targets on energy saving which has been defined by Ministry of Industry in 2016 has set target to reduce energy intensity 12% by 2020, 16% by 2025 and 20% by 2030 from base year 2012.

The target for energy efficiency, set by the Ministry of Energy in 2008, was 5% reduction in total energy consumption by 2015 and 8% by 2020 from base year 2005. The basis for these targets is in line with targets set by the Association of Southeast Asian Nations. To strengthen the institutional setup, an energy efficiency and conservation division under the Directorate of Planning at Ministry of Industry was established in April 2014. Please mention few more words about the directorate of planning at Ministry of Industry such as how is it different than the ministry.

EE&C POLICY

In 2014 the government of Myanmar released the National Energy Policy, which highlighted the importance of EE&C for the country's long-term energy goals, and recognized the financial gap to finance projects, particularly in the industry sector. The National Energy Policy 2014 states the need to improve the availability of energy supply in Myanmar through the development of the country's renewable energy resources and improvement in energy efficiency in all sectors of the economy. Various Energy Efficiency and Conservation (EE&C) objectives and work programs are included in the document, which are contained within the following policy framework:

1. To conduct awareness raising campaign and capacity building regarding energy efficiency and conservation programs
2. To prescribe relevant legal framework including laws, rules and regulations etc. required for the implementation of energy efficiency and conservation programs
3. To establish a dedicated department responsible for successful implantation of energy efficiency and conservation programs
4. To implement resources mobilization and exchange of experience of problem in coordination with international organisations who are working on energy efficiency and conservation programs
5. To formulate funding mechanism in order to successfully implement energy efficiency and conservation programs

In 2015, the Government of Myanmar developed a long-term energy master plan, including EE&C elements with support from ADB. As part of this collaboration, the government released the National Energy Efficiency and Conservation Policy, Strategy and Roadmap (2016). As part of this roadmap, the government identified Myanmar's energy consumption patterns and future demand, as well as the potential to reduce energy consumption by 25% by addressing EE&C issues mainly on the industrial (8.84%), commercial (4.97%) and residential sectors (9.70%); an additional potential of 1.7% was identified in other sectors

EE&C POTENTIAL

Myanmar has significant potential in industrial and commercial activities for substantial energy saving. The potential savings are estimated at 45% for the iron and steel industry, 65% for the pulp and paper industry, 35% for sugar mills due to their high electrical and thermal demands, and 4% for the thermal power plants. In overall, the average energy saving potential for the industry sector is about 20% and would lead to reduce the CO₂ emission by 78,690 tons in 2020.

EE&C INVESTMENT AND IMPLEMENTATION

There is well known that the country needs large investments for the Energy Efficiency measures in sectors such as industry, buildings, transport, etc. Financing of EE&C programs in Myanmar is still at a very early stage. Although the majority of industrial energy efficiency investments are financially viable, most enterprises would rather invest in business expansion than promoting energy efficiency measures due to the cheap electricity price. The same also applies true for the commercial and industrial sector.

According to Myanmar Ministry of Energy, the country's transmission system loss is getting better year by year but the 20% loss in electrical distribution in 2014 is still far worse than the world's average (9%). Hence, this sector is becoming one of government's priority for energy conservation. Through a 100 million USD governmental loan, the Myanmar's government has confirmed to finance phasing out the old 6.6-kV systems in favour of an 11-kV network, and to expand the 33-kV systems. Transition to the higher voltage transformer is necessary in order to reduce the transmission loss.

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