

Executive Summary

Natural gas is an important energy source for Myanmar and its share to total indigenous production was 61% in 2017, whilst 76% of the gas production was exported to Thailand and China in the same year. The major domestic use of natural gas in Myanmar is power generation (its share was 75% in 2017) and the remaining is used for heating demand in the industry sector and compressed natural gas vehicles in the road transport sector. However natural gas production is forecast to decline continuously up to 2040 according to the Natural Gas Master Plan for Myanmar (2019) and on the other hand, electricity consumption will increase remarkably according to the Myanmar Energy Outlook (2020). Thus, the import of liquefied natural gas (LNG) and the diverse power generation mix will be options for Myanmar for securing domestic natural gas supply.

Myanmar is fully dependent on imports of oil and its import share was 92% in 2017. Therefore the issues of oil supply are: (i) having strategic oil stockpiles including national and private ones, (ii) the need to diversify oil import sources to seek a wider area such as Japan and the Republic of Korea, and (iii) shifting from internal combustion engine vehicles to electric vehicles, which will use electricity from hydropower generation.

Coal consumption in Myanmar is limited and its share to total primary energy supply (TPES) was 2.6% in 2017. But coal will be a strategic energy source in order to diversify power generation sources with the application of clean coal technology. But the coal mining sites are located in northern Myanmar, whilst the big electricity demand is from southern Myanmar. Consequently, logistics to bring coal from the north to the south is crucial.

Hydropower generation is a key energy source and its share to TPES was 5% in 2017. But looking at a generation basis, its share was around 60%, followed by gas power generation. Hydropower generation is classified as domestic energy and does not emit CO₂. Therefore, the deployment of hydropower generation will contribute to improving energy supply security and mitigate CO₂ emissions in Myanmar.

Biomass is being phased out from the energy market in Myanmar and this trend will continue in the future. But biomass's share to TPES was 43% in 2017 and if biomass is substituted by oil and electricity continuously in the future, energy supply security of Myanmar will be vulnerable. Thus, the continuous use of biomass is one option for Myanmar to maintain its energy supply security.

Renewable energy such as solar photovoltaic (PV) and wind power generation is an option for Myanmar, but due to its negative characteristics which are intermittency, seasonal fluctuation, low capacity factor, and relatively higher generation cost, the rapid increase of renewable energy is not an appropriate energy policy for Myanmar.

As a result of the study on energy supply security for Myanmar, this report suggests available energy supply security scenarios as follows:

1. The recommended power generation mix in 2040 would consist of coal 19%, natural gas 11%, hydropower 56%, and RE and biomass 12%. It will be a well-balanced composition of the power generation mix compared to the business as usual (BAU) scenario, which is coal 0.4%, natural gas 51.1%, hydropower 47.2%, and renewable energy and biomass 1.3%. This report suggests that Myanmar increase coal-fired power generation using both domestic and imported coal and enhance the development of hydropower generation as well as RE.
2. Natural gas consumption will be secured if Myanmar will apply the recommended power generation mix mentioned above. Natural gas production in the BAU scenario in 2040 will be 8 million tons of oil equivalent (Mtoe) and the energy supply security scenario will be 2.47 Mtoe, so that Myanmar will continue to export certain amounts of natural gas to neighbouring countries until 2040 compared to the BAU scenario.
3. The share of renewable energy and biomass power generation in 2040 will be 12% and it will be much higher than 1.3% of the BAU scenario. This report expects the generation cost of RE power will decline in future and it will be available to use as one of the power sources. Thus, the renewable energy power share of 8% of total power generation is not an ambitious target.
4. A key policy to maintain oil supply security for Myanmar is to prepare strategic oil stockpiles to consist of national and private ones and to set private stockpiling as a higher priority than national ones. Mandatory private stockpiling such as 30 days is suggested under workable sub-decrees or regulations.
5. The biomass share per TPES of the BAU scenario will be 24% in 2040, on the other hand, the same share in the energy supply security scenario will be 30%, slightly higher than in the BAU scenario. The facilitation of a biomass supply chain and application of efficient types of biomass cooking stoves are recommended.
6. The share of domestic energy of the security scenario in 2040 will be about 49.7% and it will be the same as in the BAU scenario (49.9%). Looking at details, the major energy imports of the security scenario in 2040 will be oil and coal, on the other hand, in the BAU scenario it will be oil and LNG. In addition, the share of coal, hydropower, and biomass (they are classified to lower the energy price) per TPES in the security scenario will be 55% in 2040, on the other hand in the BAU scenario it will be 37%. Therefore, CO₂ emissions of the energy supply security scenario will be 20.6 million carbon-ton, a bit higher than the BAU scenario (19.8 million carbon-ton). As a result, the security scenario will clear two criteria: accessibility and affordability. For sustainability, the utilisation of domestic coal for power generation with a robust coal supply chain in Myanmar (increase of share of domestic energy) and the deployment of hybrid power systems (combined hydropower and solar PV generation [reduction of CO₂]) will contribute to maintain the sustainability.

7. An energy efficiency and conservation policy is indispensable for Myanmar to curb energy consumption, especially fossil fuel consumption. The promotion of energy efficiency and conservation to be applied across the final consumption sectors should contribute to energy supply security in Myanmar through saving oil and electricity consumption.

This report presents an energy supply security scenario for Myanmar, but this scenario will be influenced by the social and economic situation of Myanmar and the world. Therefore, updating the scenario periodically like a rolling plan is recommended.