



Chapter 5

Conclusions and Policy Implications

Conclusions

To produce the Myanmar Energy Statistics 2000–2016, the Economic Research Institute for ASEAN and East Asia (ERIA) and the Oil and Gas Planning Department (OGPD) conducted the following research activities:

- 1) Collect existing energy data and assess quality of the data.
- 2) Conduct energy demand surveys for the final energy consumption sector, which consists of the industry, road transport, residential, and commercial sub-sectors.
- 3) Collect sales data of petroleum products from oil-importing companies in Myanmar.
- 4) Estimate missing data.
- 5) Produce Myanmar's energy balance tables (EBTs) for 2000–2016 based on existing data and the estimated data from the survey results and other information.
- 6) Analyse the EBTs to evaluate the energy demand–supply situation of Myanmar.

Available existing energy data for both supply and demand sides are abundant but the quality of some data is not good, so that ERIA/OGPD revised the inconsistent data. ERIA/OGPD also faced missing data, which is on sub-bituminous coal and lignite consumption for power generation, opening and closing stocks of crude oil and petroleum products, disaggregation of own use to

each type of power plant, etc. Some data was estimated, and some was treated as zero.

ERIA/OGPD selected a local consultant, the Myanmar Survey Research (MSR), to conduct the energy demand survey. The survey was successful, but the quality of its results was not good because this was the first time for Myanmar to conduct such a survey. However, ERIA/OGPD found several meaningful results:

- 1) Energy consumption of the industry sector can be separated into 13 industrial sub-sectors, but GDP can be separated into only a few industrial sub-sectors.
- 2) Gasoline consumed for road transport activities, which is estimated based on the survey results, is the same as gasoline demand in transport activities of OGPD data.
- 3) The results of the commercial survey might indicate reasonable building energy intensity after removing the outliers.
- 4) The household survey suggests that biomass share from existing data is a bit high. This indicates that households in Myanmar are aggressively shifting from biomass to conventional energy, such as liquefied petroleum gas or electricity.

The sales data from oil companies in Myanmar has not been completed. The sales data would be useful, so ERIA should encourage the OGPD to complete this survey.

The EBTs of Myanmar are successfully produced based on existing and estimated energy data using the computer software presented by ERIA to analyse the data. According to the analysis, Myanmar has been an oil- and natural gas-producing country. Natural gas is an important energy source for the country; it is for domestic consumption, mainly power generation, and for export. But share of domestic oil has been declining and its share of 2016 was around 10% of total oil supply.

Policy Implications

Myanmar's EBT 2000–2016, as prepared by ERIA/OGPD, yields the following key findings:

- 1) The total final energy consumption (TFEC) and the total primary energy supply (TPES) for 2000–2016 grew 2.7% and 3.2%, respectively. For the TFEC, biomass was the dominant energy source, followed by petroleum products and electricity. But electricity marked the highest growth, 10.2%, followed by coal and petroleum products. For the TPES, biomass was still dominant in 2016, followed by gas, petroleum products, and hydro. But hydro marked the highest growth rate, 12.3%, followed by coal, gas, and petroleum products.
- 2) CO₂ emission from combusting energy (fossil fuel) also largely increased to about 21 CO₂ million tons in 2016 from 9 CO₂ million tons in 2000, which grew 5.7% per year. Major energy sources that emitted CO₂ in Myanmar were oil and gas. In 2000–2016, oil and gas increased 6.0% and 6.4%, respectively. Consequently, the growth rate of CO₂ was much higher than the TPES in 2000–2016.
- 3) Hydropower generation is clean in terms of CO₂ emission, but it faces seasonal fluctuation. On the other hand, gas power generation can achieve stable electricity supply, but it emits CO₂. Consequently, they are complementary. Since both are national energy sources, they will surely contribute to maintain energy supply security.
- 4) Energy intensity, defined as TPES/GDP, improved by 65% in 2000–2016. Also, elasticity defined as TPES per GDP was 0.3 (3.22/10.09) in the same period. The reason for this lower elasticity is that electricity and petroleum demand increased rapidly but biomass demand decreased, so that biomass absorbed the increase of electricity and petroleum products.

The policy implications of the key findings mentioned are as follows:

- 1) The TFEC increased 3.2% per year in 2000–2016 but, without biomass, was 6.5% per year in the same period. GDP elasticity was still less than 1 (6.5/10.1) but energy consumption in the industry and the transport sectors (especially road subsector) marked 3.6% and 5.6% per year, respectively. Consequently, energy efficiency and conservation (EEC) policies, such

as energy management system and standard and labelling (S&L), will be implemented in both sectors.

2) The dominant electricity consumer was the residential sector, so that efficient use of appliances is essential and EEC policies, such as media campaigns and S&L, will be effective.

3) Myanmar's import dependency ratio (%), defined as import/total supply, had been less than 10% until 2013 but it jumped to 15% in 2015. The rapid increase of petroleum consumption across the sector brought about this result. Internal use of domestic energy, such as natural gas and hydropower generation, will be essential for Myanmar. On the other hand, both energy sources are important as export goods. Since the use of hydropower generation and natural gas is good for maintaining energy security yet causes Myanmar to lose income from the export of electricity by hydro and natural gas, this is controversial issue.

4) Thermal efficiency of natural gas power generation, which is the second-largest power source, was very low, 20%–25%, in 2000–2016 due to the existing old-type power plants. Replacement of existing plants with combined cycle gas turbines and allocation of the saved gas for export will be recommended.

These energy statistics should be updated every year so that the OGPD/ Ministry of Electricity and Energy will continue to release Myanmar's EBTs through collecting updated original energy data and estimating it.