

Executive Summary



The Economic Research Institute for ASEAN and East Asia (ERIA) updated the East Asia Summit (EAS) Energy Outlook in 2019–2020 by revising the macro assumptions such as economic and population growth as well as crude oil price under the lower scenario in 2019 level. This outlook also incorporates more recent information on the EAS17 member countries' energy saving potentials and energy efficiency goals, action plans, and policies, including power development plans such as renewable electricity. However, this outlook does not reflect the impact of the coronavirus (COVID-19) pandemic.

The outlook still focuses on analysing the additional energy savings and renewable energy (RE) penetration that might be achieved by the individual countries above and beyond the Business-as-Usual (BAU) scenario projection. It continues to examine two scenarios – the BAU and the Alternative Policy Scenario (APS) – and the outlook predicts energy supply, consumption, and associated CO₂ emission from 2017 up until 2050. The APS includes not only more ambitious energy saving targets, but also rapid advances in low-carbon energy technologies and renewable energy.

Under the BAU scenario, sustained population growth and economic growth will significantly increase Total Final Energy Consumption (TFEC), by 1.4 times, from 2017 to 2050. The Primary energy supply in the EAS17 region is projected to grow at the same pace as TFEC – by 1.1% per year. EAS17 primary energy supply is projected to increase from 7,625 Mtoe in 2017 to 10,780 Mtoe in 2050. Coal will remain the largest share of primary energy supply, but its growth is expected to be slower, increasing by 0.3% per year from 2017–2050. Consequently, the share of coal in Total Primary Energy Supply (TPES) is forecast to decline from 40.2% in 2017 to 31.7% in 2050.

Fossil fuel energy consisting of coal, oil, and gas will still be dominant in 2050 and its share under the BAU will be 81.3%. If EAS17 countries remain dedicated to implementing their energy efficiency and conservation (EEC) policies and increase low-carbon energy technologies such as nuclear power generation and solar photovoltaic (PV)/wind (APS), the EAS17 region could achieve TPES savings of 17.8% and the fossil fuel share could fall to 69.7% by 2050. Consequently, CO₂ emissions would fall significantly, by about 37.9%, from BAU to APS in 2050. It is essential, therefore, that EAS17 countries implement their EEC and renewable energy polices (energy saving targets and action plans) as scheduled.

The targets and action plans that will be applied across sectors – industry, transport, residential, and commercial – should be appropriate and feasible.

Renewable energy such as hydro, geothermal, solar PV, and wind and biomass will also contribute to the expected reduction of fossil fuel consumption, which will result in a mitigation of CO₂ emissions. To increase the share of renewable energy in the primary energy mix, appropriate government policies will be crucial. Policies such as renewable energy targets, Renewable Portfolio Standards (RPS), and Feed-in-Tariff (FIT) have been implemented in some of the EAS17 member countries and have accelerated the deployment of renewable energy domestically.

Energy supply security has become a the priority energy issue for the EAS17 region. Implementing EEC measures and increasing renewable energy shares will certainly contribute to maintaining regional energy security through the reduction of fossil fuel consumption and increasing the use of domestic energy. For ASEAN, regional energy networks such as the Trans-ASEAN Gas Pipeline (TAGP) with virtual pipelines of LNG and the ASEAN Power Grid (APG), are recommended to maintain energy supply security in the region. Nuclear power generation is another option for securing the energy supply in the region.

The ERIA EAS17 Energy Outlook 2020 showed that coal power generation will remain dominant in the EAS17 region up until 2050. Increasing the use of Clean Coal Technology (CCT) and development of Carbon Capture Storage (CCS) technology will be critical for the coal power plants in this region to become carbon free. Hydrogen technology will also play a key role as an alternative to fossil fuels and can be applied across sectors such as power generation, industry, and transportation.

The Energy Outlook also includes an estimation of the investment cost required for power generation and the other energy infrastructure including the LNG receiving terminals, and oil refineries. The analysis results indicate that the EAS17 region will need around US\$3.92 trillion for the BAU case, and US\$5.93 trillion in the APS for power generation investment to meet electricity demand by 2050. The reason why investment in the APS is bigger than under BAU is an aggressive shift to variable renewable energy (VRE) such as Solar PV and wind.

The required investment cost of refinery and LNG receiving terminals in EAS17 will amount to US\$410 billion and US\$164 billion, respectively, in the BAU scenario. The investment in the APS is expected to result in a reduction of US\$77 billion for LNG receiving terminals due to the promotion of energy efficiency. However, these investment costs will be much lower than the investment cost for power generation. The share of investment cost of refineries and LNG receiving terminals in power generation facilities will be 14% under BAU and 1.2% in the APS, respectively. These results seem to indicate that petroleum demand will saturate, but that other VRE power generation will expand sharply due to an expected stable increase in electricity demand and the low-carbon policies in China and the Organisation for Economic Co-operation and Development countries in the EAS region such as Japan and the United States.

