Executive Summary

The Economic Research Institute for ASEAN and East Asia (ERIA) East Asia Summit (EAS) Energy Outlook has been updated in 2015–2016 by revising the macro assumptions, such as economic and population growth as well as crude oil price under the current lower scenario. In addition, this outlook incorporates more recent information on the EAS 16 member countries' energy saving potential and energy efficiency goals, action plans, and policies, including power development plans such as renewable electricity.

The outlook still focuses on analysing the additional energy savings that might be achieved by the individual countries above and beyond the Business-as-Usual scenario (BAU) projection. It continues to examine two scenarios, the BAU and the Alternative Policy Scenario (APS), but it is extended from 2035 to 2040. The APS includes not only more ambitious energy saving targets but also rapid advances in low-carbon energy technologies and renewable energy.

The ERIA EAS Energy Outlook results of both primary and final energy consumption of 2015–2016 are slightly higher than the results in 2014–2015. This is due to the changes in gross domestic product (GDP) assumption in countries estimated. Accordingly, the energy saving potential and carbon

dioxide (CO_2) reduction potential defined as BAU–APS in terms of energy demand and CO_2 emissions will also be higher.

Under the BAU, the sustained population and economic growth will significantly increase Total Final Energy Consumption (TFEC) by 1.8 times from 2013 to 2040. Total Primary Energy Supply (TPES) will also increase by 1.8 times over the same period. Although energy demand will continue to increase, GDP elasticity, defined as the growth rate of energy demand as a share of the growth rate of GDP, is expected to improve from 1.06 in 1990–2013 to 0.56 in 2013–2040. In other words, there will be a significant reduction in energy intensity, defined as energy demand as a share of GDP, in the EAS region.

Fossil fuel energy consisting of coal, oil, and gas will still be dominant in 2040 and its share under the BAU will be 84 percent. If EAS 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 EAS region could achieve fossil fuel savings of 23 percent and the fossil fuel share could fall to 76 percent. CO_2 emissions would be reduced significantly as a consequence. In view of this, EAS countries need to 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. Government support for EEC service companies' activities is also essential.

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 CO_2 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 EAS member countries and have accelerated the deployment of renewable energy domestically.

Energy supply security has become a top priority energy issue for the EAS 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. Regional energy networks such as the Trans-ASEAN Gas Pipeline and the ASEAN Power Grid, a liquefied natural gas (LNG) receiving terminal, and oil stockpiling through the ASEAN Petroleum Security Agreement are recommended to diversify energy supply sources. Nuclear power generation is another option for securing the energy supply in this region.

According to the Energy Outlook 2016, coal power generation will be still dominant in the EAS region by 2040. 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 residential.

This year the Energy Outlook includes an estimation of the investment cost required for power generation. The analysis results indicate that the EAS region will need about US$4 trillion for the construction of power plants to meet the additional capacity requirements. By region, ASEAN will need US$600 billion and the 'Plus 6' countries will need US$3.4 trillion for power generation facilities. The share of investment cost by power plants will be quite different between the BAU and the APS. Under the BAU, most of the investment will be allocated to coal power plants, whereas under the APS most of the allocation will be to renewable energy electricity such as hydro and solar PV/wind in ASEAN and renewable energy electricity and nuclear power plants in the 'Plus 6' countries. If EAS countries want to implement their ambitious low-carbon energy policies (APS), they will need to allocate significant amounts of money to developing nuclear, hydro, and solar PV/wind power plants.