Renewable Energy Investment for Power Generation in the East Asia Region

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Abstract

Sustained population and economic growth in the East Asia Summit (EAS) region [the original EAS plus United States of America (EAS17)] are the key drivers for the projection of an increasing energy demand for both primary and final energy consumption to nearly 50 percent from 2015 to 2040 periods, reflecting annual growth rate of about 1.6 percent annually. The increasing energy demand poses a threat to the region's energy security. Hence, potential energy saving and investment in renewable energy are key to reducing energy demand and carbon dioxide (CO_2) emissions. This study is part of the Energy Outlook study in East Asia region that had quantified the estimated the necessary investment in the power sector, especially power generation facilities, which comprise of coal, gas, nuclear, hydro, geothermal, solar photovoltaic (PV), wind, and biomass power generation plants. The study employed several sources of information to obtain the current capital cost of each power plant, but it did not forecast future capital cost due to its uncertainty. For all the EAS17 countries taken together, the amount of investment needs to meet the electricity demand would be $US 3.5 trillion for BAU case, and $US 4 trillion in APS. This investment cost considers the reduction of upfront cost of each technology due to fast drop of unit cost of each of the technology, especially the renewable one. The Increment of electricity demand from 2015 to 2040 of BAU will be 13,361TWh. On the other hand, its APS will be 12,641 TWh. But APS will shift to more renewable and nuclear energy and power capacity will be 3,119 GW which will be bigger than BAU, 2,875 GW due to lower operation rate of renewable energy. However, the necessary investment cost for power generation in APS case will be higher than BAU. The study also estimated the energy saving potential brought about by improvements in both the transformation sector, particularly power generation, and the final energy consumption sector where efficiencies of household appliances and more efficient building designs are expected. The findings of this study would continue to set light towards policy implications for decision-making to ensure that the region could enjoy both economic growth and renewable energy investment opportunities to improve energy security and environmental in EAS17 region.

Keywords: *Renewable Investment, Primary Energy Supply, Final Energy Consumption, Energy Saving Potential.*

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