

ASEAN energy security : An indicator based assessment.

The paper talks about the energy security of ASEAN countries accounting for 9 countries excluding Lao PDR. There are many definitions of energy security of which the developed countries and developing countries are defined differently. ASEAN have an objective to establish energy security region-wide in energy field. The roadmap consists of 7 projects : ASEAN Power Grid, Trans-ASEAN Gas Pipeline, Coal and Clean Coal Technology, Renewable Energy, Energy Efficiency and Conservation, Regional Energy Policy and Planning, and Civilian Nuclear Energy. The study aims to evaluate the energy security of all ASEAN members excluding Lao PDR in 3 dimensions : energy supply, socio-economic and environmental. Indicator-based assessments were used in this paper with the total of 35 indicators in consideration according to each dimension that the researcher has aimed to study of which came from the previous study. These indicators can be categorized into 6 components : overall energy balance, demand management, security of domestic resources, vulnerability to overseas resources, diversification of energy supply, and environmental sustainability. Firstly, the overall energy balance consists of ‘primary energy mix’ and ‘electricity generation by sources’, which refers to hydroelectricity, natural gas, oil and other renewable energy. Secondly, demand management talks about energy accessibility and efficiency, which consist of ‘access to electricity’, ‘total primary energy supply per capita’, ‘final energy consumption per capita’, ‘electricity consumption per capita’, ‘total primary energy supply intensity’ and ‘electricity intensity’. Thirdly, talks about domestic energy resources where the indicators had been used; ‘self-sufficiency’, ‘reserve-to-production’, and ‘refining capacity’. Fourthly, it represents the biggest concern, overseas energy resources. It considered ‘energy import dependency’, ‘reliance on Middle East imports’ and

‘intra-regional energy imports’. Fifthly, mainly discuss about supply diversification and supplier diversification. It uses Shannon-Weiner Index (SWI) to measure the degree of primary energy supply diversification. Furthermore, Herfindahl-Hirschman Index (HHI) were used also to reflect the degree of concentration of the import source/partner country. Lastly, environmental focus components used ‘share of fossil fuel energy consumption’, ‘CO₂ intensity’ and ‘CO₂ emission per capita’ indicator to reflect the share of renewables and capturing performance of the country in carbon challenges. The result of the study shows that ASEAN has a diversified energy mix and can classify countries into importer and exporter which is the proof of intra-regional energy markets existence but this does not reflect in a long term because the resources depletion among the member countries. Furthermore, there are evidences of the gap of economic development in terms of energy development among member countries. In addition, the emission rate of CO₂ within the region is considerably high, those with low emission did not achieve modern energy systems yet. Nevertheless, the study lack in-depth analysis of each particular countries and the particular reason of those outlier statistics in each specific country. Furthermore, there are many other dimension of energy security to consider in order to reach the conclusion.