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***The Challenge of Estimating the Energy Saving Potential and Preparing Better Energy Statistics in East Asia***

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Estimating the energy savings potential in East Asia Summit (EAS) countries proved to be very challenging. This has become apparent in a study being conducted by a working group composed of members from 16 EAS countries under the auspices of the Economic Research Institute for ASEAN and East Asia (ERIA). The possible root cause of the difficulty is in the lack of energy statistics in a number of EAS developing economies.

The energy savings and CO<sub>2</sub> emission reduction potential study aims to estimate the energy savings that could be achieved from energy saving goals and action plans of each EAS country and the corresponding reduction in CO<sub>2</sub> emissions until 2030. The methodology used in the study was to project the energy consumption in a business-as-usual (BAU) scenario and in an alternative policy scenario (APS). The BAU assumes the continuation of past energy consumption trends without new demand intervention policies while the APS assumes that energy saving goals of the EAS countries are realized. The difference in the energy consumption and CO<sub>2</sub> emissions between the two scenarios are considered as the energy saving and CO<sub>2</sub> emissions reduction potentials, respectively. The APS also takes into account ambitious targets in renewable energy, nuclear energy and biofuels until 2030.

During the first year of the study, 3 of the 16 EAS countries were not able to provide their countries' energy saving targets as these countries have no energy saving goals during that time. In the second year of the study, 2 of these 3 countries provided some numerical targets while a country that provided assumption in the first year of the study decided to reexamine their targets and did not agree to use the assumptions used in the previous year. This resulted to two countries without an alternative policy scenario in the second year of the study.

The two countries that provided assumptions in the second year seem to have given demand reduction factors that look arbitrary, such as "10% reduction in final consumption of all fuels". This target is given an interpretation of equal 10% reductions in electricity, liquid fuels, coal and natural gas from the BAU forecast. The seemingly arbitrary nature of these assumptions can be gleaned from the uniformity of reduction in all kinds of fuels. It looks like the targets are not backed by an analysis of current situations and actual data. It seems that energy saving goals is provided just to meet the requirements of the study.

In the third year of the study, there were again some revisions in the targets of some countries while the original 3 countries still have "arbitrary" targets. In order to help these countries the working group decided that consultants should be hired to assist these

countries in refining their energy saving targets. As of this writing, the countries are still working with the consultants along with 6 other countries that like to review their energy saving goals.

Going back to the submitted energy saving goals by each country, one may see three groups of countries. One group that have sound targets supported by programs that would result to reduction in energy consumption, a group that set targets that are heavily based on the action of consumers and a group that set arbitrary targets as mentioned above.

In the first group, the savings are estimated from introduction of new more efficient technologies supported by government policies to ensure the use of these new technologies. An example of this is the top-runner program of Japan on which the energy efficiency improvement is calculated by estimating the potential savings that could be derived from the introduction of more energy efficient technologies.

In the second group, the some of the estimated savings are based on the assumed impact of programs such as energy audits, information campaigns, and appliance labeling. While it could be true that savings could be incurred when consumers change their consumption pattern as a result of energy audits, or their consumption habits due to information campaigns or use more efficient appliances as a result of labeling; it is difficult to set a numerical target especially if there is no information on efficiencies of demand devices currently utilized by the consumers. How could energy efficiency improvements be quantified if there is no information on the efficiency of existing technologies? This group of countries is also the group that has energy statistics but no statistics on penetration rates of existing technologies such as industrial, building and residential equipment/appliances. This group is also not able to breakdown the impact of energy efficiency targets per types of fuel but assumed uniform reductions for coal, oil, natural gas and electricity. This indicates that there is lack of technological basis in the setting of the energy consumption reduction targets.

The third group of countries provided the weakest energy saving goals. Their targets also have no information on how those could be achieved. It is evident that the targets are arbitrary and are not based on a technically sound analysis. This could be due to lack of information on energy consumption and in technologies that are currently used in these countries. It could be argued that the targets used as assumptions from these countries are not reliable. This group has the greatest need of assistance from consultants.

The rather weak energy saving goals of the second and third groups of countries in the EAS could be due to the lack information on the inventory of equipment and appliances and their efficiencies and worse, some countries' energy statistics lack details. This makes estimating possible improvement in energy efficiency very difficult. Like, how could one estimate the potential energy savings in lighting if there is no information on the amount of energy that is consumed in lighting in the first place? How could one estimate the impact of using more efficient road vehicles if there is no information on the efficiencies of current vehicle models operating on the countries' roads?

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A number of EAS countries need to improve their statistics; not only on energy but on energy consuming devices as well. This could be achieved by conducting surveys which are very costly. In addition, a good survey also requires necessary skills on the part of the survey implementers. Statisticians in the EAS countries need to have good understanding of energy statistics which could be gained from trainings.

However, there is no reason to worry about this. EAS countries also include highly developed countries such as Japan, Australia, Korea and New Zealand that have extensive experiences in energy efficiency and energy statistics. These developed countries could assist the less developed ones in terms of developing energy statistics and subsequently their energy efficiency goals and action plans. The EAS, therefore, while discussing energy efficiency and CO<sub>2</sub> emission reduction, should include in their agenda the provision of capacity building on energy statistics as these are the foundation for a good energy saving potential and CO<sub>2</sub> emission reduction analysis. Unless this is done, estimating energy saving potential in EAS will remain very challenging.

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