Chapter 1

Introduction

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CHAPTER 1

Introduction

In many East Asian countries, energy demand is expected to grow continuously in the long run, with high economic growth and social development driving this trend. It is also expected that energy production, particularly fossil fuel production, in the East Asian region will not be able to keep up with the speed of energy demand growth, and that the region will have to face rising energy import dependence. At the same time, it is important to note that there are emerging challenges on the energy supply side in the world energy market which include: geopolitical risks, market power risks, natural disaster/accidental risks, under-investment, resource nationalism, and so on. Given these background factors, the enhancement of energy security is becoming one of the top priorities for each East Asian country, as all commonly need to achieve sustainable economic growth and development.

It is also essential to recognize that East Asian countries have a wide range of diversity in such areas as their energy resource endowment, economic development stage, industrial structure, stage of technology development and deployment, and so forth. Under these circumstances, it is necessary to analyze the energy security situation and policy implications in each East Asian country, with due consideration to the diversity mentioned above.

Furthermore, since East Asian countries have already deepened their economic and energy relationships in a bid to explore regional integration, it is very important to promote the enhancement of security, not only in each country but also in the East Asian region as a whole, through regional cooperation.

Given the above recognition, we have conducted a study on the development of an Energy Security Index and have made an assessment of energy security policy for East Asian countries.

1. Rationale

The East Asia Summit (EAS) is a diverse collection of countries. There are wide variations among them in terms of per capita income, standards of living, population density, energy resource endowments, climate, and energy consumption per capita. The EAS is composed of the 10 member countries of the Association of Southeast Asian Nations (ASEAN), namely: Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam, and 6 other countries, namely: Australia, China, India, Japan, Korea and New Zealand.

Table 1: Economic and Energy Profile, 2009

	GDP (billion 2000 USD using exchange rates)	Population (millions)	Total self-sufficiency	TPES/GDP (toe per thousand 2000 USD)	TPES/population (toe per capita)
Australia	535.2	22.1	2.37	0.24	5.93
Brunei	6.8	0.4	6.06	0.46	7.81
Cambodia	7.5	14.8	0.71	0.69	0.35
China	2937. 5	1331.5	0.92	0.77	1.70
India	874.9	1155.3	0.74	0.77	0.58
Indonesia	258.5	230.0	1.74	0.78	0.88
Japan	4872.2	127.3	0.20	0.10	3.71
Korea	752.8	48.8	0.19	0.30	4.70
Lao PDR	6.3	6.4	1.02	0.00	0.44
Malaysia	137.1	27.5	1.34	0.49	2.43
Myanmar	19.9	50.0	1.48	0.76	0.30
New Zealand	67.5	4.3	0.87	0.26	4.02
Philippines	111.7	92.0	0.60	0.35	0.42
Singapore	143.5	5.0	0	0.13	3.70
Thailand	173.9	67.8	0.60	0.59	1.52
Vietnam	58.8	87.3	1.20	1.09	0.73

Note: Data for Lao PDR is from 2010.
Sources: IEA (2011) Energy Balance, IMF (2011) International Financial Statistic, Laos Ministry of Mines and Energy (2011)

The rationale of this study is derived from the 16th ECTF[1] meeting held in Vientiane, Lao PDR, on 25 August 2011. In this meeting, the Japanese Government proposed several new ideas and initiatives for EAS energy cooperation, including the following:

- Green Growth in Asia
- An Energy Security Index for East Asian Countries
- The Potential of the Asian Biofuel Market, and
- The Impact of Nuclear Policy Changes

The participants of the ECTF Meeting exchanged views on the above issues and agreed that it was time to consider new areas in addition to the current work streams, to reflect the dynamics of energy demand and supply in the East Asian region. As such, the ECTF Meeting endorsed the proposed new areas and initiatives.

The Economic Research Institute for ASEAN and East Asia (ERIA) approved the proposal of the Japanese Government to conduct a study on the creation of an energy security index. As a result, a Working Group (WG) for the development of an Energy Security Index and the assessment of energy security for East Asia Countries was convened. All of the 16 EAS countries are represented in the WG, with Dr. Ken Koyama of the Institute of Energy Economics, Japan (IEEJ) as the leader of the group.

2. Objective

The first objective of the study was to develop an index that quantitatively indicated the country by country energy security situation, and could thereby, help policymakers to accurately gauge the energy security situation in their country.

The second objective was to analyze the linkages between policies and the historical trends shown in the index, and thereby assess the impact that policies have on the energy security situation.

The last objective was to offer policy recommendations to policymakers in East Asian countries on improving energy security based on the following analysis:

[1] Energy Cooperation Task Force under the Energy Minister Meeting of EAS countries.

- What methods and approaches are effective for improving energy security
- What kinds of regional cooperation are useful for improving energy security

3. Work Stream

The study consisted of three work streams for fiscal year 2011.

(A) Development of Energy Security Index

A quantitative analysis of the energy security situation in various countries is a challenging task, as the energy security situation can be discussed from multiple viewpoints/aspects. To provide a benchmark to assess energy security situation, the study first explored the development of an Energy Security Index for East Asian countries. To do that, we assumed that the Energy Security Index would be composed of several major indicators which reflect principal energy security components such as:

- Development of domestic resources
- Acquisition of oversea resources
- Securing a reliable domestic supply chain
- Management of demand
- Preparedness for supply disruption
- Environmental sustainability

Following this analysis, the individual major indicators could be broken down into sub-indicators in related categories. For this study, however, it was also important to note that the study might find some constraints on data and information availability when developing the Index for East Asian countries, some of which are developing countries. As the Index was used for a historical comparison, it was crucial to have appropriate and reliable data. Therefore, a very careful consideration and examination was required for the development of the Index.

(B) Data Collection and Calculation of Energy Security Indices for each country

Necessary data were collected for each indicator for each country. Given data availability issues, time series for data collection were determined later. At this moment, relevant data for each country can be collected for at least the following time period: the 1970s, the 1980s, the 1990s, the 2000s, and the latest available year. Then based on

the developed method mentioned in part (A) above, the Energy Security Index for each East Asian country was calculated.

(C) Analysis of the energy security policy of each East Asian country

Basic information on energy security policies pursued in each East Asian country since the 1970s was collected with the support of WG members, so that objectives, approaches, tools, implementations and the results of policies could be highlighted and summarized.

Reference

This study was designed as a multiple year project. With authorization from ERIA, the following work streams were planned for commencement in fiscal years 2012 and 2013.

(C) Analysis of energy security policy in each East Asian country
Detailed information on energy security policy will be collected, so that objectives, approaches, tools, implementations and the results of the policies can be highlighted and summarized.

(D) Assessment of the policy impact of analysis using the Energy Security Index
The impact of the energy security policy in each East Asian country will be assessed by analyzing the historical transition of the Index. Through this exercise, effective approaches and good practice for the enhancement of energy security suiting each country's conditions might be drawn out.

(E) Analysis of useful lessons from past experiences
From the analysis and exercise described above, policy recommendations will be created with regard to such areas as: what the best approach/practice to be adopted by each East Asian country is, so as to enhance energy security from now on; what will be required to actually implement the best approach/practice indentified in the study; etc.

(F) Projection of the Energy Security Index into the future
Making assumptions about the energy supply-demand outlook and possible policy development for the future, the Energy Security Index for each East Asian country may be calculated for the future (for example, for the year 2030) to indicate future conditions and progress related to the energy security situation. This may be useful for policy planners as a reference when considering the future energy policy options in each country.

(G) Recommendation for regional energy cooperation
The final part of the study will highlight the importance of regional energy cooperation in enhancing energy security. This part will discuss first the importance of the policies and initiatives taken by each country, emphasizing how regional cooperation compliments each country's efforts and best addresses energy security.

4. Working Group Activities in 2011

In Final Year 2010, the WG was held for 2 times in October 2011 and April 2012, both in Jakarta, Indonesia.

During the first meeting, the WG discussed and developed the 2010 study plan and each member provided information on their country's energy security. As an overview of the study, its significance and objectives were shared, and an overall image of the multi-year project was presented. In this context, members confirmed the positioning of the work streams for the fiscal year. In the reports made by the WG members, the changes in the energy supply and demand environment in their countries were described, along with changes in policy, the issues currently confronting their countries, etc. In addition, an ESI case example was presented, and this served as a basis for discussion. During that discussion, a wide range of views was exchanged on a variety of topics, including the selection of indicators and the data collection methods. Lastly, a request was made to WG members to provide the information essential for carrying the study forward.

During the second meeting, the WG discussed the calculation results for the ESI. During the discussion, a variety of views was exchanged on the ESI, such as the relevance of the data utilized for calculating the indices and the indicators which ought to be selected. It should be noted that missing data were supplemented and that data reliability was improved through the contribution of WG members. It was also an extremely important achievement that a wide-ranging discussion was successfully held on the approach for assessing the calculated indexes. Accordingly, it was decided that the knowledge of the WG members and the discussion outcomes would be reflected in the study report.