The 1st ERIN statement

on

The East Asia Energy Forum

June 2016

The Energy Research Institute Network

FOREWORD

Countries under the East Asia Summit (EAS) have diverse economic backgrounds, political commitments, institutional arrangements, market structures and domestic energy resources. Yet these countries have common goals to ensure that their energy systems are sustainable, secure and resilient. Each country requires disparate policy measures and strategies in meeting these objectives. In addition, recent changes in the dynamics of the global energy market increase the complexity and require innovation of policies to steer the EAS countries towards energy system sustainability, security and resiliency in the long-term.

The establishment of the Energy Research Institute Network (ERIN) in 2014 was timely. This unique network of distinguished leading institutions and energy research institutes is able to respond to the above needs of the EAS countries. This first ERIN statement is not only a testament of our activity but a declaration of our commitment to work on the next generation energy policies that support the long-term energy sector aspirations of the EAS countries. It is my honor to present this statement to the global community.

Romeo Pacudan
Chairperson
The Energy Research Institute Network

June 2016

The Energy Research Institute Network

The Energy Research Institute Network (ERIN) consists of research institutes from 16 East Asia Summit (EAS) countries. Economic Research Institute for ASEAN and East Asia (ERIA) requests ERIN continued cooperation as follows:

- To support ERIA's energy research activity through providing ERIA with country specific information, research themes and policy recommendations for the EAS region;
- To encourage the dissemination of ERIA's energy research outcomes to policymakers and political leaders who shall implement policies and to engage with opinion leaders in the countries;
- To support ERIA's capacity building program; and
- To allow researchers at member institutes to participate in research activities conducted by ERIA.

Australia	Crawford School of Public Policy, The Australian National University (ANU)
Brunei Darussalam	Brunei National Energy Research Institute (BNERI)
Cambodia	Ministry of Mines and Energy (MME)
China	Beijing Institute of Technology (BIT)
India	The Energy and Resources Institute (TERI)
Indonesia	Indonesian Institute for Energy Economics (IIEE)
Japan	The Institute of Energy Economics, Japan (IEEJ)
Lao PDR	National University of Laos (NUOL)
Malaysia	Universiti Tenaga Nasional (UNITEN)
Myanmar	Ministry of Electricity and Energy (MOEE)
New Zealand	The University of Auckland (UoA)
Philippines	University of the Philippines (UP)
Republic of Korea	Seoul National University (SNU)
Singapore	Energy Research Institute (ERI), Nanyang Technological University (NTU)
Thailand	Energy Research Institute (ERI), Chulalongkorn University (CU)
Viet Nam	Institute of Energy (IE)

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1. Background

Energy is indispensable for people's life and for the prosperity of any national economy. Nevertheless, East Asia Summit (EAS) countries face serious energy challenges in terms of Energy Security, Economy, Environment, and Safety (3E+S).

In terms of energy security, rapid economic growth in the region has resulted in many energy importing countries increasing their energy import dependency and some energy exporting countries reducing their energy export capacity. Consequently, energy importing countries have become more exposed to supply fluctuations and greater market risks than in the past. To illustrate the trends, the crude oil import rate in the EAS region (except for Japan) increased from 44% in 2000 to 63% in 2012[1]. Energy exporting countries have also suffered from reduced income as export volumes have declined. Further energy security risks in the region include: uncertainty of energy supplies from the Middle East and volatile energy prices.

Combined with the overall rise in energy imports over time, higher energy costs have the capacity to undermine EAS economies, the living standard of people and the competitiveness of the industries in the region. In particular, highly variable and uncertain international energy prices are a contributing factor holding back investment required for energy resource development and infrastructure improvement.

From an environmental perspective, growing energy consumption has led to an increase in carbon dioxide (CO_2) and other emissions that have negative long-term and short-term effects on people. As a ratio of global CO_2 emissions, the EAS region increased its contribution from around

[1] IEA, Energy Balance 2014

28% in 2000 to 43% in 2012, and in 2014 it totaled some 1.36 billion tons[2].

The Fukushima nuclear accident in Japan in 2011 caused many people in the region to become much more sensitive to the issues of energy safety, and in particular nuclear safety. While there are risks with all forms of energy, without nuclear power it will be difficult for countries in the EAS region to respond to future demands of energy security, economy and environment.

Currently, the nuclear power generation capacity in Asia is expected to more or less triple from the present 89 GW to 274 GW over the next 25 years[3]. To realize this growth people's trust in nuclear safety must return. This requires dissemination throughout the EAS region of nuclear safety technologies, planning and culture. In Japan, following a highly detailed safety review, its nuclear power plants are expected to resume operation gradually from 2015 onwards, with an expectation its share of nuclear power in electricity generation by 2030 will be between 20 to 22%.

[2] IEA, CO_2 emission from fuel combustion 2014
[3] IEA, World energy outlook 2014, New policy scenario

2. Achieving resilient energy systems

In response to changing circumstances inside and outside of the EAS region, each country needs to strengthen its own energy system and capacity which is resilient to future change of social structure, economical condition, and environmental circumstances such as climate change. This can be accomplished by setting balanced policy goals and through deploying comprehensive policy approaches.

Four key elements of setting balanced policy goal for a resilient energy system include:

- Enhanced energy efficiency;
- Lower cost renewable energy;
- Reduced carbon emissions and particulates from fossil fuel use; and
- Safer nuclear power.

Five key elements of deploying comprehensive policy approach for a resilient energy system include:

- Mutual policy support;
- Financial support;
- Technological development and transfer
- Human resource development; and
- Innovative thinking responding to future needs

2.1 Setting balanced policy goal

To achieve a resilient energy system all energies including fossil fuels, renewable energy and nuclear power need to be integrated to maximize benefits to energy users, to the economy and the environment.

Enhanced energy efficiency

Energy consumption, typically, increases with economic growth. The experiences of developed countries, such as Japan, show how to decouple these linkages and, thus, mitigate exhaustion of energy resources, reduce dependence on energy imports, and minimize environmental deterioration. Emerging economies also need to, where possible and appropriate, disconnect future economic growth from higher energy consumption. Where ‘energy-growth’ decoupling occurs, appropriate technologies will be required to increase energy efficiency. Where appropriate, developed countries with the technologies and successful energy efficiency experiences can assist emerging economies improve energy efficiency over time in the EAS region.

Lower cost renewable energy

Renewable energy can assist with energy security and its use is projected to increase in most EAS countries. Unfortunately, many renewable energies have a higher levelised cost of energy than existing baseload generation sourced from fossil energy and nuclear power. To make maximum use of the advantages of renewable energy, generation costs needs to decline. To reduce these costs, lower-cost renewable technology needs to be developed along with market opportunities that permit economies of scale associated with larger volumes of renewable energy production.

An obstacle to further expansion of renewable energy is that solar power generation and wind power generation are intermittent power sources. Thus, to maintain the stability of a power supply system with increased renewables there needs to be an improvement of a power supply-demand adjustment system. This can be promoted by backup power sources, power storage facilities, and demand response, plus an appropriate electric power industry's structure. These developments take time and should be done in a phased manner, paying attention to possible spillover costs of rapid changes in energy structures.

Cleaner use of fossil fuel

A key advantage of fossil fuels is that they have higher energy density, are of relatively low cost, and are convenient to use. Their principal disadvantage is that they emit pollutants, including CO_2, in their combustion. In the EAS region, where energy demand is expected to increase substantially over coming years, large increases in fossil fuels use pose environmental challenges. Thus, cleaner utilization of fossil fuels is important to respond to this problem. Specifically, what is required is reduced emissions of pollutants by using existing and to-be-developed technologies to respond to energy-related emissions. The challenge is that clean utilization technologies are currently costly, and they require a certain capacity in terms of human resources for their deployment.

Safer nuclear

Nuclear power promotes national energy security because it requires very small amounts of fuel. Further, it has benefits for the environment (CO_2 emission free) and has low operational costs for existing plants. Its adoption is underway, or is being considered, in EAS countries which are highly dependent on energy imports, or have a large population and a high energy demand.

Nuclear accidents at the Chernobyl Nuclear Power Plant and Fukushima Daiichi Nuclear Power Plant, have affected the social licence to use nuclear power. Thus, improving safety is the highest priority if nuclear power use is to grow. As with any other technology, there are always risks. To mitigate nuclear risks, continuous efforts to enhance nuclear safety should be a top priority and, in

particular, reducing the risks to health at both a national and international level.

2.2 Deploying comprehensive policy approach

To achieve a resilient energy system, all type of policies are important and should be supported in an integrated way to promote energy resilience in the EAS region.

Mutual policy support approach

Mutual policy support requires integrated decision-making and consideration of the unintended consequences. For instance, some policies that support growth in renewables, such as Feed in Tariffs are costly, and alternatives exist to achieve the same outcome at lower cost. Better and more cost effective policies require consideration of negative and positive spillovers and cross-sectoral considerations.

Financial support approach

Energy structure reform requires both adequate investment and financial support. Ideally the private sector should make the necessary energy investments, but many projects will be left unsupported if based solely on private returns, even if the public benefits are large. As a result, for high-risk investment, some public funding may be required. Possible areas for public support include the development of a strategic oil stockpile and research and development costs for immature energy technologies.

Technological development and transfer approach

Energy supply and technologies are interconnected. This is because technologies influence energy supply stability, safety and cost, and development while the use of better technologies is essential to realize a cleaner, more reliable and cost effective energy supply system.

Technology levels and development capabilities differ greatly, depending on the country and energy company. Given technologies are indispensable in the reform of energy systems, technology transfers from one country to another are highly desirable. In addition to helping the recipient country, technology transfer provides indirect benefits to a technology possessing country through enhanced regional energy security, in addition to direct export benefits.

Desirable short and medium-term technology developments include cleaner utilization of fossil fuel, reduction in renewable energy costs, and enhanced safety for existing nuclear power, among other benefits. Over time, zero-carbon technology, and artificial photosynthesis, and fourth-generation nuclear power technology capable of cooling nuclear plants without power should

be developed, and be part of future technology transfer.

Human resource development approach

Energy systems need capable human resources to make full use of them. Thus, simultaneous with technology transfers and mutual policy support, energy progress should include the development of human resources. Fortunately for the EAS region, the human resources exist to support the development of improved energy systems and capacity building.

In some cases, knowledge is already available about energy efficiency and conservation technologies and cleaner utilization technologies for fossil fuels to build capacity in the region. For other technologies, such as, nuclear power safety technologies, human resource must be developed over time.

Innovative thinking approach responding to future needs

Necessity for seeking appropriate energy system is continuously changing. For instance, emergence of decentralized electricity supply system based on renewable energy is being observed. This is a different type of energy system that requires new type of policy and innovative technology from existing centralized electricity planning. Innovative approaches are sought to foresee and respond to changing future needs.

3. East Asia Energy Forum and Role of ERIN

Energy cooperation in the EAS region is a key to achieving the '3E +S'. It requires a comprehensive approach with the four policy measures to accelerate robust economic development in the EAS region, and to support co-prosperity. In addition, such cooperation needs to account for characteristic and uniqueness of the region which may call as the East Asia Energy Forum.

The East Asia Energy Forum must represent the diversity of the region and account for:

- size of economies;
- stages of economic development;
- energy resources;
- technological capability;
- financial accessibility;
- human resources; and
- social systems.

These considerations avoid 'off-the-shelf' cooperation that may ignore the realities of the region or a country, and fail to deliver the full benefits of energy transformation. For instance, energy deregulation, as practiced in the U.S. and Europe, may not work in an EAS country where its energy infrastructure is growing rapidly or with fewer human resource capacities. Thus, the full benefits of deregulation or other possible approaches need to be tailored to the particular energy circumstances of each EAS nation.

The EAS region needs the East Asia Energy Forum that accounts for the diversity of member countries and to respond to their joint and particular energy challenges. Four features that characterize the cooperation include:

- Respect for differences;
- Learning from each other;
- Common challenges addressed in an attentive and inclusive manner; and a
- Balance between market mechanisms and government leadership.

ERIN is expected to play an important role by assisting ERIA to make policy recommendations. ERIN needs to function as a network center for high level knowledge and experiences in energy policy. To this end, it will draw from the think-tanks and/or universities in the EAS region. Each member organization of ERIN has expertise not only for their country, but also for the region and global market. ERIN, together with ERIA, will contribute to the robust development of energy

markets, co-development of the region and co-prosperity under the concept of East Asia Energy Forum.

4. Mid-term roadmap of ERIN

ERIN is expected to deliver valuable policy messages to ERIA, and eventually to Energy Ministers in EAS countries. These deliverables include:

- Three year time frame:-
  - ✓ 1st year: conceptual vision making;
  - ✓ 2nd year: detailed design making; and
  - ✓ 3rd year: start of implementation.
- This will be around four key policy areas:-
  - ✓ More efficient use of energy;
  - ✓ Lower cost renewable energy;
  - ✓ Cleaner use of fossil fuel; and
  - ✓ Safer nuclear energy.
- In turn this will be developed around four major approaches:
  - ✓ Mutual policy support approach;
  - ✓ Financial assistance approach;
  - ✓ Technological development and transfer approach; and
  - ✓ Human resource development approach.

A roadmap of ERIN activity which built on above mentioned elements can naturally share fundamental philosophy with a roadmap which will be formed by ERIA under the jurisdiction of 9th EAS Energy Ministers Meeting, ”EAS Mid- and Long- Term Energy Policy Research Roadmap”. ERIN will support ERIA to form the roadmap and take affirmative action according to the roadmap together with ERIA.

Through a phased step-by-step approach, ERIN and the East Asia Energy Forum will make practical and valuable policy advances within the region for the benefits of its citizens.

End