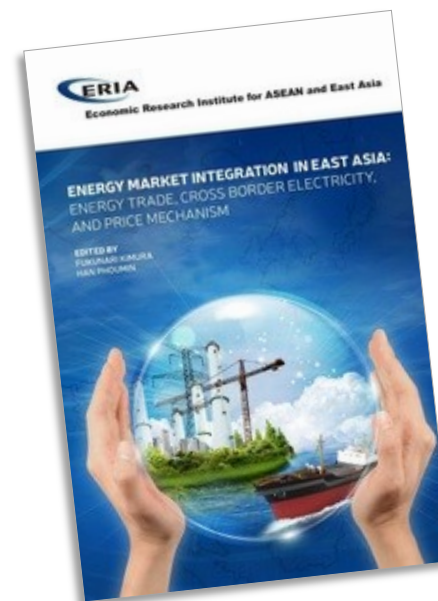


ENERGY

ERIA analyses the energy saving potential in the East Asia region, transparent energy trade and investments, sustainability of biomass energy, and other aspects of energy.

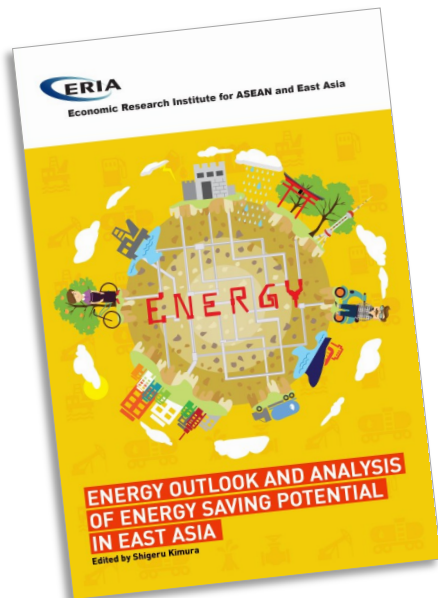


Energy Market Integration in East Asia: Energy Trade, Cross Border Electricity, and Price Mechanism

By Fukunari Kimura and Han Phoumin
ERIA Research Project Report 2013-29

Research on energy market integration (EMI) has been the focus of many scholars, researchers, and leaders in the energy field as evidence, particularly in Europe and America, tends to show the benefits from such market integration. The ASEAN Community, aiming to achieve the ASEAN Economic Community, will need to address the issue on EMI more explicitly as it has been a driving force for economic growth in the region so far. For EMI and energy trade to occur, the basic prerequisite is to have sufficient available connecting infrastructure between markets and the supporting regulatory and political conditions. A well-coordinated and effective resource allocation could happen only if markets are contestable and fully competitive, and countries may give up their policy on sovereignty from 'own-regulation' to 'deregulation' in order to join regional market integration.

This EMI study provides analytical perspectives on constraints and barriers, and the measures that countries could take to address issues—from institutional, financial, and human resources—to realise the potential benefits from energy trade-related matters, power connectivity, and other EMI-involved mechanisms.



Energy Outlook and Analysis of Energy Saving Potential in East Asia

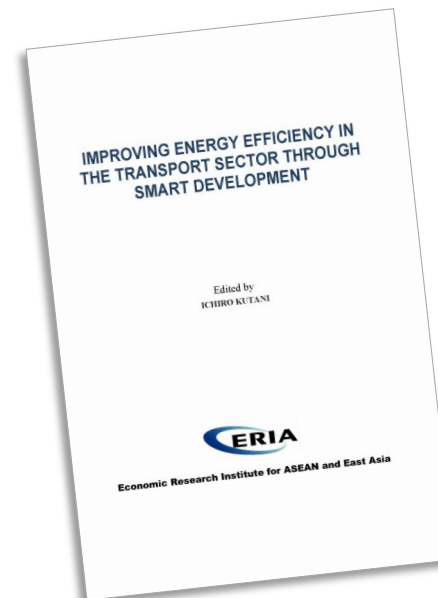
By Shigeru Kimura

ERIA Research Project Report 2013-19

This study is a response to the Cebu Declaration on East Asia Energy Security adopted by the East Asia Summit. It examines two energy outlook scenarios up to 2035: (i) business-as-usual (BAU) scenario which reflects each country's existing energy policy, and (ii) alternative policy scenario which includes additional energy saving goals and action plans currently being considered in each country. The study analyses the additional energy saving that could be achieved through the implementation of goals and action plans in each country that are beyond the BAU scenario.

Based on the results, ERIA recommended the following:

- Set up energy efficiency action plans across all energy-consuming sectors.
- Rationalise the prices of electricity, oil products, and natural gas in the near term, and remove subsidies, whilst considering support for low-income groups.
- Prepare consumption data regularly by conducting large-scale surveys, applying the experience and know-how obtained through the ERIA pilot surveys.
- Implement more aggressive energy saving goals and action plans, and utilise more low or zero carbon energy technologies.



Improving Energy Efficiency in the Transport Sector through Smart Development

By Ichiro Kutani

ERIA Research Project Report 2013-27

This study examines ways of improving energy efficiency in the transport sector of East Asia Summit (EAS) countries. Amongst various possible measures, the study especially focuses on improving traffic flow in urban areas and its subsequent effects.

Coping with increasing oil demand is one of the top policy agenda in EAS countries since such demand has been causing countries a variety of concerns, such as deteriorating security of oil supply, exacerbating fiscal balances, and worsening air quality. Although a number of studies were conducted to address this issue, few focused on an interrelation between traffic flow and energy consumption. This study is unique in its approach as it interconnects energy policy and city planning, and quantifies the effect of traffic flow improvement on energy efficiency improvement.

The study examines policy options that could enhance a modal shift from private cars to public transport, through a simulation analysis for the selected sample city, Jakarta. Based on a preference survey of the general public, this analysis figures out a possibility of modal shift which leads to reduced use of private cars and, thus, reduced oil consumption.



Investing in Power Grid Interconnection in East Asia

By Ichiro Kutani and Yanfei Li

ERIA Research Project Report 2013-23

This study covers ASEAN countries, Northeast India, and Southwest China. It estimates the cost and net economic benefits, which imply feasibility and priority of the proposed new transmission capacities, for each possible power transmission line for interconnection.

A positive net economic benefit indicates economic feasibility of the project; thus, it should be prioritised. Amongst the listed projects, the Viet Nam–Lao PDR–Thailand–Malaysia–Singapore interconnection route could be the most beneficial, and the Cambodia–Thailand linkage could be the second beneficial interconnection.

The study has the following policy implications:

- Investment efficiency for power infrastructure could be improved with enhanced grid interconnection in the region.
- Favorable investment environment is required to attract private and foreign capital to invest in the interconnection projects.



Study on Asian Potential of Biofuel Market

By Kaoru Yamaguchi

ERIA Research Project Report 2013-20

With a growing population, rising income levels, and expanding urbanisation, Asia's demand for oil is expected to increase rapidly. However, due to limited resource reserves, most countries in the region are heavily dependent on imports for their oil supply, which is a major, if not the most critical, concern in their energy policies. Though it has been debated intensively, biofuel is perceived as a possible option to address the oil security issue, since expanding the use of biofuels will not only result in reducing demand for oil but will also contribute to the diversification of import sources for liquid fuels. Moreover, biofuel production also provides an additional way of increasing the income of farmers.

This study focuses on the Asian potential on the two types of biofuel—bioethanol and biodiesel. The objectives are to find the methods and policies for promoting the sustainable use of biofuels. The core strategy suggested in this study is to improve the enabling environment: improve productivity and enhance regional cooperation for trade and energy security.



Study on International Cooperation on Nuclear Safety Management in East and Southeast Asian Countries

By Yanfei Li and Tomoko Murakami
ERIA Research Project Report 2013-25

This publication is a response to the plan of some ASEAN countries to introduce commercial nuclear reactors in 2020 because of their increased energy demand. During the working group meetings, the following were discussed: (i) current development plan on safety regulatory systems, emergency preparedness, and participation in international activities of ASEAN member countries to identify problems in establishing an emergency action plan for accidents and to consider desirable cross-border cooperation; and (ii) proposals for regional cooperation on emergency preparedness and response.

The basic principle for regional cooperation in nuclear safety management involves four main issues that could enhance nuclear emergency preparedness and response. These issues are:

- Building a cooperative relationship with the regulatory organisation in Asia that would provide expertise and technical assistance on preparedness and response in cases of radiological or nuclear emergencies.
- Sharing experiences on nuclear safety to newcomers by training and educating regulatory staff in ASEAN countries, through expert organisations.
- Learning from the European Union-Nordic models of emergency response schemes.
- Constructing a common database on nuclear facilities and alert systems in Asian countries to collect accurate information to protect public health and the environment of a country, including accident prognosis and dispersion.

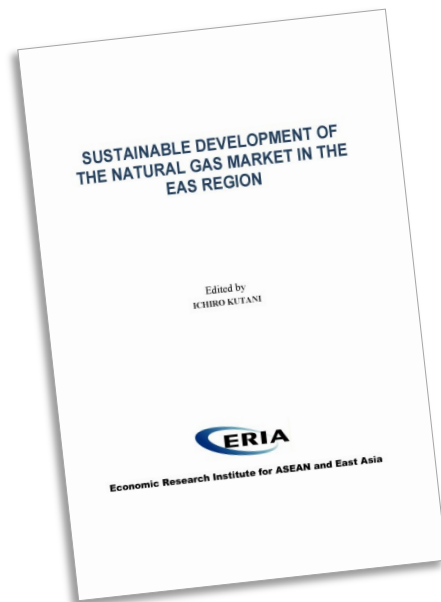


Study on the Development of an Energy Security Index and An Assessment of Energy Security Policy for East Asian Countries

By Ichiro Kutani
ERIA Research Project Report 2013-24

This study examines the quantitative status of energy security in East Asia Summit (EAS) countries to predict the future and draw out policy implications for improving their specific situations. Although the importance of energy security has already become common ground and shared amongst countries, the methodology to obtain an accurate and quantitative view of its status is not established with consensus. An accurate understanding of the current situation in energy security is essential in developing and implementing better energy policy. From this point of view, the lack of an established assessment methodology is a matter of concern. This study aims to provide a possible way to have an accurate view of the energy security situation in the EAS region.

The study developed and assessed some indices that can explain certain aspects of energy security called energy security index. The study then applied this methodology to examine the future status by using energy supply-demand outlook and other relevant data. In analysing future status, the study employed the business-as-usual and the alternative policy scenarios to conduct comparative analysis. Policy implications for enhancing energy security in the region were then derived.



Sustainable Development of the Natural Gas Market in the EAS Region

By Ichiro Kutani

ERIA Research Project Report 2013-26

This publication explores the necessary measures to achieve sustainable development of the natural gas market in the East Asia Summit (EAS) region where demand for natural gas is increasing.

The driving factors of this trend include the effective use of domestic resources, diversification of energy source, and reduction of environmental load. At the same time, import dependency for natural gas supply is rising in many member countries. Countries are also experiencing and anticipating structural changes in the global gas market, particularly as regards the shale revolution in the United States. As such, the region needs to implement the necessary and appropriate policy measures that can respond to this changing situation.

The paper examines recent changes in the global gas market that may have an influence on the EAS region. Subsequently, it explores the natural gas supply-demand and policy trends in the region. With this background information, the study further analyses the supply-demand outlook of the region for natural gas/liquefied natural gas, and discusses major issues that policymakers need to address.

Analysis on Price Elasticity of Energy Demand in East Asia: Empirical Evidence and Policy Implications for ASEAN and East Asia

By Han Phoumin and Shigeru Kimura

ERIA Discussion Paper 2014-05

This study uses time series data of selected ASEAN and East Asian countries to investigate the patterns of price and income elasticity of energy demand. The findings show that price is generally inelastic in the countries studied. Also, price elasticity in developing countries is more sensitive than in developed countries. Income has been very sensitive towards energy consumption, except in India, China, and Australia. The findings have policy implications as inelastic price will impact on the uptake of energy efficiency in developing and developed countries. Therefore, removal of energy subsidies, albeit done gradually, will be critical to the promotion of energy efficiency. Its impact likewise goes further in that it will benefit uptake of renewable energy, the environment, and society.

ASEAN-India Gas Cooperation: Redefining India's "Look East" Policy with Myanmar

By Andindya Bhattacharya and Tania Bhattacharya

ERIA Discussion Paper 2014-19

As economic power shifts towards Asia—particularly China, India, and ASEAN—a robust energy cooperation within this region will help sustain the region's development. This study focuses on India and how its 'Look East' Policy helps forge trade and other bilateral cooperation with ASEAN nations, and how Myanmar, with its abundant untapped natural resources which include hydro and natural gas, plays a strategic role in India's energy security. This study also concentrates on a particular energy resource—natural gas—and develops a quantitative assessment model to evaluate the long-term natural gas demand of India and its neighbours vis-à-vis infrastructure requirements, and investment demand. It also looks at how India's 'Look East' Policy can help secure the required amount of natural gas from the ASEAN and East Asia region and at what cost.

Deregulation, Competition, and Market Integration in China's Electricity Sector

By Yanrui Wu

ERIA Discussion Paper 2014-22

This report presents an updated and expanded review of reforms in China's electricity sector. It aims to examine the impact of reforms on competition, deregulation, and electricity market integration in China. The findings are used to draw policy implications for electricity market development, particularly the promotion of energy market integration.

Enhanced Measurement of Energy Market Integration in East Asia: An Application of Dynamic Principal Component Analysis

By Dandan Zhang, Xunpeng Shi, and Yu Sheng

ERIA Discussion Paper 2014-23

Part of the initiatives to enhance cooperation among ASEAN and its dialogue partners is the energy market integration (EMI) in East Asia that has been under way for over a decade. Despite the efforts exerted by countries in the East Asia Summit (EAS) region, little research has been done to measure the extent of EMI's progress. This paper innovatively applies the dynamic principal component analysis to measure EMI and its evolution in the EAS region between 1995 and 2011. The EMI is measured using five categories: (i) energy trade liberalisation, (ii) investment liberalisation, (iii) energy infrastructure development, (iv) domestic market openness, and (v) energy pricing liberalisation.

Results show that significant progress has been made for the EMI in the EAS region, although there are cross-country disparities in different aspects. According to the level of progress achieved, further efforts towards EMI in general should focus on liberalising national markets, then phasing out fossil fuel subsidies and, finally, liberalising investment regime. Some mechanisms have to be developed to keep national level market liberalisation under monitoring. Certain countries that lagged behind in EMI may have to catch up and learn from either their past experiences or from other nations, and focus their efforts on their relatively weak dimensions.

Impact of International Oil Price Shocks on Consumption Expenditures in ASEAN and East Asia

By Dayong Zhang and David C. Broadstock

ERIA Discussion Paper 2014-24

This paper examines the impact of international oil shocks on consumption expenditure in selected ASEAN and East Asia economies. Empirical results show that oil shocks do affect consumption and there are asymmetrical effects. There are clear differences in the level and direction of the impacts on each ASEAN and East Asia economy. These implications shed light on how the idea of regional energy market integration can be a way to share risks and optimise resource allocation. Nonetheless, given the clear disparity and similarity in sub-groups, integration should be implemented while allowing for differentiation in terms of the role of each country.

Trade-off Relationship between Energy Intensity—thus energy demand—and Income Level: Empirical Evidence and Policy Implications for ASEAN and East Asia Countries

By Han Phoumin and Fukunari Kimura

ERIA Discussion Paper 2014-15

This study has been motivated by the recent shift of energy demand's gravity to Asia due to decades of robust and stable economic growth in the region. Said economic growth has correspondingly led to increases in per capita income in emerging economies in ASEAN and East Asia. Past empirical studies showed that energy intensity—thus energy demand—tends to grow at an early stage of development. However, curbing the energy intensity remains central to green growth policy. Thus, this study formulates the hypothesis on whether energy intensity, thereby energy demand, starts to fall as a country becomes richer. The study aims to investigate the (i) non-monotonic relationship between energy demand and income levels in selected ASEAN and East Asia countries, (ii) short- and long-run association of energy demand with price and income level, and (iii) country performance in curbing the energy intensity.

The findings imply three points: (i) energy intensity—thus, energy demand—has a trade-off relationship with income level which contributes to the theory of energy demand; (ii) energy demand has a trade-off relationship with income level, albeit the fact that each country has a different threshold level, implying that whatever the level of per capita income a particular country has, that country can curb energy intensity if it has the right policies in place; and (iii) countries with persistently increasing energy intensity will need to look into their energy efficiency policies more aggressively to ensure that structural changes in the economy do keep the energy efficiency policy to its core.