



Summary of ERIA Research Projects and Publications

2015–2016



**Economic Research Institute for ASEAN and East Asia
Jakarta, Indonesia
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The ERIA Research Summary and Publications 2015–2016 was prepared by Anita Prakash, Director General, Policy Relations; Shimpei Yamamoto, Managing Director, Research Activities; Maria Priscila del Rosario, Chief Editor and Publications Director; and Chrestella Budyanto, Editorial and Publications Associate. The report was prepared from the inputs received from researchers at ERIA and its network research institutes. Detailed publications can be seen at www.eria.org



FOREWORD

It gives me immense pleasure to present the summary of research works and list of publications conducted at the Economic Research Institute for ASEAN and East Asia (ERIA) in 2015–2016 to all our stakeholders in the East Asia region and across the globe.

ERIA's research fulfills the mandate given by the leaders of the region to conduct policy-oriented research, which will contribute to the deepening of regional integration, narrow the development gaps, and foster sustainable development in the ASEAN and East Asia region. This research is the foundation of ERIA's Sherpa role in ASEAN and East Asia Summit. In 2015, our research works contributed to the successful launch of the ASEAN Community in 2015, especially the ASEAN Economic Community and the ASEAN Socio-Cultural Community. We now continue to work on ASEAN Community Vision 2025. ERIA's research contribution in this regard has been acknowledged by the Leaders in their Summit Statement.

As our work continues to influence the regional integration and development, the Global Go to Think Tank Survey for 2015 has rated our flagship work, "ASEAN Rising: ASEAN and AEC Beyond 2015", as one of the best policy studies/reports produced by a think tank in 2015. Our small team of dedicated researchers, with an equally committed Research Network in the 16 member countries, continue to work on research which are relevant to, and useful for, policymakers, businesses, and the community at large.

This report is backed up with more definitive and detailed posting of our research and publications on ERIA's website, www.eria.org. I encourage you to use it, and disseminate it, as widely as possible.

A handwritten signature in black ink, reading "Hidetoshi Nishimura". The signature is stylized and cursive.

Hidetoshi Nishimura
President, Economic Research Institute for ASEAN and East Asia
Jakarta, 15 April 2016

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**DEEPENING
ECONOMIC
INTEGRATION**

1

Economic Impact of TPP and RCEP on ASEAN and East Asia Countries

Authors: Ken Itakura, Masahito Ambashi, and Lurong Chen

Status: Ongoing

Abstract

Trans-Pacific Partnership (TPP) and Regional Comprehensive Economic Partnership (RCEP) are two substantial mega-FTAs with which Asian economies are involved. Both of them have been promoted in a multi-layered way within the ASEAN and East Asia.

TPP is said to be a U.S.-led “21st-century EPA” that is going to set up new rules and global standards that govern international trade and investment in order to facilitate international production sharing and support sustainable development. Since TPP intends to cover a wide range of disciplines concerning Global Value Chains (GVCs) that are beyond current WTO system, not only “at-the-border” liberalisation, but also “beyond-the-border” economic reforms are required. TPP will enter into force during 2017 at earliest while it was substantially concluded in October 2015. Hence, in years to come, the new rules and standards of TPP are expected to have various and unequal economic impacts on Asian countries, including both TPP member states and non-TPP member states.

In comparison, RCEP is an ASEAN-led arrangement with the participation of Asia-Pacific countries. It tries to consolidate the five existing “ASEAN-plus-one” FTAs with the emphasis on ASEAN’s centrality in regional integration as well as the commitments on the compatibility with WTO rules. In the RCEP ministers meeting held in November 2015, the ministers from the 16 countries expressed their determination to conclude the RCEP negotiations in 2016. But no matter when it will be concluded, RCEP could be another milestone of institution building in Asian regionalism.

A shift from WTO centred multilateral system to pluri-lateral governance such as TPP and RCEP could be a double-edged sword. That is, on the one side, mega FTAs include trade and investment rules that meet the need of developing countries for GVCs; but on the other side, they may contain conflicting and inconsistent rules that go against developing countries. Therefore, there is urgency for the ASEAN member states and other Asian countries to respond to these changes promptly and properly.

This ERIA's study aims to provide decision-making supports to policymakers on the basis of solid economic analyses that help ASEAN and East Asian countries formulate their trade policies in the new era. Whereas TPP and RCEP will have potentials in changing the pattern of trade and foreign direct investment (FDI) in the region, their impacts on regional economic growth and development could be different. For that reason, this research intends to estimate economic impacts of these agreements on ASEAN and East Asia countries by utilising a computational general equilibrium (CGE) model.

Research Outcomes

Major Policy Findings

1. In general, TPP will have positive economic impacts on TPP member states. In particular, impacts are large for Viet Nam. However, non-TPP members tend to face negative economic impacts from the existence of TPP agreement. Especially for countries like Thailand, such negative impacts could be quite significant, which is mainly due to trade diversion effects.
2. For Asian countries, TPP and RCEP are not substitutes, but complementary to each other. It shows that RCEP could effectively mitigate the possible negative impacts on non-TPP members and magnify the positive impacts on TPP members, which had resulted from TPP agreement.
3. The establishment of RCEP will have positive impacts on all Asian economies even though the final agreement may only contain a schedule of modest NTM reduction. If RCEP achieves a higher quality, it will make its members benefit more in terms of trade and GDP.

Likely Impacts on Policy Formation in Country/Region/or Knowledge Pools

1. ASEAN and East Asia countries can have a correct understanding of the economic impact resulting from TPP and RCEP through comprehensive and objective assessment. They are also likely to recognise the potential economic impacts brought about by an expansion of TPP member states. Using such research, governments can ensure their transparency when explaining the impacts of the agreements to stake holders.
2. Policy implications on the RCEP negotiations are provided to ASEAN and East Asia countries based upon our sensitivity analysis. More precisely, this research reveals that

promoting tariff reduction and trade facilitation (i.e. NTB reduction) in RCEP could be critical for these countries in order to both accelerate economic growth and narrow the development gap in the region.

Policy Documents/Monitoring & Evaluation Documents/Briefs, Business, Academia and Community Platforms who have used/may use these Findings

1. Governments, in particular, trade negotiation departments would be helped by the findings when they assess the economic impacts, negotiate the levels of liberalisation of trade and investment, and explain the agreements to their stake holders. Academics are also expected to refer to this research in evaluating quantitatively or qualitatively the impacts of TPP and RCEP.

2

Services Supply Chains – Implications and Opportunities for RCEP

Authors: Christopher Findlay, Shandre Thangavelu, and Lurong Chen

Status: Ongoing

Abstract

The key rationale of the supply chain is that there are ample opportunities for countries at various stages of growth to be able to participate in the production value-chain from end to end of the supply chain. Thus it might be important to examine the key fundamentals that might be needed for countries in various stages of growth and with services sector growth to participate effectively in the services supply chain.

Increasingly, supply chain activities in services are turning independent of its linkages to the manufacturing supply chain activities. For example, the development of services sectors such education, business services, wholesale activities, etc. are part of supply chain that are independent of the manufacturing sector. In this respect, the current study intends to examine the development of services supply chain activities in the region.

This study attempts to extend the work on services from a supply chain perspective and a deeper assessment of the implications for the policy coverage and design of commitments in RCEP related to services.

The work will proceed by:

- a) developing a new methodology for identifying and for mapping the international supply chain in services activities, in all the modes of supply
- b) applying this methodology to a series of services, chosen to provide relevant sectoral and economy coverage in RCEP countries, through interviews with participants in the chains
- c) consolidation of commentary on the key policy issues that impede international transactions or distort the shape of the supply chains
- d) identification of implications for the specification of services commitments in RCEP to enable countries to respond to those policy issues
- e) the specification of complementary capacity building to support the implementation of policy reform

- f) Identification of the key factors that contribute to the competitiveness of ASEAN members as participants in these supply chains and the drivers of the scope for “upgrading”, for productivity gains, and for labour markets.

The study has 10 papers which cover the following countries: Japan, China, Korea, Australia, Indonesia, Thailand, Malaysia, the Philippines, Cambodia, and Viet Nam. The papers examine various issues within the broader topic of the project, utilising rich firm- or plant-level data set from all of the countries covered. The empirical exercises in the papers are being done using careful descriptive analysis as well as robust econometric exercise.

3

Reducing Unnecessary Regulatory Burdens on Business and Engendering Informed Regulatory Conversations in Priority Integration Sectors in ASEAN

Authors/Coordinators: Ponciano S. Intal, Jr. and Melanie Milo

Status: Ongoing

Abstract

Two critical challenges facing ASEAN member States (AMSs) in an increasingly open and integrated ASEAN are to promote a conducive business and investment environment, and to improve economic performance and productivity. To meet these challenges, AMSs would need to give major focus on reducing the burden of government regulations on business, together with the minimisation of border barriers and greater investment in infrastructure and people. An important means of enhancing investment attractiveness as well as productivity and competitiveness of industries in ASEAN is **Reducing the Unnecessary Regulatory Burdens (RURB)** on business, particularly in sectors with significant export potential.

Minimising unnecessary regulatory burdens maximise efficiency and effectiveness of regulations. RURB addresses unnecessary costs arising from poorly designed or excessive regulation, as well as from poor administration and enforcement of regulations. RURB supports national regulatory reform initiatives to improve overall regulatory regime such that policies and regulations fit together; i.e. no redundancies; no conflicting policies; better still, policies and regulations complement one another in support of greater efficiency, enhanced competitiveness and increased trade. Hence, RURB facilitates investments and trade, and therefore of deeper intra-ASEAN economic integration.

Regulations in the region have not typically been crafted using established principles of good regulatory practice (GRP), and most regulators do not have established GRP principles to follow. Undertaking a thorough regulatory review of existing practices would identify the regulatory burdens that are of most concern to the sector. By reducing unnecessary regulatory burden, the sector then becomes more attractive to investments and more competitive in an increasingly integrated ASEAN.

With this in mind, ERIA in partnership with the Research Institutes Network (RIN) and under the guidance of the Malaysia Productivity Corporation (MPC) have embarked on a research project on **“Reducing Unnecessary Regulatory Burdens (RURB) on Business and Engendering Informed Regulatory Conversations in Priority Integration Sectors (PIS) in ASEAN.”**

The research project focuses on reducing unnecessary regulatory burdens particularly in the trade-related activities of firms in a selected PIS that has significant export potential in each of the nine AMSs (excluding Singapore) covered in the study. The project follows MPC’s RURB methodology for improving quality of regulation and regulatory practices. In particular, Malaysia’s approach helps businesses identify regulatory burdens, suggest solutions and then present them to regulators in a credible way.

The regulations and regulatory agencies will be reviewed and analysed to identify areas where regulation can be improved, consolidated or simplified without compromising underlying policy objectives. Any redundant, unnecessarily burdensome and outdated regulation will be identified and options will be proposed to reduce the unnecessary burdens in order to achieve a dynamic, modernised business ecosystem. Informed regulatory conversations between businesses and regulators will then be undertaken to discuss the policy options, help identify the best option(s), and build consensus in favour of the best option(s).

The project also incorporates a capacity building component for the teams for Cambodia, Lao PDR and Myanmar. Specifically, the project includes one or two government technical staff in each country team for the CLM countries. The assumption is that one of the best ways to capacitate the bureaucracy is to bring government technical people in the research process itself. In addition, there will be a 3-man Steering Committee (composed of one top government official, one from the business sector, and one from the academe/civil society) in each of the CLM countries to advise the country research team.

The project officially commenced in August 2015 and is due for completion in November 2016.

Likely Impacts on Policy Formation in Country/Region/or Knowledge Pools

1. The research project will identify specific policy actions that regulators can undertake to address the unnecessary regulatory burdens in the selected PIS in each AMS, which will be communicated to and discussed with the regulators.

2. As the country research teams learn to apply MPC's RURB methodology to one key economic sector, they can then use the acquired knowledge and expertise to examine other key economic sectors.
3. By demonstrating the benefits of addressing unnecessary regulatory burdens on business in one key sector, the research project endeavours to contribute to national regulatory reform initiatives to improve overall regulatory regime such that policies and regulations complement one another in support of greater efficiency, enhanced competitiveness, and increased trade and investment in ASEAN

Policy Documents/Monitoring & Evaluation Documents/Briefs, Business, Academia and Community Platforms who have used/will use these Findings

1. RURB Country Reports will be circulated to relevant government agencies and ministries, business associations and professional bodies, research institutes, and other stakeholders.
2. RURB Integrative Report will be circulated to relevant ASEAN bodies, including SEOM, HLTF-EI, CPR and ASEAN Secretariat.

4

International Migration and Production Sharing in East Asia

Author: Lurong Chen

Status: Ongoing

Abstract

International migration is an important element of economic globalisation. The second unbundling of globalisation is associated with international fragmentation and offshoring of production. Now, competitiveness can be determined on the sub-stage activities rather than the whole production processes. The characteristics and productivity of labour are now defined in varied details and in various categories. The expansion of global production sharing leads to a finer division of labour and a new pattern of international trade.

Liberalising movement of people tends to further optimise the allocation of human resource in the region, which will enforce the gains from regional trade and investment liberalisation and sharpen the region's edge of competition in global value chains (GVCs). However, our knowledge about the pros and cons of international migration and regional development is still limited, especially in the context of GVCs and the 21st century free trade governance.

The objective of this study is twofold: first, to better understand the patterns, causes, and consequences of international migration; and second, to help a better formulation of immigration policy in a perspective to increase the gain from trade and investment liberalisation. The study addresses following themes:

- International migration and regional production network/industrial cluster
- The impact of international migration on labour market (in sending and receiving countries)
- The interaction between regional integration and cross border migration
- The effects of immigration policies and the implications for country/regional development.

In particular, the project will emphasise on quantitative studies using micro-level data, especially first-hand data drawn from survey designed and conducted by the participants. The survey data will complement the available data released by statistical agencies. With the focus

on migration issues in East Asian countries, the survey and the related analyses could either explore the general pattern and characteristics at the country level or investigate the sector(s)/region(s) specific features.

The research team is composed of 5 country teams from Japan, Thailand, Indonesia, Malaysia and Viet Nam. Each country team consists of two to four experts. The country reports will be based on the analyses of first-hand survey data in each country. The consequent empirical exercises will be done using careful descriptive analysis as well as robust econometric exercise.

5

Globalisation, Structural Change, and Growth

Authors: Dionisius Narjoko and Chin Hee Hahn

Abstract

This research is 8th in the series of ERIA Microdata research which has been conducted annually, under a different theme to gauge the impact of globalisation on economic growth in the region, using firm level data. While there are a large number of studies on the effect of globalisation on economic growth, our understanding of this issue is far from satisfactory. Particularly when economic growth is defined as a sustained increase in per capita income level, our knowledge on whether and how exactly globalisation affects economic growth remains quite limited. Although macroeconomic growth models exist, which show positive effect of globalisation on long-term economic growth, there remains controversy on the effect among cross-country empirical studies. While the heterogeneous firm trade theories and empirical studies based on those theories have uncovered several new mechanisms of the aggregate welfare and productivity effect of trade, most, if not all, of the studies tend to focus on one-time level effect, not growth effect.

Meanwhile, sustained economic growth is almost always accompanied by structural changes of the economy: changes in the composition of industries, firms, and activities toward more capital-, skill-, and technology-intensive ones. Without structural changes defined in this way, an economy may not be able to achieve sustained improvement in living standards. In this vein, understanding better whether and how globalisation affects structural change is expected to enrich our understanding of the effect of globalisation on economic growth and of its mechanisms.

Against this backdrop, this project raises the following key questions. Does globalisation in trade and foreign investment promote sustained economic growth? Can we find evidence that globalisation promotes structural changes? If so, what are the specific mechanisms? How are globalisation, structural change, and economic growth linked together? In answering these questions, does it matter to distinguish between the effects of trade and investment liberalisation policies and the effects of trade and investment activities?

Research Outcomes

Major Policy Findings

The research finds and explains various details linking globalisation to growth. Few of these are the following:

1. Globalisation through tariff reduction and foreign investment tends to boost country's export, both in developing countries like Indonesia and relatively more developed countries like Korea. However, the results are mixed on firms' productivity and employment.
2. In particular, globalisation tend to benefit larger firms and incumbent firms in export more than smaller firms and non-exporters.
3. Meanwhile, from Japanese firms case study, there is an evidence that expanding overseas tend to increase the firm's probability to shut down establishments in low-skill-intensive (routine) industries while establishments in high-skill-intensive industries (not-routine) are more likely to survive.

Likely Impacts on Policy Formation in Country/Region/or Knowledge Pools

1. Leveraging the firms' internal capacity so that they will be in a better position to compete in export market and grow up in size could be one of the most crucial points in a country's industry policies framework in order to absorb the positive spillovers from the inevitable globalisation movements – especially for SMEs.
2. Investing more in labour skills improvement might also enhance firms' ability to survive and reap the benefits of globalisation.

Policy Documents/Monitoring & Evaluation Documents/Briefs, Business, Academia and Community Platforms who have used/or may use these findings

1. Governments and line ministries on trade and investment liberalisation, SMEs would also be helped by the findings in drawing out their policies. The academic usage and knowledge of plant level data in the EAS region will be put to use to understand the effects of globalisation in the region.

6

Maritime Connectivity in Southeast Asia: Its Role and Challenges towards Integration

Authors: Fauziah Zen, Khoirunnurofik, M. Halley Yudhistira, Riatu Qibthiyah, Shauqie Azhar, Desi Setia, Astrid Dita, M. Rizqy Anandhika, Aditya, Nazery Khalid, Adoracion M. Navarro, Chaiyot Peetijade, Ross Robinson, Sophia Everett, Lam Siu Lee Jasmine, and Y.H. Venus Lun

Abstract

One of the pressing issues in the regional connectivity in East Asia is maritime development. Indeed, as acknowledged by the Master Plan on ASEAN Connectivity (MPAC), maritime transport is the most important mode of transportation in terms of the traffic volume in international trade. However, ASEAN still has a long task to improve its marine development. The MPAC identifies three key challenges in improving marine development: 1) port infrastructure, 2) maritime services, and 3) port performance. In terms of port infrastructure, many facilities needed for reliable and efficient shipping are still not available. In maritime services, key services such as sea-traffic control and navigation, as well as mechanism to handle emergency situation and sea-environment-related issues are still inadequate. Port performance also needs improvement as most of the gateway ports of the ASEAN member states are already fairly full in capacity, which means that investment in expanding port capacity is needed to meet growth and deliveries expectation in the future.

The study focuses on maritime status and port development in the following seven countries: Indonesia, Thailand, Malaysia, Singapore, Hong Kong, and Australia. Firm-level surveys are conducted in three countries: Indonesia, Thailand, and the Philippines. The surveys confirmed valid participation from 322 manufacturing firms in Indonesia, 111 in Thailand, and 78 in Philippines, plus 79 port users in Indonesia, 39 in Thailand, and 44 in Philippines. Total survey participation is 511 manufacturing firms and 162 port users in the three countries.

Research Outcomes

Major Policy Findings

1. There are diverse stages of Port development among East Asian countries covered in this study, where Hong Kong, Singapore and Malaysia are way ahead of their peers.

Thailand, Indonesia, and the Philippines have large room to improve and utilise their ports as an element of production network.

2. Trans-shipment plays important role in port utilisation as only a few ports fulfil the requirement to become hubs in the region.
3. Most Southeast Asian ports, with the main ports of Singapore and Malaysia as exception, suffer from inefficiency, red tape, and underutilisation of capacity.
4. Indonesia's ports remain underutilised. It uses Singapore as a hub for its export and import connectivity. As archipelagic country, Indonesia is now putting more emphasis on developing domestic connectivity and less on ASEAN connectivity. Reform in soft infrastructure in port sector is still fragmented, since the road map of port development is detached from the whole supply chain system perspective.
5. The slow development in port modernisation also hampers Philippines and to some extent, Thailand. The main challenges come from internal factors, including reforming the port management system (one important aspect is multiple authorities) and having smooth connectivity with other segments of the supply chain system (inland connectivity, inventory system, etc.), while external factors such as decision made by large shipping lines to make a port call or not is another challenge as well.

Likely Impacts on Policy Formation in Country/Region/or Knowledge Pools

1. At the regional level, ASEAN still can improve maritime connectivity by encouraging more development of efficient and effective shipping lines across South East Asian countries. It is important to put maritime development into production network system perspective, in which connectivity is a crucial support system across production centres that done through sea, land, and sky.
2. The survey in three countries reveals that the users and manufacturing firms view ports as important part of supply chain system; the view largely not shared by Ports Authorities. Putting perspective of the whole supply chain system into port development will result in more efficient and productive ports.
3. Indonesia and the Philippines have more room to improve their connectivity and trade through ocean, especially between Eastern Indonesia and the Philippines.

Policy Documents/Monitoring & Evaluation Documents/Briefs, Business, Academia and Community Platforms who have used/may use these Findings

1. Governments and line ministries related to maritime connectivity would be helped by the findings in drawing out their policies, particularly in understanding interactive relationship among studied countries.

7

India as an Economic Hub for Integrating East and Southeast Asia with the Rest of Asia

Author: Ram Upendra Ras

Status: Ongoing

Abstract

India's recent economic dynamism, including its future prospects as the fastest growing economy in 2016 has been highlighted by various credible projections. These, coupled with emphasis of Indian policymaking on the Make in India initiative, suggests that India can emerge as an economic hub for integrating East Asia, ASEAN on one hand with South Asia, Central Asia, West Asia and even the eastern coast of Africa, on the other. However, this proposition needs to be posited in a broader framework, building on The Comprehensive Asia Development Plan (ERIA, 2010).

The proposed study has the basic objectives:

- To provide analytical and empirical basis for making India as an economic hub for integrating different parts of Asia
- To identify dimensions and sectors across subregions where India can play such a role
- To suggest policy measures and modalities for creating enabling conditions for the above

To achieve these objectives some of the dimensions/themes that are being explored, but not limited to, include: (i) Conceptual Basis to Regional Value Chains; (ii) Potential Trade and Regional Value Chains in Manufacturing and Services; (iii) Infrastructure and Connectivity; (iv) India as an R&D Hub and (v) Mapping, Building and Harnessing Skill Complementarities.

The study would come up with policy recommendations on the subject of enquiry. It is expected to be completed by September 2016.\

Expected Research Outcomes

Major Policy Findings

1. Identification and feasibility of creating RVCs connecting different subregions

2. Specific projects of infrastructure and connectivity identified weaving different parts of Asia
3. Assessing scope for tapping skill complementarities across subregions
4. Enabling conditions and drivers for making hub-spoke R&D framework in Asia

Likely Impacts on Policy Formation in Country/Region/or Knowledge Pools

1. Policies to promote integrated manufacturing and service/production fragmentation with its centre being India and South Asia
2. Policies for reducing service link costs, including infrastructural links

Policy Documents/Monitoring & Evaluation Documents/Briefs, Business, Academia and Community Platforms who have used/may use these Findings

1. Policymakers in India and other parts of Asia
2. Businesses, while making commercial decisions, across countries in Asian region

8

East Asian Integration: Analytical Approach

Coordinators: Lili Yan Ing, Miaojie Yu, and Shujiro Urata

Timeline: June 2016–December 2017

Abstract

This project focuses on ASEAN integration. The first objective of this study is to see how trade gains differ among member countries and affects dimensions like welfare, foreign direct investment, and domestic regulations in labour or investment. In particular, the study is interested in finding out how the ASEAN Economic Community may drive ASEAN countries to be more protectionist. One specific example is to what extent agreements on freer flow of capital and skilled labour will add complexity to domestic regulations as well as changing the domestic preferences.

The second objective of this study is to examine how regional trade agreements are able to drive unilateral reforms of small economies in a multilateral world. By using theoretical framework and empirical analyses, we will examine further on how RTAs transform domestic trade, labour, or other economic policies. Regional integration is a broad topic that requires a holistic approach to be understood. This would make other issues beyond financial gains, to be necessarily covered in this study. Issues related to inequality, security, and international relations will be addressed through collaborations with top scholars from other institutions or fields. For example, in international relations, we have looked into the impact of regional integration beyond international insecurity. Development economists, on the other hand, will be looking into the distributional effects of international trade and how regional integration might affect poverty.

The third objective is to link theoretical and empirical work of regional integration to potential policy implications and options, specifically on how to move the agenda of regional trade blocs towards multilateral blocs.

This study aims to underpin policy discussions on trade, by providing an overview of recent trends, empirical analysis on underlying drivers and impacts of regional integration. The study also aims to summarise policy recommendations, drawing on both ASEAN and other experiences.

Data and Methodology

The theoretical part of this study will be based on existing analysis on the Vinerian theory and the Kemp and Wan (1976) model. A lot of work has been dedicated to examine Viner's theory, which enables a more rapid production of creating theoretical framework. Nonetheless, most of this study will involve original research on fresh topics related to regional integration.

A number of high quality data from sources like COMTRADE, BACI-CEPII, WITS, CEIC, WID are available to conduct empirical analysis on RTAs. In addition to the theoretical work, this study will also include a substantial quantitative analysis. This analysis would become a significant base for empirical policy analysis, using counterfactual distributions, decomposition analysis, measures, impacts, evolution, and future projections of the regional integration.

The study also brings in countries' case studies to provide greater depth to the quantitative results, and to further probe our phenomena of interest. The quantitative analysis will provide evidence on trends and impacts of regional integration over time.

As we put special attention on ASEAN policies, this study requires reviewing legal documents, trade policies, and existing literature that will be heavily drawn upon to guide and situate the ASEAN analysis in a global context, to be able to identify policy options. Reviews on policies and literatures will be able to provide international context on how common or unusual the ASEAN experience is, and to address issues of regional integration and its effectiveness through existing policies in various countries.

This study will include a series of working papers that cover the following topics:

1. Vinerian analysis on regional integration
2. Kemp and Wan model analysis on impacts of blocs for both members and non-members
3. Empirical analysis on the impact of regional integration in FDI and employment
4. Countries case studies on domestic reforms due to the creation of regional integration
5. The impact of regional integration on international relations
6. The impact of regional integration of global wealth distribution and poverty

9

Non-tariff Measures in ASEAN

Coordinators: Lili Yan Ing and Shujiro Urata

Timeline: January 2015–January 2017

Abstract

With tariffs constrained by the WTO disciplines, we are expected to see increasing number of non-tariff measures (NTMs) designed to protect domestic firms and industries. This trend is quite feasible in ASEAN as one of the most growing regions in terms of growth in economy and trade.

NTMs in general is defined as policy measures, other than ordinary customs tariffs, that could affect the economy in international trade. Thus, NTMs include wide and diverse policies affecting international trade in goods, changing the quantities traded, or prices, or both (UNCTAD, 2013).

A number of incidents took place and the number of NTMs rose substantially between 2008 and 2011, as recorded by the London-based think tank Global Trade Alert. However, the increase in the number of NTMs across the globe is not necessarily a bad sign for the economy. As consumer wealth rises around the world, the demands on governments for health, safety, and environmental protection rise.

While looking at developing countries, a lot have greatly benefited from the integration in the global economy through international trade in goods and services. Integration in international market in developing countries was made possible by appropriate policies, such as tariff liberalisation, and initiatives related to trade facilitation and aid for trade. Today, deeper integration in the global economy depends not only on liberal tariffs and supportive policies, but also on increased policies in various forms of complex trade-related regional economic integration. The rise of specialisation and fragmentation of production has led to the increase of trade in intermediate goods and, in particular, to regional production networks.

In the case of ASEAN, however, the latest official database on NTMs by HS-4 digit for ASEAN countries are only available in 2009, as released by the ASEAN Secretariat. To fill the gap, the project seeks a strong multi-agency collaboration between NTM experts from ERIA and UNCTAD to (i) collect, validate, and classify NTM data from official sources issued by

governments; (ii) improve general understanding of these measures and their impact on world trade; and (iii) provide insights on policy recommendations for streamlining NTMs and trade regulation reforms.

When NTM data are collected according to the MAST NTM classification and UNCTAD's NTM data collection approach, analyses can be prepared and policy options can be devised to make appropriate assessment of the trade and development impacts of such barriers to trade.

Objectives

The project aims to contribute to developing export capacities by improving NTM transparency, and by providing trading partners with access to NTMs related information.

The value added of this project is to provide analytical exercises of impact assessment on trade-related reforms by providing reliable and up-to-date information and conducting analyses on NTMs. The project also assesses how these analyses could affect trade policy and trade performance by comparing NTMs in ASEAN to those of other regions and providing inputs in streamlining NTMs in this region.

Research Outcomes

Phase I (January 2015–April 2016): NTM Database for 10 ASEAN countries

Output: NTM Database which will be made publicly available

Team: ERIA-UNCTAD-National teams (10 ASEAN countries)

Phase II (March 2016–January 2017):

1. ERIA-UNCTAD Country Report
2. ERIA-UNCTAD Full Report (see the concept note)

**NARROWING
DEVELOPMENT
GAPS**

10

ASEAN at 50: Retrospectives and Perspectives on the Making, Substance, Significance, and Future of ASEAN

Authors/Coordinators: Ponciano S. Intal, Jr. and Lurong Chen

Status: Ongoing

Abstract

The research project is being undertaken upon the request of the Philippine Government, as part of the commemorative events to celebrate ASEAN's 50th anniversary in 2017, when the Philippines assumes chairmanship of ASEAN.

The research project will produce a commemorative publication that brings the retrospectives and perspectives of key people who have been involved in the making and working of ASEAN, voices from the ASEAN people, and the analytical insights, perspectives and reflections of eminent persons and experts on the evolution, substance and future of ASEAN. The commemorative publication will consist of three volumes:

Volume 1: The Making and Working of Emergent ASEAN: Leaders' and officials' retrospectives and perspectives

Volume 2: The Substance of ASEAN: The state, challenges, and impact of ASEAN integration and community building

Volume 3: Reflections on the Significance and Future of ASEAN

For Volume 1, key figures in the making and working of ASEAN will be invited to give their retrospectives and insights on the making and evolution of ASEAN over the past 50 years. They will consist of ASEAN Leaders, ASEAN Secretaries-General, ASEAN senior officials, and key officials or Leaders of ASEAN dialogue partners. There will be an emphasis on pivotal periods in ASEAN's development so that readers and the public would have some kind of a "front seat" view and a greater emotional attachment to the making and working of ASEAN. Volume 1 will also include thoughts from Leaders and key officials on the significance of ASEAN in the past, at present, and the immediate future.

Volume 2 focuses on addressing the following questions: What does ASEAN mean to people? What is the status of the ASEAN "project"? How does the ASEAN "project" compare with those of other regional integration efforts in the world, especially the developing world? What

is the impact of ASEAN on countries? What are the challenges in embedding ASEAN into the national consciousness, polity, policies and programmes of AMSs?

Volume 3 brings the insights, perspectives and reflections of eminent persons and experts on the significance of the ASEAN project on regional integration and East Asia, on implications of developments in East Asia and Asia-Pacific on the ASEAN project, and on the future of ASEAN. Being more reflections, the essays would focus more on ASEAN moving forward.

The publication will be launched at a High-Level Symposium on “ASEAN at 50: Reflections and Perspectives” in the run-up to the second ASEAN Summit in 2017.

11

Capturing Value-Added in Agricultural Value Chains: Challenges for Less-Developed Countries in Southeast Asia

Authors: Koji Kubo, Ikuo Kuroiwa, Lei Lei, Bill Pritchard, Pornthipa Ongkunaruk, Theingi Myint, and Vanthana Nolintha

Status: Ongoing

Abstract

For less-developed countries, integration into regional and global economy has offered not only opportunities but also challenges. Economic integration signifies expansion of the value chains – the steps of the production system as well as the linkages of various agents from producers to consumers – into less-developed countries. On the one hand, economic integration has facilitated the transfer of technology to less-developed countries and their access to the external markets. On the other hand, it has accompanied re-organisation of production units across borders, with less-developed countries potentially locked in low value-added production whereas high value-added activities remain elsewhere.

Benefits and risks of economic integration are observed in the agricultural sector of less-developed countries in Southeast Asia. In the agricultural sector of these countries, foreign firms from China and Thailand have embarked on operations as buyers in contract farming or as investors in food processing such as rice milling. Also, China has emerged as the top destination of Myanmar's rice exports in recent years. The South–South trade could reduce less-developed countries to the suppliers of low value-added and less quality-standards-intensive commodities.

This study attempts to shed light on the agricultural value chains of Southeast Asian countries, with an objective to identify channels where these countries can capitalise on economic integration, acquiring higher value-added. This study consists of five papers, including papers on maize exports from Lao PDR to China and Myanmar's rice exports to China as examples of low value-added production, Thai exports of organic rice as a case study of high value-added production, an input–output table analysis of the agricultural sector in Southeast Asian countries, as well as overview of the agricultural value chain analysis.

Research Outcomes

Major Policy Findings

1. Weak coordination between smallholder producers and marketing agents hampers the agricultural value chains capitalising on economic integration.
2. Rational responses of individual marketing agents to opportunities from economic integration do not always bring in higher value-added agricultural production.
3. There are rooms for the government to initiate coordination between producers and marketing agents which could allow them to capture higher value-added in the agricultural value chains.

Likely Impacts on Policy Formation in Country/Region/or Knowledge Pools

1. The study justifies government interventions in coordinating producers and marketing agents for realisation of higher value-added in agricultural value chains.

Policy Documents/Monitoring & Evaluation Documents/Briefs, Business, Academia and Community Platforms who have used/may use these Findings

1. Trade associations would be helped by the findings in formulating coordination among producers and marketing agents.

12

Economic Globalisation, Firms' Employment Policy, and Human Capital Formation in East Asia

Author: Hitoshi Sato

Status: Ongoing

Abstract

International production fragmentation has been a global trend for decades, becoming especially important in East Asia. Observers now widely believe that joining global production networks is crucial for a country's successful economic development. However, the dynamic economic performance in East Asian countries poses the following challenges:

- i) It is not easy for most firms to participate in global production networks; for example, only a tiny fraction of firms can export or import.
- ii) Workers are increasingly demanded to seek appropriate labour skills in the globalised economy because international production fragmentation accentuates international division of labour at the "task" level.

Based on these observations, this project conducts the following two studies. The first study attempts to investigate the mechanism of internationalisation (i.e. participation in global production networks) through the lens of firms' management practices. It explores how firms change management practices to seize opportunities to start exports or business transactions with foreign firms. In particular, it highlights employment practices because human resource management appears crucial to implement all other management practices such as the introduction of modern manufacturing systems (an example of technology adoption). Furthermore, human resource management affects job quality and human capital formation through various channels such as training and performance pay. For this purpose, this study conducts an original firm survey for three manufacturing sectors (textiles and apparel, electronics, and transportation equipment) in Viet Nam. The survey sheds light on the features of employment arrangements in firms participating in global value chains (GVC firms) and their differences as compared to non-GVC firms. Although the data collection and analysis are yet to be completed, a quick look at the data in hand suggests that although there are large gaps between GVC firms and non-GVC firms in performance measures such as sales per worker, the within-firm composition of labour skills (measured in schooling years) does not so vary

across firms as to be comparable to productivity gap. This study will show substantial differences in management practices between GVC and non-GVC firms and analyse crucial sources of such differences to obtain policy implications for the participation of non-GVC firms in global value chains.

The second study, from a more macroeconomic perspective, investigates the relationship between work-related values of the population and output per worker growth of the economy. It is widely believed that “motivated” labour is important for productivity improvement and economic development. However, empirical evidence is still limited on what (work-related) values may affect workers’ decisions and support labour motivation. Using the data from the World Values Survey (WVS) covering the period of 1981–2014 and the European Values Study (EVS) covering the period of 1981–2008, this study tests how five aspects of work-related values – importance of work, hard work and patience, independence and creativity, interpersonal relations, and rewards on productivity – affect economic growth in the standard framework of growth regression. We find that work-related values such as “thrift” as a proxy of patience and a belief that “hard work brings success” (rewards on productivity) are positively associated with growth. Although the results are less robust, the value indices for “independence”, “trust”, and “considering pay for performance fair” tend to be positively, while “obedience” tends to be negatively associated with growth. In terms of geographical distribution of work-related values, Asian economies (in particular, East Asian economies) generally score higher in multiple dimensions of these growth-enhancing values and score lower in growth-discouraging values.

Expected Research Outcomes

Major Policy Findings

1. From the original survey in Viet Nam, there are large gaps between GVC firms and non-GVC firms in terms of various performance measures such as sales per worker (as expected). However, the within-firm composition of labour skills (measured in schooling years) does not significantly vary across firms as to be comparable to productivity gap, which implies the importance of differences in management practices.
2. Better management practices tend to be applied to foreign-owned firms compared to indigenous firms. This seemingly suggests the existence of gaps in information and firm-specific knowledge assets. However, family ownership also tends to deter the application of better management practices, which implies the importance of CEO’s motivation.

3. Among various work-related values, “hard work brings success” (rewards on productivity) are positively associated with growth. This value is robust in various specifications. This value is positively correlated to the growth of human capital measured in schooling years and the residual in growth regression, which implies that this value would affect various sources of growth.

Likely Impacts on Policy Formation in Country/Region/or Knowledge Pools

1. In policymaking, governments should pay more attention to firms’ management practices because better management practices raise the odds of successful participation.
2. However, encouraging information dissemination from foreign-owned GVC firms to local firms (through joint venture, for example) may not be sufficient. Motivating local CEOs directly may be important because they tend to lack motivation to apply better management practices especially when their firms are not listed.
3. The main finding in the second study (the importance of the belief that “hard work brings success” in economic growth) suggests that policymakers should be sensitive to the role of values in the long-run economic performance. It is important to reduce economic distortions in labour markets (wages are a major income source) and make legal systems work appropriately.

Policy Documents/Monitoring & Evaluation Documents/Briefs, Business, Academia and Community Platforms who have used/may use these Findings

1. Governments and line ministries on trade and investment liberalisation, SMEs would be helped by the findings in drawing out their policies. The academic usage and knowledge of firm level data on management practices in an emerging economy (Viet Nam) will be put to use to understand the effects of globalisation on firms’ behaviour.

13

Industrial Deepening and Local Supplier Development in Southeast Asia: The Case of Thailand

Authors: Ikuo Kuroiwa and Kriengkrai Techakanont

Status: Ongoing

Abstract

It is often pointed out that local supplier bases in Southeast Asia are relatively weak in comparison with those in Northeast Asian countries, such as China, Korea, and Taiwan. Development of local supplier bases and the formation of industrial clusters are crucially important to strengthen the competitiveness of industries and sustain economic growth. However, empirical evidence is still lacking due to paucity of appropriate data.

Against the above backdrop, this study focuses on the manufacturing industry, particularly the automobile industry in Thailand. Thailand's automobile industry has developed rapidly and has become an indispensable part of global value chains. The government has played a critical role in establishing a basic policy and institutional framework, which shifted from inward-looking to outward-looking strategy since the early 1990s. Hence, it is worth studying the historical experience and the "rule of the game" that leads foreign firms to adopt their current organisational structure and their interaction with local firms.

The study examines the effectiveness of industrial policy in Thailand. Particular focus is placed on a policy framework, which supports local supplier industry. Simultaneously, empirical research is conducted to measure the strength of spatial linkages, local supplier development, and formation of industrial clusters. The trend of industrial linkages and local supplier development is examined by employing the OECD inter-country input–output data. Also, the automotive industry directory is used to construct a data set on spatial location and business type of parts and vehicle makers in Thailand.

The study consists of two papers. One is a trade in value added analysis of the Thai automotive industry. In particular, a new method of value chain mapping is developed and applied to OECD data. It is helpful to understand how the Thai automotive value chain has been shaped in both upstream and downstream transactions. The second paper focuses on the process of clustering of the Thai automotive industry. The paper examines when local suppliers

participated in the automotive supply chain, and specialised in which types of parts. It also examines how automotive clusters extended geographically, using the information on location of establishments.

Research Outcomes

Major Policy Findings

1. Trade liberalisation (since the early 1990s) was the most important factor which increased the number of parts suppliers, although local content requirements (1975–2000) provided opportunities for local suppliers to participate in the automotive supply chain.
2. Increased export-orientation and abolition of local content requirements (in 2000) started to reduce local content. However, it increased domestic value added, if the automotive industry could significantly increase competitiveness in international market by accessing cheaper or better-quality imported inputs.

Likely Impacts on Policy Formation in Country/Region/or Knowledge Pools

1. The automotive industry has significant scale economies. Hence special attention needs to be paid when liberalising trade. However, the study shows that the backward and forward linkage mechanism of the automotive industry started working after trade liberalisation.
2. The automotive clusters have expanded geographically, assisted by the government policy. In particular, infrastructure development and tax incentives have played important roles in relocating suppliers to surrounding provinces of the metropolitan area.

Policy Documents/Monitoring & Evaluation Documents/Briefs, Business, Academia and Community Platforms who have used/may use these Findings

1. The study is ongoing. It is expected that the results of the study will be used by academia as well as policymakers in the field of industrial development and spatial planning.

14

Industrial Development along the Global Supply Chain: Organisational Evidences from Southeast Asia

Authors: Patarapong Intarakumnerd and Tomohiro Machikita

Status: Ongoing

Abstract

The central question of this project is how firms have achieved product and process innovations without formal R&D unit or personnel. This study examines the inside of innovation processes from several angles to address this question. This research studies organisational aspects of industrial development, domestic transactions, and cross-border trade for firms without formal R&D department or personnel. Furthermore, the question here is how manufacturers without formal R&D units could achieve technological and product changes (i.e. innovation) in highly competitive emerging economies and what types of organisational changes are needed for these manufacturers to sustain technological and product changes.

Right understanding of innovation and production in firms and industries in emerging economies can contribute to the following three important features of East Asian industrial and trade policies under an inter-connected economy:

- entering global production networks through specialising in qualified products;
- upgrading products and services in cooperation with production partners;
- diversifying products and services at the firm level.

This research helps academia and policymakers in ASEAN and East Asia to get a deeper understanding of the firm-level facts about industrial development where firm-level investment in R&D is not ubiquitous.

The study has eight descriptive case study papers which cover the following countries: Indonesia, India, Lao PDR, Malaysia, Myanmar, Thailand, the Philippines, and Viet Nam and two micro econometric papers which can cover several countries. The case study papers examine the main question: how different types of manufacturers without formal R&D units could achieve innovations even within narrowly defined industries in each country. Eight case study papers describe first stage (e.g. idea formation) to the last (when product innovation is out in the market or when process innovation is practically introduced) as well as how internal

departments inside the firms and external parties were involved. Study also covers how internal departments and external parties worked together to overcome “resistance to change”.

This study, which is ninth in ERIA innovation project series since 2007, attempts to shed light on how firms and industries in emerging economies in Southeast Asia could achieve upgrading. The study attempts at getting clear understanding of whether and how internal capability and external linkages have affected the performances of local firms compared to foreign affiliates of MNCs or joint ventures. To continue to address this question, key variables of industrial upgrading should be identified for policy planners working towards sustainable economic development in East Asian economies.

Research Outcomes

Expected Policy Findings

1. Within industry, MNCs has a major share (both in terms of investment and patents). For indigenous firms, R&D carried out predominantly by large firms in a few sectors: electronics, pharmaceutical, automotive, food. Only a small number of firms have “formal” in-house R&D units. Some firms are very active learners, with consciously developed engineering and design capabilities, even if they have no formal R&D process.
2. Innovation without R&D comes from tangible/intangible technology acquisitions, hiring new staffs (including from overseas), training (very critical), imitation through reverse engineering, incremental improvement and learning by interacting with suppliers, senior partners, customers.
3. There are internal and external obstacles to innovations, such as lack of innovation strategies, lack of financial resources, lack of qualified engineers and technicians, lack of mindset of entrepreneurs, lack of market research, and lack of government support, especially in Lao PDR and Myanmar.

Likely Impacts on Policy Formation in Country/Region/or Knowledge Pools

1. This project is discussing the impacts of following six region-industry specific policy tools based on case study papers:
 - Grants for innovation (Malaysia)/tax incentives
 - Training for technical and marketing facilities/services
 - Positive spillovers from government-supported industrial clusters

- Connecting with global players (Malaysia)
- Government procurement (Viet Nam/India) and certification/regulation provide opportunities and pressure to local firms to innovate
- Over-regulation

Policy Documents/Monitoring & Evaluation Documents/Briefs, Business, Academia and Community Platforms who have used/may use these findings

1. The study discusses following ten policy suggestions for businesses and policymakers:

- Training courses and experience-sharing forums on innovation strategies for owners of SMEs.
- Free flow of professionals contributing to innovation (not only engineers and technicians but also business, marketing, services, and quality systems consultants, designers).
- Business matching services between MNCs and SMEs in the region.
- Innovation awards to firms with access to supermarkets/department stores in more advanced countries.
- Conducting Community Innovation Survey following Frascati and Oslo Manuals.
- Changing the mindset of local entrepreneurs on the importance of innovation through experience-sharing workshops/networks.
- Subsidising training for upgrading absorptive capacity for local firms by using engineers and technicians from MNCs and/or hire them as individuals.
- Subsidising local engineers for on-the-job training on advanced engineering and design with leading firms abroad.
- Subsidising local firms to participate in international exhibitions.
- Government procurement for local innovations.
- Labelling/certifying local innovative product.

15

International Mobility of Highly Skilled Professionals: Lessons for Developing Countries

Authors: Byeongwoo Kang, Yukihiro Sato, and Yasushi Ueki

Abstract

In the era of the global competition for talent, the international mobility of highly skilled professionals is universal. Such type of mobility is significant not only for firms but also for governments, and has been attracting much attention from scholars and policymakers. Prior studies showed the mobility of highly skilled professionals have a lot of merits such as technology transfer, productivity increase, innovation capability building, etc.

Two issues remained significant in the existing studies. First, most studies focused on international mobility from developing countries to developed countries or between developed countries. The other issue was that the process of such mobility was not studied in depth. Building on these two issues, this study investigates how the international mobility of the highly skilled professionals from developed countries to developing countries occurs.

The study focuses on cases where Japanese engineers were scouted by Korean and Taiwanese firms. The engineers were interviewed to develop a qualitative study which provides insights and policy implications about international mobility of highly skilled professionals from developed countries to developing countries.

Research Outcomes

Major Policy Findings

1. Highly skilled professionals are likely to leave the country if:
 - social system of the country does not allow the professionals to continue working after retirement
 - the professionals are retired or are about to retire
 - job satisfaction of the professionals drop significantly
2. Highly skilled professionals are likely to be scouted by firms in developing countries if
 - they have long work experience
 - they are more “visible” to other companies

- they know and/or are provided enough information about work and living overseas
3. Highly skilled professionals are likely to take offers from firms in developing countries if the supporting system for work and daily life is efficient. This also aids their performance.
 4. Stability and security levels of a developing country matters for highly skilled professionals to decide to go and work there.

Likely Impacts on Policy Formation in Country/Region/or Knowledge Pools

1. Developing Countries

This study provides some idea seeds to set policies to attract highly skilled professionals from developed countries.

2. Knowledge Pools

The international mobility from developed countries to developing countries was not studied in detail earlier. This study is important as it sheds light on the issue.

This study can be a base for further studies in two directions:

- i. The findings obtained from qualitative analyses could be further extended to quantitative analyses to test the findings.
- ii. The study is limited to East Asia. Next level of studies can apply the analyses of this study to other regions and compare analyses.

Policy Documents/Monitoring & Evaluation Documents/Briefs, Business, Academia and Community Platforms who have used/may use these Findings

1. Business (HR staffs, headhunters, etc.)

This study finds that major efforts are required to scout highly skilled professionals from developed countries. The findings suggest:

- Be patient and provide transparent and sufficient information to the target professionals
- If necessary, ask and prepare what target professionals want, and
- Prepare supporting systems for professionals' daily life.

2. Policymakers, government organisations

There are some roles that only the government can and must do.

- Government should provide attractive (at least stable and safe) environmental and social systems for highly skilled professionals
- Government could install systems to support highly skilled professionals' daily life.
- Government organisations seek suggestions from companies to remove obstacles in recruiting highly skilled professionals from abroad.

3. **Academia**

This study covers international mobility from developed countries, which has not been studied in depth, earlier. The study also provides empirical learning through the detailed processes on how the interviewees received offers from firms in developing countries and subsequent acceptance.

16

New Developments for Cross-border Transport Facilitation in the Inland ASEAN and Establishment of the ASEAN Economic Community

Author: Masami Ishida

Status: Ongoing

Abstract

The year 2015 was a big milestone for ASEAN with the establishment of the ASEAN Economic Community (AEC). The year was also the targeted year for the Master Plan on ASEAN Connectivity (MPAC). Accordingly, this study surveyed some of the roads to be upgraded in the MPAC and also the newly developed roads in Cambodia, Lao PDR, Myanmar, and Viet Nam (CLMV). Of the roads listed for upgrading in the MPAC, many did not appear to be justified for upgrading because their conditions were not so bad. Similarly, many completed roads did not show good condition. Regarding new roads, it was stated that the expressway would bring about a many benefits of development along the road, such as increase in FDI and demand for agricultural products in metropolises, which also needed to be verified.

In conducting this study, technical requirements of vehicles such as height, width, length, and maximum weight of vehicles were checked. The standards of the technical requirements are similar to the criteria shown in the ASEAN Framework Agreement on Facilitation of Goods in Transit (AFAFGIT).

Road signs were checked because the difference in signage can cause serious accidents when the vehicles cross borders freely. Most road signs were found to be similar. With some differences such as signs to prohibit to take over other vehicles and facility signs of hospitals. Some signs are written only in local languages.

A survey on the composition of road traffic laws and transportation laws was conducted as a preparation of comparative study of transportation laws.

Research Outcomes

Major Policy Findings

1. The condition of roads may not be entirely known to government officials in some countries. When the road is listed as “needed to be upgraded”, the road conditions may

not be bad; and after upgrading was completed, the conditions did not show any major improvement.

2. Even though the upgrading or improvements of roads are finished, the road conditions can be worsened in case of mountainous roads in developing countries.
3. The benefits brought in by the development of the expressway such as increase in FDI and demand for agricultural products for metropolises were found to be huge.
4. The technical requirements of each country are similar to the criteria of the AFAFGIT. However, maximum weights are higher than the set standard in some countries.
5. The road signs are not very different among the countries in the Inland ASEAN. But some signs were found to be made in local language only.

Likely Impacts on Policy Formation in Country/Region/or Knowledge Pools

1. The findings would lead governments/agencies to check the road conditions, especially in mountainous sections and to share the correct road conditions among the government officials.
2. When an expressway is designed, it is recommended to maximise the economic effects of the expressway development.
3. All governments should make efforts to harmonise the technical standards to the ASEAN criteria and harmonise ALL road signs. Signage should be mentioned in English to complement the signs in local languages.

Policy Documents/Monitoring & Evaluation Documents/Briefs, Business, Academia and Community Platforms who have used/may use these Findings

1. These policy recommendations are expected to be provided to Ministry of Transport and planning and development ministries.

17

Rethinking Migration Governance in the Mekong Region: From the Perspective of the Migrant Workers and Their Employers

Authors: Naomi Hatsukano, Archanun Kohpaiboon, Juthathip Jongwanich, Luch Likanan, Kenjiro Yagura, Atsuko Mizuno, and Maki Aoki

Abstract

The labour market in the Mekong subregion is integrated as a matter of practice, even though the free movement of unskilled workers is not mentioned in the ASEAN Economic Community. Thailand now receives more than three million unskilled workers from neighbouring countries, which include Cambodia, Lao PDR, and Myanmar and they support industries in Thailand. These migrant workers' households in their home countries are supported by remittances from these migrant workers. There is a huge demand for migrant workers in Thailand due to recent chronic labour shortage in Thailand. The workers too are seeking better opportunities that cannot be found in their home countries.

The role of migrant workers in economic activities and regional industrial development are increasing each year. This study aims to understand the overall impacts of migration on regional development and development strategies by examining migration governance, which includes the overall system and practice of legal and economic institutions in the Mekong subregion. Workers decide whether to migrate or not and how they migrate, and employers make decisions on whether or not to employ migrants under certain governmental rules and various economic conditions. By examining the motivations and the consequences of both workers and employers and the government policy of Thailand, we have conducted an analysis of migration governance.

The study has seven papers which cover the following countries: Introduction to overview the migration in the Mekong subregion, impacts of migrant workers in Cambodia (two papers), garment industry's upgrading and migrant workers in Thailand (three papers), Thai government's policy and its Mekong development strategy.

Research Outcomes

Major Policy Findings

1. Migrant workers in the Mekong subregion supported and contributed to the economic development in the region.
2. The remittances from both internal and international migration have contributed to the positive increase in educational expenditure, health expenditure, debt payments; and house improvement in the case of Cambodia.
3. Thai garment industry has succeeded in raising the efficiency of its production system and increasing value added within Thailand by moving the labour-intensive and lower value-added processes/products to the neighbouring countries.
4. Decision to upgrade is independent of hiring foreign workers. Successfully upgrading firms are in the better position to compete for workers, regardless of their nationality, as seen in survey of Thai garment industry. Garment firm's human resource management practice matters to Myanmar workers' motivation to develop skills.

Likely Impacts on Policy Formation in Country/Region/or Knowledge Pools

1. Governments in the Mekong subregion need to look toward the future of the regional development utilising the migrant workers.
2. Human resource development (HRD) of migrant workers should be achieved through cooperation between sending and receiving countries' governments and the employers. Development aids for the HRD in the sending countries should be designed in the form that is in consonance with the migration control policy.

Policy Documents/Monitoring & Evaluation Documents/Briefs, Business, Academia and Community Platforms who have used/may use these Findings

1. Governments and line ministries on investment and industry would make reference to our findings in drawing out their policies. Business people in the manufacturing industry will make reference to the findings on human resource development. These findings will offer the basic resource to understand the migrant workers and firms movement in the region.

18

Lao PDR at the Crossroads: Industrial Development Strategy 2016–2030

Authors: Fukunari Kimura, Masahito Ambashi, and Souknilanh Keola

Status: Ongoing

Abstract

The “Lao PDR at the Crossroads” project was initiated upon the request of H.E. Khemmani Pholsena, Minister of Industry and Commerce, Lao PDR. The Lao PDR government has been expressing a concern that while economic growth has increased per capita income more than seven times, from US\$235.2 in 1991 to nearly US\$1,800 in 2015, it now encounters two obvious challenges. Firstly, the growth has been based on a few sectors that are dependent on exhaustible mineral resources. It is observed that the energy and resource industries hardly generate sufficient employment required for inclusive growth. Secondly, development gaps have widened between and within regions.

Although the Lao PDR government formulated 10 Year Development Strategy (2016–2025) and Vision 2030 (2016–2030) to address these two challenges, this research aims to present potential inputs, from different perspectives, particularly to medium- and long-term comprehensive industrial development strategies. It also includes concrete policy recommendations that are likely to contribute to realisation of further development and growth in Lao PDR. More specifically, the objective of this research is to pose policy measures that can turn the weakness of Lao PDR, its landlocked location, into its strength. In this regard, the term, “crossroads”, of the research title implies the time when Lao PDR needs to make a significant decision on the future path, as well as the place where it is centrally located at the Mekong region.

The unique viewpoints presented in this research are based on geography and connectivity, and how they affect industrialisation and economic development. Both connectivity and geography are analysed in the framework of “production networks”, “Second Unbundling”, and “New Economic Geography.” In particular, it is demonstrated that three pillars of development strategies are important: formation of midsize agglomeration (Tier 1), participation in production networks (Tier 2), and regional core cities and rural development (Tier 3). In order to go up these development stages, the study lays out potential industrial strategies, such as hard/soft infrastructure development, human capital development, nurturing efficient financial

sectors, development strategies of industrial estates, expanding trade/investment relationship beyond adjacent neighbours, individual industrial policies, and among others. Furthermore, the geographical simulation is undertaken to estimate the impacts of the above-mentioned measures on the Lao PDR economy.

It can be expected that this research will assist Lao PDR government to achieve inclusive and sustainable economic growth, upgrading of its industrial structure, export diversification, tighter connectivity, and the narrowing of geographical development gaps.

Research Outcomes

Major Policy Findings

1. In accordance with the three pillars of development strategies, it would be difficult and inappropriate to arrange competitive industries in every industrial category like Thailand. The goal for Lao PDR is to participate in the production networks of goods and services and to become an essential production and logistics hub in the Mekong region.
2. Based upon survey research of industrial estates in Thailand, Viet Nam, and Cambodia, it is revealed that industrial estates are the basis for forming industrial clusters which obviously bring about economic development. Given the small population of Lao PDR, industrial estate development has to be located in relatively big cities with large population. In addition, given the geographic location of Lao PDR, the agglomeration in Bangkok would be the prime industrial core to be integrated with. It is most likely that Lao PDR would receive the largest benefit from developing industrial estates that are close to the bridges over the Mekong River.
3. Promising industries in Lao PDR include 1) agriculture and food processing, 2) mining and energy, 3) garment and other labour-intensive industries, 4) electric and electronic machinery, 5) transport equipment (automobiles and motorcycles), 6) tourism, 7) finance, and 8) transportation. In addition to productivity improvement in the agriculture industry, it is necessary to absorb redundant work force in this sector into high-productivity industries such as the electric and electronic machinery and transport equipment industries, which results in improving the productivity of the whole economy. Furthermore, promotion of the transportation industry is a clue to Lao PDR

being a logistics hub in the Mekong region, and for that purpose, hard and soft infrastructure development is required.

4. By incorporating industrial policies such as formation of industrial estates, improvement in industrial productivity, cost reduction in logistics, the GSM approach indicates not only that these policies are expected to significantly enhance economic development in Lao PDR, but also that they make development gaps between and within the regions narrow.

Likely Impacts on Policy Formation in Country/Region/or Knowledge Pools

1. The Lao PDR government is highly likely to understand the status of economy and industrial structure as they really are, and accordingly, comprehend what industrial policies it should take to address its concerns. Moreover, it is expected that the government can consider possible actions to implement industrial strategies suggested by this research.
2. The Lao PDR government can develop a connection with aid agencies such as ADB and JICA through a national seminar that will be held for the purpose of explaining research results to Lao PDR officials and disseminating them to such agencies.

Policy Documents/Monitoring & Evaluation Documents/Briefs, Business, Academia and Community Platforms who have used/may use these Findings

1. Lao PDR government officials would be greatly helped by this research in formulating their own industrial development strategies. In addition, aid agencies, which support the Lao PDR government in terms of funding and capacity building, would know more about necessary, immediate, and potential policies.

19

SME Participation in ASEAN and East Asian Regional Economic Integration

Authors: Dionisius Narjoko, Sothea Oum, and Cassey Lee

Abstract

The economies of ASEAN and East Asia have become increasingly integrated. This process of regional economic integration has been driven by the mutually reinforcing market forces and trade agreements (regional and preferential). A major area of concern among policymakers has been the extent to which small and medium enterprises (SMEs) are participating and benefiting from regional economic integration. It is a valid concern given that about 95–99 percent of all firms in the region are SMEs. Furthermore, SMEs are also likely to be more resource-constrained (compared to large firms) to take advantage of the benefits from trade and investment liberalisation. Despite their importance, there is currently a lack of systematic and comprehensive research on these issues.

The main goal of the proposed research project is to undertake a systematic, comprehensive and comparative analysis of SME participation in ASEAN and East Asian regional economic integration.

The key research questions for the project include the following:

- What is the state of SMEs participation in regional trade, production networks, and investment activities?
- What are the enabling factors and obstacles to SME participation in regional trade, production networks, and investment activities?
- How have regional and preferential trade agreements affected SMEs' activities and performance?
- What are the policy imperatives at national and regional levels to promote active participation of SMEs in regional trade, production networks, and investment?

Research Outcomes

Major Policy Findings

1. SMEs in ASEAN are still lacking of knowledge about the current Free Trade Agreements imposed in ASEAN countries and tend to not utilise the ongoing trade agreements.
2. Therefore, it is still unclear whether SMEs are benefiting from various trade agreements adopted by ASEAN countries and whether they have been relatively competitive. Most of the firms that are aware of the various ongoing FTAs and also utilise them are the large firms.
3. Lack of data either in the form of census or firm survey in less developed countries like Myanmar make it more difficult to monitor the likely impact of FTAs on the local firms, especially SMEs.
4. Meanwhile, the ongoing various trade agreements within ASEAN and between ASEAN and other countries/regions are seen as opportunities by some bigger industrialised countries such as China, who is using both ATIGA (within-ASEAN free trade agreement) and ASEAN's position in RCEP and TPP to reap bigger markets and participate deeper in global value chain.

Likely Impacts on Policy Formation in Country/Region/or Knowledge Pools

1. Significant actions to socialise the ongoing trade agreements and how they can benefit the local SMEs should be one of the focuses of Governments agendas in near future.
2. Improving the skill and capacity of SMEs workers and management could also strengthen the SMEs position to better utilise the Free Trade Agreements and be more competitive both in domestic and export markets.
3. Some schemes to ensure the positive spillovers to come from foreign investment and operations should be considered so that the market in ASEAN could be more competitive and integrative.

Policy Documents/Monitoring & Evaluation Documents/Briefs, Business, Academia and Community Platforms who have used/or may use these findings

1. Governments and line ministries on trade and investment liberalisation, SMEs would also be helped by the findings in drawing out their policies. The academic usage and knowledge of how the free trade agreement are utilised both by local and foreign firms in ASEAN countries can be used to understand the effects of globalisation in the region.

**SUSTAINABLE
ECONOMIC
DEVELOPMENT**

20

Developing Sustainable Collaboration Model for Implementing Integrated Space-Based/Geospatial Disaster Management Infrastructure to Strengthen the Resilience in ASEAN Community

Author: Ryosuke Shibasaki

Status: Ongoing

Abstract

There are urgent needs for strengthening resilience of natural disasters infrastructure in the ASEAN countries. Resilience of social infrastructure has been considered an important issue for the economic development among East Asia as well as ASEAN countries. The ASEAN Agreement on Disaster Management and Emergency Response (AADMER) developed the AADMER Work Program 2010–2015 to cover all aspects of disaster management.

The ERIA study project “Applying Space-Based Technology for Building Resilience in ASEAN Region” conducted in 2014 concluded that geospatial technologies and space technologies have notable potential to strengthen this resilience although sustainable mechanisms for integrating the technologies in practice for disaster risk management (DRM) has not still been well established. The study pointed out necessity of (i) trans-border mechanisms to deliver the geospatial and space-based information from data providers to end users in disaster-affected areas with support of international activities and (ii) financial schemes involving private sectors, or public–private partnerships (PPPs), to operate collaborative integration of the technologies in sustainable and practical manners.

To establish the trans-border mechanism with PPP scheme, the study proposes establishment of a trans-border DRM platform as a DRM service infrastructure for public disaster management agencies and private companies in the ASEAN region. The platform comprises the following components: (i) data resources interoperable and expandable in regional and global scale; (ii) knowledge on how to apply the technologies to DRM in practice; and (iii) human network of stakeholders including national and local governments, technology providers, and financing partners. To ensure sustainable operation, the platform collect operation fees from the DRM service providers while the DRM service providers develop businesses using the platform.

This study aims to (i) analyse feasibility of the proposed platform in terms of technology and finance, (ii) design the platform based on the feasibility study, and (iii) lay out strategies to establish and operate the platform in practical and sustainable manners.

Expected Research Outcomes

Major Policy Findings

1. There are possible applications of space-based/geospatial technologies which facilitate DRM activities in the ASEAN region through collaborative schemes with technological and financial partners. The applications are expected to extend from pilot exercises to operational use in ASEAN states.
2. The technologies, knowledge, and services in the applications are structured to be core examples necessary for the platform to expand them to regional and global scale. The structure is designed with technical requirements to promote collaborations, such as inclusion of standardised protocols and ICT architecture.
3. The platform can be established and operated in sustainable manners with supports of financial schemes based on cost–benefit analysis of the applications. The financial scheme will support collaborations with international development agencies who have interests in DRM technologies and applications. The financial schemes also will help to facilitate dialogues within ASEAN member states to finance for sustainable operation of the platform.
4. It is feasible to conclude short- and long-term strategies for establishment and operation of the platform by collaborations among the ASEAN member states, technology partners, and financial partners. The strategy also shall include measurable goals in disaster reduction which can be achieved by establishment of the platform.

Likely Impacts on Policy Formation in Country/Region/or Knowledge Pools

1. The ASEAN member states will be motivated to follow the strategy to include the space-based/geospatial technologies for DRM applications by the pilot demonstrations of core examples technologically and financially extensible.
2. International and local partners of the ASEAN states, such as international organisations, bilateral cooperation agencies, and private companies, will be better coordinated in

applications of space-based/geospatial technologies for DRM by the strategy for establishment and sustainable operation of the platform.

Policy Documents/Monitoring & Evaluation Documents/Briefs, Business, Academia and Community Platforms who have used/may use these Findings

1. The ASEAN Secretariat, member states, and the ASEAN Committee on Disaster Management (ACDM), will refer the proposed strategies for installation of space-based/geospatial technologies for better resilience of the ASEAN region.
2. International organisations and communities who have interests in technologies and finances for DRM will refer the findings and proposed strategies to draw out their work plans for collaborations of DRM with the ASEAN Secretariat and its member states.

21

Reducing the Vulnerability of Supply Chains and Production Networks

Author: Venkatachalam Anbumozhi

Status: Ongoing

Abstract

The global supply chain and production network is a paradigmatic example of an economic structure on which the impacts of unexpected events propagate rapidly through the system. Over the past decade, several studies had been oriented to investigate the direct impacts generated on specific geographical areas or production networks. However, a smaller number of analyses have been oriented to quantify the cascading economic effects of extreme weather events and economic crisis on the production networks. The great complexity of the global economic system, coupled with methodological and data gaps, makes it difficult to estimate the interrelated effects of unexpected events.

Recently supply chain vulnerability and its managerial counterpart supply chain risk management have received considerable attention by academics and policymakers. The impact of one entity in the global supply chain or particular component of the production network failing can affect a number of interrelated entities in the supply chain and, in some instances, disrupt the whole supply chain. The risk implications of the entwined regional and global marketplace that characterises Asian production networks and supply chains had been evidenced vividly in Japan's earthquake and Thailand floods. Moreover, incidents like the seemingly unlikely volcanic eruption in Indonesia make companies and policymakers aware of how little control they have over many vulnerabilities they are confronted with. Still, some companies appear to be able to weather the occurrence of hazardous events more effectively than others. They can sustain by coming back to normality or to a new state from which they can operate.

The apparent ability of some supply chains to recover from inevitable vulnerabilities more effectively than others has more recently triggered an important policy debate about supply chain resilience. Those supply chain risk studies provided normative guidelines based on single best-practice examples or vulnerability events which have implications for developing integrated response strategies. A clear understanding of the possible consequences is a fundamental step in building socio-economic resilience. Within this context, this study aims to

(i) define the conceptual and sectoral domains of supply chain risk management and resilience by examining the welfare effects of extreme weather events and other economic shocks on the selected global supply chain in East Asia Summit economies; (ii) have in-depth analysis on the scope of public–private partnerships in tackling the risks by exploring empirically the effects of supply chain risks and information management, and the four formative supply chain capabilities of flexibility, velocity, visibility, and collaboration; and (iii) propose a regional cooperation framework in the context of major manifest supply chain vulnerability events, such as disasters and global financial crisis.

Research Outcomes

Major Policy Findings

1. Extensive supply chains can negatively affect recovery because of higher vulnerability to network disruption, and positively through support from trading partners, easier search for new partners, and the general benefits of agglomerations – thus, policies to support the resilience programme.
2. Procurement activities and public financing immediately after disasters significantly contribute to creating supply chain resilience. Certain intra-organisational and inter-sectoral issues also impact supply chain resilience. Business continuity plans need specific considerations.

Likely Impacts on Policy Formation in Country/Region/or Knowledge Pools

1. Recommends cost-effective strategies for minimising vulnerability dimensions of high-probability disaster events along key Asian value chains and production networks.
2. Proposes effective public–private partnership in implementing various structural and non-structural measures at the national and regional levels in building resilient economies.
3. Offers a coordination mechanism needed at the regional level.

Policy Documents/Monitoring & Evaluation Documents/Briefs, Business, Academia and Community Platforms who have used/may use these Findings

1. This study identifies which supply chain capabilities can support the containment of disruptions and how these capabilities can be supported by the ASEAN Agreement on Disaster Management and Emergency Response (AADMER).

22

Industry 4.0: Empowering ASEAN for Circular Economy

Author: Venkatachalam Anbumozhi

Status: Ongoing

Abstract

The emerging economies of Asia are experiencing strong growth, accompanied by increased production and consumption. There is ample evidence to suggest that the regional economic development experienced in ASEAN, China, and India is associated with industry 1.0 (through introduction of mechanical production facilities powered by water and fossil fuel energy). This slightly differs from industry 2.0 (where mass production is based on the division of labour and renewable electrical energy), which happened in some parts of Asia. This was followed by industrial revolution 3.0, wherein electronics, information and communication technology (ICT), and robots played a key role in automation of production. For the last several years, analysis of industries 1.0, 2.0, and 3.0 has been largely absent from the assessment of integrated economic and environmental policy formulations. Recent agreements on Intended Nationally Determined Contributions (INDCs) by major developing countries of the East Asia Summit (EAS) also highlight the importance of understanding the improvements in resource efficiency that will drive industrial revolution 4.0.

Industry 4.0, where a new economic model replaces the linear approach to industrialisation and which considers the resource constraints and application of product and process innovation, will become an economic and social imperative for the EAS region. Linking economic opportunities within ecosystem boundaries of industrialisation requires a disruptive paradigm shift. In an effort to keep control over valuable natural resources, wisely use critical inputs such as energy, and reduce carbon emissions, some economies such as Japan, Korea, and Germany are finding innovative ways of doing disruptive shifts towards a circular economy. Their success also provokes bolder questions to other rapidly growing ASEAN countries to leapfrog to industry 4.0. Will a circular economy and a new type of eco-industries deliver enough social and economic benefits during the transition? What is the role of ICT? How could competitive markets for a circular economy be developed through regulations? What are the uncertainties that may hinder the investment decision on circular economy at the firm, sector, and economy levels? If there are experiences on regional cooperation, how could the power of that

architecture be leveraged? This study addresses these questions by evaluating the policies and practices available at different levels and their applicability to the emerging EAS economies.

Research Outcomes

Major Policy Findings

1. The introduction of industry 4.0 into the manufacturing environment is ushering new opportunities for export-oriented middle-income countries. But the status of technology and innovative capacity is not yet considered seriously in sectoral policies.
2. In the transition towards a circular economy, refurbishment can be applied to regain value from used products, reduce waste, and improve resource efficiency. Indicators at the city and sector levels need policy attention.
3. Creating integrated business models to meet the targets of industry 4.0 and a circular economy needs further policy incentives and capacity building programmes.

Likely Impacts on Policy Formation in Country/Region/or Knowledge Pools

1. Introduces new market transformation strategies for industries 4.0 that constitutes creative and circular economy concepts being discussed at the national and regional levels.
2. Recommends policies that augment individual workflows and allow fast learning of new production process at inter- and intra-firm level.
3. Proposes a regional architecture within the ASEAN Economic Community (AEC) that is needed to support, help, and train the next generation of entrepreneurs.
4. Findings are reported and discussed during the 15th International Business and Economy Conference contributing to better academic understanding.

Policy Documents/Monitoring & Evaluation Documents/Briefs, Business, Academia and Community Platforms who have used/may use these Findings

1. The ASEAN Social Cultural Community (ASCC) and AEC shall benefit in using the indicators framework and public–private partnership models outlined in the study.

23

Economic Policymaking in the Indonesian Economy

Authors: Dionisius Narjoko and Fauziah Zen

Status: Ongoing

Abstract

Facing the new era of globalisation with lots of modernisation movements, many of Indonesia's economic policies are still lacking in economic rationale. To contribute more in providing rational background for Indonesia's economic policies, ERIA with Center for Strategic and International Studies (CSIS), Indonesia, invited prominent experts in some of the most fundamental subjects of economic policies in Indonesia to share their thoughts in the form of policy briefs, on how the economic policies in Indonesia could take shape to give the utmost benefits for future Indonesia.

The issues covered in the policy briefs are related to investment and business climate, infrastructure, trade and market openness, service sector development, and social protection. On investment and business climate issues, emphasis was on discovering incentives for investment, revisiting Negative Investment List and evaluating the ease of doing business. Encompassing financing and regulatory issue are among the main points covered under infrastructure policy briefs while opportunities arising from participating more in foreign trade agreements and other trade openness movements are captured in the policy briefs on trade and market openness. Addressing efficiency issues are the topics covered under services sector development, both in general and, in particular in financial services sector. Finally, food security issue and investigating productivity improvement for food security are among the main points covered in the respective policy briefs.

Research Outcomes

Major Policy Findings

1. On Investment and Business Climate Issues:

- There are many regulation issues in ease of doing business such as unclear definition of things (grey areas), low coordination between central and regional governments, and weak law enforcement that induced high cost of doing business.

- The Negative Investment List (NIL/DNI) brought about similar regulation issues, along with common misconception of protectionism in the context of NIL/DNI; i.e. NIL/DNI is seen as the policy instrument to protect domestic industries from foreign investment invasion whereas NIL/DNI is actually not a tool to hinder the influx of foreign investments but only regulates the investments so that they are suitable to and consistent with national interests.

2. **On Infrastructure:**

- There are two major issues in respect of infrastructure in Indonesia, namely, cost of infrastructure (cost to construct the infrastructure) and funding (cost to operate the infrastructure sustainably), along with land issues, which involves land clearing and land acquisition issues.
- On electricity subsidies, it is found that subsidy could be more properly targeted to benefit the needy and people – including the poor who receive subsidies – should be encouraged to use the power more efficiently. This might entail restructuring Perusahaan Listrik Negara (PLN) in some way.
- The cost of logistic in Indonesia is very high – higher than Viet Nam’s or Thailand’s – but the performance was lower than Viet Nam and Thailand. High dwelling time and the lack of supporting connecting land and sea transportation are some of the major causes of high cost of logistic in Indonesia.

3. **On Trade and Market Openness:**

- The trade competition brief shows Indonesia not having any serious problems. However, exchange rates fluctuations reveal exchange rates management of mediocre kind. Trade competition is also hindered by the high cost of one of the main raw materials – electricity.
- Indonesia has been involved in less than 1% of global production network so it needs to have very open trade regime and competitive labour to participate deeply in today’s global value chain.
- On Free Trade Agreement, there is the cost of not joining along with the certain costs of joining a FTA. At times, the first cost might be higher than the other.

4. **On Services Sector:**

- Although this sector provides very important intermediate inputs for almost all industries in Indonesia, service sector still contribute to only around 6% of Indonesia’s GDP and 40 percent of total employment. At the same time this

sector is relatively closed to foreign investments as per OECD's FDI Regulatory Restrictiveness Index.

- The policy brief on financial service sector reveals that intermediary function in banking sectors is still weak and it might be correlated with other measures such as high Net Interest Margin and other pricing components although banks are still the main source of financing. Hence, in general, banking industry in Indonesia is still not efficient enough and it might be due to monopoly power exercised by major players in the market.

5. **On Social Protection:**

- There are at least five urgent socio-economic matters that deserve more attention from policymakers: 1) the slowing down of the decrease of poverty rate; 2) high numbers of people who are vulnerable to being poor; 3) bigger spending on education without corresponding improvement in quality of education; 4) on health issues, chronic child malnutrition and maternal deaths are still prominent; and 5) the steep increase of Gini coefficient that indicates wider inequality.
- A huge part of government's education spending goes to teachers' remuneration but the teachers' competencies have not improved.
- Financial inclusion in Indonesia is still low, indicated from the low percentage of formal financial account holding, although many innovations have been made such as cashless payment systems and branchless banking.
- On food security note, growth of domestic crops production cannot catch up with growing demand of food in Indonesia. However, relying too much on imported food might be risky for such a populous country. In the Global Food Security Index 2015, Indonesia was ranked at 74th position, out of 109 countries examined.

Likely Impacts on Policy Formation in Country/Region/or Knowledge Pools

1. **On Investment and Business Climate Issues:**

- To alleviate the vested interests embedded in the regulation process, an objective benchmarking criteria from a trustworthy and objective think tank might play crucial roles.
- Some notes regarding the actions to improve the communication between regulators and the business people and the coordination between central and

regional government should be considered as the desired direction of future policies.

2. On Infrastructure:

- Indonesia could simplify its process of land clearing and acquisition to enhance the infrastructure development.
- Some independent regulatory bodies might be needed to restructure the electricity market and subsidy scheme in Indonesia so that electricity supply can be more efficient, affordable, and sustainable in the long run.
- To foster private partnership in financing port development in Indonesia, bundling of schemes, such as attaching road access projects to port development.

3. On Trade and Market Openness:

- Investment in labour-intensive sectors could be increased so that excess labour is employed. Scarce labour in the market will eventually drag the industries to the sectors with higher value added without having to pick the winner in a full-employment state.
- Pooling information and simplifying the trade procedure may enhance Indonesia's competitiveness in trade.
- Performance based protection might be considered to foster the competitiveness of domestic industries.

4. On Services Sector:

- Policy reform in services sectors could identify what went wrong with the current regulations, how to implement the regulations and enforce law, and prepare the human capital needed by service sectors in the future through more competence-based training and education.
- Foreign investment in banking industries along with other internal improvement in banking system in Indonesia might enhance the competitiveness and improve banking efficiency. Banking policies that tend to improve the regulations and surveillance of foreign investments in banking industries could be the better solution on openness stance.

5. On Social Protection:

- To leverage the quality of living in general through boosting up the Human Development Index (HDI), food security policies might entail more balanced policies that enable people – especially the poor – to attain more balanced and

nourished diets, mother and child's nutrition will be better off, and society in general will also be healthier.

- More socialisation and education on financial innovations might be needed to transform financial attitudes in society that is reluctant to utilise more advanced financial services or is simply not well informed on it.
- Large amount of fertiliser subsidy to the farmers can be significantly reduced by improving farming-related infrastructure, which will also be a better way to protect the farmers and sustaining food production.

Policy Documents/Monitoring & Evaluation Documents/Briefs, Business, Academia and Community Platforms who have used, or may use these findings

1. Executive Office of the President of Indonesia/Kantor Staff Presiden (KSP), Office of the Vice President of Indonesia, Coordinating Ministry for Economic Affairs/Kementerian Koordinator Bidang Perekonomian, and related line ministries or agencies. All these agencies were consulted on time to basis in preparing the briefs.

**ENERGY-RELATED
RESEARCH**

24

Study of Renewable Energy Potential and its Effective Usage in EAS Countries

Authors: Venkatachalam Anbumozhi, Makoto Toba, Shinichi Goto, Shoichi Ichikawa, and Nuqong Chollacoop

Status: Ongoing

Abstract

To meet the corresponding increase in energy demand of the transport sector, imports of crude oil and petroleum products have increased in East Asian Summit (EAS) countries in recent years. Each country has promoted the introduction and uptake of biofuel produced from feedstock grown domestically. On the other hand, the fuel consumption of EAS countries predicted from the types of vehicle fleet is quite different from each other and does not always adjust to the national policies that promote biofuel utilisation. From the viewpoint of effective utilisation of resources and solution of the problem of oil refinery capacity, it is important to balance biofuel demand and supply through international trade.

This study has the following three components: (i) potential study of diversified transportation energy mix, (ii) research of next generation biofuels, and (iii) bio methanol as an energy carrier. Regarding the first component, the trend of energy consumption until 2030 is estimated using an original simulation method, and the possibility for achieving the energy policy target is examined based on detail data (such as vehicle information, energy conservation, alternative energy introduction, and others) supplied by each country. Then, the gap between energy consumption trend and policy target will be shown and measures to minimise the gap will be investigated. Based on the results, we will propose the policy that requires multilateral cooperation among ASEAN countries.

The production cost of biofuel is generally more expensive than petroleum fuel. Government usually gives financial support to promote biofuel utilisation. According to the cost simulation, raw material cost accounts for the most part of fuel production. The utilisation of low-grade and waste material seems to be effective for reducing raw material cost. In this study, the technical constraints to the next generation fuel production from low-grade material will be identified to propose solutions through investigation of research articles and experimental works. In addition, the utilisation of next generation fuel as a sustainable aviation fuel will be

discussed. For the third component, bio-methanol production is being investigated and the role of methanol as an energy carrier will be discussed.

Research Outcomes

Major Policy Findings

1. There exists a possibility for multilateral cooperation on renewable energy and its effective usage based on the outlook simulated by energy consumption and vehicle registration in East Asia and ASEAN countries.
2. In the transition towards a circular economy, refurbishment can be applied to regain value from used products, reduce waste, and improve resource efficiency. Indicators at the city and sector levels need policy attention. Renewable energy policy target should be made robust in East Asian and ASEAN countries.
3. R&D information of next generation biofuel and energy carrier technologies will decide the uptake of biofuels in the transport sector.

Likely Impacts on Policy Formation in Country/Region/or Knowledge Pools

1. Governments, in formulating a renewable energy development plan, should consider not only domestic resources but also fuel consumption based on vehicle registration. The possibility of multilateral cooperation proposed by this study will contribute to effective usage of renewable energy resources produced in East Asian and ASEAN countries.
2. Information supplied by this research will be useful for the introduction and standardisation of next generation biofuel and for planning future energy supply using energy carrier.

Policy Documents/Monitoring & Evaluation Documents/Briefs, Business, Academia and Community Platforms who have used/may use these Findings

1. The findings would help governments and line ministries on trade and investment liberalisation in drawing out their policies on import and export of transportation fuel, including biofuel.
2. The findings would help governments realise decisions made by the international community in reducing greenhouse gas emissions. The findings could also orient

appropriately industrial and academic R&D, such as production of sustainable alternative aviation fuel and new energy supply system.

25

Sustainability Assessment of Utilising Conventional and New-Type Geothermal Resources in East Asia

Authors: Venkatachalam Anbumozhi, Keiichi Sakaguchi, and Kasumi Yasukawa

Status: Ongoing

Abstract

In an attempt to maximise the potential utilisation of renewable energy sources, many Asian countries have been developing their geothermal resources, although the types of geothermal resources vary from country to country. Countries with rich high-temperature geothermal resources have utilised their potential by conventional steam power generation. Even in countries without volcanoes, heat extraction from the deeper underground using EGS (Enhanced/Engineered Geothermal System) techniques and/or from shallow underground for direct use have been studied and pilot-schemed.

Geothermal technologies, such as reservoir engineering, monitoring techniques, scale-controlling techniques, and others, which are all essential for sustainable utilisation of geothermal resources for both power generation and direct use, pose both challenges and opportunities.

This study aims at identifying those challenges, developing country-specific solutions, and sharing information to improve technology for sustainable geothermal utilisation in Asian countries.

This project envisages guidelines for sustainable use of geothermal energy. The guidelines will be formulated separately for (i) power generation and direct heat use and (ii) ground source heat pump (GSHP) since the necessary technologies are different for these two categories. These guidelines shall be useful to practising engineers and managers with newly started geothermal business, or by researchers in related fields.

Recommendations to policymakers for more intensive utilisation of geothermal energy are also provided in the project. It is strongly recommended that policymakers and high level government officials refer to these recommendations for rapid and sound development and use of geothermal energy.

Research Outcomes

Major Policy Findings

1. The countries that achieved substantial geothermal development have in place sound geothermal development plan explicitly stated in their energy policy, whereas others do only implicitly. National programmes and development plans should explicitly set the targets for geothermal power generation.
2. Long-term engineering and financial programmes for geothermal power generation are necessary because geothermal development takes five to seven years.
3. For direct heat use, governments should put incentives to use thermal use of geothermal energy (such as the renewable heat obligation law in the Republic of Korea).
4. For promotion and sustainable use of ground source heat pump (GSHP), governments should support R&D on hydrogeological studies, case studies, and long-term monitoring. Governments should also encourage international research collaboration on these topics.

Likely Impacts on Policy Formation in Country/Region/or Knowledge Pools

1. National, subregional, and local governments could utilise the study results for geothermal power generation so that geothermal development is done sustainably.
2. Incentive mechanisms identified in the project shall be useful in promoting private sector participation so that, in turn, so that the private sector would promote direct heat use, including GSHP.

Policy Documents/Monitoring & Evaluation Documents/Briefs, Business, Academia and Community Platforms who have used/may use these Findings

1. The findings of this report would help governments and ministries on energy issues in drawing out their energy policies. The guidelines provided in the project report for technical issues on development (installation) and sustainable use would help the private sector interested in geothermal business.

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Energy Connectivity in Myanmar

Authors: Venkatachalam Anbumozhi, Hisashi Yoshikawa, Ichiro Sakata, and Hideaki Shiroyama

Status: Ongoing

Abstract

Myanmar has achieved consistently high growth rate for the past several years, emanating from the need finding sustainable energy sources. In countries of the Mekong River Basin, the electricity and gas networks or grids were the symbol of progress itself, with increasing numbers of grid-connected people a measure of economic development. Nevertheless, more than half of the population in Myanmar does not have access to modern electricity. There are several limitations to the monolithic model of grid based development. Even with access, the grid in many regions is often unreliable, with power cuts being a common frustration. This study focuses on developing an energy road map for Myanmar, similar to other Mekong River Basin countries. The following four themes have been identified as significantly important in enhancing rural and national electrification in Myanmar: (i) comparison between mini-grids and national grid extension, (ii) possible financial mechanism to support rural electrification, (ii) potential of hydropower development focusing on small and mid-sized hydropower projects, (iii) possible role of foreign investment, particularly from neighbouring countries.

In addition to the ongoing research that will be further pursued and human resource development and capacity building activities conducted for government officials/researchers of Myanmar, these four core themes will be focused and examined through the methodologies described below. Also to be undertaken is a comparative analysis on common energy challenges of Mekong River Basin countries, such as rural electrification and connectivity.

This study has three components: (i) Simulation analysis that examines the economic rationale of the comparative advantage between mini-grids and the national grid extension to enhance the electrification in Myanmar. (ii) To grasp the enabling conditions for the successful electricity development in the rural areas of Myanmar. Extensive fieldwork filled the knowledge and information gaps, with the new data that existed because of less reliable data and limited official statistics. (iii) Stakeholder analysis to understand regional perspective on Myanmar's affluent energy and resources, such as natural gas and hydros.

Research Outcomes

Major Policy Findings

1. The transition to a more open economy entails several challenges to and opportunities for Myanmar. Perhaps the most important is to provide rural electricity to non-grid connected communities and to take care of costs in generating, transmitting, and delivering electricity, which need new business models and policy coordination among different line ministries.
2. The energy matrix of neighbouring countries, particularly Thailand, China, and India, that supports Myanmar's energy sector development must change. Effort is needed in many fronts. On the demand side, new project investments must be made with strong commitment to project development, technology standards, and financing.

Likely Impacts on Policy Formation in Country/Region/or Knowledge Pools

1. New knowledge about Myanmar coming from fieldwork, policy consultation, and capacity building workshops will support the great transformation that the government is undertaking.
2. The project reports also outline the policy reforms needed at the national level, which can potentially increase domestic and regional energy security.

Policy Documents/Monitoring & Evaluation Documents/Briefs, Business, Academia and Community Platforms who have used/may use these Findings

1. A couple of journal papers published by the University of Tokyo research team spell out a new rural electrification model, contributing to both academic knowledge practitioner's wisdom in sound policymaking.
2. Policy reports coming out of the study provide valuable processed information for development partners, from where further resources for development investment could be developed.

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Electricity Supply Mix and Role of Policy in ASEAN

Author: Ichiro Kutani

Status: Ongoing

Abstract

Increasing electricity demand and relatively lower income level are urging ASEAN countries to develop large-scale power generating capacity in an economically efficient way. In addition, mitigating environmental burden in this development is becoming important more than ever; that is, the simultaneous achievement of three elements, the so-called 3Es – energy supply security, economic efficiency, and environmental protection – in power development has become indispensable in the energy policy of ASEAN countries.

To this goal, each country has its policy/target for future power supply mix. The question is, “How can we implement such policy into actual business?” It is obvious that without an appropriate implementation tool, a policy/plan will likely not be implemented.

In addition, the past ERIA study indicates the importance of having a pan-regional planning coordination function to maximise regional benefit in power development. Basically, the power development plan of each country does not consider regional benefit or effect for neighbouring countries. Such coordination function is a possible measure to implement a policy on regional power supply mix into a market.

This is not only for ASEAN. Many developed countries have also experienced challenges on this issue; thus, ASEAN could learn much from these experiences.

In this light, the study aims at suggesting possible policy tools to achieve the appropriate power supply mix.

Expected Research Outcomes

The following activities and outcome of activities are expected.

- Analysis of policy measures to achieve electricity supply mix

Firstly, the study team will identify the necessity and importance of achieving a well-balanced electricity supply mix (i.e. fuel mix) in each country and/or region.

Secondly, based on the above, the study team will analyse the required policy measure and market/industry structure to materialise balanced electricity supply mix.

Possible issues to be discussed include (i) the role of government intervention, (ii) market liberalisation, (iii) assessment method of power station investment, and (iv) the role of electricity import/trade.

- Case study

The study team will select one ASEAN member country to analyse its existing market structure and relevant policy implementation mechanism to control power supply mix.

- Workshop

The study team will derive policy recommendations on how to implement national/regional policies for achieving a better electricity supply mix.

To share and disseminate the outcome, the study team will organise a workshop targeting policymakers of a country, which is the subject of a case study.

In view of pan-regional coordination, the study team will closely communicate with the Heads of Asean Power Utilities/Authorities (HAPUA) to implement their latest strategy into the study, and to give a feedback on the study result.

Intended Policy Implications

- The applicable policy tool for achieving electricity mix target differs by a country's developing stage and market model.
- Therefore, a simple 'copy and paste-type system' import will not work effectively; thus, each country/region needs to understand its own situation first.
- Each government and/or region is suggested to formulate its picture of future electricity supply mix in order to indicate a preferred direction for investment.
- On the industry side, a life cycle cost evaluation in power station investment is recommended to encompass the true value of different investment options.

Energy Efficiency Improvement in the Transport Sector through Transport Improvement and Smart Community Development in the Urban Area

Author: Ichiro Kutani

Status: Ongoing

Abstract

The study conducted in FY2012 and FY2013 analysed how to improve traffic flow – thus, energy efficiency of the transport sector – in major cities of the East Asia Summit (EAS) region. Jakarta of Indonesia was the subject of the case study. One key finding was that appropriate forward-looking investment is required in the initial stages of urban development. For instance, traffic congestion in Jakarta has deteriorated considerably, and measures to improve the situation are limited. The situation also requires greater change in the existing system and massive short-term investment, which may cause negative side effects for the economy.

Meanwhile, the EAS region has many mid-sized to small cities that are about to launch or have just launched explosive urbanisation and motorisation. From the initial development stage, appropriate measures must be implemented in an ex ante manner to allow these cities to realise sound development.

In this light, as in the FY2014 study, the case study in FY2015 will target a mid-sized to small city, Da Nang of Viet Nam, in its initial development stage, and will analyse policy and infrastructural measures for improving traffic and, consequently, energy efficiency. From this analysis, we aim to derive policy recommendations for many cities in the EAS region.

Expected Research Outcomes

Last year's research dealt primarily with information in the four fields of traffic, energy, cities, and policy. In addition to those four fields, this fiscal year's research would have more in-depth study from the perspectives of marketing, finance, and policy implementation. Aside from emphasising policy implementation and investigating the optimal mix of policies from the perspectives of timing and city type, the study would cover future strategies, if possible.

The study team will carry out in-depth simulation analysis for urban traffic improvement and its impact, modifying the model from the previous year's study.

The first approach is to survey people's preference of transport mode, and apply the result to the model to find better options for the bus system in the city. The preference survey is expected to identify the possibility of modal change and the key elements of people's choice which can have policy implications.

Another possible approach is to change the structure of the city, assuming a more condensed city centre. A simulation will try to quantify the effect of the concept of a compact city.

By taking these two quantitative approaches, the study team is expected to examine a possible improvement in traffic flow and consequently reduction in oil demand.

Intended Policy Implications

- While various measures contribute to traffic improvement – thus energy efficiency improvement – measures are required to be taken in accordance with urban and transport infrastructure development and motorisation stages.
- Since the development of transport infrastructure consumes much time and cost, such development should be based on a forward-looking, long-term viewpoint.
- Investment from a long-term viewpoint may sometimes fail to bring about any major effects over the short term. Therefore, strong leadership and an integrated execution body is required for implementing such investment.
- These measures will allow cities to be developed without deterioration in the energy efficiency of the transport sector.

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Possible Cooperation Framework for Oil Stockpiling and Emergency Response System of East Asia

Authors: Venkatachalam Anbumozhi, Yuji Morita, Yoshikazu Kobayashi, and Tomoko Matsumoto

Status: Ongoing

Abstract

As the economies of ASEAN countries expand, energy demand has likewise shown remarkable growth in the last decade. While all sources of energy have increased, oil demand in particular has recorded the largest increase. Due to stagnant indigenous oil supply in ASEAN, the growth in oil demand has resulted in increased oil import, which makes ASEAN countries more vulnerable to external supply disruption or highly volatile international oil prices.

As for sources of oil import for ASEAN countries, the share of Middle Eastern countries will continue to increase, suggesting that oil supply in ASEAN will contain more risk factors given the persistent political instability in the Middle East. In addition, as the oil supply security system in ASEAN in general is still at the development stage, international cooperation is needed to promote and invigorate oil supply security arrangements in the region. Given the global and integrated nature of the oil market, promoting regional cooperation for oil supply security arrangement in ASEAN benefits all East Asian countries.

Based on the above, this study aims to explore and evaluate potential cooperative actions among East Asian countries to promote their oil supply security.

The study has three components. Component 1 provides potential scenarios of oil supply disruption in ASEAN. Two scenarios are developed to describe the serious consequences for ASEAN countries in case of unexpected supply disruption. The scenarios will suggest an urgent need for ASEAN to develop oil supply security measures such as stockpiling. Component 2 explores options of oil stockpiling. The chapter on component 2 provides an overview of traditional stockpiling types, such as onshore tank or underground tank. It also considers lower cost options to start stockpiling as many ASEAN countries have budgetary constraints. Component 3 discusses how government and industry can form a collaborative relationship to attain oil supply security. This chapter reviews the experience of member

countries of the International Energy Agency in this regard and draws policy implications. It will highlight an incentive system for private players in stockpiling development.

Research Outcomes

Major Policy Findings

1. Unexpected oil supply disruption will result in catastrophic impacts on ASEAN countries through an energy price surge or increase in trade deficit and increased social discontent and potential political instability.
2. The most cost-effective option to start stockpiling is to combine expansion of existing storage capacity and set a stockpiling target. Tank leasing to commercial players will ease the burden of storage facility construction, and can be another cost-effective means.
3. Recognising transparency and equity is very important to involve industrial players in stockpiling development efforts. Utilising other regional players that have an interest in the ASEAN oil business may be worth considering.

Likely Impacts on Policy Formation in Country/Region/or Knowledge Pools

1. Governments in ASEAN can understand what will happen to their countries if they do not stockpile. The study urges government officials to accelerate their stockpiling efforts as the potential impacts of unexpected oil supply disruption may lead to intolerable damage to ASEAN countries.
2. Because physical stockpiling facilities take time to build, governments should start their oil supply security policy with cost-effective policy means. Officials can choose their most appropriate measure from the options provided in this study.

Policy Documents/Monitoring & Evaluation Documents/Briefs, Business, Academia and Community Platforms who have used/may use these Findings

1. The findings of this study would help governments and line ministries on oil supply security in drawing out their policies. Specifically, governments could utilise these findings during the budget acquisition process as the study thoroughly describes the benefits of stockpiling development.
2. Officials in international organisations such as the ASEAN Centre for Energy (ACE) or ASEAN Council of Petroleum (ASCOPE) would find the study as a useful reference in their efforts to form a workable multilateral cooperation in oil supply security.

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Achieving Integrated, Trans-boundary Energy and Electricity Markets in Southeast Asia: Identifying, Analysing, and Offering Solutions to Overcoming the Economic, Technical, Institutional, and Geopolitical Barriers to Regional Energy Integration

Authors: Ichiro Kutani, Romeo Pacudan, and Youngho Chang

Status: Ongoing

Abstract

The research is divided into four interdependent research clusters, with each cluster drawing on a combination of quantitative and qualitative research methods. The project as a whole will be informed by a preliminary literature review covering:

- Analysis of the positive and negative experiences of energy and electricity market integration in Europe, particularly the recent interconnection of Hungary, Poland, and the Czech Republic to the West European system after decoupling from the East European (Russian) system. Literature search and questionnaire.
- Compilation and assessment of the range of evaluations and recommendations provided from previous studies by ERIA, the HAPUA (The Heads of ASEAN Power Utilities/Authorities), Asian Development Bank, and International Energy Agency.

Moreover, while the scope of the project covers ASEAN as a whole, Clusters 1 and 2 use smaller case studies on the BIMP countries (Brunei Darussalam, Indonesia, Malaysia, and the Philippines) to gain sufficient depth of analysis to be useful in the time available.

Cluster 3 focuses on the non-economic factors that influence the desirability and feasibility of greater integration, especially in relation to the geopolitical dimensions of massive infrastructure projects.

Cluster 4 performs a benchmark study on successfully operating electricity pool models. It reviews papers and reports that analysed how and why a regional electricity pool operates successfully. It conducts structured interviews to exchanges, utilities, regulatory agencies, and individual power producers of the successfully operating regional electricity pool. It also performs a comparative study on the regional electricity pools and designs a feasible business model for a pan-ASEAN electricity pool.

Expected Research Outcomes and Intended Policy Implications

This is an ambitious project that is intentionally multidisciplinary and which is directly relevant to all countries of the Energy Research Institute Network (ERIN). Each of the four clusters above will provide specific policy recommendations to enable and support deeper regional electricity integration, but the most significant policy recommendations will emerge at the end of the project and will aim to:

- Identify and articulate the benefits and limitations of integrated electricity markets in the region, especially in the BIMP countries (Clusters 1 and 2).
- Identify an ‘order of priority’ for transmission line interconnections based on the economic and non-economic factors examined (Cluster 2, with input from Clusters 1, 3, and 4).
- Quantify the opportunities and benefits of greater penetration of renewable energy, with and without grid interconnection, and allowing for the emergence of new technologies (Clusters 1 and 3).
- Articulate the dynamic nature of underlying factors in electricity and energy market integration, with particular reference to market dynamics, resource opportunities and constraints, technological innovation, exogenous shocks, and demographic trends and associated impacts on energy markets (Clusters 1, 2, and 3).
- Recommend flexible organisational and regulatory arrangements to manage the operation of interconnected grids in the region, which optimise the dispatch of power in subregions (BIMP) and in the region as a whole (Cluster 2 with input from Clusters 1, 3, and 4).
- Recommend governance arrangements that can account for the dynamic and diverse nature of the energy sector in the region (Clusters 3, 4).
- Recommend a feasible business model for the pan-ASEAN electricity pool with principles, frameworks, practicalities, and conditions (Cluster 4).

To ensure the research findings are released on time to ERIN and its members, the research will be published first as discussion papers or reports, and later in peer-reviewed academic publications. A high level of interaction between the research clusters is anticipated not only to ensure that the insights and analysis from each cluster can be used to ‘cross-fertilise’ the others but also for the researchers themselves to learn from one another and build capacity within and between the ERIN membership.

Integrative Strategy and Policies for Promotion of Appropriate Renewable Energy Technologies in Lower Mekong Basin Region

Authors: Venkatachalam Anbumozhi and Nguyen Anh Tuan

Status: Ongoing

Abstract

Cambodia, Lao PDR, Myanmar, Thailand, and Viet Nam are neighbouring countries located in the Lower Mekong Basin Region with the great potential and opportunities for cooperation and development. Exploitation of renewable energy (RE) sources is one of the appropriate options to meet the increasing electricity demand and to increase energy security and economic competitiveness. That is why RE technologies in the region were researched and promoted in the past decades, though not large scale. It is found that Thailand has achieved early success in RE power development mainly by relying on important support measures, including subsidies and feed-in tariffs. However, this success is based on RE capacity expansion and is lacking if measured against other indicators of success, including energy security, innovation, job creation, and environmental impact mitigation. Moreover, an integrated strategy with setting of priorities of RE technologies to be achieved is still lacking in Thailand. These experiences as well as the weaknesses of Thailand could be used as lessons learnt to be shared and could help advance the development and use of green energy throughout the region.

This study aims to set up the strategy and policies for RE development for countries in the Lower Mekong Basin River to foresee the prioritised RE technologies and the social, economic, and environmental benefits in a strategy for RE development. The prioritised RE technologies will be selected based on the major criteria on the reduction potential of greenhouse gas; abatement cost; government's priorities; and sustainable development benefits on the economy, society, and the environment through cost–benefit analyses. The calculations of costs and benefits for each RE technology will be put in a long-term energy system, and outputs of calculations will be used as a base for selecting prioritised RE technologies and the appropriate future-installed capacity for each RE technology in the region. Because of the similarity in economic conditions and the existing exploitation status of RE sources, but limited in input data for modelling, the calculations of cost–benefit for each RE technology and the impacts of RE technologies on low-carbon and sustainable development will be carried out for Viet Nam

as a case study. To support these strategies and action plans, the RE policy instruments applied effectively in other countries will also be reviewed and analysed based on the country-specific financial conditions to get the effective policies that could reduce the project costs of RE technologies.

Research Outcomes (Expected)

Major Policy Findings

1. Assessment of regulatory policies and support mechanisms in advanced countries such as New Zealand, non-Mekong ASEAN member states as well as the lessons learnt in Thailand to get the appropriate policy mechanisms for the region.
2. The list of prioritised RE technologies selected based on the criteria on investment costs and sustainable development benefits on the economy, society, and the environment.
3. Short-, medium-, and long-term action plans to achieve the targets of RE development in each country will be made based on prioritised RE technologies.

Likely Impacts on Policy Formation in Country/Region/or Knowledge Pools

1. Specific policy measures and institutional framework proposed to support implementation of action plans at the national and subregional levels

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Sea Lane Security of Oil and LNG for Asia

Author: Shigeru Kimura

Status: Ongoing

Abstract

This study is one of ERIA Energy Research Institute Network's (ERIN) energy studies selected at the 3rd ERIN meeting held in September 2015 in Jakarta. The study is conducted by ERIA with collaboration of the Institute of Energy Economics, Japan (IEEJ) and The Energy and Resources Institute (TERI), India. To add to the quality of this study, ERIA invited four experts of oil and LNG transport in Indonesia, captain of Petronas LNG shipping company, researcher of ocean issues from China and a researcher of Petroleum Institute, Thailand.

According to ERIA energy outlook, oil and gas demand in East Asia Summit (EAS) region will continuously increase in future and majority of external oil and LNG supplies into Asia will cross the choke points of sea transportation. More imports mean that naval transportation from and to Asia will be more congested, and in narrow passages such as Strait of Hormuz and Malacca Strait, naval accident would be more likely to happen. Piracy issue will remain a large concern in the Straits and their near seas too. These factors may seriously affect the trade flow of oil and LNG transportation to Asia and thus become a serious threat for the regional energy security.

This study consists of three parts. First, IEEJ forecasts oil and LNG trade flow up to year 2040 including future alternative routes such as North America to Asia. Second, TERI studies future congestion of the choke points based on the IEEJ forecasting results, and also sea lane security issues from Middle East to East Asia, such as accidents, terror attacks, piracy, natural disasters, and regional conflict and their countermeasures. Third, the experts review current sea lane security issues.

The study is in progress and the final report of this study will be completed around June 2016.

Expected Research Outcomes

Major Policy Findings

1. Future oil and LNG trade flow from the world to Asia based on the IEEJ energy outlook results.
2. Future risks of sea lane security for oil and LNG transportation from Middle east to Asia and their countermeasures are identified based on the IEEJ's trade flow studies.
3. Expert views on sea lane security of oil and LNG transportation prepared for dissemination.

Likely Impacts on Policy Formation in Country/Region/or Knowledge Pools

1. Future oil and LNG trade flow projections leads policymakers to consider importance of sea lane security to maintain oil and gas supply to Asia.
2. Identification of risks in sea lane transportation of oil and LNG makes governments to harmonise and share real-time navigation information and data applying advanced ICT through international and regional cooperation framework.

Policy Documents/Monitoring & Evaluation Documents/Briefs, Business, Academia and Community Platforms who have used/may use these Findings

1. Diversification of energy sources and shipping route to reduce congestion at choke points, information sharing system of navigation data among stakeholder countries, risk analysis on sea lane security issues such as piracy and terror attack, recommendations on routes to reduce navigation risk.

Development of Eco Town Model in ASEAN Region through Adoption of Energy-Efficient Building Technologies, Smart Grid, and Transportation

Authors: Majid Sapar, Han Phoumin, and Team Members

Status: Ongoing

Abstract

The East Asia region had experienced rapid rates of urbanisation in the last few years, and this trend is likely to continue for some time. Thus, the Eco Town Model (ETM) will largely contribute to green energy and energy efficiency. ETM in this study refers to a town, scalable to any size based on the geographical and socio-economic features of an ASEAN country, seeking to become low energy or low carbon with a quantitative reduction target for CO₂ emissions and a concrete low energy development plan irrespective of its size, characteristics, and type of development (greenfield or brownfield development).

The model aims to promote the development of eco towns in the region by providing a basic principle that can assist central and local government officials in planning effective low and energy efficient policies and formulating an appropriate combination of low-energy measures while taking into account socio-economic conditions and city or town specific characteristics. The study will look into three main areas: building technologies, smart grid system and design optimisation, and vehicle fuel economy regulation and fuel savings analysis.

Research Outcomes/Policy Implications

- The results of the study will be useful for local government officials responsible for town and urban planning especially when considering low-energy town development. This will be especially beneficial in developing countries where a rapid growth of towns is being observed.
- The results and lessons learnt can be developed into guidelines for planners who wish to implement low-energy urban design, building on from the studies, as well as incorporating the practical methodologies for urban planning and design.
- The project will also offer local government officials in the region a very good opportunity to consider developing policies to promote the ETM concept nationally.

- It is expected that advanced technology solutions with proven field experience and results can be applied from developed distribution systems to developing distribution systems in the ASEAN region with wide applicability to islanded and non-islanded systems. Ideally, we will provide a cost–benefit table of the investment cost relative to the improvement of reliability. Such table will depend on each country’s preferred equipment, system vendors, and procurement policy to ensure system compatibility.

Energy Outlook and Analysis of Energy Saving Potential in East Asia Region

Authors: Shigeru Kimura and Han Phoumin

In Progress

Abstract

Sustained population and economic growth in the East Asia Summit (EAS) region has significantly increased energy demand. The Total Final Energy Consumption (TFEC) is projected to double from 2012 to 2040. Demand in the transport sector, among others, is projected to grow most rapidly, followed by demand of the industry and commercial sectors, and finally, that of the residential sector. The increasing energy demand poses a threat to energy security in the EAS region. Thus, potential energy saving is key to reducing energy demand and CO₂ emissions. This study will show the alternative policy scenario in the EAS region that could potentially save energy consumption by 2040 from the business-as-usual scenario. Finally, the study will provide recommendations based on the project trend of energy consumption in which energy efficiency policy and its target, together with investment, will be crucial to realise the hidden fuel, and contribute to sustain growth.

Research Outcomes/Policy Implications

- Clearly defined targets and action plans for energy efficiency and conservation are needed. These should be reassessed regularly.
- Energy efficiency and low carbon technology transfer from developed countries to developing countries is indispensable. This requires adequate access to financing. It is important that the government facilitate this process through a Bilateral Offset Credit Mechanism (BOCM), among others.
- High energy prices provide an incentive to promote energy efficiency and conservation. These increase the production of renewable energy by improving the current pricing mechanism for electricity, petroleum products, and natural gas and by removing subsidies while paying attention to low-income groups.
- There is a need to improve the quality and coverage of energy data in the EAS region. The collection of more detailed end-use data could be achieved through further survey work.

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Cost Assessment of Energy Security Improvement in EAS Region

Authors: Ichiro Kutani, Han Phoumin, and Team Members

Status: Ongoing

Abstract

Energy security is a centre pillar of energy policy in all East Asia Summit countries. Self-sufficiency in energy supply forms the basis of energy security, and there are many policy options to improve it. Enhancing oil production, increasing use of domestically available renewable energy, and improving the efficiency of energy use are examples of effective policies.

Meanwhile, governments are requested to utilise their tax income economically and effectively. Since each policy option has different costs and effects, careful assessment is required before choosing a policy to gain maximum utility under a limited budget. This study attempts to assess and compare the costs and effects of different policy options to determine which is more economically effective. Such assessment is expected to help policymakers choose which policy option will improve self-sufficiency in energy supply, thus, the country's energy security.

Research Outcomes/Policy Implications

- Since the costs and benefits of each policy option to improve self-sufficiency differ, policymakers, by using this kind of assessment, can choose which is more economically efficient.
- The costs and benefits differ in each country, reflecting each own circumstances; thus, a country-specific assessment will provide better indication for policymakers.
- Whereas economic efficiency is part of the policy choice process, it is not the only element that should be considered.

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Building a Network on Collaborating Toward a Social Acceptance of Nuclear and Coal Power in Asia

Author: Tomoko Murakami

Status: Ongoing

Abstract

The radioactive disaster at Fukushima Daiichi Nuclear Power Station on 11 March 2011 seriously impacted regional society. More than 100,000 local residents were forced to abandon their homes for a long time. People in emerging Asian economies were greatly shocked not only because it was one of the three severe nuclear accidents so far but also because it happened in Japan, which has been well known to be one of the most advanced countries in technology and infrastructure.

Meanwhile, economic efficiency is an inevitable element that should be considered in developing power stations in Asia. In this light, coal-fired power stations become an appealing option because of their supply stability and economic efficiency. However, although there are technologies that allow the use of coal with lesser environmental burden, concern over their emission sometimes harms deployment of coal-fired power stations.

Therefore, cultivating mutual reliance and agreement among stakeholders – such as government, the licensee, and local municipalities – would be crucial when a nuclear and coal facility would be built and operated. Intense and practical research on issues such as the specific feature of nuclear/coal power, its role on energy security and on climate change, social influence, and disclosure of risk information would be highly appreciated. Collaboration towards social acceptance of nuclear/coal in Asia and taking practical action are of immediate necessity and would contribute greatly to the smooth development and utilisation of these types of energy in Asia.

Expected Outcomes

For these purposes, the following methodologies will be adopted.

Review of activities for social acceptance and consensus taken in major advanced countries:
The working group members will find information from national debates and communications

between local residents and licensees in advanced countries with a long history of nuclear/coal energy use. For example, for nuclear energy, France, the United Kingdom, Sweden, and Finland are candidates for the study. The members will also discuss and analyse how these activities have influenced nuclear/coal power policies in these countries.

Extracting issues to be discussed and implications for a possible approach on risk communications: Based on the reviews above, the working group members will extract issues on the social acceptance of nuclear/coal power in Asian countries from the viewpoint of energy security, environmental aspects, social science, and risk science. Experts on these areas from the United States, Europe, or Asia will be invited to the working group meetings to provide inputs on the risk of nuclear/coal power for an appropriate approach towards building a consensus on these types of energy in Asia.

Holding a workshop and an open symposium: The working group members will hold a workshop to discuss what kind of conditions would be crucial in improving social acceptance of nuclear/coal power from the general public's point of view, other than that of engineers or policymakers. An open symposium will also be held for society to better understand nuclear power.

Intended Policy Implications

- Member countries will use a practical and useful approach towards having better social acceptance in countries that are considering or introducing nuclear/coal power.
- Transparent public debates in policymaking have not yet matured in most Asian countries compared to advanced European countries. The results of this study would provide a model case on establishing social consensus on certain public issues.

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Multilateral Joint Study for LNG Market

Author: Ken Koyama

Status: Ongoing

Abstract

Many East Asia Summit countries show an upward trend in energy demand. The role of natural gas in energy supply becomes increasingly important in various aspects, which include economic efficiency, diversification of energy, effective use of domestic resources, and reducing environmental burden arising from energy use.

Meanwhile, the global LNG (liquefied natural gas) market has seen big changes in recent years. In terms of supply and demand, while many new LNG importers are coming into the market, LNG demand for large importers such as Japan, China, and Europe is becoming uncertain. At the same time, new liquefaction capacities are coming into operation within the next few years. Yet, both oil-linked and spot prices are experiencing a downward trend. Importing countries may welcome this trend. But we should pay attention to the side effect for supply-side investment.

The Asian LNG market cannot be insulated from these changes in the global market. Although this recent price trend seems to indicate that the Asian premium issue in LNG price has diminished, the essential problem has not been resolved. The Asian premium will easily come back again depending on crude oil price. Therefore, it is requested to pursue resolving substantive reform in the Asian premium to achieve sustainable and sound development of the global LNG market.

With this background, this study is aims at deriving policy recommendations for the global LNG market.

Expected Research Outcomes

- Organise information on recent changes in the global LNG market

For this, a literature survey should be conducted to organise information on recent changes in the global market, particularly with regard to LNG price formation.

- Experts meeting

A multilateral experts meeting will be organised to discuss the issues. Each expert will provide his or her view and/or suggestion for the specific issue, after which discussion will take place.

Possible issues/questions to be discussed are:

1. What could be a credible price formation for both LNG producer and consumer?
2. What would be the prerequisite to creating a gas/LNG price hub in Asia?
3. How could long-term supply-side investment be ensured?

Intended Policy Implications

- The stakeholders in the private sector are encouraged to pursue pricing mechanisms that most appropriately and timely reflect prevailing LNG market conditions, and can eventually serve as an alternative to oil indexation in structuring long-term contracts.
- The public sector should create an environment suitable for the development of a market that properly reflects regional supply and demand conditions, by liberalising end-user markets, supporting development of necessary infrastructure, and ensuring reasonable open access to relevant facilities.
- Stakeholders from the private sector are encouraged to eliminate destination restrictions in FOB (freight on board) LNG transactions and relax them in DES (delivered ex ship) transactions.
- The stakeholders should remain committed to the principle of mutual cooperation, which has been the core of sound development of the LNG industry, albeit in different shapes reflecting evolutionary changes in it, bearing in mind LNG projects are expected to continue requiring heavy investment and, hence, long-term commitments among stakeholders.

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Study on the Advancement of Energy Management System (EMS) in the EAS Region

Author: Ichiro Kutani

Status: Ongoing

Abstract

The rapid economic growth in East Asia Summit (EAS) region countries has driven the formation of new industrial and commercial facilities as well as energy supply infrastructure, and this trend is expected to continue in the future.

Therefore, concrete efforts for controlling energy consumption will be required for maintaining sustainable economic development in these countries, which otherwise will have to increase the energy supply significantly in order to meet the demand.

Experiences in developed countries have shown that an important perspective for improving energy efficiency on the consumption side is not only to promote the diffusion of highly efficient energy equipment but also to formulate an institutional framework for efficient energy use, such as an energy conservation law, at the initial stage of capital accumulation and the development of industrial/commercial facilities.

As a result of the 1970 oil crisis and the rise of climate change issues since the 1990s, developed countries have devised various political and technical approaches for energy management. In particular, the advancement of information and communication technology since the early 2000s have greatly helped the development of the energy management system (EMS), which is now widely called xEMS.

Furthermore, efforts have been accelerated to relate the load management functions of xEMS with the demand response. With economic growth, changes in industrial structure, and changes in energy consumption pattern in EAS countries, it is worth studying the prospects of the advancement of EMS that meets the specific needs of each country in the region. Conducting a study on this subject as an ERIA research project to identify the common policy challenges to advance EMS in the EAS region is expected to contribute to the sustainable economic growth of the region.

Expected Research Outcomes

The following research activities will be carried out with the following expected outcomes:

- Additional case study of deploying EMS technologies for office buildings

During the first-year study, case studies for deploying EMS for office buildings were conducted in two sites – one site each in Indonesia and Thailand.

In order to confirm the effectiveness of the analysis, the study team will conduct an additional case study at one more site in Ha Noi, Viet Nam where the climate conditions strongly affecting air-conditioning demand and the status of economic development are different from the previous two sites. With the support of energy auditing experts, building walk-through will be carried out at the selected site.

Based on the results of the case study, the study team will propose a set of energy efficiency measures and estimate the cost–benefit balance of these measures. Following the results of case studies on the three sites, including those of the first-year study, the team will identify the possibility of EMS deployment and the challenges for its promotion that are common in EAS countries.

- Case studies of deploying EMS technologies for the industrial sector

In addition to the office buildings, the second-year study will cover case studies for the industrial sector. Two sites – one site each in Malaysia and Singapore – will be selected for the case study. With the support of energy auditing experts, a factory/plant walk-through will be carried out at the selected sites.

Based on the results of the case studies, the study team will propose a set of energy efficiency measures and estimate the cost–benefit balance of these measures.

- Quantitative evaluation of the impact of xEMS deployment on the national economies in the EAS region

Based on the results of the case studies on office buildings and the industrial sector, the study team will analyse the impact of xEMS dissemination on the national economies of EAS countries. In analysing the energy saving potential and economic benefit for each of the five countries participating in the study, the study team will refer to the cost–benefit analysis of xEMS deployment at each case study site, in combination with the nationwide energy balances data, such as International Energy Agency statistics.

In some countries where the domestic energy prices are too low compared to the international prices – thus, it is not easy to recover the costs for capital investment for energy saving – the economic benefit of energy saving investment for the national economy is estimated by identifying the subsidies to energy prices that could be reduced by implementing the energy saving measures. This analysis can justify the provision of incentives for implementing these measures.

- Identification of best practices of energy efficiency and conservation (EEC) policy for xEMS dissemination

To accelerate xEMS deployment in the EAS region, policy measures for promoting energy efficiency may need to be implemented, such as domestic tariff reforms, subsidies for capital investment for energy saving measures, minimum energy performance standards for electric appliances, and others. Best practices in this area will be studied.

Policy measures for energy efficiency in the five countries were reviewed in the first-year study. In addition, the study team also conducted a literature study on the good practices of energy saving policies in other countries aside from these five. These results will be presented at the Working Group (WG) meeting. The study team expects that through discussions at the WG meeting, the members will identify a set of practical policy measures and provide comments and suggestions.

Intended Policy Implications

The following are the expected outcomes for the aforementioned tasks.

- List of office building EMS technologies which are considered to be particularly beneficial. The challenges for promoting office building EMS deployment will also be identified.
- List of factory/industrial EMS technologies which are considered to be particularly beneficial. The challenges for promoting factory/industrial EMS deployment will also be identified.
- Quantitative evaluation of the impact of xEMS deployment on the national economies in the EAS region. For countries where the cost recovery of capital investment for energy saving is not easy because of low domestic energy tariff, the effects of subsidies to the prices are also estimated.
- Identification of best practices of EEC policy for xEMS dissemination.

In conclusion, the study team will propose a set of policy measures – referring to the best practices of EEC policy – to accelerate the dissemination of EMS technologies.

Basically the policy recommendation will consider the common challenges in EAS countries. However, considering the differences in economic development and the social conditions among the five countries participating in the study, the study team will make recommendations to deal with issues that are unique for certain countries to supplement the general recommendations.

39

Institutional Strategy and Economic Impacts by Energy Subsidy Removals in the EAS Region

Authors: Shigeru Kimura, Han Phoumin, and Team Members

Status: Ongoing

Abstract

ERIA and the International Energy Agency (2013) estimated that fossil fuel subsidies amounted to \$51 billion in Southeast Asia for 2012 alone. It is widely accepted that fossil fuel subsidies encourage wasteful energy use, burden government budgets, defer investment in energy infrastructure and efficient technology, and further undermine renewable energy uptakes. While some ASEAN countries have taken actions to remove subsidies, these must be accompanied by careful strategy and steps to do so, as it is often a politically sensitive subject. On the other hand, energy subsidies incentivise consumption and can increase energy demand. When these subsidies are inefficient, they can lead to fiscal pressure, harmful emissions, and potentially undermine sustainable green growth in East Asia countries. In theory, reduced subsidies will encourage more energy-efficient consumption, leading to a positive impact on international energy prices and energy security, and will make renewable energy and technologies more competitive. Reducing local pollution and cutting down greenhouse gas emissions further benefit the environment and society.

Research Outcomes/Policy Implications

- Recommendations towards steps and approaches to implement the removal of energy subsidies with public acceptance. This will also include the effective response of safeguarding the vulnerable group that could potentially be affected by the policy on removing energy subsidies.
- Effective recommendations for East Asia Summit economies by understanding significant diversities among individual economies in terms of geographical setting, natural endowment, industrial structure, social background, and government organisations.
- Losses in government budget, welfare, and environment as results of energy subsidy; thus, the policy recommendation of gradual removal of subsidy is needed.

- Recommendations towards the potential impact of energy subsidy removal on sectors of the economy.
- Recommendations tailored to fit the unique situation of each country, while being consistent with the theory of energy subsidy.

40

Globalisation of Low-Carbon Technologies

Author: Venkatachalam Anbumozhi

Status: Ongoing

Abstract

In recent years, tremendous strides have been made to advance low-carbon energy systems – innovating, scaling up investment, bringing down system costs, implementing the right policy frameworks, and interconnecting large amounts of variable renewable energy supply into the grid. Reflecting this, many countries have put forward ambitious plans to increase low-carbon energy in power generation. Combined, the low-carbon renewable energy plans of China, India, and ASEAN will result in an increase from approximately 9,000 TWh in 2012 to 20,000 TWh in 2030.

In addition, a number of promising initiatives currently being implemented will buttress the Intended Nationally Determined Contributions (INDCs). Some 40 implementing agreements carry out technology programmes in the areas of renewable energy (solar, wind, bios, geothermal); fossil fuels (clean coal, enhanced oil recovery, carbon capture and storage); fusion power (tokamaks, materials, technologies, safety); and energy efficiency (building, electricity, industry, and transport). To find solutions, the public and the private sectors must work together. Technology-focused alliances, such as the International Solar Alliance, Global Geothermal Alliance, Mission Innovations, and others, will play an important role in enabling countries to harness the full potential of low-carbon energy resources at their disposal. The movement on 100-percent low-carbon is growing, with over 600 cities committing to this target and an increasing number of companies joining this initiative. Thus, INDCs can provide an important impetus to enhance and achieve global efforts to mitigate carbon emissions, double the share of low-carbon energy in the supply mix, and accelerate green growth.

There is growing awareness of the urgent need to turn INDCs into analytical works and concrete actions. INDCs can and must change the current trends in energy supply and use which are patently unsustainable, but this will take a revolution and low-carbon energy technologies will have a crucial role to play. Yet despite the fact that energy-related goods account for more than ten percentage of international trade, policymakers, academics, and the business community perceive several barriers to the diffusion of these low-carbon technologies at the

national and regional levels. This study is designed to identify the opportunities and barriers within INDCs for diffusion of low-carbon energy technology and to propose the incentive mechanisms at the local, national, and regional levels to the required scale.

To ensure that critical aspects are covered, this study is designed to cover the following policy-oriented research questions: (i) What are the key low-carbon technologies that can significantly influence, in the short and medium term, the INDC targets and Sustainable Development Goal agendas? (ii) Will the transition to a low-carbon energy future by 2030 be economically feasible and viable under INDCs? (iii) How could regional/international technology cooperation accelerate investments on a scale required for achieving the INDC targets?

Research Outcomes

Major Policy Findings

1. Given the rapid increase in demand for a large and stable supply of electricity in rapidly industrialising countries in the region, low-carbon technologies provide a compromise solution to attain energy security and reduced emissions.
2. To make low-carbon technologies and measures commercially viable, globalisation of technologies is needed. The cooperation of Asia, the European Union, Japan, and the United States on low carbon can speed up the process of commercialisation through demonstration, direct investment, joint venture, build-operate-transfer (BOT) schemes, financial aid, and capacity building.

Likely Impacts on Policy Formation in Country/Region/or Knowledge Pools

1. Provides the net costs cost of implementing INDCs at the regional level for selected countries.
2. Recommends a road map for major regional economies in adopting low-carbon technologies at a scale required.
3. Identifies financing mechanisms needed at the national and regional levels for adopting the road map

Policy Documents/Monitoring & Evaluation Documents/Briefs, Business, Academia and Community Platforms who have used/may use these Findings

1. A journal paper, along with two policy briefs, is being prepared, targeting economic energy policy officials in the East Asia Summit region.

41

Preparation of Energy Statistics and Energy Balance Construction for Setting Up of Sustainable Energy Development Plan in Cambodia

Authors: Shigeru Kimura, Han Phoumin, and Team Members

Status: Ongoing

Abstract

The lack of information and inadequate capacity to carry out comprehensive planning are identified as the main contributing factors to the current circumstances of the energy sector in Cambodia. The Ministry of Mines and Energy (MME) requested support to build capacity in developing a reliable energy balance for which energy development planning could be built upon. The MME requested the Economic Research Institute for ASEAN and East Asia (ERIA) for support in developing energy statistics and energy balance construction for a sustainable energy development plan in Cambodia. The project aims to strengthen the MME to be sustainable and capable of employing advanced techniques, methodologies, and modelling tools in institutionalising the collection, processing, and analysis of energy statistics in Cambodia and of establishing and managing an energy information system. Through this project, Cambodia is expected to establish the systematic collection of energy data from various energy supply companies and other government agencies/corporations with the objective of compiling accurate energy statistics for sustainable energy planning.

Research Outcomes

- About 300 copies of the *Cambodian Energy Statistics* will be published. This publication will be delivered to participants at internal and external workshops.
- The MME is expected to regularly update energy statistics
- A series of future publications is expected as a result of the capacity built.

42

A Two-Country CGE Model for Indonesia and Malaysia

Authors: Youngho Chang and Yanfei Li

Status: Ongoing

Abstract

The energy subsidy in Indonesia started in 1967. With no restrictions on the purchase and retail of the subsidised fuels and electricity, the distributional effects have been unequal and have favoured the rich who are more capable to consume more. The energy subsidies appeared to drive for more inefficient use of fuels and electricity, and distort the market signals for energy-related investments. On the government side, they became a fiscal burden and limit the capability of fiscal policies to stimulate economic growth (Widodo et al., 2012).

Malaysia also provides subsidies on petroleum fuels and electricity. Specially, the subsidies on electricity has two channels. One is through subsidising the natural gas supplied to Tenaga Nasional Berhad (one half of the company's power generation capacity is natural gas fired), the Malaysian national power corporation. The other is through special rebates given to low-income households. Energy subsidies cause more serious problems in Malaysia than in Indonesia. Specially, such subsidies in Malaysia were believed to incentivise the use of outdated and dirtier technologies with negative environmental impacts (Hamid and Rashid, 2012).

The impact of the removal of Indonesia's energy subsidy has been the subject of a few studies which arrived at controversial conclusions. Hope and Sigh (1995), IEA (1999), and Mourougane (2010) estimated that gross domestic product (GDP) could be stimulated rather than depressed. Clement et al. (2007) estimated that there would be a two percent real output loss in the case of Indonesia. The study by Widodo et al. (2012), using a social accounting matrix method, shows a negative impact of subsidy removal on GDP. However, reallocation of the subsidy to targeted sectors could offset the negative impacts to a large extent.

The Government of Malaysia is considering the so-called rationalisation of subsidies, implying liberalisation of pricing to reflect the cost of supply while keeping the subsidies to targeted social groups. Hamid and Rashid (2012) studied the impacts of Malaysia's energy subsidy removal, using a computable general equilibrium (CGE) model with the I-O table partitioned

into energy and non-energy blocks. This study shows a painful process of subsidy removal to the economy, including declining wages and rising costs of production factors which could substitute for reduced use of fuels. However, the authors emphasise that such is healthy to the long-term economic growth path of Malaysia and boosts the competitiveness of its industries.

Indonesia and Malaysia are not just geographically close. The two economies are also well linked. For Indonesia, Malaysia is not only the closest neighbour but also the seventh biggest export market. For Malaysia, Indonesia is the ninth biggest market for its exports. As the two countries share a lot in terms of culture, language, and economic structure, it makes sense to ask how energy subsidies on both sides have affected each other.

Furthermore, both countries are embarking on a massive reduction of energy subsidies. It is also interesting to see what would be the cross-border impacts of such actions. Scenario analysis could further display the difference in timing of action from either of the two countries; namely what would be the impact on Indonesia if Malaysia cuts energy subsidies first, and vice versa.

Last but not least, which sectors of the two economies would be affected most and how policies to reallocate the fund of energy subsidies as public transfer for investment and consumption in different sectors would affect real output and welfare of each sector are also interesting questions.

Expected Research Outcomes

With the above-raised research questions, a two-country CGE model with detailed economic activities and behaviour is modelled using econometric sub-models. Simulations are run to show the impacts of energy subsidy reduction. The impacts are shown by using different sequence in the two countries.

The CGE model is adapted from the model by Hosoe et al. (2004), with extension to the modelling of energy sectors as well as energy products as factor inputs and commodities for consumption. At the current stage, the model will be static and nonlinear. It thus serves as a tool for short-term impact analysis. In the future, the framework could be extended into dynamic models.

The impact of energy subsidy removal on the two economies are estimated. Scenarios are also simulated with sequential actions of subsidy removal by the two economies. Cross-border

impacts of such removal are identified. The key measures of the impacts include output levels, imports and exports, investment levels, welfare changes to households, and others.

Intended Policy Implications

The following conclusions and policy recommendations could be expected from this study:

- What policies are needed to ensure net welfare gain for the economy in reducing energy subsidy?
- What policies could reduce energy subsidies while minimising the negative impacts on its own economy as well as possible leakage to trade partners?
- What policies are needed to minimise the negative impacts on specific sectors and social groups?
- What policies are needed to optimally reallocate the funds for energy subsidies to various sectors and social groups?
- How should policies for removing energy subsidies be synchronised to minimise negative impacts and to maximise possible gains?



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PUBLICATIONS**

ERIA Books and Research Publications

No.	Title	Author(s)	Published
Book(s)			
1.	East Asian Integration (First Edition)	<i>Lili Yan Ing</i>	August 2015
2.	Framing the ASEAN Socio-Cultural Community Post-2015	<i>Ponciano S. Intal, Jr., Venkatachalam Anbumozhi, Fauziah Zen, Hidetoshi Nishimura, and Rully Prassetya</i>	November 2015
3.	The Comprehensive Asian Development Plan 2.0 (CADP 2.0): Infrastructure for Connectivity and Innovation	<i>ERIA CADP Research Team</i>	November 2015
4.	The Use of FTAs in ASEAN: Survey-Based Analysis	<i>Lili Yan Ing and Shujiro Urata</i>	August 2015
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