

## RESEARCH & RESEARCH-RELATED ACTIVITIES



### RESEARCH AND RESEARCH-RELATED ACTIVITIES

In FY2013, ERIA completed 20 research projects and as of end of March 2014, there were 26 ongoing research projects under four major themes, namely, (a) deepening economic integration, (b) narrowing development gaps, (c) achieving sustainable economic development, and (d) energy-related issues.

Annex F enumerates the completed and ongoing research in FY 2013 by theme.

At the same time, in addition to the ERIA research projects that the ERIA researchers coordinated or were involved in, they were also active in sharing their expertise outside of ERIA as they were invited to serve as keynote speakers, paper presenters, panelists or discussants in various events organised by other institutions; resource persons or advisers on key policy issues to government officials or ministries; and contributors of articles in major journals, quarterlies, magazines and opinion columns in media dailies. These contributions not only helped in promoting the works and mandate of ERIA but also gave important perspectives and insights to public discussions of policy issues.

Annex G lists down some of these outreach activities of the ERIA researchers in FY 2013.

### Completed Research

For fiscal year 2013, the completed projects include the following:

#### 1. ASEAN Rising: ASEAN and AEC Beyond 2015

In response to H.E. Yudhoyono's clarion call during the 18th ASEAN Summit in May 2011, the Economic Research Institute for ASEAN and East Asia (ERIA) prepared the Jakarta Framework for Moving ASEAN and AEC Forward into 2015 and Beyond, the output of the Government of Indonesia-ERIA-Harvard University Symposium in October 2011. The Jakarta Framework was presented by ERIA, together with the ASEAN Secretary General, to H.E. Dr. Susilo Bambang Yudhoyono during the 19th ASEAN Summit in Bali in November 2011. As 2015 drew nearer and with the impetus for thinking through and preparing for the ASEAN Economic Community Blueprint post 2015 becoming stronger, ERIA decided in 2012 to tap a large number of specialists and experts from the ASEAN region (primarily) and outside to prepare more than 30 thought or issues papers on a wide range of areas related to moving ASEAN and the AEC forward beyond 2015. The papers explicate and deepen the ideas embodied in the Jakarta Framework and are put together in this study 'Moving ASEAN and AEC Forward Beyond 2015'.

This study highlights the progress of, and challenges facing, ASEAN and AEC, reframes the

1997 ASEAN Vision 2020, proposes targets for ASEAN indicative of a Rising ASEAN, presents and elaborates on a framework towards the achievement of an “ASEAN Miracle”, and provides key recommendations for moving ASEAN and AEC forward beyond 2015.

## 2. Globalisation and Performance of Small and Large Firms

In the past decades, growth performance of many East Asian economies has been far above the international standards. There is a growing consensus that one of the key factors behind this is because these economies were increasingly integrated with the global market, de facto and de jure.

However, in many East Asian economies, there is also a growing concern that the growth performance has been very uneven across firms. This is true not only in developed countries such as Japan and Korea but also in developing countries such as Indonesia and Viet Nam. In policy debate, this is often translated into the view that there is an increasing performance disparity between small and large firms. While it is an empirical issue as to whether or not this view has a sound factual basis, the perceived divergent performance between small and large firms has, in reality, become an important economic or socio-economic policy issue.

This study, which is the sixth in the ERIA Microdata project series since 2008, attempted to shed

light on this issue, with an objective to better understand whether and how globalisation has affected the performances of small and (or versus) large firms, as well as to identify policy issues which need to be addressed in order to achieve a stronger and resilient economic growth and development in East Asian economies. The study has 10 papers which cover the following countries: Japan (two papers), China, South Korea, Indonesia (two papers), Thailand, Malaysia, the Philippines, and Viet Nam.

## 3. AEC Scorecard Phase 3 - Towards Informed Regulatory Conversations and Improved Regulatory Regime: Logistics Sector and Trade Facilitation

Phase 3 involved the conduct of informed conversations with key stakeholders on regulatory reform as well as improved regulatory coherence in the ASEAN region with special reference to logistics services sectors and trade facilitation. The aim was for said reform to lead to the harmonisation of rules and regulations, standards, liberalisation, reduction in barriers, greater transparency and rationalisation of process, all of which are critical to the drive towards AEC 2015.

This Project Phase had two parts. Part 1 involved an overview of the regulatory regime in the logistics sector and trade facilitation, regulatory stock taking and gap analysis on actual regulations versus “best practice” regulations, and case studies of regulatory review and coherence which were done with the help of the members of ERIA’s

Research Institutes Network (RIN) in the region. Part 2, on the other hand, dealt with the estimation of the expanded restrictiveness index using both border and behind-the-border restrictions in the logistics sector and trade facilitation, and the analysis of the impact of the restrictions on the economic performance of AMSs.

## 4. Entrepreneurship and Local Technological Capacity in the East Asian Natural Resource-based Production Network

Previous researches of ERIA have emphasized the importance of participation in international production networks in order to benefit from technology transfer. But evidences show that beneficiaries in the manufacturing sector are mostly limited to multinational companies (MNCs) and a handful of local firms which are capable of meeting requirements from MNCs. On the other hand, natural resource-based (NRB) industries account for a significant portion of exports for most of the ASEAN member states. There are indigenous big enterprises in the member states which are already internationalised and have created international networks which are governed by themselves, through which technology could be transferred within the region. However, little attention has been paid to the NRB industries for establishing a clear relationship between technology and network.

The main objective of this research project is to get a deeper understanding of technological

upgrading and production networks in the NRB industries. To this end, two methodologies were adopted: case study and survey.

For the case study, one leading industry enjoying comparative advantages was selected from India, Indonesia, Lao PDR, Malaysia, the Philippines, Thailand, and Viet Nam. The selected industries for each country are the following: rubber processing (India and Thailand); seafood processing (Indonesia and Viet Nam); fruit processing (Lao PDR); palm oil (Malaysia); and furniture (Philippines).

In tandem with the case studies, the questionnaire surveys were conducted in five geographical areas that cover main industrial districts within four ASEAN countries: Jabodetabek in Indonesia, Calabarzon in the Philippines, Greater Bangkok Area in Thailand, and Hanoi and Ho Chi Minh Areas in Viet Nam. This year’s survey asks firms about product safety, in addition to the existing questions like respondent’s business profiles; innovation and upgrade activities; sources of technologies and information; and business tie-ups with customers and suppliers. In addition to these four countries, the survey was also organised in Lao PDR, focusing on firms supporting NRB industries.

## 5. Financing Infrastructure in ASEAN Member States: Fiscal Landscape and Resource Mobilisation

ASEAN Connectivity becomes a central issue to integrate and consolidate ASEAN member states



(AMSs) towards realising the ASEAN Economic Community 2015 and beyond. However, ASEAN still faces several obstacles in the realisation of all the three pillars of connectivity, i.e., physical, institutional, and people-to-people connectivity. In terms of physical connectivity, one of the main problems in implementing the prioritised projects listed in the Master Plan on ASEAN Connectivity (MPAC) is finance.

This study maps the current infrastructure development, fiscal condition and policy in all AMSs as well as the available financial sources at the regional level. It also looks at the fundamental challenges towards utilisation of funds and recommends a regional mechanism that would push forward the financing of infrastructure in the region. With a short supply of public financing to meet the demand for infrastructure, there has been an increasing need for private participation. One

important aspect in this study is to look at possible avenues to increase the role of Public-Private Partnership (PPP) in financing infrastructure and ASEAN Connectivity.

#### **6. Social Security System and Fiscal Policy in India, China, Japan and Indonesia**

This research project builds upon the previous ERIA research on Social Security Systems with three main objectives. The first is to review the modeling techniques used in the literature to project pension related old-age expenditure, and examine the quality and policy relevance of the projections, particularly for the four most populated Asian countries: China, India, Indonesia, and Japan.

The second objective is to assess the additional fiscal resources likely to be required by these four countries as they address challenges of rapid ageing. Conventional projection techniques with appropriate modifications are found to be suitable for Japan and China, but not for India and Indonesia for whom only rough projections on various components of social security system are found to be relevant.

The third objective is to explore avenues for each of the four countries in finding the fiscal space needed to finance age-related expenditure. The focus on understanding and evaluating modeling techniques for age-related pension expenditure, and then linking the projected needs to reforms in fiscal systems fills an important gap in the pension literature for these countries. Pension reforms

and fiscal reforms are usually analysed separately in the four countries. This study's premise is that an integrated approach to both is needed and an essential link between the two should be recognised. It is expected that such a linkage will assist policymakers in taking a broader view of pension system reforms.

#### **7. Public Private Partnership in ASEAN Countries Phase 2: Institutional Assessment to Develop Public Private Partnership System in Cambodia, Laos PDR and Myanmar**

Implementation of a PPP system requires an existing set of preconditions. The establishment of a PPP system itself requires several stages to be completed. CLM (Cambodia, Lao PDR and Myanmar) are, however, countries that will be mature in the not-so-distant future; international aid and investment will flow into the countries if institutional reform is successful. They therefore have opportunities to adopt PPP into their development strategies, given that international financial resources might be accessible for bankable schemes. Thus, the first task on hand is for CLM to develop a feasible and lucid PPP policy and framework. To do so, there is need for a background study and gap analysis on making appropriate PPP in the respective countries.

This study assesses the current development of private finance initiatives in CLM and the stage of PPP policy maturity. It provides analytical review of regulatory and institutional frameworks and

suggestions to move forward private participation in infrastructure development.

#### **8. ASEAN SME Policy Index 2014: Towards Competitive and Innovative ASEAN SMEs**

Because SMEs are critical for the robust growth of the AMSs and the whole ASEAN region itself, it is important for the policy regime in the region to be facilitative of the growth and development of the SME sector. Such policy regime is determined by both ASEAN initiatives and agreements as well as national policies and programs. Towards this end, it is necessary to have a consistent SME policy framework in the ASEAN at both the national and regional levels. There also needs to be a comprehensive and effective monitoring tool such as the ASEAN SME Policy Index to see whether the policies, programs and institutions are supportive of the development of SMEs in the region.

The ASEAN SME Policy Index is derived from the OECD SME Policy Index and adapted to ASEAN's specific context. Thus, the policy dimensions, sub-dimensions, indicators and levels of policy reform comprising the ASEAN SME index reflect more the specific circumstances of the ASEAN region.

The development and subsequent publication of the ASEAN SME Policy Index report is an outcome of the collaboration among the ERIA, OECD, members of the ASEAN SME Working Group and the ASEAN Secretariat.

### 9. Preparing for Natural Disasters: ASEAN Perspectives

Disaster, as a phenomenon impacting on economic activity, is quite different in many ways from other crises like a global financial crisis. It is characterised by sudden occurrence of the event, loss of lives, negative externalities, non-uniform distribution of damages over space, and a dynamic trend change from large negative shocks to a positive demand injection for recovery and reconstruction. As such, the impact estimate of disasters entails a delicate exercise methodologically. This ERIA study is a support towards serious endeavors of Asian nations to prepare for natural disaster. It focuses on the methodology of impact assessment, the cases for impact on poor households, and on disaster-linked financial instruments. The study also reviews current insurance systems of natural disaster and proposes improvement therein for ASEAN.

In the context of improving regional resilience, the study found that the region still lacks reliable data and insurance coverage. Therefore, it recommends to establish a regional center for disaster risk data, modelling and insurance that would be a critical first step for regional cooperation in natural disaster risk financing and transfer. The empirical results from the West Sumatra case also support the idea that ex-ante insurance scheme, even though the coverage is rather small, can have a positive effect on short-term recovery.

### 10. Economic Impact Evaluation of Investments on the Energy Savings and Low Carbon Emitting Technologies in East Asia – Phase 2

The first phase of this study projected energy supply and demand for 16 East Asia Summit (EAS) countries up to 2035 in two scenarios: Business-as-Usual Scenario (BAU) and Alternative Technology Scenario (ATS). The BAU considers the continued implementation of current policies and the use of current level of technology application while the ATS considers technological energy saving potential compared with the BAU and estimates the potential of those countries to reduce CO<sub>2</sub> emissions through low-carbon technologies. In the first phase, the study also evaluated the investment requirements for meeting the energy supply and demand, and conducted the analysis of the costs of introducing energy conservation and low-carbon technologies, and the direct benefits from reducing the fuel import spending.

Building on the findings from the first phase, the second phase of this study aimed to estimate the comprehensive impact from the introduction of energy conservation and low-carbon technologies on the economy of each country in the EAS. This is also based on the observation of a policy shift in recent years in the EAS countries to promote energy efficiency improvement as well as use low-carbon technologies.

Using the estimations of the investment requirements to introduce energy conservation and low-carbon technologies and their energy

saving effects by sector, the study analysed the direct impacts on each sector, and later the indirect influence on the economy by using a computable general equilibrium model, namely, the Global Trade Analysis Project or GTAP. Based on the results, the study classified the EAS member countries into several groups in trying to draw policy implications specific to each group. Considerations are given to facilitate cooperation among the EAS member countries towards achieving green growth and regional prosperity.

### 11. Analysis of Energy Saving Potential in the East Asia Region

This study is a support study for the EAS Energy Ministers Meeting (EMM) and the EAS Energy Cooperation Task Force (ECTF), and is the fifth in the series of studies on energy saving potential in East Asia. The results of the previous four studies have been reported in the past four EMMs and have been highly appreciated by the Ministers.

Based on social, economic and technological assumptions which are exogenous to the modeling, this research develops a Business as Usual (BAU) scenario for each EAS country outlining future sectoral and economy-wide energy consumption, assuming no significant changes to existing government policies. An Alternative Policy Scenario (APS) is also designed to examine the potential impacts of additional energy efficiency goals, action plans and policies that have been reported by the governments. The difference

between the BAU and APS represents potential energy savings.

The current study is extending and enhancing the analysis of energy saving potential undertaken in the past five years with new data and additional policy targets from the member countries. The study also examines other scenarios such as energy security scenario which estimates the necessary energy savings to maintain energy supply security at the 2000 level and clean coal technology scenario which estimates the impact of this technology on supply security and GHG emissions.

In 2012-2013, three additional and supportive research studies were conducted by the Working Group for the Analysis of Energy Saving Potential in East Asia and the Biofuel Sub Working Group. These three studies served as complements to the main research on energy saving potential in East Asia.

### 12. Benchmarking of Biodiesel Fuel Standardisation in East Asia

Asian countries are actively promoting the introduction of biofuels due to soaring oil prices and increasing energy consumption. The utilisation of biofuels is also important from the viewpoint of energy security and alternative fuels. However, the low-quality biodiesel fuel raises serious concerns regarding the effect on engine performance caused by fuel impurities and oxidation. Therefore, it was considered practical that biodiesel fuel



standards should be established in each country to promote more efficient distribution in the region.

The objective of this research was to define appropriate utilisation of biodiesel fuel by establishing the quality standard and quality control/management method that is required in the market. To achieve this objective, production of high-quality biodiesel fuel, its smooth distribution, and stabilisation of economic infrastructure are required.

The project collected information on test laboratories in each EAS country; compared test results and considered harmonisation of the test methods for the benchmark stand; and examined quality control measures at the pump in each EAS country.

The Working Group for this study updated the biodiesel fuel standard that was proposed in 2008, surveyed other biomass resources and investigated fuel/vehicle adaptation to reach emission targets.

### 13. Extending the ERIA Working Group Methodology for Sustainability Assessment of Biomass Utilisation in East Asian Countries – Phase 5

The ERIA Working Group (WG) on “Sustainability Assessment of Biomass Utilisation in East Asia” started its activity on sustainability assessment of biomass energy utilisation in the East Asian context in 2007 as part of a pre-ERIA test-run project. In that first phase, the WG extracted

issues of concern for sustainability assessment of biomass utilisation and summarised a WG report titled “Sustainable Biomass Utilisation Vision in East Asia”, which played an important role as scientific backup for the adoption of the “Asia Biomass Energy Principles” endorsed during the Second Meeting of the Energy Ministers of East Asia Summit in 2008. In the second phase, the WG developed a methodology to evaluate sustainability of biomass utilisation based on environmental, economic and social pillars. It also framed the “Guidelines to Assess Sustainability of Biomass Utilisation in East Asia”, incorporating the methodology developed and data required for sustainability assessment for biomass utilisation. Consequently, in the third phase, the WG conducted pilot studies in four selected East Asian countries to field-test the methodology developed and presented in the WG report “Sustainability Assessment of Biomass Energy Utilisation in Selected East Asian Countries”. The fourth phase upgraded the methodology based on the lessons learned from the pilot studies, as summarised in the WG report “Sustainability Assessment Methodology for Biomass Energy Utilisation for Small and Large Scale Initiatives: Lessons Learned from Pilot Studies in Selected East Asian Countries”.

The activities in this fifth phase aimed at (1) checking the indicators developed by the WG for assessing sustainable biomass utilisation with other international efforts such as the Global Bioenergy Partnership (GBEP) and the Roundtable



on Sustainable Biofuels (RSB), and (2) developing a basic framework of an ex-ante decision support tool for assessing sustainability of biomass utilisation systems.

For the first objective, the sustainability indicators of biomass utilisation identified in the international initiatives were considered and compared with those selected for the ERIA WG’s methodology. In this regard, the sustainability indicators in the ERIA WG methodology were found to be consistent with those in GBEP and RSB. Meanwhile, to meet the second objective, the framework of a decision support tool to make ex-ante sustainability assessments on biomass utilisation was developed and the relevance of the indicators developed by the ERIA WG was discussed. The need for such a tool had been identified earlier on to facilitate evaluation of planned biomass utilisation projects before they are actually implemented.

### 14. Effective Investment of Power Infrastructure in East Asia through Power Grid Interconnection

In the EAS countries, electricity demand is steadily rising due to population increase and economic growth. Moreover, as improving the electrification rate is an important policy task in many countries, electricity demand appears certain to increase more in the future in line with a rise in living standards. Meanwhile, as income is relatively low except for a small group of wealthy people, it is necessary to supply electricity at the minimal possible cost. Therefore, for the EAS countries, implementing large-scale power source development steadily in an economically efficient way is an urgent task.

Basically, for a country to implement power source development for self-sufficiency and energy security purposes is natural and a rational approach if the country’s demand growth for energy is moderate or if the country can implement economically efficient power source development on its own to meet the demand. However, when demand growth outstrips the capability to employ necessary domestic resources or when economically efficient power source development is difficult due to some constraints, importing electricity from neighboring countries should then be considered an option. In light of these, ways of developing power infrastructures (power sources and grids) on a pan-regional basis should be looked into. This will help optimise or improve the efficiency of power infrastructure investments.

In the ASEAN region, HAPUA (The Heads of ASEAN Power Utilities / Authorities) and the Asian Development Bank are implementing initiatives related to intra-region power grid interconnections, and bilateral power imports and exports are ongoing. However, individual countries still put priority on optimising investments at the domestic level. Besides, power imports and exports are not brisk enough to contribute to “power grid interconnection,” and moves towards pan-regional optimisation have been slow.

This study therefore quantified the possibility and benefits of the pan-regional optimisation of power infrastructure investments in the EAS region. As such, the study provided clues for facilitating policy decisions towards the development of optimal power infrastructures and investment decisions.

#### **15. Development of Energy Security Index and Assessment of Energy Security for East Asia Countries – Phase 2**

Enhancement of energy security is becoming one of the top priorities for each East Asian country since each needs to achieve sustainable economic growth and development. It is also essential to recognize that East Asian countries have a wide range of diversity in energy resource endowment, economic development stage, industrial structure, and stage of technology development and deployment. Given the above, it is imperative to analyse the energy security situation and the policy implications in East Asian countries, with such diversity taken into consideration. It is

also very important to promote energy security enhancement not only in each country but also in the East Asian region as a whole through regional cooperation.

The first objective of the research was to develop an Energy Security Index that would allow policy planners in the region to have an accurate understanding of the energy security situation in each country. The second objective was to assess energy security policy impacts in East Asian countries by using the Energy Security Index. The third objective was to draw policy recommendations for energy policy planners in the region based on the above analysis, with reference to what is the best approach/practice to enhance energy security for each country; what is the most effective way forward to enhance energy security for each country with different energy/economic conditions; and how the regional cooperation could be best promoted to enhance energy security.

#### **16. Asian Potential of Biofuel Markets – Phase 2**

Asia’s growing appetite for energy but relatively limited resource reserves makes it vulnerable to changes in international energy prices. For liquid fuel, the situation is even worse. Concerns on environment deterioration caused by the burning of fossil fuels have been growing. In facing the challenges, most Asian countries promote production and utilisation of biofuels as one of the possible solutions. However, it is an intensely debated option, with some of the following issues

being raised: biofuels versus food security, biofuels versus land use, deforestation, and others. Thus, promotion of biofuels’ production and utilisation should be planned and implemented with caution.

This study explored the Asian potential in the biofuel market. Indonesia, Malaysia, the Philippines, and Thailand were selected for study at the first stage since these countries are relatively advanced in the production and/or utilisation of biofuels in ASEAN.

In this second phase of the study, biofuel supply and demand outlook was projected and analysed for each selected country. Established results of other ERIA working groups were also utilised for the “Business as Usual (BAU)” case.

#### **17. Energy Market Integration in East Asia Summit Region: Renewable Energy and Its Deployment into the Power System**

The Energy Market Integration (EMI) study has been a continuous work since FY2009. This particular study focused on renewable energy (RE) and its deployment into the power system. It has nine research papers, six of which dealt with renewable energy. Among the topics addressed were on the impact of price distortion on the national economy, diversity in an integrated energy market, and cash transfer (subsidy removal) in India. On renewable energy issues, the studies addressed integration in ASEAN, trade and price support policy, case studies in

Cambodia, Indonesia, New Zealand, and the global perspective.

#### **18. Strategic Usage of Coal in the EAS Region – Phase 1**

With rapid economic development, electricity demand in the EAS region is also increasing. Coal- and gas-fired thermal power generation will generally continue to play a central role in order to satisfy this demand. As coal is cost competitive compared with gas, it is anticipated that coal-fired power generation will increase on a broad scale. For the sustainable usage of coal, the dissemination of Clean Coal Technology (CCT) for clean and efficient usage in the EAS region is of pressing importance.

While the necessity for the dissemination of CCT has been recognised, inefficient technology is still being widely used. It is therefore a concern that inefficient technology will lead to wastage of valuable coal resources and to less reduction of harmful environmental impacts. Based on the above, Phase 1 of this study developed a “practical” technological potential map for efficient CCT dissemination which could be used by policymakers in the region. It aimed to suggest a feasible efficiency level, environmental performance and maintenance criterion of each technology so that a country in the region would be able to select and introduce the best technologies based on its own situation.

**19. International Cooperation in Nuclear Safety Management in East Asian Countries – Phase 1**

Some of the ASEAN countries plan to introduce commercial nuclear reactors by the early 2020s due to the high growth of energy demand. In the 1st Working Group meeting of this study, the information on the current development plan with regard to safety regulation and nuclear security systems was shared among the member countries in order to identify problems in establishing an emergency action plan for accidents and in considering desirable cross-border cooperation. The 2nd Working Group meeting discussed proposals for regional cooperation such as emergency response, planning and management, technology and industrial development for nuclear safety and security.

This study's findings are:

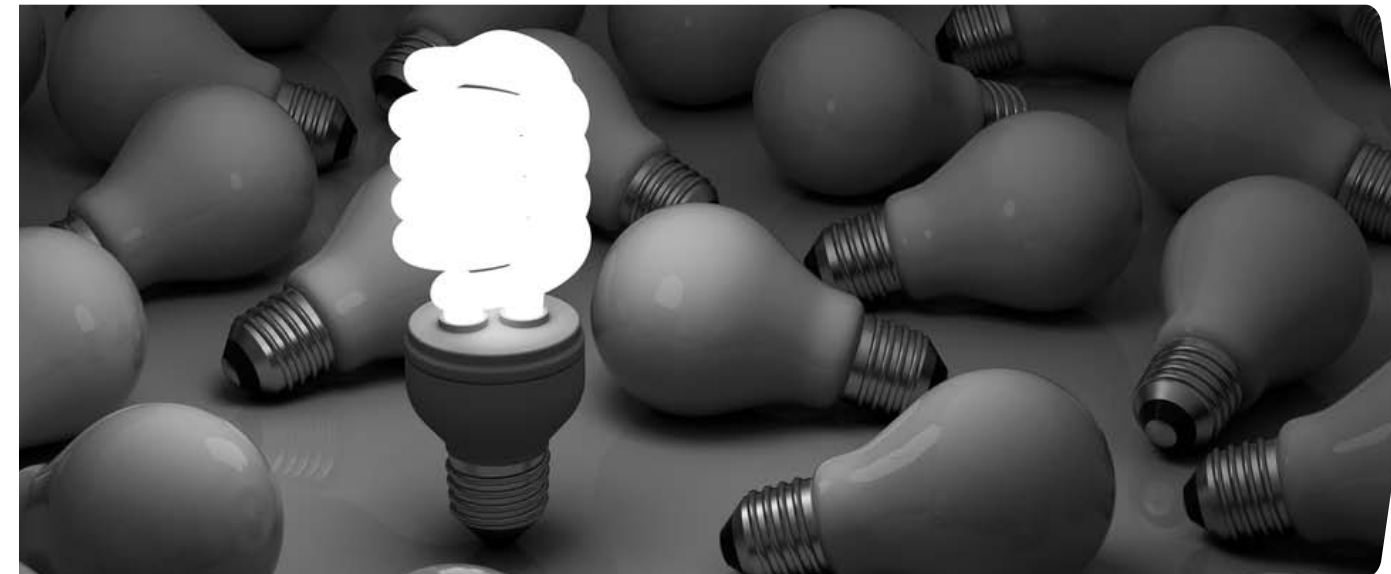
- All member countries have some kind of a national nuclear regulatory body and a common awareness that every country should play a role in regional cooperation on nuclear safety, irrespective of the development status of commercial nuclear power generation.
- The countries which already have nuclear energy technology, namely Korea, China and Japan, will be expected to provide information on the reactor and fuel technologies, safety regulatory schemes, security and safeguard issues, and most of all, human resources development plans.

- The nuclear accident at the Fukushima Dai-ichi on 11 March 2011 has had a serious impact among ASEAN countries even though the location of the accident is far from their location. Prompt and accurate information sharing at a regional scale would be the top priority in case of a serious nuclear accident.

**20. Energy Efficiency Improvement in the Transport Sector through Transport Improvement and Smart Community Development in the Urban Area – Phase 1**

The growth in transport sector oil demand has been led by motorization in some EAS countries whose income levels are growing rapidly. The expanding urban area of high income level and its soaring passenger vehicle ownership has been causing a number of socio-economic issues, including chronic traffic congestion. This in turn leads to energy waste, time losses in economic activities, and worsening air quality.

With respect to the transport sector, smart community aims to simultaneously achieve the efficiency improvement in the transport sector and the lowering of environmental burden through the optimisation of transport infrastructure such as road and rail, introduction of the next generation vehicles (hybrid, PHV, and EV), and transport demand management. In other words, smart community for the transport sector could cope with various transport issues in the urban areas of Asia.



A number of studies have been implemented to consider the energy saving potential in the transport sector of Asia through shifts towards fuel efficient vehicle units. This particular study utilised a simulation model which was able to analyse the impacts of infrastructure development on the traffic flow and subsequent impacts of the overall transport sector energy efficiency improvement within the rapidly developing Asian cities. The outcomes from the study provided new insights that would contribute to the sustainable development of cities in the EAS countries through urban transport improvement via smart community development.

### Ongoing Research

As of 31 March 2014, there were 26 ongoing research projects whose description and objectives are presented below.

#### 1. ASEAN Economic Community Scorecard - Phase 4 : Monitoring the Implementation of AEC Blueprint Measures

Effective monitoring is a central element in ASEAN's drive towards, and management of, deeper integration in the region. This is especially critical in the context of the ASEAN approach to regionalism and integration based on shared aspirations, interests and values; mutual trust and accepted procedures; frequent interaction and consensus building; and flexibility and pragmatism.

In support of the realisation of AEC 2015, ERIA has undertaken the monitoring and analysis of priority AEC measures in 2010 and 2011, in response to the task mandated by the ASEAN Economic Ministers. In preparation for AEC 2015, ERIA, through its AEC Scorecard Phase 4, proposes to once again undertake a major monitoring of the implementation of key priority AEC measures in early 2014. This new monitoring effort aims, among others, to:

- Determine the progress in the implementation of the key AEC measures as compared to the first monitoring effort done in 2010-2011. Given that the implementation of the AEC Blueprint is a continuing effort, it is expected that this new monitoring exercise will allow the measure and presentation of progress made. The measurement of progress using a common methodology will be useful for ASEAN officials in their communication with the public on both the successes and challenges of AEC 2015.
- Determine the gap between the rate of liberalisation in terms of commitments and actual policies. It may be possible that actual policies are more liberal than what were committed by AMSs in the AFAS or ACIA. It is therefore useful to determine this gap in the AMSs to help indicate areas for possible acceleration of implementation or for informing the pace and extent of liberalisation in the negotiations for the successor AEC Blueprint beyond 2015.

#### 2. Regional Comprehensive Economic Partnership Related Studies

The Regional Comprehensive Economic Partnership (RCEP) is critical to the deepening of economic integration of East Asia.

RCEP has taken the initiatives on regional economic integration to a higher level. First, in contrast to the ASEAN+1 Free Trade Agreements (FTAs) where individual ASEAN member states

(AMSs) had essentially bilateral commitments with the Dialogue Partners, AMSs would likely need to have common commitments vis-à-vis the partners (with perhaps a few exceptions) under RCEP. Second, the commitments of the dialogue partners need to be common commitments congruent with those of the AMSs. Third, the commitments under RCEP need to be substantially better than those under the ASEAN+1 FTAs; in short, RCEP should not merely be a consolidation of the ASEAN+1 FTA commitments but rather a high quality agreement in order for it to be credible and worthy of the resources and time expended for the negotiations and related activities. Moreover, given that RCEP effectively includes an implicit FTA agreement among China, Japan and South Korea which results in trade and investment diversion from ASEAN as compared to the ASEAN+1 FTAs, only deeper facilitation and liberalisation commitments would provide additional benefits to ASEAN Member States as compared to the current ASEAN+1 FTAs. With these objectives in mind, ERIA has undertaken a number of studies to support the RCEP negotiations towards a high quality trade and investment agreement, with greater emphasis on economic cooperation.

#### 3. ASEAN+1 Free Trade Agreements: The Use of FTAs in ASEAN

In collaboration with the ASEAN Business Advisory Council (ASEAN BAC) and national think tanks in ASEAN, ERIA conducted surveys on the usage of free trade agreements (FTAs) by the private sector. The surveys covered 630 exporting or importing

manufacturing firms and 182 services firms that use imported goods in their business operation across ASEAN countries. The surveys were complemented by interviews and focus group discussions with firms, business associations, chambers of commerce and government officials. In Brunei, in particular, because of its relatively small number of manufacturing and services firms, focus group discussions were organised instead of surveys. The surveys started in April 2013 and proceeded throughout August 2013.

#### 4. Meaning of Indian Economic Dynamism for the East Asia Economic Integration Process

India's recent economic performance is a success story. This economic dynamism needs to be harnessed by increasing its presence in the East and Southeast Asian region in a mutually beneficial manner. Given that East Asia is characterised by developmental asymmetries and a lack of any pan-Asian comprehensive economic integration agreement, the objective of this study is to demonstrate what Indian economic dynamism brings to the ASEAN+6 process, including its developmental implications. The study highlights the economic significance of India's integration within Asia and also how India's soft power has both cultural and ethical dimensions to this integration.

A detailed analysis is undertaken in the study to conceptually and empirically assess mutually beneficial potential in the realms of trade in goods, trade in services, FDI, demographic



complementarities and others. Based on the analysis, the study will make some broad recommendations towards creating a pan-Asian comprehensive economic integration framework.

#### 5. Trade in Value Added of Southeast Asia

The East Asia Pacific (EAP) economic growth has outperformed the world growth for the last two decades, except from 1997 to 1999 due to the Asian Financial Crisis. Most East Asian economies are well-positioned to weather any renewed volatility. As the drivers of global economic growth shift towards East Asia and Emerging East Asian economies, it is important for Southeast Asian economies to be well-positioned for them to benefit from the growing power of bigger Asian economies.

After a decade of China's accession to WTO, no one can afford not to trade with China. But as China's growth pattern changes as it moves up the income ladder and is likely to rely more on consumption and less on investment and exports (China's export performance was anemic in 2011 and has weakened further in early 2012) and more on services and less on industry, opportunities for Southeast Asian countries to expand their economies through trade and investment emerge. Much of East Asia's production is through production networks. Imports are largely used as inputs for exports. Many countries are engaged directly and indirectly in producing final products.

Given this scenario, this study aims to provide a framework on globalisation's second unbundling related to trade and industrialisation in Southeast Asia. The study will cover the following issues:

- How does the slowdown in trade in China affect Southeast Asian trade?
- How does Southeast Asia manage to level up its product value added and improve trade competitiveness?

#### 6. ASEAN Regional Integration and the Automobile and Auto Parts Industry

ASEAN has created a highly developed free trade system that is unique in Asia. In this, the automotive sector has been prioritised. The free trade system which began with the Brand to Brand Complementation (BBC) scheme in 1987 and finalised with the creation of the ASEAN Trade in Goods Agreement (ATIGA) promoted intra-regional trade and investment from automotive original equipment machineries (OEMs) and auto parts suppliers.

The automotive and auto parts industry is one of the key sectors for ASEAN to actualize AEC. This is proven by official trade statistics in which automotive parts account for more than 20 percent of the total intra-regional trade in ASEAN. The AEC Blueprint, which illustrates a roadmap towards realising an ASEAN single market and production base, schedules harmonisation of standards and technical regulations for the automotive sector. Such arrangements will also facilitate intra-regional automotive trade.

There still remain, however, some issues to be improved such as infrastructure (soft and hard) provision, mobility of skilled workers, and connectivity. The objective of this study is to observe the progress of the AEC establishment and its expected impact on industrial development, focusing on auto parts industry. Case studies have been conducted to investigate the current business conditions faced by automobile OEMs and parts suppliers. The study includes current states and issues of ASEAN's automobile and auto parts industries in ASEAN 5, AEC and Japan, ASEAN automotive parts logistics, workers mobility in ASEAN, automobile and auto parts industry in CLMV, India-ASEAN supply chain relations, and the automotive industry in Indonesia.



#### 7. Analysis of Competition Laws in East Asian Countries

As the East Asian region grows rapidly in economic activities, enactment and improvement of competition policies and laws will play a critical role in this growth by providing critical legal infrastructure to realise market-based economic environments and thus, further accelerate the economic growth. The introduction of a National Competition Policy in all the ASEAN member states by 2015 is one of the policy measures adopted in the AEC Blueprint to realise a competitive ASEAN. Moreover, the RCEP negotiations cover competition policy as one of the important chapters.

This ERIA study will therefore conduct a comprehensive comparative research on the competition policies and laws in East Asia (namely, Indonesia, Malaysia, Singapore, Thailand, Viet Nam, China, Japan and Korea). It is intended to shape common understanding on the elements required in an effective competition law system as well as to promote the harmonisation of said system with international standards. The framework of this study will be based on the features that are unique to East Asia.

The study is expected to be completed by the end of 2014.

### 8. FDI Policies and Performance in ASEAN Region

Foreign direct investment (FDI) is an important driver of industrialisation and growth in many developing countries, including those of the member states of ASEAN. The extent of FDI inflows to these countries has increased tremendously in the past two or three decades, coinciding with their economies' rapid growth. While the general positive impact is clear, the literature is still incomplete in documenting the policy issues surrounding the rapid investment flow. Moreover, previous studies have noted that there could be a great deal of variation in FDI inflow between countries and across industries within a country.

This study addresses this issue in selected ASEAN member states (AMSs). Its general objective is to examine the role of FDI policy in explaining the variation in the FDI inflows among the AMSs covered by the study. The implementation of this study will be completed in two fiscal years of research. The specific objective of the research for the first year (ERIA Fiscal Year 2013-14) is to make a rigorous documentation of FDI policy in all countries covered by the study i.e., Indonesia, Thailand, Malaysia, the Philippines, Viet Nam, and Cambodia.

In the documentation, discussions are made to align the FDI policy with other policies that are often linked to policies governing FDI. Examples are trade policy, labour policy, education policy,

infrastructure policy (hard and soft infrastructure), technology development, and regional economy within a country.

### 9. Study and Survey on Intra-ASEAN Non-Tariff Measures on Trade and Foreign Direct Investment

During the last decade, ASEAN countries have been active in mutually reducing tariff barriers to trade. This has been achieved mainly through various trade agreements concluded both bilaterally and at a regional level. Although this process has led to important reductions in barriers to trade, important non-tariff measures (NTMs) remain.

With the rising importance of global and regional production chains and international firms, NTMs constitute an increasingly important impediment both to trade and foreign direct investment (FDI). Trade and FDI that are freed from NTMs would potentially benefit all ASEAN countries. Unlike tariffs, regulation cannot just be removed. However, regulatory differences between countries and trade and investment costs that they create, can be reduced. To understand the extent of these impediments and the potential for their reduction in the ASEAN region, the first step is to measure these NTMs.

This survey study aims to identify and analyse existing NTMs and regulatory divergence at the sectoral level in the ASEAN countries. The survey and the report will focus on at-the-border

and behind-the-border costs that emerge from regulatory divergence. The results of this survey will provide insights into the extent of NTMs and regulatory divergence that exist within the ASEAN countries and how large or diverse effect they have on both trade and FDI.

The Centre for Strategic and International Studies (CSIS), Jakarta will provide a complete survey dataset together with a summary of existing surveys on the NTMs in the ASEAN region. The survey aims to observe the importance of NTMs between each trading country for each industry. The survey will cover representative exporting/importing firms considering geography, industry, size, ownership, state of being in an export zone and other firm characteristics.

### 10. Cross-border Soft Infrastructure Improvement in the Inland ASEAN

Transport facilitation is one of the essential measures for ASEAN to deepen the economic integration, strengthen ASEAN's competitiveness, and enhance people-to-people connectivity. The AEC Blueprint, Master Plan on ASEAN Connectivity (MPAC) and Brunei Action Plan clearly emphasised the importance of transport facilitation and specified the prioritised transport facilitation measures.

While AEC measures have not yet been fully implemented, production networks are expanding and becoming more sophisticated using new and existing trade and transport facilitation measures.

With ongoing transport facilitation between Laos, Cambodia, Viet Nam and Thailand, the Mekong region has been the forerunner of ASEAN in terms of transport facilitation.

Simulation analysis by IDE/ERIA-GSM revealed that development of the Mekong-India Economic Corridor (MIEC) had a larger impact on the Mekong region than the other GMS economic corridors. However, there are two missing links in MIEC: (1) Dawei deep seaport and link between Dawei and Kanchanaburi, and (2) Transit transport between Bangkok and Ho Chi Minh City. The IDE/ERIA-GSM suggests that firms would want to utilise these links as they will boost the economic activities in the Mekong region.

Given this background, this study raises the following issues: (a) the real bottlenecks in the missing link of the Bangkok-Ho Chi Minh City transit route among several soft and hard infrastructure concerns; (b) the differences and gaps between the use of bilateral MoUs and the Cross-Border Transport Agreement (CBTA) in the borders of the Mekong Region which can affect the transport facilitation during the transition period; (c) the differences between the East-West Economic Corridor (EWEC) and the MIEC; (d) the potential gains and contributions of forthcoming AEC transport measures; and (e) the areas that need to be addressed after the AEC measures are in place.

This study will cover both passenger and freight transport and will conduct comprehensive stocktaking among domestic regulations, bilateral MoUs, sub-regional initiatives, and possible AEC measures.

**11. Innovation, Technology Transfers, Finance and Internationalisation of Small and Medium Enterprises' Trade and Investment Policy: Best Practices for ASEAN**

The results of the ASEAN SME Policy Index scoring on eight policy areas (i.e., institutional framework; access to support services; cheaper and faster start-up and better legislation and regulation for SMEs; access to finance; technology and technology transfer; international market expansion; promotion of entrepreneurial education; and more effective representation of SMEs' interests) show that there is a lot to be done in order to move towards the best practice in each of these policy areas. The most significant gaps and low regional standing are on technology and technology transfer, access to finance, promotion of entrepreneurial education, cheaper, faster start-up and better regulations, and access to support services. It is therefore important to fast track the processes in support of narrowing policy gaps in ASEAN Member States, especially in the areas of technology development and transfers, access to finance, and regional strategy to boost SMEs' participation in trade and investment in ASEAN and East Asia. For this, identifying and sharing policy best practices in these areas are critical in fostering regional SMEs' policy cooperation

and providing practical policy implementation. The project would thus focus on the following policy areas of best practices: (a) SMEs' support policy for innovation, technological development, diffusion, and transfers; (b) facilitating SMEs' access to finance; and (c) promoting SMEs' participation in trade and investment in the region.

**12. Intellectual Property Policies for Investment Promotion**

This study was requested by the ASEAN-Japan Heads of Intellectual Property Offices (IPOs) to examine IP policies for investment promotion.

ASEAN adopted the "ASEAN Intellectual Property Rights (IPR) Action Plan 2011-2015" in 2011. The Action Plan recognises the need for ASEAN to ensure the protection and enforcement of IPRs of trading partners to be able to encourage foreign



direct investment (FDI) in the region. In order to do this, there is a need to identify the protection and enforcement measures pertaining to IPRs which are essential for FDI.

This study investigates the current status of IP regime and IP policy in the ASEAN Member States (AMSs) and how the AMSs should develop their IP-related policies in order to promote investments from MNCs. The main tool for this study is the use of interview survey. Selected MNCs that are considering expansion into the AMSs and those already in the AMSs are to be interviewed with a common set of questionnaires so as to identify the opportunities and challenges of the IP landscape in the AMSs.

**13. Development Potential of the Content Industry in East Asia and ASEAN - Phase 2**

This project is the second phase of the study on the development of content industry in the ASEAN and East Asia Region. In Phase 1, the study found that the market growth of the content industry (TV broadcasting, film, animation, games and music) for five countries, namely, China, Korea, Thailand, Malaysia, and the Philippines was higher than their GDP growth, indicating the growth potential of the industry. This growth also leads to a large scale labor absorption. In particular, the audiovisual content industry (TV broadcasting, film and animation) in the five countries can reach USD 200 billion at a GDP growth scenario. In addition, it also has the potential to reach USD 257 billion at a potential scenario. While all the

countries recognise the key policy issues and adopt relevant policy measures, these factors are not well organised enough to establish a strong industry and the government support measures are inadequate. Growing international demand also calls for stricter countermeasures against piracy, which is one of the industry's most serious problems, and global competition requires more aggressive governmental involvement. Following the Phase 1 study, and inviting the same members from semi-government institutions, this second Phase updates the key data (especially the content market size) and policy information by using the same methodology. Then, it examines the implementation status, policy impacts as well as perceived policy needs by utilising survey questionnaires to the private sector. It likewise aims to verify the policy recommendations presented in the Phase 1 study.

The findings and recommendations of Phase 2 will be published in July 2014.

**14. Disaster Risks, Social Preferences and Policy Effects: Field Experiment Studies in Selected East Asia Countries**

A number of devastating natural disasters have hit both developed and developing countries in recent times. Disasters can have serious negative effects not only on lives but also on the survivors' livelihoods in the aftermath. To identify effective policies to facilitate livelihood recovery of the victims of a disaster, it is imperative to clarify whether the disasters affect the poor

disproportionately. Work has recently begun to investigate the welfare impacts of natural disasters as well as man-made disasters such as economic crises through price changes.

The objectives of this project are:

- (i) to fill in the remaining large gap in the literature on behavioural impacts of disasters. Such a study is also indispensable in terms of designing and implementing appropriate post-disaster policies,
- (ii) to identify effective reconstruction and rehabilitation policies by quantifying people's behavioural responses to each policy in order to negate impact of such policies, and
- (iii) to provide policy recommendations at the community, national and regional levels.

#### **15. Energy Outlook and Analysis of Energy Saving Potential in East Asia Region**

In response to the Cebu Declaration on East Asia Energy Security in 2007 which emphasised that energy efficiency and conservation would be one of the ways to maintain energy security and mitigate climate change, Japan proposed to undertake a study of the energy savings and CO2 emission reduction potential in the EAS region. The study would quantify the total potential savings under the individual energy saving goals and action plans of each country. The potential saving was defined as the difference between the primary and final energy demand in the Business-As-Usual (BAU) scenario and Alternative Policy Scenario

(APS) – Energy Efficiency and Conservation (EEC) promotion case - of the energy outlook.

In September 2012, the 6th EAS Energy Ministers Meeting (EMM 6) held in Phnom Penh requested ERIA to prepare and analyse an appropriate energy outlook for the region taking into consideration the premises earlier made. Consequently, ERIA embarked on preparing and analysing an appropriate energy outlook of all EAS countries beginning 2013. This study would provide insights to national energy ministers in establishing goals and action plans to improve energy efficiency in their respective countries. The project also aims to prepare a methodology for the monitoring and implementation of energy saving goals and action plans of each of the EAS countries.

In addition, this year's study will include several other studies that are related to energy efficiency and saving potentials. These include, among others, energy price elasticity in selected ASEAN and East Asia Countries, impact of energy subsidies in Indonesia, and application of bottom-up approaches in road transport and household sectors.

#### **16. Energy Efficiency Improvement in the Transport Sector through Transport Improvement and Smart Community Development in the Urban Area – Phase 2**

Smart urban traffic is a research topic endorsed by the 6th EAS Energy Ministers Meeting (EMM 6) in 2012 in view of the rapid growth of passenger vehicle ownership in the urban centers of Asia.

The phenomenon has been causing a number of socio-economic issues, including chronic traffic congestion. This study identifies infrastructure investment and traffic demand management as the focus issues in transport improvement for Asian cities. Accordingly, Phase 1 of the study (2012-2013) shows that with small amounts of investment for road infrastructure improvements, a maximum of 2 percent travel time reduction and 15 percent of fuel saving could be achieved, in a 2 km section of Kuningan road in Jakarta.

This year's Phase 2 will analyse how to attract private car users for a modal shift into using the Bus Rapid Transit (BRT) system and assess the impact on the transport system in urban areas. Travel time reduction is identified as one of the most critical factors, especially for major cities like Jakarta. A field survey in Jakarta is being conducted to reveal the possible percentage of modal shift. The study will not only draw relevant policy recommendations but also apply analysis to the other cities of EAS countries.

#### **17. International Cooperation in Nuclear Safety Management in East Asian Countries – Phase 2**

The need for international collaboration in nuclear emergency preparedness and responses in the EAS region has become imperative after the Fukushima accident. The urgency, according to ERIA's energy outlook study, is further emphasised by the planned nuclear power development in the region, especially in China, India, Thailand, and Viet Nam. Thus, it is necessary to review appropriate nuclear

security and safety management measures and to establish a shared awareness in the context of energy situations, infrastructure, technological levels and other related circumstances of emerging countries in East Asia.

This research targets emerging countries in East Asia that plan to introduce or expand nuclear power generation or consider the possibility thereof, and compares the present situation in these countries with regard to safety regulations and nuclear security systems. This is to identify problems in establishing an information sharing system for accidents and in considering desirable cross-border cooperation. Through these efforts, this study aims to achieve the 3Ss - enhancement of nuclear safety standards and nuclear security, and establishment of nuclear non-proliferation safeguards - in East Asia.

Phase 2 (2013-2014) of this study will share: (1) information on and learning from the accident at the Fukushima Dai-ichi Nuclear Power Plant, (2) information on the safety standards and safety regulation systems in East Asian countries which utilise nuclear energy, and (3) information concerning safety regulation systems among East Asian countries that are considering the introduction of nuclear power generation.



**18. Development of Energy Security Index and Assessment of Energy Security for East Asia Countries – Phase 3**

Following the Cebu Declaration for Energy Security in East Asia, ERIA has regularly been conducting Energy Security Index (ESI) assessment for EAS countries to reflect the current status of energy security and accordingly, identify the most effective policies. This particular study is now Phase 3.

In many East Asian countries, energy demand is expected to grow in the long run due to their high economic growth and social development. It is also projected that energy production, particularly fossil fuel production, in East Asian region will not be able to meet the growing energy demand and that the region will have to face rising energy import dependency. At the same time, there are also emerging challenges in energy supply in the world energy market such as geopolitical risks, market power risks and natural disaster/accidental risks, among others. Given these factors, enhancement of energy security is becoming one of the top priority policy issues for each EAS country.

**19. Sustainable Development of Natural Gas Market in the EAS Region**

EAS countries have a growing demand for natural gas due to factors like economic efficiency, diversification of energy, effective use of domestic resources and reduction of environmental burden. Since the share of natural gas in the Total Primary Energy Supply in EAS countries is relatively low

except for a few countries, there remains much room to expand the use of natural gas.

To make the natural gas use sustainable, appropriate actions need to be taken through a supply chain such as exploration and production, necessary import, transmission, distribution and consumption. This would also include attracting investment for developing gas fields to enhance natural gas supply, increasing efficiency of natural gas use, and developing required infrastructure for natural gas supply. At the same time, strengthening existing capability and enhancing transparency of gas markets is important. This study aims to draw policy recommendations to address the abovementioned issues for the sustainable use of natural gas in the EAS region. The first phase of this project (2013-2014) analyses the potential of natural gas demand as well as the supply potential of natural gas in EAS countries. The study will then formulate a supply-demand outlook of natural gas. Based on this outlook, the study will analyse the possible changes in natural gas supply-demand situation and accompanying future opportunities and risks. The study will then present preliminary policy recommendations for the sustainable development of the natural gas market. The second phase of the project (2014-2015) will analyse the possibility of natural gas trading in the region and the potential of and challenges to supply infrastructure.

The study will cover countries in the EAS region that are currently exporting or importing natural

gas, namely, Australia, Brunei Darussalam, China, India, Indonesia, Japan, Korea, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Viet Nam.

**20. Strategic Usage of Coal in the EAS Region: A Technological Potential Map – Phase 2**

In the EAS region, Australia, Indonesia, China, India and Viet Nam produce large quantities of coal, and compared with other energy sources which are largely imported, an increased intensity of coal usage in the EAS region has the merit of enhancing energy security.

However, with the increase in demand for coal, notably in China and India, the supply-demand relationship of coal has become askew in recent years. In order to facilitate the economic development within the region, a cost effective and sustainable electricity supply system should be promoted. In addition, the dissemination of Clean Coal Technology (CCT) for clean and efficient usage of coal in the EAS region is of pressing importance.

The first phase of this study has been completed which focused on the economic return from investments in different types of coal technologies. Its major findings were that investments in clean coal technologies with high efficiency will bring higher return including savings in coal utilisation. However, the upfront cost of investment in clean coal technologies remains a barrier for the developing countries.

This second phase of the project will focus on updating the information from the earlier study and on finalising the laying out of a technological potential map to facilitate the deployment and dissemination of the CCT. This map, upon completion, will be practical for use by policymakers in the deployment and dissemination of technologies in their respective countries.

**21. Energy Market Integration in East Asia Region: Deepening, Understanding and Moving Forward**

Since the inception of the EAS Energy Cooperation Task Force (ECTF) work stream on Energy Market Integration (EMI) in 2005, the research has been actively promoted by East Asia governments to better understand matters impacting on energy trade liberalisation and investment, energy infrastructure, pricing reform and deregulation of domestic energy markets.



For the first six EMI studies, a theme was selected each year to have a key focus. The past EMI study themes focused on the review of the regional commitment of EAS countries, the benefits from EMI, the electricity market, theories, subsidies and renewable energy (RE). This Fiscal Year representing the seventh study, the EMI theme will once again look into gaps in the EMI in general and then focus on the energy trade in ASEAN and East Asia.

There will be 12 studies to be included in this year's EMI research, among which will focus on the welfare impacts of price equalisation in energy market integration; energy trade practices in India; deregulation, competition and market integration in China's electricity sector; case studies of the Greater Mekong Sub-region; and energy intensity and economic growth trade-off in selected ASEAN and East Asia countries.

## 22. Benchmarking of Renewable Mobility Energy in EAS Countries

Asian Countries are actively promoting the introduction of the first generation biofuels such as bioethanol and biodiesel fuel due to soaring oil prices and increasing energy consumption. On the other hand, first generation biofuels have some problematic aspects such as indiscriminate harvesting of energy crops and/or conflict with food supply. Therefore, these issues have put a brake on large-scale trading of these biofuels. Moreover, the first generation biodiesel fuel FAME (Fatty Acid Methyl Ester) has an essential

weak point of low-oxidation stability, which limits its long-term storage. The switchover to next generation biofuels, for example, non-edible feedstock, alcohols, ethers and/or synthetic hydrocarbons made from woody biomass are therefore the next avenue for East Asia and ASEAN countries to establish the Sustainable Mobility Society. Hydrogen, which can be made from electrolysis of water, is an extension of the next generation biofuels.

In this study, feasibility of next generation of biofuels such as non-edible feedstock, synthetic hydro-carbons, ethanol/buthanol, ethers, hydrogen etc. will be evaluated scientifically and economically, and proposals will be made for practical policies for each country's government.

## 23. Best Mix of Renewable and Conventional Energy Sources for Sustainable Development

Most of the countries in East Asia are currently dependent on fossil fuel imports to meet their energy needs. However, there is a high potential for renewable energy sources in this region that could help in the efforts to have a better environment. Availability of renewable energy sources is dependent on the local conditions in the Asian countries. Renewable energy initiatives in communities cannot be sustainable without their acceptance by local people. In this research, therefore, feasibility studies will be conducted on the sustainable energy systems using renewable energy sources suitable for various Asian communities and based on environmental,

economic and social considerations. There will be two phases of the study, namely, (a) Phase 1 which will develop a screening method to determine the merits and demerits of the initiatives taken from the environmental, economic and social perspectives of sustainability; and (b) Phase 2 which will develop guidelines for a sustainable and workable energy system.

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

Many Asian countries have been attempting to develop the geothermal resources of their territories. While geothermal resources vary from country to country, countries with rich high-temperature resources have mostly utilised their geothermal resources by conventional steam power generation. Heat extraction from the deeper undergrounds of volcanoes has also been studied in some places.

Geothermal technologies such as reservoir engineering, monitoring techniques, scale-controlling techniques etc., which are all essential for the sustainable utilisation of geothermal resources for both power generation and direct use, have some common and universal aspects. This research aims at extracting those common and field depending aspects, finding common/ individual solutions and sharing information to improve technology for the sustainable geothermal utilisation in Asian countries.

The output of this study will be a collection of case studies and a procedure manual of guidelines for the sustainable development and utilisation of geothermal resources.

## 25. Energy Efficiency Roadmap Formulation in East Asia

In the 4th East Asian Summit (EAS)-Energy Ministers Meeting held in 2010, the Ministers appreciated the steady implementation of Action Plans to achieve voluntary energy efficiency goals by the EAS participating countries. The Ministers also welcomed the Energy Efficiency Roadmap Formulation Project as a means to accelerate the deployment of energy efficient technologies.

As there are increased uncertainties in terms of economic growth, particularly in the emerging countries, ASEAN and the Greater Mekong Sub-region (GMS) have attracted more attention globally. Given this increased interdependence and discrepancies in the region, particularly in the field of economic activities that include energy and electricity transactions, the energy efficiency research of Lao PDR was completed in 2013. Another energy study on Myanmar focusing on how to improve energy and electricity access in the country's rural areas has also been recently undertaken.

For the Myanmar study, a first report identifying three approaches to improve electricity access in the rural areas had been prepared and included as a chapter in the Myanmar Comprehensive

Development Vision (MCDV) which was completed in 2013.

This energy efficiency roadmap study will now examine these three approaches and look into the ground reality since the official data and statistics are not sufficient and fully reliable. Towards this end, the study will conduct fieldwork, comparative study and actor analysis in the neighbouring countries, case studies of good practices of small scale renewables and Independent Power Producers (IPPs) in the region, and grid development simulation. In 2014, a joint study with Chulalongkorn University will also be undertaken on the investor and investment environment analysis on the Thailand side of the border.

#### **26. Potential of Biofuel Markets in East Asia**

In Asia, the use of biofuels has evolved as a policy response to attain energy security and fight global environmental issues. The oil price rise in the early 2000s has accelerated the efforts for energy security through the utilisation of biofuels. Hence, policies and measures for the promotion of biofuels have become very important.

In this regard, therefore, the purpose of this study is to survey biofuel promotional measures in East Asia and to address the issue and make suggestions for policies for the design and implementation of a biofuel market in East Asia. It is important to understand the future biofuel market which is based on current and planned policy and technologies. Thus, the study will cover

the following elements: (a) literature survey of production and utilisation technologies of biofuels, (b) literature survey of policies and programs to promote the utilisation of biofuels, (c) outlook of supply and demand of biofuels in East Asia using econometric analysis and forecasting, and (d) study of required policies and programs, e.g., law and regulation, subsidies, standardisation, technology development, etc. to nurture and deploy a healthy biofuel market in the East Asia region. ■

