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Energy Market Integration in East Asia

Deepening understanding and
moving forward

**Edited by Yanrui Wu,
Fukunari Kimura
and Xupeng Shi**

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Contents

<i>List of figures</i>	ix
<i>List of tables</i>	xi
<i>Acknowledgements</i>	xiii
<i>Notes on contributors</i>	xiv
1 Introduction	1
YANRUI WU, XUNPENG SHI AND FUKUNARI KIMURA	
2 The status and prospects of energy market integration in East Asia	9
XUNPENG SHI AND FUKUNARI KIMURA	
3 A regional public goods approach towards energy market integration in East Asia	25
PHILIP ANDREWS-SPEED	
4 Energy market integration and economic convergence: implications for East Asia	56
YU SHENG AND XUNPENG SHI	
5 Promoting energy market integration between China and the Association of Southeast Asian Nations through trade facilitation	76
JIANPING ZHANG AND DAOJIONG ZHA	
6 The ‘Asia premium’ in crude oil markets	99
TILAK K. DOSHI AND NEIL SEBASTIAN D’SOUZA	

7 Pricing reform and enhanced investment in the energy sector	130
ANINDYA BHATTACHARYA AND SATOSHI KOJIMA	
8 Global gas market integration and implications for the East Asia Summit region	144
YANRUI WU	
9 Towards an integrated Asia–Pacific natural gas market	163
YOUNGHO CHANG AND YANFEI LI	
<i>Index</i>	188

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2 The status and prospects of energy market integration in East Asia

Xunpeng Shi and Fukunari Kimura

Introduction

Energy market integration (EMI) has been pursued in East Asia for decades. However, no explicit definition of EMI has been established yet. There is a vague consensus in East Asia that main benefits and incentives to promote EMI should be found in improving energy security, energy efficiency, the establishment of emergency response systems and so on; reducing carbon dioxide emissions; and facilitating regional integration (Shi and Kimura, 2010; Kimura and Shi, 2011). However, what would be the final goal of EMI and how it should proceed in East Asia has not been clear at all.

One key reason is that the architecture of East Asian economic integration itself is still under development. Although European Union style integration is not obviously appropriate in East Asia, an alternative for EAS has not been well defined yet. Without a clear definition of the EMI goals and boundaries, it is difficult to formulate concrete strategies and actions to promote EMI by using a top-down approach, i.e., setting the ultimate goals and following well-defined steps to achieve them with consistent strategies and actions.

Given the lack of a clear vision for EMI in East Asia, the first ERIA EMI report (Shi and Kimura, 2010) proposed a conceptual framework based on an incremental, bottom-up approach to review the process and impacts of EMI. This approach identifies areas where closer integration can be achieved even without defining the ultimate goals of EMI. The five issues that were initially identified in the conceptual framework are: trade liberalization; investment liberalization; the linkage of regional energy infrastructure; the liberalization of domestic energy markets; and energy pricing reform, in particular, removal of fossil fuel subsidies. Such a framework has been implemented in later studies including Kimura and Shi (2011) and Wu *et al.* (2012).

This chapter further improves and elaborates the conceptual framework. We also aim to improve the understanding of the development, impact and prospect of EMI through updating the status in East Asia. The next section presents the rationale for promoting EMI in the EAS region. We then discuss the conceptual framework before going on to review the status of the EMI based on the

proposed conceptual framework. The chapter concludes with remarks on policy implications.

Rationale for pursuing energy market integration

EMI intends to promote the development of national economies, narrow development gaps among EMI participating countries, improve energy security, and reduce carbon dioxide (CO₂) emissions. Some quantitative studies on EMI in East Asia demonstrate that EMI can boost economic development and reduce CO₂ emissions in the region as a whole (Bhattacharya and Kojima, 2008; Bhattacharya and Kojima, 2010; Kimura and Shi, 2011). EMI can also narrow development gaps and facilitate regional growth convergence because less developed countries will benefit more than their richer counterparts, as discussed in Chapter 4, while reducing energy market volatility (Sheng and Shi, 2012). Estimations of the impact of free trade agreements (FTAs) involving ASEAN also imply in general that integration is beneficial (Park, 2000; Lee *et al.*, 2009; Lee and Plummer, 2010).

The integration of energy markets within the ASEAN region and with other EAS members may optimize the utilization of energy resources and improve energy security for the EAS region. The ASEAN energy sector can both supply energy and provide investment opportunities for ASEAN dialogue countries such as China, Japan and South Korea. Brunei, Indonesia, Malaysia and Vietnam all have large potential to produce oil and gas. Cambodia, Laos and Myanmar have significant undeveloped hydropower potential and therefore provide opportunities for technology transfer and investment by the 'Plus Six' countries of ASEAN, namely, Australia, China, India, Japan, South Korea and New Zealand. Southeast Asia is expected to become 'the Persian Gulf of Gas' and be responsible for one-quarter of the world's gas production and usage by 2030 (Sovacool, 2009). Eight ASEAN countries (i.e., the ten ASEAN nations minus Singapore and Brunei) have considerable potential to produce biofuels due to their favourable climate and abundant land. ASEAN countries also play an important role in the security of energy transportation for major oil importers, namely, China, South Korea and Japan since the Strait of Malacca is under the governance of Malaysia, Indonesia and Singapore.

There is significant potential for the EAS region to strengthen mutual economic interdependence and boost the regional EMI. Australia, New Zealand, Japan and South Korea are leading countries in energy-related technologies, management and regulatory framework and thus can provide lessons for the rest of the region. Australia is particularly important for the EAS region in its endowment of energy resources including coal, natural gas and uranium, which can improve the security of energy supply for other EAS countries. Japan, being one of the world's most advanced countries in energy efficient technologies and their practice, can share with the region its technologies and practices in improving energy efficiency. East Asia is emerging as the world's leading producer of renewable energy such as wind energy. It is projected that East Asia will account for around a third of total global

wind power capacity by 2020, just behind Europe's 35 per cent share but ahead of North America's 29 per cent (Dent, 2011). Investment by ASEAN's dialogue partners, such as China, Japan and Korea, can facilitate the development of energy production and infrastructure in less developed countries such as Cambodia, Laos and Myanmar which still have low electrification rates.

Although East Asia possesses technological, financial and energy resources to boost EMI, it is challenged by financial constraints as well as technical and regulatory differences among countries. ASEAN is a good example of this. Since ASEAN has worked towards the ASEAN Economic Community (AEC) for a long time, its integration should be the most advanced in East Asia. However, even within ASEAN, EMI is moving slowly due to many factors: energy and the environmental regulations differ greatly between the ASEAN Member States (AMSs); legal protection of investment is not solid in some AMSs, and thus there is a reluctance to invest by the private sector; a deregulated market has not yet been created in most AMSs, and thus third party access¹ is not secure; anti-competitive practices prevail; and no dispute settlement mechanism has been established in most AMSs (Shi and Malik, 2012). Diversification in standards for electrical appliances is another major barrier for the development of energy infrastructure and trade in electricity (Shi and Kimura, 2010). A more challenging task is to construct open and competitive energy markets and remove inefficient fossil fuel subsidies at the national level.

Lack of political trust is an additional factor that will prevent further integration of energy markets in the EAS region. Within ASEAN, there is still mutual distrust among potential trading partners (ACE, 2006). This lack of political trust has a significant impact on trade in pipeline gas and electricity. Once a physical network is established and supply is reliant on the cross-border trade, the importer could be hurt at any time by a supply interruption. Such interruptions could be caused by political disputes as well as economic and technical reasons. One example of disruption due to political reasons is Russia's suspension of gas supply to the European Union in 2009 (Fox News, 2009).

Individual countries currently pursue their own national energy security rather than depending on regional energy security strategies. National energy security requires that nations reduce their energy supply dependence on other nations and therefore limit opportunities for trade and cooperation. At a regional level, such a limitation to trade in energy, such as electricity, is not optimal in economic terms, and the region can gain from a more open market (Chang and Li, 2012). In order to pursue an integrated energy market, the paradigm of energy security has to shift from national isolation to regional cooperation. If a regional energy security strategy is pursued instead, many countries should become more open to foreign investment and energy supply, which provides a chance for optimizing the use of energy resources in the region.

Considering these huge opportunities and challenges, policy-makers have long been pursuing integrated energy markets in ASEAN and the EAS. ASEAN has tried to integrate its gas pipeline and electricity grids since the 1990s (APAEC, 1999). The ASEAN power grid (APG) and Trans-ASEAN Gas Pipeline (TAGP)

are two flagship projects for the ASEAN EMI. Greater cooperation in energy trade has been achieved through the ASEAN Plus Three (APT) process and, from 2005, the EAS process. The EAS leaders have affirmed their strong interest in promoting economic integration, as well as EMI, as evidenced by the Cebu Declaration² (Cebu Declaration, 2007).

The conceptual framework

We propose a conceptual framework for EMI in the EAS region in the incremental, bottom-up approach, rather than having a lucid theoretical breakdown when a top-down approach would work. The lack of clear vision is due to the fact that EMI is only a part of broad regional integration architecture, the vision of which has not been explicitly set yet. EMI is also subject to other serious economic and political issues such as national sovereignty, energy security, and other sensitive issues such as subsidy removal, which may not be agreed upon in the near future. Shi and Kimura (2010) proposed to review the status of EMI from the following perspectives: trade liberalization, investment liberalization, cross-border linkage of energy infrastructure; energy pricing reform; and liberalization of domestic energy markets. This framework was followed up by the later studies on EMI including Shi and Kimura (2011) and Wu *et al.* (2012).

We further developed the framework for the study on EMI from multiple angles. One major improvement is that we incorporate institutions into the infrastructure discussion. The refined conceptual framework for studying EMI includes an analysis of: (a) trade liberalization, (b) investment liberalization, (c) development of regional energy infrastructure and institutions, (d) liberalization of domestic energy markets, and (e) energy pricing reform, in particular, removal of fossil fuel subsidies.

These five issues are important elements of EMI and are interrelated. Well-functioning and transparent national energy markets are essential to developing an open, competitive and more integrated EAS regional energy market. In order to increase the efficiency of the energy market, it is necessary to remove impediments and distortions that prevent the efficient functioning of the market. This should include, but not be limited to, trade and investment liberalization and the reduction or removal of barriers, such as price restrictions, subsidies and monopolies. A region-wide movement of energy products requires both physical infrastructure and institutions to be in place. The following paragraphs provide more detailed explanation.

Full EMI needs a regional trade regime that does not have trade restrictions or non-trade barriers. In an integrated energy market, energy as a commodity should be able to move freely, which then enables us to optimize the development and utilization of energy resources in the region. Trade barriers such as tariffs and other taxes make it difficult to move energy goods across borders. Non-trade barriers such as technical standards and environmental regulations also limit trade opportunities in a less visible way.

Investment liberalization is another basic requirement of EMI. The energy industry is capital intensive, and the paying back time – i.e., the time period over which the investment costs in capital infrastructure are recovered – is often quite long (a period of several years). The investor's liquidity is also relatively lower in the energy sector than other sectors such as manufacturing. If investment is restricted at national borders, the movement of capital, technology and managerial knowhow will not be free, which will adversely affect efficiency in allocating energy investment across the region. Since energy investment often needs a relatively long payback time and liquidity is low, a stable investment regime is important for investors; otherwise, they would be discouraged by the risks.

Physical linkage of energy infrastructure is essential to facilitate trade, attract investment and reduce frictional costs among markets, and thus is necessary for the integration of energy markets. This is especially true in the case of electricity trade, which requires power grids to be in place. Trade in coal, oil and gas also needs roads, ports or ships. Innovative infrastructure methods such as marine transportation and liquefied natural gas (LNG) terminals can allow more countries to be involved in regional energy networks and thus expand the opportunities of energy trade.

Physical infrastructure must be accompanied by appropriate institutional arrangements. Without it, energy trade will not occur, and the optional allocation of resources will not be realized. An integrated regional electricity market needs harmonized regulations and standards associated with consumer protection and safety standards; legal and tax issues; contract forms; tariff-setting mechanisms; and trading systems (Wu, 2012).

National market liberalization is important both for the operation of infrastructure and the facilitation of trade and investment. Conceptually, an integrated energy market requires each of its components to be open and harmonized so that they can be connected to form a united market. In practice, in order to facilitate energy trade and make it possible for new investors to enter energy markets, it is important to liberalize and establish competitive national energy markets. For example, open access to energy infrastructure, such as pipelines and power grids, is a prerequisite for foreign investors to enter the national energy sector. If the national market is not liberalized, the incumbent players, usually state-owned, will gain preferential treatment, easily keep out newcomers, and thus leave the regional energy market to be fragmented.

The adoption of a market-oriented pricing mechanism in member countries is also a precondition for regional EMI. Energy subsidies not only distort national markets but also result in unsustainable energy-use patterns and inefficient investment. They may delay the development of energy projects and reduce opportunities for mutually beneficial trade (Bannister *et al.*, 2008). For example, the weighted average retail electricity tariff in Vietnam is lower than the long-run marginal cost of supplying that electricity, and thus Vietnam fails to attract commercial investment in the electricity sector (Kimura, 2010). Energy subsidies also threaten national economies. If the world energy prices increase, subsidies for

energy imported at world prices can become too costly and unaffordable for public finance, as happened in Indonesia and Malaysia in 2009 (*The Straits Times*, 2010).

In order not to leak the benefits of national subsidies out to other nations, a country with subsidized energy often has to close its borders, which goes against the principles of EMI. For example, in order to prevent cars from Singapore benefitting from subsidized fuels in Malaysia, the Malaysian government has banned the sale of fuel to foreign cars in the border area (Sim and Vijayan, 2008). Probably as a response, the Singaporean government has set the requirement that anyone leaving Singapore in a Singapore-registered motor vehicle must have more than three-quarters of a tank full of motor fuel (Singapore Customs, 2011). Such a 'border closure' policy works against the integration of energy markets, and its implementation is costly.

Our conceptual framework based on a bottom-up approach can assist policy-makers and researchers in analysing the complicated issues involved in promoting closer integration. In the next section, we review the status of EMI based on it.

Overview of EAS energy market integration

Trade liberalization

Trade liberalization has been strongly promoted in East Asia with ASEAN playing a leading role. ASEAN aims to establish AEC by 2015 (ASEAN, 2009). The aim for the AEC is to have a single market and production base, which certainly requires the free flow of goods, and this is being pursued through the ASEAN Free Trade Area (AFTA). By 2010, tariffs within ASEAN for more than 99 per cent of the tariff lines had been eliminated in the ASEAN-6 members, namely, Brunei, Indonesia, Malaysia, the Philippines, Singapore and Thailand, and has been brought down steadily in the newer members, namely, Cambodia, Laos, Myanmar and Vietnam. As for energy trade, tariffs in mineral fuels were reduced dramatically between 1993 and 2010 (Okabe and Urata, 2012). ASEAN has also conducted negotiations on FTAs or economic partnership agreements (EPAs) with countries outside ASEAN and has established FTAs with the Plus Six countries (ASEAN, 2012). ASEAN is also working towards the 'Regional Comprehensive Economic Partnership' (RCEP) (also known as 'ASEAN++FTA').

In East Asia as a whole, while trade in energy remains restricted by tariffs, the levels of tariffs substantially declined in the period from 1995 to 2010, as evidenced by the import tariffs reported in Table 2.1. Weighted import tariffs for coal, oil and electricity among the 16 EAS countries were 0.72 per cent, 0.09 per cent and 1.22 per cent respectively in 2010.

India's import tariff on coal is notably high compared with other countries. Oil imports are only taxed in five countries, three of which – Indonesia, Myanmar and Vietnam – are also major oil producers. Two major global oil importers – China and Japan – do not apply tariffs to oil imports. Electricity also seems to be subject to high weighted import tariffs when compared with coal, oil and natural gas.

Table 2.1 Effectively applied import tariffs for energy products among EAS members, 1995–2010

<i>Product name</i>	<i>Tariff year</i>	<i>Simple average</i>	<i>Weighted average</i>	<i>Minimum rate</i>	<i>Maximum rate</i>	<i>Import value, 1,000 USD</i>
Coal	1995	3.32	0.49	0	20	5,062,009
	2000	2.97	2.06	0	15	5,447,148
	2005	2.19	2.97	0	15	16,881,283
	2008	1.04	1.14	0	10	22,052,490
	2009	0.92	0.61	0	7	40,966,455
	2010	0.93	0.72	0	7	34,762,717
Oil	1995	1.93	1.01	0	10	10,082,124
	2000	2.58	1.92	0	20	13,855,149
	2005	1.02	0.19	0	15	25,568,192
	2008	0.89	0.16	0	10	28,084,822
	2009	0.65	0.13	0	6	35,882,340
	2010	0.66	0.19	0	6	23,998,798
Gas	1995	5.51	0.01	0	12	6,837,751
	2000	4.64	0	0	30	10,394,455
	2005	1.16	0.02	0	10	15,507,887
	2008	0.59	0	0	5	21,458,583
	2009	0.58	0	0	5	32,075,595
	2010	0.59	0	0	5	23,766,260
Electricity	1995	0	0	0	0	197
	2000	3	3	3	3	548
	2005	0.86	0.48	0	5	123,933
	2008	1.38	1.14	0	5	377,821
	2009	1.22	1.22	0	5	351,784
	2010	1.22	1.22	0	5	351,784

Source: The data in the table were extracted from WITS database.

Note: For some years, data are missing and we replaced them with the closest earlier years' data.

However, the value of electricity trade in the period 1995–2010 was trivial when compared with the other three kinds of fuel.

Trade in energy is also prone to discretionary policies on both exporting and importing countries such as export taxes and quantitative restrictions. A fresh example is Indonesia's proposal on restricting exports of low rank coal (Bloomberg, 2013). In fact, Indonesia and China have maintained a quota system for coal export for many years. However, exporters can apply for an increased quota if required.

Investment liberalization

In the current East Asian development model, foreign direct investment (FDI) is regarded as an important component of economic growth for both developed and developing countries, and most East Asian economies have an interest in liberalizing investment and welcoming FDI. Bilateral FTAs as well as AEC initiative and

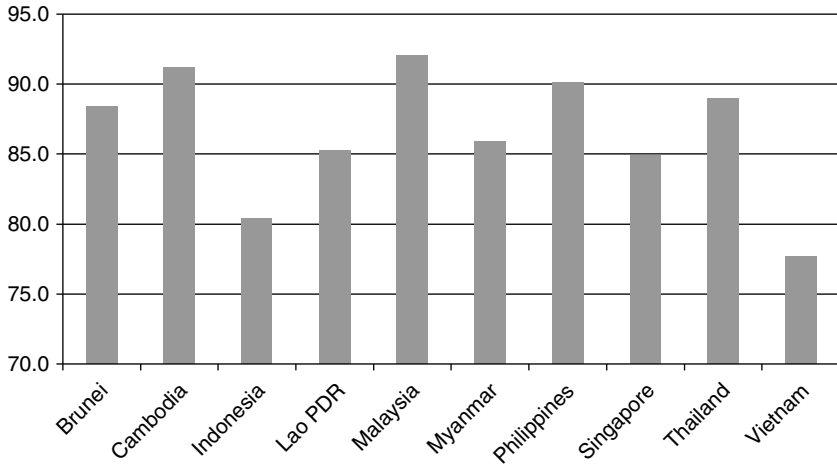


Figure 2.1 Overall foreign investment liberalization rate in ASEAN (percentage).

Source: Intal *et al.* (2011), as revised by Intal and Panggabean in 2012.

ASEAN + 1 FTAs are intended to promote investment, and most of these FTAs include investment chapters.

Investment liberalization is at the heart of ASEAN economic integration. Redirection of new foreign investment away from ASEAN and mainly into China in the late 1990s and early 2000s was one of the reasons for ASEAN's decision to accelerate its economic integration process. ASEAN believes that a free and open investment regime is key to enhancing ASEAN's competitiveness and attracting FDI as well as activating intra-ASEAN investment (ASEAN, 2009).

A recent study on investment liberalization in ASEAN countries (Intal *et al.*, 2011) shows that overall the foreign investment regime is relatively open in ASEAN, with five AMSs having overall liberalization rates between 88 per cent and 92 per cent; three AMSs with liberalization around 85 per cent; and the other two hovered around the 80 per cent rate. Among the individual countries, Malaysia, Cambodia and the Philippines had the most open foreign investment regime, followed closely by Thailand and Brunei, while Vietnam and Indonesia had the most restrictive investment regimes among the ASEAN members (Figure 2.1).

As for the mining sector, foreign equity investment is relatively restricted in Singapore (especially), the Philippines, Brunei and Thailand, compared to the rest of East Asia. Malaysia stands out as the most open ASEAN country. The other countries were at the same level in terms of foreign equity liberalization rates in 2011. When evaluating countries in terms of their progress in liberalizing foreign investment, which takes into consideration the restrictions on foreign equity investment, national treatment and other domestic regulatory barriers, the results

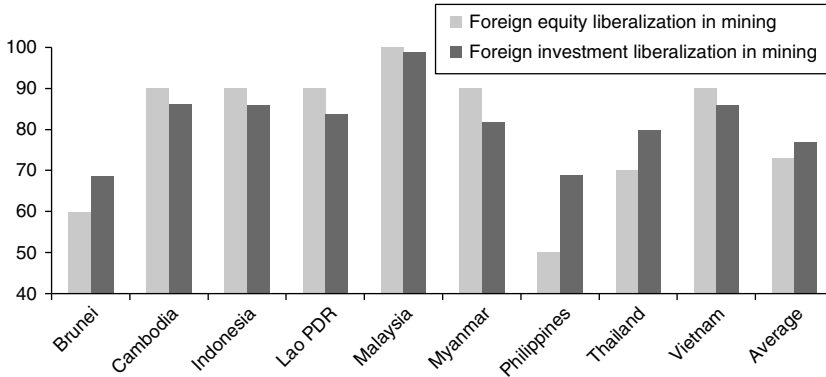


Figure 2.2 Overall liberalization rates in ASEAN mining sector (percentage).

Source: Intal *et al.* (2011), as revised by Intal and Panggabean in 2012.

Note: The score does not apply to Singapore which has almost no mining activities.

are more or less the same across countries. However, the Philippines became more liberalized due to the betterment of national treatment (Figure 2.2). Note that the estimates of the liberalization rates in the study are based on commitments in the ASEAN Comprehensive Investment Agreement (ACIA). The actual liberalization rate may be different depending on whether the actual regulations are consistent with the commitments.

An earlier study shows that investment in the energy sector remains restricted in the ASEAN dialogue partners (Bannister *et al.*, 2008). Some countries such as Australia tend to welcome foreign investment in the resource sector and do not have rules to ban majority foreign ownership. Others such as China require majority ownership of local counterparts or apply other restrictions to foreign investment, which may limit or even inhibit foreign investment. The restrictions on investment are often embedded in domestic regulations and thus cannot be resolved by international agreements alone.

Development of regional energy infrastructure and institutions

Linkage of energy infrastructure across countries has long been pursued in ASEAN. The AEC blueprint toward 2015 set up two flagship projects on ASEAN energy cooperation: APG and TAGP (APAEC, 1999). The APG was proposed to ensure regional energy security while promoting the efficient utilization and sharing of resources (APAEC, 2009). The ASEAN Interconnection Master Plan Study (AIMS) II finalized in 2010 identified 16 interconnection systems to be developed under the APG programme. At the time of writing, only five out of the 16 systems are in operation. It is likely that three or four additional interconnection systems will be in operation by 2015. The remaining systems have been scheduled to complete after 2015. The main constraint in the development of the APG is that many

projects are not yet commercialized. Lack of economic viability is the main reason why APG has lagged behind the AEC targets (Shi and Malik, 2012).

The TAGP will interconnect the gas pipeline infrastructure of AMSs to ensure the reliability of gas supply for AMSs and encourage the use of environment-friendly fuel. At the end of 2011, there were 11 bilateral gas pipeline interconnection projects in operation. Between 2001 and 2011, the distance covered by the TAGP infrastructure almost doubled to 3,020km as a result of the development of six new cross-border gas pipeline interconnections. The twelfth pipeline connection, a new 150km pipeline connection from Myanmar to Thailand, will be in operation in 2013 (ASCOPE, 2012). At the time of writing, although more than half of the pipelines have been constructed, the remaining planned pipelines depend on the development of the East Natuna gas field in Indonesia, which has not yet been developed due to some technical and financial considerations. The commencement date of the four pipelines is expected to be approximately seven years from the conclusion of East Natuna gas supply agreements.

However, even if the East Natuna field can be put into operation, the gaps between demand and indigenous supply in ASEAN remain large and are becoming larger due to the depletion of indigenous reserves. Consequently, the focus of TAGP now includes LNG as an option to secure gas supply in the region. Many countries have also initiated the construction of LNG re-gasification terminals to bring gas from outside the ASEAN region. LNG terminals are in operation in Indonesia and Thailand. Construction of the LNG-receiving terminals has been progressing well in Singapore, Malaysia and Vietnam. The Singapore LNG terminal became operational in 2012 at a capacity of 6 million tonnes per annum. Thailand is increasing its capacity of LNG terminals, and Vietnam will also build a LNG terminal to diversify the gas supply sources (Shi and Malik, 2012).

Another regional block to promoting interconnection, other than the issues within ASEAN, is the greater Mekong sub-region (GMS) that includes Cambodia, China's Yunnan and Guangxi provinces, Laos, Myanmar, Thailand and Vietnam. The GMS countries signed an inter-governmental agreement (IGA) on regional power trade in 2003 and formed a regional power trade coordination committee (RPTCC) in 2003. Although the process is slow, some connectivity has been achieved among the GMS economies. China started exporting electricity to Vietnam in 2004, importing electricity from Myanmar in 2008 and exporting electricity to Laos in 2009 (Wu, 2012). Construction of the Myanmar–China oil and gas pipelines began in June 2010 and will be completed in 2013 (Xinhua, 2010).

At the time of writing, proposed energy infrastructure projects are concentrated within the ASEAN region plus China, partly because the other Plus Six countries of ASEAN, excluding India, are somewhat physically disconnected. India has a potential to link with other EAS countries because of its convenient location between gas supply centres and East Asian demand regions, but no plan has been set yet. In the EAS area, other regional interconnections have also been proposed, such as potential interconnection between Japan and South Korea for emergency backup and trade with Russia, and potential interconnection between India and Myanmar (Wu, 2012). With the development of more infrastructure, such as

marine transportation and LNG terminals, networks of energy infrastructure may be expanded to other countries, such as the Philippines and Australia in the case of LNG. In general there is still a long way to go in terms of interconnectivity and trade in the EAS electricity sector. EAS is also lagging behind Europe where physical cross-border exchanges of electricity reached 10.3 per cent of consumption in 2005 (Wu, 2012).

Institutional arrangements and organizations are necessary in order to promote regional energy security and development including regional power interconnection. Harmonization of technical specifications for the electricity trade, including design and construction standards, system operation and maintenance codes and guidelines, safety, environment and measurement standards, are internationally recognized needs (Shi and Kimura, 2010). However, very little progress has been made. In ASEAN, discussion on the institutional infrastructure has started but is only in the phase of preparation for study (preparation of Terms of Reference), and progress has been slow due to lack of financial resources (Shi and Malik, 2012).

National energy market liberalization

Behind national borders within ASEAN, barriers are deterring regional integration, and such domestic barriers are often difficult to remove (ADB, 2010). To promote EMI, national energy markets must be competitive, which often requires the break-up of vertically integrated energy enterprises. EMI is heavily affected by national energy market regulations. Electricity is often the most restricted energy product, and the electricity market is segmented by national boundaries. In many EAS countries there is only one vertically integrated state-owned electricity company, and thus there is little chance for new investors, private or foreign, to enter the market.

The effort of liberalizing and deregulating the electricity sector has been initiated in many countries around the world. The most common reforms include the break-up of monopolies; privatizing the state-owned utilities; introducing a wholesale market; increasing transparency in industrial information; encouraging consumer switching; and regulatory incentives for transmission and distribution investment (Shen and Yang, 2012). Electricity sector reform has been implemented across the ASEAN region since the 1980s, aiming to break up monopolies and attract investment. Many targets, however, have not been achieved (Sharma, 2005).

In the EAS region, energy market liberalization has been conducted in Australia, Japan, India, New Zealand, the Philippines and Singapore, while in other countries, energy markets are more or less restricted. India and the Philippines are pioneers in liberalizing their domestic energy markets (Shi and Kimura, 2010). India has opened up its energy sectors with the exception of coal.

Overall in East Asia, energy market liberalization is at a very preliminary stage, as demonstrated by Bannister *et al.* (2008). In terms of market integration, most EAS members are yet to develop a national electricity market. In terms of the

integration and unbundling of business activities, on one end of the spectrum are Australia, New Zealand and Singapore, which have fully disaggregated the generation, transmission, distribution and retailing operations, while at the other end is Brunei, which has a fully integrated and state-owned electricity sector. China and India have kept the retailing and distribution operations integrated and have separated the other two operations – generation and transmission. In the other EAS countries only the power generation is independent (Wu, 2012).

In order to build an open and competitive domestic market, it is important to establish clear and transparent market rules and principles. This will provide strong legal protection, reduce transaction costs to business, enhance investor confidence, and enable the free flow of goods, services and capital.

Energy pricing reform and fossil fuel subsidies

Energy subsidies, frequently defined as ‘any government action that lowers the cost of energy production, raises the revenue of energy producers, or lowers the price paid by energy consumers’, are a common feature in developing countries (Global Study Initiative (2011)). In East Asia energy subsidies are deep rooted in their social and political structures starting from the time of colonization when Western forces used cheaper energy as an instrument to reduce the protests made by local people over extraction of natural resources (Kojima and Bhattacharya, 2011). For example, India and Laos, which have limited domestic oil production, have regulations on oil prices, and Indonesia and Malaysia maintain a heavy subsidy scheme for gasoline.

Energy subsidies can cause problems in investment, consumption, national economies and so on. They may delay the development of energy projects and reduce opportunities for mutually beneficial trade (Bannister *et al.*, 2008). If the world energy prices increase, subsidies on energy imported at these prices can become very costly, as happened in Indonesia and Malaysia (*The Straits Times*, 2010). Energy subsidies not only distort national markets but also cause unsustainable use patterns and inefficient investment. For example, the weighted average retail electricity tariff in Vietnam is lower than the long-run marginal cost of electricity production, and thus Vietnam fails to attract commercial investment into the electricity sector (Kimura, 2010).

These subsidies often distort the market while producing negative incentives, namely, the misuse and overuse of cheaper energy sources. With under-priced fuels, consumers tend to use more than they would if fuels were more expensive. A low price due to subsidies may also allow a fuel to be used in cases where the marginal value added from the use is lower than the market price of the fuel. Even if the subsidies are designed with the objective of shielding poor consumers from high oil prices, poor people are not necessarily the largest beneficiaries. A report based on Indonesia by Ardiansyah (2012) argued that fuel subsidy policies benefit the rich more than the poor: the 40 per cent richest households captured 70 per cent of the fuel subsidies.

Pricing reforms, in particular removal of energy subsidies, have been declared by policy-makers and attempted by some countries. Energy prices have been broadly liberalized in Australia, Japan, South Korea, New Zealand and the Philippines. The APEC leaders have declared that they would rationalize and phase out fossil fuel subsidies over the medium term (APEC, 2009). Plans or actions for liberalizing energy prices and removing subsidies for fossil energy have been implemented in many countries, such as China, India, Indonesia, Malaysia and Vietnam. In China, energy subsidies are currently being cut, and the government is promoting market-determined energy prices. China implemented market-based pricing for coal in the past few years (Yu, 2008). Malaysia planned to cut its fuel subsidies under a proposed five-year plan starting from 2010 (*The Straits Times*, 2010). In Vietnam, a road map for energy price increases has been formulated, but so far the implementation has lagged behind (Kimura, 2010). The Indonesian government planned a gradual reduction of total subsidies by 10–15 per cent per year on average from 2011–14 (Mourougane, 2010), but the first attempt in March 2012 failed. In general, removal of fossil fuel subsidies is politically sensitive as shown in Indonesia and Malaysia (*The Straits Times*, 2010). Therefore, the pricing reform has to be carefully planned and managed.

Education of the public and compromise between political parties are important prerequisites for a successful removal of energy subsidies. If the public is not convinced, a subsidy removal could induce unrest and possibly even riots. Fuel subsidy removal could also be complicated by other domestic issues. Many demonstrations triggered by fuel subsidy removal are believed to be a result of wider public dissatisfaction with the corruption and inefficiency that was perceived to permeate political and bureaucratic life in Indonesia (Bacon and Kojima, 2006). Another observation is that fuel subsidy removal is often used as a weapon in domestic politics. The failure of reducing gasoline subsidies in Indonesia in March 2012 was partly because the parliament could not agree on a plan.

Concluding remarks

This chapter discusses the rationale for EMI, proposes a conceptual framework, and reviews progress of the EMI in the EAS region. The review finds that a large number of attempts at policy reform have been made to increase bilateral/multilateral trade and investment liberalization. However, energy trade continues to be restricted with both trade and non-trade barriers, and thus further efforts to remove these trade barriers should be taken to achieve freer trade in the EAS region. In particular, investment is restricted in many EAS countries; ongoing and proposed energy infrastructure projects have been limited to ASEAN and China, while institutional arrangements related to energy trade have not been well developed; and major challenges exist at national levels, such as the liberalization of the domestic energy market and removal of fossil fuel subsidies.

Much work needs to be done on both the physical and institutional part of regional interconnections, particularly more on the latter because it has lagged behind progress in the physical aspect. Development of physical infrastructure

should continuously move forward because physical infrastructure is a necessary factor in realizing regional energy trade. Meanwhile, associated institutional arrangements, such as technical and environmental standards, fiscal policy and regional transmission agreements, should also be established in an integrated energy market.

Good investment policy and governance should be implemented to liberalize national energy markets. To deepen the integration of energy markets, it is also necessary to improve political trust among countries involved in the integration.

Each country needs to have a comprehensive road map to achieve market-oriented energy pricing mechanisms. For sensitive and challenging issues such as market liberalization and subsidy removal, policy discussions should be undertaken for long-term implementation of these goals with immediate action plans.

Notes

- 1 Arrangement for third party access for power interconnection and trade in accordance with internationally accepted standards in the electricity supply industry and the formulation of a transmission pricing framework within ASEAN.
- 2 EMI is one of the three work streams under the EAS Energy Cooperation Task Force (ECTF), which was established based on the Cebu Declaration.

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