

# ASEAN ENERGY MARKET INTEGRATION (AEMI):

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**A DISCUSSION PAPER**

**AEMI FORUM, BANGKOK, AUGUST 27-28, 2013**



# CONTENTS

|  | Page |    |
|--|------|----|
| <b>Introduction</b> .....                                  | 3    |    |
| <b>AEMI Group members</b> .....                            | 4    |    |
| <b>I. Rationale for AEMI</b>                               |      |    |
| (a) ASEAN energy challenge.....                            | 6    |    |
| (b) ASEAN energy cooperation.....                          | 7    |    |
| (c) Barriers to APAEC 2010-2015.....                       | 9    |    |
| (d) Building on APAEC accomplishments.....                 | 10   |    |
| (e) Energy market integration in East Asia (EMI).....      | 16   |    |
| <b>II. Benefits and challenges</b>                         |      |    |
| (a) Benefits.....  | 17   |    |
| (b) Energy poverty.....                                    | 18   |    |
| (c) National constraints.....                              | 18   |    |
| <b>III. The promise of AEMI within the AEC</b>             |      |    |
| (a) AEMI strategic objectives.....                         | 20   |    |
| (b) AEMI building blocks.....                              | 21   |    |
| (c) From APAEC to AEMI.....                                | 21   |    |
| (d) Initial elements of AEMI blueprint within the AEC..... | 22   |    |
| <b>IV. The way forward for AEMI within the AEC</b>         |      |    |
| (a) Guiding principles.....                                | 28   |    |
| (b) Institutional and governance structures.....           | 29   |    |
| (c) Deployment strategy.....                               | 30   |    |
| (d) The political economy of AEMI.....                     | 31   |    |
| <b>V. Immediate next steps</b> .....                       |      | 32 |

# ASEAN ENERGY MARKET INTEGRATION (AEMI)

## Introduction

The *ASEAN Energy Market Integration (AEMI)* initiative makes the case for energy market integration across ASEAN in the framework of the *ASEAN Economic Community (AEC)*. A network of ASEAN academics, the *AEMI Group*, is working together to develop the rationale for the approach, assess its benefits, design its architectural structure, and draw a strategy to deliver it through 2030. Their work has been developed in close cooperation with the *ASEAN Secretariat*, and is based on publications from the *ASEAN Center for Energy*. The 31<sup>st</sup> Senior Officials Meeting on Energy (SOME) endorsed the AEMI initiative last June in Bali.

The *AEMI Initiative* was fueled by an emerging consensus among a number of ASEAN academics that a successful AEMI would be a necessary condition for achieving sustainable growth in the framework of the AEC. It would enhance energy security and environmental viability across the region and undoubtedly yield significant benefits to all involved, from the economic, societal, and environmental perspectives. The ultimate objective of the *AEMI Group* is the adoption of AEMI in the framework of the AEC, and its deployment through 2030. For this purpose, the members of the *AEMI Group* have prepared *AEMI Papers* as a first step to providing analytical underpinnings for the rationale for AEMI, its building blocks and its implementation.

The *AEMI Forum* is convened on behalf of the *ASEAN Secretariat*, the *ASEAN Centre for Energy*, *Chulalongkorn University* as well as the *AEMI Group*. Participants include representatives from Senior Officials of Energy; ASEAN Council on Petroleum, Heads of ASEAN Power Utilities/Authorities, ASEAN Forum on Coal; Renewable Energy Subsector Network, Energy Efficiency and Conservation Subsector Network, Regional Energy Policy and Planning Subsector Network, Civilian Nuclear Energy Subsector Network; ASEAN Centre for Energy; ASEAN Secretariat. Also some government officials, international organizations, and research institutes will be present at this event.

The purpose of the *AEMI Forum* is to engage a dialogue between academics and policymakers on *AEMI* to seek their feedback and guidance in an *informal* setting. This dialogue will be conducted under the *Chatham House Rule* whereby participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed. An *AEMI Forum Declaration* will capture the conclusions from this interactive dialogue and outline agreed next steps to further develop *AEMI*. The Proceedings from the *AEMI Forum* will be published by the *ASEAN Studies Center*, *Chulalongkorn University*, shortly thereafter and will include the final *AEMI Papers*.

This *Discussion Document* was written on the basis of the *AEMI Papers* and other academic work, to serve as a guide for the discussion during the *AEMI Forum*. As such, it is structured along the lines of the *AEMI Forum Agenda*, with each section corresponding to a session of the *AEMI Forum*.

*The AEMI Group*  
*Bangkok, August 2013*

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## I. RATIONALE FOR AEMI

### A. ASEAN ENERGY CHALLENGE

1. Primary demand for energy in ASEAN is set to grow steadily at 4.4% per annum up to 2030 in the face of increased economic activities with a 5.2% growth per annum as well as population growth, greater electrification rates, and expansion of the transport sectors throughout the region.<sup>1</sup> The implication is practically a doubling of energy demand during that period, a significant increase in vulnerability in reliance on energy imports (particularly Middle East oil) and a doubling of ASEAN's contribution to global carbon emissions.<sup>2</sup> These developments are also set against a background in which notable segments of the population across ASEAN still lack access to modern and clean energy services, and are becoming increasingly vulnerable to climate change adversities.
2. Such prospects have raised serious concerns about the availability of conventional sources of energy to meet such a growing demand as well as about the implications for the environment in the region and beyond. There have been increasing calls for ASEAN to take urgent steps to address the situation, essentially through measures to curb and increase efficiency of energy demand, increase and diversify supply sources, and accelerate the transformation of energy markets (improve the energy investment climate and strengthen regional cooperation in sharing best practices).<sup>3</sup> Energy security and sustainability have therefore emerged at the top of the political and social agendas of ASEAN leaders.
3. More recently, the Asian Development Bank featured a special chapter on Asia's energy challenges in its flagship annual report.<sup>4</sup> It asserts that one of Asia's biggest challenges is that its energy needs will expand in tandem with its growing economic influence, while its own energy endowment is not sufficient to sustain its growth prospects. It further argues that the region needs an ample supply of clean, affordable energy to continue its rapid growth in the coming decades.
4. The report warns that in order to achieve energy security, developing Asia must actively contain its rising demand, aggressively explore new supply sources and technology, and progressively integrate regional energy markets and infrastructure. Expanding renewable energy sources will not be enough to meet such a future demand. Consequently, it concludes that Asia needs to invest in making conventional power cleaner and more efficient, and that it must aspire by 2030 to the degree of regional cooperation and integration in energy of the same type that currently prevails in Europe.
5. The rest of this section is based on an AEMI paper, "Rationale for AEMI",<sup>5</sup> which touches upon two important issues related to the rationale for ASEAN energy market integration, i.e., mapping out the ASEAN energy challenges and defining ASEAN energy market integration.
6. The ASEAN region has been experiencing rapid economic growth for the past few decades and is expected to expand further into the future; the regional economic growth projected for the next 25 years is encouraging and the GDP per capita for ASEAN is projected to more than double from 2010 to 2030, reaching US\$ 3,736 per capita (in 2000 US dollars). However, this economic growth will spur demand

<sup>1</sup> *The 3<sup>rd</sup> ASEAN Energy Outlook*, ACE, IEEJ and ESSPA, 2011.

<sup>2</sup> *World Energy Outlook 2012*, International Energy Agency.

<sup>3</sup> Numerous publications notably by the Economic Research Institute for ASEAN and East Asia (ERIA); ASEAN Center for Energy ACE; International Energy Agency; Asian Development Bank (ADB); and World Bank Group (WBG).

<sup>4</sup> *ASIA Economic Outlook 2013: Asia's Energy Challenge*, Asian Development Bank.

<sup>5</sup> By Endang Jati Mat Sahid, Asihah Mohd Isa, Y P Leong, and Xunpeng Shi.

growth for energy, which is expected to more than double from 2010 to 2035. Energy demand for each ASEAN country (even Brunei Darussalam) is projected to continue increasing beyond 2030. For some countries, such as Indonesia and the Lao PDR, the increase is more than double the demand in the base year. The implications are energy production that is unable to meet the rapidly increasing demand, further widening the supply-demand gap beyond the outlook horizon in 20 years.

7. The increasing energy gap for ASEAN countries can be attributed to two main factors, i.e., the rapidly increasing energy demand and the depleting energy reserves. There are also other factors that may further exaggerate the situation; for example, technically available renewable energy and hydropower potential may not be exploitable if the cost of harnessing this potential is too expensive, or the use of nuclear energy for electricity generation may not be pursued if perceived as a high risk to national safety and stability in the region.
8. This paper identifies the following four potential mitigation measures for the energy gap:
  - (a) Efficient utilization of energy – enhancing energy efficiency (EE); reducing demand for personalized modes of transport and planned public transport schemes for the transportation sector; promotion of co-generation in industrial facilities; and tackling technology inefficiencies in the industry sector;
  - (b) Reducing carbon content of energy – developing renewable energy; developing low carbon electricity such as nuclear power plants; applying carbon capture and storage system at coal-based power plants; and increasing use of alternate fuels and cleaner sources of energy for the transport sector;
  - (c) Diversifying sources of energy supply – intensifying hydro resources development; securing more gas from foreign sources; strengthening and expanding supply infrastructures to facilitate regional interconnection; and exploring and building capacity for the nuclear options; and
  - (d) Regional interconnection of energy supply infrastructure and resources. Energy resources in ASEAN are unevenly distributed, some countries are rich in fossil fuel resources, others have vast hydropower potential while some are resources-poor and have limited indigenous energy potential. Expanding the energy supply infrastructure and resources to facilitate regional interconnection are some of the key measures needed to tackle the issue of the energy gap and security.

## **B. ASEAN ENERGY COOPERATION**

9. As of 1997, ASEAN Heads of State embarked on energy cooperation with the declaration for ASEAN Vision 2020 which sought “to establish interconnecting arrangements for electricity, natural gas and water within ASEAN through the ASEAN Power Grid and the Trans-ASEAN Gas Pipeline and promote cooperation in energy efficiency and conservation, as well as development of new and renewable energy resources”.
10. Since then, ASEAN leaders have adopted a number of initiatives to address these energy challenges, and have directed their Ministers of Energy to cooperate in delivering them.<sup>6</sup> The energy component of the ASEAN Economic Community Blueprint (2007) recognizes that the “secure and reliable supply of

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<sup>6</sup> *Development of the ASEAN Energy Sector*, ASEAN Center for Energy and the Korea Energy Economics Institute, 2013; and *ASEAN: The 45 Year Evolution of a Regional Institution*, Philip Andrews-Speed, University of Westminster, 2012.



energy, including bio-fuel, is crucial to support and sustain economic and industrial activities”.<sup>7</sup> It pledges to accelerate regional collaboration, specifically by taking action to:

- (a) Develop the interconnected oil and gas pipelines through the Trans-ASEAN Gas Pipeline (TAGP) and the ASEAN Power Grid (APG) projects;
- (b) Finalize the ASEAN Petroleum Security Agreement to enhance oil and gas security;
- (c) Strengthen renewable energy development, such as bio-fuels, in view of the limited global reserves of fossil energy and the unstable world prices of fuel oil; and
- (d) Promote open trade, facilitation and cooperation in the renewable energy sector and related industries as well as investment in the infrastructure for renewable energy development.

11. Subsequently, in 2009, ASEAN Ministers reiterated their support for enhancing energy security, accessibility and sustainability, and agreed on 26 strategies and 91 actions towards these objectives through APAEC 2010-2015. This plan, the third in a series of action plans to cover the energy component of the ASEAN Economic Community Blueprint, serves as the blueprint for ASEAN cooperation in the field of energy, to ensure regional energy security while promoting efficient use and sharing of energy resources. More specifically, APAEC 2010-2015 directs ASEAN to enhance energy security and sustainability through accelerated implementation of seven components: (a) the ASEAN Power Grid (APG); (b) the Trans-ASEAN Gas Pipeline (TAGP); (c) coal and clean coal technology; (d) renewable energy; (e) energy efficiency and conservation; (f) regional energy policy and planning, and (g) civilian nuclear energy.

12. It is interesting to note that the APAEC 2010-2015 document, while advocating the integration of energy networks (both pipelines and power grids), does not mention the introduction of trade/energy markets. The existing cross-border energy exchange thus far is limited to zero exchange or pre-established purchase agreements (bilateral).<sup>8</sup>

13. In their latest meeting in 2012, ASEAN leaders strengthened the environmental dimension of their cooperation and pledged “to minimize any harm to the environment, ecosystem, nature and society aiming for reduction of global climate change”.<sup>9</sup> They further pledged to ensure that ASEAN development would be “sustainable through, among others, mitigating greenhouse gas emissions by means of effective policies and measures, thus contributing to global climate change abatement.”

14. Moreover, ASEAN Member States (AMS) have recently ratified the agreement on the oil sharing scheme for emergency, i.e., the ASEAN Petroleum Security Agreement (APSA), establishing the ASEAN Emergency Petroleum Sharing Scheme for crude oil and/or petroleum products in times or circumstances of both shortages and oversupply.<sup>10</sup> They also agreed on the Coordinated Emergency Response Measures (CERM), under which all the AMS will endeavor to supply petroleum to another ASEAN Member in distress at an aggregate amount equal to 10% of that member’s normal domestic requirement, on a voluntary and commercial basis.

15. APSA also includes voluntary oil stockpiling as one of the medium- and long-term measures. The caveat is that oil stockpiling, whether individually or jointly by the AMS, is on a voluntary and commercial basis. Therefore, oil stockpiling is an option and not a stipulation to ensure supply security

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<sup>7</sup> ASEAN Economic Community Blueprint 2015, signed by ASEAN leaders in 2007, Articles 53-55.

<sup>8</sup> ASEAN Centre for Energy, 2013.

<sup>9</sup> “ASEAN Green Connectivity”, Joint Ministerial Statement, 30<sup>th</sup> ASEAN Ministers of Energy Meeting, Phnom Penh, 2012.

<sup>10</sup> The ASEAN Petroleum Security Agreement (APSA) was signed in Manila in June 1986, and ratified recently by all AMS. Implementation of CERM was fully ratified by all AMS in March 2013.



in times of emergency.<sup>11</sup> Moreover, across the AMS there are uneven oil stockpiles and capacities to storage oil. Unlike in the case of members of the International Energy Agency, effective coordination on the utilization of national oil stockpiles is absent.<sup>12</sup> Some argue that the AMS do not need such investment in oil stockpiles, and that such a capital intensive project is only affordable in developed countries. However, increasing ASEAN dependence on foreign oil makes supply disruption a severe scenario.

### C. BARRIERS TO APAEC 2010-2015

16. The ASEAN Center for Energy (ACE) and the Korea Energy Economics Institute (KEEI) recently carried out a joint review of the main components of APAEC 2010-2015 in order to identify the major challenges that ASEAN energy sector is facing in ensuring energy security and sustainable development.<sup>13</sup> The results of their research shed light on the major barriers to implementing the current cooperative approach. The review recognizes that realizing the objectives of ASEAN energy cooperation “do not merely require having the infrastructure available, but also having all the institutional, regulatory, legal, technical and economic aspects functional.” It stresses the need to go beyond the current “piecemeal approach” based on “bilateral trade under pre-arranged power purchase and limited exchange”, and towards the creation of “sub-regional integrated power grids and ultimately an integrated APG.”
17. The APAEC review highlights the fact that actions under APAEC are undertaken essentially from a national perspective, and bilateral agreements are struck sporadically as piecemeal endeavors that do not add up to the cohesive, effective system needed to deliver secure, affordable and sustainable energy efficiently throughout the region. The overall conclusion is that the absence of policy and institutional dimensions constitute major barriers to the successful implementation of APAEC and greatly slow down its progress. Moreover, despite numerous resolutions and efforts for more than three decades, the APAEC review concedes that there is a lag in effectively delivering more cohesive ASEAN energy markets, and a sense that the political will for doing so is lacking.
18. The forthcoming ASEAN Economic Community (AEC) provides for arrangements and agreements to transform ASEAN into a single market with a free flow of goods, services, investment and skilled labor, so that resources go into their most productive uses within ASEAN for the benefit of all. The objective of AEMI is to extend the scope of such provisions to the energy sector – that is, to allow the free flow of energy products, services and investment in the framework of AEC, in order to achieve access to secure, affordable and sustainable energy sources within AEC.<sup>14</sup> AEMI would thus build on the series of three APAECs, taking them a step further, from regional energy cooperation into regional energy integration.<sup>15</sup>

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<sup>11</sup> *ASEAN Petroleum Security Act: Sealed or leaking?* Chang Youngho and Collin Koh, 2009; *Hormuz and ASEAN: Are we ready?* Beni Suryadi, April 2012.

<sup>12</sup> Every International Energy Agency member country has an obligation to stockpile 90 days of its net oil imports, which means if oil supply disruption happens, those countries will be able to continue their economic activities in normal practice for 90 days without any supply from outside.

<sup>13</sup> *Development of ASEAN Energy Sector*, ASEAN Centre for Energy, Korea Energy Economics Institute, 2013.

<sup>14</sup> Consistent with a similar definition for EMI, covering the EAS countries, in *Energy Market integration in the East Asia Summit region: Review of Initiatives and Estimation of Benefits*, ERIA, 2010.

<sup>15</sup> For a full review of current ASEAN initiatives in the energy sector, refer to *Development of ASEAN Energy Sector*, ASEAN Center for Energy and Korea Energy Economics Institute, 2013.

19. AEC provides for a framework where such policies could be devised and implemented, if they were elevated to an ASEAN level within the AEC framework. The argument is that creation of AEC opens up a new approach to addressing them, and increases their chances of success. This is because it offers a more effective approach than the current fragmented case-by-case solutions and Memoranda of Understanding (MoUs). More importantly, inherent to the creation of AEC is the commitment to the free flow of products, services and investments. This approach would require that the same commitment would be extended to the case of energy products, services and investment.
20. Altogether, according to the ACE-KEEI review, APAEC 2010-2015 continues to face seven types of barriers that impede its ability to deliver its strategic goals on an efficient and timely basis. Overall, these barriers are: institutional and regulatory frameworks; tariffs, taxation and pricing; safety, health and the environment; financial availability; technology acquisition; security of energy supply; and political commitment. These are summarized in table 1, which also highlights the main recommendations for addressing them.

#### **D. BUILDING ON APAEC ACCOMPLISHMENTS**

21. ASEAN energy cooperation has gone through a series of three APAECs and has successfully delivered notable successes towards this objective. However, after several decades of cooperation, the underlying approach characterized by coordination on energy projects and actions has reached its limit. It is facing several barriers that are impeding its successful delivery of major projects in a timely fashion. The time has come to reconsider the fundamentals of the approach, and to capture the new opportunities made possible by the advent of AEC. The successor of APAEC needs to move beyond coordination of efforts to the integration of energy markets.
22. AEMI will strive to deepen APAEC accomplishments by addressing the challenges it has faced, and broaden them through its toolkit of policies and frameworks. To reach its full objectives, AEMI will make every effort to introduce policies that will lift the barriers facing APAEC implementation, and to establish frameworks within AEC to elevate challenges beyond coordination on a case-by-case basis, into integration at the ASEAN level.
23. AEMI will therefore deliver a successor to APAEC that will go from coordination to integration, from bilateral negotiations to ASEAN deliberations – effectively performing an “Aseanization” of approaches to what is deemed to be an ASEAN challenge. Such approaches would lift the barriers and fill the gaps where they have been identified, thereby deepening APAEC accomplishments and broadening them within the AEC. Table 2 outlines the policies and framework that AEMI would adopt to address the challenges faced by APAEC, thereby deepening its accomplishments and taking them a step further.

**Table 1**  
**Barriers to APAEC**

**(1) Institutional and regulatory frameworks**

- (a) There is no specific ASEAN policy and institutional framework related to gas, power, RE or EE at the regional level. Instead, the approach is based on the signing of MoUs between the relevant AMS concerned, on a case-by-case basis, and relying on a long history of regional cooperation by resolving issues through ASEAN forums.
- (b) APG and TAGP have MoUs, but the APG MoU has yet to develop a common ASEAN policy on power interconnection and trade. No MoUs have been signed on cooperating on RE and EE.
- (c) The AMS have different technical standards, guidelines, regulations and procedures, which makes cross-border trade difficult to implement.

**Recommendations:**

- (a) Establish a formal regional cooperation agreement for the planning, development and operation of ASEAN power grid and gas pipelines.
- (b) Harmonize technical standards, guidelines, regulator, and common frameworks, in order to secure long-term investment and to alleviate associated barriers towards the realization of a fully-integrated power grid, and to make cross-border trade possible.
- (c) Negotiate a multilateral arrangement or treaty at the ASEAN level to address the subject of transit passage rights in order to avoid future conflicts that could threaten the flow of gas and/or electricity. This would also facilitate the issuance of permits, licenses, consent or other forms of authorization for the passage of gas and and/or electricity.
- (d) Establish an ASEAN-level agreement to address policy, legal, regulatory and institutional frameworks for cross-border supply, transportation and distribution of gas and power of the proposed APG and TAGP networks. The newly-established ASEAN Energy Regulatory Network (AERN) is already assessing the regulatory frameworks for trade, investment and cross-border transmission of APG.

**(2) Tariffs, taxation and pricing**

- (a) There are no harmonized common tariffs on energy trade. APG is planning to establish them, but it is not known whether this would relate to power purchase, energy exchange or other trade arrangements. Under the GMS program, bilateral and case-by-case agreements are used.
- (b) There is no harmonized taxation, which could distort competitiveness of resources and production and hamper cross-border trade. APG has not as yet addressed taxation issues. For TAGP, tax and duties on natural gas and pipelines are essential to commercial arrangements. Tax is set prior to the construction and operation of a pipeline, while tariff rates are a matter of commercial and contractual negotiation between parties.
- (c) Pricing of energy is treated differently across the AMS, which impedes the ability to structure cross-border projects, ensure their commercial viability, and attract proper funding.

**Recommendations:**

- (a) Agree on treaties for transnational pipelines to address taxation, import, export, transit passage or pipelines, product quality and technical infrastructure standards, settlement of cross-border disputes, contractual dispute resolution, and health, safety and environmental quality standards.
- (b) Harmonize tariffs, taxes and pricing of gas and electricity.

**(3) Safety, health and the environment**

- (a) There are no Safety, Health, Environment (SHE) regulations at the regional level across AMS.
- (b) There is no specific cooperation agreement or institutional arrangement to manage impacts on SHE for energy projects.

**Recommendations:**

- (a) Devise safety measures and environmental requirements at the ASEAN level to govern the construction, operation, surveillance and maintenance of pipelines or power grid.
- (b) Ensure reliability of operation, performance, and safety standards and procedures in generation and transmission of electricity interconnection.

**(4) Financial availability**

- (a) More investment needs to be attracted to fund APG and TAGP, which are infrastructure projects that require large financial investments in their construction, operation and maintenance. Also needed is the investment in gas exploration to reduce the region's reliance on crude oil.
- (b) Securing funds for development and implementation of RE and EE technologies and their deployment is also difficult as they are perceived as high-risk projects.

**Recommendations:**

- (a) Address the decisive factors in attracting investment, which are (i) perceptions of each Government's long-term commitment; (ii) the existence of reliable and predictable policy and regulatory measures; and (iii) sound project economics.
- (b) For RE and EE, devise systems for measuring, monitoring, verifying energy savings.

**(5) Technology acquisition**

- (a) The capability to design, manufacture and deploy renewable and energy-efficiency technologies are weak in some AMS, with limited collaborative R&D.
- (b) Limited infrastructure also contributes to low levels of local manufacturing; consequently, most RE and EE equipment is imported from other countries.
- (c) The AMS do not all have national standards for renewable energy or for efficient use of energy. Testing and certification labs in most AMS are inadequate, which leads to difficulties in enforcing technical standards and prevents local product development.

**Recommendations:**

- (a) Agree on an ASEAN commitment to cooperate in technological innovation and acquisition.
- (b) Devise ASEAN standards for renewable energy or for efficient use of energy.

## **(6) Security of energy supply**

### **Recommendations:**

- (a) APG and TAGP need to ensure energy security through reliability of electricity and gas supplies for the AMS.
- (b) RE and EE must be developed to enhance AMS energy security through greater diversification and enhanced utilization of energy sources.

## **(7) Political commitment**

- (a) Governments' firm commitments are strongly required to deliver APG and TAGP infrastructure projects according to Master Plans. Absence of firm commitments results in delays in project execution and difficulties in attracting investment. The regional power grid has been on the agenda of ASEAN for more than a decade now, and has not been progressing timely as planned.
- (b) Lack of firm commitment from governments could also be the indirect cause of possible diverted budgetary resources and deterred foreign investment.
- (c) The AMS have yet to agree on an approach to share investments needed for APG and TAGP projects, as these have not been specified in detail.
- (d) There is a perception that trans-boundary gas pipeline could create dependency situations like those between Russia and Ukraine.

### **Recommendation:**

The AMS Governments must demonstrate commitment to energy cooperation so as to encourage investment from private sector currently available in the region.

*Source:* Author's analysis and compilation based on APAEC 2010-2015; *Development of ASEAN Energy Sector, 2013*, an APAEC review conducted jointly by the ASEAN Centre for Energy and Korea Energy Economics Institute.

**Table 2**

**AEMI deepening accomplishments:  
Lifting APAEC barriers**

| <b>AEMI Strategic Goal<br/>(Within AEC)</b>   | <b>AEMI actions<br/>(Policies and frameworks)</b>   |
|---|---|
| <p>Create an efficient ASEAN energy market within AEC, with a free flow of energy products, services and investment as well as skilled labor.</p> | <p>Creating AEC requires lifting all tariff and non-tariff barriers to trading of goods, services and investment as well as harmonizing the legal, regulatory and institutional frameworks. Therefore, by including energy as part of the vision for the realization of AEC it will be necessary to:</p> <ul style="list-style-type: none"> <li>▪ Design institutional, legal and regulatory frameworks;</li> <li>▪ Formulate proper trade and investment policies;</li> <li>▪ Address energy pricing and subsidies across ASEAN;</li> <li>▪ Harmonize tariff, taxation and pricing;</li> <li>▪ Formulate SHE measures and environmental requirements.</li> </ul> <p><i>Lifts three barriers identified under APAEC (as identified in table 1): Institutional and regulatory frameworks; Tariffs, taxation and pricing; Safety, health and environment.</i></p> |
| <p>Leverage energy investment</p>   | <p>AEMI would create a consolidated energy market, with greater commercial viability and opportunities to attract investors, and leverage financing. This would secure long-term investment and alleviate associated barriers towards realization of large infrastructure projects.</p> <p><i>Lifts barrier identified under APAEC (as identified in table 1): Financial availability.</i></p>  |
| <p>Expand technology acquisition and deployment</p>   | <p>AEMI to forge ASEAN-level commitment to cooperate on technological innovation and acquisition; this is consistent with AEC objectives for sustained growth and narrowing development gaps. It would also open up new business opportunities and quality jobs for skilled labor across ASEAN.</p> <p>AEMI would, within the AEC framework:</p> <ul style="list-style-type: none"> <li>▪ Establish an ASEAN commitment to cooperate on technological innovation and acquisition;</li> <li>▪ Devise ASEAN standards for renewable energy or for efficient use of energy.</li> </ul> <p><i>Lifts barrier identified under APAEC (as identified in table 1): Technological acquisition.</i></p>   |

**Table 2****AEMI deepening accomplishments:  
Lifting APAEC barriers (continued)**

| <b>AEMI Strategic Goal<br/>(Within AEC)</b> | <b>AEMI actions<br/>(Policies and frameworks)</b>  |
|---|--|
| Enhance energy security                     | <p>Energy security is essential to the success of industrial development across AEC, and represents a precondition for AEC ability to achieve and maintain sustainable growth. AEMI would provide the framework to address the issue of security of supply across ASEAN.</p> <p>The AEMI vision is to enhance energy security as it will allow for the efficient free flow of energy from net exporters to net importers across AEC, thereby securing energy sources for importers and extending resources and development opportunities to exporters.</p> <p>AEMI support for the creation of new technology and its deployment will increase energy security by: helping to generate alternative sources of energy and their commercialization; diversify energy sources; and decrease dependence on foreign markets;</p> <p>AEMI could consider creation of own ASEAN emergency stocks of oil and gas reserves, together with effective coordination on the utilization of such energy stockpile. This could be construed as the next step for enhancing PSA within AEC, as there are uneven oil stockpiles and uneven capacities to store oil across the AEC.</p> <p><i>Lifts barrier under APAEC (as identified in table 1): Security of energy supply.</i></p> |
| Create political cohesion and commitment    | <p>Adoption of AEMI as an integral part of AEC will generate a clear demonstration of commitment to supporting the development of an ASEAN energy sector, and will go a long way towards lifting the political uncertainties for investment.</p> <p>Such political support could unlock the energy to tackle sensitive issues such as the inclusion of a cost-sharing formula for investment in infrastructure projects across AEC.</p> <p>Political support will also help alleviate concerns about the creation of interdependency through connectivity projects (notably gas pipelines and electric grids). These will be viewed in a broader perspective as AEC, and within it AEMI, are about to generate several inter linkages, and create interdependence and co-dependence at several levels, allowing for new ways to address these fears and tools to leverage power.</p> <p><i>Lifts barrier under APAEC (as identified in table 1): Political commitment.</i></p>   |

Source: Author's analysis and compilation based on APAEC 2010-2015, and *Development of ASEAN Energy Sector, 2013*, an APAEC review conducted jointly by the ASEAN Centre for Energy and Korea Energy Economics Institute.



## E. ENERGY MARKET INTEGRATION IN EAST ASIA

24. Since 2007, leaders of the East Asia Summit (EAS) and their Energy Ministers have embraced the ASEAN energy agenda, and have taken it a step further.<sup>16</sup> Going beyond the ASEAN cooperation model based on cooperation in delivering projects for joint connectivity, EAS has adopted a more efficient approach and an ambitious agenda to address the region's energy challenge. Those countries have pledged to establish an open and competitive energy market across the region, and further identified the creation of Energy Market Integration (EMI) as one of their major priorities. The vision for EMI encapsulates an energy policy agenda across EAS members to address all aspects of its implementation – including trade liberalization, investment environments, energy pricing reform, removal of trade and investment barriers, liberalization of the energy markets and the development of an energy infrastructure. It also introduces cohesion in the governance and regulatory environments across the EAS energy markets.
25. Work has started on EMI, fueled by an emerging consensus that a successful EMI would enhance energy security and environmental viability across the region and undoubtedly yield significant economic benefits for all involved.<sup>17</sup> Several actions have been taken in the direction of EMI and several more are being planned for the near future and beyond.<sup>18</sup> Nevertheless, analysts recognize now that the realization of EMI across the 16 EAS nations is a considerable undertaking that will likely take several decades to accomplish and one that is probably best started at the sub-regional level.<sup>19</sup> AEMI would represent a gradual approach towards the full realization of EMI, starting with integration within ASEAN before its expansion to the six dialogue partners in EAS nations.
26. The question is whether ASEAN can afford to wait until EMI is established across the EAS area. Postponing such issues would run the risk of undermining ASEAN growth prospects, increasing energy costs for consumers and businesses, and weakening ASEAN competitiveness and quality of life. Given the lead time necessary to agree on a common course of action and to adjust energy systems, ASEAN members need to start addressing this challenge as part of the creation of AEC in 2015. The major tenor of the AEMI initiative is that while increased cooperation across ASEAN constitutes a positive development, elevating the approach to energy market integration would be more effective in addressing the looming energy challenge.<sup>20</sup>

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<sup>16</sup> The East Asia Summit (EAS) countries include the 10 ASEAN member countries – Brunei Darussalam, Cambodia, Indonesia, the Lao People's Democratic Republic, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Viet Nam – and six ASEAN Dialogue Partners: Australia, China, India, Japan, the Republic of Korea, New Zealand. The EAS was established in 2005.

<sup>17</sup> A number of policy investigations have been carried out and academic papers produced, notably commissioned by ERIA as part of the project on Energy Market Integration in the East Asia Summit Region (EMI), 2010-2012.

<sup>18</sup> *Energy Market Integration and Economic Convergence: Implications for East Asia*, Yu Sheng, Xunpeng Shi, ERIA 2011.

<sup>19</sup> *Energy Market Integration in East Asia: A Regional Public Good Approach*, Philip Andrews-Speed, ERIA, 2011.

<sup>20</sup> The case for energy market integration at the pan-Asian level was made in the feature chapter, "Asia's energy challenge" in the recently released *Asian Development Outlook 2013*, Asian Development Bank.

## II. BENEFITS AND CHALLENGES

### A. BENEFITS

27. This section is based on an AEMI Paper, “Benefits of the AEMI”, Youngho Chang, Tri Widodo, Nguyen Thi Mai Anh and Phouphet Kyophilavong.
28. Overall, AEMI holds the promise of enabling the AMS to share the least cost energy resources, with the best attainable environmental impact, in order to achieve greater regional economic integration and international competitiveness. It is expected to reduce the cost of electricity generation, facilitate regional investment on power development projects and promote adequate power reserves.
29. AEMI would help AEC function well by ensuring energy products and services flow freely, which in turn will make energy product prices converge and stable, and firms more efficient and innovative. There would be various benefits in AEMI, including economic, energy and environmental benefits.
30. Regarding economic benefits, higher welfare – measured in equivalent variation (EV) – and increases in GDP among member countries are seen as the main economic benefits of AEMI. The welfare benefits range from US\$ 58.66 million for the Lao People’s Democratic Republic to US\$ 8,856.67 million for Indonesia. An increase in real GDP for the ASEAN member countries could reach between 1% and 3% of real GDP. Specifically, real GDP would be 0.89% larger for Cambodia and 3.46% larger for Malaysia. Other economic benefits would be converging and stable prices, higher foreign direct investment in the region and more elastic demand that gives the consumer more choices.
31. Apart from the economic benefits, AEMI would bring energy benefits such as improvements in energy security, higher energy efficiency, lower energy system costs, higher level in energy diversification and improvements in energy development indicators. By linking energy deficient countries to energy abundant countries in the region, AEMI would enhance the level of energy security.
32. AEMI would also reduce the energy intensity of the countries and thus increase energy efficiency. With the integrated energy market, the energy intensity level is expected to reach 452 tons of oil equivalent in 2030 due to a more diversified fuel mix as well as higher availability of efficient and cleaner fuels. The integrated energy market is expected to decrease energy system costs by 3% if up to 20% of each country’s demand is allowed to be imported, and by 3.9% if up to 50% is allowed as imports. AEMI would enable energy diversification among the countries and they would thus become more resilient to exogenous energy shocks. AEMI would raise energy development indicators by making access to modern energy and producing less amounts of pollution.
33. Together with economic and energy benefits, AEMI would provide environmental benefits. The key environmental benefit would be lower levels of carbon dioxide emissions. A simulation study of power trade between two countries shows that the power trade via the integrated energy market could decrease carbon dioxide emissions by 2% compared with a base case.
34. The various benefits arising from AEMI support the necessity for integrating energy markets in the region. These benefits would easily materialize under AEC where energy products and services are freely flowing. In fact, AEMI is a path towards AEC. These findings recommend carrying out a holistic study that could verify and accurately quantify AEMI benefits.

## **B. ENERGY POVERTY**

35. This section is based on an AEMI paper, “AEMI and ASEAN energy poverty”, by Adoracion Navarro, Maxensius Tri Sambodo and Jessie L. Todoc.
36. The strong connection between AEMI and energy poverty has been established both at the macro and the energy sector levels. At the macro level, energy market integration can contribute to national economic growth and development by facilitating the catching up by less developed economies with those more developed. However, this will not be possible without addressing the issue energy poverty or increasing energy access, as a lack of access to modern energy services is a serious hindrance to economic and social development, and which must be overcome if the United Nations Millennium Development Goals (MDGs) are to be achieved.
37. At the energy sector level, integration of energy markets would allow national governments to more easily address the energy policy challenges that any country face, including: (a) the security of energy supply and/or demand; (b) economic efficiency of the energy sector; (c) social equity, particularly with regard to access to affordable energy; and (d) reduced emissions of pollutants. Energy security has been the first priority among these policies, and energy security itself rests on the three pillars of adequacy and reliability of physical energy supply, environmental sustainability and affordable access.
38. Indeed, AEMI cannot come about without addressing the situation of more than 127 million people in the region who do lack access to electricity, and at least 228 million people without access to modern cooking fuels and technologies. However, ASEAN recognizes the severity of the energy poverty situation in the region and is committed in closing the gap in energy access through energy cooperation, which to all intents and purposes is the precursor to energy market integration.
39. The study recommends an estimation of the direct and indirect impacts on the poor of energy prices subsidy reform. Assessing the impacts of fossil-fuel subsidy reform is “an important foundation for persuasively communicating the necessity for reform and for designing policies to reduce the impact of higher fuel prices on the poor.” It will then be necessary to design alternative methods to subsidize energy for the truly needy, at the same time as ensuring that those that can afford to are paying the full cost of the energy they use.
40. The study also recommends estimating the investment requirements for achieving universal energy access by 2030 and studying financing options. In cooperation with the International Energy Agency/Organization for Economic Co-operation and Development, it is recommended that ACE determine the investment requirements needed for achieving universal energy access by 2030 either in ASEAN or among ASEAN member countries. This undertaking should not be limited to estimating the investment requirements in United States dollar terms, but more importantly should include the technological options behind such investments. Equally important are the potential sources of financing for those investments. This is to put real value on, and stress the urgency of, the tasks ahead. Above all, insofar as AEMI is concerned, such an undertaking should point to areas of cooperation in the area of energy access. AEMI cannot be realized if some people in the region are without access to clean energy.

## **C. NATIONAL CONSTRAINTS**

41. Energy prices vary considerably across ASEAN, due to various structures of energy consumption and different national policies among the AMS. For example, the residential sector is the largest final consumer of energy in Indonesia and Viet Nam, whereas transportation is the largest in Brunei

Darussalam, Malaysia, the Philippines, Singapore and Thailand. Such existing variations within the structure of energy prices and consumption indicate the possibility of “winners” and “losers” if collaboration in the energy sector is implemented rigidly across the board. In that case, individual AMS will face challenges when AEC is established.<sup>21</sup>

42. The implication is that energy policy across ASEAN should not be implemented across the board, without country-specific considerations. Instead, it should demonstrate a significant amount of flexibility to allow for country differences. The implication is that this would also allow a substantial amount of complementarity across AEC. Therefore the energy strategy should identify areas of complementarity that are of advantage to the ASEAN community.<sup>22</sup>
43. The remainder of this section is based on an AEMI paper, “Addressing national constraints, energy pricing and subsidies”, by Maxensius Tri Sambodo, Adoracion Navarro and Tran Van Binh. The paper focuses on national constraints that are divided into two main parts, i.e., institutional challenges, especially energy pricing policy, and infrastructural constraints in the case of APG and TAGP. The five main findings of the study are:
  - (a) The exit strategy on energy subsidies has not been discussed in-depth at ASEAN Ministers of Energy Meetings (AMEM). As a result, most of ASEAN countries still provide energy subsidies of different degrees. This condition is contradicts the ASEAN Energy Market Integration (AEMI) objectives and targets itself because subsidies on fossil fuels not only cause over-consumption of such fuels but also reduce the incentives for investment in energy efficiency and renewable energy.
  - (b) There is still a high level of national resistance to conducting institutional reform of the energy market, due to political considerations.
  - (c) APG can become well-developed if each country does its best to develop grid connections close to the border, harmonize technical standards, minimize environmental impact, and reduce transmissions and distribution loss. However, there is cause for concern over the sustainability of power trading if a country increases its national capacity.
  - (d) While investing in pipelines is an important part of supporting TAGP, it is also important to prepare a trading hub, promote a competitive natural gas market and develop a national gas infrastructure.
44. AEMI has three major roles to play in measuring national constraints:
  - (a) The endorsement of countries attempting to eliminate fossil fuel subsidies. This indicates that countries share responsibility in promoting a more competitive and efficient energy market.
  - (b) The preparation of procedures and criteria before countries decide to provide energy subsidies.
  - (c) The promotion of innovative financing that can encourage infrastructure connectivity in the context of ASEAN+3.
45. Finally, the paper suggests developing an energy security framework in analyzing the phase of national interest and AEMI interests. It notes that there are two possibilities for investigating the relationship between national constraints and regional objectives. If a common interest at the national level is similar to that at the regional level, national constraints should disappear. However, if the common interest at the national level conflicts with the regional level, national constraints will remain.

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<sup>21</sup> *Prospects and Challenges for an ASEAN Energy Integration Policy*, Ditya Agung Nurdianto and Budy Prasetyo Resosudarmo, Australia National University, Canberra, 2011.

<sup>22</sup> *Ibid.*

### III. THE PROMISE OF AEMI WITHIN THE AEC

#### A. AEMI STRATEGIC OBJECTIVES

46. The AEMI vision is to gradually build a regional energy market by 2030 that will allow a free flow of energy goods, services and investment within the AEC framework. AEMI would therefore be geared towards building a competitive, secure and sustainable energy market in the framework of AEC. As such, it would create opportunities for more efficient sharing of energy resources, diversifying its sources, and securing energy availability for citizens and businesses throughout AEC.
47. If properly structured, AEMI would have the potential to insulate net energy importers within AEC from the uncertainties of international oil markets, while offering net energy exporters a readily available and efficient market for their energy products and services, together with investments to develop them. Moreover, AEMI would deliver a number of benefits as part of the AEC agenda, from the economic, social and environmental perspectives.
48. The development of AEMI is an imperative requirement for the success of AEC, given the vital role that energy plays in sustaining economic growth and in securing the well-being of people. Its concept is predicated on a solid understanding that an integrated energy sector is essential to the well-being of all AMS, and represents a necessary condition for the sustainability of the ASEAN economic aspirations within AEC. Indeed, AEC will not be able to deliver an efficient economic integration in the absence of an underlying integration of its energy markets. In other words, AEC cannot succeed without AEMI.
49. Experience of energy market integration around the world (notably in the European Union) illustrates the enormity of the challenge ahead. However, ASEAN has a far better chance today of making good progress, guided by its ASEAN way of doing business, the lessons from successes and failures from around the world, and, most importantly, the creation of AEC, which will provide the proper framework for nurturing it and delivering its promises.
50. Moreover, AEMI would come in the context of a history of energy market cooperation within ASEAN, starting with the first energy agreement signed between Thailand and the Lao People's Democratic Republic in 1966, and evolving through all the initiatives that have been conducted since then.<sup>23</sup> It would be built on the experience of major energy infrastructure projects within ASEAN, notably in the Greater Mekong Sub-region (GMS) where the six countries involved are expected to be interconnected by 2020.<sup>24</sup> Finally, it would also be built on the ongoing and current initiatives within APAEC 2010-2015, and could be construed as its natural successor.

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<sup>23</sup> For a review of initiatives towards integrating the energy market in the East Asia Summit region refer to *Energy Market integration in the East Asia Summit Region: Review of Initiatives and Estimation of Benefits*, ERIA, July 2010.

<sup>24</sup> The GMS includes Cambodia, the Lao People's Democratic Republic, Myanmar, Thailand and Viet Nam as well as two southern provinces of China.

## **B. AEMI BUILDING BLOCKS**

51. In addition to carrying over connectivity projects and infrastructure development, the design of AEMI will require combining energy policies and institutional frameworks to be established within AEC, in support of its efficient functioning and delivery of aspirations. The core objective of AEMI will be to identify such instruments through two distinct components:
- (a) “Hardware” components (e.g., infrastructure, physical energy trading), including connectivity projects (such as APG and TAGP) and the deployment of new technology for energy efficiency and renewable energy;
  - (b) “Software” components (e.g., policies, standards and regulations), including energy policies and required institutional frameworks. These include the regulatory, legal, governance and institutional frameworks for proper commercialization of products and services, efficient decision-making, and effectual implementation of resolutions and operations.
52. In designing its key “software” components, AEMI will focus on those energy policies and institutional frameworks that would gain from being elevated to the ASEAN level, or “Aseanized”, within AEC for greater cohesion, efficiency and leverage. These are the hardware and software components that represent a challenge to deal with at the bilateral or even multilateral levels, as they are best addressed in a coherent and cohesive manner within the AEC framework. These building blocks would essentially capture AEMI value-added relative to the current piecemeal approach, and would constitute the “tool kit” of policies and frameworks needed for AEMI to deliver its mission.
53. AEMI “software” will comprise a series of policies and frameworks that will allow AEMI to deliver its strategic objectives. These will include policies aimed at pooling efforts across AEC, beyond individual national entities, in order to leverage talents and resources, and capture their benefits beyond national borders. These objectives are difficult for any nation to accomplish alone, and which would be greatly facilitated by ASEAN joining forces and multiplying impacts.
54. Overall, AEMI “software” will be an integral part of the efficient functioning of AEC, and will:
- (a) Create value for ASEAN from its ability to effectively pool resources and leverage them;
  - (b) Create value-added through the broader markets and interaction;
  - (c) Provide a more efficient way to address joint and common issues;
  - (d) Create a higher level of political commitment, embraced within the AEC;
  - (e) Produce a critical mass for commercialization and leveraging of innovation, products and services;
  - (f) Create an environment more conducive to investment, with the larger market; and
  - (g) Offer a more stable political commitment over an approach involving varied entities.

## **C. FROM APAEC TO AEMI**

55. Accomplishments from the APAECs will serve as the platform for launching AEMI and expediting its implementation. Building on such accomplishments, and capturing the new opportunities provided by AEC, the approach would move from MoUs to policy agreements at the ASEAN level; from coordination and harmonization on a project basis to framework agreements on a broader basis within the AEC; from piecemeal disparate actions as agreed upon during forums to regional ASEAN energy



policy formulation designed within an agreed framework; and from disparate decision-making entities into a cohesive institutional framework within AEC. Overall, AEMI would be a logical progression of APAEC and a credible successor to it in the context of AEC. AEMI will elevate the approach to the AEC level, taking it beyond piecemeal trading arrangements to fully integrated systems within and across ASEAN – thereby “Aseanizing” the approach.

56. AEMI provides a set of policies and designs frameworks that will create an ASEAN energy market and bring cohesion to the APAEC’s set of projects and actions. AEMI thus goes beyond actions and projects, and elevates the agenda to policy formulation in the AEC framework, addressing energy challenges at the ASEAN level, and establishing the institutional frameworks to implement them. This is “Aseanizing” challenges to better address them, effectively deepening APAEC accomplishments by lifting the barriers it was facing, and broadening it to include objectives relevant to AEC as an economic community; it is thus essential to the economic success of ASEAN and the well-being of its societies.
57. As indicated in table 3, in order for AEMI to address APAEC barriers and deepen its accomplishments, it will need to develop a set of policies and frameworks within AEC that will focus on five major building blocks:
- (a) Create an efficient ASEAN energy market within AEC;
  - (b) Leverage energy investment;
  - (c) Expand technology acquisition and development;
  - (d) Enhance energy supply security;
  - (e) Create political cohesion and commitment.
58. AEMI will further expand its objectives beyond the current APAEC, by broadening its perspective and the scope of its action, leveraging the value-added from the integrated ASEAN energy market. As such, AEMI will focus on seven additional building blocks:
- (a) Scale up efforts to address the energy environmental footprint;
  - (b) Pool efforts to expand renewable energy (RE) and energy efficiency (EE);
  - (c) Leverage clean and renewable energy sources;
  - (d) Enhance energy conservation and efficiency;
  - (e) Develop clean energy strategies and options;
  - (f) Extend energy access to the majority of ASEAN people and eradicate energy poverty; an
  - (g) Enhance human and institutional capacity.

#### **D. INITIAL ELEMENTS OF AEMI BLUEPRINT WITHIN THE AEC**

59. Altogether, assembling AEMI building blocks for deepening and broadening APAEC 2010-2015, using its “toolkit” of energy policies and institutional frameworks, will yield the initial elements of an AEMI Blueprint as presented in table 4.



**Table 3****From APAEC to AEMI:  
Deepening and broadening accomplishments**

| <b>AEMI<br/>(Integrated policies and frameworks)</b>   | <b>APAEC<br/>(Coordinated programs and actions)</b>   |
|--|---|
| <b>Deepening accomplishments</b>   | <b>Lifting barriers<sup>25</sup></b>  |
| Create an efficient ASEAN energy market within the AEC, with a free flow of energy products, services, investment and skilled labor. | This lifts barriers identified under APAEC: <ul style="list-style-type: none"> <li>- Institutional and Regulatory</li> <li>- Tariffs, taxation and pricing</li> <li>- Safety, health and environment</li> </ul> |
| Leverage energy investment   | This lifts barrier identified under APAEC <ul style="list-style-type: none"> <li>- Financial availability</li> </ul>  |
| Expand technology acquisition and deployment   | This lifts barrier identified under APAEC <ul style="list-style-type: none"> <li>- Technology acquisition</li> </ul>  |
| Enhance energy security  | This lifts barrier identified under APAEC <ul style="list-style-type: none"> <li>- Security of supply</li> </ul>  |
| Create political cohesion and commitment   | This lifts barrier identified under APAEC <ul style="list-style-type: none"> <li>- Political commitment</li> </ul>  |
| <b>Broadening perspectives</b>   | <b>Capturing AEC Opportunities<sup>26</sup></b>   |
| Scale up efforts to address the energy environmental footprint and develop clean energy strategy and options                         |   |
| Pool efforts to expand renewable energy (RE) and energy efficiency (EE) through a more broadly integrated ASEAN market               |   |
| Leverage clean and renewable energy sources  |   |
| Enhance energy conservation and efficiency   |   |
| Develop clean energy strategies and options  |   |
| Extend energy access to a vast majority of ASEAN people and alleviate energy poverty   |   |
| Enhance human and institutional capacity   |   |

Source: Author's analysis and compilation based on APAEC 2010-2015, and *Development of ASEAN Energy Sector, 2013*, an APAEC review conducted jointly by the ASEAN Centre for Energy and Korea Energy Economics Institute.

<sup>25</sup> As identified in *Development of ASEAN Energy Sector, 2013*, an APAEC Review conducted jointly by the ASEAN Centre for Energy and Korea Energy Economics Institute.

<sup>26</sup> Building blocks not covered as such under APAEC 2010-2015.

**Table 4**

**Initial elements of an AEMI blueprint within the AEC**

**I. Create an efficient market for energy products and services within AEC**

- (a) Commit to the free flow of energy products (crude oil, petroleum products, natural gas and coal), services and investment within AEMI;
- (b) Create the enabling framework to enhance the integration of energy markets, to gain benefits from economies of scale and enhance the viable exploitation of renewable energy sources;
- (c) Build market fundamentals, including: the design of the appropriate institutional, legal and regulatory frameworks; harmonization of the legal, regulatory and institutional frameworks; and formulation of proper trade and investment policies;
- (d) Address energy pricing and subsidies across ASEAN, and harmonize tariffs, taxation and pricing;
- (e) Optimize use of energy resources and transportation across AEC (oil, natural gas and coal) to secure energy supplies at lower prices and improve the competitiveness of ASEAN industries;
- (f) Design appropriate standards related to energy resources as well as the framework for their implementation and enforcement;
- (g) Ensure the long-term sustainability of the electricity sector (power generation, transmission and distribution) through timely investments in infrastructure and appropriate technologies; increase the use of renewable energy; improve the legislative and regulatory framework; and increase cross-border trade of electricity, including that generated from renewable energy sources;
- (g) Design programmed expansion of electricity generation, transmission, distribution and trade;
- (i) Provide the proper investment climate for greater collaboration between the private and public sectors in the development of energy resources.

**II. Leverage energy investment**

- (a) Undertake the necessary reforms to encourage greater investment in the energy sector in production, transformation and distribution of viable energy resources;
- (b) Design the approach to exploring and establishing an institutional framework for leveraging financing mechanisms for the development of viable energy resources.

**Table 4**

**Initial elements of an AEMI blueprint within the AEC (continued)**

**III. Deliver a secure energy supply**

- (a) Ensure increased energy security through timely access to adequate, reliable and affordable supplies of energy by all AMS within AEC;
- (b) Develop sustainable and secure energy supplies through the diversification of energy sources, and investment in energy infrastructure and connectivity;
- (c) Support the creation of new technology and its deployment in order to increase energy security, by helping to generate alternative sources of energy and their commercialization, diversify energy sources, protect the environment; and decrease dependence on foreign markets;
- (d) Create ASEAN emergency stocks of oil and gas reserves, together with effective coordination of the utilization of such energy stockpiles. This could be construed as the next step to enhancing PSA within AEC, as there are currently uneven oil stockpiles and uneven capacities for oil storage across AEC.

**IV. Create political cohesion and commitment**

- (a) Promote the adoption of AEMI as an integral part of AEC in order to provide a clear demonstration of commitment to supporting the development of an ASEAN energy sector, as a way to lifting political uncertainties;
- (b) Address concerns about cost-sharing formulae for investment in AEC infrastructure projects;
- (c) Address concerns about the creation of interdependency through connectivity projects (e.g., notably gas pipelines and electric grids).

**V. Scale up efforts to address the energy environmental footprint**

- (a) Scale up new technology at the production and transmission levels (particularly for the grid) in order to generate clean energy technologies (particularly for coal);
- (b) Create efficiency gains from moving small-scale energy generation from local to regional and, subsequently, cross-border large-scale use of renewable energy;
- (c) Introduce consistent “energy efficiency indicators” and standards to monitor the use of energy; develop innovative “smart cities” and introduce additional environmentally-friendly energy saving measures; measure the impact of EE when used by national Governments for public transportation, buildings and public procurement contracts; and help national public authorities measure their energy efficiency gains relative to their objectives;
- (d) Create the critical mass for potential use of the Clean Development Mechanism (CDM) as part of the contribution to address environmental concerns.

**Table 4**

**Initial elements of an AEMI blueprint within the AEC (*continued*)**

**VI. Pool efforts to expand renewable energy and energy efficiency**

- (a) Create efficiency gains from pooling efforts to create and deploy new energy efficiency (EE) and renewable energy (RE) technology, and from leveraging potential for technological innovations; broaden the markets for their deployment; improve their commercialization through their larger-scale use; and reduce the risk factor currently associated with them;
- (b) Leverage funding for EE and RE, relying on access to broader markets to commercialize EE and RE, and to provide the investment basis for supporting the creation and early-stage experimental deployment of RE and EE technologies (e.g., introduction of standardized smart electricity grids);
- (c) Build on EE and RE targets to devise appropriate product standards, and to create an ASEAN framework for monitoring their implementation and enforcement (AMS have agreed on regional targets of 15% share of RE in power generation mix; and 8% reduction in energy intensity);
- (d) Determine appropriate cohesive standards and targets to produce higher energy savings, and to generate and deploy new energy-efficient technology;
- (e) Establish reliable and predictable RE and EE policies and regulatory measures;
- (f) Adopt policy instruments for RE and EE to enhance the potential for technological innovation;
- (g) Create systems for measuring, monitoring and verifying energy savings as well as calculating proper economic valuation; and explore innovative market-based instruments to stimulate higher energy savings and enhance ability to generate promising new technologies.

**VII. Leverage clean and renewable energy sources**

- (a) Accelerate deployment of renewable and clean sources of energy supplies towards increased energy supply diversification and affordability;
- (b) Make greater use of renewable energy for electricity generation as well as in the transportation, industrial and agricultural sectors;
- (c) Increase technology transfer and information sharing;
- (d) Strengthen research, development and innovation efforts in the energy sector, especially in areas of clean and renewable energy sources and technologies;
- (e) Diversify energy sources through increased use of renewable energy in a manner that assures optimization with other sectors.

**Table 4**

**Initial elements of an AEMI blueprint within the AEC (continued)**

**VII. Enhance energy conservation and efficiency**

- (a) Promote energy savings efforts in all sectors;
- (b) Promote fuel switching to cleaner energy sources and encourage greater efficiency of energy use in the transportation sector;
- (c) Establish and enforce labeling and standards for the import and production of electrical appliances and vehicles;
- (d) Maintain ASEAN and national targets for emissions reduction, with corresponding mitigation actions, and for substitution of fossil fuels in electricity generation.

**IX. Develop clean energy strategies and options**

- (a) Ensure that energy is supplied and consumed in a manner that creates minimal adverse impacts on the environment;
- (b) Establish regional and national targets for the reduction of greenhouse gas emissions in the energy sector, and implement appropriate mitigation actions relevant to the energy sector;
- (c) Develop strategies to ensure: availability of energy supplies and products; a strategic response to any oil spill or natural disaster; and sustainability of energy services during any crisis.

**X. Improve energy access and poverty alleviation**

- (a) Improve access to affordable energy by the poor and vulnerable populations;
- (b) Extend energy access to the vast majority of ASEAN people in order to eradicate energy poverty.

**XI. Enhance human and institutional capacity**

- (a) Build and strengthen human capacity, skills, and institutional capacity within the AEC;
- (b) Encourage research and development, and increase public education and outreach;
- (c) Enhance AEC cooperation in the compilation and sharing of energy information and data.

*Source:* Author's analysis and compilation based on APAEC 2010-2015, *Development of ASEAN Energy Sector, 2013*, an APAEC review conducted jointly by the ASEAN Centre for Energy (ACE) and Korea Energy Economics Institute (KEEI), and the Energy Policies and Blueprints in the North America Free Trade Agreement (NAFTA), the Caribbean Community (CARICOM) and the European Community.

## IV. THE WAY FORWARD FOR AEMI WITHIN THE AEC

### A. GUIDING PRINCIPLES

60. AEMI would be developed as an integral component of AEC. As such, it would be based on four principles, fundamental to the ASEAN Way:<sup>27</sup>

- (a) Voluntary and non-binding among all ASEAN Member States;
- (b) Based on overall mutual benefits for the AMS and AEC;
- (c) Mutual respect as well as respect for multilateral cooperation and integration within AEC;
- (d) A step-by-step gradual approach, with long-term perspectives for deployment through 2030.

61. Additional basic principles could guide any further discussion for the design and development of AEMI within AEC. Consistent with the ASEAN Way, these could also include:

- (a) Opting out – the AMS will only commit to taking individual action where relevant and feasible. Nothing in the AEMI framework will imply a binding commitment on any AMS to implement any action that is not relevant or feasible to that particular AMS;
- (b) Flexibility – AEMI would lend itself to targeted and programmatic implementation of its constituent elements. This could be relevant, for example, in (i) the case of the creation of ASEAN strategic reserves and the modalities associated with it; or (ii) the case of diversification of the energy mix and increase in the proportion of renewables in the production of energy;
- (c) Complementarity – AEMI is based on the recognized synergies attained by the AMS joining forces to address common challenges. AEMI would design ASEAN energy policy but would remain complementary to national energy policies. Furthermore, AEMI is consistent with AEC and recognizes the cross-cutting nature of energy as a key input to economic activities;
- (d) Leverage – AEMI will be designed around actions that have a comparative advantage to being elevated to the AEC level, relative to being treated at the national level.

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<sup>27</sup> Based on the principles of the Oil Stockpiling Roadmap (OSRM), adopted and ratified fully by ASEAN+3 as of March 2013 as well as those of AEC.

## B. INSTITUTIONAL AND GOVERNANCE STRUCTURES

62. This section is based on an AEMI paper, “Institutional and governance dimensions of ASEAN energy market integration”, by Philip Andrews-Speed and Adnan Hezri. It argues that effective governance is a key requirement for multi-lateral energy cooperation and for AEMI. This is because the objective of AEMI is to deliver not only direct economic efficiency gains but also a range of external benefits that have the character of regional public goods.
63. Energy market integration in European Union and MERCOSUR reveal a number of lessons that are relevant to AEMI. These obstacles to integration arise principally from national differences and can persist for decades. These differences can be found in energy mix, energy balance, economic wealth, openness to investment, pricing and fiscal policies and energy policy priorities. Corporate or political actors may also seek to undermine integration if they see their interests threatened. These factors weaken the political will of national leaders to pursue energy market integration beyond rhetoric, except in cases where short-term economic gains are obvious.
64. While some measures such bilateral energy transmission connections can be undertaken on an *ad hoc* basis, sustained moves towards a regional energy market requires delegation of authority or pooling of sovereignty to an agency charged with implementation, in order to overcome the national obstacles. The period of gradual integration is marked by the progressive build-up of trust, liberalization of domestic energy markets, and harmonization of policies, regulations and standards.
65. The obstacles to implementing AEMI are numerous. First is the long-standing importance to the Member States of sovereignty and nationalism, which easily translates into protectionism. Second, some Member States have a relatively weak capacity to govern a sector as technically and economically complex as energy. Third, the degree of variability across ASEAN is much greater than across the European Union, even after the recent enlargement of the latter.
66. While formal supranational governance structures may be desirable in principle, arrangements that are less formal, and which lack binding commitments and enforceable sanctions, are more consistent with the nature of regionalism that prevails in South-East Asia today. In these circumstances, it will prove difficult to move ahead with certain initiatives that involve substantial political and economic commitments from a large number of countries in the region. Instead, efforts may be best directed at making progress incrementally either by focusing on a limited number of activities that cover most or all ASEAN countries or by building closer energy market integration among a sub-set of ASEAN countries that are able and willing to participate.
67. In the longer term, it is essential to enhance the authority and capacity ASEAN’s energy leadership and administration, e.g., the ASEAN Secretariat, AMEM, Senior Officials Meeting on Energy (SOME) and ACE, if progress towards energy market integration is to be sustained. This will necessarily involve the progressive delegation of authority or pooling of sovereignty. Without this step being taken, progress towards AEMI will be tightly constrained.



### C. DEPLOYMENT STRATEGY

68. This section is based on an AEMI paper, “The pathway to ASEAN energy market integration”, by Adoracion Navarro and Maxensius Tri Sambodo. This paper shows that countries that choose to join a regional integrated energy market can enjoy regional public goods produced in the integration process. For the member countries these regional public goods create positive spill-over effects that are greater than what could be achieved if the countries produce the goods on their own. Examples of regional public goods in regional integrated energy markets include knowledge-related services such as best practices in regulating the energy market, infrastructure such as electricity transmission network, and security services such as an emergency energy reserve sharing system.
69. In the review of the experiences of selected regional energy markets around the world, broad elements or building blocks of integration emerged that have public characteristics, i.e., binding agreements, physical infrastructure, standardized or harmonized rules of operation, and governing or coordinating institutions. The decision to take advantage of the positive spill-over effects of, and mutual benefits from regional energy market integration can lead the ASEAN Member States to taking steps to supply these regional public goods through AEMI.
70. The sequencing of steps towards energy market integration is not clear-cut, as shown by the experience of other regional energy markets; rather, the steps are interrelated and could be given varying emphasis depending on the regional market’s environment and history. As interpreted in this paper, the highlight of the European Union experience is the integration of legal structures. The NAFTA experience highlighted free trade in energy. The emphasis in the MERCOSUR experience is from liberalization of investments that made infrastructure build-up possible. The highlight of the Central Asia experience is the operation of infrastructure interconnection. Finally, the highlight of the GMS experience is forging bilateral agreements.
71. In the case of AEMI, this paper recommends that the practicable option is to expand the initiated GMS integration effort in scale and scope within ASEAN through “the ASEAN Way”, which emphasizes building trust among Member States. Trust should be built by candidly disclosing mutual gains from, and shared costs and externalities in energy resource development, trading energy products, market adjustments and regulatory reforms.
72. There is also a need to accumulate shared databases on, and assessments of resource, trade, investment, market structures and regulations in order to reveal the elements that should be part of an AEMI regional accord. ASEAN leaders could then forge a regional accord for AEMI through to 2030 with actionable targets and timetables, such as establishing or strengthening institutions for facilitating the integration efforts, removing border and behind-the-border barriers to energy trade and investments, harmonizing rules and standards, and building the physical infrastructure for regional energy trading.
73. The ASEAN Member States are currently confronted by national constraints in varying intensities and these could have an impact on their motivation to join AEMI. One sticking point is the lack of independent regulators for the energy sector in some ASEAN Member States. Thus, this paper recommends that, at the minimum, the ASEAN Member States should have independent energy regulators, and pursue harmonization of rules and standards.
74. Finally, the ASEAN members should note that energy supply and demand imbalances that drive integration and create mutual gains from trade are never permanent. It is also possible that the ever-changing supply and demand outlook could lead to one or several ASEAN Member States being either overconfident or insecure, both of which could result in less reliance on energy market integration, the pursuit of energy self-sufficiency domestically, or a greater inclination to look outwards from the region

for trading and investments. However, ASEAN Member States must recognize that the future will always be uncertain. Moreover, it is this same dynamic nature of supply and demand, both within and outside ASEAN, which should motivate the pursuit of energy security through an integrated energy market that has the flexibility to adjust to changing global conditions.

#### **D. THE POLITICAL ECONOMY OF AEMI**

75. This section is based on an AEMI paper, “The political economy of ASEAN energy market integration”, by Philip Andrews-Speed and Christopher Len.
76. Forty-six years of conscious effort by ASEAN Member States to enhance regional security, promote economic development and build a sense of regional identity have met with a significant degree of success, despite encountering many obstacles. Despite this important achievement, ASEAN has fallen short of expectations in a number of ways. It has shown the ability to manage or diffuse disputes but not to resolve them. Its capacity for building institutions remains weak and the implementation of policy initiatives is generally slow, except at times of crisis. In particular, the reluctance of Member States to pool sovereignty or delegate authority has hampered the development of multilateral binding agreements and the formation of an authoritative supra-national agency. As a result, progress towards the achievement of specific integration programmes such as AEC has been much slower than hoped for.
77. Energy market integration is a process through which a range of infrastructure and services relating to energy are provided across a region through collective action. The aims of such integration are not limited to enhancing economic efficiency but include the delivery of external benefits that have the nature of a regional public good. Collective action to deliver a regional public good requires a convergence of interests and a high degree of trust between different actors.
78. The general political and economic constraints to ASEAN integration are exacerbated by factors specific to the energy sector, such as the role of state-owned energy companies, energy subsidies and the treatment of energy as national security issue. To date, concerted collective action related to energy has generally been limited to activities where the costs to the individual governments are either negligible or do not outweigh the short-term benefits. Such costs may be political or economic. Self-evidently, a supply of external funding can ease participation in certain circumstances. However, such funding will be restricted to public sources unless there are profits to be made. In the meantime, the preference of Member States appears to be for bilateral initiatives, either with other Member States or with States outside ASEAN.
79. Nevertheless, given the challenges that need to be addressed, it will be necessary to develop a clear strategy and a step-wise pathway to achieving AEMI by 2030. The AEMI initiative will need to identify the sequencing of these steps, on the grounds of their interdependency, the net benefits they can deliver and the ease of their implementation.<sup>28</sup> The challenge will be to: (a) formulate the set of policies required for its efficient functioning; (b) design the institutional frameworks needed for its sound governance; and (c) deliver the physical infrastructure necessary for its implementation. Action needs to be taken immediately in order to establish AEMI as an integral part of the AEC in 2015, although its full deployment would be delivered through 2030.

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<sup>28</sup> *Energy Market Integration in East Asia: A Regional Public Goods Approach*, Philip Andrews-Speed, 2011, ERIA.

## V. IMMEDIATE NEXT STEPS

80. More studies will be necessary in order to quantify the full benefits of AEMI, and to address the national constraints facing its deployment. Based on the findings of these studies and others, work will need to be undertaken to develop the AEMI Blueprint and Roadmap as an integral component of AEC. In particular, studies should:

- (a) Examine pricing and subsidies within ASEAN, and devise a coherent ASEAN approach;
- (b) Investigate national constraints in joining AEMI and options for addressing them; and
- (c) Quantify the benefits of AEMI within AEC at the ASEAN and national levels, including the impact on energy prices, energy savings and energy poverty alleviation.

81. In terms of process, the AEMI Group will update its work in the light of the comments received during the AEMI Forum. The ASEAN Studies Center, Chulalongkorn University, will publish the AEMI papers as part of the proceedings of the AEMI Forum in time for the next SOME meeting in Bali, September 2013. The AEMI Group will then hope that SOME could consider that the work will be advanced enough to present AEMI to AMEM for their endorsement in principle. In that case, the AEMI Group hopes that the Ministers appoint a Special Task Force to further assess it, and to draft a Blueprint and Roadmap within one year for consideration by AMEM in time for the inclusion of AEMI as an integral part of the inauguration of AEC in 2015. AEMI will then be deployed until its full implementation throughout 2030.

