Energy market integration and regional institutions in east Asia

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HIGHLIGHTS

- The structures of institutions explain East Asian energy market integration.
- Transaction costs are increased by statist trade institutions and bilateralism.
- Order-creating institutions are sub-optimal for energy market integration.
- Multi-level great power management offers limited leadership for integration.
- The environmental stewardship institution supports cooperation on green energy.

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ABSTRACT

This article assesses the case made for energy market integration in East Asia by comparing the role of institutions in South East Asia and North East Asia. The types and functions of institutions and their overall structure are examined in light of global energy market trends. In South East Asia, the shift attempted by ASEAN towards more competitive markets is hampered by the remaining statist variants of the trade institution and bilateral energy diplomacy, which, as regards transaction cost functions, are sub-optimal. As for institutions with order-creating functions, the unresolved status of sovereignty within ASEAN hampers regulatory harmonisation; the great power management institution has since ASEAN's establishment reduced conflicts without providing decisive leadership conducive to integration. North East Asia's dependence on global energy markets overshadows the regional integration potential of the diverse liberalisation efforts and interconnection projects. Bilateral energy diplomacies, new trilateral institutions combined with 'Track Two' institutions and remaining great power competition co-exist. In both regions the institutional structure allows for step-wise, technical infrastructure integration. The environmental stewardship institution co-exists with statist energy security and development objectives while it supports cooperation on green energy. The overall structure of informal institutions constrains deeper energy market integration in several ways.

1. Introduction

In this article the integration of energy markets in East Asia is examined by assessing the different types and functions of regional institutions, including regional cooperation among national level institutions, and by taking account of global energy trends.

Studies conducted under the auspices of the East Asia Summit (EAS) have proposed that energy market integration should comprise liberalisation of energy trade, investment and domestic energy markets, development of regional energy infrastructure and institutions together with energy pricing reforms. These measures would strengthen the region's economies, reduce development gaps, optimise the use of energy resources and improve energy security as well as environmental and climate policy (Shi and Kimura, 2014, p. 10; Bhattacharyay, 2010, pp. 1–2). Correspondingly, failure to integrate regional energy markets could become an obstacle to economic growth in East Asia (Horii, 2011, pp. 451–57). Furthermore, in a survey of over 3000 Asian opinion leaders in 2010, improving energy interconnections and other infrastructure was ranked as the most potent and urgent area of regional integration (Capannelli, 2011, p. 8).
A compelling case therefore exists for energy market integration in East Asia. At the same time regional integration is inseparable from global trends owing to the region’s heavy dependence on external supplies of fossil fuels. Only Australia, Indonesia, Myanmar, Malaysia and Vietnam have a positive ratio of domestic energy production to supply (Bhattacharya and Kojima, 2011). Some early signs suggest the regional cooperation facilitates the North East Asian states’ energy dialogues with their Middle Eastern oil suppliers that have so far provided half of China’s oil imports and some 80–90% of those of Japan and South Korea. New regional energy infrastructure also enhances competition by bringing Russian supplies onto the markets (Kanekiyoshi and Yoshikazu, 2013, pp. 77–84; cf. Motomura, 2014; Shadrina, 2014; Tabata and Liu, 2012, pp. 160–3).

East Asia is currently most dependent on external supplies of oil. In the IEA’s New Policies scenario, oil demand in non-OECD Asia will increase by 2035 to 35.5 mb/d plus 2.8 mb/d in Japan. Production will only be 6 mb/d, plus 3.7 mb/d in Kazakhstan and 9.4 mb/d in Russia (IEA, 2013a, pp. 481, 505). These features indicate how East Asian regional integration is intertwined with the global trends discussed in this Special Issue: new interconnections; more competitive markets; new suppliers (including Russia); and the market entry of new sources of energy from the proliferation of LNG to unconventional fossil fuels and renewables (Aalto and Talus, 2014).

The role of institutions in actually facilitating the targeted positive outcomes in East Asian energy market integration remains under-investigated. The constraints imposed by the relative weakness of regional intergovernmental institutions on energy market integration, however, are frequently noted (e.g. Shi and Kimura, 2014, p. 19). In this situation, the operations of international companies, primarily of Japanese origin, have so far provided the impetus in the form of foreign direct investment and cross-border production and distribution networks. These, in turn, have been facilitated by decreasing transportation costs (Fujita, Kuroiwa and Kumagai, 2011, p. 2; Kim and Gokan, 2011; Capanelli, 2011; Dieter, 2012, p. 117; cf. Bhattacharyay, 2010). This predominant economic integration pattern returns us to the role of states and their mutual coordination as providers of transport, energy supply and other infrastructure to facilitate the regional operations of companies.

The lack of more detailed attention to how state institutions are actually involved in regional energy market integration is problematic given the centrality of state institutions in the economies of East Asia. The states’ centrality is a natural consequence of the state capitalist, neo-mercantilist, developmental and markets socialist variations of how the institution of trade is often organised in East Asia (see e.g. Beeson, 2009; Bremmer, 2008; Dent, 2012a; Garcia, 2011; Stubbs, 2012; Aalto, 2014; Shadrina, 2014). Moreover, insufficient attention has been paid to the order creating functions of states and other institutions vis-à-vis the provision of a firm enough structure for energy market integration. State sovereignty is a major order-creating institution in international relations and in particular in East Asia (Narine, 2012, p. 156). In fact, the existing studies of regional economic and energy market integration, and studies on how sovereignty shapes regional integration in East Asia, have explored very different questions (see Beeson and Stubbs, 2012, p. 5).

In order to fill some of these gaps in the existing research, in this article market and sovereignty issues, or transaction cost reduction and order creation problems are scrutinised systematically as parts of the same methodological framework alongside ecological/climatic problems. The research question is: to what extent do institutions support energy market integration in the sub-regions of South East Asia (SEA) and North East Asia (NEA)?

In the next section the comparative methodological framework and material utilised is introduced. In the third section the results are discussed in the context of the global trends. The final section concludes the article and discusses some policy implications.

2. Methodological framework: institutions and energy markets in East Asia

2.1. Heuristic case study comparison

In this article the similarities and differences among regional level institutions in the SEA and NEA regions are compared vis-à-vis energy market integration (for the method, see Porta, 2008, pp. 204–208). These two East Asian case studies are heuristic or instructive with regard to the wider prospects of integration in representing the only Asian sub-regions with notable intraregional trade (see Capanelli, 2011, p. 5).

The two case studies will build on the comparison of the institutional structure of the EU and Asian mega-regions (Aalto, 2014), and other contributions to this Special Issue. Set against this wider background, the two sub-regional case studies are heuristic in the sense of ‘serving to find out’ further constraining and enabling institutional features on the basis of an additive logic or ‘building-block’ technique, where cases are examined one after another (see Eckstein, 2009, pp. 137 and 38). Each new case can help to reveal new context-specific features of institutional structures which, for their part, facilitate the assessment of the integration of Asian energy markets in more detail. The analysis builds on the finding that institutions need to be adapted to and examined in their relevant regional context (see Talus, 2014).

The SEA represents a maximalist case of regional level formal institutions so far in Asia in the form of the numerous bodies of ASEAN. The ‘ASEAN way’, which relies on wide consultation, avoidance of contentious issues, consensus-building and informal networking, underpins other regional fora in Asia not least due to ASEAN’s outreach institutions embracing the NEA partners and others (Beeson and Stubbs, 2012, p. 3; see Section 3 below). The trends of competitive markets and new interconnections can well be scrutinised through this case. ASEAN Member States have jointly declared liberalisation targets and have ambitious regional energy infrastructure projects in natural gas (TAGP) and electricity (the APG). The Greater Mekong regional power trade is intended to link Cambodia, China’s Yunnan and Guangxi provinces, Laos, Myanmar, Thailand and Vietnam. Yet, with the exceptions of the Philippines and Singapore, ASEAN lags behind Australia in energy market liberalisation (Shi and Kimura, 2014, pp. 14–21). On the whole, SEA can be compared to European energy market integration in the late 1980s and early 1990s. Regarding the building block technique it represents an Asian benchmark for our second case.

NEA is a minimalist case vis-à-vis regional formal institutions. While this region represents a more mixed pattern with regard to commitment to competitive energy markets, it has several new interconnection projects in oil, natural gas and electricity grids (see Aalto, 2014; Motomura, 2014; van de Graaf and Sovacool, 2014 and Shadrina, 2014). NEA is a pilot case regarding Russian supplies of oil and natural gas to Asia. Russian natural gas could also become economically viable for some ASEAN members by the 2020s (Chang and Li, 2014a, pp. 172–5). Further, NEA illustrates the trend of new sources of energy. China has globally the second highest potential in unconventional gas production. LNG use is expected to expand in China and South Korea, alongside new demand in the world’s largest LNG market in Japan occasioned by the Fukushima nuclear accident. China and Japan have ambitious plans for developing renewable sources (see Table 4). NEA can be compared to Europe before the establishment of its first formal energy market institutions in the 1950s, and to the initiation of
major pipeline infrastructures linking the Soviet Union’s supplies with European markets since the 1960s.

2.2. Types and functions of institutions in East Asia

The second step in our methodology is to identify four different types of institutions in the two sub-regions following an inclusive definition informed by classical institutional economics, international relations theory and political practice (see Aalto, 2014). As for our first type, formal rules and regulations, the most legalised of such institutions of East Asia originate in the blueprint for an ASEAN Economic Community by 2015 (ASEAN, 2008), followed up by agreements on trade in goods (ATIGA) and investments (ACIA) (ASEAN, 2009a, 2009b). Despite provisions for the monitoring of compliance and settlement of disputes, the Economic Community does not strive to create a customs union nor an EU-type energy market (cf. Chia, 2013, p. 94).

Second, formal organisations acting in the role of principal initiate, monitor, enact and enforce rules and regulations. They include the ASEAN Member States Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam; the NEA-4 states China, Japan, Russia and South Korea; and energy companies, IFIs, as well as business lobbies and NGOs.

Third, formal organisations acting in the role of agent have been delegated technical energy market related tasks such as information compilation, processing, advice and coordination. In East Asia they are organised in a horizontally overlapping structure. Various ASEAN bodies occupy the most central roles of ‘hubs’. The outreach institutions comprise webs of bilateral FTAs, representing the ‘spokes’: the ASEAN Plus Three (including China, Japan and South Korea); and ASEAN Plus Six (in addition to the Three, also involving Australia, India and New Zealand). The East Asia Summit (EAS) links these states with the USA and Russia since 2011; and has ERIA to examine and promote regional economic integration. Bilateral dialogues and expert level Track Two diplomacy bodies co-exist with such ‘hub and spokes’ sub-regionalisation. The role of the more inclusive APEC has diminished, while the WTO, the United Nations energy and environmental fora and the Pacific Energy Summit have limited roles (see Okamoto, 2011; Hiratsuka, 2011, p. 333; cf. Camroux, 2012, pp. 378, Aalto, 2014, Table 3).

Fourth, the informal institutions include well-established rules, norms and practices underpinning the formal rules and regulations, and the conduct of formal organisations. The structure of informal institutions includes the several varieties of trade institution mentioned above, which we will call derivative institutions of this master institution. Another master informal institution is energy diplomacy, which refers to the practices and norms of attempting to balance security of supplies and demand. In East Asia, energy diplomacy is ultimately supervised by governments, practically facilitated by the regional agent organisations they have set up, and coordinated with the region’s mostly national energy companies and their agent organisations such as the ASCOPE and HAPUA under the ASEAN umbrella. It includes bilateralism, multilateralism and Track Two meetings. The great power management institution, for its part, refers to order creation among the region’s great powers, i.e. the stabilisation of the overall framework of international political economy. Narrow definitions often limit this institution to disputes on ‘energy geopolitics’, while a wider definition followed here also includes the informal consensus-building, non-legalistic decision-making and other networking among East Asia’s great powers for example through summits (Söderbaum, 2012; cf. Acharya and Johnston, 2007; Katzenstein, 2005). The sovereignty institution refers to decisions on the ownership and use of energy resources and on their regulation. The resource-poor states of East Asia increasingly exercise competition-enhancing policies, attempting to balance these with the security of supplies and efficiency. The policies of resource-rich states are geared to securing demand and revenue (Talus, 2014). Such differences impede the development of regional formal institutions similar to those of the EU (Andrews-Speed, 2014, pp. 48–51). Finally, environmental stewardship can be counted as an emerging informal institution in East Asia (see Section 3, Aalto, 2014, Table 3).

2.3. Functions of institutions in east Asia

The third methodological step is to discern what functions the different formal and informal institutions can fulfil in East Asia (see Aalto, 2014).

First, transaction cost reduction functions support several trade policy needs. Fossil fuel resources, which cover some 90% of Asia’s energy supplies, are unequally distributed. The lack of fossil fuels in Japan and South Korea stands out. At the same time, demand is increasing rapidly in China. Indonesia has become a net oil importer while Malaysia may soon become one with its maturing oil and gas production (IEA, 2013a, pp. 78, 85; IEEJ, 2013, p. 1). Some new exporters of natural gas, such as Myanmar, are entering markets alongside expanding or new supplies from Australia, Russia and the USA (e.g. Chang and Li, 2014a, pp. 173–5; Chang and Li, 2014b, p. 13). Simultaneously the expected growing trade in oil, natural gas and electricity will require new infrastructure. This in turn presupposes regional cooperation. Developing new sources of energy, such as unconventional fossil fuels and renewable energy, often necessitates transfers of technology from abroad alongside imports of rare earths, many of which are found in China. Each measure requires overcoming the lack of information, the costs of concluding agreements as well as their monitoring and enforcement.

Second, the order creation functions of institutions are present in the demand for regional institutions on the part of economic actors. Because of the consequences of different sovereign decisions and regulations, and the problem of defection in international interaction, the supply of regional institutions presupposes leadership or what was called above great power management—in the East Asian context referring to the leadership (or lack thereof) of China, Indonesia, Japan and Malaysia. Japan has funded many regional programmes kick-starting economic integration in East Asia (see Mattli, 1999; Laursen, 2010, pp. 4–9; Horii, 2011, pp. 474–6). With sufficient order created, regional institutions can contain potential government failures by diffusing and/or enforcing collectively rational common rules in energy trade and policy.

Third, the environmental externalities of energy production, transport and use often have a regional and/or sub-regional footprint. These ecological/climatic functions can be addressed in part by means of regional cooperation (e.g. oil spills) even though global level action remains primary in climate issues.

2.4. Explanatory model

We can now state that the differences and similarities between energy market integration in SEA and NEA can be explained by referring to the types and functions of institutions, and to the overall patterns of institutional structures in these two sub-regions. In particular we will need to elaborate the order-creating functions of informal institutions whose role has so far been largely under-researched. In addition, the global energy market trends need to be taken into account.

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1 North Korea is generally excluded from this analysis owing to its low present and foreseen impact on regional energy market integration.
2.5. Material

The material to be used to compare the two cases is based on the contributions to this Special Issue and other existing studies; and policy documents, briefs and statistics provided by ASEAN, the Asian Development Bank, EIA, ERIA, IEEJ and the OECD/IEA. Although the material mostly comprises existing sources, these are used to produce a new, systematic comparison of the SEA and NEA regions. Further case studies will naturally be needed for more comprehensively cover regional energy market integration in East Asia.

3. Results and discussion: institutions in the East Asian energy markets

3.1. SEA: trade

The ASEAN Economic Community aims at a ‘single market and production base, a highly competitive economic region, a region of equitable economic development, and a region fully integrated into the global economy by 2015 (ASEAN, 2008, pp. 6, 22). In the Plan of Action for Energy Cooperation 2010–15, ‘open and flexible markets’ are linked with energy security and sustainability objectives, infrastructure projects and institutions (ASEAN, 2010, pp. 9–12). While ASEAN Member States attempt a shift towards more competitive energy markets, the very different variants of the trade institution they traditionally prefer uphold persistent non-trade barriers and create long exclusion lists in the ATIGA and ACIA agreements (Austria, 2013). The relative weaknesses of regional agent organisations such as the ASEAN Secretariat to push for reforms create further constraints (Chia, 2013, p. 97 and 8). We can use several indicators to assess the declared competition objectives: the liberalisation of energy trade, investment and domestic markets; pricing reform and subsidy removal; and interconnecting infrastructure (Shi and Kimura, 2014, pp. 12–14).

Energy trade was liberalised in several rounds from the early 1990s to the 2010s. By 2015 tariffs should be non-existent or low except for oil products in some countries (Table 1). The investment liberalisation rate varies between some 80% and over 90%, with market socialists Vietnam the least liberalised. The Philippines and Singapore have liberalised domestic energy markets, while most Member States have one vertically integrated state-owned electricity and gas company. Energy price subsidies are typical, originating in colonialism. In 2012, fossil fuel subsidies totalled 51 billion US dollars, with almost 30 billion in Indonesia and close to 10 billion in Malaysia and Thailand. Since then measures to cut subsidies have been taken. Laos regulates oil prices (ibid. pp. 14–16; 20 and 21; IEA, 2013b, pp. 23–25; Shi and Malik, 2013, pp. 8, 50–1).

Interconnecting infrastructures are developed under the supervision of the ASEAN Economic Council’s agent organisations including the Ministers of Energy Meeting and Senior Officials Meeting on Energy. The ASEAN Centre for Energy provides technical support together with the ASEAN Gas Consultative Council and the ASCOPE Gas Council (ASEAN, 2008, pp. 22, 52; ASEAN, 2010). ASCOPE, comprising the Member States’ national oil companies (in the case of Cambodia, the Ministry of Mines and Energy), conducts the TAGP pipeline project, which is half built and reached 3020 km as of 2013. LNG regasification terminals are being incorporated into the project to compensate for the technical problems and high costs in the development of the region’s remaining untapped natural gas fields of which Indonesia’s East Natuna is the largest (van de Graaf and Sovacool, 2014). HAPUA, representing power utilities, supervises the APG project of which five interconnections were built by 2012, four more to be finalized by 2015, out of 16 planned. Owing to concerns of economic viability and slow progress in the regulatory process, the completion rate is some 40% (Shi and Malik, 2013, pp. 8–14).

The IEEJ’s Reference Scenario foresees ASEAN becoming more dependent on the global oil trade towards 2040 owing to declining indigenous production. The share of oil will fall in the energy mix, but its consumption will double due to increased overall energy consumption and demand for transport fuels. ASEAN will mainly import and refine Middle Eastern oil. As a regionalising counter-trend, the share of coal, in which SEA is self-sufficient thanks to production in Indonesia and Vietnam, will grow from 16% to 24% driven by industrial demand (IEEJ, 2013, pp. 17, 18, 31–9; cf. Kanekiyo, 2013, pp. 22, 23). Vis-à-vis new sources of energy, LNG is set to be imported from Australia, North America and Russia in particular. Myanmar’s natural gas can enter the ASEAN markets in higher volumes. The consumption of gas is expected to triple by 2040, while its share in the energy mix will grow modestly. Renewable production will almost double even though its overall share will shrink. The greatest potential is in biofuels (IEEJ, 2013, pp. 17, 18 and 41, 42; Soundarajan and Thomson, 2013; see Table 2). In the Enhanced Development scenario, unconventional gas production could reach 41 bcm in Indonesia and 11 bcm in Malaysia, accounting respectively for 28% and 12% of production (IEEJ, 2013, pp. 51, 52 and 63). Commercial production could start up in 2018 in Indonesia (IEA, 2013a, p. 122).

In most ASEAN Member States the attempted shift towards more competitive markets is still hampered by statist varieties of trade institution (cf. Dent and Thomson, 2013, pp. 206, 7); and by the dominance of state-owned energy companies (Umbach, 2013). However, the oil and gas companies intend to be globally competitive in an open international market and become ‘more business-oriented’ (ASCOPE, 2014). In short, to achieve the competition targets the Member States need to continue with the

### Table 1

<table>
<thead>
<tr>
<th>Source</th>
<th>2011/20/30/40</th>
<th>2011/20/30/40, Mtoe (2011/2040, % of energy mix)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td>70.1/86.2/114/139.5 (33.2/36.3%)</td>
<td>35/50/67/91 (17/26%)</td>
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<tr>
<td>Malaysia</td>
<td>4.2/3.9/5.4/6.7 (5.5/4.5%)</td>
<td>28/45/55/61 (38/40%)</td>
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<tr>
<td>Myanmar</td>
<td>11.4/11.4/14.2/14.2 (79.2/36.1%)</td>
<td>1.4/5.1/10/14 (10/42%)</td>
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<tr>
<td>Philippines</td>
<td>16.2/15.8/17.2/18.9 (40.1/21%)</td>
<td>3.5/4.5/8.5/12 (8.1/14%)</td>
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<tr>
<td>Thailand</td>
<td>22.7/20/25/29.3 (18.6/11.5%)</td>
<td>31/43/67/100 (26/38%)</td>
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<tr>
<td>Vietnam</td>
<td>17.6/21/25.9/29.1 (28.2/13.5%)</td>
<td>7.4/13/23/35 (12/24%)</td>
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### Table 2

<table>
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<tr>
<th>Source</th>
<th>2011/20/30/40, Mtoe (2011/2040, % of energy mix)</th>
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* Renewables include hydropower, geothermal, solar and wind power as well as biomass and waste.
3.2. SEA: energy diplomacy

The agent organisations ASCOPE and HAPUA consistently refer in their communications to their principals, the ASEAN Member States (e.g. ASCOPE, 2014; HAPUA, 2013a). States assume the main responsibility for energy diplomacy. The ASEAN energy ministers have met annually since 1980 in addition to the senior officials’ meetings. However, regardless of such multilateralism, ASEAN remains essentially a web of bilateral FTAs accompanied by regional level coordination (Okamoto, 2011, pp. 303–10). Moreover, ASCOPE and HAPUA also rely on bilateral connections to build the individual parts of the regional energy infrastructures they are developing (see e.g. AMEM, 2012; HAPUA, 2013b).

The external dimensions of ASEAN energy diplomacy include, for example, the four expert groups within the ASEAN Plus Three framework. The webs of ASEAN’s external energy diplomacy involve the EU, nine further Asian, EU and North American states, the United Nations agencies and at least 11 other global and regional energy organisations in programmes on new trends such as renewables, energy efficiency, clean coal and regional energy planning. Support coordinated by the EU has amounted to 415 million euros during the period 1999–2009 (ASEAN, 2010, p. 28).

Although ASEAN strives for information gathering, sharing and research among Member States and energy companies, Member States do not always support these measures (Jetsche, 2012, p. 335). Consequently, bilateral energy diplomacy retains a significant role vis-à-vis contracts and infrastructure projects. Bilateralism is in general arguably ineffective in reducing transaction costs (Dieter, 2012, pp. 127, 8). Yet bilateralism can take better account of the variation in trade integration within ASEAN. Although in one view especially, the ASEAN Plus Three context presupposes different trade agreements (Hamanaka, 2012, pp. 15–17), in practice for example Japanese companies utilise them little due to their limited impact and the series of bureaucratic procedures bilateralism leads to (Terada, 2012, p. 372). Because the limits of bilateralism are more obvious in order creation, trust-building among Member States should continue to cultivate the solidarity that increased multilateralism would require.

3.3. SEA: sovereignty

The inherent limitations of ASEAN’s energy diplomacy in creating regional order result from the Member States’ preference for policy autonomy and respect for diversity. Simultaneously the implementation of the ASEAN Economic Community potentially challenges their sovereignty. However, decision-making continues to be based on consensus. Decisions are not binding. No strong formal enforcement mechanisms exist (Sukma, 2014, pp. 11, 12). A dispute settlement mechanism is in force but is not actively used (see ASEAN, 2004; Hsu, 2013, p. 405). Although the harmonisation of standards and regulation is a frequently repeated objective in the Plan of Action (ASEAN, 2010), Member States’ unresolved stance on sharing sovereignty hampers the capacity of ASEAN’s numerous agent organisations to promote these objectives authoritatively. The equal contributions principle further limits the growth of these organisations.

The constraints imposed by sovereignty are evident in infrastructure projects. The completion of the APG infrastructure suffers from slow progress in the harmonisation of regulation in the areas of licensing, expropriation of assets, contractual confidentiality, consumer protection and safety, grid codes, third-party access, investment recovery and access to information. Typically reforms take place in one country rather than being coordinated. For example in 2012 Indonesia’s new regulation allowed electricity imports, but prioritised national generation capacity and stipulated that national sovereignty should not be violated (Navarro and Sambodo, 2013, p. 16). The TAGP suffers from differences in the regulation of gas transmission, transit, distribution and swapping, environmental protection and safety, investor protection, dispute settlement and open access in the targeted more competitive environment. The ASEAN Forum of Coal plans to organise Coal Business Forums and conduct feasibility studies. Harmonisation is needed in coal use and trade practices, emission standards, minimum efficiency requirements for coal-fired power plants and coal quality testing. In the emerging renewables segment, harmonisation of standards and specifications for biofuels are pending. By 2015 nuclear energy regulatory bodies are expected to be in place (Shi and Malik, 2013, pp. 10, 11; 20, 21; 27, 28; 38 and 41).

The attempted regulatory harmonisation will most likely have to be accomplished by respecting the historically evolved sensitivities vis-à-vis the sovereignty institution by the Member States. For example in Central Asia and the Greater Mekong sub-region, state ownership and vertically integrated energy companies have prevailed in infrastructure integration projects. Demonstrating the benefits of harmonisation could serve as an incentive for ASEAN governments while the establishment of independent regulators, which are currently missing in six Member States, would be required (Navarro and Sambodo, 2013, pp. 14–18). Adoption of the principle of winners compensate losers could further persuade the Member States to make the necessary national decisions (Bhattacharya and Kojima, 2010, p. 99). In this way, SEA could target a sovereignty-respecting, intergovernmentally approved technical cooperation as in the EU-Russia energy dialogue (Aalto, 2012; Romanova, 2014).

3.4. SEA: great power management

ASEAN originated in its Member State’s state-building needs after colonialism. Today it remains strongly committed to the institution of non-intervention into each other’s affairs, except when members have implicitly consented to neighbours helping them to suppress opposition movements. In these conditions, ASEAN’s ability to create regional order is limited (Narine, 2012, pp. 155–160). Of its regional great power members Indonesia and Malaysia have so far not provided leadership to facilitate energy market integration as seen in how France and Germany through their mutual accommodation facilitated the emergence of sufficient regional order to enhance integration in the EU context since the 1980s and in how the USA did in NAFTA.

Nevertheless, if order creation capacity is measured against the Association’s establishment in 1967 and new countries joining it, we find that the average number of conflicts has decreased by 60% and the number of battle-deaths by 93%, while no interstate wars with more than 25 deaths have occurred. These indicators can be explained in terms of the ‘ASEAN way’, or the institution of non-intervention, the focus on potentially uniting rather than dividing factors, prioritisation of developmentalism and consensus-based, personalised diplomacy that has enabled face-saving for troubled leaders. However, as this order-creation model is largely a result of internal socialisation processes within ASEAN, in the context of global trends such as increased communication, access to information and rising levels of wealth and democracy, it may be under long-term threat even though the organisation has rebranded itself to be closer to the people (Kivimäki, 2012, pp. 404–9).

At the same time many analysts doubt whether the regional order achieved is attributable to ASEAN at all (Jetsche, 2012, pp. 336, 7); or if the ‘ASEAN Way’ rather explains the lack of leadership for monitoring and enforcing the attempted economic integration for example in the area of energy. ASEAN’s successes in
creating the agent organisations ASEAN Plus Three and Plus Six, the EAS and the confidence-building security organisation ASEAN Regional Forum can also be attributed to its non-threatening posture rather than to its order creation capacities (Terada, 2012, p. 368). Assessing this divided debate, we can note that the number of agent organisations created is complemented by only a limited delegation of functions to them, which suggests an endemic lack of trust.

3.5. SEA: environmental stewardship

Climate and other environmental considerations receive frequent mention in ASEAN's Plan of Action for Energy Cooperation (ASEAN, 2010). Nevertheless, in the IEEJ’s Reference Scenario, primary energy consumption within ASEAN will almost triple by 2040, thereby to reach the levels of the EU (IEEJ, 2013, p. 16). The relative share in the use of coal is increasing while GHG emissions will double or triple in many Member States during this period, reaching to over 5% of global levels (Table 3). Basic renewable energy industries have potential, unlike energy efficiency or advanced renewable technologies (Dent, 2012a, p. 566). That said, the relative share of renewables in the energy mix is decreasing (Table 2). The constraints for developing renewables include import tariffs for renewable energy technologies, low R&D and insufficient regulation (Moinuddin and Bhattacharya, 2013). Overall, in ASEAN's developmentalism, climatic and environmental functions considerations often compete with others related to transaction costs and order creation such as general national economic objectives and reinforced energy security (see Dent, 2012a, p. 581). The policies intended to fulfil ecological/climatic functions should make better use of the ASEAN Plus Three and EAS institutions to increase synergies (see Section 3.10).

3.6. NEA: trade

Sub-regional trade integration in NEA is becoming more formalised. The Trilateral Cooperation Vision 2020 by China, Japan and South Korea foresees an FTA and an investment agreement ("Trilateral Cooperation Vision 2020", 2010). A Secretariat has existed since 2011, but energy market issues are not yet addressed through this format. More legalised institutions include the ASEAN-China, ASEAN-Japan and ASEAN-South Korea FTAs and the ASEAN Plus Three, alongside APEC. These co-exist with burgeoning bilateral FTAs initiated by China, Japan and Korea since the mid-2000s (Dieter, 2012, p. 121). Of 57 such initiatives, 21 were with resource-rich states. By 2013, seven out of 11 FTAs concluded contained clauses establishing resource policy cooperation and investment protection by extending Most Favoured Nation status to NEA based resource companies (see Wilson, 2014, pp. 27–9).

Using the same indicators as in the case of SEA, we find less sub-regional energy market integration in NEA. This is the case even though the NEA-3 have liberalised trade and have lower overall intra-regional trade costs including non-tariff costs (in 2011, 47%) than Indonesia, Malaysia, Thailand and the Philippines (79%) (Austria, 2013, pp. 66–8). A major constraint is that for the NEA-3, Russia is the only potential sub-regional supplier of export fossil fuels.

China and Japan do not levy tariffs on oil imports, on which China depends for more than half of its demand and Japan for its entire demand. China became a net importer of all fossil fuel resources with its 5% net imports of coal in 2011 because its domestic coal supplies are geographically too remote from the sites of demand (Froggath, 2013, pp. 294, 5). Coal accounts for over two thirds of China’s energy consumption. China imposes export tariffs for coal although it has a flexibly extendable export quota (Shi and Kimura, 2014, pp. 14, 15; Kanekiyo, 2013, pp. 19–23). China and Russia restrict foreign investment in the energy sector. Japan has liberalised domestic wholesale gas prices and is developing an LNG futures market, but continues to have vertically integrated private gas and electricity companies in regional near-monopoly positions. Korea’s wholesale gas market is dominated by the majority state-owned KOGAS. In China, although the majority state-owned companies CNPC, CNOOC and Sinopec control the natural gas market, local utilities also play a role, while gas-to-gas transaction competition exists alongside a small LNG spot market in Shanghai (IEA, 2013c, pp. 52–60). In the electricity segment, China has separated generation and transmission but maintains integrated retailing and distribution. Russia has unbundled but in practice has several regional electricity markets. Japan and Korea have liberalised energy prices; China and Russia are cutting subsidies (see von Hippel, Savage and Hayes, 2011, p. 6709; Shi and Kimura, 2014, pp. 15–21).

Interconnecting infrastructure projects link Russia’s production with demand in the NEA-3. Of these the Sakhalin-2 project, which produces oil and since 2009 Russia’s first LNG, epitomises the state-centric variants of the trade institution in the NEA. Until Gazprom’s 7.45-billion US dollar acquisition to assume a 50% plus one share majority from the previous operator Royal Dutch Shell in 2006, the project was controlled entirely by the latter together with the Japanese Mitsubishi and Mitsui based on the 1994 Profit-Sharing Agreement. The Russian government would only have benefitted financially once the foreign companies had recouped their investments. In the mid-2000s the foreign companies announced the doubling of their costs and hence made the project’s payback schedule unpalatable for the now state capitalist, reinvigorated Russia. In the takeover the Russian government linked its own profit interests, the fiscal needs of the Sakhalin regional administration and Gazprom’s interests in accessing new markets in NEA (Aalto et al., 2014, p. 21). The building of the ESPO oil pipeline from Siberia to Kozmino to reach the East China Sea and Asian markets, for its part, only moved ahead once the state-controlled Rosneft overtook the concept from the bankrupted private company Yukos in 2004; and once the project was granted a 25 billion US dollars loans in 2009 by the China Development Bank in exchange for a supply agreement (see Tabata and Liu, 2012, pp. 165, 66). The Power of the Siberia natural gas pipeline, set to deliver 39–61 bcm to China and starting by 2017, links the state-controlled Gazprom and CNPC (Motomura, 2014). Furthermore, the lack of progress in the Gobitec solar electricity interconnection project proposal can be traced to the reservations of the affected governments (van de Graaf and Sovacool, 2014).

In the IEEJ's Reference Scenario the doubling of China’s oil consumption by 2040 will make it more dependent on global

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**Table 3**
GHG emissions, South East Asia.

<table>
<thead>
<tr>
<th>Country</th>
<th>CO₂ emissions, 2010 (Mt)</th>
<th>Energy-related emissions, 2011/2040 (Mt)</th>
<th>CO₂ emissions per capita, 2010 (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brunei</td>
<td>9.16</td>
<td>–</td>
<td>23.0</td>
</tr>
<tr>
<td>Cambodia</td>
<td>4.18</td>
<td>–</td>
<td>0.3</td>
</tr>
<tr>
<td>Indonesia</td>
<td>434.0</td>
<td>402 (1.3)/1279 (2.9)</td>
<td>1.8</td>
</tr>
<tr>
<td>Laos</td>
<td>1.87</td>
<td>–</td>
<td>0.3</td>
</tr>
<tr>
<td>Malaysia</td>
<td>216.80</td>
<td>188 (0.6)/372 (0.8)</td>
<td>7.6</td>
</tr>
<tr>
<td>Myanmar</td>
<td>9.0</td>
<td>8 (0.0)/55 (0.1)</td>
<td>0.2</td>
</tr>
<tr>
<td>Philippines</td>
<td>81.59</td>
<td>78 (0.2)/221 (0.5)</td>
<td>0.9</td>
</tr>
<tr>
<td>Singapore</td>
<td>13.52</td>
<td>60 (0.2)/90 (0.2)</td>
<td>2.7</td>
</tr>
<tr>
<td>Thailand</td>
<td>295.28</td>
<td>228 (0.7)/549 (1.2)</td>
<td>4.3</td>
</tr>
<tr>
<td>Vietnam</td>
<td>150.23</td>
<td>132 (0.4)/514 (1.1)</td>
<td>1.7</td>
</tr>
</tbody>
</table>
markets. Its own production will increase only modestly from 4.1 to 4.8 mb/d, aided by emerging shale oil production reaching 1.2 mb/d. Japan and South Korea will not increase their dependence and may in fact diversify supplies further towards Russia and Africa (IEEJ, 2013, pp. 13, 34, 38; Motomura, 2014). In the natural gas segment, the tripling of China’s own production and unconventional gas production reaching 127 bcm will not offset growing global market exposure. Russia’s ability to meet this demand is limited owing to its increasing domestic consumption. China’s progress with renewables is expected to roughly match rising demand while Japan, Korea and Russia look to expand this segment (IEEJ, 2013, pp. 38–41; Table 4). In the Enhanced Development Scenario, Japan and Korea’s imports from Russia can grow, aided by Russia’s largest in the world unconventional oil reserves yielding a 3 mb/d production by 2040. China could produce the same in addition to 356 bcm of unconventional gas. This would lower its imports from Russia, which does not yet need to tap much into this resource thanks to ample conventional natural gas reserves (IEEJ, 2014, pp. 59–69).

Russia has limited capacities to boost its production. This makes sub-regional energy trade an inadequate policy measure on its own for the NEA-3 who each seek to lower the transaction costs accruing from dependence on imports.

3.7. NEA: energy diplomacy

The ASEAN plus Three institutions involve the NEA-3 on both governmental and Track Two levels (Fook, 2013). Further on Track Two the North East Asia Petroleum Forum links Chinese, Japanese and South Korean experts and companies to discuss relations with suppliers and has recently also invited Russian delegates (Kanekiyo and Yoshikazu, 2013, p. 78). Less successful past multilateral initiatives include the Korea-Oil Producing Nations Exchange (Kopex, 2007) and the Korean Peninsula Energy Development Organisation launched by Japan, South Korea and the USA, which was terminated in 2006 with the failure of the light water reactor project intended for North Korea. New multilateral initiatives include LNG buyer cooperation initiated by Japan with South Korea, and Mitsui with the Indian ONGC and Chubu with GAIL, and TEPCO’s multilateral joint procurement proposal (Vivoda, 2014).

However, most of NEA’s energy diplomacy remains bilateral. The Japanese think tank ERINA organises the Japan–Russia Energy and Environmental Dialogue. The Dialogue builds on the joint Sakhalin-2 and 1 oil and gas projects (SODECO being the Japanese partner in the latter), and the Vladivostok LNG as well as the Magadan II and III oil projects. Nevertheless, Japan’s government and companies seek cheaper LNG from Australia, Africa, Canada and the USA along with exploring domestic alternative resources (Minami, 2014, 478; Motomura, 2014). The Japan–China energy dialogue focused on oil imports from Daqing until China’s own oil import needs increased in the early 2000s. Apart from their competition for supplies since then, Japan and China have an annual Energy Conservation Forum comprising high level and Track Two meetings among over 1000 participants annually (Kanekiyo, 2013, pp. 33–5). The Russia–China energy dialogue, for its part, involves ministerial levels and NOCs but in practice excludes the private companies (Liu, 2013). In 2011, Russian–Korean energy diplomacy yielded a Memorandum of Understanding on a natural gas pipeline through North Korea to South Korea (Aikimoto, 2013, pp. 78–80).

On the whole, regional energy diplomacy in NEA is constrained by China’s more global perspective and problems of great power management. South Korea acts as an intermediary between China and Japan (Dent, 2012b, 270; see Section 3.9 below). The NEA-3 states have reinforced their energy diplomacies to better compete for resources since the mid-2000s. China has a newly launched, decidedly bilateral and state-centric energy diplomacy also involving pariah states, while Japan and South Korea have a longer tradition in this field (Wilson, 2014).

3.8. NEA: sovereignty

The sovereignty institution in the NEA region remains an uncontested Westphalian concept accentuating territorial integrity and political self-determination, supported by China’s rise and decreased western influence. China and Japan support ASEAN’s technocratic leadership role in East Asian integration because of the Association’s respect for sovereignty (Narine, 2012, p. 156). However, disputes on sovereign borders exist between China and Japan over the Diaoyu/Senkaku Islands, and between Japan and Korea in the East China Sea, which is estimated to contain 60–100 Mb of oil and 28 bcm of natural gas (EIA, 2012, pp. 2, 3). The Russo–Japanese Kurile Islands dispute adds to the constraints sovereignty creates on the creation of regional order.

According to some analyses, the NEA-3 states prefer neo-mercantilist type, state-led resource policy combining interventionist financial assistance with sovereign control over external supply networks (see Wilson, 2014, p. 29). To this can be added Russia’s alleged state capitalism, which privileges state sovereignty over resources (Bremmer, 2012). Yet the full picture is not so straightforward. For example, Russian companies depend on foreign partners for investment and technology to develop the new energy resources in the Arctic and off-shore. Consequently Rosneft works with Sinopec, which has a 25% interest in the Sakhalin-3 off-shore Veninsky Block, and with the Japanese SOGECO, which holds a 30% stake in Sakhalin-1. Gazprom works with Mitsubisi and Mitsui, which have 12.5% and 10% stakes in Sakhalin-2. In the Yamal LNG project led by the mostly privately owned Novatek, CNPC and the French Total hold 20% stakes, while the Japanese JPC constructs the LNG plant with the French Technip. Mitsui and South Korea’s Daewoo deliver ice-breaking LNG carriers.

Sovereignty becomes problematic in these decidedly capital-intensive fossil fuel projects when the investors and host countries operate under different regulations (Hwang, 2009, p. 84). This problem also exists in the trade in renewable technologies which would be much needed given the lower level renewable energy capacities and targets in the SEA compared to NEA. Protectionism and regulatory risks prevail in China, while lack of overall regional coordination, common policies and incompatible technical standards increase transaction costs (see Lee, 2013), as do differences in trade tariffs, feed-in tariffs and other subsidies (see Sections 3.5, and 3.10). Harmonisation of utility quota obligation, net metering and tradable RE certificates would bolster such trade (Moinuddin and Bhattacharya, 2013, pp. 143, 149, 153 and 154).
3.9. NEA: great power management

NEA’s great power management manifests a shifting structure with multiple actors and levels. First, the action capacities of the region’s three great powers are variously limited. China, the world’s second largest economy and largest energy consumer is expected to gradually gain ascendancy, but it espouses a ‘peaceful rise’ doctrine wary of overt hegemony ambitions. Japan exercises ‘stealth or quiet leadership’ in regional economic integration driven by companies and facilitated by Japan’s significant technological capacities through numerous policy networks (Dent, 2012b, pp. 272–4). Thanks to its expanding energy deliveries, Russia has re-emerged as an East Asian power after its post-Soviet weakness as evinced by the invitation to the EAS. Yet it is largely limited to exercising bilateral relations. Its annexation of the Crimea and re-emerging energy delivery disputes with the Ukraine in 2014 undermine its leadership credentials and the expansion potential of its Eurasian Economic Union initiative.

Second, demand for leadership varies. The traditional mediator, South Korea, is raising its profile vis-à-vis China and Japan, and hosts the Trilateral Secretariat (Yeo, 2012, p. 4; cf. Dent, 2012b, p. 270). Concomitantly the three partners have reservations regarding the management process through the trilateral institutions not least owing to the negative historical legacies since the Second World War, which make the cooperation confidence-building rather than strategic (Dent, 2012b; Yeo, 2012).

Third, ASEAN’s agent institutions, including the EAS, also have varying demand for Chinese or Japanese leadership, and concomitantly exemplify East Asia’s regional multilateralism where both China and Japan are allotted ‘responsible powers’ roles depending on the issue area (Dent, 2012b, p. 273). Overall, this multi-level structure obscures the action capacities and responsibilities of the region’s great powers.

3.10. NEA: environmental stewardship

China is the world’s largest emitter of GHGs, with Russia fifth, Japan sixth and South Korea ninth. China is not party to any Kyoto Treaty obligations but its Copenhagen commitments target a 40–45% CO2 intensity reduction by 2020 compared to the 2005 baseline (Qi, Zhang and Karplus, 2014, p. 61). Russia’s inclusion in the Treaty since 2005 has not meant any real emission reductions because its allowances were calculated artificially low on the basis of the 1990 level reflecting Soviet era industrialisation (Aalto, 2012, p. 217). China will account for 30% of the global growth in coal consumption and 30% of emissions growth although its industrial change will decrease coal use after 2020 (IEEJ, 2013, pp. 25, 49). Energy related emissions in China will increase until 2040, but decline in Japan and South Korea (Table 5). In the NEA-3 renewable energy is part of developmentalist industrial policies. By 2010 China already had the world’s largest renewable electric power capacity at 263GW, Japan was third with 60GW. South Korea is a leader in tidal energy and solar PV (Dent, 2012a, b, pp. 562, 571). Russia’s potential permits mostly to domestic energy security and some technological cooperation (Aalto, 2012).

The NEA-3 states seek to contribute to climate action and decarbonisation alongside other policy targets such as energy security and development. Russia approaches these ecological and climatic functions somewhat more instrumentally. To fulfil the ecological/climatic functions, the EAS institutions could build on the synergy existing by virtue of the more basic renewable energy industry capacities of Russia and ASEAN Member States, and the more advanced technologies and targets of NEA-3, as part of existing information compilation and capacity building on energy efficiency and biofuels (see EAS, 2013). Ultimately a regional green energy cluster could be built.

4. Conclusions and policy implications

In this article the main similarities and differences in energy market integration between the SEA and NEA regions were explained by referring to the types, functions and overall structure of institutions, and to the impact of global energy market trends.

Regarding the research question on the extent to which institutions can support energy market integration, we can conclude that in both sub-regions energy companies spearhead energy market integration by means of the infrastructure projects they lead. States steer integration through these often state-owned companies. In both sub-regions informal institutions constrain integration but in somewhat different ways.

In SEA, Member States have delegated only limited functions to ASEAN’s numerous agent organisations. The formal agreements concluded and the declared shift towards more competition remain compromised by non-trade barriers prompted by the different statist variants of the trade institution espoused by the Members. Bilateral types of the energy diplomacy institution form further constraints. As for order-creating institutions, the historically developed sensitivities regarding sovereignty complicate regulatory harmonisation and enforcement. Further, the merits of the ‘ASEAN way’ of organising the great power management institution through consensus are debatable vis-à-vis offering leadership for integration.

The NEA-3 States have each individually progressed further in liberalisation than most of ASEAN. Energy market integration is nevertheless constrained by the fact that Russia, which has less ambitious liberalisation targets than China and Japan, is the only potential sub-regional supplier of fossil fuels; hence the NEA-3 continue to be heavily dependent on the trends in the global fossil fuel markets while the oil and gas export capacity of ASEAN’s main producers decreases. While the multilateral LNG buyer cooperation initiated by Japan potentially opens up the region’s predominantly bilateral energy diplomacy, the implications of the trilateral cooperation among NEA-3 remain unclear in this respect as do its effects on regulatory harmonisation which would facilitate infrastructure integration and development of the renewables segment. The trilateral multilateralism has likewise limited capacity to mould the sub-region’s multi-level great power management more conducive to supporting energy market integration.

While the institutional structure in both regions enables some sectoral energy market integration, especially of infrastructure, the harmonisation of regulation, although crucial, seems capable of progressing slowly and mostly on the technical level. The differences vis-à-vis the trade institution, the unresolved status of sovereignty in SEA and its firmly traditional variant in NEA, and the multi-level great power management practices in East Asia are not optimal for altering this situation.

Regarding policy implications, great integration potential exists in the wide policy field characterised by the ecological and

---

**Table 5**

<table>
<thead>
<tr>
<th>State</th>
<th>CO2 emissions, Mt (2010)</th>
<th>Energy-related emissions, Mt (2011/2040), Mt (% of global excluding CCS)</th>
<th>CO2 emissions per capita (t), 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>8286</td>
<td>8558 (26.9%)/12,187 (27.2%)</td>
<td>6.2</td>
</tr>
<tr>
<td>Japan</td>
<td>1171</td>
<td>1178 (3.7%)/955 (2.1%)</td>
<td>9.1</td>
</tr>
<tr>
<td>South Korea</td>
<td>568</td>
<td>580 (1.8%)/546 (1.2%)</td>
<td>11.8</td>
</tr>
<tr>
<td>Mongolia</td>
<td>11.5</td>
<td>–</td>
<td>4.2</td>
</tr>
</tbody>
</table>

Sources: ADB (2013); IEEJ (2013).
climatic functions of institutions. The NEA-3’s de-carbonisation targets and advanced renewable energy capacities offer East Asian wide integration potential if combined with Russia’s and ASEAN’s more basic renewable capacities. The constraints, however, include the long physical distances in East Asia, which consequently suggest prioritising sub-regional infrastructure projects (cf. Andrews-Speed, 2014, p. 53). In this green energy sector production and distribution networks of equipment could be built as in the company-led East Asian economic integration so far. Such step-wise technical integration model is bound to be slow. Although we have argued that institutions should be adapted into their local context (Taluš, 2014), in this green energy sector, the EAS institutions could study the best practices emerging from the experiences of Denmark and Sweden in the realisation of their targeted fully de-carbonised societies by 2050. The ASEAN and ASEAN Plus Three institutions could examine the best (and worst) practices regarding how to institutionalise relations with East Asia’s emerging new supplier Russia (see Romanova, 2014; Shadrina, 2014). However, the findings in this article underline how the needed institutions cannot as mere agents accomplish demanding energy market integration tasks in the absence of more legalised formal regulations and delegation of authority from the principal formal organisations which are also in charge of the important function of order-creation. In East Asia the relative lack of this good underlies the multiple remaining government failures in energy market integration.

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