
Cross-border power trade with Myanmar: barriers and their removal from the Thai's perspective

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Abstract: How can we remove barriers regarding the cross-border electric power trade between Myanmar and Thailand for the promotion of power integration? While Myanmar has traded electricity with China, the bilateral power trade with Thailand has made little progress. Taking some cases such as Dawei, through stakeholder meetings and focus group interviews, using the frameworks derived from a UN literature survey, we have identified the characteristics of distinctive barriers related to fuel types. While coal-fired power projects tend to experience more issues related to economic barriers, hydropower projects are likely to face social barriers, often interrelated with environmental issues. As both barriers are embedded within insufficient legal arrangements, legal technical assistances are crucially required.

Keywords: Myanmar; cross-border power trade; stakeholder meeting; barrier analysis; GMS.

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1 Introduction

After a number of past projects and debates, the potential for various types of benefit from trans-boundary power projects has been widely recognised. In the context of developing countries, for instance, it is largely agreed that the benefits of widening access to inexpensive electricity by establishing a cross-border grid are desirable. The resultant socio-economic improvements, including improvement of local labour markets and health conditions, are effectively stimulated by the improved economic efficiency derived from better conditions surrounding energy supply, due to enlarged economies of scale and widened market access (DESA, UN, 2006). The case of the joint Lao PDR/Thailand Nam Ngum¹ hydropower project further demonstrated the potential to benefit both countries despite its adverse environmental and societal impact. Namely, during most of the year, Lao PDR is a major supplier of hydropower to Thailand; however, when the dry season starts in the Lao PDR, the option of importing energy from Thailand becomes very beneficial.

Looking at the blueprint for the ASEAN Economic Community in 2015, the implementation, particularly of bilateral power agreements between neighbouring countries, has been regarded as being in a crucial initial stage of coordination. The bilateral trade of electrical power is conceptually plausible when there are poor countries with rich energy resources adjacent to countries that have a great demand for energy, but a limited supply, just as with Myanmar and Thailand. While Myanmar is richly endowed with natural gas, coal, and hydro resources, the country appears to have inadequate financial means to develop a grid system adequate to improve the remarkably low electrification rate (currently about 25%). On the other hand, growth in the Thai economy has resulted in rapidly rising wages, with a related increase in demand for energy that is likely beyond its existing physical grid capacity.

ASEAN Power Grid (APG) plan was initiated in 1997. Since then, APG has been studied by means of the 'ASEAN Interconnection Master Plan Study (AIMS)' by 'Heads of ASEAN Power Utilities Authorities (HAPUA)'. The latter organisation counts the trade in electrical power between Myanmar and Thailand as one of its 16 projects. While various potential benefits from the AEC blueprint have recently been spotlighted, the anticipated bilateral power trade between Thailand and Myanmar has not yet accelerated. Despite recognition of the large potential for power generation in Myanmar, very few of the joint Myanmar/Thailand projects have seen any success (for example, as in Dawei, Hutgyi and Tasang). In attempting to unravel the profound complexity of the reluctance to realise these proposed bilateral power projects, previous research has indeed indicated a variety of barriers found in such bi/multilateral power trade projects.

However, regarding specific debate on barriers, although there is a fair amount of precedent research available on bi/multilateral power integration, there seems to be a lack of the analytical research with extended case studies needed to explore the underlying structural complexity of multi-lateral power projects. Our research, therefore, includes a deliberate academic aim to contribute to the existing research by providing specific case studies of trades of electrical power between Thailand and Myanmar. Looking towards the ultimate goal on how to widen access to energy in rural Myanmar, specifically by strengthening bilateral trade in electrical power, we have purposively crafted research questions to ultimately reveal that which is underpinning the reluctance toward development of bilateral power projects by the officials of Thailand and Myanmar:

- a What are the barriers to achieving the proposed 'win-win power trades'?
- b What are the policy recommendations needed to remove the barriers identified?

In order to address the proposed research questions we framed, the research work was extensively supplemented by a detailed comparison among three selected ongoing joint Myanmar/Thailand power projects: Dawei, Tasang and Hutgyi. The rationale of the case selection is explained by our particular interest in comparison studies based on the fuel-types (i.e., coal-fired power and hydropower), to highlight distinct differences in the features of the barriers affecting each one. It was necessary to demonstrate effectively the challenges embedded in the three selected ongoing projects, as a comparative case study under a framework provided by the World Bank. Therefore, our research utilised a combination of qualitative methods:

- 1 primary data analysis including collection of relevant official data and semi-structured interviews to stakeholders for each case

2 a series of focus group interviews to supplement the primary research result.

As a result of this research, we found a set of distinct barrier tendency on power development projects with the two fuel-types. The barriers identified that affect the coal-fired power plant development project in Dawei can be uniquely attributed to economic barriers, whereas the major barriers in both hydropower projects appear to heavily involve social and environmental aspects. It was also noticed that a lack of necessary legal arrangement was a condition shared among projects, and that this acted as a critical root supporting both economic and social barriers.

This paper is structured as follows. In Section 2, we first review previous academic debates on the benefits of bilateral trade in electrical power, and discuss previous successful joint Lao PDR/Thailand projects, as well as the barriers hampering bi/multilateral trades of electrical power. Then, in Section 3, after touching upon the current progress in bilateral trade between Thailand and Myanmar, and describing the three selected case studies, the framework and methodology that we applied are described extensively. In Section 4, the research findings resulting from the analytical phase are concisely described. In Section 5, conclusions are drawn and policy recommendations made.

2 Previous studies

2.1 Benefits of power integration

Among the discussions on why countries are incentivised and driven toward bi/multilateral power trades, four types of benefits have been found: economic, technical, political, and environmental. In addition, although earlier work on power trade pointed out wide benefits involving various dimensions, these research outcomes could be categorised as one of two types: direct economic benefits, and indirect political, environmental, and technical benefits. That is, while the direct benefits widely discussed by authors, is primarily illustrated in economically related gains, the indirect benefits seem to be in the social, environmental and political spheres, closely aligned with proposed economic benefits to complement the direct benefits (DESA, UN, 2006).

2.1.1 Economic benefit

Regarding the direct economic benefit, the concerned parties are able to appreciate the improved economic efficiency that comes with better conditions of energy supply (Fritz et al., 2009) from economies of scale introduced by larger market access (DESA, UN, 2006). Moreover, deregulations resulted in the reduction of fiscal strains on the national government (Teusch et al., 2012). In particular, the host country could benefit from having local economies stimulated and human capacity developed during the construction and operational phases. As an empirical example from studies, the Greater Mekong Subregion (GMS), and other regional power connectivity projects such as Asian Power

Grid, appear to have launched primarily in response to direct economic incentives (Chang and Li, 2013). GMS power trade derives its motivation from leveraging the resource endowments of poorer economies in the region for regional economic gains (ECA, 2009).

2.1.2 Political benefit

In light of political benefit, because grid development projects generally require a long-term political commitment, relevant parties can enhance their governmental capacity, often through the scale-up of existing policy. Consequently, they are able to earn recognition as economic partners able to provide political stability (DESA, UN, 2006; Nakayama and Maekawa, 2013). In a broader picture, this mutually compromising process among regional actors, when it enlarges, effectively promotes regional cooperation and security. Furthermore, due to increased interdependence and integration among neighbours, the legal and political capacity of a government to commit to long-term power projects could also be improved (DESA, UN, 2006).

2.1.3 Environmental and technical benefit

Another widely discussed issue is that, to expand the transboundary power grid ultimately contributes to more sustainable energy and cleaner environment by reducing the negative externalities. For instance, as pointed out in DESA, UN (2006), in a certain condition, replacing biomass energy usage not only reduces air and water pollution, but also prevents deforestation. Likewise, more efficient and optimised use of regional energy resources is likely to have a positive impact on fossil fuel costs and emission savings (Teush et al., 2012; von Hippel et al., 2011). Considering both parties, it is argued that seller states can appreciate the sustainable development in local livelihoods, whereas buyer states can attain political credibility as environmentally committed countries by shifting to lower-emission power options (Nakayama and Maekawa, 2013; Crousillat, 1998).

Technically, bi/multilateral power trades are regarded as benefitting the concerned parties with enhanced expertise capacity, shared among the relevant human resources (Nakayama and Maekawa, 2012), while successfully being able to minimise the electricity losses (Teush et al., 2012; Crousillat, 1998) through more reliable and productive power infrastructure.

2.2 Barriers to power integration

However, even though the benefits of power integration are widely known, there are also ongoing discussions about the challenges and barriers that still face the realisation of bi/multi-lateral power trades (Meslier, 2000). Because transboundary power integration requires interaction among different domestic political structures, the socio-economic environment, and other exogenous factors such as volatile financial market price (Eynon et al., 2000), the relevant actors often face multi-dimensional barriers.

2.2.1 Technical barriers

As widely discussed, the technical barriers can be seen as a major bottleneck for the smooth bilateral trade of electric power because these usually prevent the transmission capacity from being effectively maximised (DESA, UN, 2006). For instance, the power grid sometimes tends to experience technical loss, often owing to its geographical location and anticipated transmission system (Teusch et al., 2012). This may result from insufficient grid capacity, which would mean that it could not optimally handle the reallocation of power between peak and off-peak periods. Another problem is that anticipated grid interconnections might not be able to inject regional transmissions into the national grid effectively (Teusch et al., 2012). In other literature, geographical challenges were highlighted, such as vulnerability of infrastructure in earthquake prone regions and difficulty in connecting very remote power stations, which also increase the difficulty of smooth functioning of trans-boundary power trades (Taggart et al., 2012).

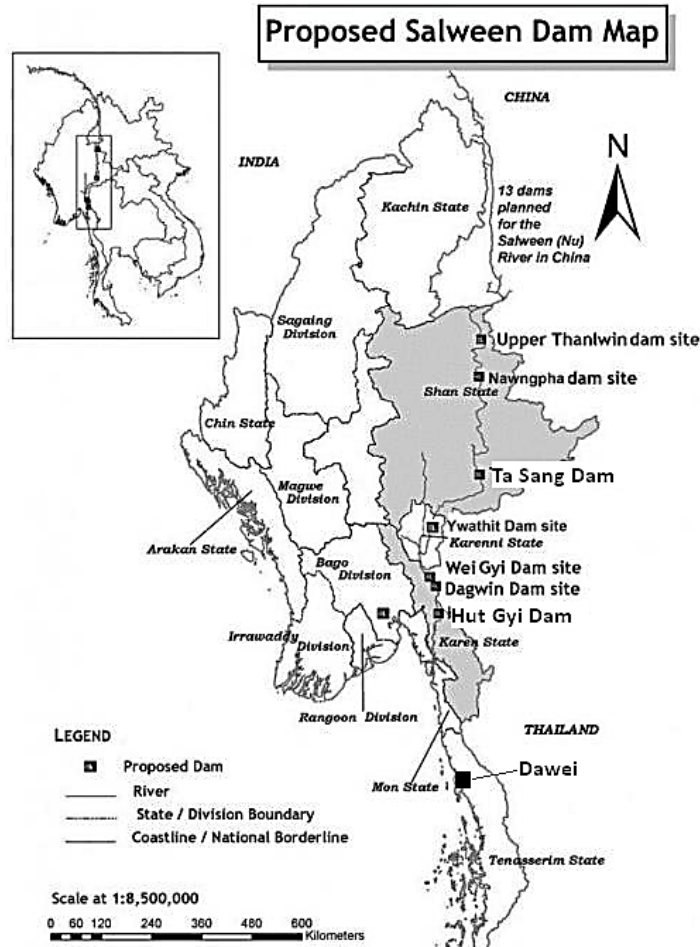
2.2.2 Economic barriers

The need for removal of economic barriers simultaneously with (preferably prior to) physical interconnection has been also emphasised in the current debate. Referring to events in the EU, Meslier (2000) pointed out that the coexistence of internal domestic and integrated regional electricity markets is the key challenge to progress in bi/multilateral power trades. Other authors also argue that a market mechanism without competitive participation, or appropriate economic and financial architecture, could result in inefficiency (DESA, UN, 2006; Teusch et al., 2012). These proposed economic conditions, in general, are to facilitate access to the network, compatible pricing and congestion management, and arrangement for a wholesale market; not only in a transparent and cooperative manner, but also in line with electricity market regulations (SEETEC, 2009; Teusch et al., 2012).

2.2.3 Legal barriers

The lack of adequate legal and regulatory support can also hamper cross-border power trades. Haggblade and Boughton (2013) emphasised that cooperative legal and regulatory arrangements are equally important to improving the physical infrastructure. This regulatory framework includes such as human resources to provide legal capacity, power purchase agreements (PPAs), liability for supply failures, environmental responsibility, and agreements for the security of transmission operations (Haggblade and Boughton, 2013; DESA, UN, 2006). The failure to create these appropriate regulatory frameworks, or the presence of an unstable regulatory regime, could potentially increase the complexity of the transmission development project (Teusch et al., 2012). It is also worth noting that, since political agreements underlie the legal frameworks, regulatory systems that increase the political costs, such as through the rent-seeking activities of interest groups, is also perceived as a critical, destabilising obstacle to successful bi/multi-lateral power trades (DESA, UN, 2006). Particularly for developing countries, significant uncertainty can be perceived in poorly organised regulatory and monitoring systems, with emphasis on the stability of civil society and independence of judiciary institutions (DESA, UN, 2006).

Figure 1 Project location in Dawei, Tasang and Hutgyi



3 Approach

3.1 Three cases: Dawei, Tasang and Hutgyi

In the previous discussion, the number of in-depth studies using actual case studies to attempt to understand comprehensively the barrier structure, and how to unravel the proposed challenges to bi/multilateral power trade, were limited. Because economic sanctions have been lifted, and Myanmar opened up to foreign trade and investment, a number of global investors rushed to partner with Myanmar, in consideration of its geopolitical importance.

Despite the fact that Myanmar is recognised as a promising partner with a much larger potential for the generation of electrical energy (39,720 MW) than Lao PDR (26,000 MW), the major joint Myanmar/Thailand power projects are essentially stalled.

The Electricity Generating Authority of Thailand, EGAT, created its Power Development Plan of 2013, which was to increase the purchase of power generated by coal-thermal (10,000 MW) and hydropower (another 10,000 MW) from neighbouring countries. In the initial EGAT plan for Myanmar, it was stated that the power purchase from Myanmar should be up to 10,000 MW, rather than the 1,500 MW specified in the previous plan. Nevertheless, after the PDP expired in 2013, the memorandum of understanding (MoU) was not updated to reflect the newer agreement.

In Myanmar, there are several huge power projects (>1,000 MW), in which Thai utilities have invested. For our research, we selected three case studies (Dawei, Tasang and Hutgyi) as examples, in order to determine and analyse the categories of barriers to effective transboundary power trade.

3.1.1 Dawei

This is a coal-thermal power project with capacity of 1,800 MW. Construction is planned to be completed and the facility to be fully operational around 2020. Dawei is on a 196 km² of site located in the Tanintharyi Region of Myanmar, 160 km away from border with Thailand (see Table 1 for its short chronology). Because the site faces the Indian Ocean, not only rail and road systems all the way to Bangkok, but also a deep-sea port (16–20 m in depth) are being constructed. The Dawei power project is expected to provide direct benefits not only for enhancing energy security by establishing a stable power supply, but also for accelerating industrialisation and FDI/cash inflow into the area due to competitive power costs. Socio-technical development is also expected to occur as a byproduct, including labour market development, higher living standards, and transfer of technology and training.

Table 1 Chronological events of the Dawei project

<i>Date</i>	<i>Event</i>
2010	<ul style="list-style-type: none"> Italian-Thai Development Public Co. Ltd. (ITD) got the MOU with the share of 70% and 30% for EGAT
2012	<ul style="list-style-type: none"> Thousands of people refused the coal power plant in Dawei Ministry of Energy cancelled the coal power plant project in Dawei Dawei Development Association (DDA) sent environmental and social issues to Japanese government and related organisations MOU of the development in economic and related projects in Dawei has been set up 1,000 MW will be used in Dawei; 4,000 MW will be sold to Thailand
2013	<ul style="list-style-type: none"> In the Japan-ASEAN Summit, DDA sent a request to Japanese Government to stop all investments in Dawei Due to some issues, the joint venture of Thailand and Myanmar companies was set up and replaced ITD
2014	<ul style="list-style-type: none"> EGAT planned to support the Electricity Generating Public Co. Ltd. (EGCO), EGAT holds 25.41% stake, to take care the coal power plant projects in Dawei

Source: Interviews with online sources from Prachatai (<http://www.prachatai.com/>) and International Rivers (<http://www.internationalrivers.org/>)

3.1.2 Hutgyi

The 1,190 MW Hutgyi hydropower project, one of the Salween River projects, is jointly run by EGATi and a Chinese investor sponsored by a Chinese bank (Table 2). It was subject to a feasibility study almost ten years long that was finally completed in 2014, and has moved forward to the next step in the implementation process.

Table 2 Chronological events of the Hutgyi project

<i>Date</i>	<i>Event</i>
2005	<ul style="list-style-type: none"> • MoU by EGAT
2006	<ul style="list-style-type: none"> • Shared between EGAT (45), Chinese investor (40) and Myanmar (15) • Landmine incident during the investigation
2007	<ul style="list-style-type: none"> • National Human Rights Commission verified and reported the abuse of human rights to Thai Government • EGAT investigation camp was bombed
2008	<ul style="list-style-type: none"> • EIA by EGAT was completed
2009	<ul style="list-style-type: none"> • Sub-committee was formed for impact study • Stake was revised to EGATi (39), Chinese investor (51) and Myanmar (10) • The conference ‘Abuse of Human Right in Hutgyi and Tasang Projects’ was held
2011	<ul style="list-style-type: none"> • A large scale hearing in Maehongsom was coordinated with regard to the impact of the project on environment and livelihood • Under the updated MoU, EGATi and Chinese investor agreed on 10% of free share to Department of Hydropower Planning (DHPP) for 1–17th term
2013	<ul style="list-style-type: none"> • EGATi changed the shareholding to 36.5%
2014	<ul style="list-style-type: none"> • Feasibility study is planned to be completed

Source: Interviews with online sources from Prachatai (<http://www.prachatai.com/>) and International Rivers (<http://www.internationalrivers.org/>)

Table 3 Chronological events of the Tasang project

<i>Date</i>	<i>Event</i>
1996	Myanmar Army evicted 300,000 Shan population out of the project site
2006	<p>MoU between MDX (85%) and Myanmar (15%)</p> <p>Shan Sapawa Environmental Organization reported 60,000 locals were forced to emigrated, and received violent activities</p>
2007	Chinese investor joined (51%) the joint venture with MDX (24%) and Myanmar (25%)
2009	The conference ‘Abuse of Human Right in Hutgyi and Tasang Project’ was held
2011	Chinese workers were kidnapped by Shan State Army
2013	MDX Group joined the joint project scheme with Chinese ventures including Sinohydro

Source: Interviews with online sources from Prachatai (<http://www.prachatai.com/>) and International Rivers (<http://www.internationalrivers.org/>)

3.1.3 *Tasang*

Another mega hydropower project, with 7,000 MW capacity, is being constructed on the Salween River in Tasang. This project arrangement includes a 10% free share for use in Myanmar (Table 3). Although this project is uniquely characterised by its long-term social conflict with the local Shan Tribe, Ratchaburi and Chinese investors are reported interested and the operation is expected to begin in 2026.

3.2 *Methodology*

Much of the literature has recognised multidimensional barriers; however, few of them have attempted using a typological approach to analyse the barriers rooted in the transboundary power trade. The research framework was purposefully constructed based on a typological approach with six dimensions (technical, economic, political, legal, social and environmental barriers) as proposed by DESA, UN (2006). In order to effectively facilitate the research discussion within the given typological framework, we applied a combined qualitative methodology:

- 1 primary data collection, utilising official information and un/semi-structured interviews with the experts and practitioners at utility companies who were recognised as the most relevant actors in each project
- 2 a series of focus group interviews to supplement and to better understand the results from the first step of the qualitative research (primary) data collection and un/semi-structured interviews.

We launched the un/semi-structured interviews, incorporating a series of open-ended questions, with the experts and key people at Thai utilities and relevant research institutes from December 2013 to June 2014 (Table 4). The respondents and interviewees were selected through collegial networks with assistance from the Energy Research Institute at Chulalongkorn University and the Policy Alternatives Research Institute at Tokyo University.

Next, to achieve the ultimate goals of crafting potential policy recommendations as preliminary conclusions from the collective research results, the respondents, interviewees, and participants were further invited to focus group interviews (Table 4). These interviews were conducted two times during the interval from June 2013 to June 2014. In Bangkok, the first was organised in 16 December 2013, and the discussion was primarily focused on identifying the barriers rooted in bilateral power trade from the perspective of utility investors. The interview hosted more than 30 participants not only from academia but also from key utility authorities and governmental entities in Thailand.¹

The second focus group interview followed on 4 April 2014, also in Bangkok². The interview aimed to capture and frame the various barriers in the three chosen projects with six typological dimensions, effectively applying a small, interactive discussion session. Nearly 40 participants joined and shared the practitioners' point of view, specifying and finding distinctive features in their investment activity, both for the coal-fired power project (Dawei) and the two hydropower projects (Hutgyi and Tasang). Then, on 2 October 2014, the third was held in Bangkok.³ In this interview, the power trade case of Nam Ngum Dam between Thailand and Lao PDR was partly focused as a

certain benchmark. Then, targeting each project, the way of barrier removal was discussed.

Table 4 Respondents and participants for the un/semi structured and focus group interviews

<ul style="list-style-type: none"> • Electricity Generating Authority of Thailand (EGAT) • Electricity Generating Public Company Limited (EGCO) • EGAT International • Italian-Thai Development Corporation Limited • Sri U-Thong Limited • KWR International, Inc. • National Economic and Social Development Board • Economic Research Institute for ASEAN and East Asia (ERIA) • Japan External Trade Organization (JETRO) • Japan International Cooperation Agency (JICA) • Electric Power Development Company (J-Power) • Energy Research Institute, Chulalongkorn University • Institute of Asian Studies, Chulalongkorn University • Peace and Conflict Studies, Chulalongkorn University • Faculty of Economics, Chulalongkorn University • National University of Lao PDR
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4 Findings

4.1 Barriers in general between Thailand and Myanmar

Before selecting the three power developing projects, we had already found barriers which might be regarded as general, but which were unique in the specific context of the trade of electrical power between Myanmar and Thailand.

4.1.1 Technical barriers specific to Myanmar/Thailand projects

Exploring the primary data and interview outcomes from relevant actors, there were many technical obstacles widely recognised among the relevant stakeholders in Thailand and Myanmar. In general, while the region has experienced rapid growth in electricity consumption (an average of 14.7% over the past three years), technical issues appear to have resulted in the failure to meet this increasing demand for electricity. As touched upon earlier, technical inadequacy due to the aging grids, great distance and difficult geography, and the diffuse human population in some regions, has made it difficult for international partners to adjust to the seasonal ups and downs in the power traded from Myanmar. In addition, although uneven electricity demand between its urban and rural areas is well-known as a major obstacle to an effective power system, appropriate sets of statistical data are hard to obtain.

The Thai purchaser of power from Myanmar (the EGAT) identified major issues associated with technical barriers on these transmission projects: system insecurity and power losses. In particular, there is poor coordination between existing power transmission systems and the planned high-voltage grids in Myanmar. Moreover, officials of the Ministry of Electric Power in Myanmar stressed the necessity to address the technical issues resulting from inactive power development projects. A Myanmar electric officer pointed out that underinvestment in the power sector caused nearly 20% of the power loss now occurring in transmission and distribution. The major reasons for this underinvestment, as they explained, are regarded to be:

- 1 geographical remoteness between main load centres and main generation plants with few substations, which leads to voltage drops and system instability
- 2 aging distribution facilities
- 3 inconsistent transmission voltage levels ranging from 0.4 to 230 kV, although new plans call for the use of 500 kV.

4.1.2 Economic barriers specific to Myanmar/Thailand projects

EGAT and major Thai investors also remarked about challenges such as low project bankability, which in the end results in economic barriers. First of all, Myanmar demands some of the generated electrification goes to its domestic supply as a concession of independent power producers (IPPs). Yet, due to the Myanmar's heavily subsidised tariff, it is economically difficult for the Thai investors to go into the power sector in Myanmar. Concerning the domestic power supply in Myanmar, the tariff structure reform is often pointed as one of the critical points for the IPPs business in Myanmar (ADB, 2013).

Second, regarding the initial cost, from a Thai investor's point view, an investment in Myanmar should be considered to determine if the combined costs of:

- 1 the purchase price of electricity at the border
- 2 the cost of related new transmission systems required in Thailand are cheaper than other options.

At the same time, the seller state, Myanmar appears to struggle to fund the upfront costs, which is disproportionately high in comparison with the current, regionally fragmented electricity demand. Although Myanmar established the Power Development Plan in 2000 in order to address the pervasive electrical poverty issues, according to a public bank, the plan has not been actively implemented due to insufficient funds. According to the Minister of National Planning and Economic Development, Myanmar will require up to \$30 billion in order to achieve its target to electrify 75% of population, from the current 25%.

4.1.3 Legal barriers specific to Myanmar/Thailand projects

To start with, the legal condition of a 10% free share of the electricity produced by a bilateral power project is increasingly regarded as unfair from the investor's perspective. Moreover, relevant officials in Myanmar are aware of the fragmented arrangement of authority among regulatory institutions in the energy sector. In addition, as has been much discussed, the regulatory framework is inadequate, including problems with trade

regulation, a weak judicial system, control of currency, and unclear property rights. These have consequently shaped the unbalanced industrial structure of Myanmar, in which inward FDI in manufacturing, services, and other secondary industry are essentially absent, leaving industry solely concentrated in the energy and electric power sectors (Bissinger, 2012).

4.1.4 Political barriers specific to Myanmar/Thailand projects

Quite importantly, the majority of the interviewees highlighted political issues as highly critical. With regard to Thai investors, we identified through the qualitative interviews with experts that the domestic political turmoil in Thailand increases the difficulty of efficient decision making for electricity investment. After existing under unstable political conditions for too long, it appears that most extractive and power development projects have been suspended for long periods due to the politicised nature of the relevant actors in the power trade.

When it comes to any form of partnering with Myanmar, in general, it seems that political barriers could be one of the most crucial obstacles to overcome. Looking at the domestic politics in Myanmar, the government is still in the political transition to a post-army regime, making it difficult to avoid a lack of adaptability and to find stability in the newly democratic policy-making process. On the other hand, external factors are also worth noting. One of the organisations analysing investment risks, for instance, made an insightful point: risks related to resumption of sanctions and to change in political regimes, add extra challenges to development of economic ties with Myanmar. Namely, from a global perspective, the political status of sanctions on Myanmar remains 'suspended' and this adds significant uncertainty in political and social movement.

Moreover, this indicates other relevant risks in linking with the operation of local firms because they generally have close political ties with the government. The interviewees also agreed on the lack of capacity of the Myanmar government, particularly for easing social tensions in local communities, for instance, by conducting appropriate environmental assessment. As a result of political inability in both countries, there remains a lack of government-to-government cooperation, this being the evident reason why the MoU between them has not been updated since the original expired in 2013.

4.1.5 Social barriers specific to Myanmar/Thailand projects

Given the fact that around 30% of the population is ethnically diverse, and that the major power plants are to be located in their residential areas, there has been obvious social tension between locals and distant economic stakeholders in the power trade. That is, a large portion of the power generated is currently exported to Thailand (80% of hydro-power); and a rising public voice has been calling to utilise this generated power for domestic usage. Although recent political decisions have been shifting towards more domestic-consciousness (Talbot et al., 2012), the social unrest in local ethnic groups (particularly among those concerned with potential environmental damage and forcible relocation out of project sites) still remains a significant concern for power trade partners. The ongoing ethnic civil violence (for more than 60 years), is broadly recognised as a major factor discouraging the private sector and, as a current example, the strategic economic cooperation of China with Myanmar is reported to have decreased significantly.

4.1.6 *Environmental barriers specific to Myanmar/Thailand projects*

Finally, environmental barriers are also pointed out in the existing literature. Particularly developing the dams, requires not only a hugely important displacement of population, but also damages and alters the natural ecosystem. In light of the discussions about Myanmar, it has been subjected to the highest deforestation rates of any country with tropical forest (Talbot et al., 2012), mainly because of its lack of legal provision of environmental safeguards for infrastructural development projects.

4.2 *Barriers in three cases*

Importantly, when analysing the three selected cases, we placed them in two categories based on the power source to see if there were distinct features that might be highlighted between them. This assumed that there would be a characteristic barrier structure depending not only on the scale of the project but also on the power source used to operate the facility. We therefore have set two stages for discussion: Dawei as a coal-fired power project, and Hutgyi and Tasang as hydropower projects.

4.2.1 *Identified barriers in Dawei*

The barriers identified in relation to the coal-fired power plant development project in Dawei, one of the topical projects in Myanmar, is significantly characterised by various economic barriers, closely interlinked with a lack of necessary legal arrangement (Table 5). Interestingly, social and environmental barriers appear to be minor issues in the Dawei project. Indeed, the use of a coal-fired plant sparks environmental debate and opposition movements in the local community, as it entails external impacts such as the potential for air pollution, without any responsible plan for compensation of potential damage. Likewise, when looking at technical aspects, despite having enough electricity demand, the grid infrastructure has not been comprehensively organised yet, particularly in the western side of the city. In addition, a lack of competent human resources with appropriate operational management skills in the special economic zone was also noted. However, and more importantly, the discussion by agents of the Thai utilities was primarily dominated by economic barriers:

- 1 a lack of strong governmental commitment to craft clear legislation to secure the economic risks needed to activate foreign direct investments
- 2 an inappropriate pricing mechanism for the PPA between the two countries.

The first economic obstacle came in prior to the feasibility study of the project, according to the Thai investors. Despite the fairly large scale of the project, no detailed master plan has been fully developed yet that comprehensively considers the future power-demand outlook in line with the national policy on power development. Moreover, a similar discussion can be applied to the relevant legal arrangement. The government has as yet developed almost no legal framework for managing foreign direct investment. Although the existing legal framework affecting foreign investment was revised in 2012, ambiguity and lack of transparency appear to remain.

Another economic barrier is determined by how the concerned parties craft the PPA, which ultimately affects the project longevity. In fact, a number of private utility companies claimed that the off-taking price by EGAT is insufficient to stimulate the

necessary investment in Myanmar and, even if it occurred, insufficient to manage the project, in general. Especially when the government of Myanmar requires a 10% share of free power as a given condition in any project, the economic risk can be perceived as larger from the private investors' point of view, if the agreement entails no financial support by either government. This perception of risk could potentially be greater because the relevant MoU between Myanmar and Thailand has not been updated. This is because any project is selected based on its MoU and the priority details written there. In this regard, considering that the PPA is also bound to the fixed MoU, its absence only leaves ambiguity and risk for managing the power project sustainably.

These economic risks, deeply rooted in weak legal instruments, will be factors that discourage private investors from stepping up, even for the feasibility study, no matter how highly they may be interested in the potential profitability of the project. The root reason, again, mainly seems to revolve around the lack of comprehensive planning, for example, master planning that takes into account the demand for regional growth in power demand, and a sustainable PPA with an appropriate off-taking price.

Table 5 Barrier summary in Dawei

<i>Dawei</i>	
Technical	<ul style="list-style-type: none"> • Grid infrastructure is not ready in cities around Dawei • Lack of local experts and firms
<i>Economic</i>	<ul style="list-style-type: none"> • Lack of bankable loan options • High uncertainty and (marginal) cost involved such as in feasibility study due to unclear selection process • Off-taking price is too low by EGAT • No MoU updated between Thailand and Myanmar, therefore, no appropriate PPA development • Lack of comprehensive planning and project clarity
Political	---
<i>Legal</i>	<ul style="list-style-type: none"> • Lack of support by EGAT • Unclear selection process • No clear regulatory for IPPs in Myanmar • No transparent legal framework to secure the foreign investment
Social	<ul style="list-style-type: none"> • Social opposition against Chinese firms
Environment	<ul style="list-style-type: none"> • Concern with externality of coal-fired-based generation

4.2.2 Identified barriers in Hutgyi and Tasang

The other two case studies we selected are both hydropower projects in the Salween River basin. Before determining the barriers found in these two cases, a brief description on the differences between the two should be noted. Although both projects are located on the same river, several differences can be found in the projects, according to the Thai practitioners. Technically speaking, the two cases are distinct from each other not only in size, but also in the price of the generated power, due to the economy of scale. Because the generation capacity at Hutgyi is significantly less than at its Tasang counterpart, the

practitioner highlighted, the price of electricity per unit from Hutgyi is expected to be 1.4–1.5-times more expensive than from Tasang. Moreover, the remoteness of the transmission system in both projects is also worth special attention. Regarding technical details, the power generated at Tasang is conveyed straight to a substation close to Bangkok with a direct high voltage transmission line while at Hutgyi, the power generated has to be converged in other lines in northern Thailand.

Major barriers in both hydropower projects mostly lay in the social and environmental dimensions, indirectly influenced, again, by the insufficient legal arrangement. What is distinguishable from the Dawei project is that the investment activity of Thai utilities appears more strictly constrained by these socio-environmental factors, rather than technical and economic barriers. Our research revealed that some of the technical and economic factors do impact the project, and often interrelate. Namely, the distance between the power plant and the nearest substation could result in higher transmission costs as this often means significant loss, when utilising an aged grid all the way to Thailand from the geographically remote power stations. Regarding bankability, the difficulty in obtaining an acceptable financial scheme from Thai banks and multilateral financial institutes, such as ADB, was also pointed out.

Nevertheless, what was most emphasised in the course of the qualitative interviews was mainly the socio-economic barrier to the hydropower projects. As seen in the chronological chart in Table 2, despite of the launch of the Hutgyi hydropower project in 2005, progress has not been effective. Rather, it is still in the final phase of a feasibility study (as of May 2014). The relevant stakeholder company at the interview explained that the project delay is mainly attributed to the long-term social opposition movement by the local minority (Karen Tribe) who has been constantly affected by shifts in political regime. Interestingly, this endless demonstration movement appears to involve an increasing number of international NGOs having an active voice in resisting mega-hydro power projects due to their environmental concerns.

Table 6 Barrier summary in Hutgyi and Tasang

<i>Hutgyi and Tasang</i>	
Technical	<ul style="list-style-type: none"> Distance to the closest sub-station
Economic	<ul style="list-style-type: none"> Difficulty to find multilateral/Thai lender Cost for long feasibility
<i>Legal</i>	<ul style="list-style-type: none"> No regulatory on environmental impact assessment
Political	<ul style="list-style-type: none"> No accessible channel to political updates for investors
<i>Social</i>	<ul style="list-style-type: none"> Local community's active opposition Various international NGOs' involvement Resulted in long investigation process prior to the project launch
Environment	<ul style="list-style-type: none"> Potential damage of biodiversity Unclear EIA standard

In hydropower projects, therefore, environmental barriers show a strong inter-linkage with social barriers, but, concurrently, with legal barriers (Table 6). The relevant legal barriers discussed by utilities, include such as a lack of legal arrangement for

environmental impact assessments, and a perceived uncertainty in regulatory change. To reiterate, it is the investors who are in the end required to pay the costs for complications, such as for a much prolonged feasibility study, caused by this legal insufficiency.

5 Recommendations

While coal-fired power projects tend to experience more issues related to economic barriers including project viability/bankability during the initial stage, and for project longevity, hydropower projects are likely to face social barriers, often interrelated with environmental issues. They seem initially plausible, however, a lack of necessary legal arrangement can be further indicated as the root which shapes, and is deeply embedded in, both types of barriers. Even so, in order to achieve a mutually beneficial “win-win” relationship in bilateral power trade by lifting such barriers, a few points can be highlighted as preliminary policy recommendations.

For both countries, to clarify the legal arrangement is highly encouraged, in particular to secure the FDI, which effectively assures project bankability for initial capital investment, and project sustainability for the longer term. First, the project bankability could be adequately addressed by establishing clearer legal arrangement for the intellectual property rights involved in foreign direct investment, or concession rights, in order for the project to be more bankable prior to launching the project. Equally importantly, is to set the adequate standards for the environmental impact assessment, preferably in line with international standards, not only to enhance the project viability when initial investment is about to be considered, but also to ease the social tension of local opposition movements against power development projects.

Second, for the long-term, legal coordination based on appropriate planning is likely to require another legal instrument to remove the challenges that investors have faced. Looking at the project longevity, the tax privilege and a clearly planned power development plan based on the appropriate demand and supply data collection, and, of course, the MoU between the concerned parties appear to be fundamental and pre-requisite conditions for achieving viable and sustainable project management. The reason primarily lies in the investors’ perception that clear legality of the FDI and governmental statements, for instance reflected in the PDP, means not only that officials in the government make a strong commitment, but also that the allocation of responsibility and benefits is clear.

Third it is also suggested, as an important policy intervention, to coordinate an appropriate Power Purchase Agreement between Myanmar and Thailand. As stressed by a number of IPPs, the current off-taking price for the electricity to be generated by these projects remains inadequate, and this appears to be one of the major concerns for IPPs to manage their project sustainably. As seen particularly at the coal-fired power generation project at Dawei, economic efficiency and sustainable profitability of the project are recognised as very important factors for investors, considering all the costs and risks involved in the project. It is difficult to find lenders under present conditions for which the long-term purchase price is low for the electricity supplied by, for instance, the EGAT.

With those legal arrangements, economic barriers should be largely removed while social barriers remain more incorrigible. For example, recent environmental movements regarding public acceptance of power plants cannot be covered by policy tools such as

Strategic Environment Impact Assessment. In this regard, risk-communications among stakeholders must be deepened in an inclusive manner, focusing on the local's livelihood.

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Notes

- 1 The detail is reported online at http://pari.u-tokyo.ac.jp/eng/event/smp131216_rep.html (accessed 29 August 2015).
- 2 The detail is reported online at http://pari.u-tokyo.ac.jp/eng/event/smp140404_rep2.html (accessed 29 August 2015).
- 3 The detail is reported online at http://pari.u-tokyo.ac.jp/eng/event/smp141002_rep2.html (accessed 29 August 2015).