

Connecting ASEAN through the Power Grid: Next Steps

Philip Andrews-Speed

SYNOPSIS

The ASEAN Power Grid (APG) was identified as a “Flagship Programme” within the ASEAN Vision 2020 as early as 1997, and was a key component of the first ASEAN Plan of Action for Energy Cooperation (APAEC) for the period 1999–2004. Progress in constructing the required connections has lagged behind expectations on account of a range of policy, regulatory and fiscal obstacles that have been well documented by ASEAN officials. The theme adopted by the new APAEC (2016–25) is “Enhancing Energy Connectivity and Market Integration in ASEAN to Achieve Energy Security, Accessibility, Affordability and Sustainability for All”. In order to accelerate the development of an integrated power market, ministers from four nations agreed in September 2014 to establish a pilot project to assess the feasibility of cross-border trade through the Lao PDR–Thailand–Malaysia–Singapore Power Integration Project (LTMS PIP). To date, it is not clear if this pilot project can be launched in the near future as envisaged, and the issue is still being deliberated by policy-makers. The accepted wisdom is that a regional power market can only be created in ASEAN after national power sectors have been liberalised. However, the success of the Southern African Power Pool in adapting the experience of the Nordic Power Pool to local conditions shows that a regional power exchange can be created between power industries that have not been liberalised.

KEY POINTS

- Energy market integration and connectivity lie at the heart of the current ASEAN Plan of Action for Energy Cooperation and are essential for building the ASEAN Economic Community.
- Progress in constructing the ASEAN Power Grid has been slower than hoped and the outlook for developing an integrated regional power market in ASEAN does not appear to be promising.
- Nevertheless, the experience of the Nordic power pool (Nord Pool), as applied in southern Africa and across all the states of India, can provide inspiration for ASEAN.
- Effective energy policy-making and market design requires ASEAN to boost its capacity for energy policy analysis at the national and ASEAN levels.

INTRODUCTION

The obstacles faced by ASEAN in enhancing energy market integration and energy connectivity, and in developing a regional power market are similar to those faced in

other parts of the world. The European Union, with its 28 member states, illustrates the scale of these challenges, and the time and political will needed to overcome them. In contrast, the Nordic states and sub-regions of the European

Union provide examples of how small groups of nations can make substantial progress in building regional electricity markets. This is well illustrated by the Nordic power pool (Nord Pool), one of the most successful power markets in the world that has been adapted and applied to build regional markets in southern Africa and India. These experiences provide useful lessons for ASEAN to address the challenges facing the APG project.

ANALYSIS

The ASEAN Power Grid: An Ambitious Endeavour

Physical connectivity between national power grids across ASEAN continues to develop through a series of bilateral, inter-state connections dating back to the 1980s, well before the formulation of the 1997 APG vision. The Heads of ASEAN Power Utilities/Authorities (HAPUA) completed its first ASEAN Interconnection Master Plan Study (AIMS I) in 2003, which concluded that it was uneconomical to create a single ASEAN grid. Instead, the study recommended 11 bilateral interconnections to be built over the period to 2019. A second study (AIMS II), published in 2010, was much more ambitious. In addition to identifying a larger number of interconnection projects, the new report concluded that it was economically viable to construct an ASEAN-wide power grid, but acknowledged that there would be intermediate steps involving geographically separate sub-systems.

By the end of 2014, 11 interconnections between 6 pairs of countries were in commercial operation, with a total capacity of nearly 3,500 MW. Most of these were already operational or under construction by the time the AIMS II report was published in 2010, and 7 of the 11 interconnections involve taking power to Thailand. All 11 projects are underpinned by bilateral agreements covering either power purchase or energy exchange. Another 13 projects are under development, totalling over 7,000 MW, all of them having been identified in the AIMS II report. Most of

them are two years or more behind the original schedule, but are due for completion by 2020. Another 20,000 MW or more interconnections are envisaged for the period after 2020.

Challenges to Building the Market

Whilst progress in constructing bilateral interconnections has been significant, it continues to lag behind the schedule set by the AIMS II report. The reasons for this lag are well understood and documented, including by HAPUA itself. National governments and state-owned enterprises have been unable, unwilling or slow to invest and, at the same time, many interconnection projects remain commercially unattractive to private investors. The major exceptions are the numerous projects that take power from Lao PDR to Thailand, as Thailand has a great need for more electricity and the pricing is commercially competitive.

The main constraint to progress in building the regional power market is seen to lie in the contrasting ways in which different countries manage their energy sectors. These gaps or mismatches in policy, structure and regulation have been the subject of studies carried out by HAPUA, the ASEAN Studies Centre (ACE) and the Asian Development Bank in 2013, and were explicitly recognised in the APAEC (2010–15). These studies all emphasised the need to harmonise legal and regulatory frameworks relating to power interconnection and trade, as well as technical standards and codes relating to planning, design, system operation and maintenance. In addition, it is necessary to develop institutional and contractual arrangements for cross-border trade including matters such as taxation, transmission tariffs, and third-party access. In this context, HAPUA recently completed a study on the taxation of cross-border power transactions, and has also commissioned studies relating to setting up an APG Transmission System Operator and an APG Generation and Transmission System Operating Group. In addition, it is promoting

public-private partnerships for investment. In parallel, the ASEAN Energy Regulators Network (AERN) has two working groups devoted to, respectively, technical and regulatory harmonisation, and the creation of a database of legal and regulatory documents.

Progress in Building a Regional Power Market

Relevant to efforts to build the ASEAN power market, steps have been taken in two sub-regions: the Greater Mekong Subregion (GMS), which includes two provinces in China; and the LTMS-PIP between Lao PDR and Singapore.

The strategy for the GMS has, for several years, been quite explicit that trade will evolve from initial sales through power purchase agreements (PPAs), through grid-to-grid trading to a wholly competitive regional power market. A Regional Power Trade Coordinating Committee was established in 2005 to lay the groundwork for this evolution. A key component of the Committee's work has been to establish a Regional Power Coordination Centre, which would synchronise operations across the national power markets. The need to create this Coordination Centre was first mentioned in October 2010. As of the end of 2015, the Centre had not been established because the GMS Member States have yet to agree on the country that should host it.

A more recent initiative to create a power market within ASEAN is LTMS-PIP. This idea was launched in September 2014 as a pilot project for trading power beyond immediate neighbouring countries by enabling electricity trade from Lao PDR to Singapore using existing infrastructure. The project would involve annual trade of up to 100 MW of power, to be wheeled from Lao PDR to Singapore. Whilst the technical aspects of the projects are clearly soluble and the infrastructure is practically in place, those relating to commercial arrangements and legal and regulatory matters will prove more challenging. In particular, the choice of LTMS as the most

attractive pilot seems to have been made with no prior analysis of supply and demand, and cost competitiveness. This was highlighted at the annual meeting of the ASEAN Ministers of Energy in October 2015, during which it was emphasised that more work was needed to explore further possible commercial arrangements for cross-border trading.

What Can Be Learned from the Nordic Model?

Nordic electricity market (Nord Pool) links the four main Nordic nations (Norway, Denmark, Sweden and Finland) as well as the Baltic countries (Estonia, Latvia and Lithuania), and is now also fully integrated with EU power markets. The development of the Nordic power market began in the early 1990s in response to two pressures: to improve the economic performance of national power sectors through market liberalisation, initially in Norway; and to take advantage of the complementary fuel mix in each of the four countries. In contrast to the top-down EU approach to market integration, the development of the Nordic power market took place on an incremental and voluntary basis, driven by the utilities themselves. Another key difference is that the regulation of the Nord Pool is based on principles agreed upon unanimously by the respective national governments rather than detailed rules designed by the European Commission.

Whilst the Nord Pool today is a sophisticated market involving highly developed nations with slow or negligible demand growth, the basic mechanisms can be adapted and applied to build regional power markets under quite different circumstances. The most notable example is the Southern Africa Power Pool, which allows the vertically-integrated and state-owned power companies in 12 southern African nations to trade with one another despite the absence of any liberalisation to domestic markets and the persistence of energy subsidies to consumers. These and other successes, in India for example, indicate a path to electricity market integration for

ASEAN to consider, provided it is approached in a pragmatic and stepwise manner.

The Nordic experience suggests a number of key actions that could be taken to support ASEAN energy connectivity, and that deserve to be considered by ASEAN policy-makers.

Enhance Capacity for Energy Policy and Planning

Coherent and effective national and collaborative energy policy and planning cannot be successfully achieved without the support of a region-wide cadre of energy professionals in government, research institutes, think-tanks and universities. Possessing both the skills and funds to carry out research and analysis, these experts and specialists should also make frequent contact with one another, as well as with policy-makers, both on a formal and informal basis. It is necessary to build a research network that can support the ASEAN Centre for Energy, and also deliver training and education.

Assess the Relevance of the Nordic Experience to ASEAN

The application of the Nordic experience to Southern Africa and India shows that it is possible to establish a regional electrical power exchange between states or sub-national entities even though some of the power industries remain fully state-owned and vertically-integrated, and consumer subsidies remain in place. It is worthwhile to assess what elements of this approach may be relevant to developing the ASEAN power market.

Encourage Power Utilities to Develop Plans for their Transition to the ASEAN Regional Market

The Nordic experience shows not only that the drive for developing a regional power market can come from the power industry itself, but also that the industrial entities may be the most appropriate ones to work out the modalities of the market and adapt to it. ASEAN's power utilities can play a useful role

in designing the regional power market, while at the same time developing a common approach to transitioning themselves to a commercial mode of operation.

WHAT TO LOOK OUT FOR

- A ministerial decision on the LTMS-PIP pilot project and the steps taken to implement it.
- Any decision by senior ASEAN officials to assess the relevance of the Nordic experience.
- Action at the ASEAN ministerial level to support energy research across academic institutions, and to enhance capacity for ASEAN energy policy formulation on an analytical basis.

Dr Philip Andrews-Speed is a Principal Fellow at the Energy Studies Institute of the National University of Singapore.

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