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Opportunities for Malaysia with an interconnected Asean grid

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A comprehensive interconnection of Asean's power grid has been a long-held dream, first emerging into serious discourse in the 1980s. Now, almost four decades later, we might finally be approaching a moment when the pressure for climate action moves this idea towards a more established reality.

The push for renewables in Southeast Asia

Electricity demand in Southeast Asia is growing at a phenomenal rate — forecast to triple in volume from 2022 to 2050, according to the Asean Energy Outlook. Meeting this surging demand while balancing the energy trilemma of secure, affordable and sustainable energy will not be easy.

Nations are increasingly looking to renewable energy sources to form part of the solution, with most Asean countries targeting a share of about 30% of renewable energy in the power mix by 2030. Asean benefits from having a diverse and varied renewable energy capacity to achieve these ambitions — substantial geothermal capacity in Indonesia and the Philippines, wind and solar in Vietnam, hydropower capacity in Laos and Malaysia, and significant solar energy capacity across the region, especially in Thailand and Malaysia.

However, integrating renewable technologies has its own set of challenges. It requires investment in both technologies and grid upgrades to transport renewable electricity from the point of generation to location of demand. Intermittent generation will also require careful investment to balance peak times of generation with peak demand.

Ultimately, the potential in renewables will also depend on local geography and weather. Malaysia has the advantage of significant hydropower resources as well as solar power potential, as shown by recent efforts to accelerate solar technologies through the Large Scale Solar (LSS) programme. Combining these opportunities with an interconnected Asean grid could unlock a positive new energy paradigm for Malaysia, putting it on a successful path to achieving its 2050 net



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zero targets and accelerating the net zero pathways of neighbouring countries.

Overcoming challenges with interconnections

Interconnections — high-voltage cables that connect the electricity systems of several countries — can play a critical role in mitigating the challenges of integration for renewables.

Interconnections allow the transfer of energy from areas with abundant energy generation at a time when other regions face a shortage. This would enable the region to integrate different sources of renewable energy with complementary supply profiles, facilitating the decarbonisation of Asean power systems.

Such trade in electricity allows for better stability and improved load balancing. It can also help optimise power infrastructure investment across the region as countries can invest in assets for which there is high potential in renewables, while relying on the Asean grid to supply energy from other sources of renewables where needed. This would enhance market efficiency, bring down costs and improve affordability. Alongside lower investment costs, interconnections can also reduce required reserve ratios and facilitate development in resource-rich emerging economies.

An interconnected power system also boosts resilience in the face of significant global pressures. Having a reliable regional supply of renewables can help reduce reliance on fossil fuels and mitigate fuel volume and price uncertainties from events such as the war in Ukraine and the recent volatility of Southeast Asian coal prices triggered by fluctuating demand in China.

When combined with an interconnected grid, Malaysia's significant renewable energy

capacity can provide a potential pathway for wider economic benefits, allowing it to export excess renewable energy to its regional neighbours in times of surplus.

The reality is that even Malaysia — where full national decarbonisation can be accelerated through carbon offset opportunities — would require new technologies to reach true net zero status for the power sector. This is likely to require a transition towards capital-intensive future technologies such as green hydrogen or carbon capture as solar power may be limited due to land availability and intermittent generation. These technologies will then increase the cost of true decarbonisation. However, Asean interconnection can help mitigate those costs, supporting a resilient and decarbonised power landscape for Malaysia and beyond.

Making the Asean grid a reality

Achieving an effective and interconnected Asean grid will require several key enablers. Regional funding mechanisms need to be established to push forward interconnection projects and fair financial settlements will be required to create a sustainable market for import and export.

Technical considerations include ensuring the appropriate technical standards are met for inter-grid connections, ensuring secure and accurate data flow and information to enable operations, and maintaining the reliability of power transmission across participating countries.

Countries need to ensure fair governance and transparent regulations on interconnection projects and operations. They should also promote forward planning in line with growing demand and define a clear process for project approvals. Most critically, alignment across governments of the region will be vital to drive this transition towards success.

One example of such success is the mature energy market of the EU, where interconnections enable the regional supply of electricity from varied low-carbon sources such as nuclear in France, hydropower in the Nordic countries, and solar and wind in Germany. Key coordinating institutions such as the

European Network of Transmission System Operators for Electricity and the Agency for the Cooperation of Energy Regulators help align efforts across more than 30 countries. The Energy Infrastructure Forum provides a platform for technical cooperation, while investment needs are addressed by EU funding instruments such as the Connecting Europe Facility. Power trading is enabled by the set-up of several power exchanges and a common regulatory framework helps harmonise the regulatory landscape.

Delivering on this interconnected future will take time. Europe took decades to develop the infrastructure we see today. Yet, Southeast Asia is a region on the rise, and as economies continue to mature, interconnected power infrastructure offers a chance to support that growth.

Why now is the time to drive action

There are signs of growing momentum for the Asean grid. After decades of limited bilateral power deals, the first tripartite power-sharing agreement in the region was established in 2017. This agreement saw Malaysia purchasing more than 100mw of hydroelectric power from Asean partner Laos, transmitted through Thailand's grid in a power wheeling agreement. The agreement was extended in 2019, with capacity expanding to 300mw. Singapore, which is renewables-constrained due to its limited land area, is completing the chain by participating in the Laos-Thailand-Malaysia-Singapore (LTMS) Power Integration Project to trial the import of hydropower from Laos.

These initiatives are promising and should encourage further regional cooperation on the development of the wider Asean grid. Given the time horizon required to plan and build the necessary regulatory, financial and physical infrastructure, the region must act swiftly to accelerate interconnection efforts and enable a green, secure and affordable energy future for all.

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