Unlocking Clean Energy Growth

Why Southeast Asia's Power Markets Need Reform

January 2026

By Marko Lackovic and Alexandre Salesse

Boston Consulting Group partners with leaders in business and society to tackle their most important challenges and capture their greatest opportunities. BCG was the pioneer in business strategy when it was founded in 1963. Today, we work closely with clients to embrace a transformational approach aimed at benefiting all stakeholders—empowering organizations to grow, build sustainable competitive advantage, and drive positive societal impact.

Our diverse, global teams bring deep industry and functional expertise and a range of perspectives that question the status quo and spark change. BCG delivers solutions through leading-edge management consulting, technology and design, and corporate and digital ventures. We work in a uniquely collaborative model across the firm and throughout all levels of the client organization, fueled by the goal of helping our clients thrive and enabling them to make the world a better place.

Contents

Executive Summary

Southeast Asia is entering a defining phase of its energy journey. Electricity demand has grown by roughly 24% in just four years, yet coal and gas still supplied most of that increase, even as renewable technologies become cheaper and more accessible. The challenge now is to take measured steps to adapt power-market structures so they can support the region's clean-energy ambitions.

Single-buyer models and long-term power purchase agreements have contributed to the twin goals of rapidly expanding power capacity while securing affordable electricity and energy security. Markets in the region are now wrestling with adapting these tried-and-tested structures to embrace the flexibility needed for renewables to fully show their value.

Policymakers are exploring varied approaches to transition within the trusted structures of a single-buyer market. This report reviews the latest regional efforts for transition and identifies six practical levers that can support markets and policymakers to pave the way to more renewable investments.

MARKO LACKOVIC
Managing Director and Partner

ALEXANDRE SALESSE
Partner

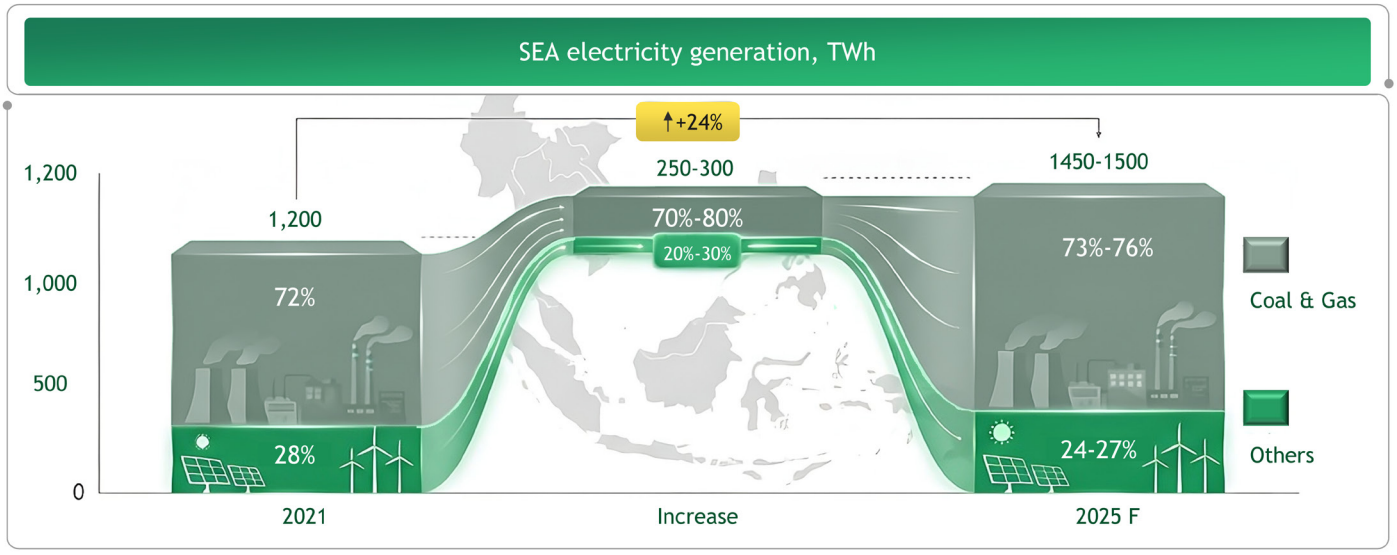
Rising power demand meets Southeast Asia's fossil-fueled status quo

Southeast Asia faces a charged question of future growth, as legacy generation sources create a complex future for electricity demand. Regional electricity consumption surged by 24% from 2021 to 2025—more than twice the global average [Exhibit 1.]

The bitter paradox is that while sustainable renewable sources become more affordable, coal and gas met 70% to 80% of new Southeast Asian electricity demand, not wind or solar. Why are cheaper renewables not seizing a larger share of this demand?

EXHIBIT 1

70-80% of Southeast Asia Electricity growth met by Coal & Gas



Source: ASEAN Energy for 2021, BCG Analysis based on Global Energy Monitor & macroeconomic forecasts for 2025

As with most energy policy, the answer is complex. The fossil-fueled status quo has deep roots in past policy choices. As decision-makers sought solutions to power the region's economic growth, Southeast Asian governments banked heavily on abundant domestic coal and imported gas, building large thermal plants under secure, long-term contracts.

The result of this policy approach is that many markets in the region optimized around steady coal power: grids are engineered with limited storage and interconnectivity, while market structures are regulated around pricing systems that assume fixed-price always-on supply. This design may keep the lights on, and has succeeded in securing stable tariffs for decades, but does it leave room for investment in cleaner energy?

This question is all the more relevant at a time when electricity demand is not only rising, but consumption and generation patterns are changing. Accelerating electrification means demand peaks are getting higher, while supply becomes more intermittent due to the nature of renewable generation.

Current systems are struggling to respond to this new reality. Electricity is a unique commodity, as power must be produced at the very instant it is consumed. A megawatt-hour delivered at midday in one city isn't interchangeable with a megawatt-hour needed at sundown in another province—electricity is non-fungible across time and geography.

The fossil-based status quo, however, treats power like a uniform product, with fixed prices that ignore when power is abundant or scarce, thus concealing the value that better timing-based signals could unlock.

Southeast Asia faces the need for change that reflects its own unique circumstances. With better-designed contracts—framed by competitive tenders, shorter agreement tenures, and transparent dispatch dynamics—local markets can actively support energy transition in a similar way to that of liberalized markets.

Without such reforms, however, the region risks locking in higher emissions for decades, missing out on the opportunities and rewards of cleaner, more flexible growth.

The Legacy of PPA-based power markets in Southeast Asia

Decades of state-led development have left Southeast Asia with electricity markets dominated by long-term contracts and monopolies.

In most countries, a vertically integrated national utility—often positioned in the role as 'single buyer'—controls the grid and electricity procurement, while private power producers participate via power purchase agreements (PPAs). This model was widely adopted in the 1990s and 2000s, and achieved its primary goal of rapidly expanding generation capacity with the help of foreign investments.

Indonesia offers a prime example, where state utility PLN takes on this role, operating as a classic, vertically integrated single buyer. Malaysia, Thailand, and Vietnam have their own adjusted versions of this strategy, leveraging 'unbundled' single-buyer models. In this model, generation is separated from the grid operator, but a central buyer—often a subsidiary or unit of the national utility—agrees and signs most PPAs.

The Philippines and Singapore stand out as exceptions within the region, having liberalized generation and retail markets. In these two countries, multiple generators compete to sell into a wholesale market with near-real-time bidding.

Long-term PPAs have been vital to finance essential power plants, but often favor fossil-fueled assets as a side-effect of terms designed to attract investors with guaranteed returns—limiting potential contributions from wind or solar projects. This is because governments, in order to ensure investors' confidence in new coal or gas projects, designed contracts that lock in fixed capacity payments.

In Indonesia, Thailand, Vietnam and others, many PPAs include minimum offtake clauses or take-or-pay clauses. These are designed to provide a minimum return to attract investors, but with the side-outcome of incentivizing the system operator to dispatch coal or gas plants before renewables.

Even in the Philippines, with its liberalized wholesale market, many generators still have power supply agreements (a form of PPA) that include capacity payments linked to utilization. These terms mean that coal plants are paid extra when they run below full capacity, ensuring their investors recover costs. The result is a bias toward dispatching thermal plants, no matter if cheaper renewable energy is available.

Another hallmark of Southeast Asia's legacy model with important implications for renewable power adoption is a history of regulated electricity tariffs and government control over prices.

Policymakers have historically kept electricity prices low and stable to spur industrial growth and appease voters. This has meant subsidizing fuel costs and averting price fluctuations—but also suppressing the price signals that a market would normally send.

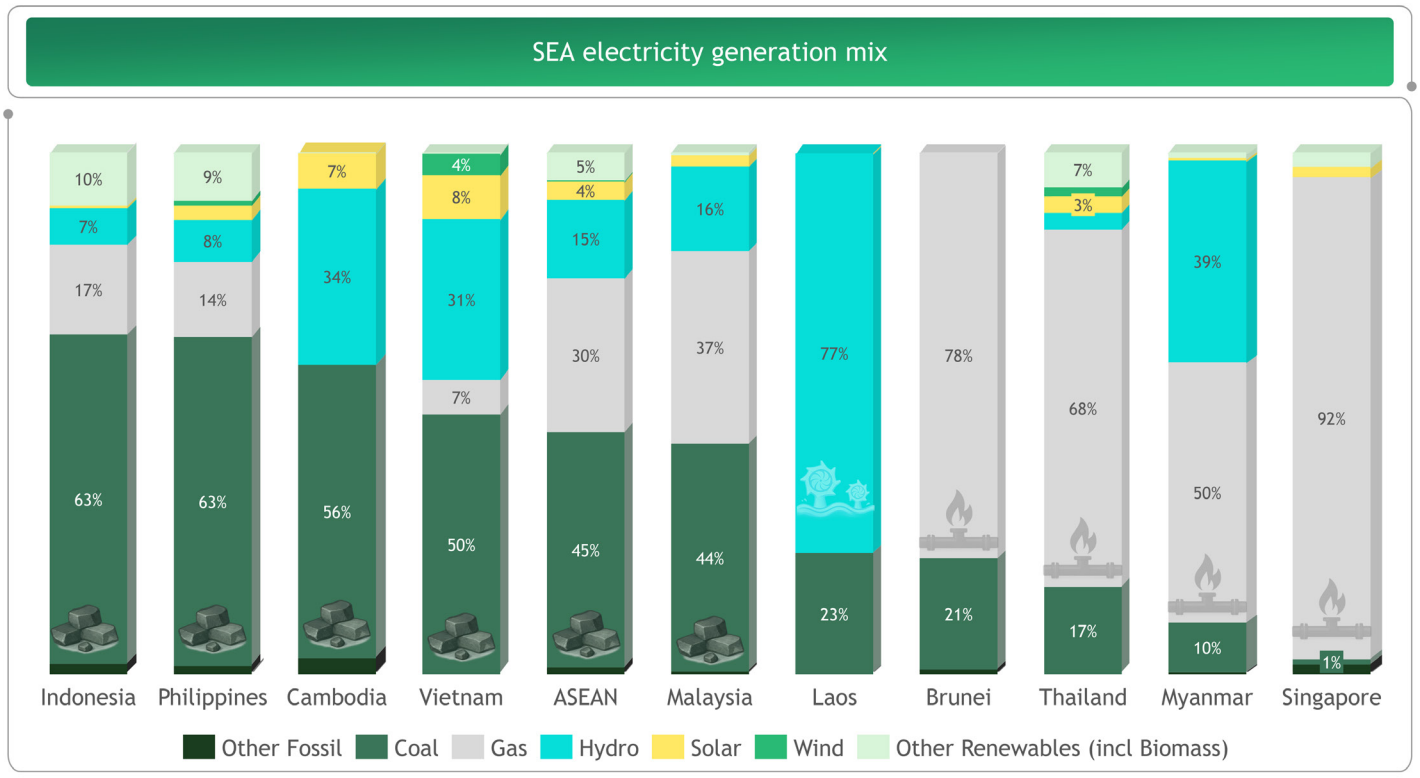
In practice, this caution translates into uniform tariffs and infrequent adjustments, with governments stepping in to approve or deny rate hikes. For example, in Malaysia, electricity tariffs are reviewed several times a year, but political pressure often overrides full cost pass-through. Indonesia, meanwhile, has traditionally frozen consumer tariffs and compensated PLN for any revenue shortfall. Such policies prioritize affordability and predictability—undeniably important social goals—but in doing so they also limit the visibility of cost advantages from renewables and mask important supply/demand price signals.

Southeast Asian markets are now poised in an inflexible equilibrium, with fossil-fuel sources dominating across the region. [Exhibit 2.] Fossil fuel generators were given assured returns through PPAs to secure capacity build-up. However, by their nature, these PPAs lock in certain dispatch orders—often coal first—meaning that when renewable supply does outrun demand, coal power is contractually obliged to be used and paid for, even when cheaper, low-carbon wind or solar is curtailed. The costs for consuming the more expensive conventional power are then picked up by the operators, and thus ultimately the taxpayer, while renewable project developers are deprived of some revenue.

Changing this paradigm is essential for Southeast Asia to harness new technologies and maintain reliability. It can be done without a liberalized market, but the transition has to be managed carefully to reflect legacy contracts and institutional constraints.

EXHIBIT 2

Electricity Generation Mix By Country



Note: 2024 for all countries except ASEAN, Indonesia, Laos and Brunei which uses 2023 data

Recent efforts towards flexibility enabling renewable investments

Southeast Asian countries have taken some important steps towards adopting more flexible power market structures in recent years. These changes can help improve how the market signals when and where power is needed—something that more mature electricity markets achieve through dynamic pricing—allowing renewables to show their true value. In Europe, for example, day-ahead and intraday markets now balance supply every 15 minutes.

In Southeast Asia, structural reform typically began with unbundling of legacy utility functions. In Malaysia, Tenaga Nasional Berhad (TNB) was reorganized into separate business entities—generation, system operator, single buyer, transmission, and customer services—each with distinct roles.

Such unbundling can, in theory, create a neutral entity responsible for system operations and power procurement, ensuring that the party allocating PPAs or dispatching plants is not the same one that owns generation assets. This separation reduces conflicts of interest, improves transparency in contracting, and helps build investor confidence in renewable energy projects—even where a single-buyer framework remains in place.

More recent regional reforms have tended to concentrate on improved contract design. Vietnam, for example, has taken steps from feed-in tariffs to competitive auctions and piloting direct power purchase agreements (DPPAs) that allow renewable producers to sell to corporate buyers. In Malaysia, Malaysian Electricity Supply Industry 2.0 (MESI 2.0) reforms shorten PPA term lengths and introduce auction-based capacity procurement, while Indonesia is revising some coal contracts and exploring limited direct sales where PLN does not provide supply. These steps shift procurement toward competition for dispatch and flexibility, while maintaining the single-buyer model that ensures system reliability.

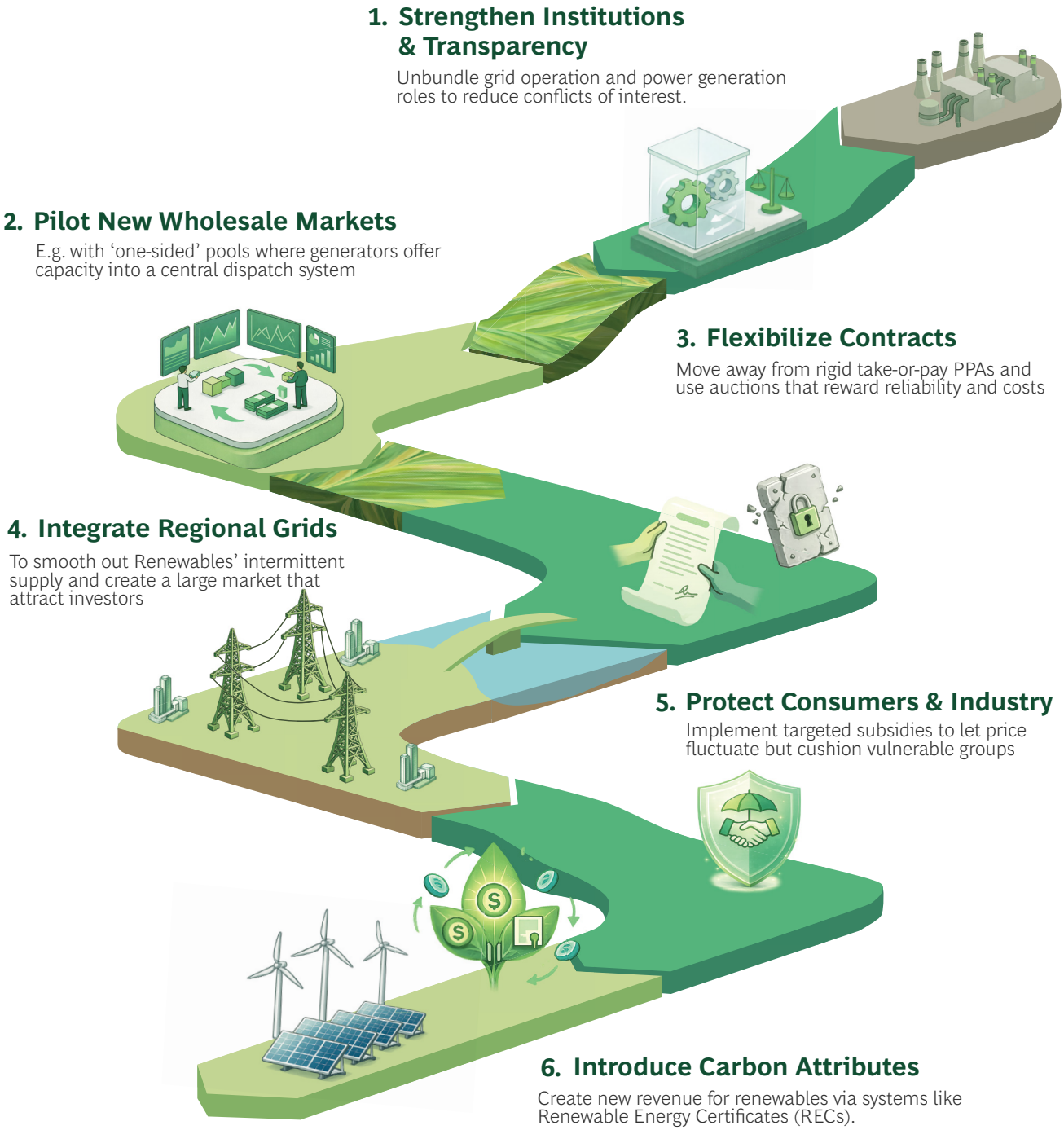
Several countries are going further to introduce third-party grid access. Malaysia now allows private generators to sell directly to industrial users through TNB's network, with similar arrangements being piloted in Vietnam and Indonesia. This approach introduces some flexibility to the single-buyer framework, with private-to-private transactions that can still generate revenue for the utility through wheeling charges.

A measured path forward for single-buyer markets

Transforming Southeast Asia's electricity markets from PPA-driven systems to renewable-friendly dynamics will be a delicate, but essential, endeavor—one that is achievable through a phased and pragmatic approach. At Boston Consulting Group (BCG), we have identified six strategic levers which can help nurture that transition based on our global experience. [Exhibit 3.]

EXHIBIT 3

A measured path forward for Southeast Asia's single-buyer markets



Lever 1: Strengthening Institutions and Transparency with Unbundling

In some Southeast Asian markets, the same organization still procures power, operates the grid, and owns the generation assets. This setup can create conflicts of interest and hamper investor confidence.

Unbundling these roles—even within a single-buyer framework—helps ensure that the buyer, the system operator, and generators operate with clear, separate mandates.

When the entity awarding PPAs or dispatching plants is structurally independent from those competing to supply power, procurement becomes more neutral and market access more predictable for renewable developers. Several countries, like Malaysia, are already moving in this direction. Vietnam is considering separating its system operator, The National Load Dispatch Center (NLDC), from national utility EVN. Meanwhile, Laos has taken initial steps with the spin-off of EDL-Gen from public utility Électricité du Laos (EDL). A further step to consider is enabling third-party access to the grid for private-to-private PPAs.

These important changes can help create a more level playing field for investors in renewables, all while maintaining the established function of a single buyer.

Lever 2: Pilots and Gradual Market Introduction

Pilots and gradual market introductions of wholesale markets or day-ahead trading platforms can be introduced alongside existing contracts. Initial markets for these pilots might be 'one-sided' pools, whereby generators offer into a central dispatch model.

This gradual approach allows system operators to gain experience with cost-based dispatch and pricing following a 'merit-based order' of dispatch, without immediately exposing consumers to volatility. Over time, the market can expand the scope of pilots, for example adding an intraday market for adjustments, and eventually allowing large consumers to buy directly from the pool.

The Philippines' Wholesale Electricity Spot Market (WESM) offers an important example. Launched in 2006, WESM took several years to mature and was extended region by region—Luzon first, then Visayas, then Mindanao. This experience shows the importance of testing systems and software, training dispatchers, and ironing out settlement processes in pilot areas before full rollout.

Lever 3: Flexibility in Contracts

Regulators can review and modify existing PPAs, where feasible, to reduce inflexibilities. This might mean renegotiating minimum offtake clauses or imposing terms that any new PPAs for thermal plants be 'flexibility-ready'—with a shorter duration, no or limited must-run obligations, and convertible to financial contracts if a market is established.

A strong recommendation from most energy transition experts is to consider limiting new baseload-only PPAs and instead procuring new generation through auctions that reward reliability and low cost. Malaysia's recent capacity auctions for solar farms under its Large-Scale Solar (LSS) scheme present an obvious example—setting competitive prices for renewables without a guaranteed dispatch. This approach retains investment security but still exposes generators to short-term market signals to optimize dispatch.

Lever 4: Integrating Grids and Providing Cross-National Investment Frameworks

A unified ASEAN Power Grid has been a long-discussed goal for the countries of the region. Under this vision, countries might import cheap hydropower from Laos or excess solar from Vietnam to offset shortages elsewhere.

Small steps towards this goal are already underway—Laos now exports power to Vietnam, Thailand, and Cambodia via dedicated lines, and even a tripartite power trade has begun where Thailand passes Lao power through to Malaysia under an energy wheeling agreement.

This regional approach offers a path to reduce the cost of transition by smoothing out each country's variability. It also creates a larger market that has improved potential to attract big energy investors.

A next, vital step to enabling international cooperation, is to provide a clear framework to investors rather than negotiating ad-hoc arrangements. For example, the Monsoon Wind Project, which sees Laos exporting 600 MW to Vietnam, famously spent 14 years working through Laotian and Vietnamese red tape and politics before being built in just 27 months.

This protracted negotiation barrier must be eliminated for future projects. Instead, these learnings should be distilled into ready-to-deploy contractual frameworks enshrined in government-to-government agreements that provide clear visibility and confidence for renewables investors.

Lever 5: Protecting Consumers and Industry During the Transition

Crucially, a calibrated reform should maintain focus on affordability. Policymakers can design mechanisms to prevent price shocks as markets open to protect customers during industry transition.

One tool which may be used is a two-part tariff or capacity-payment mechanism at the retail level—charging a predictable fixed fee for capacity availability and a variable fee for energy that reflects market prices. Vietnam is already trialing a two-part retail tariff for some customers to help EVN recover costs without sudden spikes in energy charges.

Another possible tool is targeted subsidies or rebates. Rather than universally suppressing the market price, governments can let the wholesale price fluctuate but cushion vulnerable groups—such as low-income households or small enterprises—with direct support or socialize the cost of hedging instruments.

Lever 6: Introducing Carbon Attributes

Introducing carbon attributes such as renewable energy certificates (RECs) or other verified environmental attributes can help Southeast Asian markets scale corporate demand for clean electricity and improve transparency in renewable procurement. Establishing standardized, government-endorsed carbon attribute systems would create valuable new revenue streams for renewable developers.

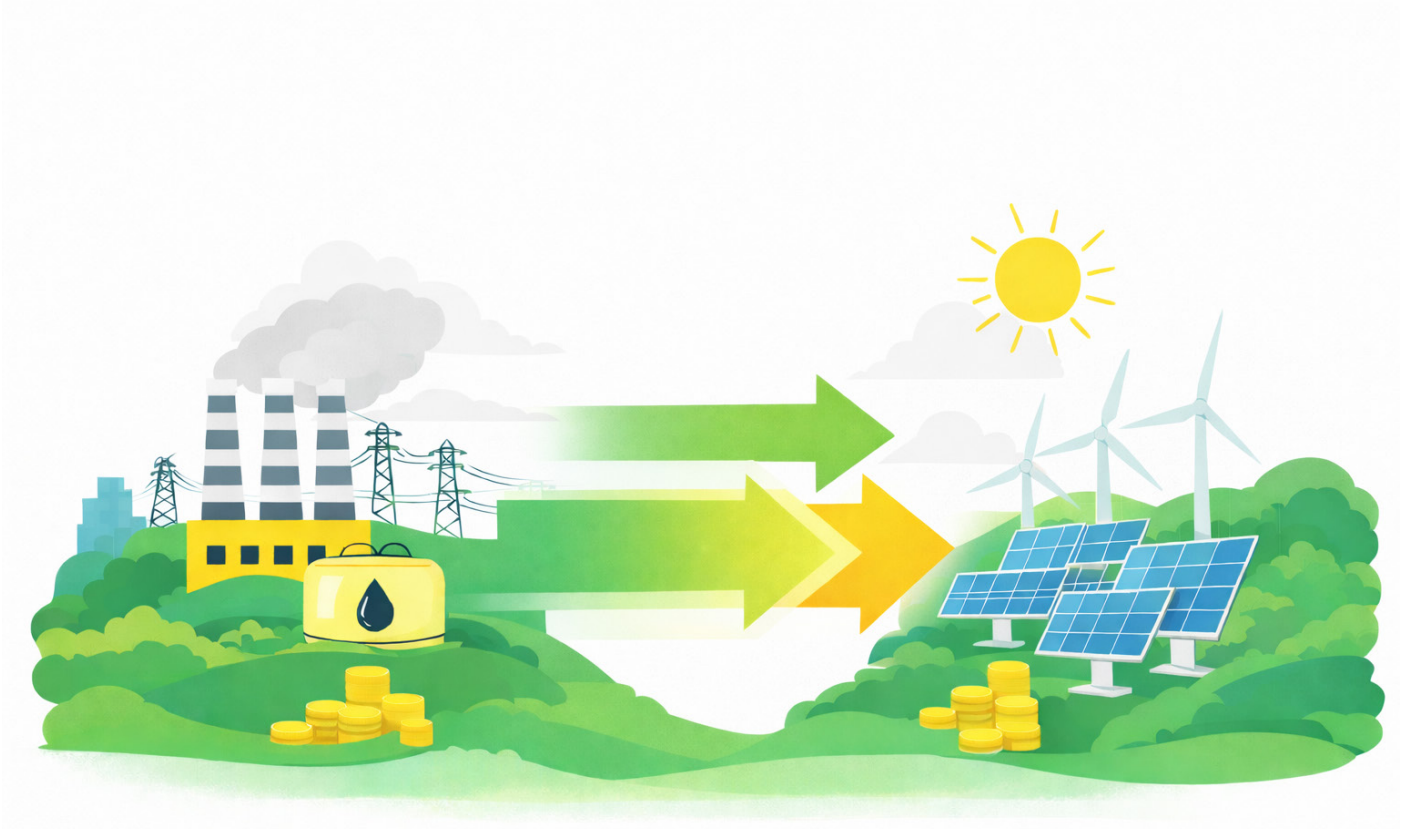
What's next to energize market transition?

In plotting the path ahead, it is important that countries focus on practical solutions and avoid wishful thinking. Thermal power will remain part of Southeast Asia's energy mix for a long time. The route forward is leveraging these plants to support renewable integration, not simply stand as obstacles.

This could mean redesigning their role to better fit this new paradigm—keeping some coal plants as reserve or peaking units rather than baseload, for example. Enabling this approach would require new kinds of contracts, or possibly new market products that value capacity and flexibility, not just energy.

The current PPA-heavy model locks in inflexibility at a time when flexibility is most needed. By embracing competitive market principles in a careful way, within existing single-buyer structures, Southeast Asian countries can attract the investment needed to power up renewables across the region. The decade ahead is an important window for these reforms to take hold—a chance to re-engineer power markets so that they support a cleaner and more dynamic energy future.

These challenges are not unique to Southeast Asia, and as such there is a rich repository of knowledge on what market designs might work, and which are most likely to fail. By tapping into this expertise, Southeast Asian regulators can tailor proven solutions to local conditions, and in doing so energize a more flexible and sustainable future for the region's power markets.



About the Authors

Marko Lackovic is a Managing Director and Partner in Boston Consulting Group's Singapore Office. You may contact him by email at **Lackovic.Marko@bcg.com**.

Alexandre Salesse is a Partner in Boston Consulting Group's Singapore Office. You may contact him by email at **Salesse.Alexandre@bcg.com**.

For Further Contact

If you would like to discuss this report, please contact the authors.