

SENTINEL ADVISORY
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APAC ENERGY TRANSITION · TRANSMISSION

The constraint is no longer generation. It's the wires.

Why grid infrastructure is becoming a defining capital-allocation and bankability risk of the next decade.

Across Asia-Pacific, renewables can now be financed, procured and built faster than networks can absorb, dispatch and transport their output. The binding constraint is migrating from generation to transmission and, more precisely, from engineering to institutions.

Grids are now the weak link

Generation can be financed and built. The network cannot keep pace.

The International Energy Agency is blunt: in many regions, insufficient grid capacity is now a critical bottleneck to connecting new generation, storage and demand.

~US\$1tn

Annual investment in generation — up almost 70% since 2015

~US\$400bn

Annual investment in grids — rising at less than half the pace

~1,700 GW

Advanced-stage renewable projects stalled in connection queues worldwide

~600 GW

Utility-scale battery storage waiting in the same queues

SOURCES: IEA (2025), World Energy Outlook 2025; IEA (2026), Electricity 2026: Analysis and Forecast to 2030. Queue figures are indicative for 2025.

The imbalance surfaces as network congestion, curtailment, delayed connections and, increasingly, negative wholesale prices.

Southeast Asia doesn't lack capital. It lacks conversion.

Announced does not mean built. Approved does not mean connected.

Of **~US\$540bn** of green capex announced across Southeast Asia's power and EV value chains through 2030, only **~US\$315bn** is on a credible path to deployment — a realisation gap that Bain and Standard Chartered put at **more than 35%**.

50–60%

of renewable projects in Vietnam, Thailand and Indonesia were cancelled between 2021 and 2025, Bain and Standard Chartered report — citing unclear PPA structures, permitting and grid-connection rules.

Bain and Standard Chartered give the region 24–36 months to get it right — with an additional ~US\$80bn of green capex in the balance.

SOURCE: Bain & Company and Standard Chartered (2026), Southeast Asia's Green Economy Report 2026: The New Calculus.

One constraint, five faces

The bottleneck is regional — but it does not present identically.

SENTINEL ADVISORY ASSESSMENT · TRANSMISSION CONSTRAINT STATUS, 2025–26

Australia

SEVERE

~6,000 km of new transmission by 2050 under AEMO's 2026 ISP (Step Change); long lead times, multi-jurisdictional approvals and social licence. Access-standard reforms are underway.

Vietnam

CRITICAL

Grid congestion and curtailment; network investment lag and EVN financial stress; slow offshore-wind delivery. The revised PDP8 commits to a major 500 kV and 220 kV build-out.

Indonesia

SEVERE

~48,000 circuit-km planned under RUPTL 2025–34 (roughly 4,800 km a year) across archipelagic grids with a structural resource / demand mismatch.

Mongolia

CRITICAL

Centralised, ageing lines with limited redundancy; load in the north, best wind in the south. A staged transmission programme is advancing with multilateral lender support.

South Korea

SEVERE

Compulsory curtailment; renewable zones distant from industrial demand; grid-facility shortage under KEPCO's transmission and distribution monopoly. KEPCO's 11th long-term plan expands the network to ~61,200 circuit-km by 2038.

SOURCES: AEMO (2026), 2026 ISP; Decision No. 768/QĐ-TTg (2025), revised PDP8; PLN, RUPTL 2025–2034; KEPCO (2025), 11th Long-term Transmission & Substation Plan; Sentinel Advisory analysis. Status ratings are Sentinel Advisory assessments.

Connection is not a completion event

It is a continuous performance risk that runs for the life of the asset.

FOR DEVELOPERS

- ✓ In constrained systems, treat grid-connection risk as a primary development risk — priced into the model with an explicit curtailment allowance, not a residual formality.
- ✓ Where network capacity is scarce, a deliverable connection-queue position is itself a valuable project asset — though regulators are increasingly purging speculative applications.

FOR LENDERS & INDEPENDENT ENGINEERS

- ✓ Where material curtailment is reasonably foreseeable, model it in the base case — not only as a remote downside sensitivity.
- ✓ The question is no longer “is there a connection agreement?” but “what will the network actually accept, when, and for how long?”

A right to connect is not a right to be dispatched — and only one of them repays the debt.

When the constraint becomes a dispute

The asset works exactly as designed — yet the power cannot be dispatched.

1 **Grid readiness & commercial operation**

Mechanical completion is reached, but energisation and connection are not — and the parties contest delay, liquidated damages and COD certification.

2 **Curtailment & deemed generation**

The plant is available, but dispatch is restricted — parties divide over whether revenue accrues on available or only on delivered output.

3 **Grid-code compliance**

System-strength, inertia or grid-forming duties are tightened after financial close — and the parties contest who bears the cost.

A treaty-level dimension can arise where state measures materially alter the regulatory framework after investment. The Spanish Energy Charter Treaty cases show the tension: states retain the right to regulate, and liability has turned on the treaty standard, the facts and how the change was implemented.

Institutional, not technical

The engineering is largely known. Delivery is not.

HVDC can be built. Grid-forming inverters and synchronous condensers can hold a low-inertia system together. These are increasingly mature or technically solvable problems. What is not solved is delivery: permitting, land acquisition, community consent and financially constrained utilities.

GENERATION

Standardised, modular, globally supplied and financeable. IEA: 1–5 years from planning to operation for solar PV and wind.

TRANSMISSION

Site-specific — land, permits, community consent and politics across vast geographies. IEA: 5–15 years to plan, permit and complete.

SOURCES: IEA (2026), Electricity 2026 · Author's field experience — Mongolia, Indonesia, Vietnam & Australia. Full references in the long-form commentary.

Capital can sometimes be raised in months. An institution able to route, approve and deliver a 500 kV line across three jurisdictions and hundreds of land parcels takes years to build.

The wire problem is the energy-transition problem

- ✓ Transmission, not generation, increasingly sets the pace of the transition.
- ✓ A connection agreement is a right to connect — not a right to be dispatched.
- ✓ In demonstrably constrained grids, treat foreseeable curtailment as an operating assumption — not merely a downside sensitivity.
- ✓ The binding limit is increasingly institutional capacity — not technology or capital.
- ✓ Ask the hard questions at feasibility — not when the dispute arrives.

“The wire problem is no longer somebody else’s problem to note in a risk register and then ignore. It is the problem.”

Has transmission become the critical path on your projects?

For the full long-form commentary, visit sentineladvisory.co/insights

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