

Behind ASEAN's ambitious power grid

We often talk about international trade in goods and services. Whether it's a net good or bad for the economy is up for debate. And Trump, for one, clearly thinks it's bad for the U.S., hence all the tariffs.

But there's something else that's traded across borders which doesn't feel very intuitive: electricity. Unlike electronics or crude oil, which can be shipped anywhere in the world through sea routes, electricity is bound by geography. You can only trade power through transmission lines. No transmission means no trade. Which means — an interconnected grid is everything.

India, unfortunately, doesn't have the most cooperative neighbours for this. We don't have many logical trading partners when it comes to electricity, and even with the [few we've tried](#), it hasn't exactly been smooth sailing.

Elsewhere though, this is a big deal. Europe is a [giant interconnected grid](#), and that's no small achievement. Building transmission infrastructure itself is a massive technical challenge, but getting so many countries to coordinate and run it smoothly is nothing short of remarkable.

Today, we're talking about another, lesser-known multinational grid that's closer to home: the ASEAN Power Grid. Conceptualized in 1997, it spent a long time stuck in limbo, but is now finally [gathering pace](#).

This story is about what happened there — what went right, what went wrong, why getting such projects off the ground takes so much effort, and whether interconnected grids are actually worth all the effort. By the end, we'll hopefully have learned a thing or two about power systems, a bit of geopolitics, and a lot about transmission.

Let's dive in.

What Is the ASEAN Power Grid, and Why Does It Matter?

Imagine a giant electricity network stretching across Southeast Asia, seamlessly connecting all ten ASEAN countries. That's the vision behind the ASEAN Power Grid (APG).



[Source](#)

The idea dates back to the late 1990s, but progress was sluggish for decades. Now, however, this long-held dream is gathering momentum after years of inertia.

Why the renewed interest? One obvious, big reason is *climate change*. Southeast Asian (SEA) nations are looking for ways to cut carbon emissions and meet their climate pledges, and they're realizing they can't get there alone. In other words, countries like Singapore, Vietnam, or Indonesia will find it much easier to shift to clean energy if they can trade electricity with neighbors.

A shared regional grid would let a country with surplus renewable power (say, hydroelectric dams in Laos or wind farms in Vietnam) export it to places facing power deficits, and vice versa. In fact, as per some expert estimates, better regional power integration could slash the cost of decarbonization by about [\\$800 billion \(11%\)](#) compared to each country going it alone.

Beyond climate concerns, practical economics are also at play. For one, SEA's power demand is soaring; the region is on track to see one of the [fastest electricity consumption growth rates](#) in the world over the next decade. At the same time, their governments are under pressure to keep energy affordable and reliable.

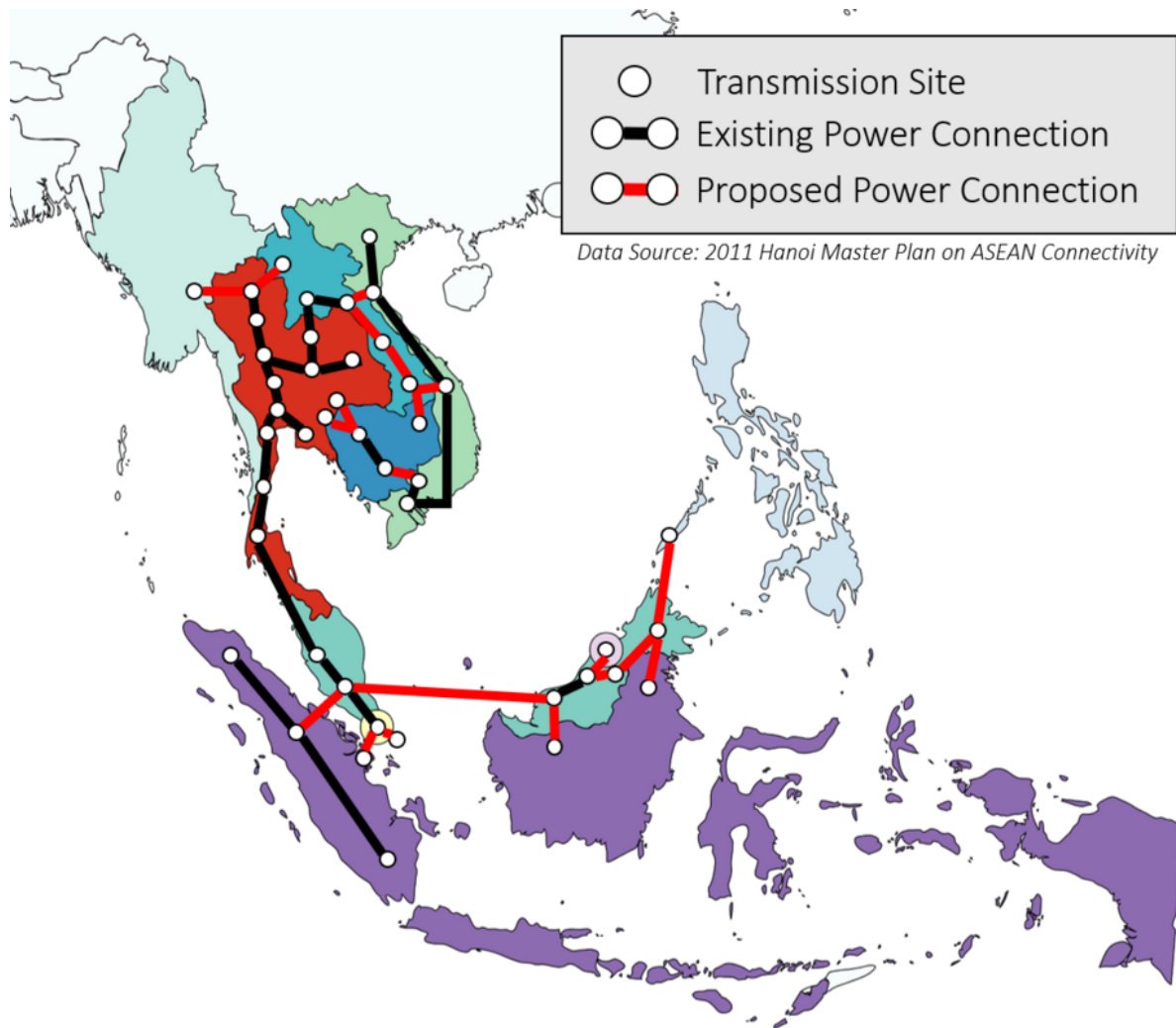
Additionally, a regional grid can resolve demand-supply mismatches. Laos, for instance, has an [abundant supply](#) of hydropower that it can't fully consume itself. On the other hand, Singapore is trying to decarbonize itself, but [doesn't have enough land](#) to install large solar farms or hydroelectric dams, and has always been reliant on imports for its own power needs. An ASEAN grid would solve both of their problems.

A unified grid potentially promises cheaper, more secure power for nearly 68 crore people. Instead of each nation building expensive backup power plants or suffering blackouts, they could buy electricity from a neighbor through the grid when needed. This kind of cross-border trading could lower overall generation costs and reduce reliance on polluting fossil fuels. A more integrated ASEAN grid might even trim consumer electricity prices by up to [3.9% across the region](#) — a win-win for wallets and the environment.

What's Actually Included in This Grid?

So, what does a “*regional power grid*” look like in practice? Rather than one physical mega-grid being built overnight, the ASEAN Power Grid is coming together through dozens of **cross-border links** and trading arrangements, piece by piece.

Think of it as connecting the dots: first between two neighboring countries, then gradually expanding those links into a wider network that spans the whole region. The ultimate goal is a fully integrated, Europe-style power system by 2045, where electricity flows freely across borders as needed. But getting there is a phased journey.

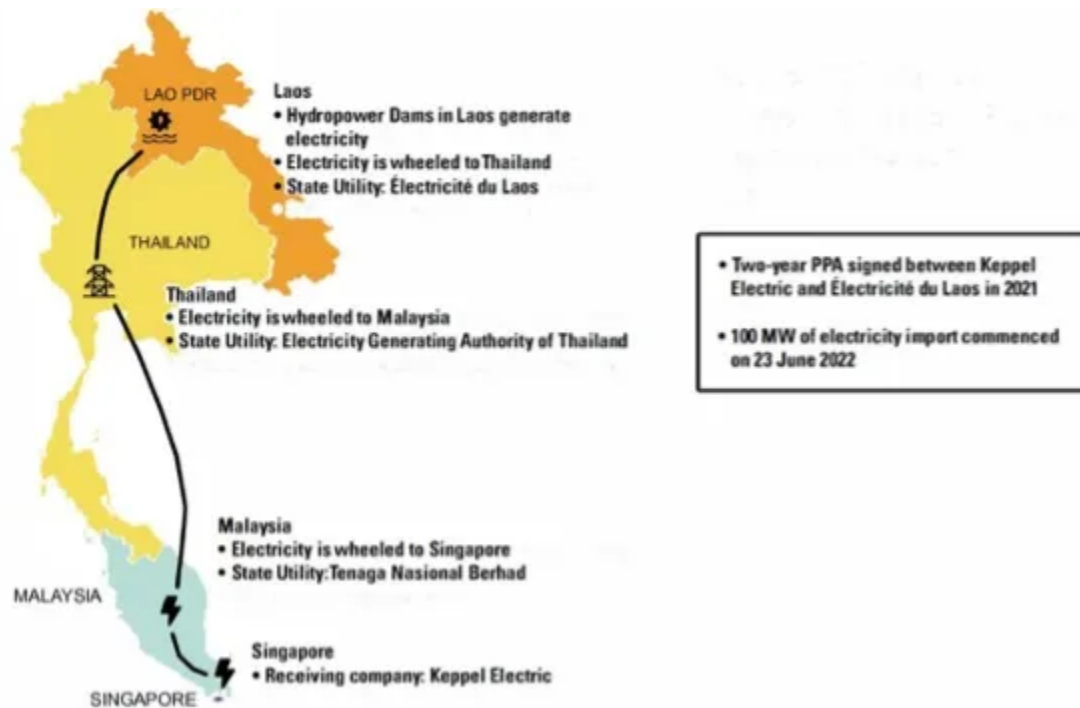


[Source](#)

The first phase is **bilateral connections** — building grid interconnectors between two countries. Many such links already exist: Malaysia and Thailand's grids are linked at their border, as are Thailand and Laos, Laos and Vietnam, and so on. These lines allow one country to directly buy power from another. For example, Thailand generally imports electricity from hydroelectric dams in Laos via dedicated transmission lines. These one-to-one deals prove that cross-border trade is feasible technically and commercially.

The second phase is **multilateral trading projects**. The next step is linking multiple countries in a single power exchange agreement, essentially expanding from bilateral to small multilateral pilots.

The most notable breakthrough here is the *Laos-Thailand-Malaysia-Singapore Power Integration Project* (or LTMS-PIP). It works like this: Laos generates hydropower and sends it into Thailand's grid; from Thailand the power flows to Malaysia, and ultimately into Singapore. This makes LTMS-PIP a **proof of concept** that multiple ASEAN countries can coordinate to buy and sell electricity as a group. However, it's worth noting that currently it's still a relatively *small*, one-directional deal largely relying on existing bilateral connections.



[Source](#)

Another ambitious multilateral initiative on the drawing board is the *Brunei-Indonesia-Malaysia-Philippines Power Integration Project* (or **BIMP-PIP**). This one aims to connect the power grids across countries with lots of islands and sea between them. Unlike the land-based links of mainland SEA, the BIMP-PIP will require **undersea cables** to hop between islands. The vision is for two-way flows of clean energy but it's a far more complex undertaking than LTMS-PIP, both technically and financially.

The third phase will aim at creating **one unified grid**. In the long run, by the 2040s, ASEAN's goal is to weave these bilateral and multilateral links into a fully integrated regional grid with an open electricity market. In practical terms, this could mean a

future where, say, a surplus of midday solar power in Indonesia could instantly be sent to help power factories in Thailand. Or, a wind farm in Vietnam could ramp up output to keep Singapore's data centers running after dark. That is the endgame.

So what's the holdup?

If the ASEAN Power Grid sounds so great on paper and is the need of the hour you might wonder why it isn't already a done deal. The truth is, building an integrated regional grid is hard, for a mix of technical, financial, market, and political reasons. Here's a breakdown of the key challenges holding the project back:

Technical challenges

It's tough to synchronize electricity systems across ten different countries. Power grids need common standards and *grid codes* to operate in unison, which ASEAN currently lacks.

Let's understand it with an example. India and EU operate their grids at 50 Hz frequency. However, India's grid often fluctuates around 49.5–50.5 Hz. The EU grid is kept extremely tight: usually between 49.95 and 50.05 Hz. These tiny differences matter. Cross-border links need both sides to stay stable; otherwise, power can trip or destabilize the network.

There's also the basic issue of reliability: if one country's grid experiences a blackout, how do you prevent that from cascading to neighbors through the interconnections? This is something that actually happened to [Spain](#) this year because of a fault in an interconnection line with France. These technical hurdles mean progress has been cautious and countries are careful about hooking up to a neighbor's grid if it could introduce instability to their own network.

Financial costs

Building an ASEAN-wide power grid is an expensive proposition. We're talking hundreds of billions of dollars in new infrastructure, like high-voltage transmission lines, subsea cables, substations, and so on. The Asian Development Bank (ADB) estimates the region will need to invest at least [\\$100 billion by 2045](#) just on cross-border transmission lines. ASEAN officials have put the total price tag for the full grid vision as high as [\\$764 billion](#).

The ADB and World Bank [recently launched](#) an ASEAN Power Grid Financing Initiative with the ADB committing \$10 billion to kickstart projects, but that's just a fraction of what's needed. Private investors are afraid of putting money into giant transmission projects unless they're confident they'll get paid back, which requires stable agreements between countries.

The cost challenge is especially high for the **island connections**: linking, say, the Philippines or Indonesia's archipelago to the mainland grid means laying very long, very high-capacity cables under the sea. That's vastly more expensive than building overland lines.

Market mismatches

Even if the physical wires are in place, you need compatible market rules to trade electricity smoothly. Here, ASEAN's diversity becomes an obstacle.

Some member states, like Singapore, have liberalized electricity markets – multiple power generators compete and trade on a wholesale market, and prices fluctuate with supply and demand. Others, like Laos, Malaysia, and Thailand, still use a “*single-buyer*” model where a state-owned utility company controls all power purchases and sales, somewhat like India.

These different market structures make regional trading tricky. For instance, Singapore might want to buy power in real-time from whoever offers the best price. But if Laos on the other end has only one state utility that sells at a fixed price under long-term contracts, how do you reconcile that? Each country has its own laws on energy imports/exports, tariffs, and monopolies. Harmonizing these rules or creating a regional marketplace for electricity is a slow process.

Political Will

To be fair, the technology exists, the capital can be raised, and markets can be designed. All of it becomes possible if there is enough political will. Energy policy touches on national sovereignty – governments can be uncomfortable about depending on neighbors for something as critical as electricity.

In ASEAN, decision-making is consensus-driven and member states guard their autonomy closely. Getting all 10 countries to agree on bold, long-term infrastructure

sharing is not easy. Some countries forged ahead on bilateral deals that suited them, but there wasn't always a collective drive to push the *regional* project as a top priority.

In short, technical, financial, market, and political issues have all conspired to keep the ASEAN Power Grid progressing slower than hoped. As of now, only about half of the 18 originally planned interconnection projects have been completed, and most of those are just basic two-country links. The fully integrated grid is still a long way off.

Conclusion

A fully connected ASEAN Power Grid could be transformative, cutting fossil fuel reliance, lowering energy costs, and boosting the region's competitiveness. It would let renewable power flow across borders to where it's needed, creating a more secure and efficient energy system. Beyond ASEAN, it could eventually anchor an "*Asian supergrid*" linking India, China, and beyond — a distant but powerful vision.



[Source](#)

If countries align, this grid won't only be a success story for renewable energy. It could actually light the way for a new model of cooperation between countries in today's tense times.