

Powering data centers in ASEAN with green energy

Southeast Asia is becoming a popular destination for data centers with the market projected to double by 2030 to reach a value of \$11.8 billion.

Six major ASEAN economies—Indonesia, Malaysia, the Philippines, Singapore, Thailand and Vietnam will become global data center hotspots, with 2.9 GW of new capacity currently in the pipeline, according to the Southeast Asia Energy Outlook of the International Energy Agency. With an average Chat GPT inquiry requiring 10 times more energy than a Google search – electricity demand will surge. In Malaysia demand from data centers is expected to contribute up to 30% of the nation's power consumption by 2030 while in Thailand it is expected to lead to a doubling in demand during the same time period.

To attract data centers, Thailand is offering investment incentive packages and these are receiving strong interest with proposals worth approximately \$3 billion already presented to the country's Board of Investment. In Indonesia investors are being enticed with tax breaks, relaxed foreign ownership restrictions, and streamlined procedures for profit repatriation.

Alongside these opportunities, data centers also bring challenges, with concerns raised over their energy use and environmental impact. For example, Meta is developing data centers in the US that cross the 1GW threshold with a physical footprint similar to Manhattan and use enough energy to supply one million homes. Because of similar concerns, in 2019 Singapore imposed a moratorium on new data center developments. While this was lifted in 2022, limitations on installed capacity remain, with stricter eligibility criteria requiring projects to be energy efficient and use green power. Consequently, industry players are looking at neighboring markets, especially Indonesia and Malaysia.

Since global tech companies such as Google and Microsoft aim to power their businesses with renewable energy, all ASEAN countries face the challenge of finding sufficient green energy and are turning to various options such as self-generation, corporate power purchase agreements and green tariffs.

One gap in the current landscape is regional coordination. Initiatives like the ASEAN Power Grid (APG) could enable cross-border trading of renewable electricity—allowing countries like Laos (hydro) or Vietnam (wind) to supply clean power to data-heavy economies like Singapore or Thailand. But such mechanisms remain underdeveloped.

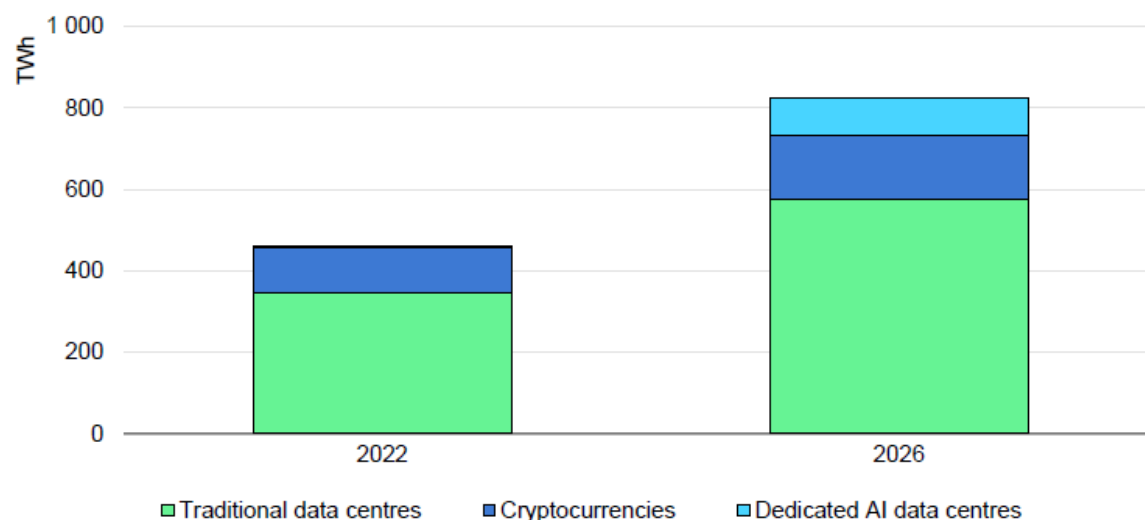
To meet Thailand's green energy needs the government is initiating projects such as the Utility Green Tariff (UGT) program and direct Power Purchase Agreements (PPAs). Indonesia meanwhile aims to become a regional hub with its vast stores of renewable energy plus digital data but the government is requiring certain conditions such as control over data to maintain its digital sovereignty. Malaysia meanwhile has introduced the corporate renewable energy supply scheme which allows third parties such as data centers the opportunity to buy directly from green energy suppliers to the national grid.

The global energy think tank Ember estimates that around a third of data center electricity demand in ASEAN in 2030 could be generated by solar and wind. This will also have to be

matched by energy efficiencies as data centers will need to develop systems to optimize operations and curb excessive energy demand such as time and location shifting of electricity demand.

For now the rapid growth of data centers in the region is outpacing the supply of renewable energy – it remains to be seen how successful governments around the region will be in tackling this challenge. Data centers are the new factories of the digital age but without clean power, they risk becoming the region's largest polluters.

Estimated electricity demand from traditional data centres, dedicated AI data centres and cryptocurrencies, 2022 and 2026, base case



IEA. CC BY 4.0.

Note: Data centre electricity demand excludes consumption from data network centres.

Sources: IEA forecast based on data and projections from [Data Centres and Data Transmission Networks](#); Joule (2023), Alex de Vries, [The growing energy footprint of artificial intelligence](#); Crypto Carbon Ratings Institute, [Indices](#); Ireland Central Statistics Office, [Data Centres Metered Electricity Consumption 2022](#); and Danish Energy Agency, [Denmark's Energy and Climate Outlook 2018](#).
