

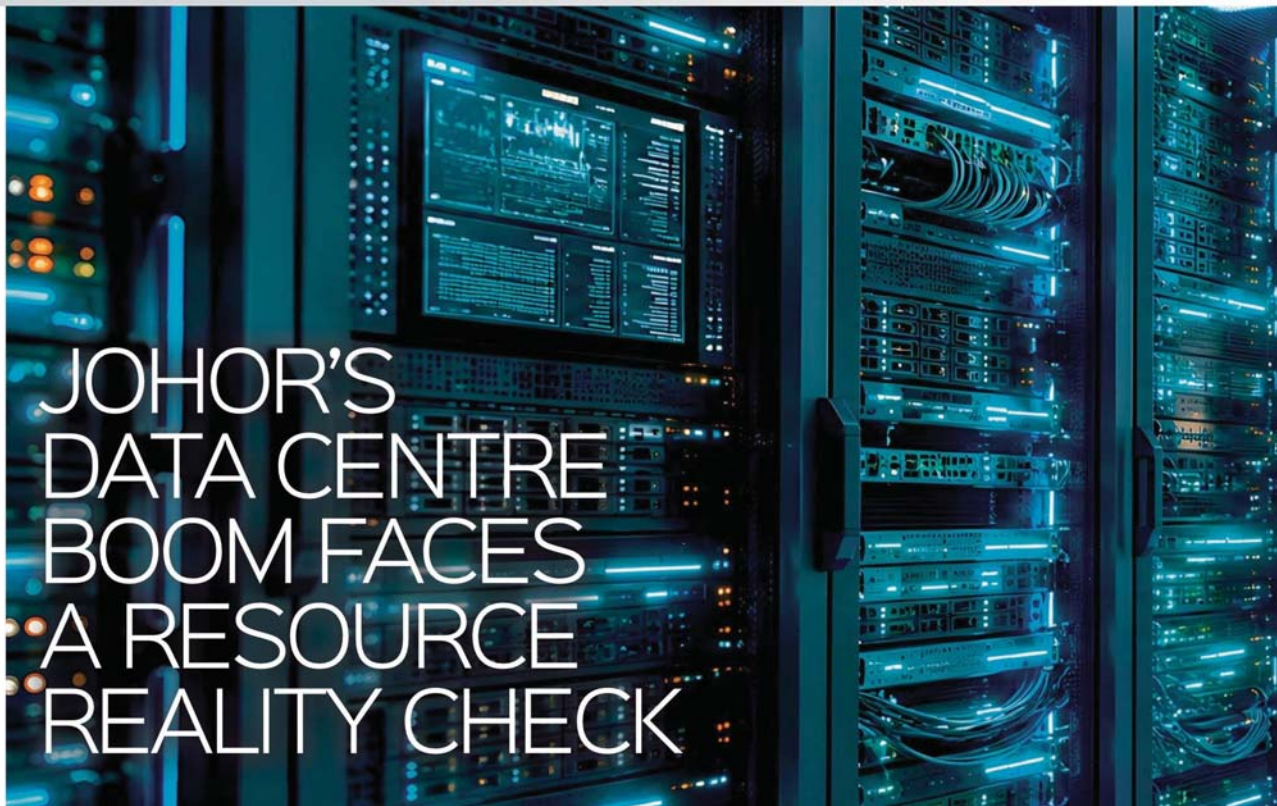
19 OCT, 2026

JOHOR'S DATA CENTRE BOOM FACES A RESOURCES REALITY CHECK

The Edge, Malaysia



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JOHOR'S DATA CENTRE BOOM FACES A RESOURCES REALITY CHECK

BY RACHEAL LEE

Johor's data centre boom is entering a new phase, one in which the biggest question may no longer be how much investment the state can attract, but how much it can sustainably support.

Johor already has about 1GW of operational data centre capacity, another 2GW under construction and a further 4GW to 5GW in announced investments, according to Roland Berger partner Mohit Gidwani. But as more projects compete for electricity, grid capacity and water, the limits of the state's infrastructure are becoming harder to ignore.

"Systemically, it is important to shift the question from whether Johor can attract data centres to how much can realistically be delivered and absorbed, and what economic value data centres generate in return for consuming increasingly scarce resources," he says.

The growth story remains compelling. Artificial intelligence (AI)-related investment continues to drive global demand, while Johor offers available land and power, favourable tariffs and renewable energy regulations, and geopolitical neutrality.

But the scale of the pipeline raises a bigger question about what comes next. Mohit estimates that the new capacity built by 2035 could represent 15% to 25% of Peninsular Malaysia's total installed power generation capacity — capacity that was built over decades to serve the entire peninsula.

The issue is therefore no longer simply whether Johor can accommodate more data centres, but whether its power, grid and water infrastructure can keep pace.

FROM CAPACITY TO VALUE

For policymakers, this points to the need to rethink how the success of the data centre industry is measured. Investment value and megawatts of capacity have traditionally been useful indicators of the sector's growth. But as resources become more constrained, simply attracting more capacity may no longer be sufficient.

"Malaysia should be selective about the data centres it attracts — and is already doing so," says Mohit, referring to the federal government's Data Centre Task Force that coordinates inter-agency approvals, as well as Johor's technical committee that evaluates developments and enforces more stringent requirements, including on energy efficiency and water usage effectiveness.

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— BILLEN, ROLAND BERGER



MOHIT GIDWANI

POWER IS MORE THAN A GENERATION ISSUE

While electricity demand is clearly rising, Roland Berger partner Dieter Billen says the challenge is more nuanced than simply asking whether Malaysia can generate enough power.

The country is already preparing for a significant expansion of generation capacity, driven not only by data centres but also by further industrialisation and rising household electricity consumption.

On the renewable energy front, the Large Scale Solar 6 (LSS6) programme launched in July has a total capacity of 2.65GW. The Corporate Renewable Energy Supply Scheme (CRESS) also allows corporate users, including data centre operators, to procure renewable electricity directly from renewable energy projects, with several CRESS contracts currently being negotiated with data centre companies.

"[At the same time] the Energy Commission has conducted tenders for new gas-fired generation capacity. The latest NEWGEN26 tender targets 6GW to 8GW of capacity, while additional regasification capacity is being planned as Malaysia prepares for greater reliance on imported gas," says Billen.

"Nuclear power is also being considered, although no official decision has been made and it would take at least a decade for the first plant to come online."

The more immediate constraint is therefore not necessarily national generation capacity, but whether sufficient electricity can be delivered to the right locations, he explains.

"It's not only whether enough power will be available nationally, but whether it exists at a specific site, with adequate substation and transmission capacity, without multi-year queueing," he notes, adding that this is particularly relevant as demand becomes concentrated around established data centre clusters such as Sedenak Tech Park and Nusajaya Tech Park.

Tenaga Nasional Bhd (KL:TENAGA) is responding with a cluster-based grid strategy, modernising the grid and concentrating transmission infrastructure investment along identified growth corridors, with Johor among the key active clusters.

But Billen cautions that the pace of data centre development means new generation capacity will have to come online quickly enough to match demand.

Malaysian Photovoltaic and Sustainable Energy Asso-



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With the influx of data centre in Johor, the issue is whether its power, grid and water infrastructure can keep pace

ciation (MPSEA) deputy president III James Lee says the country's electricity grid is already approaching its buffer threshold, with maximum electricity demand at about 22GW against total generation capacity of 25GW. "Approved data centres could add another estimated 6GW of demand, [and] this rapid influx creates a strong possibility of near-future energy shortages," he says.

The timing is critical. Conventional gas turbine power plants can take three to four years to develop, while some data centres are expected to come online by 2028.

This makes solar power a potentially important gap-filler as solar projects can typically be deployed within 1½ to two years, says Lee. Malaysia has the technical capability to meet much of the additional energy demand through renewable sources, particularly solar, he adds.

"While floating solar on unutilised water bodies is an emerging option, rooftop solar lacks the scale needed for massive data centre loads. Other renewable sources such as wind, biomass and hydro present reliability, feedstock competition or environmental challenges that make them less practical than solar."

But adding solar capacity alone will not resolve the issue. The intermittent nature of solar generation means energy storage will become increasingly important, particularly in a country where cloud cover can cause frequent fluctuations in solar output.

"Without clear operational definitions for batteries, operators risk 'stranded capacity', a scenario where excess solar generation is insufficient to fully charge a battery but also cannot be absorbed by the grid. Grid-scale standalone batteries, such as those in the MyBeST (Battery Energy Storage System) programme, can store excess energy during low-load periods to efficiently support the grid infrastructure," says Lee.

CRESS NEEDS GREATER CERTAINTY

CRESS offers another route for data centres to secure renewable electricity. Under CRESS, corporate users can purchase green energy from off-site renewable energy developers, potentially allowing large electricity consumers to support additional renewable generation without relying entirely on on-site installations.

But Lee says the scheme has faced a significant challenge in the form of wheeling charges.

"These charges can increase by up to 15% every three years, which heavily disrupts the financial modelling re-



Grid access is monopolised and highly regulated by TNB. This dynamic, combined with physical grid congestion and limited transparency regarding infrastructure upgrades, slows renewable energy integration."

— LEE, MPSEA



JAMES LEE, MPSEA DEPUTY PRESIDENT III

quired for corporate power purchase agreements. This has been temporarily addressed via the recent release of the accelerated CRESS," he adds.

Under the accelerated scheme, the system access charge has been reduced from 20 sen per kWh to 14 sen per kWh, while contracts are required to have a fixed 10-year period. Solar photovoltaic farms under the scheme must also be commissioned by December 2028.

"Grid access is monopolised and highly regulated by Tenaga. This dynamic, combined with physical grid congestion and limited transparency regarding infrastructure upgrades, slows renewable energy integration," says Lee.

For data centres, this creates another layer of planning complexity. Securing renewable electricity is one thing, but ensuring that the electricity can physically reach the facility when required is another.

WATER EMERGES AS THE OTHER CONSTRAINT

If electricity is a challenge of generation and delivery, water presents a more immediate physical constraint for Johor.

"Water is the other major constraint because Johor is itself water-stressed," says Roland Berger's Billen.

He notes that Johor in late 2025 moved to temporarily defer some water-dependent expansion, pause approvals for less efficient Tier 1 and Tier 2 facilities and push operators towards reclaimed water and non-potable cooling sources, while tightening water usage effectiveness requirements.

The direction is significant because data centre operators are increasingly being asked to look beyond the availability of land and electricity when selecting sites. One example of how operators are responding is ZDATA Malaysia's data centre in Gelang Patah.

ZDATA acquired the 38.56 acres from Tropicana Corp Bhd (KL:TROP) in 2024. The development is being carried out in phases, with 18 acres in Phase 1 and Phase 2 already completed and operational. The remaining campus is targeted for completion by end-2027, according to a spokesperson for ZDATA.

Rather than relying on fresh municipal water for cooling, ZDATA says its facility uses 100% reclaimed water. "We have set up purpose-built treatment facilities in two IWK (Indah Water Konsortium) plants, which enable us to process treated effluent water in these water treatment plants to cool our data centre operations," says the spokesperson.

"Our approach benefits the local community as it ensures our project does not compete with residential water supply. That means more potable water stays available for local families and communities, with the emphasis on efficiency and 100% reclaimed water capability."

The result is a closed-loop recycled water cooling system that uses treated wastewater instead of fresh municipal water for cooling. ZDATA was also one of the first signatories to the Johor Special Water agreement.

MPSEA's Lee notes that cooling systems present a potential conflict with public water supply, particularly during periods of drought. Technologies such as closed-loop cooling and desalination can reduce the pressure, but both come with significant cost implications.

Meanwhile, land remains a relatively lesser constraint. Billen says Johor still has significant land available at relatively low cost, but rising electricity and water tariffs are beginning to narrow that cost advantage. This could eventually influence not just where data

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centres are built, but also how they are designed and operated, he adds.

THE DECARBONISATION DILEMMA

Another challenge is whether Malaysia's energy transition can keep pace with the rapid increase in electricity demand.

Under the National Energy Transition Roadmap (NETR), Malaysia is targeting renewable energy to account for 40% of generation capacity by 2035 and 70% by 2050, compared with 31% in 2025. But installed capacity does not necessarily translate directly into electricity generation.

Roland Berger's Billen points to the July 2026 electricity mix in Peninsular Malaysia, when renewables accounted for only 4.8% of electricity generation, comprising 2.6% solar and 2.2% hydro. Coal and gas remained dominant at 57.3% and 37.9% respectively.

"[Hyperscalers and other major data centre platforms] are likely to continue building in grids that are not yet fully green, but their location decisions may increasingly depend on whether there is a credible pathway to additional renewable supply rather than simply the current grid mix," he says.

Mechanisms such as CRESS could help provide that pathway.

ZDATA, for instance, has signed a memorandum of understanding for a large-scale, long-term green energy supply programme under which renewable energy generated by two local solar farm assets will be channelled to its site. The programme is scheduled to supply 630,000MWh of renewable energy annually from 2028.

For MPSEA's Lee, the transition also represents an opportunity to strengthen Malaysia's domestic renewable energy industry. He says Malaysia already has a mature local renewable energy industry capable of supporting the expansion, even though local companies face competition from foreign players offering lower project costs.

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ZDATA says its facility in Gelang Patah uses 100% reclaimed water

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Going forward, the key measure should increasingly be the economic and digital value created per unit of constrained resource, particularly electricity and water.”

— MOHIT, ROLAND BERGER

ROLAND BERGER



PLANNING FOR 2030

By 2030, a genuinely sustainable data centre ecosystem in Johor would look quite different from one measured primarily by the number of projects announced or megawatts committed.

Roland Berger's Billen envisages resource-efficient data centres operating with a high share of renewables, whether through CRESS or on-site generation, alongside sufficient transmission and substation capacity.

On the water side, treated wastewater could become the norm for data centre cooling, supported by dedicated pipeline infrastructure serving both data centres and nearby industrial customers.

ZDATA's experience points to a possible model: using treated wastewater specifically for cooling rather than competing with municipal potable water supply. But getting to this point will require significant investment in power and water infrastructure, including renewable generation, battery storage, grid upgrades, wastewater treatment and pipelines.

The bigger question is who should pay for it.

Data centre operators can bear part of the investment burden, but Billen argues that the infrastructure should form part of a broader ecosystem and be shared with other industrial users where possible. That points to more cluster-specific planning, allowing infrastructure investments to be shared and making the economics more viable for all parties.

For Mohit, the key metric is increasingly straightforward: the economic and digital value created for every unit of constrained resource, particularly electricity and water. "Going forward, the key measure should increasingly be the economic and digital value created per unit of constrained resource, particularly electricity and water," he says.

"However these measures have to be rooted in commercial reality and shouldn't scare away investment. Policy-makers could consider elements such as speculative versus committed capacity and the timeline towards utilisation, local expenditure per MW and so on."

He adds that data centres themselves are not highly labour-intensive once operational, so their wider value comes from developing local engineering and technology supply chains, attracting cloud and AI infrastructure, and enabling downstream digital activity across the economy.

As Johor enters the next phase of data centre expansion, that distinction could become increasingly important. The next measure of success may not be how many gigawatts the state can attract, but how much economic value it can generate from every gigawatt, and every drop of water it consumes.



As more projects compete for electricity, grid capacity and water, the limits of Johor's infrastructure are becoming harder to ignore



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