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Scaling solar power to meet surging industrial demand

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Despite structural barriers, industrial users are making advanced RE strategies

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Accounting for 28% of total energy consumption (19,016 ktoe) in 2024, the industrial sector stands as Malaysia's second largest energy user, according to the Energy Commission. To achieve net-zero emissions by 2050, the National Energy Transition Roadmap (NETR) prioritises a shift toward renewable energy (RE).

Rising energy costs under Tenaga Nasional Bhd (TNB)'s automatic fuel adjustment framework, coupled with government initiatives such as the Green Investment Tax Allowance (GITA), the Corporate Renewable Energy Supply Scheme (CRESS) and the Large Scale Solar (LSS) programmes have accelerated solar adoption among industrial players. However, widespread integration remains constrained by scalability, grid access and regulatory hurdles, even as electricity demand surges due to Malaysia's rapid expansion into data centres.

According to Solarvest Holdings Bhd (Solarvest) executive director and group chief executive officer Datuk Davis Chong, solar energy adoption continues to confront issues such as gaps in energy generation (intermittency), the resulting need for grid balancing and finding an equitable offset mechanism for excess energy producers (settlement). In a Q&A session with StarProperty, Chong also highlighted that industrial solar energy adoption is maturing even as it grapples with the above hurdles.

Towards the cutting-edge

StarProperty: Solarvest was established 14 years ago. During this period, how would you describe the shift towards RE in the industrial spaces?

Chong: Over the past 14 years, clean energy has shifted from an ESG discussion into a core business decision. Industrial customers now consider energy cost, carbon reduction, energy security and long-term competitiveness together.

Malaysia has about 32% of installed RE capacity to date. Achieving a 70% RE mix (by 2050 as per NETR target) will require stronger grid infrastructure, better forecasting capabilities and the development of smart-grid systems.

As RE penetration increases, the national grid must become more flexible and intelligent. Digital grid management, demand response and automated balancing systems



Chong said while many businesses want to procure renewable energy directly from developers, adoption slows down due to limited grid access.

will be critical to managing variable renewable generation more efficiently.

The engineering bottleneck has therefore shifted. It is no longer simply about whether we can install more solar panels. It is whether we can coordinate variable generation, storage and industrial demand reliably in real time.

StarProperty: Has technology improved to allow for RE to scale at even the construction-related hard-to-abate industries?

Chong: The energy system is also moving from a one-way, centralised power supply towards a more distributed model, where businesses, factories, commercial buildings and communities can generate and manage their own electricity using solar and Battery Energy Storage System (BESS).

We are witnessing a transition where the value has shifted away from the simple procurement and installation of hardware toward the sophisticated orchestration of energy assets. An industrial manufacturer may secure a combination of solar PV, onsite BESS and have energy efficiency strategies in place to achieve energy-saving goals. Technology also has improved materially. Higher-efficiency solar PV, BESS, electrification and AI-enabled energy management now allow renewable energy to support much larger industrial loads with far greater visibility and control.

The companies that will dominate the next decade will not necessarily be the ones with the largest installation footprints but those that:

- Manage the system, integrating storage, grid management and AI optimisation into a single, seamless solution.

- Asset-owners with strong governance as investors are increasingly prioritising entities with long-term, inflation-protected,



An aerial view of a solar-powered industrial facility in Malacca. Pic courtesy of Solarvest.

recurring cash flows while maintaining high ESG standards.

- Have cross-border capability and strategic partnerships to bridge the gap between global green finance and local asset deployment.

Digitalisation is central to this transformation. Digitalisation improves many facets of energy management, from performance analysis, grid management, energy input and output to optimising power quality. Without digital systems, renewable assets remain isolated hardware. With digitalisation, they become measurable, predictable and optimisable.

Solarvest integrates AI-powered smart monitoring systems and digital performance analytics into our projects. Most of our projects are equipped with automated alert mechanisms that detect anomalies early, accelerate response times and enable proactive maintenance before issues escalate. These capabilities have over a 20- to 25-year operating life, helping optimise system performance and reliability, maintain stable energy generation and maximise clean-energy output.

Grid barriers and market reform

StarProperty: Modern industrial parks, some of which are green-certified, are becoming more common in Malaysia. What is the main challenge for the industrial parks to adopt RE wholesale, rather than piecemeal adoption by individual occupiers?

Chong: One of the biggest structural barriers is access to sufficient renewable energy at the park level, particularly through greater third-party access to the grid. Most industrial parks cannot meet their full electricity requirements through onsite solar alone, especially as tenants become more energy-intensive.

Today, many businesses want to procure renewable energy directly from developers but grid access limitations can sometimes slow down adoption. If third-party access is expanded, it would create a more open and competitive electricity market.

CRESS is an important market reform because it enables corporate consumers to procure renewable electricity directly from renewable-energy developers through the grid. The reduction in the System Access Charge to 20 sen per kWh for firm supply and 40 sen per kWh for non-firm supply was a positive intervention.

However, grid-access cost remains a major component of the final delivered tariff. The market will not adopt CRESS simply because the mechanism exists. It will adopt CRESS when the overall economics, connection process and contractual structure are competitive, predictable and financeable.

For energy-intensive users, particularly data centres, access to reliable and competitively priced clean electricity is now part of site selection. If Malaysia cannot offer that combination, investors will compare us with alternative regional markets.

Removing structural opacity

StarProperty: What are your proposals to address the challenges?

Chong: CRESS is the right platform but the next step is to make it bankable. For developers, banks and corporate buyers, the key is clarity on charges, settlement, curtailment (a deliberate imposition of limit on power generation) and approval timelines.

First, there should be greater clarity and predictability on system access charges and wheeling-related costs. If the charges are too high or

uncertain, the economics become difficult for both developers and off-takers.

Second, there should be clearer treatment of intermittency, balancing and settlement. Solar generation and data centre consumption do not perfectly match. The commercial model needs a transparent way to manage mismatch, balancing cost and backup supply.

Third, CRESS should allow more flexible contracting structures. This includes aggregated demand, portfolio-based supply, multi-site arrangements and possibly hybrid solar-plus-BESS structures.

Curtailment risk should be clearly allocated. If a renewable energy producer is curtailed due to grid constraints, the commercial treatment must be defined upfront so projects can be financed.

StarProperty: What is your outlook on the pace of RE scalability to claim a significant share of the country's 8.4GW data centre pipeline (based on total energy supply agreement signed with TNB as at early Sept)? Could you give a best estimate?

Chong: The opportunity is substantial but we must define the numbers correctly.

The 8.4GW figure represents secured maximum demand across Malaysia's data-centre pipeline. It does not mean that 8.4GW of data-centre load is being consumed today. TNB reported that approximately 4.5GW of projects have been completed, while reported actual load utilisation remains much lower because data centres energise racks and ramp up their electricity consumption progressively.

For an individual hyperscale data centre, onsite solar will normally provide only a relatively small part of its electricity requirement because of land and rooftop constraints. The much larger opportunity is therefore offsite renewable generation connected through the corporate power purchase model, from the grid, complemented by BESS and intelligent energy management.

If we look towards 2030, I believe it is reasonable for renewable energy to supply at least 30% to 40% of the annual electricity requirement of Malaysia's growing data-centre ecosystem, provided the country can accelerate RE capacity, BESS deployment and grid infrastructure. Leading hyperscale operators with aggressive sustainability commitments could achieve considerably higher renewable-energy procurement.