INTELLIGENCE UPDATE

Malaysia manages data center growth with regulations

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Malaysia is rapidly emerging as a major data center hub in Southeast Asia. The government is positioning the country as a regional powerhouse in technology, AI and cloud computing — combining its inexpensive land and excess power capacity with its proximity to Singapore's expanding but constrained data center market to attract operators. However, this digital expansion presents significant challenges. Projections estimate that data center energy demand could exceed 5 GW by 2035 — nearly 40% of Peninsular Malaysia's current total power demand.

In response, the Malaysian government is delaying new approvals in specific regions and emphasizing the need to balance economic growth with environmental responsibility and finite national resources. To direct and control development, authorities have established or proposed five key regulations and standards over the past two years.

- The Data Centre Planning Guidelines — in force.
- The Energy Efficiency and Conservation Act 2024 (EECA) — in force.
- The Building Energy Intensity label — in development, required by the EECA.
- The Guidelines for Sustainable Development of Data Centres — in force.
- Specification for Green Data Centres — in development.

The three mandates in force establish a framework for data center development: they introduce a planning process to guide permitting and construction, require operators to institute an energy management system with regular audits to enhance energy efficiency, and offer development incentives to attract energy-efficient data centers. The Building Energy Intensity label — now 90% complete — addresses the EECA mandate to develop labels that report building efficiency by type (e.g., office, data center). Meanwhile, the Specification for Green Data Centres is in development and its relationship to the existing requirements is currently undefined.

The Data Centre Planning Guidelines

Overseen by the Malaysian Ministry of Housing and Local Government, the *Data Centre Planning Guidelines* outline a set of design considerations — including construction specifications — and permitting requirements related to site selection, as well as electricity, water and

telecommunication infrastructure connection processes.

Site selection and design. Developers should consider access to critical utilities and infrastructure, as well as proximity to potential hazards and physical risks, such as national security targets and areas prone to natural disasters, including floods and windstorms. The final site should minimize these risks, avoid environmentally sensitive areas, and simplify utility connections.

Electricity. Data centers should have main intake substations sized to meet expected power demand and are encouraged to locate them near existing transmission lines. Operators should also consider efficient power use based on PUE, as well as the procurement of renewable energy and the application of energy-saving methods.

Water. Developers should verify the continuous daily availability of the water supply, taking into account the scale and type of data center. Storage tanks may be required based on peak usage levels, while water-saving and renewable technologies — such as direct expansion and eco-chiller water systems — are encouraged. Developers must consult with state water suppliers before finalizing plans and should strive to minimize the operational water use effectiveness (WUE) value for the facility.

Telecommunications. Data centers must provide space for neutral communication infrastructure to support at least two providers and ensure internet connectivity via fiber optic or dark fiber, with a minimum internet speed of 300 megabits per second.

These guidelines standardize the siting and permitting process for data center facilities, ensuring consistency in the development criteria and construction process across Malaysia.

Energy Efficiency and Conservations Act 2024

The *Energy Efficiency and Conservations Act 2024* (EECA), effective as of January 1, 2025, authorizes the Malaysian Energy Commission to regulate any energy-using entity with an annual energy consumption exceeding 6,000 megawatt-hours (MWh). This threshold will apply to most data center operations, as it corresponds to an average power demand of 0.7 megawatts (MW).

Under the EECA, eligible entities must assign an energy manager to oversee the implementation of an energy management system (EMS), complete periodic energy audits, and submit regular energy efficiency and conservation reports. These reports should include a description of the EMS, breakdown of the facility's total energy consumption by purpose, and proposed measures for improving the facility's energy efficiency.

The EECA mandates the development of an energy label for all eligible facilities, which is discussed in the following section. The National Building Energy Intensity Benchmarking program is developing the data center-specific label.

Non-compliance with the EECA mandates may result in penalties up to RM100,000 (about

$24,000). The Energy Commission has the power to enter data center buildings and inspect, document and record all aspects of their operation relevant to the EECA. It is worth noting that the EECA mirrors Article 11 of the EU's Energy Efficiency Directive (see *EED comes into force, creating an enormous task for the industry*).

Building Energy Intensity program

Malaysia's Energy Commission is creating and will issue a Building Energy Intensity (BEI) label for six building types, including data centers. Energy intensity metrics — a measure of the annual energy use per square meter (or square foot) of building space — offer a straightforward benchmark for assessing building energy performance and will serve as a foundation for the energy performance label. The BEI program will establish national guidelines for BEI benchmarking and reporting for different building types, while also developing a BEI database to collect and monitor building performance data.

The data center BEI label, designated as the EECA label, is slated for release in 2026. The Ministry of Energy Transition and Water Transformation is responsible for developing the BEI standards for data centers, with technical support from the Malaysia Digital Economy Corporation (MDEC). MDEC has organized workshops and engaged with industry stakeholders to develop the BEI benchmarks for data centers. The Ministry has completed the public consultation process and proposed a five-tier PUE rating and labeling scheme (see **Table 1**).

Table 1 Proposed BEI 5-Star rating for the data center sector

	Benchmark	5 Star	4 Star	3 Star	2 Star	1 Star
	PUE (PUE_β)	PUE $\leq 0.85*E_\beta$)	($0.85*PUE_\beta$ <PUE $\leq 1.10*PUE_\beta$)	($1.10*PUE_\beta$ <PUE $\leq 1.20*PUE_\beta$)	($1.20*PUE_\beta$ <PUE $\leq 1.30*PUE_\beta$)	(PUE $>1.30*PUE_\beta$)
Proposed hyperscale rating range	1.4	PUE ≤1.20	1.20 < PUE ≤1.55	1.55 < PUE ≤1.70	1.70 < PUE ≤1.80	PUE >1.80
Proposed colocation rating range	1.6	PUE ≤1.35	1.35 < PUE ≤1.75	1.75 < PUE ≤ 1.90	1.90 < PUE ≤2.10	PUE >2.10
Proposed enterprise rating range	1.7	PUE ≤1.45	1.45 < PUE ≤1.90	1.90 < PUE ≤ 2.00	2.00 < PUE ≤2.20	PUE >2.20
Existing PUE rating ranges						
GBI		PUE ≤1.30	1.30 < PUE ≤1.50	1.50 < PUE ≤ 1.70	1.70 < PUE ≤1.90	PUE >1.90
GreenMark		PUE ≤1.39	1.39 < PUE ≤1.42	1.42 < PUE ≤ 1.49	1.49 < PUE ≤1.66	PUE >1.66
MTFSB		PUE ≤1.10	1.10 < PUE ≤1.30	1.30 < PUE ≤ 1.50	1.50 < PUE ≤1.90	PUE >1.90

The proposed PUE rating uses a Benchmark Comparison Method with the percentages: 85%, 110%, 120% and 130%
GBI: Green Building Initiative; MTFSB: Malaysian Technical Standards Forum Bhd

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Benchmark PUEs are proposed for hyperscale, colocation and enterprise data centers. A 5-star data center must operate with a PUE value of 85% or less of the benchmark value, while a 4-star rating applies to facilities operating between 85% and 110% of the benchmark. Data centers rated at 1 to 3 stars can exceed the benchmark by 10% or more.

New or recently constructed data centers are likely to achieve a 4- or 5-star rating when operating at full capacity. Older data centers will likely fall within the 2- to 4-star range. Facilities operating at higher PUE values may face business risks, particularly in markets where more efficient colocation or hyperscale facilities exist.

Guidelines for Sustainable Development of Data Centres

This guideline, published by the Malaysian Ministry of Investment, Trade, and Industry, details the eligibility criteria for the Digital Ecosystem Acceleration (DESAC) incentive scheme (see *Guidelines for Sustainable Development of Data Centres*). The scheme is intended to attract high-quality, environmentally responsible data center projects. While the details of the incentives have not yet been finalized, new data centers that meet the DESAC criteria will be eligible for benefits such as:

- Investment tax allowance of 60% or 100% on qualifying capital expenditures, offset against up to 100% of statutory income for up to five years.

- Reduced corporate tax rate of 5% or 10% on qualifying income for up to ten years, depending on the nature of the income and adherence to specific criteria.

To qualify for the incentives, the guidelines set minimum performance standards for PUE, carbon usage effectiveness (CUE) and WUE (limited to 2.2 m^3/MWh). In terms of the design PUE, data centers are rated by their power demand and interconnection voltage through the following tiers:

- Low-voltage colocation and enterprise data centers of 0.85 MW to 4.25 MW demand a PUE of 1.7.
- Medium-voltage colocation and enterprise data centers with demand ranging from 4.25 MW to 21.25 MW require a PUE of 1.7.
- High-voltage colocation and enterprise data centers of more than 21.25 MW demand require a PUE of 1.6.
- High-voltage hyperscale data centers of more than 21.25 MW demand a PUE of 1.4.

Note, the incentive scheme is set to terminate at the end of 2027. While receiving incentives does not accelerate an operator's approval under the Data Centre Planning Guidelines, it is likely to influence and smooth the overall approval process.

Specification for Green Data Centres

The Specification for Green Data Centres was initially published as part of Malaysia's National Energy Transition Roadmap, which set net-zero energy targets for 2050. Although certification is voluntary, the code is intended to help data center operators improve their energy and environmental performance, reduce costs, lower their carbon footprints, and boost competitiveness.

The Malaysian Technical Standards Forum BhD and the Malaysian Communications and Multimedia Commission jointly delivered a draft revision of the code in 2024, though it has not yet been finalized. The draft set out minimum voluntary energy efficiency standards for PUE values (1.5 or less) and UPS system efficiency targets, such as double-conversion efficiency of 96% or the use of EcoMode where practical. Operators are encouraged to monitor IT space temperatures and relative humidity, WUE and CUE. However, the code does not specify recommended thresholds or operating ranges. It also promotes best practices for all data centers — whether private or commercial — encompassing the integration of renewable energy sources into the energy supply, high-efficiency lighting, and the deployment of information management and governance processes.

Note, MDEC informed Uptime Intelligence that the relationships between the code and the Data Centre Planning Guidelines, as well as the Guidelines for Sustainable Development of Data Centres, have not yet been established. For now, the thresholds set out by the code remain voluntary and operate independently of the EECA.

The EECA, combined with the data center BEI PUE rating proposal and supported by The Guidelines for Sustainable Development of Data Centres, governs data center operations in

Malaysia. As these three documents are mandatory, they supersede the Specification for a Green Data Centres, which remains a voluntary standard.

The Uptime Intelligence View

Malaysia is taking measured steps to regulate and control the development, design and operation of data centers within its borders. Around the world, governments are deploying mandatory regulations, standards and guidance to ensure that data center are designed and operated to minimize energy and water use, while integrating with local communities, ecosystems and energy systems.

To align with these expectations, operators must embed sustainability and energy performance into the design and operation of their data centers:

- Facility designs should optimize and minimize the energy and water use, with waterless cooling systems employed in water-stressed and water-scarce regions.
- Each operating facility should deploy an EMS, based on ISO 50001 or an equivalent standard, to support continuous improvement in energy performance across both facilities and IT infrastructure.
- Key IT and facility metrics should be tracked and publicized to communicate the sustainability performance.

Operators can successfully navigate a regulatory environment by integrating these activities into their operating processes and philosophy.

ABOUT THE AUTHORS

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About Uptime Institute

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With its data center Tier Standard & Certifications, Management & Operations reviews, broad range of related risk and performance assessments, and accredited educational curriculum completed by over 10,000 data center professionals, Uptime Institute has helped thousands of companies, in over 100 countries to optimize critical IT assets while managing costs, resources, and efficiency.