

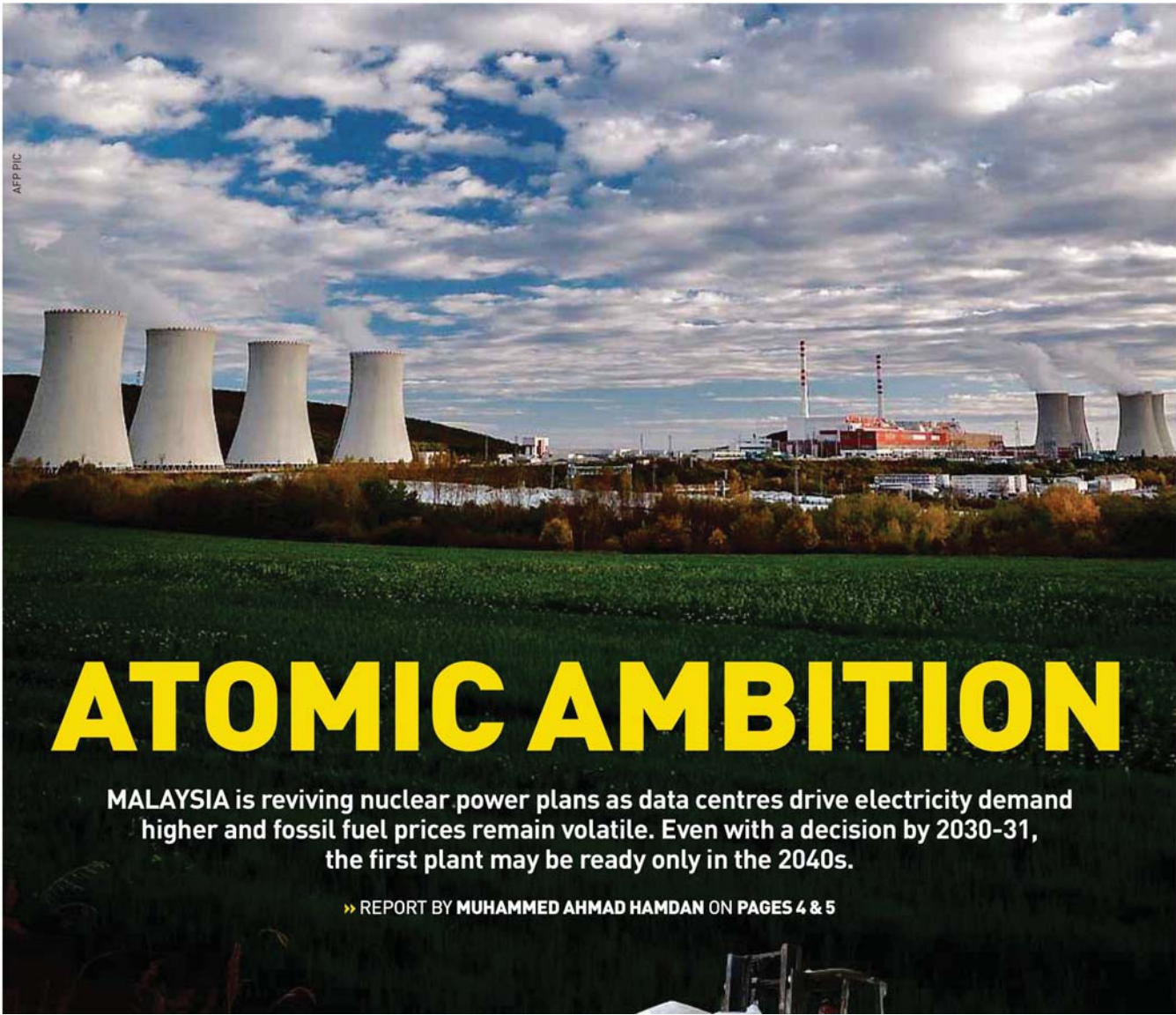


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NUKE POWER COULD ARRIVE BY 2046



New Straits Times, Malaysia





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MALAYSIA'S decades-old nuclear power ambition is back on the agenda as rising electricity demand from data centres and volatile fossil fuel prices revive the case for firm, low-carbon power.

But even if the government decides to proceed with nuclear power by 2030 or 2031, the country's first plant may not begin operating until between 2040 and 2046, an analyst said.

Malaysia has begun preparatory work under the International Atomic Energy Agency's (IAEA) Milestones Approach, with the Malaysia Programme Office for Power Electricity Reform Corporation (MyPOWER) coordinating the process.

The process requires the country to assess the feasibility of nuclear power and establish the necessary infrastructure before making what the IAEA calls a "knowledgeable commitment" to a nuclear power programme.

MyPOWER, a company under the Energy Transition and Water Transformation Ministry, was set up to drive electricity industry reforms before its mandate expanded to coordinate Malaysia's nuclear power programme.

CIMB Securities Sdn Bhd analyst Muhammad Afif Zulkapli said the renewed assessment is timely as discussions about Malaysia building its own nuclear power plant have resurfaced among industry players.

He said the renewed interest comes as the Middle East conflict exposes vulnerabilities in the country's energy security while electricity demand accelerates on the back of data centre investments.

The assessment comes as the government steps up preparations for a possible nuclear power programme, although it has said that no decision has been made to adopt nuclear energy.

Science, Technology and Innovation Minister Datuk Chang Lih Kang said on Tuesday that Malaysia was studying the potential role of nuclear energy in its future energy mix, while carrying out preparatory work in technology, talent, and regulation.

He said rising energy demand from semiconductors, advanced manufacturing, artificial intelligence, cloud computing and hyperscale data centres meant Malaysia needed to consider various options to meet its long-term power requirements.

"It does not mean that we have already made a decision but we need to be prepared so that our

DATA CENTRE BOOM

NUKE POWER COULD ARRIVE BY 2046

Rising demand from data centres is driving the search for reliable, low-carbon electricity



Turkiye is building the Akkuyu nuclear powered plant. AFP PIC



Datuk Chang Lih Kang

regulatory framework is ready, our talent is ready, and at the same time, we need to ensure the industry is also ready," Chang said.

The issue has taken on greater urgency as data centres consume a growing share of Malaysia's electricity. Energy Commission data showed data centres' share of overall electricity consumption hit a record 9.3 per cent in the second week of August, compared with an average of 7 per cent this year, reports said.

Data centres could account for as much as 31 per cent of Peninsular Malaysia's electricity demand by 2035.

At the same time, Malaysia will need another nine gigawatts of gas-fired capacity by 2032 as it progressively retires coal-fired plants.

Afif said nuclear could provide firm, low-carbon electricity while requiring less land than solar photovoltaic installations.

It could also reduce Malaysia's exposure to fluctuations in fossil fuel prices, particularly during geopolitical conflicts, while nuclear fuel's high energy density allows refuelling cycles to run for years.

"However, nuclear is not the cheapest or fastest new-build clean energy option, as it requires comprehensive long-term plan-

ning," he said in a note.

A DECISION BY 2030 OR 2031?

The IAEA framework divides the development of a nuclear power programme into three phases covering 19 infrastructure issues, ranging from policy and regulation to ownership, financing, safeguards, workforce, emergency planning and waste management. Phase 1 considers whether the country should proceed with nuclear power, while Phase 2 involves preparations for contracting and construction. Phase 3 covers the implementation of the first nuclear plant.

Assuming Malaysia completes the first phase, CIMB Securities estimates that it could decide whether to adopt nuclear power by 2030 or 2031.

CIMB Securities said another three to four years would then be needed for regulatory preparations, site assessments, vendor selection and commercial negotiations before construction or fabrication could begin.

This puts the possible commissioning of Malaysia's first nuclear plant between the early and mid-2040s, depending on the technology selected and any breakthrough, said Afif.

The IAEA recently conducted a five-day workshop involving MyPOWER, the Malaysian Nuclear Agency, the Atomic Energy Department (Atom Malaysia) and Tenaga Nasional Bhd (TNB), among others, to help Malaysia project the manpower and skills

required for a nuclear power programme.

TNB A LIKELY ANCHOR

One of the biggest questions is who would eventually own and operate Malaysia's first nuclear plant.

Afif said TNB is the most logical anchor operator because of its balance sheet and control of the electricity grid.

An independent power producer with nuclear experience could alternatively be awarded a concession to operate the plant.

Private-sector involvement during the initial stage is likely to be limited, the analyst said, except for TNB's potential role as the commercial delivery vehicle for the pioneering project.

TNB itself has begun preparing for such a possibility.

In its 2025 integrated annual report, the utility said it was exploring the opportunity to become a developer, owner and operator of nuclear power facilities over the longer term.

It said early investment in technical expertise, regulatory frameworks and partnerships with global nuclear agencies could establish the institutional capabilities required to operate nuclear assets.

CIMB Securities said Malaysia already has much of the institutional structure needed to begin its preparations.

MyPOWER is the country's nuclear energy programme implementing organisation, while Atom Malaysia would serve as the nuclear regulator.

The Malaysian Nuclear Agency would provide technical expertise and workforce training, while the Energy Commission would oversee electricity-market matters such as generation licensing, capacity procurement, grid connection and tariffs.

BIG REACTOR, SMR OR FLOATING PLANTS?

Malaysia has yet to decide what kind of nuclear technology it would use.

CIMB Securities said the country remains "technology agnostic", with conventional large-scale reactors, small modular reactors (SMRs) and floating nuclear power plants among the options that could be evaluated.

Conventional reactors of more than 1,000 megawatts offer economies of scale and have a proven operating record, but require substantial upfront capital and extensive site preparation.

SMRs, meanwhile, are designed to be factory assembled and transported to site, potentially reducing construction delays and allowing capacity to be added gradually.

"However, there are no proven commercially viable units yet that demonstrate replicable economics," Afif said.

A third possibility is a floating nuclear power plant, where reactors are installed on a barge or platform offshore and connected to the coastal electricity grid.

Such a system could reduce land constraints and opposition to locating reactors near communities, although CIMB Securities said international maritime law presents potential complications.

Only one floating nuclear power plant is currently in commercial operation, in Russia.

WHO PAYS?

Beyond the technology, financing could prove to be one of the biggest hurdles.

Afif highlighted nuclear projects in the United Arab Emirates (UAE), Türkiye and Bangladesh as useful references for Malaysia.

At the UAE's Barakah plant, state-owned Emirates Nuclear Energy Company retained control while South Korea's Korea Electric Power Corp participated as the technology and construction partner and minority shareholder.

Türkiye took a different approach at Akkuyu, where Russia's Rosatom is responsible for financing, constructing, owning, operating and eventually decommissioning the plant.

Bangladesh retained state ownership of its Rooppur plant but relied heavily on Russian financing, exposing the country to sovereign debt, foreign-exchange and project oversight risks, CIMB Securities said.

In the case of Malaysia, Afif said full foreign ownership is unlikely to be a viable option.

He said a structure similar to Barakah may be more appropriate, with TNB or another Malaysian company retaining control while an experienced foreign supplier provides minority equity, project delivery and operating support.

"In our view, the final decision should focus on the allocation of liability for cost overruns, delays, operating underperformance, fuel and waste obligations, and long-term tariff risk," he said.

MAJOR QUESTIONS REMAIN

Despite the renewed momentum, CIMB Securities' assessment shows that some of the biggest decisions remain unresolved.

Malaysia does not yet have a project cost, tariff model or site, while a structured public consultation has yet to be completed.

The ownership and financing structures have not been decided, while arrangements for spent-fuel management, radioactive waste and eventual plant decommissioning have yet to be established.

Regulation and emergency preparedness also remain under development.

Public acceptance could present another challenge.

CIMB Securities said negative perceptions remain one of nuclear power's main drawbacks, although acceptance appears to have improved in recent years.

The long lead time also means nuclear cannot solve Malaysia's immediate power needs.

Gas is expected to play a bigger role as Malaysia phases out coal and expands renewable generation, with nuclear potentially emerging as another source of firm, low-carbon electricity over the longer term.

Malaysia plans to retire its last coal-fired power plants by 2044, while no additional gas-fired capacity is expected to come online this year or next, according to Energy Commission officials.

That leaves the country's nuclear assessment running alongside a more immediate challenge: securing enough reliable electricity for the next decade while demand from data centres and other industries continues to grow.