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Nuclear could add to Malaysia's low-carbon, reliable energy mix



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SINGAPORE: Nuclear power could be a viable long-term addition to Malaysia's energy mix, complementing renewable energy to deliver a system that is low-carbon, environmentally sustainable, secure and reliable.

World Nuclear Association Senior Programme Lead, Climate, Dr Jonathan Cobb said developing the right energy mix required combining different energy sources rather than viewing renewables, fossil fuels and nuclear power as competing options.

"The fact that nuclear energy generates electricity around the clock, 24/7, securely and reliably, it's a great complement working together with renewables, particularly intermittent renewables," he told Bernama on the sidelines of the Singapore International Energy Week (SIEW) 2026.

He said the objective was to develop an optimal combination of energy sources to deliver an effective and affordable electricity system.

Nuclear Technologies Offer Flexibility, But Costs Must Be Assessed Holistically

Cobb said advances in nuclear technology had expanded the options available to countries with different electricity grid capacities, including Malaysia.

While conventional nuclear reactors typically generate 1,000 to 1,500 megawatts, small modular reactors could produce up to around 300 megawatts, while micro-modular reactors could generate as little as five megawatts.

"So, there is a nuclear technology that is suitable for every electricity grid," he said.

On competitiveness, Cobb said countries should assess the overall costs of electricity generation, including backup power and storage for intermittent renewable sources, as well as the environmental costs of fossil fuels, including carbon dioxide emissions and other air pollutants.

He said the aim was to determine the optimal combination of energy sources to deliver the most effective system at the lowest overall cost.



Cobb says advances in nuclear technology had expanded the options available to countries with different electricity grid capacities, including Malaysia. — AFP photo

Financing, Local Supply Chains Key To Economic Benefits

Meanwhile, Cobb said Malaysia could explore several financing arrangements for a nuclear programme, including government-to-government vendor agreements, build-own-operate agreements, direct state financing, regulated asset base (RAB) schemes and contracts for difference (CfD).

"The important thing really is to ensure that there's the appropriate allocation of financial risk in any project," he said, adding that proper risk allocation could help lower overall financing costs.

Beyond electricity generation, nuclear projects could create employment during construction and operation, including highly skilled jobs over the reactors' potentially long operating lifetimes.

Cobb said domestic companies could also benefit by supplying components for nuclear plants, provided they met the required codes and standards. Engaging local suppliers before construction would help them develop the necessary capabilities.

"When you build a nuclear plant, often this is a large infrastructure project, a lot of people involved, and that means you get a lot of capital input into local communities," he said, adding that spending by workers could support local businesses.

Policy, Institutional Readiness Crucial Before Commitment

Meanwhile, Cobb identified policy development, institutional and infrastructure readiness, and project and programme preparedness as critical requirements for countries considering nuclear power.

He said Malaysia had a head start through its decades-old research reactor, which had helped establish regulatory capabilities and scientific expertise in reactor operations. However, a successful programme would require a firm, long-term government commitment, an appropriate nuclear policy and legal framework, and a regulator capable of assessing reactor designs and overseeing commercial nuclear facilities.

He also stressed the importance of developing domestic manufacturing and supply-chain capabilities.

For countries planning multiple reactors, Cobb said nuclear development should be treated as a continuous programme rather than a one-off project, allowing skills and experience to be transferred between projects while helping reduce costs.

Nuclear Expansion Driven By Energy Security, Safety

Cobb said the global nuclear industry was experiencing an acceleration rather than simply

making a comeback, driven by environmental concerns and growing energy security risks arising from disruptions to fossil fuel supplies.

He said 39 countries had signed a pledge to triple nuclear capacity between 2020 and 2050.

Among the countries are China, the Netherlands, Brazil, the United Kingdom and Italy.

On nuclear power safety, Cobb said the industry had strengthened its focus following the Chernobyl and Fukushima nuclear accidents, with lessons learned helping improve plant resilience.

"Nuclear is a very safe form of generation. Safety is at the heart of nuclear culture."

"There is a great focus and safety. We should have safety in everything we do, not just nuclear energy," he said.

He said the public should also consider the benefits nuclear energy could offer, including affordable and reliable electricity supplies and reduced air pollution compared with fossil fuel generation.

"What nuclear can offer, I think, is the thing that people are actually interested in: securing clean supplies," he said, referring to its potential to provide affordable, reliable electricity while avoiding the air pollution associated with fossil fuel generation. — Bernama