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`Borneo well-placed to harness offshore solar energy`

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Barbulescu speaks during a plenary session titled Modernising Power Grids: Accelerating Renewable Energy Integration and Advancing Energy Storage Technologies at the International Energy Week 2025 on Tuesday.

'Borneo well-placed to harness offshore solar energy'

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> Nineta Barbulescu

KUCHING: Borneo holds a strategic advantage when it comes to harnessing offshore solar energy, said Romanian Ambassador to Malaysia Nineta Barbulescu.

She said the island of Borneo possesses ideal physical conditions for large-scale renewable energy projects, including offshore solar, carbon capture and storage, as well as green hydrogen and methanol production from seawater.

"The fact that Borneo offshore wind and wave output are lowest globally, it's a fact, but it's a very useful feature.

"Therefore, it makes this place ideal for offshore solar development, carbon capture and storage for green hydrogen extracted from seawater and green methanol for shipping," she said.

She said this during a plenary session titled Modernising Power Grids: Accelerating Renewable Energy Integration and Advancing Energy Storage Technologies at the International Energy Week 2025 held at the Borneo Convention Centre here yesterday.

Barbulescu also shared research done with the Australian National University which found that Borneo is among the few places globally that meet the key physical conditions needed for offshore renewable energy infrastructure.

"This region gets an average solar insulation of 175 watts per square metre, wave heights up to seven metres, water depths less than 800 metres and no hurricanes.

"If you look around the world, there are not many competitors in this category," she added.

She also introduced the concept of a "hydro battery" proposal through a research consortium involving several universities including Universiti Malaysia Sarawak (UNIMAS), Australia National University, and institutions from Romania and Singapore.

She explained that the Sarawak hydro battery concept involves using Bakun and Murum lakes as a closed-loop pumped storage hydro (PSH) system.

This allows for the generation and storage of renewable energy while also serving as a flood mitigation tool during emergency.

Using the Bakun and Murum dams as example, she said 500 gigawatt-hours of storage can be achieved by pumping 1,700 gigalitres of water uphill through a 2.8-kilometre penstock.

The estimated cost is RM47 per kilowatt-hour, which is less than 5 per cent of the cost of lithium batteries.

The plan involves three phases of development, from 2 to 5 to 15 gigawatt-hours, with full-scale deployment reaching 500 gigawatt-hours.

Up to 120 gigawatts of floating solar panels can be installed on both lakes, supplying power to the hydro battery system for round-the-clock renewable energy output of 20 gigawatts.

The total capital cost for hydro battery is estimated at RM15 billion per gigawatt, with a levelised cost of energy at 5.5 sen per kilowatt-hour.

In comparison, gas power plants with carbon capture systems cost about RM13.6 billion per gigawatt and deliver energy at 8.5 sen per kilowatt-hour.

"The end product is that hydro battery generates energy, which is cheaper even than gas. And of course, it's friendly with the environment," she said.

Barbulescu said the hydro battery pathway has already attracted international interest and investment.

"Around two weeks ago, Saudi Arabia committed RM10 billion for a floating solar and hydro battery project in Kenyir Lake, Terengganu," she said.