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# BESS programme: A game changer for the Malaysian energy landscape?

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BY **INTAN FARHANA ZAINUL**

In a bid to accelerate the adoption of renewable energy (RE) and ahead of the upcoming fifth large-scale solar (LSS5) programme, the government has opened up the installation of battery energy storage systems (BESS) to third parties, under concession agreements, according to documents sighted by *The Edge*.

Essentially, BESS is a collection of batteries to store electrical energy, and a crucial component in balancing fluctuations in RE output, especially solar power, and preventing sudden surges that could damage the grid or cause power outages. It is also aimed at addressing the intermittency of solar power by storing balance supply on the grid or providing backup power.

For the BESS programme led by the Ministry of Energy Transition and Water Transformation (Petra), the bidding process will be conducted in two stages, starting with a request for qualification (RFQ) where interested bidders may submit their qualifications to the Energy Commission (EC). Only qualified bidders can proceed to submit their proposals via a request for proposal (RFP).

According to the RFQ, the BESS programme is somewhat similar to the power purchase agreement (PPA) that Tenaga Nasional Bhd (KL:TENAGA) signed with independent power producers (IPP).

The document reads that the successful bidder will sign a "storage service agreement with Tenaga to ensure the availability of electrical energy stored by BESS".

"In a way, it resembles the PPA system, where developers invest in the asset and recover by selling electricity to the grid at certain tariffs. However, for BESS, it would not be so straightforward because the utilisation of the battery is unknown," Aimi Aizal Nasharuddin, Citaglobal Bhd's (KL:CITAGLB) executive director of the energy division, tells *The Edge*.

Under PPAs, IPPs have a clear understanding of the electricity generation volume required, whereas for BESS, it depends on usage.

"For BESS, the usage will depend on how the grid would utilise the battery in extracting power from and charging to it.

"This utilisation pattern in terms of frequency, volume and capacity is unknown at this juncture and we believe it is not standard for all sites. As such, it would be a challenge for BESS providers to model the pricing and tariff structure.

"Battery life is influenced by usage patterns. Currently, we are involved in BESS installations for commercial and industrial applications, where daily usage patterns are predictable or predefined.

Aimi points out that, on average, a battery life can last 14 to 15 years without replacement, provided it is charged and discharged once daily.

"With unclear charging and discharging patterns, the lifespan of the BESS may even be shorter than the expected period of investment recovery. It is very important that all these factors are being taken into consideration to ensure the economics of the project is feasible" he says.

Under the RFQ, Petra is offering players a total capacity of 400MW and 1,600 megawatt-hours (MWh).

The programme is broken into four projects with a capacity of 100MW/400MWh each and includes the design, installation and operation of BESS at various sites in Peninsular Malaysia. Each project must start operations by 2026 and is expected to have commercial operations spanning over a period of 15 years.

Solarvest Holdings Bhd (KL:SLVEST) group CEO Davis Chong estimates the installation cost of BESS to be around US$200 per kilowatt-hour (kWh), translating to about RM400 million for the 400MWh project.

"The engineering, procurement and construction job for battery installation is less technically complex than a solar power plant, with the primary cost driver being battery prices," he tells *The Edge*.

He points out that the main concern is the potential for faster depreciation of the battery system compared with solar panels.

"We estimate the optimal battery lifespan to be around 10 to 15 years, although this can extend depending on usage patterns and maintenance technology. This BESS project spans over 15 years, which is quite good compared with other countries," he reckons.

As this marks Petra's inaugural standalone BESS programme, Chong emphasised that pioneering the initiative does not automatically guarantee a higher internal rate of return.

"With CRESS (Corporate Renewable Energy Supply Scheme) and LSS5 projects coming on stream, it is the best time to roll out more BESS programmes as it is a game changer in the country's energy transition" he adds.

## Opening up new revenue streams

Under the BESS bid, it is understood that a local company may submit no more than two RFQs — as a sole participant and a member of a consortium.

Meanwhile, foreign companies can only participate in one RFQ as a member of a consortium with a local company.

But, it is not so straightforward. Bidders without BESS installation experience would need to have experience in building or operating at least one conventional power plant or solar plant with a capacity of not less than 50MW, or experience in developing two substation projects, or show they have raised at least RM500 million in total financing (debt and equity) for one infrastructure project in the last five years.

Nevertheless, despite the requirements, channel checks indicate that there is keen interest to participate in the BESS programme. MN Holdings Bhd (KL:MNHLDG), for instance, is in talks with several foreign BESS players to team up for the programme.

"The BESS programme has opened up a new avenue for us to participate in RE development, as it is not exclusively limited to existing RE players. BESS development primarily focuses on understanding the software aspects, rather than solely relying on hardware expertise," says its managing director Datuk Clement Toh.

With more than 17 years of experience, the company specialises in the provision of underground utilities engineering and substation engineering services and solutions.

An analyst perceives the BESS programme as an opportunity for local energy players to expand their revenue streams and enhance their expertise within the RE sector.

"Historically, the primary obstacle was the exorbitant cost of battery systems. In fact, battery cell prices were three times higher than current levels. Furthermore, solar development must be synchronised with battery system implementation," the analyst says.

Based on the current smaller-scale BESS projects implemented in the country, he anticipates that companies should be able to achieve profit margins of at least 8% to 9%, comparable to existing solar farm projects.

"However, these margins are contingent on battery cell prices. Furthermore, it is crucial to acknowledge that the primary players in the BESS market are predominantly from China. We anticipate that some domestic companies will likely collaborate with foreign entities to participate in the bidding process for BESS projects," he adds.

At the moment, BESS projects are awarded directly, as the system is still in the pilot phase. Independent RE producers are also encouraged to install BESS at their solar farms.

For instance, Tenaga and UEM Group Bhd-backed NUR Power Sdn Bhd are involved in the development of a 400MWh BESS facility for RM600 million. The project marks Peninsular Malaysia's first utility-scale battery storage project.

Back in February, Tenaga had talked about a battery pilot project that it said would be "operated by Grid System Operator (GSO), and overseen by the EC".

In Sabah, Tenaga's 80%-owned Sabah Electricity Sdn Bhd is also developing a BESS project of a similar scale for RM645 million. The project was awarded to an associate of Seal Incorporated Bhd (KL:SEAL) in September.

## Building local capabilities

"Last year, the government estimated about RM180 billion in investment to upgrade the national grid. About half of it is expected to be for battery installation to strengthen the grid in preparation of increasing RE adoption," says Aimi of Citaglobal.

With this in mind, Citaglobal launched its home-grown solution MYBESS last year to reduce dependency on imported energy storage technology.

"We cannot solely rely on overseas players, as electricity constitutes a critical national resource. Therefore, I believe it is timely for the government to encourage more participation from local players to expand their expertise in this area and cultivate local capabilities. This approach is crucial to effectively achieve the nation's target of attaining a 70% RE mix by 2050," he says.

Nevertheless, the key challenge is how the government ensures that the cost of implementing BESS does not affect the overall tariff.