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Deploying solar power for the low-carbon economy

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Transitioning towards a low-carbon power system is critical for Malaysia to realise its potential for green growth and unlock the critical opportunity to restructure the nation's economy for a second economic take-off. Large-scale deployment of solar power is critical in realising this national vision, and the acceleration of solar power adoption has also been highlighted as the key to stimulating the energy transition in the National Energy Transition Roadmap (NETR). To this end, the Energy Commission has recently launched the fifth large-scale solar (LSS5) competitive bidding process, which will have immense implications for the country's low-carbon economy future while having wider implications on opportunities across the energy value chain.

The recently announced LSS5 is a clear indicator of the country's commitment to energy transition. Not only is LSS5 the first competitive renewable power bidding exercise announced since the launch of LSS4 more than three years ago, but the 2,000_{MW} capacity quota up for bids in LSS5 also makes it the largest renewable power auction in the country's history, representing more than double the total capacity awarded in LSS4, or over 85% of the total capacity awarded in the first four LSS auctions combined. Not only will investors and developers who succeed in the auction benefit from having long-term revenue certainty for their solar assets through the 21-year power purchase contracts that would be awarded, but businesses involved in engineering, procurement and construction (EPC) contracting and others along the renewable power supply chain will also benefit from the large amount of investment anticipated from the scale of solar power deployment that could be realised from LSS5.

If the entire 2,000_{MW} capacity in LSS5 is fully realised by 2026, in alignment with the targeted operational date, the country will be well on track to achieve its 2030 NETR target. This achievement is critical to demonstrate the credibility of NETR to investors and would have a significant impact in boosting confidence in other energy transition-related markets, from low-carbon mobility to renewable hydrogen and carbon capture, use and storage.

In addition, the significant increase in renewable power generation anticipated from LSS5 would also expand the availability of green electricity in Malaysia in the near to medium term, allowing businesses greater optionality to reduce their Scope 2 emissions. The green electricity administered through Tenaga Nasional Bhd's green electricity tariff (GET) scheme is currently oversubscribed. The scale of additional renewable power generation that could be realised through LSS5 would allow businesses in Malaysia greater optionality to decarbonise their electricity consumption, allowing them to meet the environment, social and governance (ESG) requirements of their international clients committed to de-



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carbonising their supply chains, ensuring Malaysian businesses do not miss out on high-value export opportunities due to lack of optionality to decarbonise.

Unlocking additional renewable power generation is also especially critical for attracting investments from data centres and multinational corporations in the RE100 (100% renewable energy) initiative, which have a strong demand for low-carbon electricity for meeting their decarbonisation commitments.

Nevertheless, the renewable energy certificate (REC) product offered through Tenaga's GET scheme will need to be enhanced in parallel to fully realise the opportunities in capitalising on the willingness of these consumers to pay for high-quality green electricity, and subsequently enhancing the business case for renewables to enable further deployment of renewable power. The recently announced collaboration between Bursa Carbon Exchange and the Malaysian Photovoltaic Industry Association represents a step in the right direction — the joint effort should expand beyond enhancing the REC market through promotional efforts and should incorporate efforts in studying consumers' requirements to enhance the quality of Malaysia's REC products, for example, by designing mechanisms to tag RECs to power generated at a specific time from a given renewable power plant, which can better fulfil some consumers' ESG criteria that has an emphasis on temporal and locational tracking of the origin of green electricity consumed.

Furthermore, LSS5 also revised the foreign participation rules and allowed up to 49% foreign equity in 1,500_{MW} of solar capacity quota, in which all fall under the larger capacity and more novel technology products up for bid (Package 3: rooftop or ground-mounted solar plant between 30_{MW} and 500_{MW}; and Package 4: floating solar plant between 10_{MW} and 500_{MW}). This revision from only fully local entities being allowed in LSS4 to up to 49% foreign equity in LSS5 can translate into an increase in foreign participation in Malaysia's solar power market and strengthen energy-related foreign direct investment.

Additionally, greater experience and access to cheaper cost of capital of large foreign power market players could result in downward pressure on bid prices in LSS5, lowering the overall cost required for solar power procurement, and ultimately resulting in electricity cost savings. Nevertheless, the need for 51% Malaysian equity at the same time ensures that domestic companies will not be priced out, but instead sets them up to co-benefit from the increased competition with foreign player participation.

Not to mention that the maximum size for individual solar plants has also been increased tenfold from 50_{MW} in LSS4 to 500_{MW} in LSS5 — this will not only make the country's power market more attractive for investors looking at renewable projects of substantial size, but could also further drive down the unit cost of renewable power compared with the last four LSS auctions, which are already on a decreasing price trend. This will ultimately mean a lower cost of renewable power in Malaysia, resulting in lower green electricity prices for businesses committed to reducing their Scope 2 emissions compared to when only small-scale renewables are allowed.

Additionally, the inclusion of 500_{MW} floating solar capacity in LSS5 also has the potential for domestic renewable players to realise new opportunities at scale. Floating solar has already been developed in our neighbouring markets including Singapore and Indonesia. Although floating solar plants are expected to be more expensive than the ground-mounted counterparts due to the requirement of expensive floaters, this initiative to bring floating solar power plants online in Malaysia can enhance the local players' experience in this nascent technology and provide a platform for local manufacturers to venture into

the technology, potentially enhancing their capability to become regional players and compete in other future floating solar projects in Southeast Asia and beyond.

The significant increase in solar capacity would also result in notable requirements to upgrade the rest of the power system, such as power network reinforcements and the development of energy storage facilities to mitigate the increased intermittency of power generation with greater solar penetration. To this end, EPC and investment opportunities beyond power generation could be realised alongside the ambitious deployment of new-built solar power plants under LSS5. While the detailed mechanism to incentivise large-scale energy storage deployment has not been announced, the significant increase in renewable power generation under LSS5, in alignment with NETR, would mean higher investment requirements on energy storage and power system balancing — these all represent the wider opportunities across the energy value chain that can be realised as a result of LSS5.

To ensure the success of LSS5, greater clarity and enhancement of the auction design could be considered to allow for a more business-friendly environment and achieve fairer competition. For example, providing greater clarity around the rules for solar aggregation or combining multiple smaller solar assets to participate in LSS5 bidding would be critical to informing potential auction participants on their bidding strategy — this is especially critical for small and medium enterprises (SMEs) that would more likely be entering the bid with an aggregation of rooftop solar projects due to the lower capital requirement. Greater clarity on the non-delivery penalty should also be provided in LSS5 to allow auction participants to appropriately factor the risks into their bids. This is especially relevant since the increase in supply chain cost has led projects under LSS4 to turn uneconomical, resulting in intervention to extend the 21-year contract to 25 years to ensure the financial viability of LSS4 projects. Such clarity on the risks or penalties can also enable fairer competition in the auction process while ensuring auction participants have a contingency budget to mitigate the non-delivery risk, especially since the minister of Energy Transition and Water Transformation recently announced that there will be no more extension of contract length in LSS5. Other mechanisms, such as consideration of allowing LSS5 contract transfer when a project is delayed or cannot be realised, could also help mitigate the penalty cost that would have been incurred by the committed developer, hence, reducing their risk exposure while ensuring the capacity target in LSS5 is achieved. Wider considerations beyond bid prices, such as job creation and the potential to improve long-term supply chain cost competitiveness that a project can help realise can also be included in the bid evaluation — making these criteria detailed and transparent could support local SMEs that currently do not have access to a low cost of capital like foreign participants to have a greater chance in succeeding in the bidding process while maximising the wider economic benefits of LSS5.

All in all, the recently announced LSS5 is a step in the right direction in the country's energy transition journey and serves as a confidence boost to the NETR. The success of LSS5 would be critical in unlocking opportunities across various parts of the low-carbon power system value chain, however, greater clarity on mechanisms to incentivise investments in the adjacent services such as power system balancing, and enhancement of the auction process will need to follow to enable the ambitious target towards net zero. ■

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