



**ENERGY TRANSITION:
MALAYSIA'S PATHWAY TO
NET-ZERO EMISSIONS**

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Introduction

In line with the global shift towards energy transition and sustainable development, Malaysia has demonstrated significant ambition in advancing renewable energy within its economy. In 2023, the Government introduced the National Energy Transition Roadmap, which outlines the country's goal of reducing reliance on fossil fuels and achieving net-zero emissions, with the aim of reaching 70% renewable energy in its energy capacity mix by 2050.

To support this goal, the Ministry of Energy Transition and Water Transformation launched the Corporate Renewable Energy Supply Scheme ("**CRESS**") as part of the Government Renewable Energy Enhancement for Niche Sector (GREENS) MADANI initiative, which is aimed at advancing the energy transition in high-priority sectors.

Corporate Renewable Energy Supply Scheme

CRESS is a framework which allows for an open grid access system where third

parties can supply or acquire electricity with a fixed charge. In summary, CRESS will operate as follows:

- The Renewable Energy Developer ("**RED**") will develop, own and operate a green energy plant which shall have a minimum of 30MW capacity and have direct connection with the grid system. The energy produced will be exported through the electricity supply network, which can be procured directly by the Green Consumer ("**GC**").
- The GC must be an existing customer of Tenaga Nasional Berhad ("**TNB**") who needs additional power supply or a new customer who will enter into an agreement with TNB.
- The RED can supply energy to multiple GCs. The GC can also source green energy from multiple REDs.
- The RED will pay a system access charge ("**SAC**") to the Single Buyer ("**SB**") which will be used to recover the cost of network infrastructure and other necessary charges in delivering green energy from the RED to the GC.

- The grid system operator shall manage the dispatch of the energy produced from the green energy plant and any storage system associated with the RED.
- Where the GC consumes more electricity than can be supplied by the RED, the GC can procure additional electricity supply from TNB.

According to the Guidelines for CRESS published by the Energy Commission of Malaysia (“**CRESS Guidelines**”), there are five (5) contracts involved under CRESS:

1. **Bilateral Energy Supply Contract:** This agreement will be entered between the RED and GC for the sale and purchase of green energy. The terms of this agreement may provide for, but is not limited to, the applicable governing laws, information on the RED and its responsibilities, GC’s rights regarding the quality of energy supply and information on the energy sales, billing, supply interruption, emergency operation and any green attribute arrangements.
2. **Renewable Energy Supply Access Agreement:** This agreement will be entered between TNB, as the grid owner, and the RED. This agreement will bind the RED to the technical

requirements for the network access.

3. **New Enhanced Dispatch Arrangement (“NEDA”) Agreement:** This agreement will be entered between the RED and the SB for the invoicing and collecting of the relevant SAC and compliance to the NEDA guidelines, which will be part of the mechanism for the CRESS implementation.
4. **Corporate Renewable Energy Supply Agreement:** This agreement will be entered between the GC and TNB for the sale and purchase of electricity from TNB in the event that the RED is not able to generate or supply energy.
5. **Backfeed Agreement:** This agreement will be entered between the RED and TNB for the sale and purchase of electricity from TNB for the green energy plant’s own consumption, backfeed requirement during construction and other usages.

Key Takeaways from CRESS

CRESS will play a pivotal role in reducing the carbon footprint and decreasing the dependency on fossil fuels for power supply by lowering the entry barriers for

renewable energy generation and enhancing corporate access to green energy supply. By allowing third party access to the grid system, the GCs and REDs can negotiate directly, bypassing TNB. This encourages a more competitive market, as the REDs and GCs are given the opportunity to agree on pricing based on a market-driven approach, potentially reducing electricity prices and offering the GCs more options in fulfilling their green energy commitments. The implementation of CRESS has the potential to advance the country towards a decentralised and liberalised energy market, enabling Malaysia to capitalise on the increasing demand from energy-intensive data centres. These data centres have seen significant growth in recent years, projecting to require almost 7GW of capacity by 2030. By facilitating access to renewable energy for these data centres and thereby encouraging its uptake, CRESS would help in fostering a more sustainable and resilient data centre ecosystem in Malaysia, reinforcing the country's competitive edge as a preferred destination for digital investments.

Despite the progress made through the CRESS initiative, there remains a fundamental issue with renewable energy which hinders its widespread use – its

intermittent nature. As renewable energy is heavily dependent on environmental conditions, which fluctuates daily and seasonally, there are periods where the energy generated exceeds the energy needed, and vice versa. This makes renewable energy less reliable and consistent, discouraging both power producers and consumers from depending on this form of power generation and supply. Further, this intermittent nature also comes at a cost to the REDs, as the SAC will be higher for non-firm energy supply to the grid, at 45 sen/kWH instead of 25 sen/kWH for firm energy supply. To effectively increase renewable energy generation and uptake, a solution to address the intermittency of renewable energy must first be identified. One potential solution is through the development of battery energy storage systems.

Battery Energy Storage Systems

The Battery Energy Storage Systems (“**BESS**”) is an emerging technological solution that many countries are actively exploring to address the challenges posed by the intermittent nature of renewable energy generation. BESS can assist in improving the balance between energy demand and production for intermittent

renewable energy by storing excess energy during periods of low demand or high production and distributing energy during periods of high demand or low production. To do this, BESS utilises an intelligent battery software to coordinate energy production and an energy management system to determine when to store energy and when to release it into the grid.

Benefits and Challenges of BESS

The technology behind BESS helps ensure a more consistent and reliable supply of renewable energy, ultimately improving the efficiency of the energy grid and maximising the output of renewable energy plants. The flexibility provided by BESS makes it integral to essential ancillary applications such as load balancing and peak shaving (the ability to manage energy demand to avoid a sudden short-term spike in consumption). By offering these services, BESS lays the foundation for a more resilient energy infrastructure that can accommodate a higher share of renewable energy. Overall, by addressing the concerns around the intermittency of renewable energy, the development of BESS will help in encouraging more consumers and power producers to move to green energy.

Given the advantages offered by BESS, Malaysia has started working on plans to increase its usage. The Government aims to equip 20% of its electricity production sites with BESS, with 500 MW of Energy Storage Systems already planned under the Peninsular Malaysia Generation Development Plan (2020). Recently, the Government launched a bidding process for the development of BESS for the electricity supply system in Peninsular Malaysia. The first phase of BESS development will provide a total capacity of 400 megawatts (MW) and 1,600 megawatt-hours (MWh). This phase will be divided into four projects, each with a capacity of 100 MW/400 MWh, and is expected to begin operations by 2026. The development of BESS is expected to generate new economic opportunities, with an estimated investment value of RM2.8 billion.

Although the implementation of BESS offers significant benefits, there are challenges that need to be addressed. One of the key hurdles is the high upfront cost, as the installation of these systems requires a substantial initial investment. While the price of battery technology is decreasing, it can still represent a major financial commitment for industry players. Additionally, as BESS is a relatively

new technology, there are financial and technological risks involved. These risks include potential performance issues, the lack of a proven track record for warranty providers, and insufficient supporting infrastructure. Moreover, BESS has limitations regarding the amount of energy it can store and the duration for which it can supply power. Battery life typically ranges from 5 to 15 years, depending on the specific technology. Furthermore, the environmental impact of battery production, usage and disposal needs to be carefully considered, as these may have adverse environmental consequences.

Conclusion

Malaysia's push towards renewable energy through initiatives such as CRESS and the development of BESS marks significant strides in its energy transition and efforts to achieve a sustainable and low-carbon future. However, challenges persist, particularly with the intermittency of renewable energy sources. While BESS offers a promising solution to mitigate this issue, the technology comes with its own set of challenges. The high upfront costs, limited storage capacity, and environmental concerns associated with battery production, usage and disposal require careful consideration and planning.

In short, while the road to a fully sustainable energy future for Malaysia involves overcoming various technological, financial and environmental hurdles, these recent efforts set the country on a promising trajectory towards achieving its ambitious renewable energy goals.

References

1. Bernama, 'Data centre electricity use expected to increase to 20.9GW by 2040, Dewan Negara told.'
https://www.tnb.com.my/assets/news_clip/12122024b1.pdf
2. MIDA, 'Battery Energy Storage System (BESS): A Lucrative Investment Opportunity in Malaysia for Businesses in the Green Energy Sector'
<https://www.mida.gov.my/battery-energy-storage-system-bess-a-lucrative-investment-opportunity-in-malaysia-for-businesses-in-the-green-energy-sector/>
3. The Edge, 'Government mulls independent installers to speed up roll-out of battery storage'
<https://theedgemaalaysia.com/node/731978>
4. The Edge, 'BESS programme: A game changer for the

- Malaysian energy landscape?’
<https://theedgemaalaysia.com/node/737951>
5. OWC, ‘The Challenges and Outlook for BESS Development in Malaysia’
<https://owcltd.com/media/blog/the-challenges-and-outlook-for-bess-developments-in-malaysia/>
 6. New Straits Times, ‘Malaysia’s rise as SEA’s fastest-growing data centre hub vital for shift to RE’
<https://www.nst.com.my/business/economy/2024/09/1099677/malaysias-rise-seas-fastest-growing-data-centre-hub-vital-shift-re>
 7. The Star, ‘CRESS initiative gets the thumbs up’
<https://www.thestar.com.my/business/business-news/2024/07/30/cress-initiative-gets-the-thumbs-up>
 8. Berita RTM, ‘Government introduce CRESS starting September, boost green electricity access for companies’
<https://berita.rtm.gov.my/highlights/senarai-berita-highlights/senarai-artikel/government-introduce-cress-starting-september-boost-green-electricity-access-for-companies>
 9. Borneo Post, ‘CRESS a catalyst for expanding RE beyond solar’
<https://www.tnb.com.my/assets/newsclip/03102024a.pdf>
 10. Bernama, ‘Petra says new scheme to increase corporate access to green electricity coming in September’
<https://www.nst.com.my/business/corporate/2024/07/1081859/petra-says-new-scheme-increase-corporate-access-green-electricity>
 11. The Edge, ‘Ministry faces gripes over high grid access fees under third-party access for green energy’
<https://www.tnb.com.my/assets/newsclip/14102024a.pdf>

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