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NMB Sustainably Advances National Energy Resilience with Green Innovations

Kuala Lumpur, 11 May 2026 – In response to growing global energy challenges, on-going fossil fuel supply crisis, rising electricity demand, and the urgent need for sustainable solutions based on renewable energy, NMB (NanoMalaysia Berhad), a company limited by guarantee under the Ministry of Science, Technology and Innovation (MOSTI), is advancing a suite of clean energy innovations to strengthen Malaysia's energy security towards enhanced resilience and accelerate the transition to a low-carbon emission future.

Through strategic programmes, partnerships and venture-building investment models, NMB is spearheading market-driven green technology development, leading towards real-world deployment of hydrogen production, energy storage systems, energy-efficient and EV-related technologies. These initiatives include the HyPEReactor off-grid hydrogen production system for stationary and mobility applications, Peninsular Malaysia's first Mobile Hydrogen Refuelling Station (MHRS) to catalyse the use of clean fuel in the public transportation sector, graphene-enhanced sodium-ion battery technology to shift away from lithium supply chain dependency, and solar-powered EV charging stations as a way to reduce reliance on coal-fired power stations. Together, these technologies form a package of solutions designed to improve energy security, reduce harmful emissions and fossil fuel dependency and scale through real-world validation and off-take based on partnerships with the industry.

NMB's Group Chief Executive Officer, Dr Rezal Khairi Ahmad, said: "Principally, resilience should be built before impact and not a reaction to adversity. As global energy demand continues to rise and the world energy crisis disrupts fossil fuel supplies, countries are increasingly exploring alternative energy sources and resilient infrastructure. Malaysia is similarly facing challenges, including rising energy consumption in high-growth areas, particularly by digital economy infrastructure such as data centres and telco towers, grid reliability in remote areas, dependence on imported fuels, and growing demand for electric mobility. Energy security and sustainability are critical national priorities. Through these initiatives, NMB is strengthening Malaysia's clean energy ecosystem by developing technologies that are scalable, resilient, and locally driven, while building long-term national capabilities."

HyPEReactor: Clean Power for Underserved Communities

NMB's HyPEReactor represents a breakthrough in off-grid renewable energy, delivering zero-emission hydrogen-based power to rural and underserved communities. Deployed at the Tibang Orang Asli village in Perak, the solid-state hydrogen system replaces diesel generators with clean, reliable electricity.

Powered by sodium-based hydrogen-generation technology, the HyPEReactor provides uninterrupted electricity at low operating pressure and with enhanced safety,



making it suitable for rural electrification, telecommunications infrastructure, and mobile energy applications. The solution supports equitable energy access while reducing carbon emissions.

MHRS: Enabling Hydrogen Mobility

NMB and its collaborating partners also launched Malaysia's first Mobile Hydrogen Refuelling Station (MHRS) in Peninsular Malaysia, marking a key milestone in hydrogen mobility readiness. The MHRS serves as a pilot project to demonstrate hydrogen as a viable alternative fuel for transportation under real-world conditions.

The mobile refuelling station provides essential infrastructure to support trials of hydrogen-powered vehicles, including early pilot use cases involving buses and lorries. It also serves as a testbed for technology validation and future commercial pathways, creating opportunities for scale-up, particularly in heavy-duty transportation segments where hydrogen offers significant operational advantages and emissions reduction potential.

Graphene-Enhanced Sodium-Ion Battery: Next-Generation Energy Storage

NMB's graphene-enhanced sodium-ion battery prototype, developed under the NanoMalaysia Energy Storage Technology Initiative (NESTI), delivers an energy density exceeding 300 Wh/kg and offers a safer, more sustainable alternative to lithium-based batteries. The technology has been successfully validated at the laboratory scale, and we are currently progressing towards further scale-up and higher TRL development for real-world applications.

The battery technology is designed for grid-scale energy storage, renewable energy integration, telecommunications backup systems, and electric mobility applications. By reducing reliance on critical minerals such as lithium and cobalt, the innovation supports sustainable and cost-effective energy storage solutions.

Renewable Energy EV Charging Stations: Supporting Green Mobility

NMB is also advancing renewable energy EV charging infrastructure to support Malaysia's growing electrification needs. These charging stations are designed to support both two- and four-wheeled environmentally friendly vehicles powered by renewable energy sources.

The integrated system reduces carbon emissions and dependence on fossil fuels by using renewable energy for EV charging, supported by solar photovoltaic systems and battery energy storage. The initiative also includes a wireless charging prototype capable of delivering approximately 18 kW, supporting NMB's broader focus on next-generation wireless charging systems.

Collectively, these initiatives demonstrate NMB's commitment to building a resilient and sustainable energy ecosystem through diversified alternative pathways. From



hydrogen power for off-grid resilience and mobility infrastructure to next-generation batteries and renewable-electrification solutions, these projects reflect Malaysia's growing capabilities in clean-energy technologies.

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