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Singapore's A*STAR partners with H2G Green GEIH to commercialize Biomass-to-Hard Carbon Technology

01 August 2025 | News

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H2G Green Limited, a leader in sustainable energy solutions, and its subsidiary Green Energy Investment Holding Private Limited (GEIH) announced a licence agreement withÂ Singapore'sÂ Agency for Science, Technology and Research (A*STAR).

GEIH is an innovator in sustainable hydrogen with proprietary technologies that repurposes and transforms waste biomass into green hydrogen, as well as biochar and other high-value, sustainable materials. GEIH will commercialize a proprietary treatment process by A*STAR Institute of Materials Research and Engineering (A*STAR IMRE) to purify biochar, a by-product, into high-value hard carbon material for market use. Hard carbon materials are primarily used as anodes for batteries such asÂ sodium-ionÂ and lithium-ion batteries, due to their unique properties. They are also found in applications for water and air purifications as well as conductive additive in paints and coatings.

Following execution of the licence agreement, GEIH and A*STAR will begin the next phase of scaling up to accelerate the commercialization pathway of the biochar purification process, focusing on producing hard carbon as anodes for use inÂ sodium-ionÂ batteries.

An earlier exploratory phase found that the hard carbon GEIH produces tends to be superior to existing commercial materials due to a high graphite content, which makes the material favourable for anodes in sodium-ion batteries. These have possible applications for grid-scale energy storage, electric vehicles, and consumer electronics. The abundance of sodium makes sodium-ion batteries a more sustainable alternative to lithium-ion batteries.

GEIH's technologies make it especially suited to this endeavour. The Company's proprietary high-temperature thermochemical process turns any type of biomass without silica into hydrogen, biochar, bio-oil (for sustainable aviation fuel), and wood vinegar. The entire process incorporates circularity of materials as a guiding principle, and production of biochar results from incorporating carbon sequestration. The output materials power sectors as diverse as data centres, wafer fabrication, construction, agriculture, food manufacturing, laundry services, and central kitchens.

Pek Hak Bin, CEO of H2G, added: "Hydrogen is the energy of the future and a core part ofÂ Singapore'sÂ low-carbon energy strategy. H2G is expanding possibilities forÂ SingaporeÂ and beyond by pioneering a novel hydrogen production process that is cost-effective, less carbon intensive than electrolysis, and repurposes waste into sustainable materials. These power sustainable industries, as our hard carbon anode materials for sodium-ion batteries will empower a broader range of industries to reduce their environmental impact. In this way, H2G creates win-win-win sustainability solutions to multiple problems across industries."