

Epsilon Advanced Materials Develops Hard Carbon Anode Material Targeting Fast-Growing Sodium-Ion Battery Demand

Bio-based Hard Carbon derived from coconut shell waste is purpose-built for Sodium-Ion batteries with up to 50% lower CO₂ emissions than conventional anode production

Mumbai, India, 18th May 2026: Epsilon Advanced Materials Pvt. Ltd. (EAMPL), a leading global manufacturer of sustainable anode & cathode materials announced the launch of its Hard Carbon Anode material, purpose-engineered for Sodium-Ion (Na-ion) batteries targeting grid-scale Energy Storage Systems (ESS). Fully developed through in-house R&D, the material offers cell manufacturers a low-cost, graphite-free, and more sustainable anode solution at a time when sodium-ion chemistry is gaining rapid commercial traction globally.

Sodium-ion batteries emerge as the preferred chemistry for grid-scale storage, because of sodium's geographic abundance and a substantially lower ESG footprint compared to lithium-ion batteries which use lithium whose extraction involves energy-intensive mining, significant water consumption, and supply chains concentrated in geopolitically sensitive regions. CATL, the world's largest battery manufacturer, has made significant commitments to Na-ion cell production, and cell manufacturers across Asia and India are actively seeking anode materials that match ESS performance demands at competitive cost.

Hard Carbon's disordered microstructure, enlarged interlayer spacing, and closed nanopore architecture make it uniquely suited for sodium-ion storage. The material delivers high reversibility, strong cycle life, and fast charge-discharge capability which are critical for grid applications that require sustained operation across thousands of charge cycles. Paired with sodium, it represents one of the most cost-effective and durable anode options available for ESS today.

Vikram Handa, Managing Director, Epsilon Group *"The clean energy transition needs materials that are affordable, available, and easy to scale, faster. Sodium-Ion is the right chemistry for energy storage and Hard Carbon is the right anode for it. The feedstock is something India has in abundance, the process is cleaner than anything that came before it, and the performance is where it needs to be for real-world grid applications. We are building for what energy storage will look like ten years from now."*

What distinguishes EAMPL's Hard Carbon Anode material is its feedstock strategy. The company's primary development pathway uses coconut shell waste, which is widely available across India, as its carbon precursor. Through controlled pyrolysis and high-temperature carbonization, this agricultural byproduct is converted into a disordered carbon structure with the precise microarchitecture required for sodium-ion storage. This bio-based route eliminates graphite dependency entirely and produces up to 50% lower CO₂ emissions compared to standard graphite anode manufacturing, owing to significantly lower processing temperatures. For cell manufacturers and policymakers focused on supply chain resilience and ESG compliance, this is structurally a unique different input.

The Hard Carbon Anode launch is part of Epsilon Group's broader build across the battery materials stack, spanning silicon-graphite anode materials and Gen III LFP Cathode Active Materials for lithium-ion applications alongside this hard carbon anode for sodium-ion batteries. The Group's intent is to position India not merely as a consumer of advanced battery chemistry, but as a developer, manufacturer and exporter of the battery materials that make next-generation electric vehicles & energy storage possible.

Epsilon Advanced Materials Pvt. Ltd. (EAMPL), established in 2018 is a subsidiary of Epsilon Carbon Pvt. Ltd., is dedicated to developing sustainable and high-performance battery i.e. anode & cathode active materials for strengthening the domestic & global battery material supply chain. The company has successfully commissioned India's 1st Graphite Anode material customer qualification plant in Bellary, Karnataka with plans to produce 30,000 tons/annum by 2028 which will scale up to 100,000 tons/annum by 2031. Epsilon Advanced Materials has made strategic investments globally, including a \$650 million investment in North Carolina for graphite anode material facility with 60,000 tons capacity by 2031. EAMPL recently forayed into lithium-ion phosphate (LFP) based Cathode Active Material business through a technology center in Germany reflects its commitment to technological advancement in the battery industry. EAM also plans to build India's 1st Cathode Active Material manufacturing facility with 10,000 tons by 2028 to scale up to 100,000 tons/annum by 2035. These initiatives align with its mission to support the global battery industry and contribute to sustainable development to Energize the World.

For more details: www.epsilonam.com

Media Contact

Sandeep Kumar

Sandeep.kumar@epsiloncarbon.com

Neha Shinde

Neha.shinde@epsiloncarbon.com
