Swansea University-Led Consortium Secures Funding to Advance Sustainable E-Mobility in Sub-Saharan Africa

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A collaborative initiative spearheaded by Swansea University has successfully secured critical funding to facilitate the deployment of advanced battery systems in sub-Saharan Africa. This effort aims to propel cleaner and more sustainable mobility solutions across the region.

The project, named StamiNa (Sustainable Transport and Affordable Mobility through Innovation in Na-ion technology), is one of five collaborations to receive investment from the Faraday Institution under the second phase of the Ayrton Challenge on Energy Storage (ACES) R&D programme. The consortium, led by Swansea University, brings together expertise from Coventry University, Batri Ltd, Strathmore University (Kenya), AceOn Group, and the Federal University of Technology Owerri (FUTO) in Nigeria.

The overarching goal of these projects is to optimize and validate battery systems for improved performance, enhanced efficiency, and extended lifespan, thereby accelerating their path to commercialization. StamiNa specifically focuses on demonstrating and validating a novel **sodium-ion battery (SIB) technology** through the development of a prototype swappable battery pack. This pack is custom-designed for e-mobility applications in East Africa.

Professor Serena Margadonna, Chair in Materials Engineering at Swansea University and project lead, highlighted the initiative's broader impact: "We're proud to lead the StamiNa project, which combines state-of-the-art sodium-ion battery technology developed at Swansea University with a shared vision for sustainable, equitable innovation. This collaboration extends beyond technological advancements; it's about delivering environmentally responsible, locally sourced solutions that are accessible to all. Together, we aim to accelerate commercialization while supporting the growth of an African-led battery ecosystem with a local supply chain."

Sodium-ion batteries present a promising alternative to traditional lithium iron phosphate (LFP) batteries for Africa's e-mobility transition, offering advantages in transportability and reduced supply chain complexities. The StamiNa project's proprietary SIB technology, developed jointly by Batri Ltd and Swansea University, utilizes Prussian White cathodes and anodes derived from coal. This innovative composition is predicted to surpass the energy density of currently available commercial SIBs, positioning it to directly compete with LFP technology.

Notably, the Prussian White material is synthesized in water under mild conditions and is free of nickel and cobalt, ensuring a more sustainable and energy-efficient production process. This also facilitates the establishment of localized supply chains, further enhancing regional economic development.

The StamiNa project will pursue several key objectives, including: scaling up the production of active materials; refining electrode and cell assembly processes and manufacturing multilayer pouch and 18650 cylindrical cells at Coventry University; integrating cylindrical cells into AceOn's swappable battery pack for real-world field testing on e-bikes at Strathmore University in Kenya; evaluating pack performance at FUTO in Nigeria and benchmarking it against LFP and existing SIB alternatives; and comprehensively assessing the cost, supply chain viability, recyclability, and overall sustainability of the technology for Sub-Saharan markets.

Through this concerted effort, the StamiNa project aims to expedite the commercialization of UK-developed SIB technology while simultaneously fostering a sustainable, African-led battery ecosystem to underpin clean mobility and electrification across the continent.