

Why Sodium-ion pouch cells could be the future of batteries in Wales

The Future of Batteries in Wales - Development of a Pouch Cell Assembly Line for Sodium-ion Batteries

CAERPHILLY, SOUTH WALES, UNITED KINGDOM, January 22, 2020 /EINPresswire.com/ -- Welsh battery developer, Deregallera, has won a share of Welsh Government's EU funded £63.4m SMART Cymru programme funding that will enable the Caerphilly based company to commission a pilot scale [pouch cell](#) production line for advanced [sodium-ion batteries](#).

The project fills in the missing link between Deregallera conducting lab-scale materials discovery and commercial-scale battery manufacture; demonstrating their advanced materials in packaged cells conforming to industrial standard regulations in large, commercially relevant sized batteries.



Sodium-ion pouch cells could lead the way in sustainable energy storage

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*Martin Boughtwood,
Managing Director,
Deregallera Limited*

Funded by SMART Cymru, which supports growth of Welsh industry by increased investment in research, development and innovation, the new pouch cell production line is anticipated to create a massive step-change in developing future-friendly, non-toxic and sustainable energy storage technologies by using sodium-ion instead of lithium.

Why Sodium-ion? As we race towards an all-electric future, we need to develop energy storage technologies that do not rely on toxic materials such as lithium and cobalt, which require energy intensive and environmentally destructive means of extraction and processing. Deregallera's Chris Kavanagh, Materials Scientist and project lead explains:

“The drive for low carbon technologies has resulted in an explosion in demand for lithium-ion batteries (LIBs). However, scarcity of lithium precursors and the spiralling costs both financial and environmental in sourcing cobalt, is driving demand for cleaner, safer battery chemistries. “Sodium-ion is an abundant material. It is comparable to lithium in terms of battery operation and manufacture – with the added advantage that it can be discharged to zero volts, making it eminently safer to transport. Switching to sodiumion based energy storage is viewed as a ‘drop-in’ technology to replace LIB without disrupting established manufacturing lines.”

Deregallera's capability is excellent in materials discovery and development, allowing their materials research team to rapidly manufacture prototype battery and supercapacitor devices. The company's flagship technology has matured through a host of InnovateUK funded awards, under the Faraday Battery Challenge programme, resulting in a suite of exciting electrode materials developed for sodium-ion batteries: An advanced composite material has been proven feasible during a funded collaborative R&D



They may look like silver jiffy-bags, but pouch cell batteries are at the frontier of energy storage technology

project, "Composite carbon electrodes for sodium-ion batteries" and is now being prepared for manufacture at scale under follow-on project, "Low-cost, scalable and agile synthesis routes for sodium-ion battery materials". In parallel, a novel metamaterial is also being developed under "Advanced metamaterials for sodium-ion battery anodes". Finally, the company's supercapacitor material is being scaled, in partnership with bespoke cell manufacturer QinetiQ under grant award, "Dramatically extending 1st life via next generation battery management systems".

With the new award from SMART Cymru, Deregallera's path to commercialisation will be accelerated, allowing the firm to manufacture their advanced materials in packaged cells that conform to industrial standard regulations in large commercially relevant sized batteries.

The Education Minister, Kirsty Williams, whose portfolio includes research and innovation, said:

"Innovative projects like SMART Cymru provide wide benefits for the local economy, by creating jobs and contributing to sustainable growth. Establishing a pilot scale production line for sodium-ion batteries in South Wales will make the region a global spearhead for this exciting emerging technology."

The project involves acquisition and commissioning of a pilot scale pouch cell production line in Deregallera's state-of-the-art laboratory in Caerphilly. The class 100 clean room is to be converted into a 'dry room' to optimise processing of the moisture-sensitive sodium-ion into pouch cells, the most commercially relevant packaging solution for the company's technology. Production of pouch cells will provide the right format for demonstrating excellent volumetric and gravimetric energy density of the devices.

Martin Boughtwood, Deregallera Managing Director, said:

"We aim to manufacture large devices in sufficient quantity to be introduced in to commercially relevant scenarios including the 'buildings as power stations' demonstrators in SPECIFIC at the University of Swansea."

The UK is not currently a global leader in manufacture of battery materials at scale. However, the novel materials synthesis processes that Deregallera is developing could well provide an opportune moment to reshore the manufacture of advanced and sustainable battery technologies to the UK.

Ends

Editors Notes

Deregallera is an exciting and progressive high-tech research and development company committed to reducing the environmental impact of modern society by exploring and evolving new materials and technologies for an all-electric future. Activities include materials discovery for energy storage in capacitor, supercapacitor, pseudocapacitor and battery systems, as well as developing a range of novel electric motors, generators and advanced control systems demonstrated by our full scale EV prototype (named "Yr Glanaf" – Welsh for "The Cleanest").

Founded in 2010 by electric drives technology innovator and clean energy visionary, Martin Boughtwood, Deregallera employs 21 staff and has won grant awards under Innovate UK's highly competitive Faraday Challenge to develop a new Hybrid Energy Storage System (HESS) to extend the life of Electric Vehicle (EV) batteries by 50%. It has 23 filed patents to date.

The company works in partnership with leading scientists and development engineers from Cambridge, Southampton, Exeter, London South Bank, Queen Mary, Cardiff and Swansea universities and technology leaders such as QinetiQ, NPL, HPC Wales & Cymru and Dstl.

Welsh Government's £63.4m SMART Cymru programme is backed by £27m of EU funds. SMART Cymru has supported more than 350 welsh businesses to date and is part of the wider EU funded SMART Suite of support, which provides advice and guidance through our team of SMART Innovation Specialists to help businesses find the right path for implementing their innovative ideas.

Wales is benefiting from around €2.4bn of EU Funding under the four Structural Funds Programmes for the period 2014-2020, including around €200m under the East Wales ERDF Programme¹. These Programmes will focus on investments that can contribute to the creation of sustainable jobs and economic growth, with a concentration of resources in those areas where the greatest impact can be made.

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