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Developing supercapacitors to power rail rolling stock

The Rail Manufacturing Cooperative Research Centre (CRC) is overseeing a new project between the HEC Group and University of Technology Sydney (UTS) to develop hybrid supercapacitors to power rail rolling stock.

This is the second Rail Manufacturing CRC-funded project between the HEC Group and UTS, and is a follow-on from the original project to develop lithium ion batteries to power rail vehicle propulsion, regenerative braking, signaling systems and auxiliary applications.

This new project aims to develop a hybrid supercapacitor with high energy and power densities and advanced supercapacitor management systems for rail.

“Supercapacitors have the potential to revolutionise the rail industry – these technologies could reduce the need for overhead electrical infrastructure and also aid in the future development of hybrid-powered trains,” said Dr Shuwei Wan, CEO, HEC Group Australia.

The implementation of this new supercapacitor technology will effectively provide voltage stabilisation for rail systems, greatly improve the performance of propulsion for light rail vehicles and significantly advance the locomotive engine starting technologies.

“This project is looking to develop a supercapacitor with an enhanced energy density through changes to cell chemistry, with hybrid supercapacitors expected to eventually form a large part of the energy storage market,” said Lead Researcher Distinguished Professor Guoxiu Wang, who is Director of the UTS Centre for Clean Energy Technology.

Powering rolling stock requires energy storage devices to be robust and reliable, with long service life and low maintenance. In response, supercapacitors have the ability to charge and discharge very quickly for up to 100,000 cycles.

“The development of enhanced supercapacitor technologies not only benefits the Australian industry, but the global rail market as a whole, so this is another important collaboration between the Rail Manufacturing CRC, the HEC Group and UTS,” shared Dr Stuart Thomson, CEO, Rail Manufacturing CRC.

Worth approximately $5.5 million, the project is expected to finish by December 31st, 2019.

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About the Rail Manufacturing CRC
The Rail Manufacturing CRC was established in 2014 and will operate for a period of six years, funded by the Business Cooperative Research Centres Programme of the Australian Government's Department of Industry, Innovation and Science. The Rail Manufacturing CRC fosters, sponsors and directs collaborative innovative research and commercialisation partnerships between key stakeholders in the rail manufacturing sector, looking to support the development of new products, technologies and supply chain networks to increase Australia's rail manufacturing capacity and competitiveness.

About the HEC Group
Founded in 1997, the HEC Group is a high-tech multinational enterprise with a turnover of more than AU $5 billion in 2016. HEC has core manufacturing businesses in the areas of electronic materials, energy storage systems, intelligent electronic devices, pharmaceuticals and wellbeing products, with five manufacturing bases. With over 15,000 employees including 1,800 staff dedicated to Research and Development, the HEC Group owns the largest production facilities of anode foil for electrolytic capacitors in Asia.

About the University of Technology Sydney
Australia's #1 young university, UTS is committed to practical innovation and to the development of impact-driven research that benefits industry and the broader community: helping shape the world we live in. The UTS Centre for Clean Energy Technology focuses on the development of efficient devices for energy harvesting, production, saving, storage and conversion of cutting-edge renewable energy technologies for a green future.

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