



The research commercialisation office of the University of Oxford, previously called **Isis Innovation**, has been renamed **Oxford University Innovation**

All documents and other materials will be updated accordingly.
In the meantime the remaining content of this Isis Innovation document is still valid.

URLs beginning www.isis-innovation.com/... are automatically redirected to our new domain, www.innovation.ox.ac.uk/...

Phone numbers and email addresses for individual members of staff are unchanged

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The portfolio

The latest **spin-out** and **investment** news

Portable Fuel Cells – PowerAq

PowerAq will emerge as a leading designer and manufacturer of a new generation of portable fuel cell energy packs. The PowerAq concept is based on nanosilicon (with water as a point-of-use additive), and is more efficient, cleaner, safer and potentially cheaper than comparable products, with an energy density 10 times higher than that of conventional batteries.

Professor John Foord and a co-founder from Oxford's Chemistry Department have invented a new approach to control the release of hydrogen to power a portable fuel cell. The technology - PowerAq - uses processed silica nanoparticles that release hydrogen when water is added. The hydrogen then supplies fuel cells, generating electricity. The only waste product is sand.

The potential energy density of this technology is 10 times higher than that of Li-ion batteries, largely because a key component of PowerAq, water, need not be transported but can be sourced at point-of-use. Potential applications will be found in feeding portable fuel cells used to power devices requiring off-grid electricity in scenarios where recharging a battery is not possible. For example, the technology could provide a backup power solution for electric boats and yachts, which are particularly sensitive to noise and pollution.

After many years of gestation, the market for portable fuel cells has started to grow, and is expected to be worth \$0.66bn in 2022. Primary market segments are defence applications (>50%), external battery chargers (>30%), remote monitoring (15%) and fuel cells for portable electronics (<5%). Further market analysis (via direct engagement with fuel cell manufacturers) is required to determine likely profitability in each market segment and the best point of entry for PowerAq.

“10 times higher energy density than conventional batteries”



PowerAq will partner with fuel cell integrators and product developers looking for a better source of portable hydrogen. The aim is to commercialise mobile hydrogen fuel packs for different markets, as outlined above. Together with partners, PowerAq will be able to deliver customised fuel packs tailored to each application.

A total investment of £200,000 is sought to incorporate the company.

For more information, please contact:

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