# PRESS RELEASE

## Nano-Engineered Platinum Catalyst Layers for Fuel Cells

### *Project funded by Technology Strategy Board*

A £1.1 million project aimed at creating new platinum based catalyst layer designs for fuel cells has been awarded funding by the Technology Strategy Board[1]. Johnson Matthey Fuel Cells Ltd is leading the NECLASS project (Nano-Engineered Catalyst Layers and Sub-Structures), and together with partners Qudos Technology Ltd, Teer Coatings Ltd and Thomas Swan & Co. Ltd, is developing novel micro-and nano-structured materials to enable a significantly increased oxygen reduction mass activity of platinum within the fuel cell catalyst layers. Effective use of the precious metal platinum in the catalyst layers is one of the keys to unlocking the widespread commercialisation of the more energy efficient fuel cell power generation technology.

Qudos Technology is investigating micro-scale templating of catalyst layers and interfaces to increase the interfacial area and the access and egress of the reactants and products to the active layer, whereas at the nano-scale Teer Coatings is developing thin conformal Pt coatings onto carbon particulate and fibre materials by physical vapour deposition. Thomas Swan is studying the surface functionalisation of carbon nanotubes for application as the catalyst support in the catalyst layer. Johnson Matthey Fuel Cells will integrate these complementary developments into membrane electrode assemblies (MEAs) and test them in practical fuel cells.

**Partner Information**

**Johnson Matthey Fuel Cells (JMFC)**
Johnson Matthey Fuel Cells is a subsidiary of Johnson Matthey plc, the speciality chemicals company and world leader in advanced materials technology. JMFC is a leading developer, manufacturer and supplier of fuel cell catalysts, membrane electrode assemblies and other catalysed components to fuel cell developers worldwide. Headquartered at Swindon in the UK, JMFC is capable of researching and fabricating a wide range of developmental and production-scale MEAs.

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[1] The Technology Strategy Board is a business-led executive non-departmental public body, established by the government. Its role is to promote and support research into, and development and exploitation of, technology and innovation for the benefit of UK business, in order to increase economic growth and improve the quality of life. It is sponsored by the Department for Business, Innovation and Skills (BIS). For further information please visit www.innovateuk.org

**Qudos Technology Ltd.**
Qudos Technology Ltd is a leading UK research and development company specialising in micro and nano-scale technologies. Highly innovative, the company has been based at Rutherford Appleton Laboratory since 1992. In 2006, Qudos was designated as a National Prototype Facility; the company continues to give UK and international customers the means to develop device concepts, produce prototypes and to set up production. A highly skilled, experienced team of process engineers are able to perform simple processes like deposition right through to advanced techniques such as nano-imprint, grey-scale masks and advanced etching.
Qudos Technology's role in the NECLASS project is to perform the prototype manufacture of the micro and nano scale tooling required to enable templated catalyst layer and membrane fabrication.

**Teer Coatings Ltd. (TCL)**
Teer Coatings Ltd was founded in 1982 and specialises in thin film physical vapour deposition (PVD), providing an industrial coating service, coating and associated test equipment to a world wide customer base. The company also invests heavily in R&D to maintain its technological leadership in this field. TCL has continued to grow its business and relocated to larger, fully refurbished premises in 2004. The company has achieved ISO9001:2008 certification for its Quality Management System.
TCL now has a workforce of 57 people and a typical turnover around £4-5M pa, of which equipment sales typically contribute 50% or more. There is a high proportion of export sales.
TCL's role in NECLASS is to develop systems and PVD methodologies for the "nano" coating of porous substrates, fine particulates and carbon nanotubes.

**Thomas Swan & Co. Ltd.**
Thomas Swan is one of the largest family owned chemical companies in the UK. It was founded by "Tommy Swan" in 1926 and has been managed by four generations of the Swan family, and as such has been independent for over 80 years. Thomas Swan specialises in Performance and Speciality chemicals, has a turnover of ~£17M with 120 employees and has offices in the UK, USA and China. Between 2001 and 2004, in association with the University of Cambridge, Thomas Swan developed a manufacturing process for single and multi-wall carbon nanotubes. Further work with the University of Oxford focused on purification and dispersion of the nanotubes, and the product was launched under the Elicarb® brand name in April 2004.
Thomas Swan's role in the NECLASS project is to design, manufacture, purify and functionalise an ideal and optimised carbon nanotube for use as the catalyst support in fuel cells.