Accolade for solar-hydrogen project

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A research project that aims to produce hydrogen on an environmentally friendly and cost-effective basis by using energy from the sun has won a prestigious E.ON research award.

The new process of producing 'green' hydrogen uses three abundant and renewable sources — sunlight, biomass and water. It combines solar driven cleavage of water and the degradation of organic compounds avoiding the use of energy derived from fossil fuels and CO_2 emissions.

This year's E.ON Research Awards topic was on the application of nanotechnology in the energy sector. The awards were given to nine outstanding projects by 11 universities and institutes from six countries — the UK, Sweden, Greece, USA, Australia and Germany.

Hydrogen has huge potential as an environmentally clean energy fuel. Associate Professor Gianluca Li Puma, an expert in photocatalysis and photoreaction engineering, in the Energy Technologies Research Institute (ETRI) and in the Faculty of Engineering, is co-coordinating the 920,000 euro project which is being carried out in collaboration with Patras University in Greece. Energy from the sun will be collected through a nano-structured photocatalyst and used in an efficient photoreactor to release hydrogen from the mixtures of biomass and water.

Dr Li Puma leads photocatalysis and photoreaction engineering research at The University of Nottingham in the fields of environmental nanocatalysis, advanced oxidation processes, indoor air purification,

water treatment and purification, solar energy conversion and solar engineering.

Dr Li Puma said: "Hydrogen production by conventional water splitting over a nano-structured photocatalyst has been the topic of numerous investigations since the pioneering work of Fujishima and Honda in 1972 (Nature, 238, 37). However, after an initial enthusiasm it was quickly realised that hydrogen production rates were too modest to warrant scale-up. In contrast, the Solar-Hydrogen process, which has been demonstrated at a laboratory scale, yields hydrogen at rates up to 100 times greater than with conventional water splitting making the process commercially feasible."

Dr Li Puma has a leading international reputation in the design and modelling of photocatalytic reactors, solar engineering and novel photoreactors for sustainable energy applications. His research group in photocatalysis and photoreaction engineering will lead the work on scale-up of the Solar-Hydrogen process.

The project builds up strength at ETRI — in 2008 The University of Nottingham secured two other E.ON Research Awards on energy storage led by Professor George Chen and Professor Seamus Garvey, respectively.

Launched in November 2006, the Energy Technologies Research Institute brings together academics and industrial partners nationally and internationally to develop cutting-edge energy technologies that are both sustainable and affordable.

A multidisciplinary team of more than 100 engineers and physical and social scientists are working on research projects totalling more than £8 million in collaboration with a range of industrial partners in the energy sector, including E.ON and Rolls Royce on projects funded by the UK

research councils, the Department of Trade and Industry and the European Union.

Source: University of Nottingham (news : web)