

# Ray of light for water industry

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Scientists at the University of Aberdeen are developing new technology that uses sunlight to treat dirty water and create electricity simultaneously.

The three industrial partners - OpTIC Technium, Yorkshire Water and Scotoil Services – together with the UK Government Department of Trade and Industry (DTI), have committed £1.2m to commercially develop novel technology for breaking up pollutants found in all types of water supplies.

From landfill sites to domestic water tanks, the technology has the potential to be more cost-effective and environmentally-friendly than current methods.

The sunlight-driven technology will clean ‘dirty’ water and will provide electricity as a by-product by a process similar to that exploited in fuel cells. The electrical energy delivered may be used to drive equipment such as pumps, valve controllers and remote sensing electronics, further benefiting the environment.

The industrial partners represent two potential end users along with a specialist manufacturing consultancy. Aberdeen-based Scotoil Services is examining the potential for the new technology in its mainstream oil industry environmental services business, along with other industrial and pollution control applications. Yorkshire Water is looking at the potential within the water supply industry and, like Scotoil, offers industry knowledge and testing facilities. OpTIC Technium, based in St Asaph (North Wales), provides the manufacturing expertise.

Speaking ahead of the launch of the project today (April 28), Dr Donald Macphee, Lead Investigator and Senior Lecturer in the Department of Chemistry at the University, said: “The photoelectrocatalytic fuel cell (PECFC) is environmentally-friendly technology aimed at cleaning up pollutants found in the water supply.

“The technology at the centre of the project is a catalyst, which under illumination by visible light is capable of breaking up complex pollutants into harmless products whilst simultaneously producing an electrical current.

“Everyone wants access to 'clean water' and this project is aimed initially at the water supply industry. The new research will act as a platform to commercialise the lab-based prototype and will benefit the likes of the offshore industry and consumers by producing clean water.”

Using visible light offers the opportunity of capturing sunlight for this environmental ‘clean-up’ technology.

The Aberdeen scientists involved in the project include Drs Donald Macphee and Richard Wells and Professor John Duffy - all from the Department of Chemistry, along with Professor Ken Killham from the School of Biological Sciences. They bring together a unique blend of materials chemistry and environmental microbiology to develop the cutting-edge nanotechnology aimed at solving both the chemical and microbiological decontamination of water.

Professor Albert Rodger, Head of the College of Physical Sciences, said: “I am delighted to be involved in today’s launch of this exciting new research programme which will be based here at the University of Aberdeen.

“The project is interdisciplinary and will be conducted in direct

partnership with industry. I would like to take this opportunity to thank the UK Government Department of Trade and Industry (DTI), along with the three industrial partners – OpTIC Technium, Yorkshire Water and Scotoil Services - for the £1.2m funding they have provided to develop this solar-driven, sustainable technology.

“The research will be based on both materials science and environmental science and the aim is to have a full-blown prototype in three years which will lead to the development of technology that will provide ‘safe’ water from sunlight treatment whilst at the same time create electricity.”

The challenges that face the water supply industries continue to grow however this is a significant opportunity for the fuel cell to emerge as a viable ‘dirty’ water treatment technology. Other applications include treatment of industrial liquid waste, polluted water from landfill sites, and dirt from the oil and gas sector, which will aid environmentally-friendly activities.

The sunlight-driven, sustainable technology is also suitable for treating contaminated water in developing countries.

Source: University of Aberdeen

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