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19 March 2010

## Sheffield selected for UK dream team in biofuel challenge

The Carbon Trust has announced today (19 March 2010) that the University of Sheffield is one of eleven universities and research institutions across the UK to form part of a 'UK dream team' which will compete on the world stage in the race to commercialise algae biofuels.

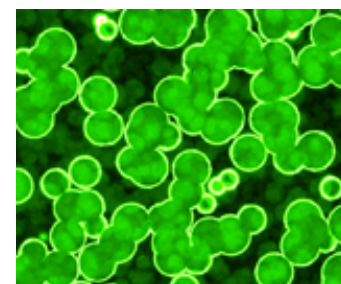
The 'dream team' of eleven leading UK institutions will work together with the Carbon Trust to find a winning formula for cultivating 70 billion litres of algae biofuel a year by 2030. This will be the equivalent to 6% of road transport diesel and a saving of over 160 million tonnes of CO<sub>2</sub> every year. The eleven institutions were selected from over 80 initial proposals following an extensive competition and detailed assessment process.

Sheffield's project will focus on choosing the correct strain and species of microalgae and optimising the production of it. Previous work has identified marine microalgae for biofuel production and these species will be used as a starting point to identify the best strains. The main criterion for choosing suitable strains of microalgae is their ability to produce high levels of neutral naturally occurring lipids, as these can be converted to biodiesel.

The Carbon Trust challenge will start from first principles of agriculture, and will screen thousands of strains of algae to find the winning few that can produce large quantities of a substance similar to vegetable oil. Additional research will develop methods for enabling large-scale production in algae ponds and next year the Carbon Trust plans to start the construction of a pilot demonstration plant in an equatorial region where algae are most productive.

Algae has the potential to deliver 5 to 10 times more oil per hectare than conventional cropland biofuels and new Carbon Trust lifecycle analysis indicates that, over time, it could provide carbon savings of up to 80% compared to fossil fuel petrol and jet fuel. With costs of algae biodiesel currently estimated to be approximately \$5-\$10 a litre, the Carbon Trust is focussing on more cost-effective production methods to ultimately bring the cost down to less than \$1 a litre.

Dr Jim Gilmour, from the University's Department of Molecular Biology and Biotechnology who will be leading



Algae under the microscope  
(Courtesy of i-stock)

the project at Sheffield, said: "Choosing the correct strain and species of microalgae is crucial to the success of the Algae Biofuels Challenge. Our main aim will be to develop a set of experimental techniques that will allow the identification of suitable algal strains. As well as producing high levels of lipids, the microalgae we aim to identify must also have high photosynthetic efficiency, ease of harvesting from relatively dilute cell suspensions and the ability to grow in outdoor ponds without becoming contaminated with other microbes."

Tom Delay, Chief Executive of the Carbon Trust, said: "We have pulled together a dream team of over 70 UK algae scientists who have the expert knowledge to turn algae into a British biofuel success story. Applying principles this country has developed from its proud agricultural heritage and leading bioscience expertise we will be developing a truly sustainable biofuel that could provide up to 80% carbon savings compared to diesel savings in car and jet fuel. With a market value of over £15 billion the potential rewards are high."

Production of 70 billion litres will require man-made algae ponds equivalent to a landmass larger than Wales to be built in optimum locations across the world. Algae need a source of carbon dioxide and water to grow so Carbon Trust is now looking to investigate possible locations for large-scale plants which could be, for example, next to industrial facilities located near the sea.

Notes for Editors: The Carbon Trust is investing £8 million over 3 years into the projects using funding from the Department for Transport and the Department for Energy and Climate Change (DECC).

Those universities and institutions selected to conduct the research are:

- University of Coventry
- London Queen Mary
- University of Manchester
- University of Newcastle  
(Supported on one project by Critical Processes Ltd)
- Plymouth Marine Laboratory (PML)
- Scottish Association for Marine Science
- University of Sheffield
- University of Southampton
- University of Swansea (Supported by Bangor University and PML)

The research projects address five key challenges identified by the Carbon Trust:

1. Isolation and screening of algae strains
2. Maximising solar conversion efficiency
3. Achieving both high oil content and high productivity
4. Sustained algae cultivation in open ponds
5. Design & engineering of cost effective production systems

The Carbon Trust

The Carbon Trust is a not-for-profit company with the mission to accelerate the move to a low carbon economy, providing specialist support to business and the public sector to help cut carbon emissions, save energy and commercialise low carbon technologies. By stimulating low carbon action we contribute to key UK goals of lower carbon emissions, the development of low carbon businesses, increased energy security and associated jobs.

We help to cut carbon emissions now by

- Providing specialist advice and finance to help

organisations cut carbon

- Setting standards for carbon reduction

We reduce potential future carbon emissions by

- Opening markets for low carbon technologies
- Leading industry collaborations to commercialise technologies
- Investing in early stage low carbon companies

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