Pilot plant cleans waste water and creates fuel

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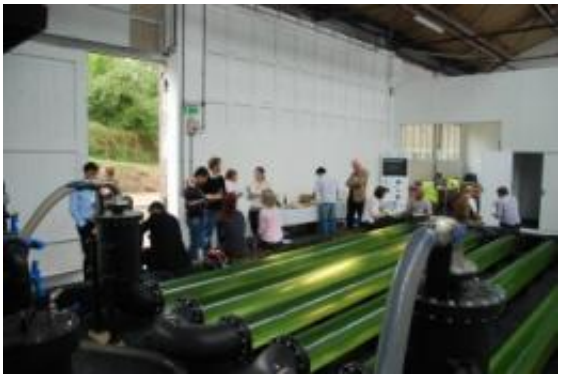

The opening of the pilot plant took place recently. Algae can be seen in the photo bioreactor.

A new industrial plant that uses algae to clean waste water has opened in Gloucestershire, run by scientists from the University's Department of Biology and Biochemistry, and environmental innovation company Aragreen.

The pilot facility will demonstrate the efficacy of algae as a sustainable water polishing technology, using waste water from a nearby Welsh Water plant. The algae will then be harvested and used in the production of saleable products.

The first of its kind in the UK, this pilot scheme will be used to trial different techniques and methods, and to experiment with different

species of algae to find those suitable for water polishing and biofuel, biochemical and protein production.

The plant has been built on a brownfield ex-First World War field telephone cable production site, which has been derelict for the past seven years. The team hope that it will enter commercial production by the end of 2012.

Rod Scott, Professor of plant molecular biology and academic lead on the project, said: “There is a large demand for both sustainable water polishing techniques and production methods for renewable fuels and algae biomass which pose less competition to increasingly scarce productive farmland.

“However, finding a cost-effective method for growing algae in large quantities has historically been difficult.

“By working with Dr. Tom Arnot in the Department of Chemical Engineering and Professor Matthew Davidson in the Department of Chemistry, we have invested in a multidisciplinary approach to tackle these issues”

Algae is put into the photo bioreactor, which waste water will pass through. The algae will polish the waste water, and be harvested as a product.

Waste water is high in nitrates and phosphates, which companies have to remove to create clean water. Currently, a number of chemical processes are used to treat the water and remove these substances to avoid pollution of natural water systems.

Professor Scott said: “Nitrates and phosphates are required by algae as nutrients, and the process of growing algae strips them out of the waste water.

“In the future we may also use waste carbon dioxide from industry to further enhance the process and make use of another waste stream.

“We are also currently investigating algae growing in the city’s Roman Baths which can survive at higher temperatures and could cut the cost of cooling the photo-bioreactors.

“Along with other cost-cutting measures, such as low-energy lighting, we hope to be able to demonstrate a viable waste water cleaning solution which may also provide valuable biomass as a by-product.”

The waste water for the pilot plant will be piped from a nearby Welsh Water plant into photo-bioreactors, large clear tubes under LED lights, in which the algae will grow. The clean water will be returned to Welsh Water free of cost for the purposes of the pilot scheme, although resale of this product will eventually be essential in reaching commercial viability.

When the algae is ready to be extracted from the photo-bioreactor it is first concentrated by specialised machinery before being dried into biomass which can be used for a range of purposes such as biofuel, fertilizers or proteins.

Provided by University of Bath