

Demo plants show potential of algae as sustainable energy source

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The BIOFAT project – which runs until April 2016 – has confirmed algae's potential as a sustainable source of biofuel and bio-products with low greenhouse gas emissions. Pilot-scale processing facilities, each one-half hectare in size, were constructed in Italy and Portugal, and a scaled-up 10-hectare demonstration facility is currently being finalised.

Sustainability has been the key factor throughout the project, with consortium partners focusing on environmental issues (such as the use of marine strains of [algae](#) to limit freshwater use) and economic issues (such as achieving low energy consumption). These plants have demonstrated exactly how generating biofuels from algae technologies will work from an economic standpoint, and shown that large-scale microalgae production platforms can be operated efficiently.

Green algae – a common garden pond nuisance – have immense potential as a new sustainable and affordable energy source. Key benefits include the fact that algae are among the fastest growing photosynthetic organisms. They can double their numbers every few hours and can be harvested daily, and have the potential to produce a volume of biomass and biofuel many times greater than that of our most productive crops.

Algae also store energy in the form of oils and carbohydrates, which, combined with their high productivity, means they can produce from 2 000 to as many as 5 000 gallons of biofuels per acre per year. Algae produce oils that can be converted into biodiesel and carbohydrates, which can then be fermented into ethanol.

After oil extraction, the remaining algal biomass can be dried and 'pelletized' and used as fuel that is burned in industrial boilers and other power generation sources. Algae can also be cultivated to produce a variety of products for large to small markets: plastics, chemical feedstocks, lubricants, fertilizers, and even cosmetics.

BIOFAT is part of a concerted effort by the EU to tap into alternative forms of energy, in order to effectively address issues such as climate change and the impact of fuel crops on food production and land use change. The project is one of three large-scale industry-led initiatives aimed at demonstrating the production of [algal biofuels](#) along the whole value chain, covering strain selection to algae cultivation and production, oil extraction, biofuel production and biofuel testing in transportation applications.

Key findings from this so-called 'Algae Cluster' were discussed at the Third European Workshop on LCA (life cycle assessments) for Algal Biofuels and Biomaterials in May 2015 in Brussels, Belgium. The workshop addressed issues relating to up-scaling, a central concern of the BIOFAT project.

More information: For further information, please visit the BIOFAT project website: www.biofatproject.eu/

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