

All-gas Newsletter 12/2016

All-gas main facts

The **All-gas** Project demonstrates the sustainable large-scale production of biofuels based on the low-cost cultivation of microalgae. The complete process chain is designed for a cultivation area of up to 10 hectares, making wastewater treatment energy self-sufficient, and recycling the nitrogen and phosphorus from wastewater into microalgae biomass.

The Project (n° ENER/FP7/268208) is co-financed with € 7,1 million by the EU Commission within the FP 7 programme: "ENERGY.2010.3.4-1: Bio-fuels from algae".

Project participants

Aqualia (Spain) as coordinator, BDI-Bio Energy International (Austria), Fraunhofer-UMSICHT (Germany), HyGear (The Netherlands), University of Southampton (UK), Volkswagen (Germany).



More info:

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First car worldwide run with microalgae biofuel

All-gas project extended until June 2018

DEMO plant under construction

The FP7 Project **All-gas** started in May 2011 and has reached its main objective, showing that an algae biomass yield above 90 t/ha/yr is possible, based on 2 years of operating a 1000 m² of open raceways fed by raw municipal wastewater. The LCA carried out by Fraunhofer-UMSICHT showed that, when converted to biomethane also considering water purification, the energy return on investment (EROI) is close to 2, higher than most plant biofuels (corn ethanol and palm oil diesel with typically 1.3).

For one ha of algae cultivation, about 1000 m³/d of wastewater can be treated to the EU Standards (WWTD) - while simultaneously producing a biomethane yield that allows to run 10 cars. This is twice the productivity of sugarcane ethanol or palm-oil biodiesel, which both yield fuel for up to 5 cars/ha.

The **All-gas** project is now reaching its final phase of large scale demonstration and fleet testing, building 4 raceway ponds of 5200 m² each as a first phase of a 10 ha of algae cultivation - that could power around 20 cars.

All-gas project extended 24 months

On February 22nd 2016, the European Commission accepted the second amendment granting a project extension of 24 months until June 2018. This will allow to construct the final demonstration plant to convert the All-gas plant into the largest installation of microalgae culture in Europe, starting with an initial 2 ha of algae cultivation to treat around 2000 m³/d of wastewater.

First car worldwide run with microalgae biofuel

In August 2015, a 25 m³ anaerobic digester and a biogas pre-treatment plant coupled to a gas station were started up to convert the algae produced at the 1000 m² prototype plant in Chiclana to biomethane. Currently this plant is producing at least 3 m³ of raw biogas per day (69% CH₄ and 31% CO₂, up to 6000 ppm H₂S), which is pre-treated in a special water scrubber to increase CH₄ concentration to 93% and remove almost 95% of H₂S. The daily CH₄ production of this plant powers a vehicle VW UP with a fuel equivalent around 80 km/day.



aqualia

BDI

Fraunhofer

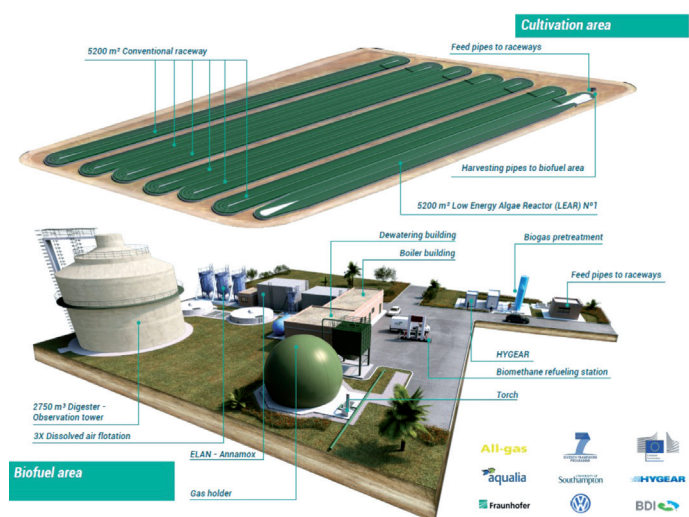
HYGEAR

Southampton



DEMO plant under construction: From dreams to reality

On 25th May 2016 started the construction of the final demonstration plant, first with the solids handling and biofuel facility, based on a 2750 m³ anaerobic digester, then in August 2016 with the preparation of 4 x 5200 m² as the first phase of raceways. Completion is expected in early 2017, so that more than one year of operation can be performed before the conclusion of the project in summer 2018.



In Lisbon with our Scientific Advisory Board (SAB)

During the last EABA conference held in Lisbon in December 2015, **All-gas** project meetings both with the EU Project Officers and the SAB were carried out. The latter was attended by John Benemann (Microbio, US), Emilio Molina Grima and Gabriel Acien (both university of Almería, ES), while Tryg Lundquist (CalPoly, US), Charles Banks (Soton, UK) and Rupert Craggs (NIWA, NZ) connected via call conference. The SAB was consulted about the most relevant results obtained during the RTD activities, and the issues to be solved for the design of DEMO, evaluation of prototype, including the energy and mass balances, to confirm the design parameters of the demo unit.



General Assembly in Chiclana de la Frontera

The consortium held its general assembly meeting in Chiclana de la Frontera in June 2016 in order to report and evaluate new results obtained by the partners and to visit the Demo construction works. John Benemann joined the meeting as part of the SAB.



Dissemination: All-gas around the world

LEEDS, UK, 21-23 March 2016

11th IWA Conference on wastewater ponds.

OLHAO, PORTUGAL, 6-8 April 2016

"European Roadmap for an algae-based industry", International Conference.

JEREZ DE LA FRONTERA, SPAIN 13- 16 June 2016

13th IWA Leading Edge Conference on Water and Wastewater Technologies.

ATHENS, GREECE, 14-16 September 2016

13th IWA Conference on Small Water and Wastewater Systems & 5th IWA Conference on Resources-Oriented Sanitation.

BRISBANE, AUSTRALIA, 9-14 October 2016

IWA World Water Congress & Exhibition 2016.

PHOENIX, ARIZONA, (USA) 23 - 26 October 2016

ABO 10th Algae Biomass Summit.

MADRID, SPAIN, 13-15 December 2016

EABA AlgaEurope Conference.

DELFT, THE NETHERLANDS, 16 and 17 March 2017

IWA Conference on Algal Technologies for Wastewater Treatment and Resource Recovery.

