



# DOWNSTREAM Project

Applied research on optimising the cultivation of algae in wastewater and its subsequent processing. The seasonality of microalgae cultivated in mixotroph, the fluid-dynamic design and production of CO<sub>2</sub> in raceway reactors will be studied to optimise cultivation. The harvest and its subsequent concentration, drying and energy recovery will be optimised for biomass processing.

The FP7 SWAT supports the INNPACTO DOWNSTREAM programme, as its aim is to develop a universal technology to cultivate algae. On the one hand it is based on knowledge regarding the elimination of matter in wastewater, and on the other, on using and optimising current technology to harvest algae.

The diagram illustrates a wastewater treatment plant (WWTP) integrated with an algae-based bioenergy system. The process flow is as follows:

- Wastewater** enters the **RACEWAYS** (aeration tank).
- The effluent from the **RACEWAYS** goes to **HARVESTING**.
- HARVESTING** produces **Effluent** and feeds into **ALGAE DIGESTION**.
- ALGAE DIGESTION** produces **Biogas** and feeds into **DEWATERING**.
- DEWATERING** feeds into **SOLAR SLUDGE DRYING**.
- SOLAR SLUDGE DRYING** feeds into the **BIOMASS BIOLER**.
- The **BIOMASS BIOLER** produces **Combustion gases** and feeds into **Energy generation**.
- Energy generation** produces **Heat** and **Biogas**.
- Biogas** is fed back into **ALGAE DIGESTION**.

**Aqualia: 747,280 €**

## PROJECT PARTICIPANTS:

### Partners:

**Leader:** aqualia gestión integral del agua

**Other partners:** Universidad de Cádiz

Fundación Tecnalia

Instituto tecnológico de Canarias

### Main Collaborators:

Fundación Cajamar

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## GRANT:

### INNPACTO PROGRAMME 2011

The National Public-Private Cooperation Programme under the framework of the National Scientific Research, Development and Technological Innovation Plan, 2008-2011. Ministry of Science and Innovation.

The main objective of the INNPACTO subprogramme is to foster the creation of cooperative projects among research bodies and companies to jointly undertake R&D&I projects that help to foster innovative activity, mobilise private investment, generate employment and improve the country's technological balance.

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Financeable budget: 1,285,377 €

Aqualia loan: 597,824 €