



ALGADISK - Novel algae-based solution for CO₂ capture and biomass production

The ALGADISK project aims to develop a biofilm reactor for algae biomass production which could compete with current algae cultivation technologies (e.g. open-pond and tubular photobioreactors). Biofilm formation is a widely observed characteristic of microalgae, which is considered as one of the main problems of tubular, flat-plate and other suspended photobioreactors. While in ALGADISK reactor, biofilm formation is enhanced and supported due to its special design, allowing harvesting high dry solid content biomass, reducing water loss and decreasing energy consumption. The reactor is scalable, modular, contains a sensor and control system to follow and keep growth conditions in optimal range, real time (e.g. pH and volume of medium, nutrient concentrations, temperature). Reactor consists of vertically positioned plastic disks and non-transparent tanks, in which disks are placed half way in growth medium. Surfaces of disks are modified in order to intensify primary biofilm formation and provide sufficient cell number for regrowth of biofilm after harvest. Continuous rotation of disks provides proper wetting of the whole surface and light distribution over the biofilm. In addition, negative effects of saturating light intensity are precluded by cyclic movement of biofilm from light part into the dark tank. Due to the position and orientation of disks, light utilization of reactor can reach a high level, resulting in high biomass productivity. Modules are covered with transparent, removable lids in order to reduce risk of contamination and protect biofilm from extreme weather changes. During the process of system development, concept of CO₂ capturing from flue gases was one of the main aspects of design. Reactor is capable of enhancing CO₂ to dissolve in the growth medium, just as to reach a high CO₂ percentage in the air phase, thus microalgae have access to CO₂ both in liquid and gas phase, that results in high biomass production. A semi-automatic harvesting system was developed uniquely for the ALGADISK reactor to provide an easy and efficient method of biomass collection.

www.algadisk.eu

Training Events on the ALGADISK System

Training activity organized by ALGADISK consortium consists in a two stages programme.

First stage consists in a continuous training activity from RTDs to the SMEs and SME-AGs of the consortium. The crucial objective is to ensure that all partners are aware of the state of the art of the relevant research fields, have up to date knowledge on the technological developments performed throughout the project as well as on IPR issues and exploitation of research results, trainings have been taking place during the project meetings. During the last year of the project, live prototype demonstrations are planned to be organized at the premises of BFC in Almazan, Spain when the consortium SMEs and SME-AGs will see the ALGADISK system under operation and they will be trained on the use in line with the operational guide.

According to the action plan of the “second stage” of the training activity, SME Association partners will organize training events for members and stakeholders and provide them with lectures and customized trainings so that they will also be able to use and operate the ALGADISK system.

Planned Training Seminars to SME-AG Members

Task focuses on the training to end-user SME-AGs and their members. EUBIA, CESFAC and FC are responsible for the venue and organize at least one training session until the end of the project.

EUBIA will organize a training event addressed to SMEs to present the technical specifications, operating conditions and potentials of the ALGADISK system. See below the Event Programme of EUBIA Training event which will take place in Brussels on the 23rd of October 2014.

TRAINING EVENT - PROGRAMME

Venue: Scotland House - Rond Point Schuman, 6, B1040, Brussels.

Date: Wednesday 12th November 2014

AGENDA

09.30: Welcome to participants

09.45: Introduction of the Microalgae market potentials

10.00: ALGADISK project concept - ALGADISK PBR technical scheme and components specifications

10.20: Presentation of on-site installation and adjustments

- a. Assembly of the prototype*
- b. Connection of the ALGADISK system to end-user system*
- c. Electric control and operation system set-up*

10.40: Presentation of ALGADISK tests' in Spain and results:

- a. Context: Climate conditions, hours operation, algae species, etc..*
- b. Growth rate*
- c. Energy consumption*
- d. Nutrients (N-P consumption)*
- e. CO₂ consumption*
- f. Biomass productivity*

11.00 - 11.15 Coffee Break

11.15: Estimated business plan according to the tests provided in Spain

- a. Present Estimated investment per 1 model*
- b. Investment of technology at commercial level*
- c. Maintenance costs (personnel, energy consumption, nutrients, etc..)*
- d. Productivity per year*
- e. Amount of dry algae produced for sale (market average cost, €/kg)*
- f. Economic feasibility and return of investment*

12.30: Prediction software utilization for ALGADISK economic feasibility estimation in different regions

12.50: Regular use and maintenance of the ALGADISK system

- a. Hardware components*
- b. Control system and control software*
- c. Algae inoculation and adding nutrients for algae production*
- d. Harvesting*
- e. Troubleshooting*
- f. To-dos at the end of the season*

13.15 - 13.30. Closing session