

## Editorial Hans Reith, Project Coordinator

**T**he third Newsletter marks the end of the first 18 month period, in which significant progress has been made. In WP1 algae biomass from 4 industrial strains was produced by partner Fitoplancton and delivered to partners for R&D on processing and application. The effect of cultivation parameters on the expression of genes involved in various metabolic pathways was studied, revealing the existence of fine-tune transcriptional regulation mechanisms. These results form the basis for the development of new molecular tools for optimization of target products in the algal biomass during cultivation.

The work on supported amine-based technology for CO<sub>2</sub> capture from air aims at achieving a suitable CO<sub>2</sub> concentration for algae cultivation at minimal cost. For several sorbents a good CO<sub>2</sub> adsorption capacity was found while the stability of sorbents was shown to be an important parameter for optimization. The final aim is to enable stand-alone cultivation in remote areas such as deserts.

The development of innovative membrane based harvesting and medium recycle technologies in the project aims to reduce costs and energy use. Screening tests have shown that the selection of membrane material and pore size is dependent on algae type and that optimum filtration techniques for algae and supernatant are different. Cultivation tests using recycled medium have shown no reduction in algal growth until now, which is an encouraging result.

Good progress has also been made in WP2, which is aimed at bioprospecting and selection of robust, highly productive algal species. Existing microalgae collections in the partner countries have been extended by a sampling program in highly diverse climatological locations (Arctic waters, subtropical islands, altiplanic desert). Industrial partners provided a list of target compounds and functionalities with commercial potential. To date, 46 strains have been screened, of which 4 may have industrial potential. To evaluate the productivity potential in different climatic conditions, identical outdoor photobioreactor systems are being installed at partner locations in Norway, Gran Canarias and Chile. This will present a unique opportunity to compare productivity data under (very) different climatic conditions!

Additionally, there has also been interesting progress in the development of integrated biorefinery technology (WP3). Cell disruption methods were tested and compared and it was shown that the application of enzymes or chemical pre-treatment contributes in a positive manner to disruption efficiency.



TMUC pilot scale algae cultivation and harvesting facilities

Several extraction procedures for specialties are under development and work was started on the use of supercritical CO<sub>2</sub> for extraction of algae oils and use of membranes for separating water soluble algae components. This also remains an area of challenges and potential breakthroughs.

In the area of product development and market assessment (WP4), the first samples were tested and indicated the possibility to incorporate whole-cell micro algae in bioplastic compounds and glues for wood panels. In the coming period we expect to produce the first results in different application domains (food, aquafeed, cosmetics, bioactives...).

In WP6, three preliminary conceptual process designs have been developed and a start was made with the evaluation and the environmental and socio-economic assessment. The work on dissemination, exploitation & intellectual property management of the results of the project (WP7) has produced a range of communication tools, including this 6-monthly Newsletter, a roll up banner, brochures, a public website, social networks and a web-based platform for exchange within the consortium. Work on the management and exploitation of intellectual property has also started.

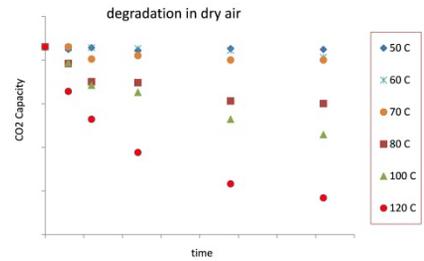
On 12-13 May 2015 the 2nd Intermediate Progress Meeting was held in Antwerpen, Belgium. A highlight of this meeting was the acceleration of the demonstration work through the selection of preliminary, process based, specialty value chains for demonstration. For each value chain an industrial partner was appointed as “champion” to monitor/coordinate the development of the value chain across the Work Packages. Evidently these activities will be closely coordinated with WP6. Another highlight was the visit to the pilot scale algae cultivation and harvesting facilities at partner TMUC in Geel, BE (see photo).

Overall the project shows good progress and I am looking forward to the coming period!

## Innovation in algae cultivation

Significant progress in the development of molecular technologies to better control the algae culture and quality, characterization and selection of adsorbents for CO<sub>2</sub> concentration, harvesting and medium recycle and development of a novel photobioreactor concept.

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## Joint bioprospection campaigns

Identification of promising novel microalgae strains with industrial potential from the Arctic, the sub-tropics and the Chilean desert.

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## Development of integrated biorefinery technology

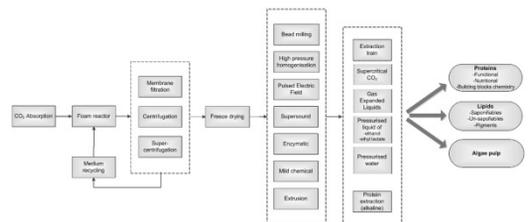
The key findings for 2015 include the chemical characterization of four algae strains, cell disruption and green extraction procedures

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## Preliminary conceptual process design models and the evaluation of selected integral value chains

Aiming at the implementation of a techno-economic and sustainability assessment of a multi-product integrated biorefinery for microalgae.

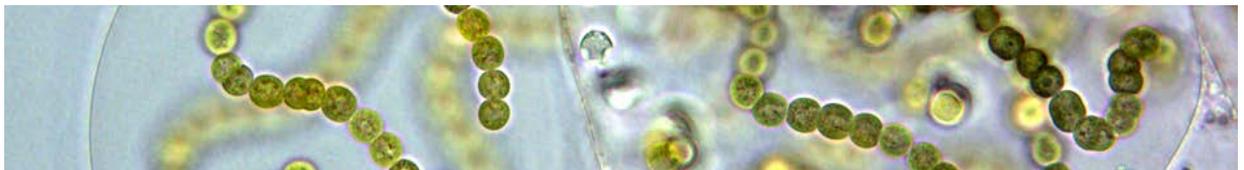
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## Product development and market assessment

WP4 is dealing with the back-end of the process: application validation and marketing aspects

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## 2nd Intermediate Progress Meeting - Antwerp, BE, May 2015

The Project's 2nd Intermediate Progress Meeting took place in Antwerp, Belgium, bringing together all consortium partners for two days on 12th and 13th of May 2015. The meeting started by reviewing the progress of the activities developed during the last six months. In several break-out workshops and plenary sessions the R&D results achieved in each Work Package and the planning for the forthcoming project period were discussed and agreed in detail. A highlight of this meeting was the preparation of the demonstration work via the selection of preliminary, process based, specialty value chains for demonstration.

On the 13th of May the meeting was concluded at the location of project partner Thomas More University College at Geel, where the partners visited the pilot scale algae cultivation and laboratory facilities. The pictures of the meeting can be seen in our [Facebook page](#)

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