



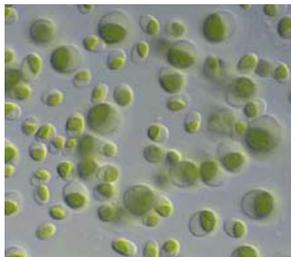
## Research News

# Coating Components firing the Economic Biorefinery of Algae; *AlgiCoat*

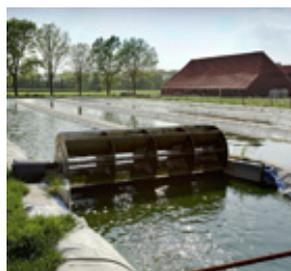
**The BU Biobased Products of the Agrotechnology & Food Sciences Group (AFSG) has a long history of R&D activities on different aspects of the Biobased Economy and related (bio-polymeric) products, microbial strain development, downstream processing, analyses and product development. AFSG coordinates this *AlgiCoat* Project to develop a “whole crop” biorefinery concept for large-scale algal cultures, co-producing base chemicals, fuels and heat / electricity.**

### Background

Phototrophic algae use solar energy for photosynthesis to bind CO<sub>2</sub> for the production of biomass and useful components, such as oil, food and feed ingredients.



Chlorella micro-algae



Ingrepro's open pond cultivation

Of special importance is the high biomass production capacity of some algae of probably between 20 - 50 tons of dry matter per hectare per year, making this crop even superior to *e.g.* beet and potato.

### Novelty

Algal systems so far have been studied in order to derive biofuels or very high value added food components. This project offers a unique approach in developing a whole crop biorefinery system with a focus on the development of base chemicals.

### Importance for a clean, reliable and affordable energy household

The project significantly contributes to a clean, reliable and affordable energy household. Upon commercialisation AkzoNobel could use more than 200,000 tons per year of durable base chemicals derived from algae for its production of coatings and surface active agents. Furthermore, by using CO<sub>2</sub> released from energy plants, it will decrease the net generation of CO<sub>2</sub> by companies such as AkzoNobel and Essent correspondingly. As base chemicals are higher priced than fuels on the one hand and have large market volumes on the other hand, this acts very favourable on the overall economics of algal production systems.

### Further implementation

Already during the initial project phase AkzoNobel and Ingrepro have built a small demonstration unit showing that algal systems can be used for base chemicals, fuel and heat / electricity production. Essent will deliver the CO<sub>2</sub>. However, the research and development activities of the project are mandatory to generate the technological breakthroughs required for full scale economic operation. The demonstration unit has been built as it is important to get experience with complex biological processes in a chemical environment. Optimization of the biological and chemical conditions is essential. In a

later stage the demonstration unit will be used to show that algal systems can produce feedstocks for the chemical industry.

### Partners and their contributions

Initiated by AkzoNobel and Wageningen UR a consortium has been created from lead-partners in their specific expertise areas comprising the complete chain of knowledge needed for a successful development of the technology and for final commercial implementation. Partners/tasks are:

Wageningen UR Agrotechnology & Food Sciences Group with the involvement of Biobased Products and BioProcess Engineering: one of Europe's largest Research organizations in the area of renewables with expertise on biology of algae and on coating components  
- Biology, selection and culture stability of algae, small-scale cultivation parameters, extraction, analyses, initial chemical conversion, side products.

AkzoNobel: World-leader in the production and sales of chemicals, coatings and paints  
- Synthesis of resins, formulation and evaluation of paints and coatings  
- Process design and integration  
- System/chain evaluation, economics.

Ingrepro: Netherlands' largest producer of algal systems  
- Large-scale cultivation parameters and harvest.

Essent: Netherland's largest energy company  
- Energy and CO<sub>2</sub> aspects, biodiesel, extracted biomass, other side streams, heat / electricity.

### Information

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