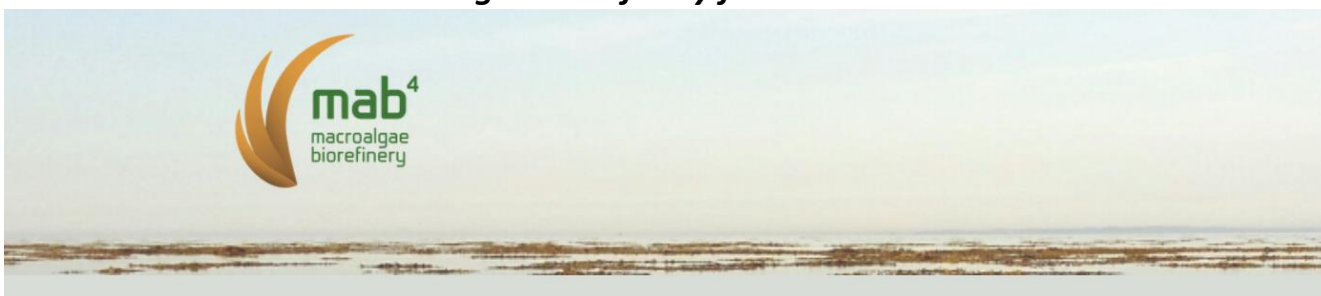


MAB4 - MacroAlgae Biorefinery for Value-Added Products



AU-ENVS project lead:

[Marianne Thomsen](#)

Staff:

Xueqian Zhang (PhD student), co-supervisor
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Links:

mab4.org

MAB4 will bridge the gap between research, innovation and market within the macroalgae (seaweed) sector. The goal is to establish seaweed cultivation as a Danish discipline for providing seaweed biomass for the business sectors of food and feed ingredients, and cosmetics. MAB4 will breed and mature sea-farmed crops of seaweed by improved and new cultivation methods in Danish and Faroese waters, with particular attention to seasonal development of algae bioactive substances and their conservation during harvesting and storage. The project will also develop sustainable enzymatic and Green Solvent extraction methods for development of new algae products i.e. antioxidants, fucoidan, laminarin, alginate, proteins, and minerals. The products will be tested as food and feed ingredients as well as in skincare products. Techno-economic feasibility and LCA will assess for the whole value chain from cultivation to final marketed seaweed products. MAB4 is a trans-disciplinary project running for 3½ years. The project consists of a strong consortium of national and international algae cultivators, biorefinery experts from universities, RTO's, SMEs and relevant industrial end-users. The results from MAB4 will provide guidelines for stakeholders from industry and for future seaweed cultivation.

The role of AU-ENVS is to cross systems modelling of sustainable resource flows across the human and natural ecosystems. AU-ENVS participates in several international and national projects on whole value chain assessments of the use of marine resources and ecosystem services for marine biobased production systems. In MAB4 Professor Marianne Thomsen will lead and primarily work with feasibility and identification of barriers in algae industry (WP 5), and support the techno-economic and sustainability assessment of the supply chain of macroalgae resources and products, including socioeconomic measures. AU-ENVS has core competences in integrated systems modelling of sustainable resource flows across the human and natural ecosystems, and sustainability assessment of macroalgae cultivation is a core research field for AU-ENVS.

AU-ENVS will contribute to the setup of an integrated model assessment framework focusing on the valuation of biobased products and services, on quantitative measures of the impact services provided the use of emissions as resources for macroalgae growth by circular regenerative businesses and on decision support for policy instruments supportive for the development of regenerative circular blue economy business models of high socioeconomic value. The model will valorise the biosorption of emission by macroalgae, which represents a transition from linear open loop to closed loop production systems. Transforming the macroalgae feedstock via a biorefinery process into high value products creates a resilient biobased production system characterized by circular closed loop resource flows and ecosystem health preservation.