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PROTEUS: Flagship Project to Establish the World's First Industrial Scale Biorefinery for Brown Seaweeds

The PROTEUS consortium seeks to launch the first fully integrated industrial biorefinery for brown seaweeds in Norway. This project aims to transform sustainable bio-based ingredient production, supporting environmental goals and European climate objectives.

Key Highlights:

Innovative Biorefinery Technology: Uses state-of-the-art technology to maximise biomass utilisation from 15% up to 100% without harmful chemicals.

Sustainable Practices: Focuses on eco-friendly harvesting, optimised resource use, and significant greenhouse gas reductions.

Collaborative Effort: Funded by the Circular Bio-Based Europe Joint Undertaking and its members, bringing together 11 key partners to scale bio-based product impact across industries.

Oslo, Norway – 15 May 2024

The PROTEUS consortium, funded by the Circular Bio-Based Europe Joint Undertaking (CBE JU), aims to establish the first industrial-scale biorefinery for brown seaweeds. This facility will enhance sustainable production of bio-based ingredients from *Laminaria hyperborea*, an untapped European renewable resource, meeting global demand in food, feed, personal care, and industrial sectors.

Innovative Technology and Sustainable Production

Located in Avaldsnes, Norway, the biorefinery uses an innovative technology to avoid harmful chemicals like formaldehyde, ensuring efficient water and energy use. The facility maximises the use of aquatic biomass, increasing industry utilisation from 15% up to 100%. It operates with the hybrid electric vessel *Hypomar Ocean 1*, minimising environmental impact.



Consortium and Collaborative Impact

The consortium, coordinated by Alginor ASA, includes 11 international partners including Alginor Biorefinery, Hypomar, Borregaard, Vaess, Olmix, Essity, Norsus, Institute of Marine Research, Steinbeis, and CLIC Innovation. It sets new standards for harvesting, biorefining, and applications of brown seaweeds in food, feed, personal care and bio-based industrial markets.

At the PROTEUS kick-off meeting in Oslo, held on 14–15 May, the CBE JU project officer Monica Padella praised the project: “Flagship project PROTEUS by building up a first-of-its kind biorefinery will contribute to accelerating the market deployment of innovative bio-based solutions based on the valorisation of sustainable aquatic biomass as feedstock and unlocking the potential of the EU’s blue economy.”

Commitment to Environmental Stewardship

PROTEUS incorporates eco-friendly practices, optimised water and energy usage, and extensive recycling, aligning with European climate goals by reducing petrochemical dependence and greenhouse gas emissions.

Kjetil Rein, CEO of Alginor ASA, said in his keynote speech that this project is a significant milestone, unlocking the full potential of brown macroalgae.

Future Prospects and Scaling Up

With a €14.4 million budget over four years, including a €9.6 million grant from the CBE JU, PROTEUS plans significant expansion. The biorefinery aims to produce over 5,000 tonnes of high-value ingredients annually, with duplication of future biorefineries planned for additional macroalgae biomass and species.

About the Circular Bio-Based Europe Joint Undertaking

The CBE JU is a €2 billion partnership between the European Union and the Bio-based Industries Consortium, funding projects to advance circular bio-based industries in Europe.

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