



**CIRCALGAE**

Food • Feed • Cosmetic

# Policy Recommendations for Sustainable Algae Biorefineries in Europe

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Co-funded by the  
European Union

Expertise: algae (seaweed/microalgae), water quality and environment, cultivation, algae-based products and processes

Creation: 1982

Headcount: ~ 29 permanent employees

Turnover: € 2.6 M



## Roles in CIRCALGAE:

- **Task 1.1 Leader:** Current analysis of the use of macroalgae and microalgae in Europe
- Tasks 1.2 / 1.3: Assessment of harvest and cultivation and optimization within biorefinery
- Task 4.1: Regulatory aspects for CIRCALGAE products
- **Task 6.2 Leader:** Training activities and trans-disciplinary recommendations  
incl. **Policy Brief** on sustainable algae biorefinery



# Policy background and strategic environment

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## Broader Societal Transition

Marine resources replace fossils/agriculture;  
Consumer push for responsible production

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## Biorefineries

Aligns with the circular bioeconomy principles  
pursued by the Circalgae project  
EU Bioeconomy Strategy

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## Co-Products as Resources

From waste to value via upcycling, driven by  
sustainability demands and EU support  
Circular Economy Act



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## EU Algae Initiative

In November 2022, the European Commission launched the "Towards a Strong and Sustainable EU Algae Sector" initiative, aiming to increase sustainable production, safe consumption, and innovative use of algae.

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## EU and National strategies and tools

EU4Algae platform

Algae Declaration, Feuille de Route Algues

# An urgent need to scale algae production and usage

01

## Limited European production

EU seaweed production represents ~1.4% of global production • 99% from wild harvesting

Microalgae production is even smaller (350–650 dry tonnes, <0.5% global production).

02

## Import dependence • Under-utilisation

Significant imports, mainly for hydrocolloid extraction. Only 15–35% of the biomass is turned into products.

### European macroalgae import



**382 060 tons**

mix of dry weight/semi dry/fresh weight

mainly in the phycocolloid industry



65-85% of the total algal biomass is discarded as waste



European algae production (1.4%)

### European microalgae production



**350 TONS**  
DRY WEIGHT

*Circalgae estimation*

EUROPEAN MICROALGAE PRODUCTION

**650 TONS**  
DRY WEIGHT

*EABA, 2024*



represents less than 0.5% of the global microalgae production

# Regulatory and Market fragmentation

03

## Diverse national regulations

- Regulations and practices vary across EU Member States (and beyond), and across algae markets;
- Other regulations not considering algae or not tailored for biorefineries;
- Uneven/unclear regulatory landscape creates unfair competition and uncertainty for producers, processors and investors;
- Competitiveness vs third countries is also at stake.

04

## Fragmented industries and co-products

- The multi-sector algae industry includes diverse sub-domains (hydrocolloids, food, cosmetics, feed, biomaterials).
- A large number of SMEs and start-ups : small facilities, core competencies gaps for biorefining or multi-market approach
- Coproducts are geographically and volumetrically fragmented, hindering the creation of economies of scale.



# Five pillars for a Competitive and Sustainable sector

**01**

PILLAR

Boost seaweed and microalgae cultivation

**02**

PILLAR

Unlock regulatory constraints and harmonize regulatory landscape

**03**

PILLAR

Foster regional clusters for co-product valorization

**04**

PILLAR

Promote consumer acceptance of algae foods

**05**

PILLAR

Boost funding for innovation, scale-up and standardization



# 01 Boost seaweed and microalgae cultivation

PILLAR



**Scale-up algae production**

Adopt innovative production models to enhance algae yield



**Simplify licensing & integrate algae cultivation in maritime spatial planning**

Make licensing process faster for offshore, near-shore and inland seaweed farms



**Enable the cultivation of high-demand species in controlled environment**

Support controlled algae cultivation to meet the market demand



**Showcase ecosystem benefits to improve societal acceptance**

Highlight carbon impact, biodiversity gains and other benefits of algae production



**Measure environmental, economic and social impacts**

Prove algae's role in the blue economy & circular bioeconomy



# Unlock regulatory constraints and harmonize regulatory landscape



Establish a clear, supportive and coherent regulatory framework for microalgae production

- ✓ Encourage safe use of secondary input materials in algae production where appropriate
- ✓ Utilize cost-effective fertilizers like Nitrogen (N) and phosphorous (P) for algae cultivation
- ✓ Establish clear regulations for algae grown with secondary inputs or sourced from environmental remediation
- ✓ Define the regulatory status of waste-fed algae products



**Harmonize and simplify European regulatory framework**  
Standardize regulations across Europe with clear field-specific guidelines aligned with European laws



**Align feed and food safety regulations for contaminants**  
Define thresholds for harmful substances based on portion size and toxicity



**Clarify the definition of novel food ingredients and feed additives**  
Establish clear purity criteria, differentiate raw vs. extracted products, and streamline authorization processes



**Reevaluate testing and assessment requirements**  
Review toxicological and genotoxicological testing requirements and reassess allergenicity risk assessments, protein quality, and digestibility



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# 03 Foster regional clusters for co-product valorization

PILLAR



## Facilitate technology transfer from research to industry

Encourage the transfer of innovative technologies from research institutions to industry with licensing agreements and provide support for pilot-scale testing



## Build open-access pilot-scale facilities for biorefinery processes

Establish pilot scale biorefinery facilities near co-product resources to support algae processing. These facilities should be designed to benefit all stakeholders



## Enhance cooperation through biorefinery cluster

Foster collaboration between companies by creating biorefinery clusters (stabilization and transportation of co-products optimization, local collaborations...)



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# 04 Promote consumer acceptance of algae foods

PILLAR



**Encourage wider adoption of algae, particularly for food**

Increase consumer awareness of the algae's nutritional and environmental benefits in daily diets



**Raise public awareness through targeted campaigns**

Educate the public on algae's health benefits, sustainability and the role in circular economy



**Engage with educational institutions**

Collaborate with schools, universities, and vocational programs to create curricula that train a skilled workforce for the algae industry



**Support the EU4Algae platform**

The platform facilitates collaboration among European algae stakeholders and provides easy access to evidence-based algae informations



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05

PILLAR

# Boost funding for innovation, scale-up and standardization



## Expand funding and subsidies for the algae industry

Offer financial support to drive growth and innovation in the algae sector



## Establish grant programs

Launch targeted grants for research, development, and commercialization of sustainable algae technologies



## Support standardization initiatives

Fund industry standardization efforts like the CEN TC 454, ensuring long-term support



## Facilitate matchmaking between business and investors

Create platform that connect algae businesses with potential investors to provide financial backing for innovative algae-based solutions



## Create dedicated investment funds

Set up investment funds focused on sustainable algae innovations



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# Thank you

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