

# EU4Algae

<b>Project Name</b>	European algae stakeholders' forum (EU4Algae) and bringing more algae species to the EU market		
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<b>Name</b>	1 <sup>st</sup> Version of Working groups' action plans		
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<b>Task</b>	1.4	<b>Task Owner</b>	João Santos
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<b>Description</b>	The Working Groups action plans define a series of actions to be undertaken by the working groups that will positively impact the algae sector in Europe, resulting in policy recommendations.		

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## EU4ALGAE WORKING GROUPS ACTION PLAN – 1<sup>st</sup> VERSION

### Working Group 1. Macroalgae Production

WG Name	Macroalgae Production	WG Number	1
Facilitator	Adrien VINCENT	Organisation	SYSTEMIQ
Identified Constraints, Obstacles, and Issues			
<p>A robust demand for high-quality, traceable, sustainably grown seaweed is expected to increase significantly in the coming years. However, if this demand is met through imports, Europe will miss out on many of the benefits associated with seaweed farming (e.g. innovation, ecosystem services, coastal jobs). Satisfying this growing demand translates into the need to produce millions of tonnes of fresh seaweed each year, which is far above current production levels. While Europe can build on expertise and know-how from decades of science, wild harvesting and processing activities, production growth of this magnitude will depend on cost-efficient farming scaleup, which must meet sustainability criteria.</p> <p>Today, cultivated European seaweed is insufficient in volume, too expensive and produced by a fragmented supply chain. So far only a few companies have managed to secure a license for large-scale operations and leverage sufficient funding to expand. Besides, high quality, traceability and local sourcing are value-adds that can justify a price premium for European seaweed versus imported Asian products. However, European seaweed will not be viewed as an economically viable source of large-scale future supply if the price structure does not change – the current price premium often makes it ten times as costly as imports. To enable this change and help propel European producers up the ladder of preferred sources of supply, production costs in Europe have to be cut drastically. Economies of scale will naturally occur as farms grow bigger in size and assets like boats or seeding and harvesting machinery can be amortised.</p>			
General Objective			
<i>Support the sustainable and cost-efficient scale-up of European seaweed cultivation</i>			
Specific Objectives			
<ul style="list-style-type: none"> <li>▪ Create useful centrally accessible knowledge and facilitate knowledge and experience sharing between seaweed farmers</li> <li>▪ Create a bridge between the seaweed farmers community and other stakeholders groups (e.g., policy makers, journalists, investors, etc.)</li> <li>▪ Inspire new entrants to launch and develop a seaweed farm in Europe</li> </ul>			
Working Groups Actions			
<p>A.1. Upgrade and maintain up to date the Licensing Toolkit developed by Seaweed for Europe</p> <p>A.2. Organise knowledge and experience sharing sessions with farmers from other continents</p> <p>A.3. Organise webinars presenting latest scientific developments and new technical solutions for seaweed cultivation</p> <p>A.4. Facilitate organisation of on-site trips for journalists and policy-makers/ politicians to visit farms and meet seaweed farmers</p> <p>A.5. Explore potential to create a public seed bank at European level</p> <p>A.6. List and profile success stories of seaweed farmers</p> <p>A.7. Identify potential sources of financing for seaweed farmers (types of capital + potential partners)</p> <p>A.8. Host 5x WG meetings (online or in-person) with rotational chair / host</p>			
Outcomes			
<p>O1. Online licensing toolkit available on EU4Algae online forum, enriched with country profiles and maintained up to date</p> <p>O2. 3 sessions organised (1 per year) with farmers from e.g. Asia, North America, Africa</p> <p>O3. 3 webinars organised (1 per year) presenting latest scientific developments and new technical solutions for seaweed cultivation</p> <p>O4. 3 on site farm visits for journalists and policy-makers/ politicians (1 per year) co-organised with local partners in e.g., France, Netherlands, Portugal</p> <p>O5. Scoping document for the set up of a public seed bank at European level</p> <p>O6. Fact sheets/ profiles of European seaweed farmers success stories</p> <p>O7. Mapping of potential sources of financing for seaweed farmers (types of capital + potential partners)</p> <p>O8. 5x WG meetings (online or in-person) with rotational chair / host</p>			
Next Steps			
<p>S1: Contact WG participants with summary (meeting agenda, action plan, tasks forum pre-registration, Doodle for 1<sup>st</sup> WG7 meeting Q3/4 2022)</p> <p>S2: Identify WG chair for the next 6 months</p> <p>S3: Scope activities, expectations from WG participants and timeline for the outcomes</p>			

## WORKING GROUP ACTION PLAN

WG Name	Microalgae production	WG Number	2
Facilitator	Jean-Paul Cadoret	Organisation	EABA
Identified Constraints, Obstacles, and Issues			
<p>Everyone agrees to see in microalgae, a great complement to the food of tomorrow. That the applications of this exceptional plant are very numerous, in chemistry, industry, medicine etc. As such, European research is very advanced and has nothing to envy to the rest of the world. However, the production itself remains at a relatively constrained level compared to the cultivation and sales of macroalgae. It is crucial to identify the constraints and bottlenecks that maintain European production at a level that regularly questions the future of this sector. And yet, scientific or general public publications or communications suggest important fields of application. We know broadly where the obstacles lie. This Working Group sought to list them, classify them and measure their importance. Beyond this identification and an accounting vision of these obstacles, this working group proposes action plans and possible solutions. This in accordance with the vision and instructions of this tender</p>			
General Objective			
<p>To promote algae related sector by enlarging the current production capacity/technologies and quality of produced biomass by improving the business environment and cooperation across the algae sector. This WG aims at tackling together all the production techniques at all scales. Improve the production yield with the quality control at all levels. These proposals will be accompanied by a critical and objective examination of European regulations</p>			
Specific Objectives			
<ul style="list-style-type: none"> <li>• Facilitate access to most efficient technologies</li> <li>• Identify bottlenecks for scale-up of current or innovative production systems</li> <li>• To support new initiatives to contribute to enlarge the capacity and quality of current production systems</li> <li>• To tackle the regulation hurdle</li> </ul>			
Working Groups Actions			
<ul style="list-style-type: none"> <li>- A.1. Set up a working group on "Market" to understand the market, inform investors, stakeholders</li> <li>- A.2. Act to reduce the burden and harmonize the regulation. Within and outside Europe</li> <li>- A.3. Create a portfolio for guidance, species, type of cultures</li> <li>- A.4. Set up a specific WG on downstream processing with the other algae lines (macroalgae)</li> <li>- A.5. Set up the creation of the "service level" offered by algae (CO2, Bioremediation..) with the support of EU legislation and regulation</li> <li>- A.6. Create a federation of European Algae Bio Banks</li> <li>- A.7. Formalize a unique forum with clear satellite smaller meetings</li> </ul>			
Outcomes			
<ul style="list-style-type: none"> <li>- O1. Better market knowledge, industry contacts, investors mapping</li> <li>- O2. A listing of solutions to free the circulations of the goods. (Novel food, Wastewater/manure regulation, Biofertilizers...</li> <li>- O3. The reassessment of the equivalences regimes with countries outside Europe (and within)</li> <li>- O4. Creation of a European label of , high-quality EU microalgae production</li> <li>- O5. Criteria for certification of biomass quality for food, feed, nutraceuticals, cosmetics, Biostimulants/Biofertilisers</li> <li>- O6. Knowledge platform to steer cost-effective and sustainable production, including automatization</li> <li>- O7. Knowledge platform to focus on the production systems</li> </ul>			
Next Steps			

- Harmonize the outcome from all the working groups
- Formalize the action plans
- Identify overlapping and common convergence with different WG
- Plan the next meetings of WG for 2023
- Identify some potential key animators to chair and coordinate

### Working Group 3. Algae for Food

Working Group 3 started developing an ignition document to start the discussions regarding the action plan. The document can be found here: [Ignition Document](#)

WG Name	Algae for Food	WG Number	3
Facilitator	Vitor Verdelho	Organisation	EABA
Identified Constraints, Obstacles, and Issues			
Algae can be more sustainable than other plant-based? Algae can have better farm-to-fork food safety than other plant-based? Algae for food can be theoretically (with necessary requirements) produced everywhere?			
General Objective			
<i>To support the broader adoption of algae for food purposes.</i>			
Specific Objectives			
<ul style="list-style-type: none"> <li>• TBD</li> </ul>			
Working Groups Actions			
<ul style="list-style-type: none"> <li>• Under discussion</li> </ul>			
Outcomes			
<ul style="list-style-type: none"> <li>• Development of an ignition document to start the discussions</li> </ul>			
Next Steps			
<ul style="list-style-type: none"> <li>• Defining the Actions and outcomes: WGs Meetings and activities (July to October)</li> <li>• Discussions and Action Plan Refinement (October to November)</li> <li>• 1st WG Annual Meeting during the EU4Algae Event (Rome 12/12/2022)</li> <li>• 2nd Version of Action Plans (December)</li> </ul>			

### Working Group 4. Algae for Feed

WG Name	Algae4Feed	WG Number	4
Facilitator	Efthalia Arvaniti	Organisation	s.Pro – sustainable projects. GmbH

<b>Identified Constraints, Obstacles, and Issues</b>	
<p>According to EC, approximately there are 5 million EU farmers raise animals for food production, for which they need approximately 450 million tons of feed for their animals. As a result, to use as animal feed, EU imports 27 million tons soybean alone<sup>1</sup>, putting an enormous pressure outside EU borders. The feeds are a commodity product and thereby qualities and prices are controlled by global markets. Feeds from algae, such as ingredients and additives, are an upcoming application sector in EU, directly replacing feed imports, as algae feed products have been extensively studied and tested by industry, and there are some products in the market already.</p> <p>However, to replace feed imports, we need to meet the market demand on supply and commodity prices, and so far ingredients from algae-based ingredients are costly, while innovation and market access is slowed or even stopped by regulatory barriers, lack of investment, business support and also product standards.</p>	
<b>General Objective</b>	
<i>The aim of WG4 Algae4Feed is to promote algae feed product development by improving the business environment and cooperation across the algae feed value chains.</i>	
<b>Specific Objectives</b>	
<ul style="list-style-type: none"> <li>• Develop recommendations for best business support</li> <li>• Promote interregional cooperation for R&amp;D, innovation and market access, by increasing visibility of funding opportunities</li> <li>• Develop an algae feed online knowledge hub and promote research and development needs by consolidating studies and project results, incl. national projects.</li> <li>• Identify algae feed regulatory barriers and make recommendations to boost innovation and market access</li> <li>• Support integrating technologies that promote circular economy.</li> <li>• Identify sectors particularities and seek solutions to transfer from other sectors and also WGs.</li> <li>• Promote algae feed products, their benefits, and the sectors are applied.</li> <li>• Develop licensing roadmaps for 1-2 product categories, considering scaling barriers, distinguishing feed additive vs. feed ingredient.</li> <li>• Promote current market, players, for new entries</li> </ul>	
<b>Working Groups Actions</b>	
<p>For delivering the outputs/outcomes, the planned activities are:</p> <ul style="list-style-type: none"> <li>• Integrate knowledge from relevant studies and project results</li> <li>• Develop a knowledge hub on <ul style="list-style-type: none"> <li>• novel feed ingredients and clinical trial results on large studies</li> <li>• energy integration in production, e.g. microalgae production combined with industrial flue-gases, solar-powered algae production</li> <li>• science to policy e.g. continue work on EC regulation on algae heavy metals</li> </ul> </li> <li>• Define next level of R&amp;D needs of most important themes</li> <li>• Develop 1-2 product licensing roadmaps</li> <li>• Raise awareness to understand the feed market and consumer trends.</li> </ul>	
<b>Outcomes</b>	
<p>The planned deliverables by the end of 2024 are:</p> <ul style="list-style-type: none"> <li>• Factsheets on R&amp;D needs for feed products</li> <li>• Funding opportunities for innovation and market access</li> <li>• Guidance on best available business support</li> <li>• Campaigns for algae feed products</li> <li>• 1-2 product licensing roadmaps e.g. feed ingredient vs. feed additive.</li> <li>• Meet 5x online or physically, usually for half a day or one day and back-to-back with existing events e.g. AlgaEurope, IFIF FAO, Nordic Algae, AES etc</li> </ul>	
<b>Next Steps</b>	
<ul style="list-style-type: none"> <li>- Contact WG participants with summary (meeting agenda, action plan, tasks forum pre-registration, Doodle for 1<sup>st</sup> WG4 meeting Q3/4 2022</li> <li>- Identify WG chair for the next 6 months</li> <li>- Scope activities, expectations from WG participants and timeline for the outcomes.</li> </ul>	

### Working Group 5. Algae for Feed

WG Name	Algae4Eco	WG Number	5
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<sup>1</sup> <https://www.eea.europa.eu/media/infographics/eu-animal-feed-imports-and-1/view>

Facilitator	Efthalia Arvaniti	Organisation	s.Pro
<b>Identified Constraints, Obstacles, and Issues</b>			
<p>Bioremediation and other ecosystem services provided by algae have been extensively studied in Europe (and overseas) for decades and by now are widely accepted by scientific and engineering community. EU4Algae and the EU algae initiative target research and innovation activities involving EU-wide stakeholders to remove relevant barriers to adoption of these algae technologies and accelerate market access for the ecosystem services they provide.</p> <p>Some focus sectors for algae bioremediation and ecosystems services are:</p> <ul style="list-style-type: none"> <li>• Macroalgae produced near-shore or in tanks on-shore, that protect marine ecosystems and their natural capital, and provide crops that capture nitrogen, phosphorus and other pollutants, and protect biodiversity.</li> <li>• These include “integrated multi-trophic systems” (IMTA) that combine aquaculture production of fish, shellfish and others with algae production.</li> <li>• Microalgae produced on shore, integrated with water and wastewater (e.g. municipal, industrial), of for higher value products.</li> <li>• Industrial symbiosis systems, agro-industrial parks, that can combine water, energy and material exchange, e.g. CO2 utilization, with utilities, agriculture, industrial, food etc.</li> </ul> <p>Main identified challenges are:</p> <ul style="list-style-type: none"> <li>• fragmented knowledge on algae benefits, monitoring schemes, quantifying ecosystem services, and barriers to innovative technologies in market uptake.</li> <li>• Fragmented and small ‘Communities of Practice’ working with ecosystem services - Existing sites of addressing ecosystem services are small and few (only 4 sites are relatively large and of even demonstration scale).</li> <li>• Lack of regulation, norms and specific standards for the use and production of algae (and adapted to the territories) which causes administrative barriers and does not facilitate the implementation of innovative initiatives with micro and macroalgae and boost their benefits (e.g. in bioremediation, IMTA, obtaining high added value products and ecosystem services).</li> </ul>			
<b>General Objective</b>			
The main goal of WG5 Algae4Eco is to develop recommendations for a coherent, structured and forward-looking strategy to overcome the specific market constraints.			
<b>Specific Objectives</b>			
<p>The objectives of the Algae4Eco WG are:</p> <ol style="list-style-type: none"> <li>1. Develop a knowledge hub on             <ol style="list-style-type: none"> <li>a. the bioremediation potential of algae in particular for nitrogen and phosphorus uptake</li> <li>b. The carrying capacities of EU (coastal) waters for seaweed aquaculture and marine permaculture and impacts of algae cultivation on the health of the ocean and humans.</li> <li>c. good practices providing algae bioremediation and ecosystem services.</li> </ol> </li> <li>2. Identify regulatory barriers in taking up ecosystem services and provide recommendations</li> <li>3. Promote development of pilot and demonstration facilities and success stories for nutrients and energy recovery in the context of pollution prevention and waste treatment.</li> <li>4. Facilitate matchmaking between companies and sectors providing and needing algae circular solutions. To be discussed.</li> <li>5. Develop innovation roadmaps to accelerate innovation, based on what worked and did not work in existing Communities of Practice. (Aqualia/Almeria, Kalundborg Symbiosis, etc.)</li> <li>6. Define R&amp;D needs for ecosystem services of algae, both micro and macro.</li> <li>7. Make recommendations for a monitoring framework and targets for quantifying ecosystem services (metrics, validation, unification)</li> </ol>			

8. Assess whether findings and results can be presented in the format of a potential EU marine waters and land-based processes, i.e. geographic maps, to be integrated into available geographic map services (summarised at European level under EMODNET).

#### Working Groups Actions

For reaching WG objectives, the planned activities are:

1. Analyse innovation ecosystem surrounding algae bioremediation and ecosystem services, analyse innovation barriers and develop recommendations on quantification of ecosystem services relevant for all EU seas and at scale
2. Promote good practices, pilot sites, testing labs etc. working with algae ecosystem services and bioremediation.
3. Integrate knowledge from relevant studies and project results
4. Define next level of R&D needs of most important themes

#### Outcomes

1. The planned deliverables by the end of 2024 are:
2. A knowledge hub with a project repository, and factsheets addressing benefits and risks and potential of bioremediation and ecosystem
3. Regulatory barriers with recommendations for accelerating innovation and market uptake of bioremediation schemes and ecosystem services
4. Factsheets on state of play of and innovation roadmaps for algae bioremediation and ecosystem services R&D needs
5. A Framework for quantifying ecosystem services
  - a. Monitoring
  - b. Good practices
  - c. Business models
  - d. Scalability – sensitivity
6. Meet 5x online or physically, usually for half a day or one day and back-to-back with existing events e.g. EMODnet open conference, Blue Cloud, European Algae Biomass Association annual meeting (AlgaeEurope), etc.

#### Next Steps

- Contact WG participants with summary (meeting agenda, action plan, tasks forum pre-registration, Doodle for 1<sup>st</sup> WG5 meeting Q3/4 2022)
- Identify WG chair for the next 6 months
- Scope activities, expectations from WG participants and timeline for the outcomes

## Working Group 6. Materials, Chemicals, Bioactives & Algae Biorefining

WG Name	Materials, Chemicals, Bioactives & Algae Biorefining	WG Number	6
Facilitator	Gabriel Acien	Organisation	University of Almeria
Identified Constraints, Obstacles, and Issues			
<p>C1 Algae (seaweed and microalgae) biomass production capacity and cost must be improved. Guarantee biomass supply chain, quality and production capacity</p> <p>C2 Collaboration between processor/producers and formulators/end-users. Promote platforms for exchange/development of new processes and case studies</p> <p>C3 Avoid critical terms (biorefinery, waste biomass, contaminated biomass).</p> <p>C4 Need for education and training courses for young people and entrepreneurs</p>			
General Objective			
To promote emerging applications of algae related to Materials/Chemicals/Bioactives further than conventional uses by improving the business environment and cooperation across the algae sector			
Specific Objectives			
<ul style="list-style-type: none"> <li>• Collaborate in market/product development</li> <li>• Promotion of ongoing activities/projects</li> <li>• Identification of the most important research, development and innovation needs</li> <li>• Defining expert and training courses</li> </ul>			
Working Groups Actions			
<ul style="list-style-type: none"> <li>• Develop EU Algae Industry/connect with the chemical industry</li> <li>• To promote demonstration processes</li> <li>• To promote social acceptance of algae products</li> <li>• To improve education/training activities</li> </ul>			
Outcomes			
<ul style="list-style-type: none"> <li>• Database of algae-related companies/technologies</li> <li>• Network of open pilot/demo facilities</li> <li>• Position paper about materials/chemicals/bioactive</li> <li>• Collaboration in education/training courses</li> <li>• Campaigns for social acceptance of algae products</li> </ul>			
Next Steps			
<ul style="list-style-type: none"> <li>• Defining the Actions and outcomes: WGs Meetings and activities (July to October)</li> <li>• Online working group meeting (1st week of October)</li> <li>• Discussions and Action Plan Refinement (October to November)</li> <li>• 1st WG Annual Meeting during the EU4Algae Event (Rome 12/12/2022)</li> <li>• 2nd Version of Action Plans (December)</li> </ul>			

## Working Group 7. Youth & Entrepreneurship

WG Name	Youth & Entrepreneurship	WG Number	7
Facilitator	Frederick Bruce	Organisation	s.Pro
Identified Constraints, Obstacles, and Issues			
C1: Navigation of regulatory landscape C2: Access to experts, business support, finance, markets, training			
General Objective			
<i>To explore tools and initiatives to attract more youth and entrepreneurs into the algae industry</i>			
Specific Objectives			
To 1) create and share an overview of events, support tools, platforms & communities to provide a clear pathway to a career in algae-related industries; and 2) to attract more young people and entrepreneurs to the algae industry.			
Working Groups Actions			
T1: Map stakeholders and establish contact with 10+ relevant youth & entrepreneurship networks / associations (e.g. European Youth Forum) and invite to WG meetings T2: Host 5x WG meetings (online or in-person) with rotational chair / host T3: 1+ Social media campaign with business "success stories" and endorsement from target groups, i.e. 1000+ likes/shares T4: Create online repository of information & resources (practical guidelines, finance, regulations, species, experts, facilities, markets) to be promoted via social media campaign (T1) T5: Present to or meet with 10+ Business Support Organisations (BSOs) to co-develop algae-related activities (e.g. hackathons) & algae-relevant business models (e.g. by sector, species, region etc.) T6: Co-design framework for 1+ algae apprenticeship scheme with relevant companies T7: Facilitate 1+ Workshop(s), Matchmaking event and/or Hackathon(s) e.g. <i>"How to kickstart your career in algae"</i> T8: Define follow-up actions to maintain momentum and monitor progress post-project			
Outcomes			
O1: Stakeholder map of target groups and contact persons at 10+ relevant youth & entrepreneurship networks / associations O2: 5x WG meetings (online or in-person) with rotational chair / host O3: Social Media campaign and target group endorsements: 1000+ likes / re-posts O4: Online repository of information & resources O5: Presentations, meetings or event attendance at 10+ Business Support Organisations (BSOs) O6: Framework for 1+ algae apprenticeship scheme O7: Deliver or co-organise 1+ Workshop(s), Matchmaking event and/or Hackathon(s) e.g. <i>"How to kickstart your career in algae"</i> O8: KPIs for follow-up actions defined			
Next Steps			
S1: Contact WG participants with summary (meeting agenda, action plan, tasks forum pre-registration, Doodle for 1 <sup>st</sup> WG7 meeting M12 (Dec 2022)) S2: Draft strategy document for social media campaign (content + timeline) S3: Map stakeholders and establish contact with 10+ BSOs and invite to join WG7 S4: Define structure & content of online repository S5: Develop shared events calendar for algae-related events until end of 2025 S6: Shortlist of potential companies for apprenticeship scheme co-design S7: Identify and contact high-profile BSOs (e.g. Blue Invest) for event co-organisation S8: Draft follow-up KPIs			

