

# EU4Algae

a collaborative European stakeholders forum on algae

# About EU4Algae

Algae have been harvested, produced and consumed throughout the world for centuries. They are appreciated in especially Asian cuisine for their high nutritional value and distinct salty or umami taste. In recent years they have started to become a popular ingredient in Western diets. Outside of the culinary realm, algae are also increasingly seen as a sustainable feedstock for a wide range of applications such as fertilisers, animal feed, cosmetics, or bio-packaging.

The attractiveness of algae also comes from their regenerative nature: their production has positive impact on the ecosystems, helping improving ocean health, fighting climate change and stimulating biodiversity. They can also provide local sources of feedstock while creating good jobs in Europe.

In order to scale up a regenerative, resilient, fair and climate friendly algae industry in Europe, as well as bring more novel algae species to the European market, the European Commission has created EU4Algae.

EU4Algae consists out of an online platform where algae stakeholders in Europe can access knowledge, meet, discuss and find new opportunities to develop the algae industry.

# Task 1.5 – Improving legislation and regulatory framework

**Elements :** 1) exploring existing legislation and governance frameworks and investigating the effectiveness of the legislation and policies in promoting and supporting sustainable and regenerative algae production, and 2) exploring existing market policies and investigating the effectiveness of these policies in facilitating the market uptake of algae products.

**Outcomes:**

01.19 - Report on existing legislation and policies promoting and supporting sustainable and regenerative algae production, and existing policies facilitating the market uptake of algae products (M24, M32, M36)

01.20 - Quarterly notes (used for communication to Forum Members) on relevant policy developments (M24, M32 and M36)

# Our approach (methodology)

## Current studies and initiatives

- Methods: desk study ; information from client ; information consortium
- Output: Information overview/ database; input for monitoring process

## Stakeholder consultation

- Methods: survey, 7 workshops with working groups
- Output: validation of information; complementing information; identify barriers; and best practices)

## Report and dissemination

- Analyse (Where are effective policies missing → barriers; what policies are effective → identify best practices.)
- Report

## Monitor

- Based on: monitoring newsletters, publications, project updates, policy updates
- Output: updating information overview and communication to forum members

# Desk study results

- In total, identified 33 EU regulations identified that are most relevant to the EU4Algae stakeholders
- Of these:
  - 9 relate to production of Algae- both macro (WG1) and micro (WG2)
  - 9 relate to using Algae for Food (WG3)
  - 5 relate to using algae for Feed (WG4)
  - 8 relate to using Algae for ecosystem services (WG5)
  - 6 relate to using Algae for products, materials and chemicals (WG6)

# Legislation Database (Excel based)

Policy name	Responsible	Geography	Status	Type of policy	Objective of the policy				
Complete name of the policy/ legislation	EC/ national entity responsible	Applicable to (EU/ country x)	Any (relevant) changes/ updates expected in the next 3 years? Leave it open if you don't know this	Choose from the list	Briefly describe the (most important) objective(s) of the policy. To understand if it's directly focused at facilitating algae production/ use, or if the focus is different (what is it) but algae production/ use is impacted (e.g. the objective can be ensuring food safety)				
EU food safety legi	European Foc	EU		Regulation	Food safety regulation sets out				
Novel Food Regula	European Foc	EU	Yes. Continuous	Regulation	The NFR gives food business c				
Novel Food Catalo	European Foc	EU	Yes. Continuous	Other (explain	The NFC lists products of ani				
Relevance	Production	Macroalgae	Microalgae	Food	Feed	Ecosystem	Other uses	Comments	Barriers
Briefly describe how the policy (directly/ indirectly) influences algae production/ use.	Does the policy (positively or negatively) influence the production of algae	Does the policy (positively or negatively) influence the production of macroalgae	Does the policy (positively or negatively) influence the production of microalgae/ cyanobacteria	Does the policy (positivel y or negativel y) influence the use of algae for food?	Does the policy (positivel y or negativel y) influence the use of algae for feed?	Does the policy (positivel y or negativel y) influence the use of algae for ecosystem services/ bioremediati on?	Does the policy (positivel y or negativel y) influence the use of algae for other uses: materials/ chemicals,	Optional: room for comments/ explanation on the relevance (e.g. if you checked 'maybe/ in some cases')	What problems/ barriers for algae production/ use come from this policy? (Could be similar as the description of the relevance)



# Summary of challenges: algae for food

- There are legislation inadequacies regarding the use of algae as a raw material for food
- The Novel food regulation is applicable to all foods classified as “novel food”, which applies to a variety of micro- and macroalgae produced for food or food supplements (Araujo and Peteiro, 2021). Furthermore, new algae substances are required to request authorisation under the regulation before entering the market (EFSA)
- Because of limited European regulation, some EU countries are implementing their specific regulations regarding the use of algae as a food source (non-approved algae species are being commercialized for food purposes in several European countries).
- **Example:** in 1990, France was the first European country to establish a specific regulation concerning the use of seaweed for human consumption as a non-traditional food substance, authorizing the consumption of algae for food (other than what is considered to be a novel food)

# Summary of challenges: organic legislation

- The challenges of Organic Regulation **848/2018**:
  - **Hydroponic farming** (growing plants by using mineral nutrient solutions in a water solvent) is not allowed in organic production, even though this is used for algae production
  - **Fertilizers and nutrients** are allowed only if they have low solubility – which is unsuitable for algae production as they grow in water. In micro-algae production, there is no risk of fertilizers running off into the ground water, as the production facilities are closed. Micro-algae do need to get these soluble nutrients to nourish the algae, like nitrate and CO<sub>2</sub>.
- Thus, the organic legislation needs to be adapted to incorporate algae
- Harmonisation between countries of the implementation of this regulation is needed as now the differences can lead to confusion



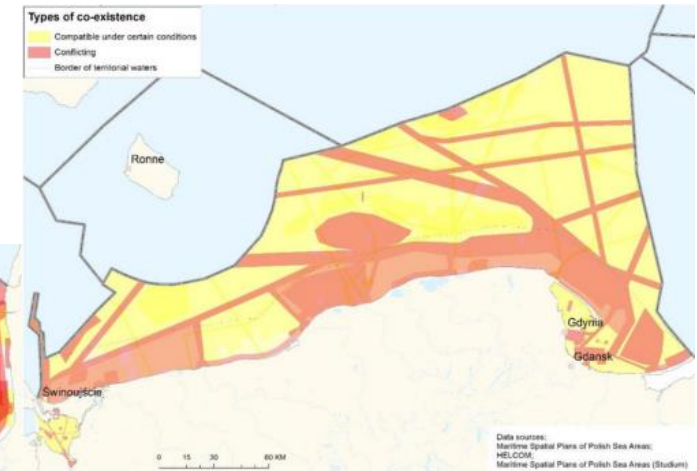
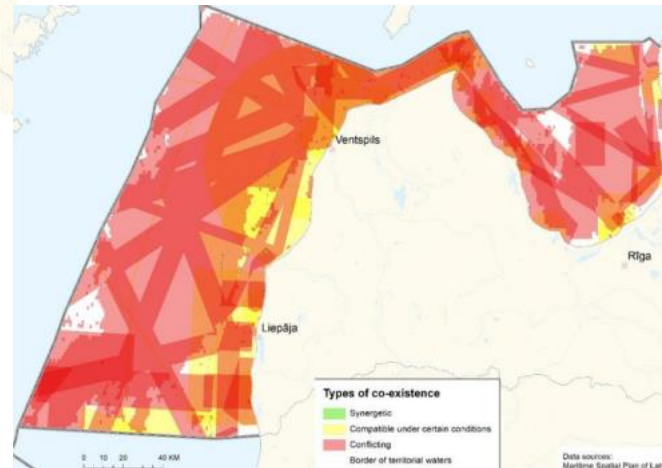
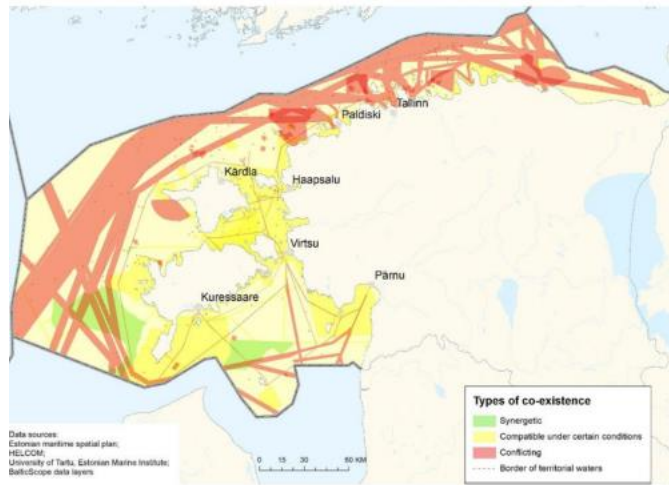
# Summary of challenges : contaminants

- The specificity and complexity of algae contaminants is not well addressed by the current food legislation
- **Example:** the **quantification of arsenic** could be differentiated as organic and inorganic, as health risks are much lower when consuming the organic form. If these were detailed, seaweed products containing mostly organic arsenic could ensure product safety and build higher customer trust
- As algae contamination is product-dependent, frequent chemical analyses, coupled with legal quantification limits, could ensure product safety
- This could open the door to introducing and categorizing algae products to the market and promoting the development of the algae food industry

# Summary of challenges- allocation of space

- MSP is a tool that is intended to regulate various uses of marine space. MSPs for all EU MS have been prepared /submitted for review (early 2022)
- Studies show that not all have sufficient provisions for algae ( refer to “Considerations of Use-Use interactions between Macroalgae cultivation and Other Maritime sectors: An eastern Baltic MSP Case Study”, Journal “Sustainability”, No 13, December 2021)
- Of 3 studied countries (Estonia, Latvia & Poland), only Estonia has provisions for synergetic use (see next slide)
- Only in Estonia, entrepreneurs were involved/consulted in MSP process

# Potentially synergetic, compatible and conflicting sea use areas from macroalgae cultivation perspective (“Sustainability” 2021, No 13, 13888)



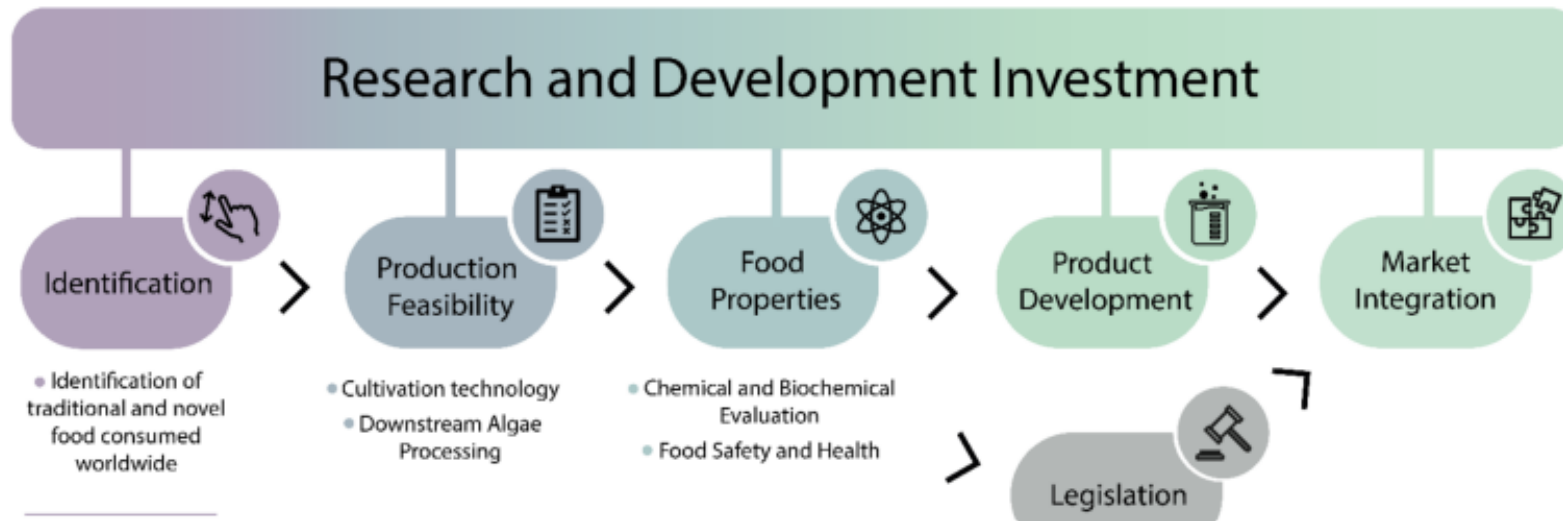
# Preliminary findings – preconditions for development

- EU directives set common objectives for all member states, but states may decide how to reach the goals, and put in place stricter requirements. Thus, the implementation/enforcement of Directives led to substantial discrepancies between MS
- Centralized procedures (for novel foods, food additives, feed substances, cosmetic products, and fertilizers/biostimulants) as well as methodologies for safety evaluation at the EU level are helping to realise the single market for products
- Algae cultivation rules are based on EU environmental and water laws, but the licensing procedures are national or regional
- Application of more general regulatory instruments (MSP, agricultural/aquacultural subsidies, aquaculture licensing, tax schemes, and trade agreements) can significantly influence sector development
- New developments - multi- purpose use of marine space and IMTA have yet to see significant uptake and will require additional regulatory support
- In some MS, unfeasible regulations exist re. use of terrestrial space (such as, algae can only be grown on the coast, where there is competition for space)

# Preliminary findings - preconditions for development

- Specific regulations on seaweed cultivation at the EU level are missing but there are several regulations and directives that can be applied to it (MSPD 2014/89/EU, and the MSFD 2008/56/EC) to facilitate the regulation and development of this new industry
- Specific regulations on algae at MS level are largely missing as well
- With legislation amendment and investment in the research and development of production systems and algae products, the algae market in Europe has the potential to grow
- To facilitate this development, specific updates of legislation will be required (esp. re. algae for food -see next slide)

# Preliminary findings



Source: “Algae as food in Europe” (Foods 2022, 11, 1871.  
<https://doi.org/10.3390/foods11131871>)



# Recent developments: EC communication on algae (released November 15, 2022)

Commitments by the **European Commission re. governance and legislation** framework:

- in close collaboration with relevant stakeholders, develop a **new algae farmers' toolkit** (2023 – onwards);
- work with Member States **to facilitate access to marine space**, identify optimal sites for seaweed farming and include seaweed farming and sea multi-use in maritime spatial plans;
- together with the European Committee for Standardization (CEN), **develop standard testing, quantification and extraction methods for algae ingredients and contaminants** (by the end of 2026);
- together with CEN, **develop algae biofuel standards and a certification methodology for algae-biofuel products** to be used in various transport sectors, particularly heavy road, aviation and maritime transport (by the end of 2026);
- assess the **market potential, efficiency and safety of algae-based materials when used in fertilising products and the need to amend Regulation (EU) 2019/1009 on EU fertilising products** to include algae-based materials (starting in 2023)

The Commission also calls **on the Member States** to simplify **national licensing procedures and governance** for algae cultivation

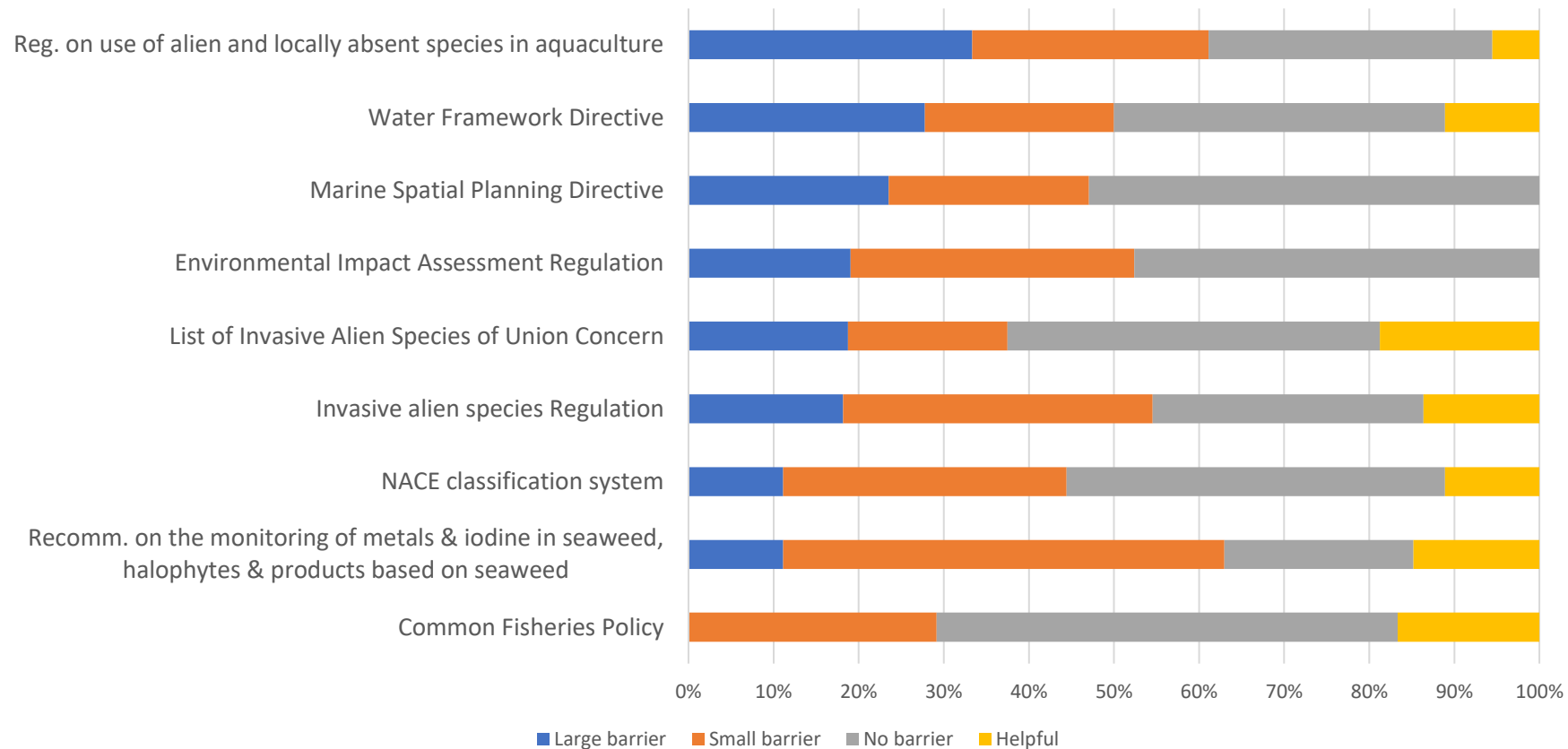
# Survey –main data

- Carried out during September-October 2022
- Inputs were used to prepare WG sessions
- 35 Participants



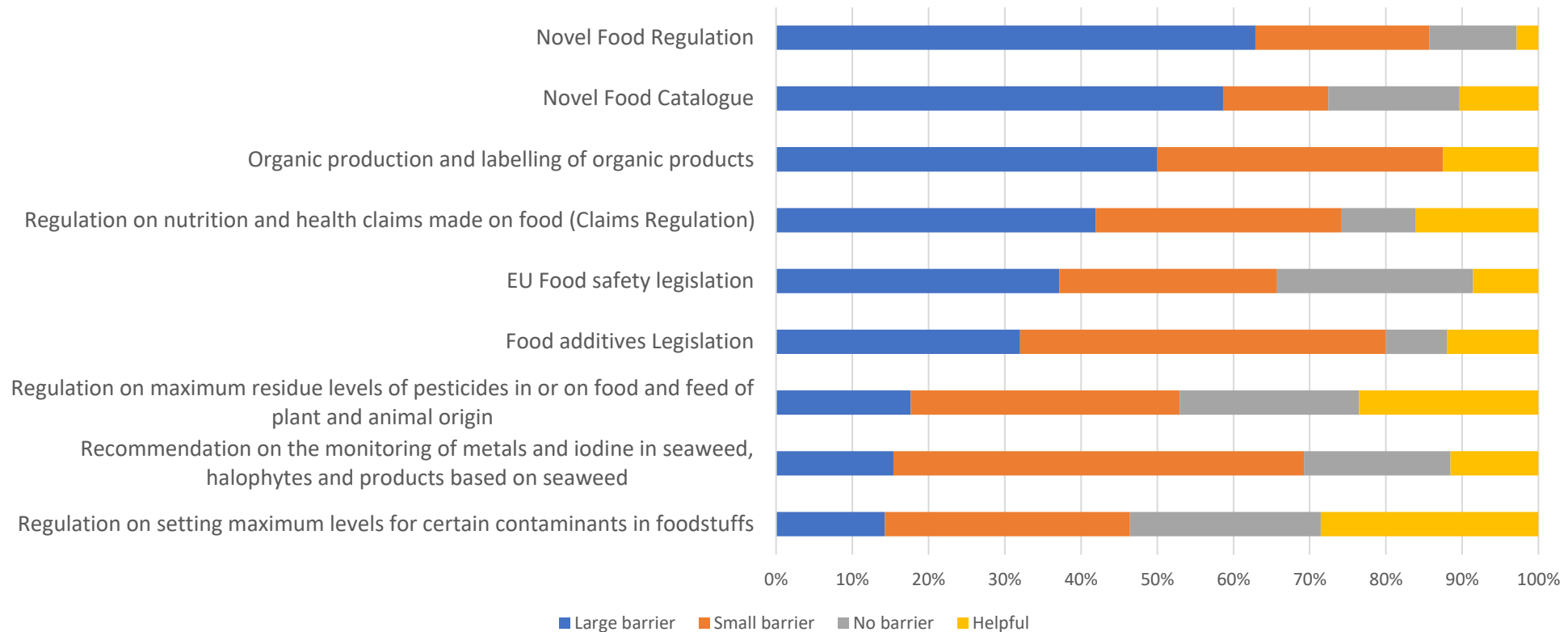
# Survey results- Production (1&2)

Are you familiar with the legislation? And if so, do you consider this legislation to be ...



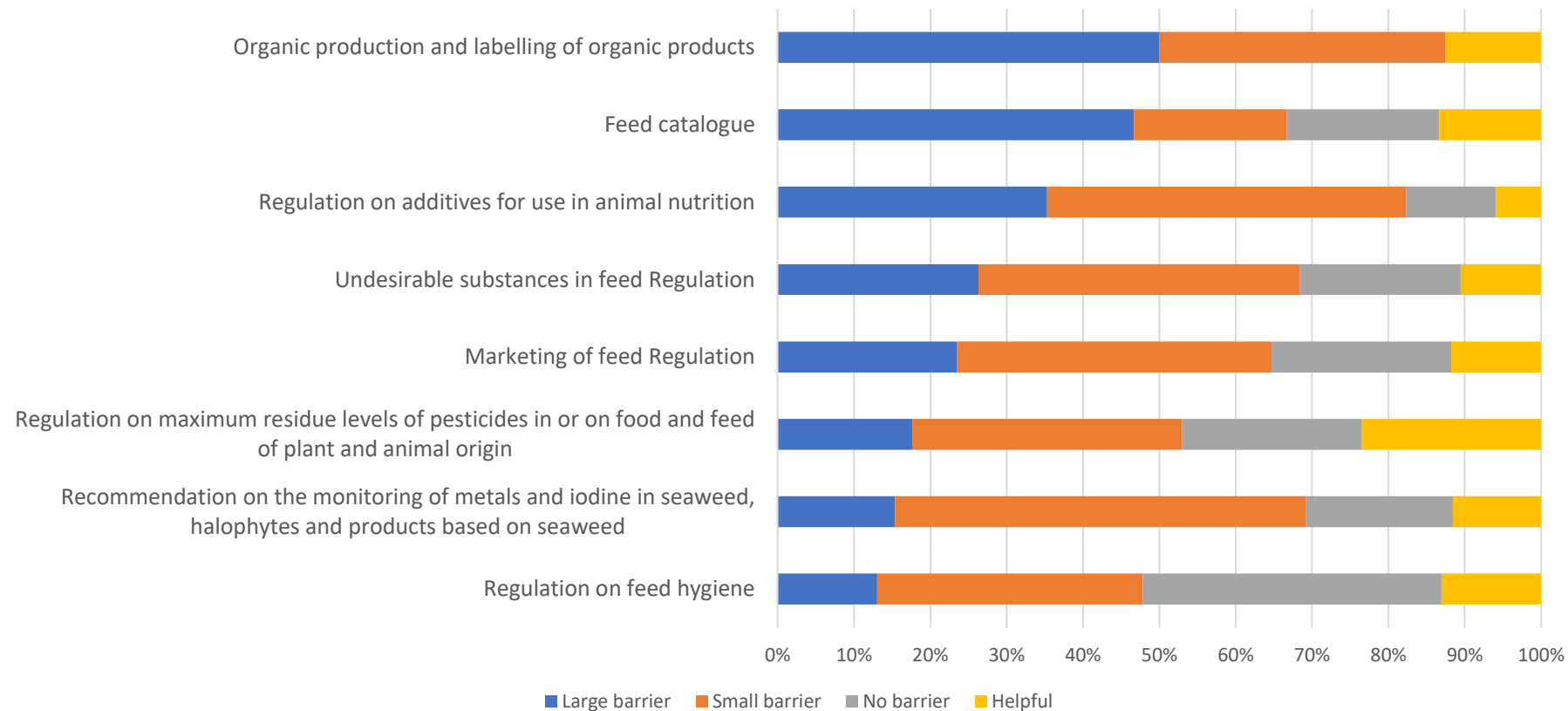
# Survey results- Food (WG3)

Are you familiar with the legislation? And if so, do you consider this legislation to be ...



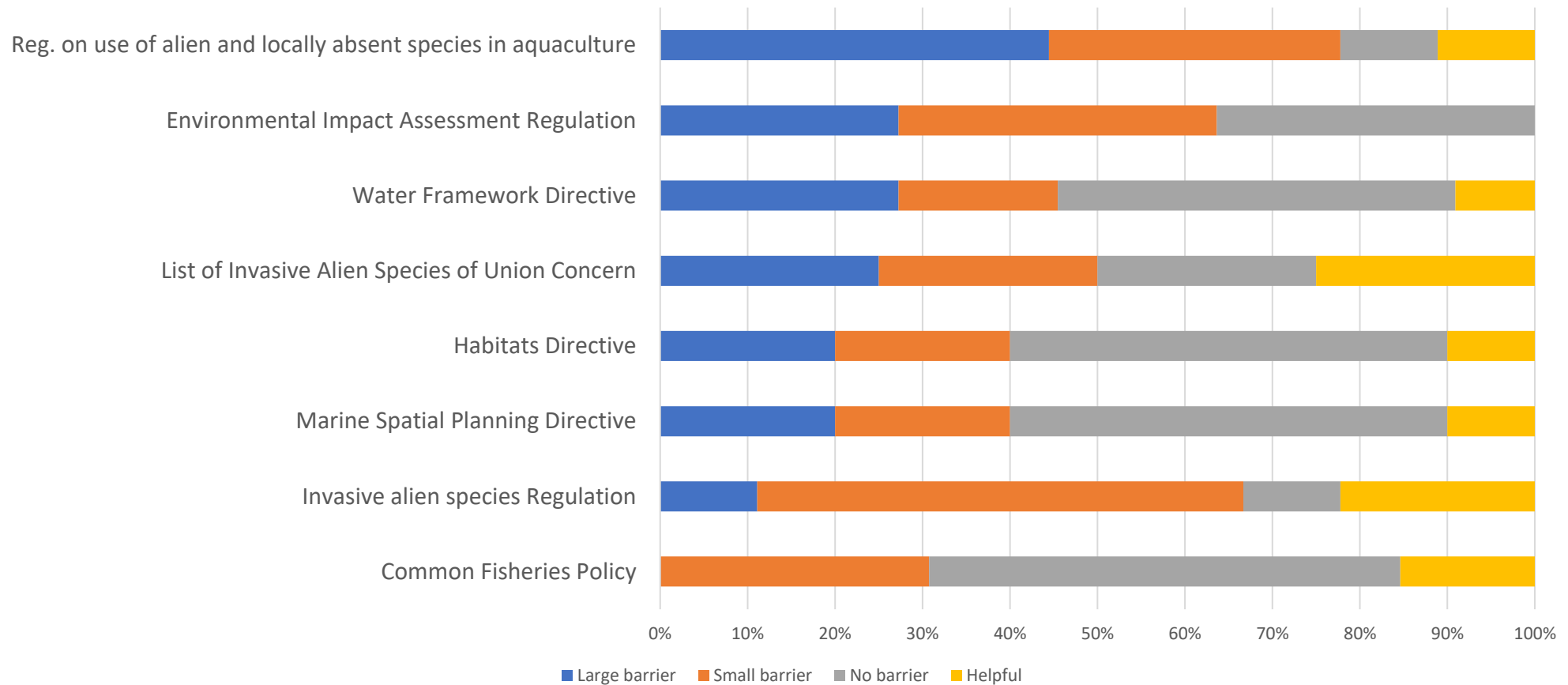
# Survey results- Feed (WG4)

Are you familiar with the legislation? And if so, do you consider this legislation to be ...



# Survey results- ecosystem services and bioremediation (WG5)

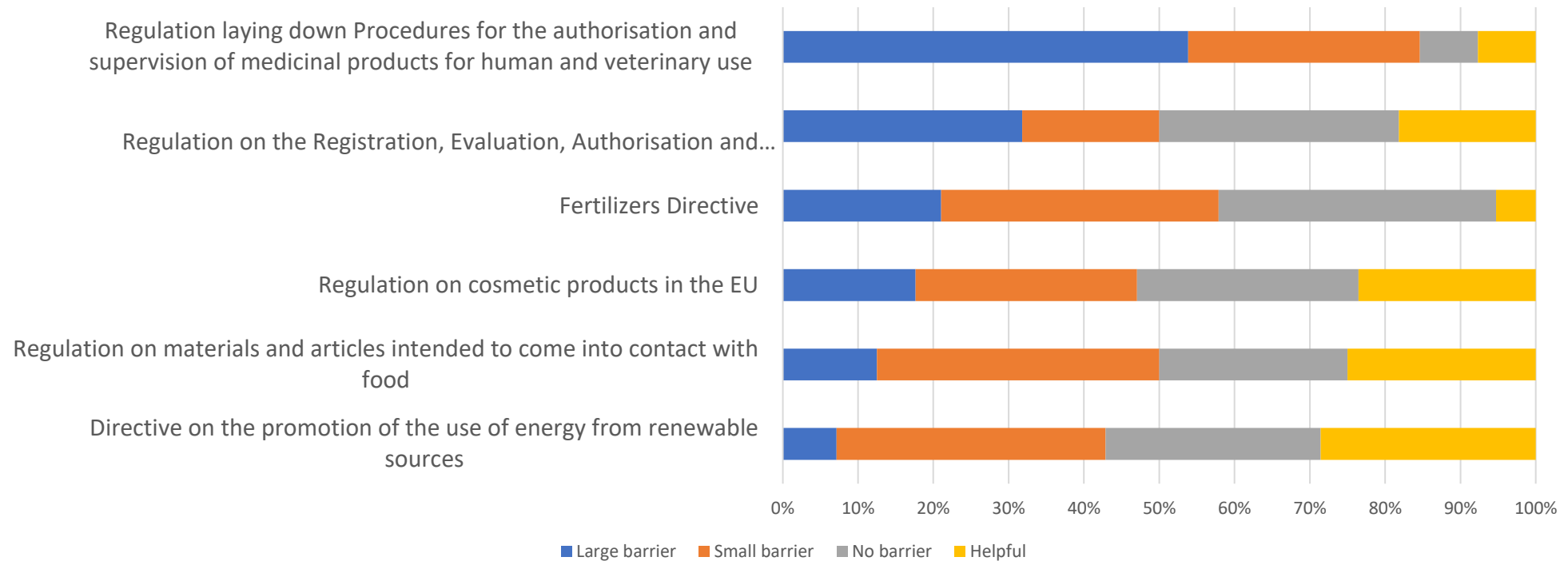
Are you familiar with the legislation? And if so, do you consider this legislation to be ...





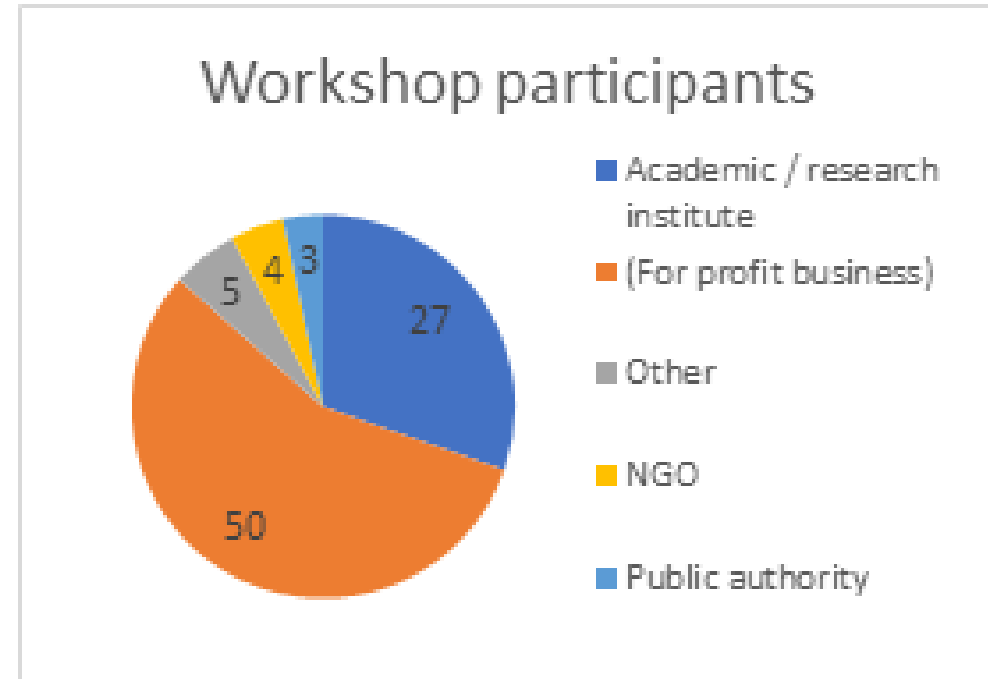
# Survey results- Products (WG6)

Are you familiar with the legislation? And if so, do you consider this legislation to be ...



# Work group sessions on legislation

- Work group sessions with all 7 WGs (during November)
- Participation varied (13-30+ participants)
- Interactive process (using Mentimeter tool, for voting on priorities and additional input/comments from participants)



# Work group results -WG1

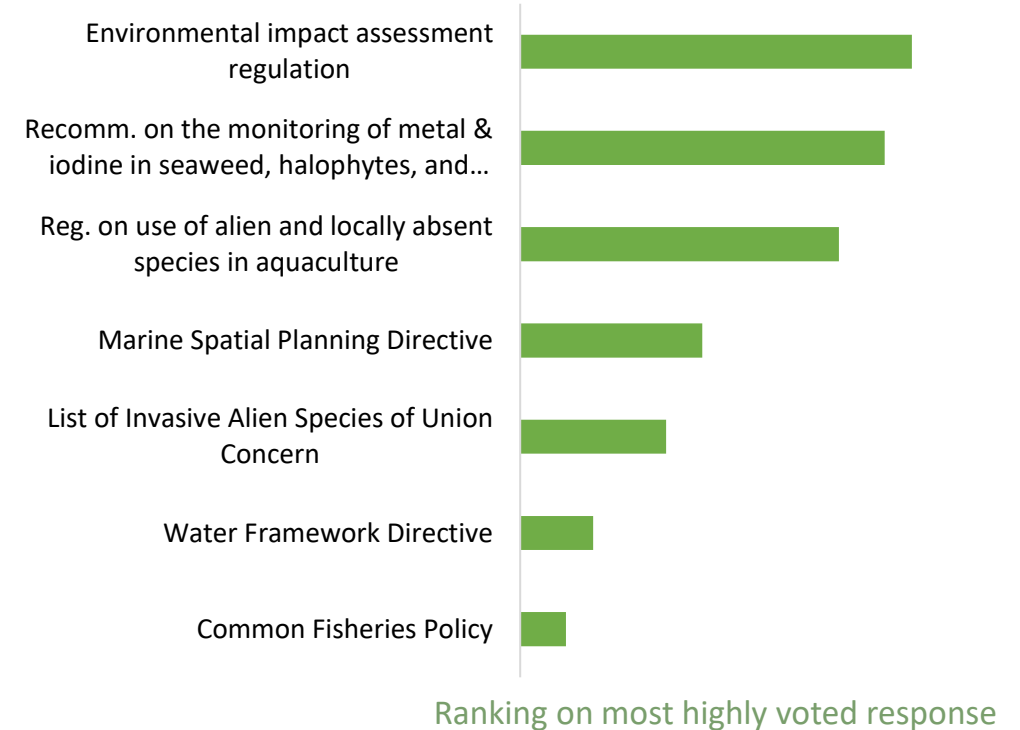
## Barriers:

- Permits, licences, certification – long procedure time, and high burden of proof for applications
- Lack of algae-specific legislation
- No algae compliance officer to support /advise members of algae sector
- Unfair competition with products from non –EU countries
- Safety requirements

## Needs:

- Specific algae legislation (regulations are related to aquaculture which does not cover algae well)
- Unified legislation process for all EU MS

Are there specific regulations that should be prioritized to adapt for your working group?



# Work group results – WG2

## **Barriers:**

- Restrictive legislation (2x)
- Permit, licensing and certification (2x),
- Complex or unclear legislation (1),
- Unfair competition with products from non EU (2x),
- Circularly economy (waste use) 2x
- Novel food (difficult for small companies)

## **Needed:**

- NACE code for algae
- Organic legislation suitable for algae
- Environmental impact assessment regulation to be more suitable for Microalgae cultivation

# Work group results – WG3

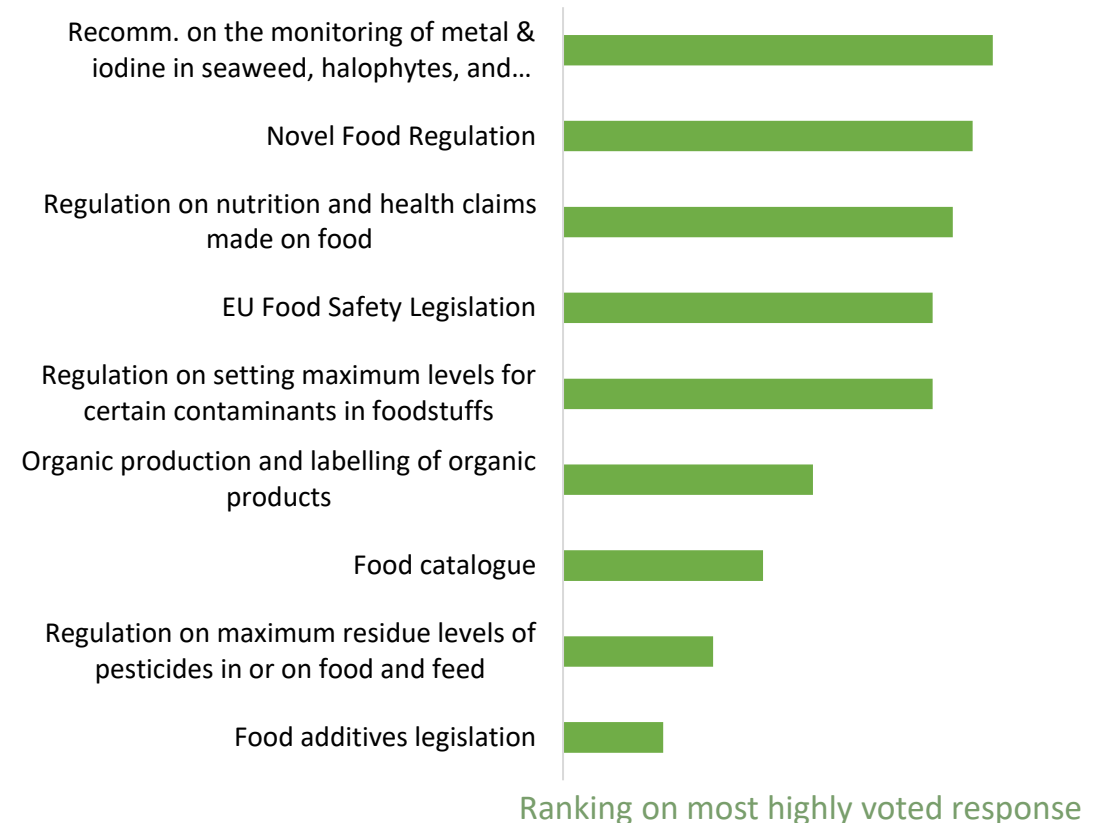
## Barriers:

- Novel food regulation & catalogue (2X : applications cumbersome)
- Lack of knowledge about algae
- Complex and unclear legislation
- Unfair competition with products from non-EU
- Claims regulation: But you cannot e.g. claim healthy algae product in general.
- Safety requirements

## Needs:

- Enforcement of algae standards on imports from non-EU countries
- Support with novel food applications (funding)
- Harmonised EU organic certification
- Reviewed and EU-level harmonized metal and toxicity levels
- Mandatory quotas of algae products
- One-stop-shop – centralized source of regulation
- Update novel food catalogue
- Fast tracking and prioritization of licensing and permits for SMEs

Are there specific regulations that should be prioritized to adapt for your working group?



# Work group results – WG4

## Barriers:

- At current prices, algae is way too much of a premium product for feed
- It's not about what we need in terms of legislation- it's about understanding what is already out there and how to interpret it.
- Safety requirements in algae: bioaccessibility of some metals is lower, than the chemical counterparts. So the maximum levels are too restrictive than needed. Some member states have even more restrictive levels than EU.
- Waste streams processing rules could be relaxed- allowing to use different types of waste products to produce algae feeds.
- Waste streams: processing rules could be relaxed- allowing to use different types of waste products.

## Needs:

- Legislation (clear pathway), clear guidelines what regulators see as the risk
- Possibility to use waste streams
- To be able to scale things up, commercially (to get to the scale of industrial production)



# Work group results – WG5

## Barriers:

- Complex or unclear legislation (3x)
- Lack of legislation (3x)
- Lack of knowledge of Algae (1x)

## Needs:

- Mandatory quotas for use of algae products (similar to biodiesel)
- More tolerance for waste streams processing (clearer distinction between waste streams and side streams)
- Algae has various uses and is not always related aquaculture (different legislations for different algae purposes)
- MSPdirective- seaweed farms take only a moderate amount of space but there is general weariness and poor perception> seaweed farms are the last in the space allocation
- Waste water legislation (and more broadly waste streams regulation) too prohibitive
- IMTA even more difficult to license than seaweed farms.
- Regulatory **framework on ecosystem services and valuation is not existent**

# Work group results – WG6

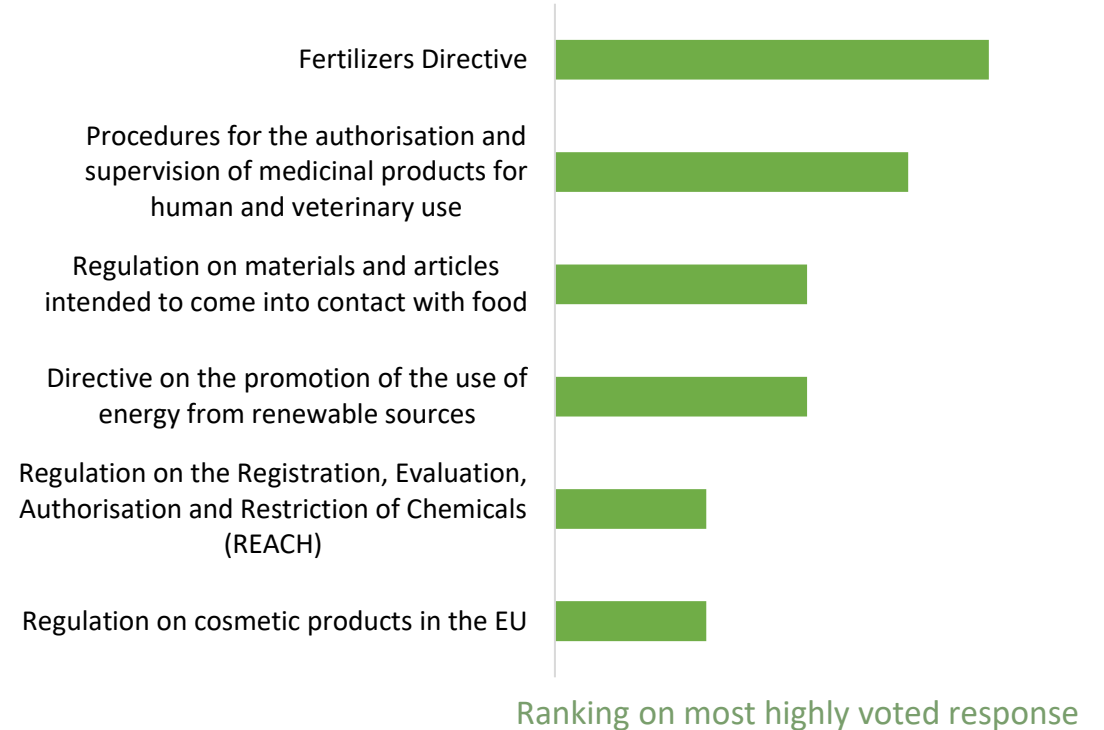
## Barriers:

- Restrictive legislation
- Permits, licensing and certification (2x)
- Lack of legislation
- Complex or unclear legislation (2x)
- Unfair competition
- Lack of knowledge of algae products (2x)

## Needs:

- Create a list of applications for which algae can be used for
- One stop shop for all things algae-regulation and algae- applications
- Fertilizers directive needs to be revised

Are there specific regulations that should be prioritized to adapt for your working group?



# Work group results - WG7

## Barrier:

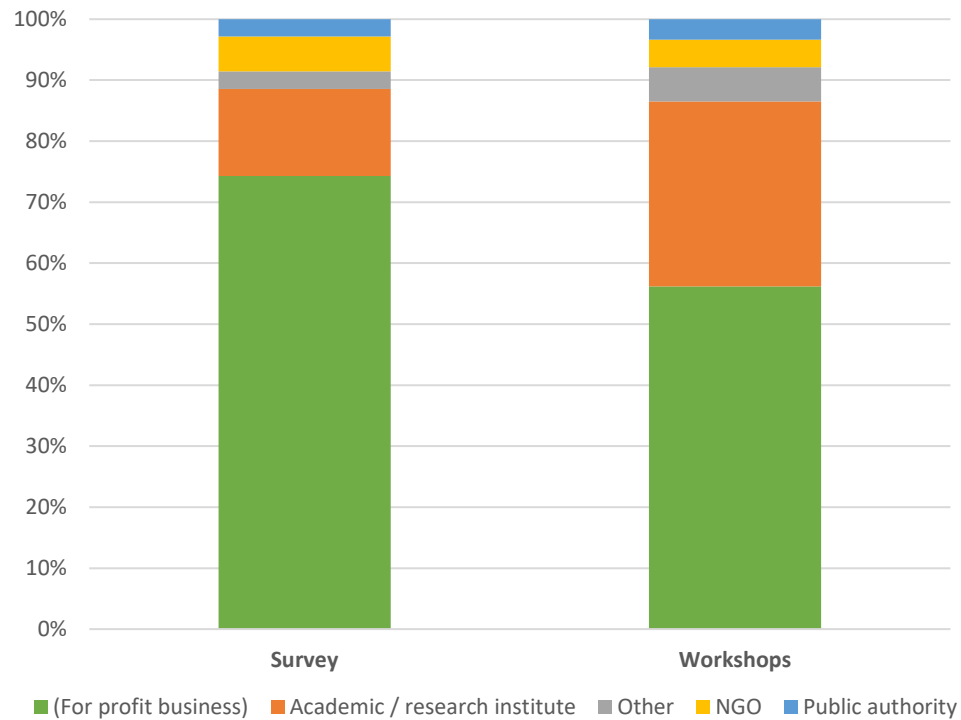
- Understanding the legislation

## Needs:

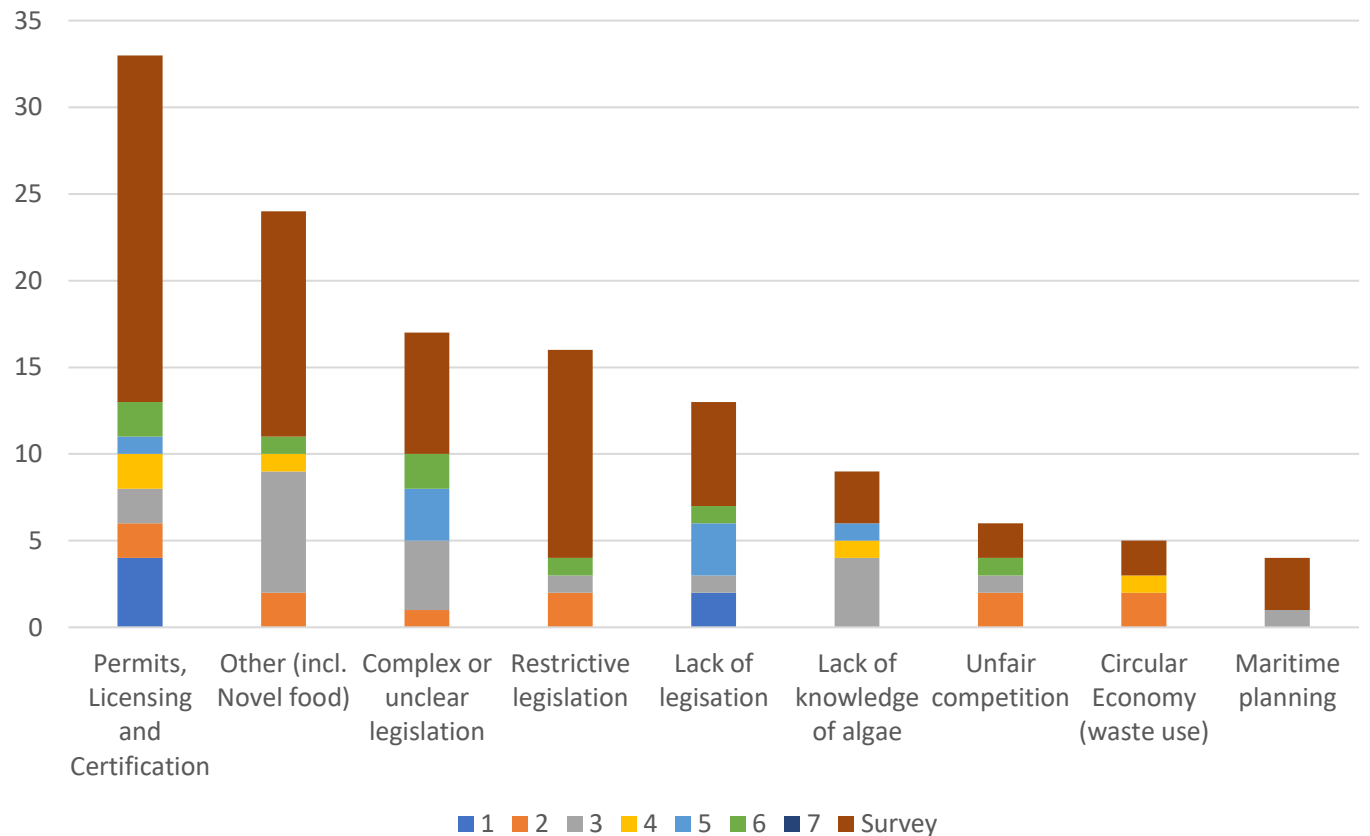
- One stop shop for all things algae-regulation and algae- applications
- Funding for collaborative research
- Fast track processes for SMEs
- End to unfair competition
- Young entrepreneurs need **bioentrepreneurship training programmes**

# Survey + Working groups/ combined results

Participant composition of survey and workshops



Most encountered barriers by Workgroup and survey participants



# Summary of findings: Biggest barriers

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Lack of harmonization of permits/licensing/certification across countries

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Lack of understanding of legislation amongst government officials and algae entrepreneurs

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Process of application (e.g. novel food) has a heavy burden of proof on the producer (lots of documentation and research is in very early stage)

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Organic regulation (not written with algae in mind)

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Unfair competition with non EU algae products (due to lack of enforcement of regulation)

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Novel feed: less progressed area (compared to food)

# Overall conclusion

- Current EU legislative and regulatory framework, as well as national implementation in its current shape is **largely ineffective and too restrictive for algae entrepreneurs** (it can take up to 5 years to get a licence to operate, limited space for development, too large burden is placed on producers to prove product safety and compliance, etc.)
- This is enhanced by **limited understanding** (of real risks) and **implementation capacity** (at Member State level)
- No regulatory framework **on ecosystem services and valuation**
- Given shortages of EU regulatory framework (and lower production costs outside EU), there **unfair competition** with imported algae products
- Focussed **national and regional policies and strategies** can help sector to develop (but only a few identified so far)

# Priority actions

**Algae-specific licensing & permitting**, harmonised across EU member states by national legal experts

**Enforcement** of EU regulations on algae product imports

**Terrestrial & marine spatial plans**: ensure sufficient space for algae (since algae is not just aquaculture, it's also micro-algae production facilities which are more like fields if outdoors or factories if indoors), and co-locating algae with other activities

**Standardised list of algae contaminants and testing procedures**

**Provide incentive measures** for algae sector companies that can prove high ecosystem service "score", according to standardized parameters (dissolved carbon, dissolved oxygen, nutrient (N,P) uptake, contaminant uptake, biodiversity, water pH, turbidity...)

# Responsibilities

Recommended action	EC	Member states
<b>One stop shop for algae processing &amp; algae products</b>	Initiate&Facilitate discussion with MS; provide guidance &support	Setting up structures/ Implementation in MS
<b>Enforce regulations for imported algae products to adhere to EU production and application rules</b>	To review process, and to provide guidance and support to MS	Adequate enforcement of regulations
<b>Terrestrial &amp; marine spatial plans: ensure sufficient space for algae</b>	Check MS MSP to ensure that in all MSP there are provisions for algae Provide guidance to MS	Review MSP and SPs, remove unnecessary restrictions
<b>Make specific regulations more adherent to requirements of algae sector</b>	To review/ revise regulations (Organic regulation 848/2018, WFD, EIA Reg., Novel food Reg. &catalogue, Feed catalogue, reg on Alien species, Rec. on mon metals&iodine in seaweed, etc), and provide guidance to MS	Adequate enforcement of regulations
<b>Provide incentive measures for algae sector</b>	Allow use of EMFF resources to support algae sector, and/or launch centrally managed calls	To include incentives in national EMFF programming



# Good practice example: Scotland



## Seaweed Cultivation Policy Statement

- The policy aims to help facilitate the growth of the sector by setting out SG policy on the suitability of seaweed cultivation in different scenarios
- The policy provide those wanting to operate in this sector a better understanding of the type of development that may be given approval
- The overall benefit: to provide greater certainty for the industry, while ensuring that activities which may have an environmental impact are understood and mitigated

# Good practice example- Denmark

## Havhøst ( “Ocean Harvest”)

- The largest member organisation gathered around regenerative ocean cultivation in Denmark. The organisation encourages the use of the blue areas in and around cities for people of all ages to try their hand at local, sustainable food production. With a starting point in education and dissemination, the organisation is working to share knowledge and bolster a network of communities throughout Denmark gathered around reinvigorating our oceans whilst cultivating food
  - There is very simple application form for cultivation activities: 1 page
  - More information: [Havhøst - velkommen - Havhøst \(xn--havhst-eya.dk\)](https://xn--havhst-eya.dk)
- [Blue community gardens – experiences from Denmark - YouTube](#)

# Good practice example: France

- Highest number of algae enterprises in EU (JRC, 2022)
- Well defined responsibilities at the national level, supportive national legislation, streamlined application procedure (good example of vertical integration)
- Scientific support/advice (CEVA, IFREMER), involvement of scientific advice during approval process
- **Brittany: regional innovation strategy** has specific algae/IMTA-related objective: “Finance R&D projects for the development of innovative technologies for integrated multi-trophic aquaculture technologies towards zero waste and alternative sources of nutrition (insects, microalgae, algae)”.

# Good practice example: Brittany (FR)

- Advertised as local tourism attraction/specialty of local cuisine:

## Good addresses for trying seaweed

- [Hôtel de la mer in Brignogan \(FR\)](#) with the chef Mickaël Renard
- Chef Mikaël Amisse is a fan of “algucuisine” in the [Royal Barrière restaurant in La Baule](#)
- Hugo Roellinger at [Château Richeux \(FR\)](#) emphasises his seafood cuisine with [Epices océanes d'Olivier Roellinger \(FR\)](#), a range of spices and ground seaweeds
- Inspired by Japanese cuisine, chef Julien Lemarié cooks fresh seaweed in his restaurant [Ima \(FR\)](#) in Rennes



<https://www.brittanytourism.com/matching-what-i-want/food-drink/fish-and-shellfish/seaweed/>

# Next ...

- Follow up (discussion) on legislation
- A few questions and voting (via Mentimeter)
- Let's proceed to next session!...

# EU4Algae Partners





**Thank you!**