CONNECTING THE DOTS FOR A CIRCULAR BLUE BIOECONOMY

From science to policy and regulatory solutions

Policy event hosted by MEP Clara Aguilera
30 January 2024, 8:30-10:00
European Parliament, Room ASP 1E1 / Online

Consolidated report

On 30 January 2024, the Blue Bioeconomy ERA-NET Cofund (BlueBio) organised the policy event "*Connecting the dots for a circular blue bioeconomy – from science to policy and regulatory solutions*", hosted by **MEP Clara Aguilera (Spain, S&D)** in the European Parliament (Brussels).

INTRODUCTION

MEP Clara Aguilera (Spain, S&D), member of the Parliamentary Committee on Fisheries (PECH) and of the Committee on Agriculture and Rural Development (AGRI), opened the meeting by thanking all panellists and guests attending the event and those following online. MEP Aguilera recalled that the European Green Deal and Farm to Fork Strategy have been crucial files during this mandate. Yet, the Green Deal's implementation has been incomplete, she argued. She expressed her hope that further actions – especially in the field of marine topics and algae – will be undertaken by the new European Parliament and Commission after the June 2024 European elections. A further development of the European blue bioeconomy is needed as the European aquaculture sector has not yet reached its full potential, she added. She concluded her opening speech by stating that science, innovation, and research are essential prerequisites for adequate European legislation, thus welcoming this policy event.

Ingeborg Korme, BlueBio ERA-NET Cofund Coordinator, gave a brief presentation of the BlueBio ERA-NET Cofund which aims to unlock the potential of aquatic bioresources. She further expressed that the goal of BlueBio is to identify new and improve existing ways of bringing bio-based products and services to the market – focusing on all the links of the value chain from resource management and biomass producers, to supply systems and market.

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She further underlined that many of the BlueBio-funded R&D projects have concluded that regulatory obstacles exist and currently limit further innovation, investment, and/or European aquaculture developments in general. There is a lot of potential to transform the sector into a more sustainable and circular one – she concluded – but further work, development, and enhanced cooperation at the European level is needed to make this modification happen.

REGULATORY BARRIERS TO THE VALORISATION OF BLUE BIOBASED PRODUCTS

MEP Aguilera (Spain, S&D) introduced the presenters of the first round of presentations of BlueBio ERA-NET Cofund funded projects.

BlueBioChain: Microalgae to Assets: Identifying Regulatory and Social Hurdles in Turning Wastewater into Valuable Products.

*Presentation by **Dr Panagiotis Kougias**, Hellenic Agricultural Organization - Demeter Soil and Water Resources Institute, Project Coordinator of BlueBioChain.*

Dr. Kougias briefly outlined the project and its main goals – the valorisation of wastewater from food industries and aquaculture farms with microalgae to generate high market value products such as cosmeceuticals, food colouring agents and aquaculture feed. The barriers identified during the project's course are linked to the absence of regulatory standards leading to a lack of clarity and predictability for further investment. Dr. Kougias also noted the existing challenges facing the use of food processing wastewater to ensure the production of safe end-products assisted by traceability control. Data is therefore needed to ensure safety, he added.

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During the BlueBioChain project, a survey has been conducted to retrieve results regarding the social acceptance and perception of this project. The survey showed that there was a high awareness of the project's subject (85% for wastewater use and 75% for microalgae use) and an overwhelmingly positive perception regarding the use of wastewater and microalgae for bio-based products. The survey further outlined that consumers show varying levels of willingness to purchase different types of bio-based products:

- Cosmeceuticals: 63% in favour; 11% opposition;
- Food additives: 56% in favour; 20% opposition; and
- Fish: 52% in favour and 19% against.

In light of this, Dr. Kougias shared that consumers are "generally reluctant to pay a premium price for food additives and fish, [but] are more willing to pay a premium for cosmeceuticals".

Dr. Kougias concluded his presentation with some key points in respect to the identified regulatory barriers:

1. Safety and Toxicity concerns
2. Quality and Purity standards
3. Environmental Regulations
4. Approval and Certification processes
5. Labelling and Marketing regulations
6. Traceability and Supply Chain Oversight
7. International Trade & Compliance

MariGreen: Barriers in the valorization of BLUE residues for the production of fertilizers and biostimulants

*Presentation by **Prof. Dr. Eng. Oana Cristina Parvulescu**, National University of Science and Technology POLITEHNICA Bucharest, MariGreen Project Coordinator.*

Dr. Parvulescu introduced the project and its overall goal: to upgrade poorly used residual materials from the blue value chain (*i.e.* from fish capture, organic aquaculture and the seaweed industry), by applying several appropriate technologies to produce fertilizers and biostimulants useful for green agriculture.

She explained that fish processing wastes and aquaculture sludge are both rich in nutrients and offer valuable potential as inputs to agriculture, as fertilizers and biostimulants. However, their use is currently blocked by EU regulations as fish excreta are not *animal by-products* under the Animal By-Product Regulation (2009/1069, art. 3.20). Also, for fertilizers to be applied in organic growing, there [currently] is no regulation on acceptable additives and processing methods. She concluded her speech stating that "collaboration between decision-makers, research community and industry units is

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essential to develop appropriate strategies to support the adoption of these new organic fertilizers and biostimulants".

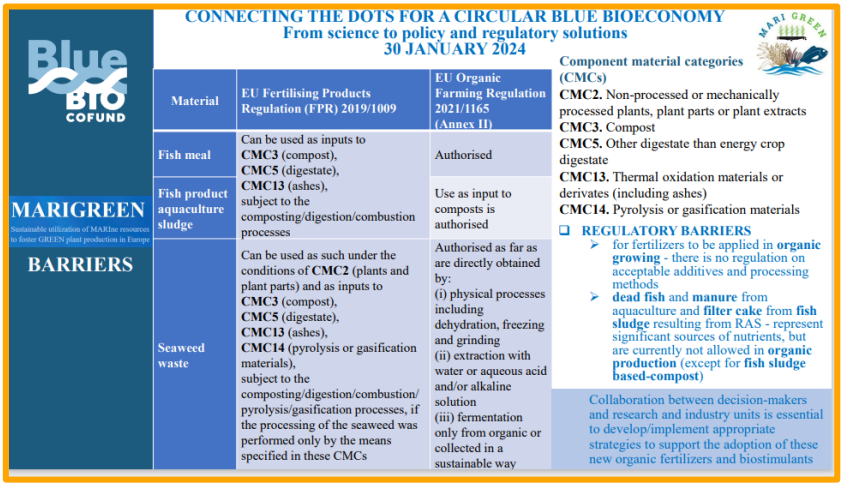

Figure 1: MariGreen identified barriers

AquaHealth: Investigation of bioactive compounds from microalgae microbiomes for sustainable health management in aquaculture

*Presentation by **Prof. Dr. -Ing. Kerstin Kuchta,** Hamburg University of Technology*

Dr. Kuchta opened her presentation by stating that the AquaHealth consortium aimed at identifying novel biofilm-inhibiting and antimicrobial enzymes, as well as antiviral candidates derived from microalgae. The project has a great potential in relation to reducing waste, offering feed and disease treatment solutions with a lower environmental impact and carbon sequestration.

Prof. Kuchta explained that less complex and harmonized procedures and standards are suggested just as the fact that – if mixed algal biomass is grown – authorisation is difficult in product regulations which are based on individual algae species.

To end her presentation, Dr. Kuchta outlined the project's key findings, which are:

- microalgae biomass, supernatants and extracts showed antimicrobial and antiviral effects against fish pathogens;
- The project contributed to a potential reduction of environmental impact from finfish aquaculture by more than 5%; and
- Dienelactone hydrolysate proteins (e.g. Dlh3) exhibit significant biofilm inhibition effects.

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MEP Catherine Chabaud (France, Renew Europe), Member of the Parliamentary Committees on Fisheries (PECH) and Environment (ENVI) reacted on the above-mentioned presentations underlining the **need for a European Blue Deal** equal to and within the European Green Deal. Algae can be considered as a key link between the marine blue bioeconomy and the Green Deal, she added. MEP Chabaud concluded that Europe is still lacking an integrated and holistic approach for issues related to the sea, which are currently dealt in silo, and that is in this regards, the EU Mission: Restore our Ocean and Waters by 2030 could be further implemented. Scientific outcomes of relevant projects should be considered more when working on the EU's maritime policies, she further argued. She really welcomed this policy event as a way to draw attention to important issues and solutions.

MAKING THE BLUE BIOECONOMY MORE CIRCULAR

MEP Clara Aguilera (Spain, S&D) thanked all speakers and MEP Chabaud for their insightful presentation and useful information regarding the encounters, barriers, and stumbling blocks. A more global vision is therefore crucial. She further introduced participants to the second part of this meeting, Ms. Efthalia Arvaniti and Dr. Ann-Cecilie Hansen.

Authorising algae as an ingredient

*Presentation by **Efthalia Arvaniti**, Programme manager of the SUBMARINER Network*

Dr. Arvaniti gave her presentation in the context of the "SEAMARK" project, an industry-led Horizon Europe funded project in which the SUBMARINER Network is providing communication. The SEAMARK project aims "to demonstrate how to scale up innovative seaweed cultivation and processing into price-competitive product applications making the entire supply chain attractive for commercial investments".

An enhanced promotion of alternative ingredients from seaweed is needed, but SEAMARK showed in a new "EU regulatory landscape in a global context" report, that as regards the use of seaweed as food – the current EFSA novel foods approval process is both cost-intensive and time-consuming hampering further innovation, whilst also putting a significant burden on companies willing to market seaweed products fit for the European internal market. The costs of testing and authorising health and nutrition claims are a major obstacle to the marketing of such products.

She stressed that a "healthy algae product" in general cannot be claimed yet, and underlined that obtaining authorisation for health and nutritional claims is demanding, and communicating preliminary scientific evidence to consumers is not possible"', due to Regulation (EU) No 432/2012 and Regulation (EU) No 957/2010. Furthermore, as regards to the use of seaweed as food, following Commission Recommendation (EU) 2018/464 on

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heavy metals, "[this] does not indicate specific regulatory thresholds for seaweed that Member States should adopt" and a "lack of differentiation between inorganic and organic arsenic" still exists.

In the United States, **seaweed in nutraceutical applications** benefit from the fact that "in addition to authorised health claims based on significant scientific agreement, 'qualified' health claims are allowed based on a less demanding level of scientific evidence" than in the European Union.

In addition, Dr. Arvaniti presented some barriers to the use of **seaweed as feed** as there is a lack of harmonisation in feed regulations across EU member states can create barriers to market entry. Feed ingredients authorised in one country may not be automatically accepted in others, leading to a fragmented market.

Also, due to the Harmful contaminants Directive 2002/32/EC, "the EU maximum metal threshold levels are too restrictive [and] lack of differentiation between inorganic and organic arsenic". While the "allowed levels of certain contaminants, e.g. arsenic, are way higher in other countries [such as] by 1/3 in Japan and ½ in USA".

Figure 2: SEAMARK identified barriers

The study, now at a draft stage, will be presented on seamark.eu when finalized.

Facilitating the circularity of aquaculture feed

Presentation by ***Dr Ann-Cecilie Hansen***, Norwegian Food Safety Authority

Dr. Hansen – as representative of the Norwegian Authorities – clarified that, under the EEA agreement, Norway is legally obliged to comply with significant parts of the EU regulatory framework in several sectors, including food and feed production. Furthermore, Norwegian authorities are currently focussing on circular economy related topics, such as sustainable production of fish feed.

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To sustain her presentation, Dr. Hansen introduced the participants to fish sludge, which is faeces from the production of farmed fish, consisting also of undigested excess feed and is collected from closed on-land aquaculture systems. It is a product suitable to be used as fertilizer and authorised in Norway under its national regulations. However, it is excluded from the EU Fertilising Products Regulation (EU) No. 2019/1009.

In light of this, fish sludge producers face a major regulatory puzzle as they can choose to either follow Norwegian national regulations, the EU regulatory framework or follow the principle of Mutual recognition outlined in Regulation (EU) No. 2019/515.

Figure 3: Fish sludge as fertiliser - regulatory puzzle

However, fish sludge is not on the list of component materials and thus not allowed to be used as fertiliser under the EU fertilising products Regulation (EU) No. 2019/1009, Dr. Hansen added. It is also not covered by the Animal By-product Regulation: since excrements and/or urine of farmed fish is not included in the definition of manure (Regulation (EU) Nr. 1069/2009, art. 2 (k) and art. 3, nr. 20).

Dr. Hansen also outlined the current challenges of recycling of fish sludge for use in agriculture which include food-chain and environmental safety issues such as heavy metals as their levels need to be controlled.

Other issues include organic pollutants (such as plant protection chemicals and pharmaceuticals) and the sufficient understanding of risk in relation to food safety and the environment. Hygiene is another important issue that needs to be tackled as there is a need for knowledge regarding possible processing methods that secure good hygiene and prevent the spread of infectious agents. At last, to be used as a fertilizer, the products must have physical properties that allows them to be transported to where the nutrients are needed in agriculture. In Norway, sludge arises in the West and Northern coast. However, the need for fertilizer – in agricultural areas – is mostly located in South-East Norway. This entails that sludge has to have "good storage and spreading properties, little smell [and] not too high salt content".

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Dr. Hansen concluded that "a fertilizer must also contain available nutrients and a balance between nutrients that fits the crops needs".

Another viable alternative for fish sludge as part of the circular economy, is to be used as feed for insect farming. However, this poses the risk of recirculating pathogens and contaminants. Reason why this route is currently excluded by the EU feed regulations and requires more research regarding safety measures.

Also, farmed insects fall within the category of farmed animals according to the EU Regulatory Framework. Consequently, insects may only be fed with material edible for farmed animals. Hence, the use of fish sludge is prohibited to produce and/or feed these types of animals. This as it is not allowed to use faeces, urine, and content from the digestive tract, "irrespective of any form of treatment or mixture".

To end her presentation, Dr. Hansen added that feed may only be placed on the market and used if:

- it is safe; no adverse effects on human or animal health or make the food derived from food-producing animals unsafe for human consumption; and
- It does not have a direct adverse effect on the environment or animal welfare (ex. covers the nutritional requirements).

Dr. Hansen concluded her presentation by noting that to change the status quo, three elements are needed:

- New scientific knowledge available;
- The new data is risk-assessed by EFSA;
- There is political will to change the legislation.

ROUND TABLE DISCUSSION

As third part of this event, a round table discussion was held in presence of the following participants:

- ***Lorella De La Cruz Iglesias,*** Deputy Head of Unit Blue Economy Sectors, Aquaculture and Maritime Spatial Planning, Directorate General for Maritime Affairs and Fisheries, European Commission

- ***Alex Obach*****,** President of the European Aquaculture Technology and Innovation Platform

- ***Anne Mette Bæk*****,** Managing Director, European Fishmeal and Fish Oil Producers, Member of the North Sea Advisory Council

The round table discussion was moderated by **Ingeborg Korme**, BlueBio Cofund Coordinator.

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To start the discussion, **Alex Obach**, underlined that the EU's aquaculture sector is one of the most sustainable in the world. Today, 40% of fish meal used in aquaculture feed originates from marine food production co-products and over half of the ingredients used are co-products of marine, vegetable, and animal origin (e.g. maize or soja processing), he added. Also, the sector is leading in terms of development of aquaculture technology and innovation along the value chain, putting the EU at a competitive advantage in terms of RTDI transfer.

However, he further argued that despite the efforts of the sector, 70% of aquaculture food products consumed in the Union are still being imported, resulting in a €25 billion trade deficit. The sector's development is also stagnating as underlined by MEP Aguilera in her opening statement. Therefore, it is essential that the regulatory framework provides both safety and flexibility to allow innovation in the EU to support a sustainable and ambitious growth of the industry. Market policies and promotions campaigns of aquatic products are also essential.

Anne Mette Bæk expressed her excitement to be part of the roundtable discussion as representative of the industry association representing European fishmeal and fish oil producers. This event was a huge opportunity for the industry to provide a perspective on some of the regulatory challenges faced by the industry, she added.

She highlighted that currently 40% of the raw materials used by EFFOP members is rest raw materials from the fish processing sector. In light of this, she added that EFFOP considers side streams as an important material for the production of fishmeal and fish oil.

She pointed to one of the regulatory hurdles facing her industry: the production of food grade fish oil in the same sites as oil for feed. Such integration is pivotal for enhancing industry efficiency and making best value of raw materials. She emphasized the need to revisit the 2009 Animal By-Product Regulation to align with the principles of the circular economy and food sustainability, without compromising safety standards in the current landscape.

Lorella de la Cruz Iglesias explained that the Commission is working with the industry and other stakeholders to identify regulatory obstacles to bring the circular economy approach to aquaculture. Regulations are not always up to speed with innovation. This is why a "foresight" approach – executed by the European Commission – tries to ensure to the extent possible that EU policy and regulation anticipates future societal and technological developments, continuing to ensure high levels of safety and consumer confidence, she added. She recalled that in 2021, the Commission adopted an overarching strategy[1] for a more competitive and sustainable EU aquaculture. The strategy insists on the contribution of aquaculture to the green transition, and valorisation of renewable aquatic ingredients is key. Both algae and aquaculture side-streams are seen as important drivers. The Commission is making further efforts to connect policy making and legislation to research and innovation. Guidance being

[1] Strategic guidelines for a more sustainable and competitive EU aquaculture for the period 2021 to 2030

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prepared on a number of areas relevant for the sustainable growth of aquaculture in the EU (e.g. environmental performance) are based on the results of EU funded research and innovation. With respect to the amendment of EU legislation, she noted that opening parts of a piece of legislation is a complex issue in itself. There is a need for sound scientific advice (where appropriate to be delivered by EFSA) to support modifications to existing legislative framework. She also noted that in some cases, there are other options to address regulatory obstacles than amending legislation. For example, in the case of algae, the Commission is reviewing the previous use in the EU of certain species so that it is not necessary to follow the full process for their authorisation as Novel Food under EU legislation.

Ingeborg Korme, BlueBio Cofund ERA-NET Coordinator, then dived into the relationship between policymakers and stakeholders questioning how these connections can be further facilitated.

On this, **Alex Obach** and **Anne Mette Bæk** replied respectively that high-level policy events are a good way of proceeding. However, he added, a focus should be kept on the current low-hanging fruits which can rapidly improve the further development of the blue bioeconomy. A lot of the innovations in the field of aquaculture are done by Universities, Start-ups, and SMEs he added. Often these actors face problems with funding and access to the right funds. **Anne Mette Bæk** added that there still exists a major lack of communication between scientific and regulatory worlds. The fishmeal and fish oil producing industry is, however, heavily involved in dialogue with other feeding industries to tackle certain transversal issues. She argued that if Europe is truly believing in the blue bioeconomy, it should look at the Animal By-Product Regulation as it is now a major

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stumbling block. “If we need to upgrade our feed processes, regulations should also be upscaled” she underlined.

Ingeborg Korme, BlueBio Cofund ERA-NET Coordinator, asked the European Commission representatives how the regulatory authorities can be better informed on very technical and scientific discoveries and how this would help the internal communication between the Commission’s services before the publication of a Commission proposal.

In his response, **Paolo Caricato** – Deputy Head of the Unit G5 Food hygiene, feed, and fraud at the Directorate General for Health and Food Safety (European Commission) **–** underlined that the discussions between different Directorate Generals is strong – especially once a proposal is in the phase of being developed at Commission level, through the interservice consultation process. However, as Mr. Caricato explained that to accelerate change in regulation, the most important input for the Commission, besides scientific recommendations, is the input and requests made by European Member States, as they have lots of information on the matter. Nevertheless, without a strong political input and will from Member States it is more difficult for the Commission to justify its reasoning on why certain regulations of the EU *acquis Communautaire* should be modified. This is also linked to the fact that a lot of the blue bioeconomy segments are shared competence with Member States.

The round table participants concluded that the EU is the world's leader in research and innovation, sustainability in the field of aquaculture but an enhanced coordination/cooperation between researchers, industry, and regulators – in order to promote implementation – is highly needed. R&D projects are delivering useful policy recommendations, however, a key question remains how to define policies that have the potential to upscale – in terms of size and finances – the circular blue bioeconomy as a whole.

CONCLUSION

Ingeborg Korme, BlueBio ERA-NET Cofund ERA-NET Coordinator, thanked all participants in the room and online. She expressed her hope that by raising awareness of the regulatory barriers identified in the BlueBio Cofund funded projects, a more holistic approach to the matter would be the result. An enabling regulatory framework is needed to make sure blue bioeconomy related products and innovations can be put on the European internal market.

Presentations given during this event showed that there are many solutions to make the European blue bioeconomy more circular, she added, and the June 2024 elections will be crucial to continue working in this direction.

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