The SUBMARINER Network a facilitator for sustainable & innovative blue growth cooperation

GRASS Macroalgae Conference

6/7 May 2021

SUBMARINER NETWORK

Angela Schultz-Zehden

Managing Director

SUBMARINER Network members

Bio-based Industries Consortium

BIOMARINE Community

SEAWEED for EUROPE

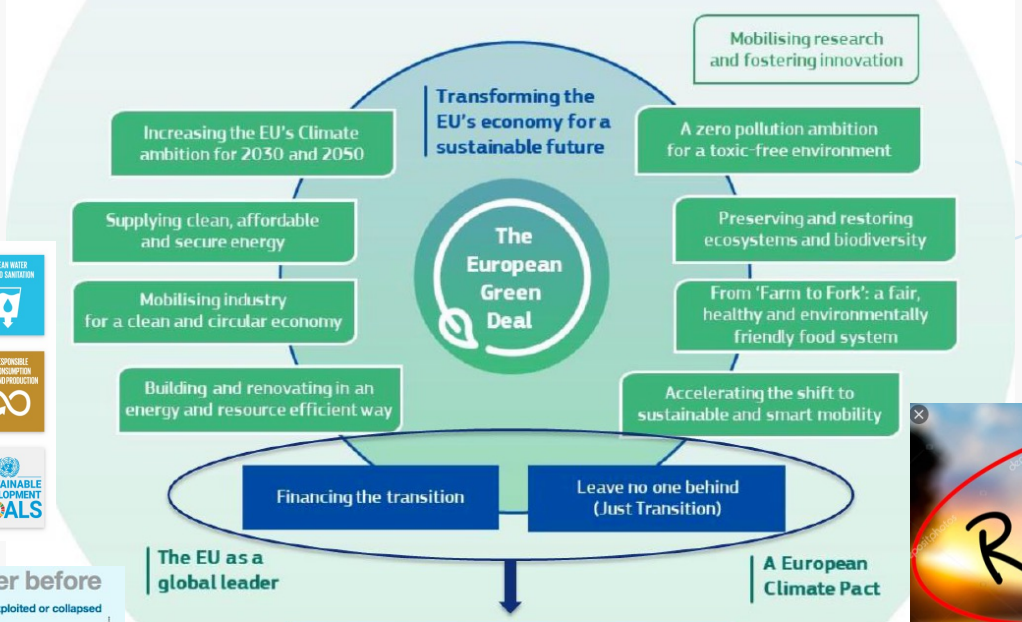
eurocean

EU STRATEGY FOR THE BALTIC SEA REGION FLAGSHIP

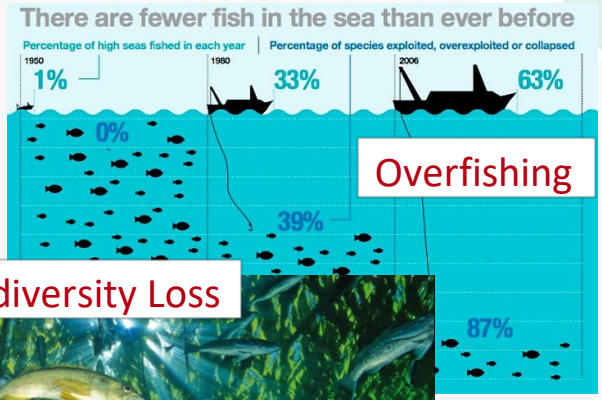
Innovation, Bioeconomy,
Spatial Planning, Nutri, Tourism,
Culture, Energy, Ship

SUBMARINER NETWORK

Our ambitions



Competitiveness



Overfishing

Plastic Pollution

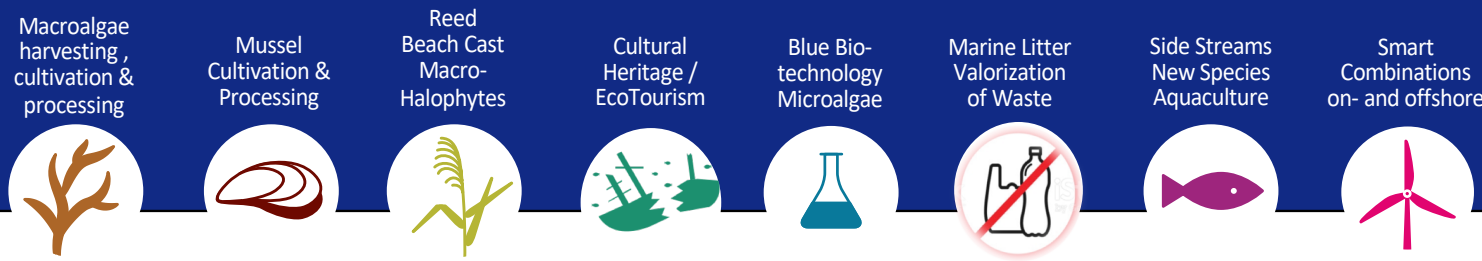
Biodiversity Loss

Eutrophication

Climate Change

Demographic Change

SUBMARINER topics



Strategic Action Fields

Multi-Actor and Sector Approach

Companies, Research, Authorities, Civil Society

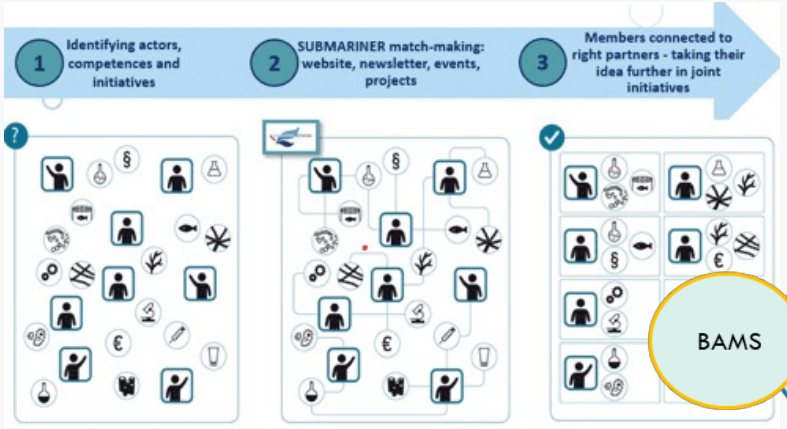
Natural and Social Science, Informatics, Creative Arts, Economics

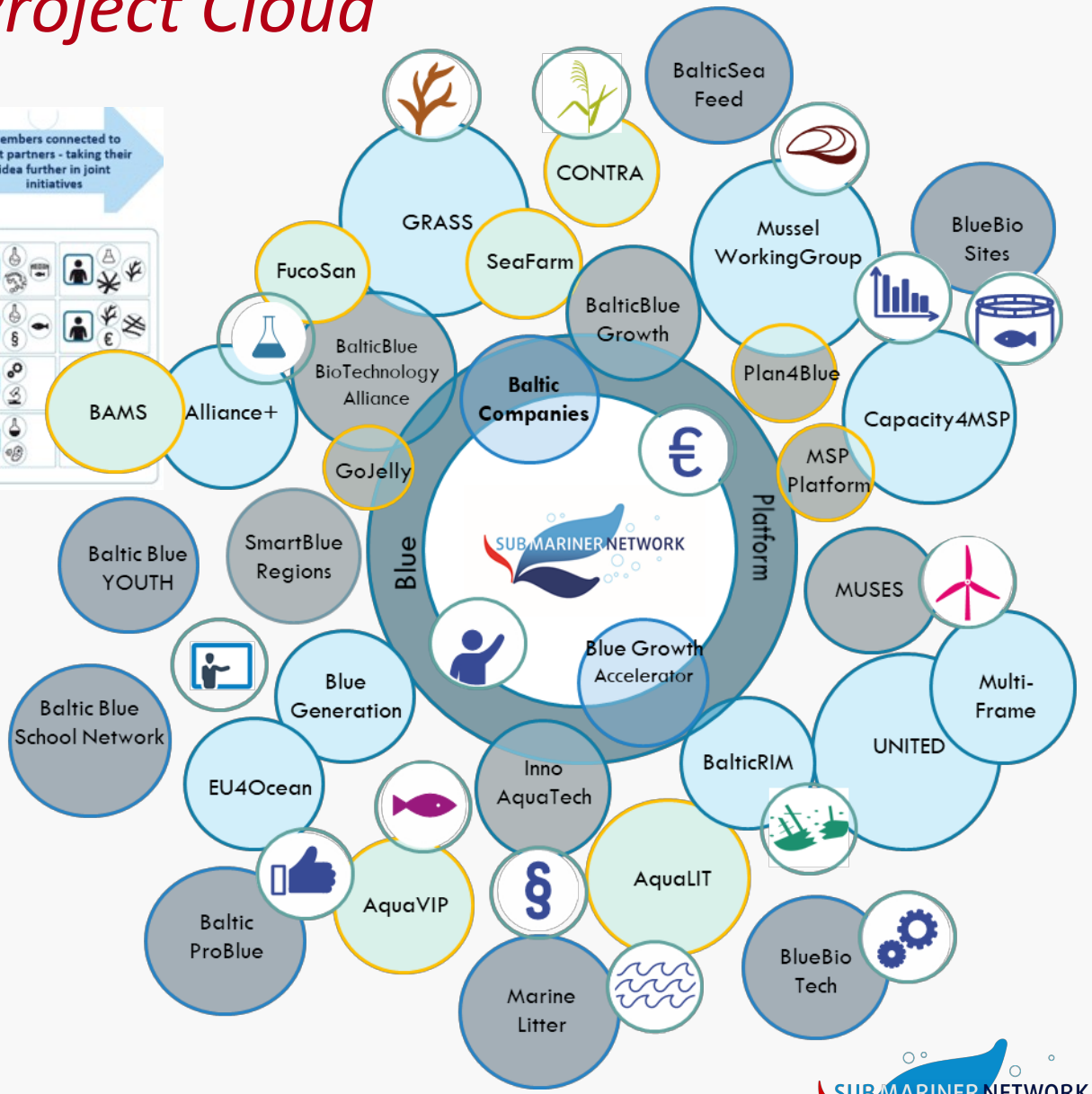
Vision 2030

SUBMARINER NETWORK

Angela Schultz-Zehden,

SUBMARINER Project Cloud





€ 300.000 membership fees

20 transnational projects

€ 41 million total

€ 30 million Baltic

43 members (2021)

150 partners

NO strategic funding

SUBMARINER NETWORK

The Baltic Blue Bioeconomy hub …

Communication/Dissemination:

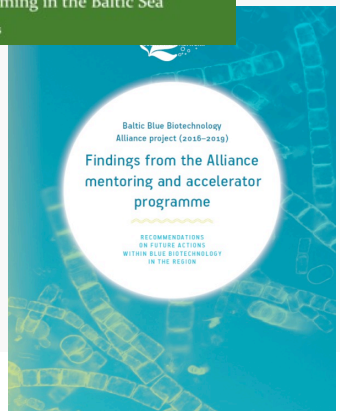
- Blue Platform Repository
- Social Media – Conferences
- Position & policy papers
- 3000 Actors mapped

Services to Members:

- Promotion of members' competences
- Funding Opportunities; Match-Making
- Network meetings; Project Development
- Access to searchable stakeholder database

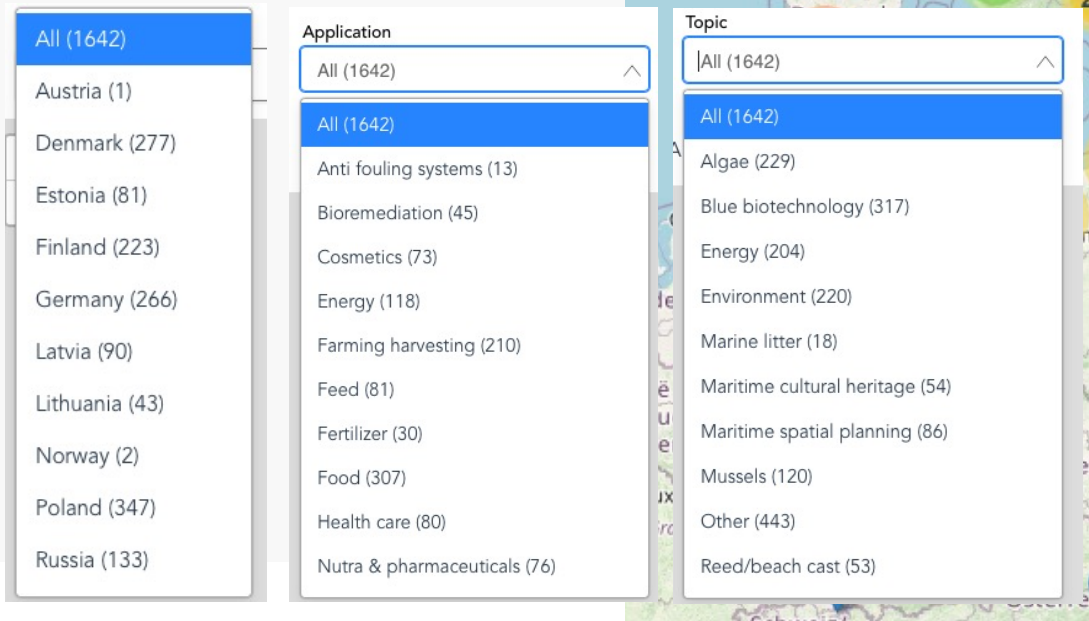
Expert Advice & Coaching:

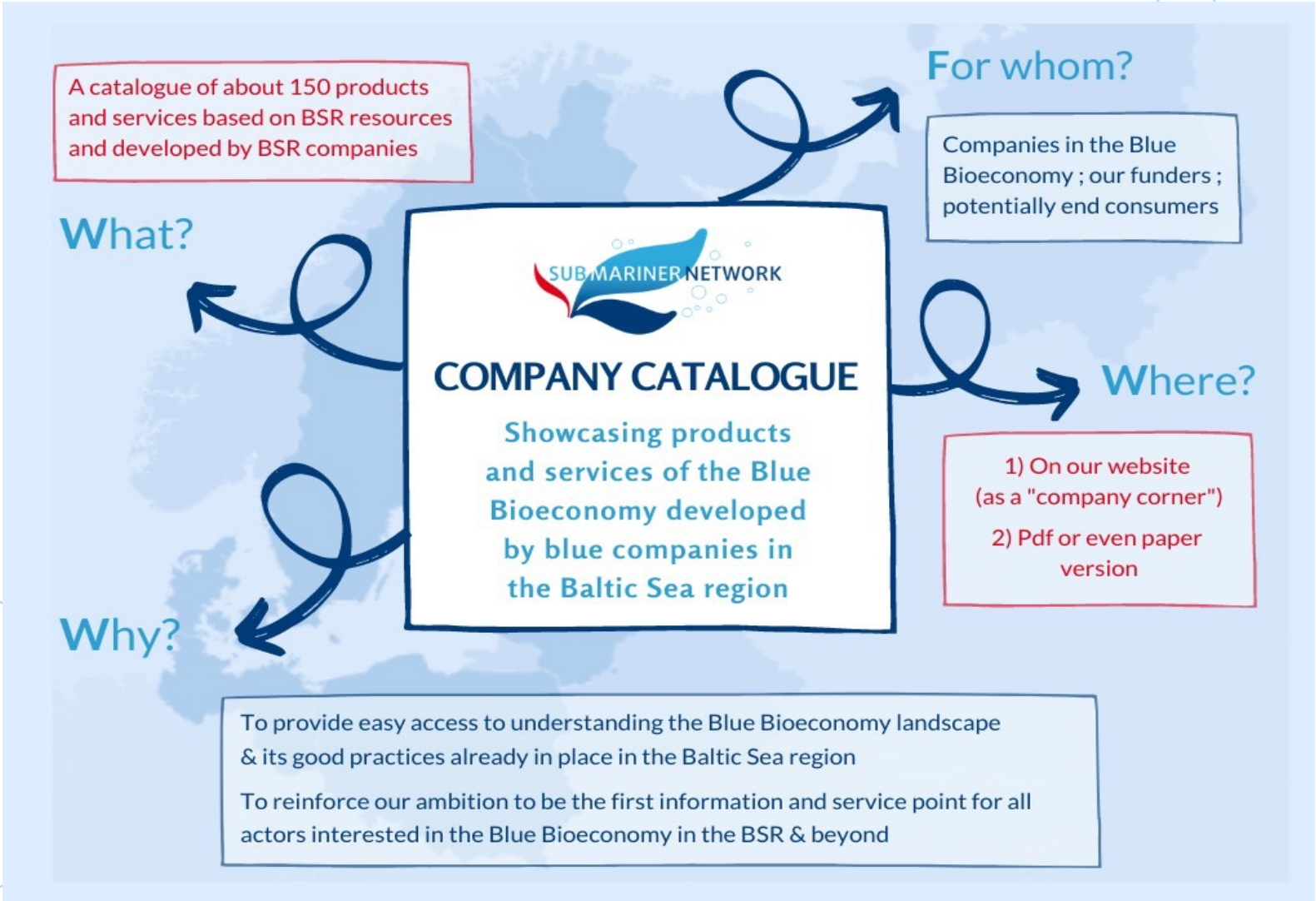
- Accelerator, Company Corner, Start-ups
- Research – Company – Policy



Actors mapping

- **43 members**, 260 partner organizations
- 6,000 actors throughout BSR, 1700 institutions
- approx. **650 companies** in blue bioeconomy linked via SUBMARINER





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PRODUCT EXAMPLE

Berrichi: the secret benefits of algae in natural cosmetics

Marine resources involved: Baltic red algae

Based on one product example, this template offers possible content on how to present products in the catalogue.

Berrichi is an Estonian brand of natural cosmetics that produces algae-based facial creams using a special resource from the Baltic Sea region - its red algae.

The opportunity:
Applying the power of algae to skincare products

The idea for Berrichi originates from Berit Joosep **from Estonia**. Berit struggled with skin problems, had allergies and suffered from dry skin and inflammations. This forced her to look for natural alternatives to over-the-counter skin care products.

The Estonian entrepreneur then discovered the **power of algae** during a trip to Asia where they have been at the heart of Asian beauty traditions for centuries given their strong moisturizing, smoothing and anti-aging effects.

Berit Joosep believes that "clean and natural is the best for the skin". And the Baltic Sea has untapped potential for natural products. She has therefore undertaken research to **develop a marketable product based on Baltic red algae.**

Product:
facial creams made of Baltic red algae

Topic involved:
algae

Product family:
cosmetics

The product:
Facial creams made from Baltic red algae

Red algae growing in the Baltic Sea are the special feature of facial creams in the Estonian cosmetics line Berrichi. Berit's passion for natural skin care and algae brought her together with scientists of Tallinn University in Estonia – the power of red algae turned into a **first cream in 2017.**

The ingredients have been studied and tested, and their effectiveness is scientifically proven. They awaken the body's natural ability to regenerate and heal – nourishing, restoring and moisturizing the skin deeply. The main key component of the products, **furcellaran**, is a strong antioxidant extracted from the Baltic red algae and comes from Estonian local company Est-Agar.

Their first facial cream was followed in 2018 by five more facial moisturizers, a hand cream and corresponding nutritional supplements. Berrichi natural products are available via the **company's online store (https://www.berrichi.ee/).**

The company: Furcella OÜ

Berrichi brand is manufactured by Furcella OÜ located in Tallinn, Estonia, and led by Janno Jossep, Berit's husband. Initially, the entrepreneurial couple cooperated with chemists from Tallinn University. **Two years of scientific research** and testing for Berrichi products provided proven evidence, that furcellaran has a powerful anti-aging and deep moisturising effect.

Then the "blue detective", Mariann Nõlvak from Tartu Biotechnology Park, spotted them and invited Furcella to join **the ALLIANCE** and its mentoring programme for start-ups. The ALLIANCE helped Furcella and made direct connections to new suppliers of material for the cosmetics, such as organic oils and the vitamin Retinol A. The suppliers based in Germany fulfilled Furcella's high expectations concerning sustainable production and now help to keep production going.

Current status/future prospects:

As a next step, they are trying to find a "blue" solution for the packaging of their algae-based natural creams, for example tubes or boxes produced from algae.

Location: Estonia

Creation date: 2015

Type of company:
Product manufacturing

Company website:
https://www.berrichi.ee/

Social media activity:
Instagram, Facebook

Contact information:
Email: hello@berrichi.ee
Phone: +372 5186 655

SUBMARINER NETWORK

SUBMARINER Accelerator for Blue Growth 2021+

- 68+ active mentors and service providers from BSR and beyond
- **12 active cases, 28 alumni cases,**
- 12 private investors regulars in our events
- **60% find partners, reach higher TRL, accelerate product development**
- 2 pitching / match-making events per year in BSR
- Monthly Expert/Mentors' forum meetings, also with invited gues
- Several digital and published solutions

ECBF
European Circular Bioeconomy Func

Interreg Baltic Sea Region ALLIANCE
EUROPEAN UNION
EUROPEAN REGIONAL DEVELOPMENT FUND

From projects to working group & vice versa

Completed projects (2014-2019)

Baltic Blue Biotech Alliance
Advancing marine bio-based product development

InnoAquaTech
Cross-border development & transfer of innovative and sustainable aquaculture technologies

Baltic Blue Growth
Initiating full scale mussel farming in the Baltic Sea

Baltic RIM
Baltic Sea Region Integrated Maritime Cultural Heritage Management

Smart Blue Regions
Smart Specialisation and Blue Growth in the Baltic Sea Region

MUSES
Exploring opportunities for Multi-Use in European Seas

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Mussel & Aquaculture working group

CONTRA

SEAFARM
Testing macroalgae cultivation in Sweden

EU4Ocean
Focal Point for Ocean Literacy Actors across the Baltic

Blue Platform
Capitalization on transnational blue bio economy project findings and capacity building

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Strengthening the capacity of MSP stakeholders and decision makers

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AquaLIT

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Technology development and transfer for a thriving Blue Bioeconomy in the Baltic Sea Region

BlueBioSites - SEED
Data, information and tools to identify and monitor optimal sites for the Blue Bioeconomy in the Baltic Sea Region

BalticSeaFeed - SEED
Develop sustainable feed from Baltic Marine Resources

Next GEN SUBMARINER projects (submitted)

Blue Bio Company Catalogue

& Innovation Cluster
Promote and support Blue Bio Product & Service Companies through matchmaking, marketing, innovation projects

And more to come .....

Ecosystem restoration
Restore biodiversity in coastal & marine areas

Sea2Fork
Promote uptake of healthy & sustainable blue food throughout EU

Algarithm
Map evidence supporting low-trophic aquaculture potential in Europe

Ocean Literacy
Enable citizens to act on climate change through environmental protection

HARMO-LITT
Support monitoring of marine litter under MFSD new cycle

Proposals submitted

Permanent Working Groups

- Low Tropic: Mussel and Algae
- Fish & Shrimp Aquaculture
- Blue Growth Accelerator
- Beach Wrack / Halophytes
- EU4 Ocean Literacy Platform
- Marine Litter

Members of the WG

Mussels

Jordbruks verket

BIOTHOT

SATPOS

Nofima

EUC Coastal & Marine

ECOPELAG

Dansk Akvakultur

Roskilde University Denmark

VCO
Vattenbrukscentrum Ost

AARHUS UNIVERSITY

asc

FERMENTATIONEXPERTS

ORBICON

Leibniz-Institut für Ostseeforschung Warnemünde
IOW

DTU

Kalmar kommun

Kieler Meeresfarm

SLU

Region Östergötland

KTH VETENSKAP OCH KONST

Borgholms kommun

CRM
Coastal Research & Management

LÄNSSTYRELSEN ÖSTERGÖTLAND

TARTU ÜLIKOOL
UNIVERSITAS TARTUENSIS
1632

Linnæus University

ivl

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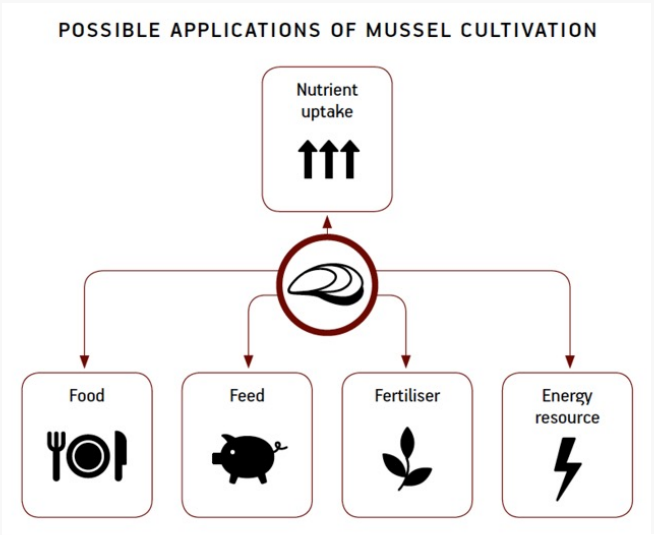
Mussel Cultivation Policy Brief

- With new technology much better results
- Muss less difference between mussels in high or low salinity areas:
  - Toal amount of mussel meat
  - **Nutrient content almost same**
- No oxygen depletion noted
- Mussel meal good raw material



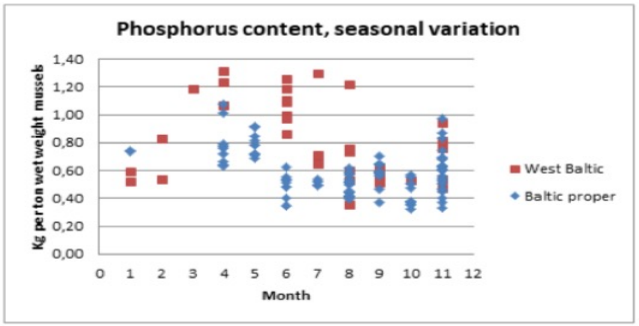


Figure 2. Phosphorus content, seasonal variation.

Area	Salinity	Meat dry matter %	% Soft tissue	Soft tissue fat %	N (% soft tissue dry weight)	P (% soft tissue dry weight)
Western Baltic	High	15.1 a	58 a	9.5 a	9.5 a	1.41 a
Central Baltic	Moderate	14.2 a	52 b	10.3 a	10.3 a	1.48 a
Eastern Baltic	Low	13.7 a	41 c	9.7 a	9.7 a	1.33 a

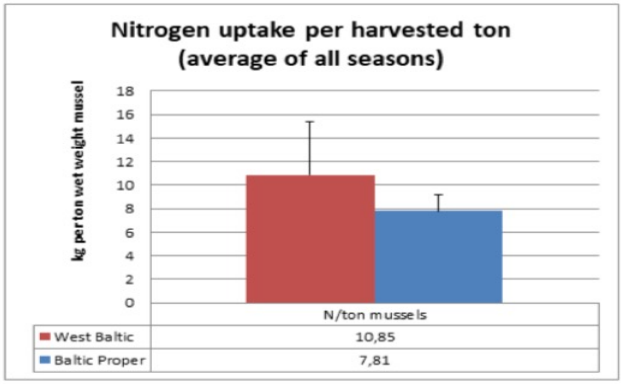


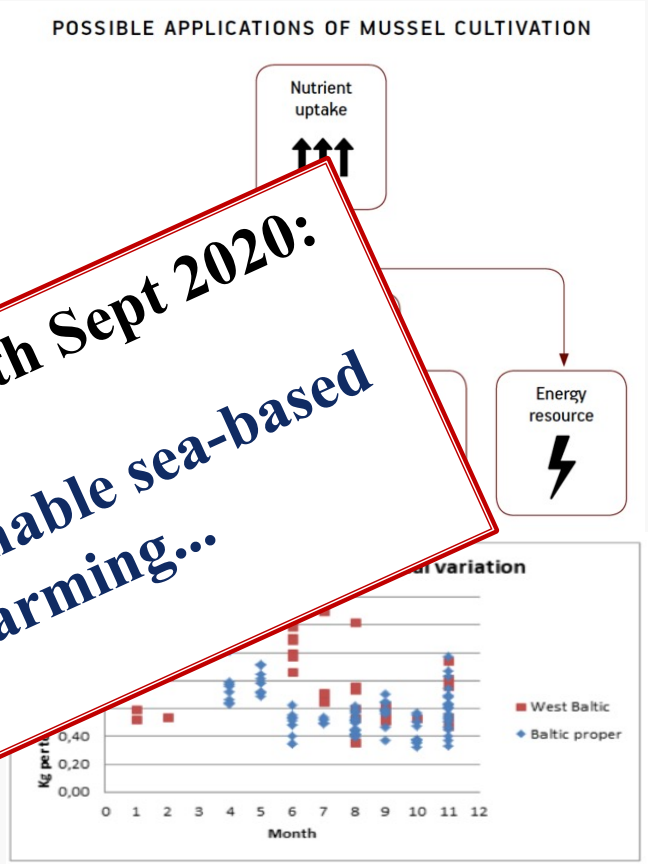
Figure 4. Nitrogen uptake per harvested ton.

Mussel Cultivation

- With new technology much better results
- Muss less difference between mussels in high or low salinity areas:
  - Toal amount of mussel meat
  - **Nutrient content almost**
- No oxygen depleti
- Mussel m

Ministerial Declaration ‚Our Baltic' 28th Sept 2020:

We will promote ecologically sustainable sea-based measures, such as mussel farming...



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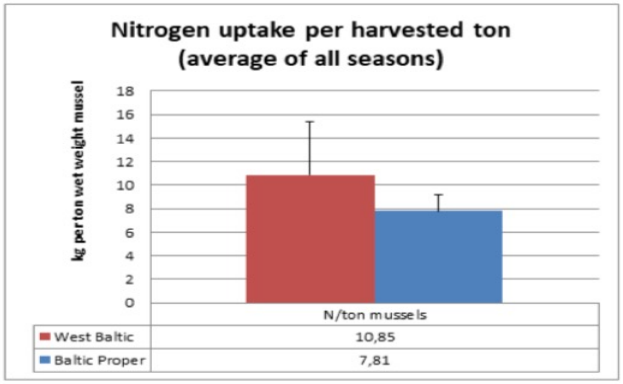

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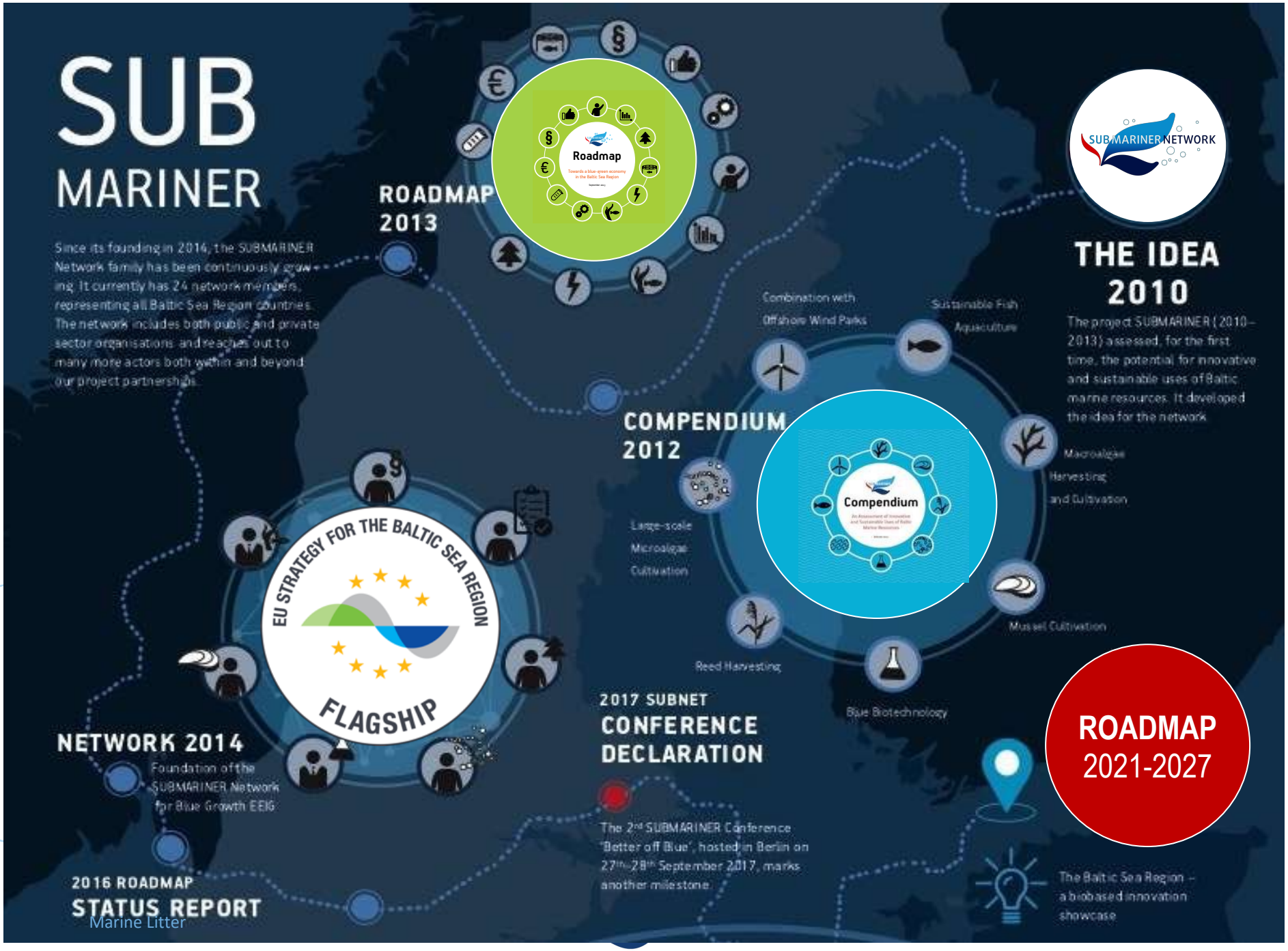
SUB
MARINER
Since its founding in 2014, the SUBMARINER Network family has been continuously growing. It currently has 24 network members, representing all Baltic Sea Region countries. The network includes both public and private sector organisations and reaches out to many more actors both within and beyond our project partnerships.
ROADMAP 2013
Roadmap
SUBMARINER NETWORK
THE IDEA 2010
The project SUBMARINER (2010–2013) assessed, for the first time, the potential for innovative and sustainable uses of Baltic marine resources. It developed the idea for the network.
COMPENDIUM 2012
Compendium
Combination with Offshore Wind Parks
Sustainable Fish Aquaculture
Macroalgae Harvesting and Cultivation
Large-scale Microalgae Cultivation
Mussel Cultivation
Reed Harvesting
Blue Biotechnology
EU STRATEGY FOR THE BALTIC SEA REGION
FLAGSHIP
NETWORK 2014
Foundation of the SUBMARINER Network for Blue Growth EEIG
2017 SUBNET
CONFERENCE DECLARATION
The 2nd SUBMARINER Conference 'Better off Blue', hosted in Berlin on 27th–28th September 2017, marks another milestone.
ROADMAP 2021-2027
2016 ROADMAP
STATUS REPORT
Marine Litter
The Baltic Sea Region – a bio-based innovation showcase

The SUBMARINER Network as facilitator for sustainable & innovative blue growth cooperation

Efthalia Arvaniti

Programme Manager

SUBMARINER Roadmap State of play: macroalgae & beach-wrack

- **Macroalgae No longer only research**

  => more and more companies

  => 650 companies earmarked >> 130+ on algae, also LE

  => more and more products on the market

  => Growing demand for seaweeds from Baltic consumers

  => Few commercial seaweed farms

- **Proof of Concepts**

  => macroalgae can be cultivated in the Baltic proper, wild harvesting is a commercial practice in many Baltic countries

  => negative environmental impacts limited

  => IMTA at sea and with RAS

  => Low-trophic mariculture is a permitted MSP planning activity

  => better knowledge on beach wrack collection, biogas, business models

- **Established market**

  => ex-soviet countries traditionally eat/use seaweed

  => Vegan market in Nordic countries

- **Successful services**

  => Few Baltic countries have algae roundtables & Associations

  => Baltic info and data hub

  => effective blue science-company interlinkage created

  => with GRASS Baltic local & national authorities and regulators now have the to make evidence-based decisions

Initial conclusions for macroalgae and beach-wrack challenges

- **Little biomass production** => Production slow moving and only with a few species
  => Algae companies import algae

- **Legal Barriers** => Lagging behind actual positive developments
  => Aquaculture behind agriculture
  => For beach-wrack confusing waste policies and labels.

- **Difficult economic valuation**
  => Lack of data from large farms

- **For beach-wrack, lack of basic knowledge**
- => environmental impacts of collection
  => Technologies, costs

Action 1. From projects to working group & vice versa

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- Mussels & Macroalgae
- Fish & Shrimp Aquaculture
- Accelerator for Blue Growth
- Halophyta & Beach Wrack
- EU4 Ocean Literacy Platform
- Marine Litter

Action 2. Get pilots to the next level

- Foster cooperation to create critical mass of biomass for industry
- Continue to collect and assess common parameters
- **Establish large scale demonstration farms / plants**
- Change legislation / introduce ecosystem service payments
- Develop comprehensive regional plans

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Identification & monitoring of sites

- Collect minimum set of joint parameters at operational seaweed farms in central platform (i.e. ODSS) to validate environmental benefits, alleviate risks, assess harvest results as well as socio-economic benefits
- Establish Baltic Sea wide system to identify optimal blue bio sites depending on purpose
- Agree on most effective monitoring technology
- Use existing offshore structures & activities (OWFs; Ships; Fishery) to provide also environmental data

Organise national / regional roundtables

- between industry, R&D and regulators to remove legal barriers; i.e. licensing, waste and zero pollution definitions; novel food regulation; single / multi-use sector licenses
- establish ecosystem payment pilots schemes
- agree on suitable demonstration sites; incl. specific multi-use areas
- Develop comprehensive regional development and marketing plans: Biodiversity; Zero Pollution, Carbon and Nutrient reduction, Circular and Regional Economy

Encourage and coordinate new cooperative structures

- Share costs for joint equipment, testbeds & knowledge
- Secure joint larger contracts / foster direct interaction with relevant larger companies
- Develop regional business plans to show how many farms / biomass harvest are needed where to provide critical mass to industry

Merge uses

- Integrate with other multi-use systems, e.g. underwater cultural heritage and energy.

Action 3. Increase company involveme

- Collect and maintain Baltic Blue Bio-economy Product & Company Catalogue
- Reach out and assess companies according to SUBMARINER criteria
- Address the need for a networking platform (cluster)
- Continue and expand company specific services

Sustainable product & service development

Continuous scouting for ideas & entrepreneurs

- 365 days enrolment service
- Quick assessment / mentors match-making
- Bi-annual pitching and match-making events
- Link to business accelerators, fundings
- Increase collaboration with BIG companies

Lobby for continuous blue assistance programme

- Regular communication and dissemination hub
- Integrate outputs and results from research
- Promote inter-regional funding pool
- Promote transnational innovation voucher system
- Prepare blue economy funding guide

Foster co-creation / ideation

- Future Business Canvas scenarios
- Innovation Bootcamps, Hackathons, Creative & Disruptive Workshops
- Study Tours / inspiration from more advanced
- Foster regional circular economy value chains
- Forms of Multi-Use, e.g. with tourism

Foster technology development and transfer

- Drying, harvesting, biorefining/ processing techniques and upscaling
- Combinations of renewable energy and aquaculture
- New technologies for farm/site management
- Submerged or more offshore systems
- Blockchain technology, AI, digitalization, big data ...

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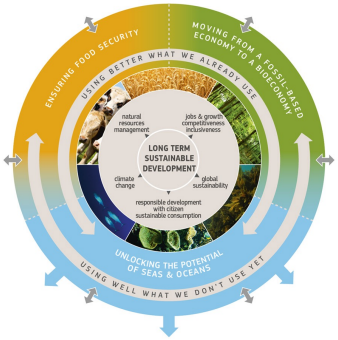
Action 4. Consolidate new focus areas

CPMR BALTIC SEA COMMISSION

SmartBlue REGIONS



- Create Market Push and Pull: Citizen and Consumer Awareness
- Education & Skills Development
- The 'Blue on Land': Regional Development, Circular bioeconomy
- Cross-cutting assessments and plans: Biodiversity, Ecosystem, Climate Impact

Ocean Literacy and Public Awareness

- Baltic Sea wide knowledge exchange & cooperation Streamline into all projects plus continuous platform
- Ocean Literacy Library
- Network between knowledge providers / public spaces (i.e. aquaria & museums) and schools
- **Consumer awareness actions: cook books; blue movement week; tastings; sea gardens**
- Collaborate with: supermarkets; chefs; influencers…
- Use: youtube; Instagram; apps, etc.

Education / Skills

- Assess needs & create formal education and training programmes to address company needs
- Continue & expand Baltic Sea wide internship / job / career exchange service
- Create & foster closer collaboration between companies & formal educators

Blue Green Deal e.g. Circular bioeconomy

- Develop joint strategies across blue/green sectors aiming for zero waste, and closing the nutrient and carbon cycle e.g. Remove carbon from the sea and add to soil.
- Assess the impact of blue economy in non-coastal regions

Blue Biodiversity & Climate Concepts

- Understand marine biodiversity decline
- Exchange and develop knowledge & tools to address ecosystem restoration
- **Assess blue economy contribution to climate change reduction and mitigation**
- Develop & support implementation of comprehensive regional blue climate measures & plans

SUBMARINER Macroalgae WG setup proposition

- **Roundtable of actors** meeting periodically with own agenda and minutes
- **Meet 4-6 times a year**, co-led and supported by volunteers
- SUBMARINER facilitator, BUT content comes from experts

- **Proposed activities:**
  - Knowledge exchange & match-making
  - Increase visibility and access of relevant communication materials
  - Project/business development
  - Collect monitoring data from farms
  - Support innovation structures
  - Connect with EU algae sector
  - Support formation of local cooperatives
  - Tech transfer

1st task of the macroalgae WG:
Macroalgae policy paper

- **Proposed aim:**
  - Raise awareness of benefits, risks, opportunities of Baltic seaweed
  - Showcase innovation barriers and propose solutions: siting, licensing, R&D, piloting, supply chain.
  - Provide support on what it takes to create equal opportunities with agriculture/ forestry, e.g. ecosystem service payments
  - Showcase regional needs, e.g. new innovation and business support structures, strategies e.g S3.

Suggested target groups:

- Policy makers, National, regional authorities, Planning authoriries, Funding programmes, R&D offices of Unis.

SUBMARINER NETWORK

SUBMARINER Macroalgae policy paper – suggested thematic areas

- Seaweed cultivation in the Baltics and environmental benefits, e.g. internal nutrient load reduction.
- Baltic-wide seaweed and socio-economic benefits e.g. new opportunities for lost fisheries jobs.
- Development of short Baltic food value chains with seaweed (post-COVID19).
- Combinations of seaweed farming with other uses, e.g. tourism or off-shore wind farms.
- IMTA combinations with fish farming for nutrient compensation schemes.
- Develop research and innovation agendas (national, RIS3) for Baltic seaweed production and use e.g. selection of sites, species, technologies, combinations, product markets.
- Transfer of good practices from other sectors or regions.
- Raise awareness on environmental and socio-economic benefits and opportunities, e.g. campaigns, citizen science, cookbooks, roadshows.
- Other.

SUBMARINER NETWORK

Macroalgae Baltic Working Group!
Who is on board?
What is YOUR policy paper?
What is YOUR roadmap?

SUBMARINER NETWORK

www.submariner-network.eu

@submnet

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