

SUBMARINER –

Towards establishing the Baltic Sea as a model region for cooperation in Marine Biotechnology

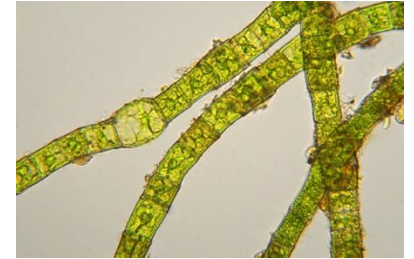
Angela Schultz-Zehden, Project Coordinator
s.Pro – sustainable projects GmbH



Part-financed by the European Union (European
Regional Development Fund)

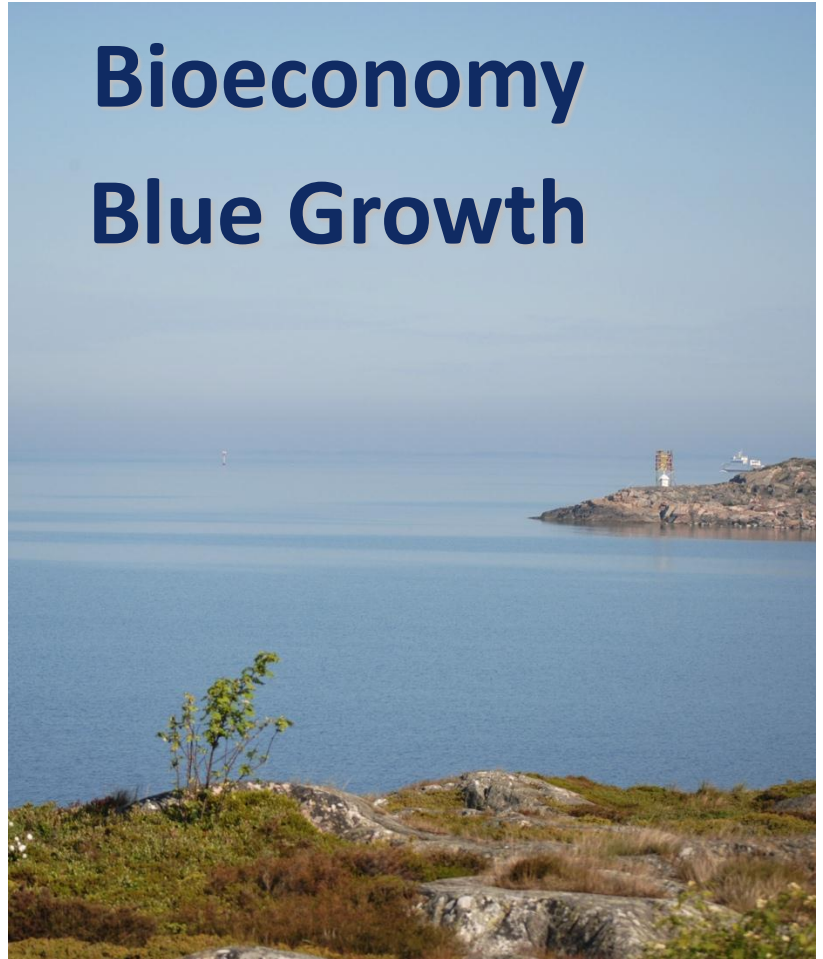
- Baltic Sea Region Programme 2007–2013
- Duration: 2010–2013 / Budget: € 3.6 million
- 19 partners from all Baltic Sea Region countries: ministries & administrations, centres of excellence, regional development agencies & innovation centres
- Lead partner: Maritime Institute in Gdańsk
- **Activities:**
 - Pan-Baltic Assessment
 - Pilot Cases (Regional, Use specific)
 - Networking / Awareness Raising

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“To proactively contribute to improving the future condition of the Baltic Sea Region’s marine ecosystem while promoting sustainable economies by supporting and developing new sustainable marine uses and discouraging potentially damaging ones”

Bioeconomy Blue Growth



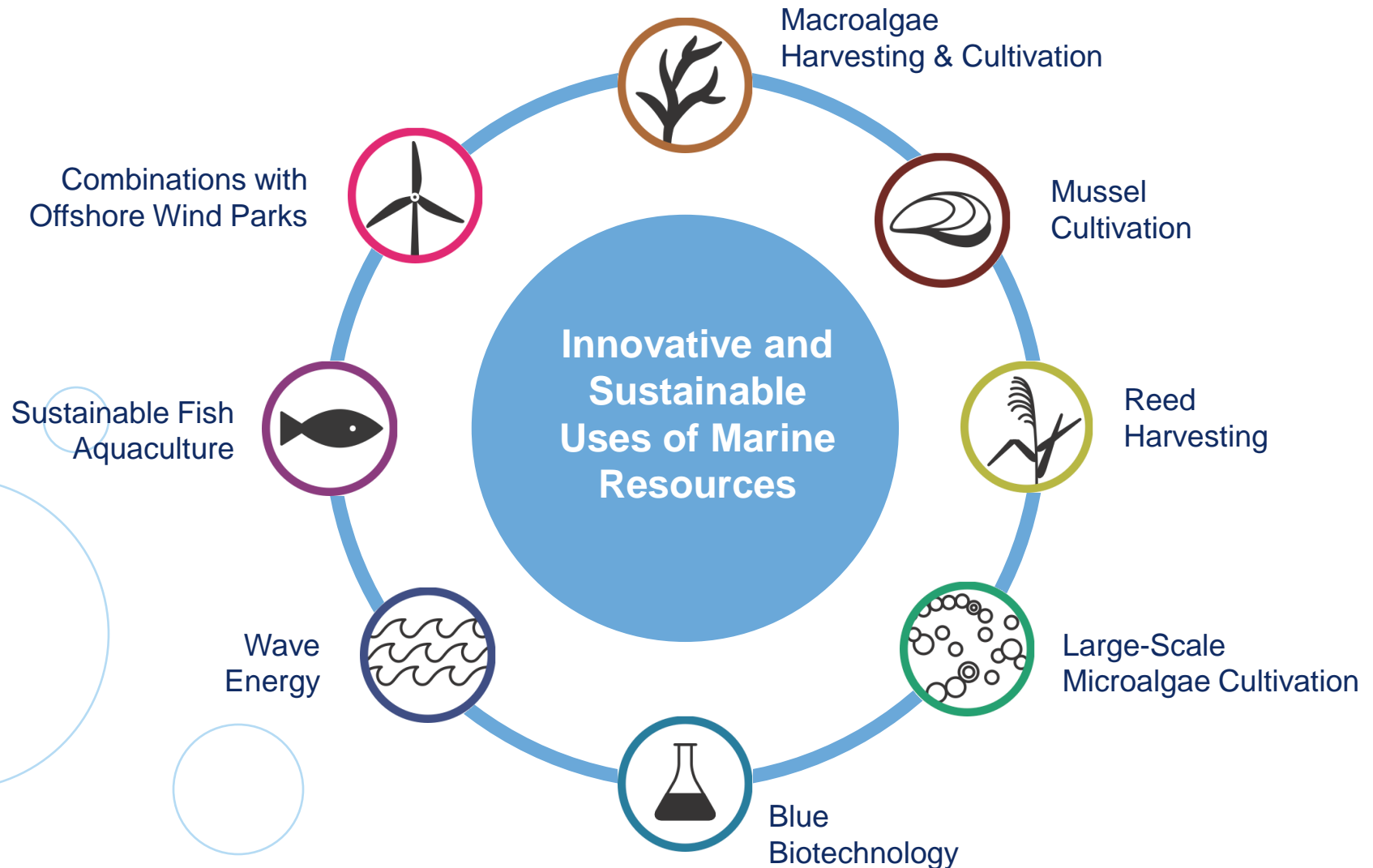
The FUTURE → SUBMARINER Network

- **Flagship under EU Strategy of Baltic Sea Region**
Priority Area „Inno“ (PA7)



- **Time horizon:** 2013–2020 and beyond
- **Purpose:** Umbrella / Network to promote future actions / initiatives identified in SUBMARINER Roadmap 2020 → create / coordinate future funding, implementation, communication between projects/ initiatives
- **Flagship Project Leader:**
Ministry of Economic Affairs, Employment, Transport and Technology
Schleswig-Holstein (contact: Dr. Steffen Lüsse)
Co-Leaders:
 - Swedish Agency for Marine and Water Management
 - Maritime Institute Gdansk

Innovative and Sustainable Marine Uses



The Groundwork

Lessons from regional pilots and strategies



Inventory of innovative uses



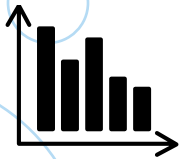
Competence Centres around the Baltic Sea



Current status around the Baltic Sea



Socio-economic framework



SUBMARINER
COMPENDIUM

Potential and opportunities around the Baltic Sea



Market potential



Gaps and obstacles in legal framework



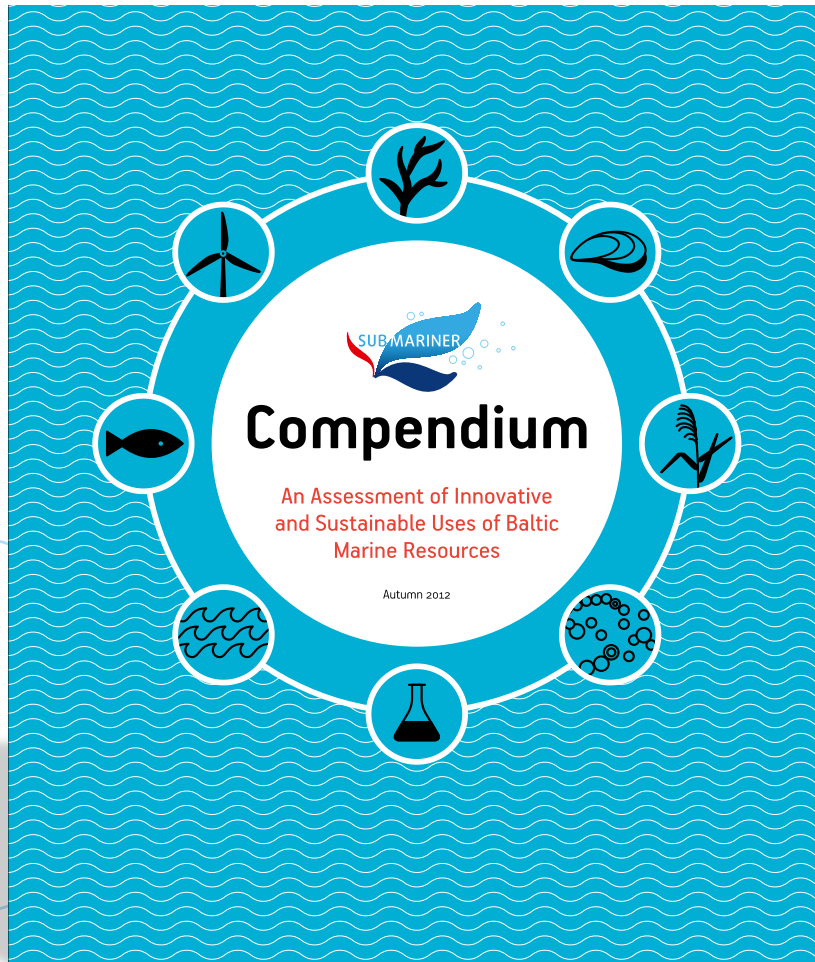
Environmental impacts



State and availability of technologies












The SUBMARINER Compendium



- Consultations:
Distributed to more than 500 experts and stakeholders in the Baltic Sea Region and beyond
- Basis for the BSR Roadmap:
Actions and projects under SUBMARINER Network

Potential Benefits of the SUBMARINER Topics

	<i>Water Quality</i>	<i>Renewable Energy</i>	<i>Biodiversity</i>	<i>Societal: health/food</i>	<i>Spatial efficiency</i>	<i>Economic</i>
 Macroalgae Harvesting	○	○				○
 Macroalgae Cultivation	○	○	○			○
 Mussel Cultivation	○	○	○	○		○
 Reed Harvesting	○	○	○			○
 Microalgae Cultivation	○	○			○	○
 Blue Biotechnology	○			○		○
 Wave Energy		○				○
 Sustainable Fish Aquaculture	○		○	○	○	○
 Combinations with Offshore Wind	○	○			○	○

Uses with global growth appeal



Large scale microalgae cultivation

⇒ Biorefinery concept: integration of algae production and ecosystem services



Blue Biotechnology

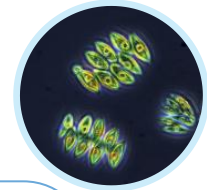
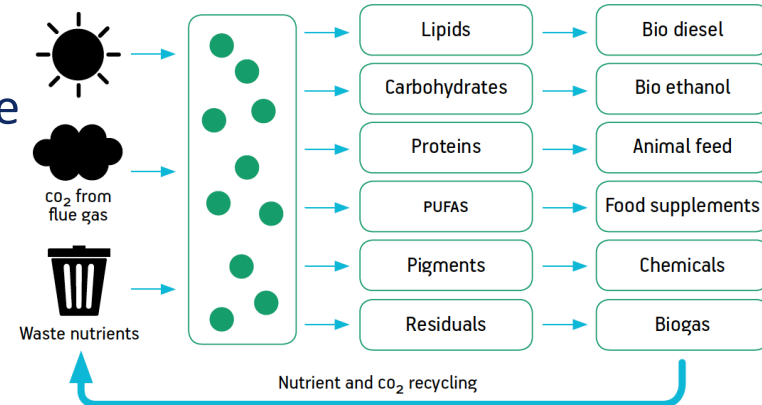
⇒ Important supporting technology



Wave Energy

⇒ small-scale, versatile, low-cost, high capacity linear generators for use in BSR

- ⇒ **Natural conditions might not be ideal**
- ⇒ **But much competence / technology / laboratories**
- ⇒ **Strategy required based on complementary advantages**
- ⇒ **Cooperation models private - public**



Uses with regional - environmental appeal



Substantial amounts of beach cast macroalgae
→ with many benefits....



Baltic Mussels → too small for food, but cost
effective for nutrient recycling & sustainable fish
feed source



Reed → a local renewable energy source & method
to remove nutrients from shallow coastal seas



- ⇒ **Requires compensation for ecosystem service**
- ⇒ **Better / more efficient harvesting methods**
- ⇒ **Reinterpretation of Natura 2000**
- ⇒ **Not “big” business: but substantial sub-regional appeal**

“Smart” Combinations



Currently very limited fish aquaculture

⇒ Lack of suitable sites

⇒ Negative impact on water quality



Approx. 850 km² of space for
combined uses by 2030

Innovative technologies bring opportunities:

⇒ **land-based recirculating aquaculture systems (RAS)**

⇒ **adding integrated multi-trophic aquaculture (IMTA) to existing open net cages**

- **Very limited practical knowledge**
- **no tradition in cooperation & economic incentives**



Combinations of
Offshore Wind
Farms with...



Harvesting of
natural foul-
ing agents



Macroalgae
Cultivation



Mussel
Cultivation



Fish
Farming



Wave Energy



Microalgae
Cultivation





Blue Biotechnology in BSR SWOT Analysis

Strengths

- Baltic Sea organisms show great potential for exploration (cost-efficiency & legal certainty)
- Experts & laboratories in place
- Technologies for bioprospecting of Baltic organisms exist in some regions => good basis for technology transfer
- Existing networks (e.g. Life Science Nord, ScanBalt) provide basis for promotion
- Schleswig-Holstein / Denmark strategies can serve as “models”

Weaknesses

- Low awareness about “Blue” potential => market not developed
- Skills shortage esp. in cross-cutting disciplines
- Lack of venture capital & investment for R&D / start-ups
- Low technology transfer, networking & collaboration
- Limited knowledge on scale of environmental impacts

North Germany

- University of Greifswald
- Kieler Wirkstoff Zentrum at GEOMAR
- University of Bremen
- Fraunhofer Research Institution for Marine Biotechnology
- Institute for Marine Resources GmbH (IMARE)

Denmark

- Danish Technology University
- University of Copenhagen KU-Science

Sweden

- University of Gothenborg

Latvia

- Latvian Institute for Aquatic Ecology

Finland

- Finish Environment Institute (SYKE)
- Helsinki University
- VTT Technical Research Centre in Finland

Lithuania

- Klaipeda University of Coastal research and Planning Institute

Estonia

- University of Tartu / Estonian Marine Institute
- Competence Centre of Food & Fermentation Technologies



Blue Biotechnology in BSR SWOT Analysis

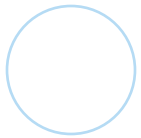
Opportunities

- Growing market needs / markets for in pharmaceutical, cosmetics, food industry & environmental solutions
- Specific BSR NEEDS exist
- Growing interest in marine biotechnology as source for greener & smarter economies
- Good underlying resources, i.e. universities, scientists, facilities => synergies / complementarity
- BSR regional cooperation
- Growing public (EU) support
- Positive perception of Baltic Sea Region brand products

Threats

- Lack of “real case” samples for blue biotechnology solutions
- Short term project related funding cycles not suitable for long term processes
- Lack of policies in some BSR countries to support biotechnology
- Lack of financial support due to economic & financial crisis
- Difficulties to create win-win solutions for public-private partnerships

Overall Conclusions from the SUBMARINER Compendium



Baltic Sea Region Wide Strategy for Blue Growth & Marine Bioeconomy

Introduce ecosystem service
compensation mechanisms

Create more pilot sites / known
practice

Disseminate local
success stories

Strengthen interdisciplinary
approaches



Address research gaps in socio-
economics and governance

Create fair industry-research
collaboration

Cooperate with traditional
(maritime sectors)

Improve unclear or inconsistent
legal regulations

CROSS-CUTTING ISSUES

Large-Scale
Microalgae
Cultivation



Blue Bio-
technology



Wave
Energy



Sustainable
Fish
Aquaculture



Combinations
with Offshore
Wind Parks



Macroalgae
Harvesting &
Cultivation



Mussel
Cultivation



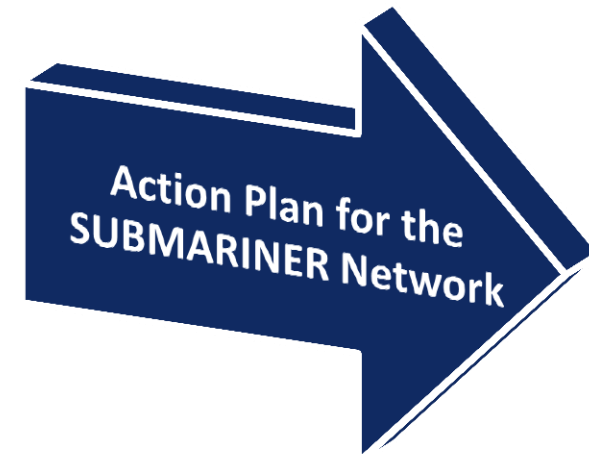
Reed
Harvesting



SINGLE
TOPICS

Roadmapping process

SUBMARINER Roadmap: a vision on where we want to be in 2020 and necessary actions across all disciplines to reach this vision
Why? in order to realise the EU 2020 aims in general and its maritime pillar in particular



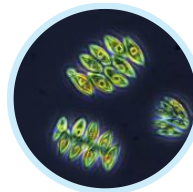
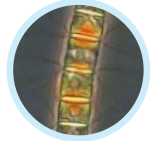
Roadmapping process:

Necessary to define actions in close cooperation with multitude of stakeholders
Series of workshops & interviews between December 2012–April 2013



Creation of BSR Blue Biotechnology Strategy based on:

- BSR most urgent market needs
- Complementarity of country strengths
(i.e. laboratories in the Eastern BSR available for „Blue”)
- Improving modalities of technology transfer
- Making better use of existing support technologies & platforms
- Strengthen application-oriented approaches
- Ensuring that Blue Biotechnology is truly „blue” and sustainable,
i.e. to the benefit of the sea



- **Yearly SUBMARINER Network's conference:**

a meeting place for all stakeholders, i.e. big & small companies, ministries, regional & local administration, associations, research community, donors / financial institutions

- **SUBMARINER Network Communication:**

website; newsletter / special "Issues"; contacts with special working groups (topical / regional)

- **Promotion of SUBMARINER Ideas:**

at various events, facilitate meetings with national & transnational finance institutions

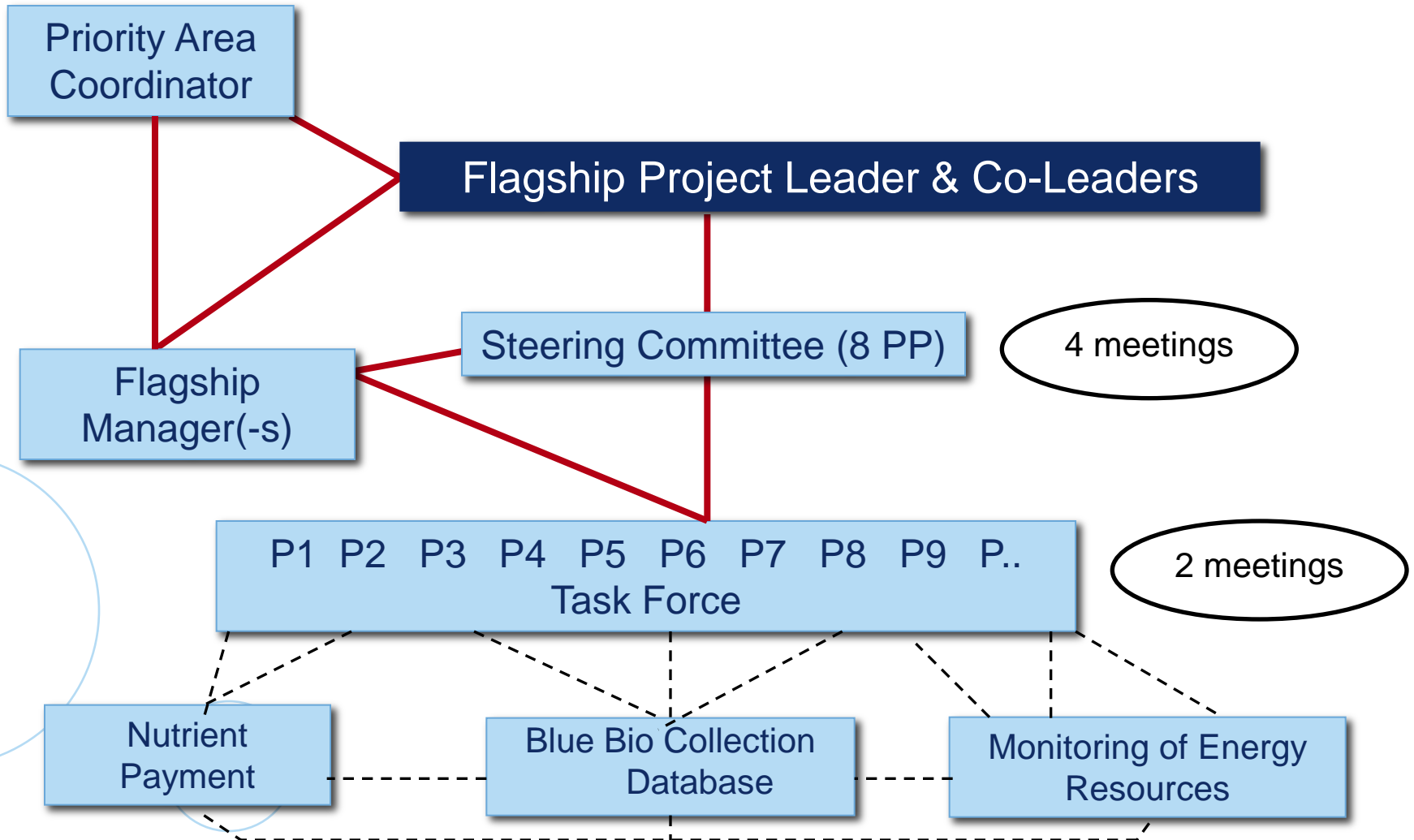
- **Organise Regular Network Meetings:**

e.g. decision-making or ad hoc working groups

- **Prepare JOINT input to policy papers / strategies:**

- *Flagship Project Function*
- *Communication to EU (DG Mare Blue Growth, etc.)*
- *Communication to other national & transnational programmes*

SUBMARINER Network Structure

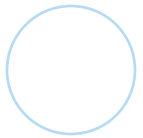


What comes next?

- Agree on SUBMARINER BSR Road Map as the ‘strategic paper’ for the Network activities
- Registering the Network (EEIG)
- Official launch of the Network:

SUBMARINER FINAL CONFERENCE

5-6th September 2013 in Gdańsk



Please stay updated

www.submariner-project.eu

THANK YOU FOR YOUR ATTENTION!!!



EUSBSR
EU STRATEGY
FOR THE BALTIC
SEA REGION



Part-financed by the European Union
(European Regional Development Fund)