SUBMARINER
Sustainable Uses of Baltic Marine Resources

Regional energy solutions including the biorefinery concept

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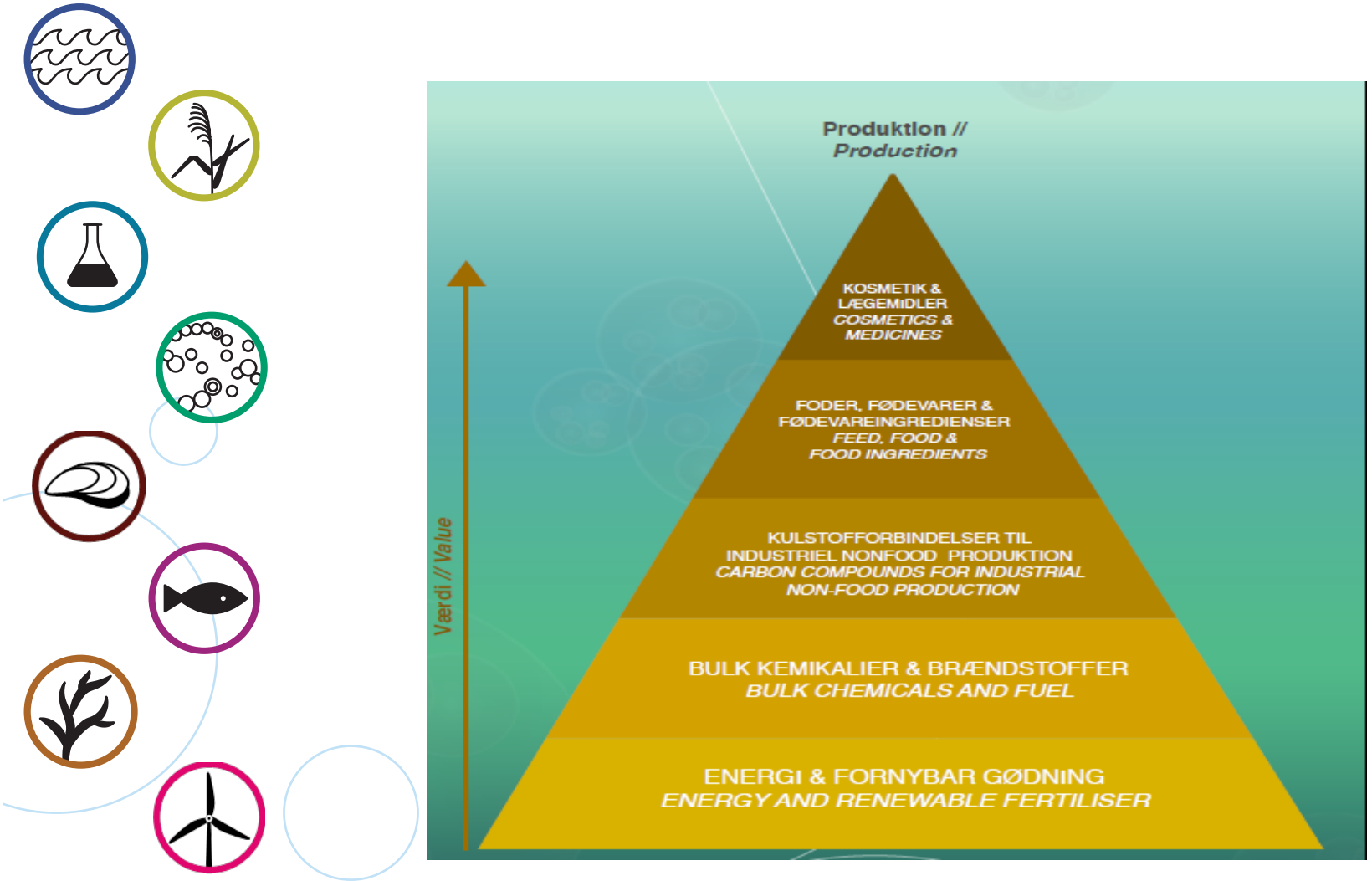
Gdańsk, Poland | 5th September 2013

EUSBSR
EU STRATEGY FOR THE BALTIC SEA REGION

Baltic Sea Region
Programme 2007–2013

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

The biorefinery



Main SUBMARINER findings 1

- Bioenergy from marine resources and use of CO2 from flue gas can contribute to climate change mitigation
- Mussel, macroalgae and reed harvesting and cultivation offer additional and flexible solutions for nutrient harvesting to combat eutrophication and to close the nutrient cycle
- Competent researchers/scientific knowledge and some experience, pilots and case studies within the BSR
- Multi-product, zero waste combinations increase economic and environmental sustainability

Main SUBMARINER findings 2

Growing demand for:

- Energy from alternative sources
- Local Baltic Sea products
- High-value products, such as medicine, cosmetics and bioengineering products
- Sustainable feeds for organic farmers and aquaculture enterprises
- Developments in high-technology and bioenergy production

And a global drive towards sustainable development

Objective of action field

Encourage appropriate consideration of marine resources in energy planning in order to create markets for climate friendly energy production

SUBMARINER ACTIONS 1

- Develop regional concepts for integration of marine resources in regional plans on renewable energy and climate protection ensuring the use of both existing and new marine and terrestrial resources, e.g. wind mills, solar energy, biogas;
- Introduce concept of smart combinations of uses, where a systematic approach to biomass use beyond the energy sector complements the biorefinery concept;
- Promote marine resource use in renewable energy production with stakeholder involvement and policy support; i.e. introduce concept as part of sustainable region development with the authorities, politicians and business representatives;
- Develop economic models for use of marine resources in renewable energy production;
- Develop regional and national case studies and models;

SUBMARINER ACTIONS 2

- Develop a placement strategy for biorefineries including marine resources around coastal regions;
- Improve networking among biorefineries across BSR;

- Use experience of forestry and agriculture in blue refinery concepts: collect relevant information about their experience on biorefinery concepts to help to transfer to blue concepts;

- Encourage technology development and continue to refine the process of biogas from marine resources;

- Optimise techniques and logistics for harvesting biomass, transport to biogas plants, and for refining products;

- Promote use of small scale wave energy generators;

Submariner actors

POSSIBLE ACTORS:

- Municipal and regional authorities
- Sector associations /organisations
- Universities and research institutions
- Individual companies
- National ministries – (But which ones ?)
- Baltic Development Forum and the Baltic Sea Action Group
- Others??
- Who else?

NETWORK COORDINATOR: Green Center (DK)

Todays questions ??

- How can marine resources contribute to finding innovative regional energy solutions?
- What is needed in order to make the biorefinery concept come true?

and

- What are the most promising ways to combine biomass production with environmental remediation of the Baltic Sea?
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Todays speakers

- **Assessment of biomethane production from maritime common reed** Emma Risén, KTH Royal Institute of Technology, Sweden
- **Biofuels from microalgae – current status and way forward** Jukka Seppälä, Finnish Environment Institute – SYKE
- **Increasing the value of our fish landings – what´s beyond the fillets?** Ingrid Undeland, Chalmers University of Technology, Sweden
- **Biorefining – a necessary solution worldwide** Leo Christensen, Lolland Energy Holding, Denmark
- **The Danish R&D project: The macroalgae biorefinery** Lars Nikolajsen, Danish Technological Institute