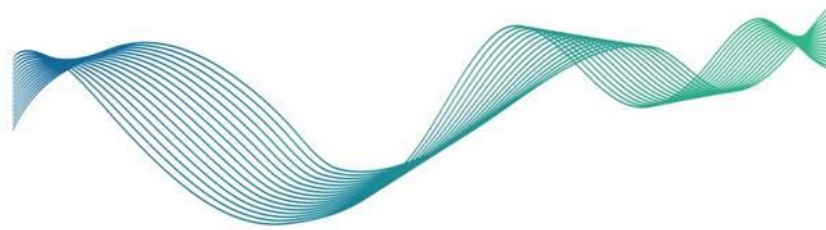


# MarineBiotech



## Research and Innovation Roadmap

**Dermot Hurst**

Marine Institute Ireland



Marine Biotechnology ERA-NET (ERA-MBT) is funded under the European Commission's Seventh Framework Programme. Grant Agreement Number 604814  
December 2013 - November 2017

# MARINE BIOTECHNOLOGY STRATEGIC RESEARCH AND INNOVATION ROADMAP

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INSIGHTS TO THE FUTURE DIRECTION  
OF EUROPEAN MARINE BIOTECHNOLOGY



This project has received funding from the European  
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grant agreement no 604814.



SEPTEMBER 2016



- A key element of the ERA-MBT project deliverables
- Secured extensive inputs from an array of contributions
- Resulted in a plan to increase the role of biotechnology in unlocking the value of marine bioresources
- Provides insights to future challenges and opportunities

# Why do we need a roadmap ?

## BREMEN 2007

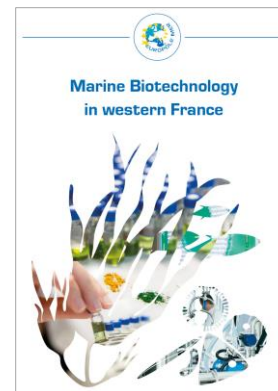
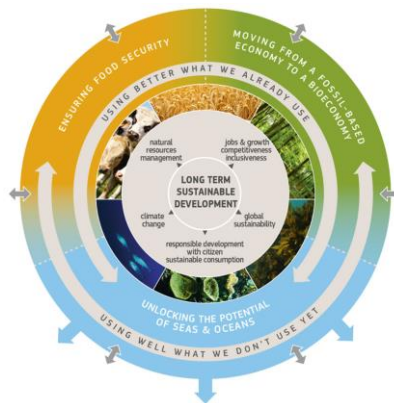


- Making a commitment to large-scale marine science research, including deep sea exploration;
- Defining and prioritising Europe's future marine science and marine biotechnology research activity;
- Securing a greater participation by industry as a potential user of outputs from marine biotechnology research;
- Stimulating scientific research in areas that underpin marine biotechnology;
- Improving the funding and co-ordination of marine science and targeting resources at marine biotechnology;
- Ensuring Europe's traditional marine science laboratories continue to contribute to the development of marine biotechnology research activity; and
- Encouraging Europe's best scientists to engage in marine biotechnology research.

# Since Bremen



- Resource-efficient eco-innovative food production and processing
- Tackling disease related challenges and threats faced by European farmed aquatic animals
- Novel marine derived biomolecules and industrial biomaterials
- Enhancing the industrial exploitation potential of marine-derived enzymes
- Economic sustainability and competitiveness of European fisheries and aquaculture sectors to reap the potential of seafood markets
- Large-scale algae biomass integrated biorefineries
- Blue green innovation for clean coasts and seas
- Innovative sustainable solutions for improving the safety and dietary properties of seafood
- Securing sustainable biomass supply for bio-based goods and services



# Why else do we need a roadmap?



## MARINE BIOTECHNOLOGY STRATEGIC RESEARCH AND INNOVATION ROADMAP

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SEPTEMBER 2016

- Fills a number of knowledge gaps
- Creates awareness
- Highlights opportunities
- Provides a common shared vision

# Roadmap influenced by global megatrends and EU Challenges



## Changing demographics

- World population to exceed 8 billion by 2030
- Living longer = ageing populations (median age 34y by 2030)

## Globalisation

- Strong market growth in BRIC and ASEAN

## Scarcity of resources

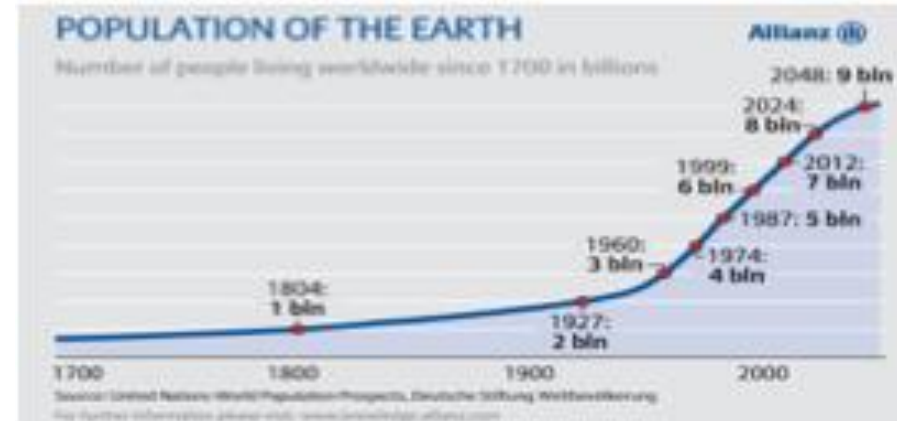
- Rising food demand, food security issues
- Materials shortages

## Climate change

- Loss of biodiversity

## Science and technology

- Impact of innovation
- Age of the life sciences



# Contributions to the Roadmap



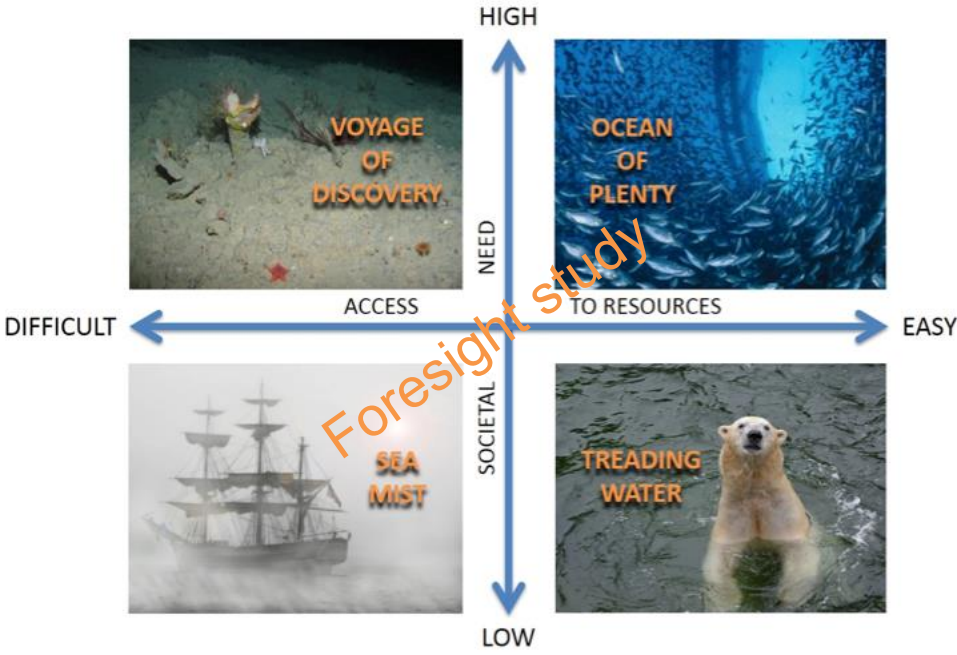
Stakeholder workshops



Surveys



Focus groups



# Markets for marine biotechnology enabled products



By 2018 the global market for nutraceutical products is expected to be worth \$250 billion

Global market for cosmeceutical products was \$30.5 billion in 2010 and set to rise 9% per annum between 2015 and 2020

***“The global market for marine biotechnology has the potential to reach \$4.8 billion by 2020, rising to \$6.4 billion by 2025.”***

Biostimulant market grow to \$3 billion by 2018

Omega 3 polyunsaturated fatty acid is reach close to \$19 billion by 2020

World industrial enzyme market to be worth \$6.2 billion by 2020

Opportunities exist for low-hanging fruit (near markets) and longer-term more challenging applications in human and animal health

“Marine biotechnology is a key enabling technology that supports the development of the bioeconomy.”

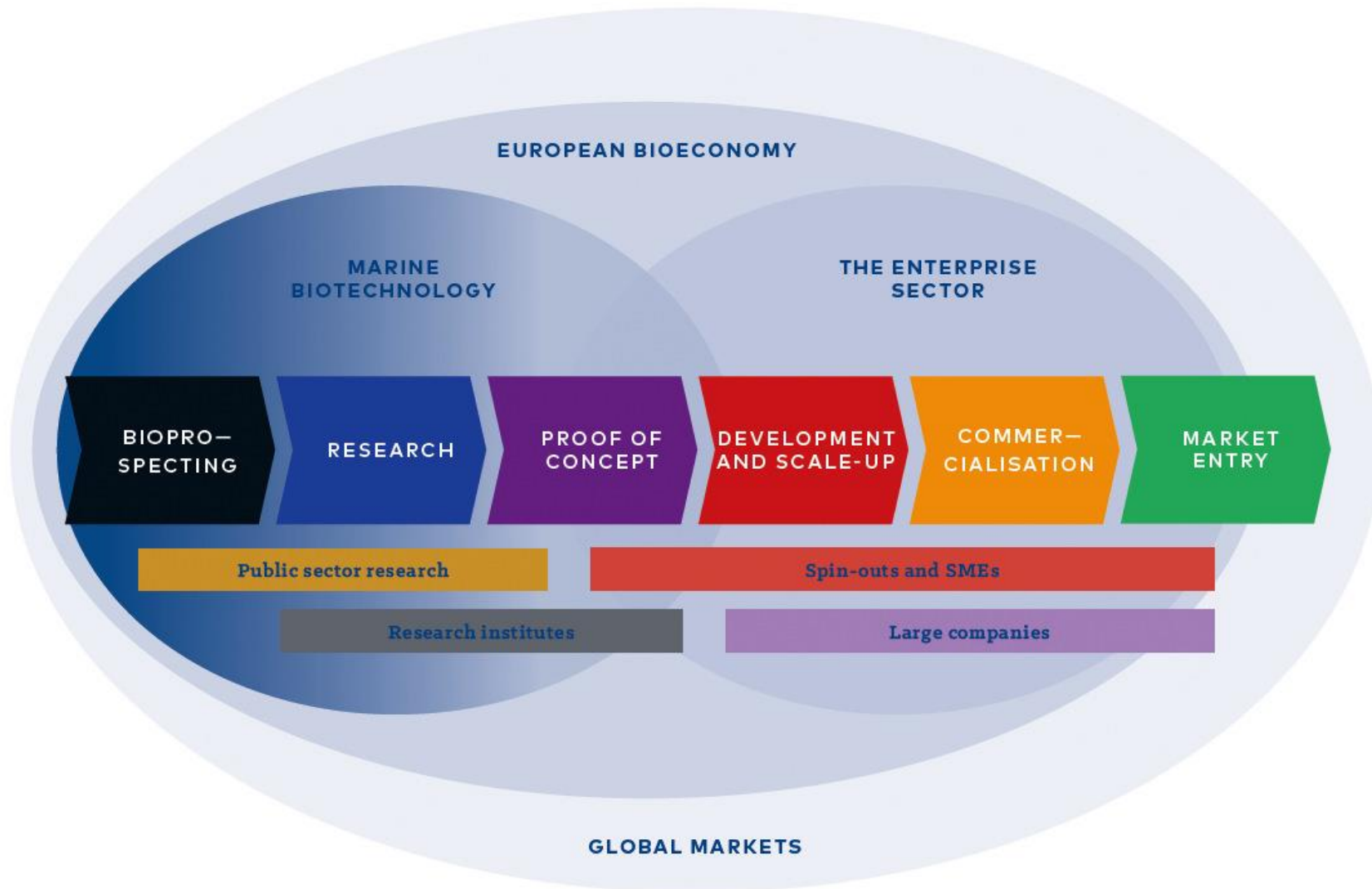
“Major opportunities exist to extend the use of ocean bioresources in markets for industrial enzymes, pharmaceuticals, functional foods, cosmetics and agricultural products.”

“The global market for marine biotechnology has the potential to reach \$4.8 billion by 2020, rising to \$6.4 billion by 2025.”

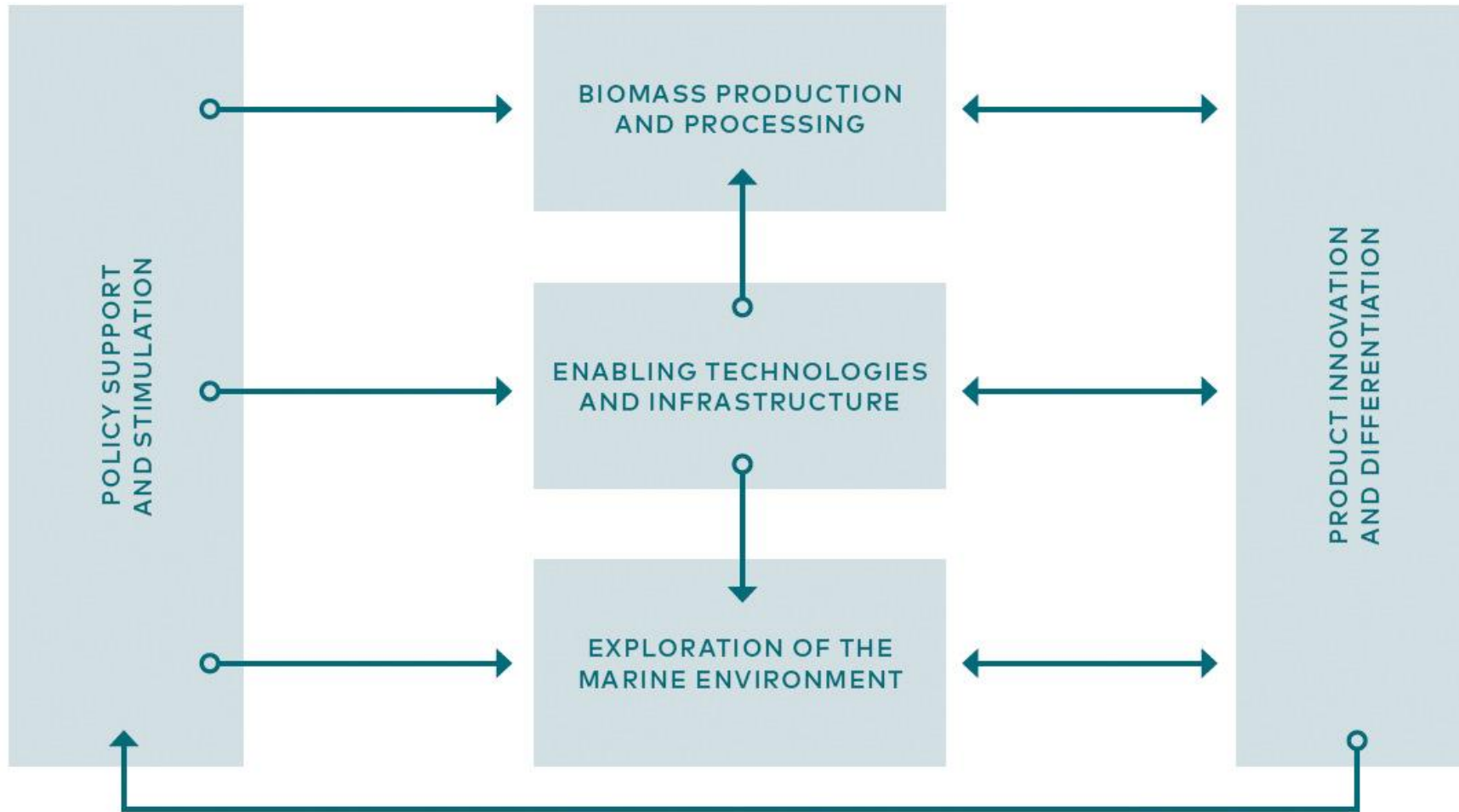
“Marine exploration is largely dependent on collaborative research activity and technologies developed outside the biological area.”

“The projected high-growth opportunities for health, food and biomaterials-related applications offer considerable scope to create high-value products from marine bioresources.”

# A position for marine biotechnology



# Thematic areas



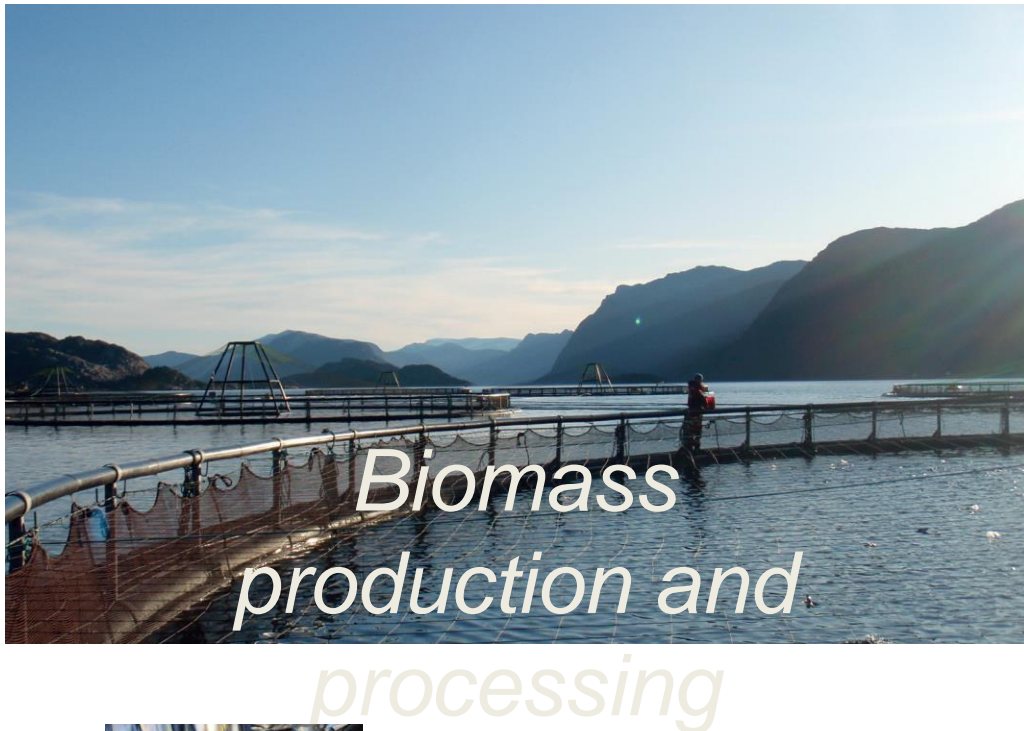
# Thematic areas



- Target sources of marine organisms/ biomass
- Identify marine species and characterise materials
- Access marine habitats



# Thematic areas



- Sustainable use of wild species
- Sustainable culture of marine organisms
- Transformation/refining marine biomass



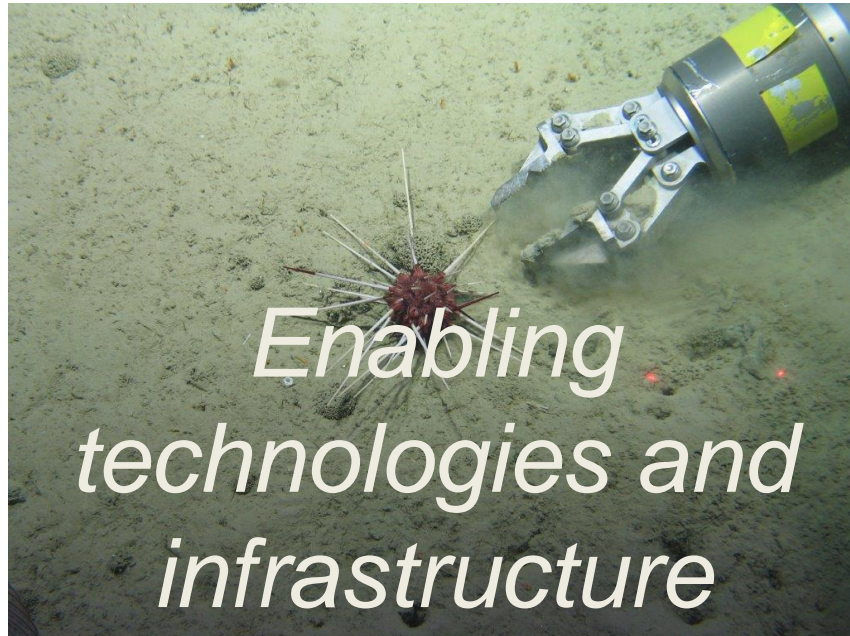
# Thematic areas



- Human and animal health products
- Food and feed products
- New industrial products and processes
- Environmental measures



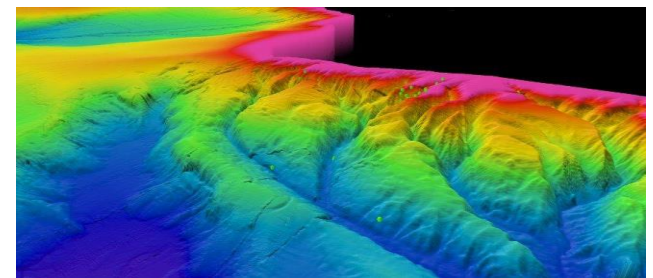
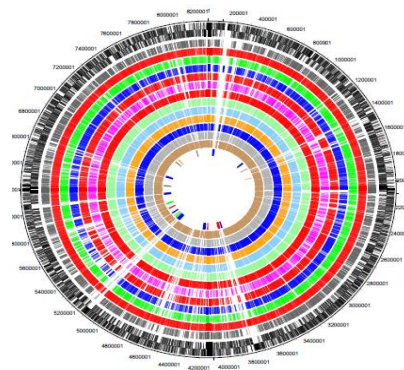
# Thematic areas



- R&I networks and collaboration
- Development of the marine biotech toolbox
- Supporting infrastructure

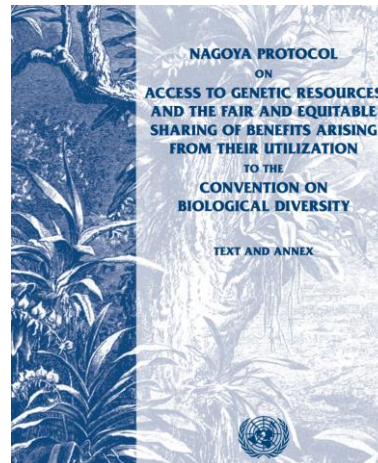
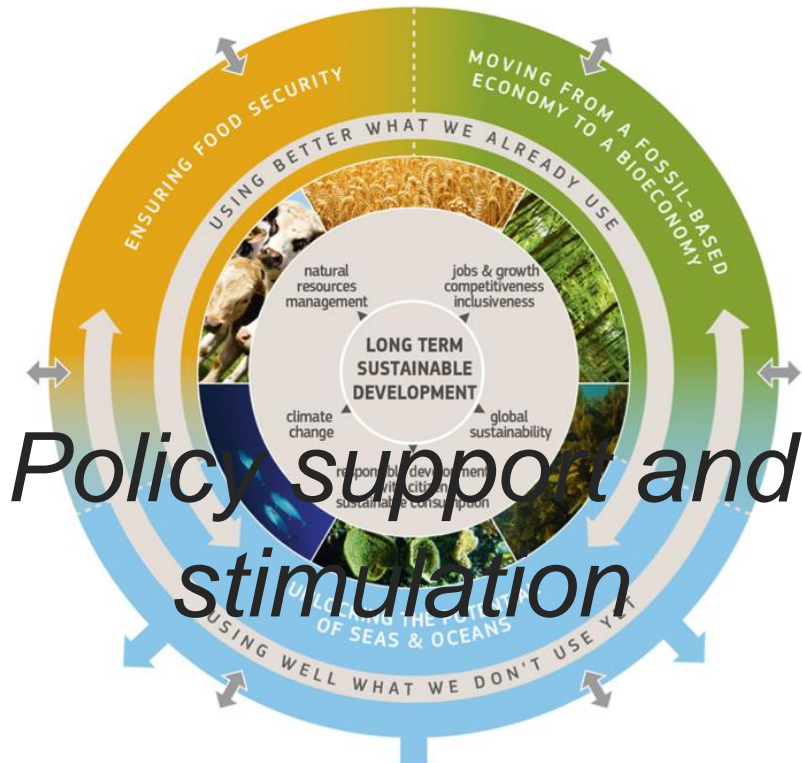
## NEPTUNA

Novel Extraction Processes for multiple high-value compounds from selected Algal source materials



# Thematic areas

- Develop the bioeconomy
- Legal issues
- Environmental regulations



**The new Common Fisheries Policy: sustainability in depth**

**What?**

- MSY** (Maximum Sustainable Yield) is the best possible objective for renewable and portable fisheries, ensuring the maximum amount of fish on a long term basis.
- Regionalisation**: Natural resources and the socioeconomic characteristics vary greatly from one place to another. A balanced representation of local stakeholders knows best how to apply EU rules in their respective areas.
- Fisheries science**: Scientific advice is the basis for good policy making, setting fishing opportunities according to the state and productivity of fish stocks.
- Multinational plans**: Consider the goals and needs for fish stock management and the roadmap to achieving the objectives in a sustainable and inclusive way.

**How?**

- Rules**: Because fishing is an activity that requires common shared resources, it needs to be regulated to safeguard fair access, sustainability and profitability for all.
  - Total Allowable Catches
  - Fishing licenses
  - Boat capacity management
  - Reducing environmental impact
- Discards**: The binding obligation (to be gradually introduced from 2015 to 2020), are back the essential principle. All products that are discarded on real catches, and will be easier to reuse selectively and better planning.
- Targeted funding**: For new entrants, small scale local fleets, important for employment, marine entrepreneurship and fishing together the coastal communities.
- Aquaculture**: Will need fish no longer able to satisfy the world population. Socio-economic opportunities is called to meet the growing demand for seafood.
- Control**: Good management relies on awareness, compliance and enforcement. Significant and reliable data must be generated, managed and supplied by Member States.

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# Theme - biomass production and processing



SUB-THEME

SHORT-TERM (2016-2020)

LONG-TERM (2020-2030)

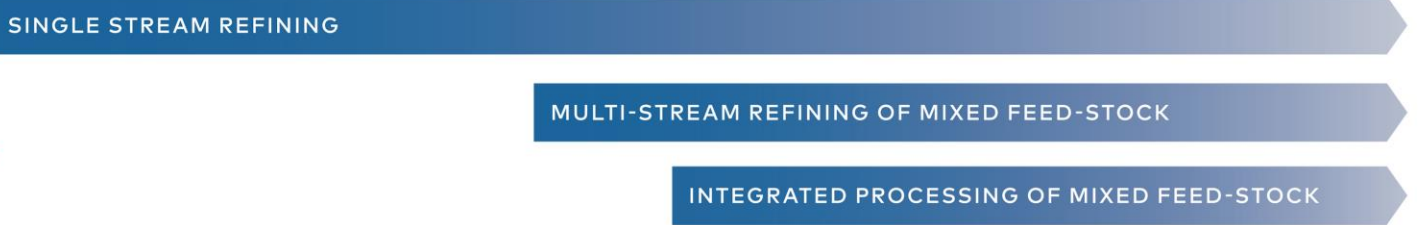
SUSTAINABLE  
USE OF WILD  
SPECIES



SUSTAINABLE  
CULTURE  
OF MARINE  
ORGANISMS



TRANSFORMA-  
TION/REFINING  
MARINE BIOMASS



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