

# Bioeconomia per l'Economia Circolare

*Politiche Europee a sostegno della Bioeconomia  
basata sullo sfruttamento di materie prime nuove o  
inutilizzate*



Consiglio Nazionale  
delle Ricerche



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# Europe's Bioeconomy Strategy

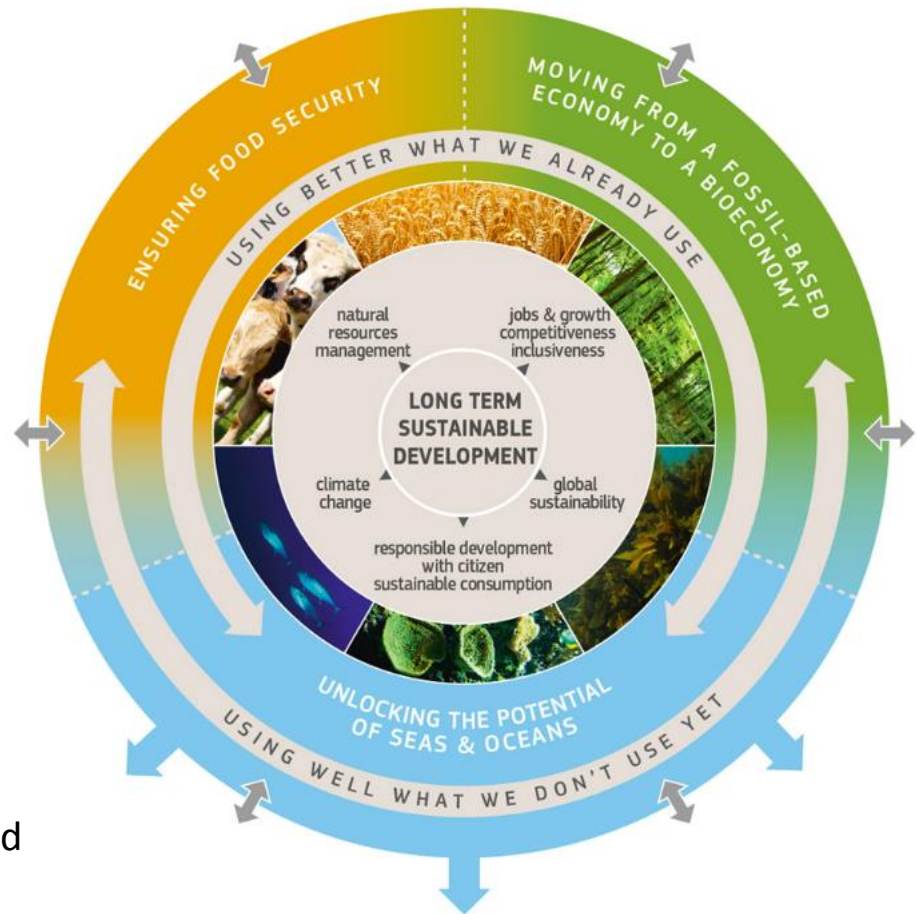
## For a resource-efficient and sustainable economy

Answer to:

- ✓ increasing populations
- ✓ depletion of natural resources
- ✓ climate change

And includes:

- ✓ sustainable natural alternatives as part of the shift to a post-petroleum society
- ✓ It calls for new approaches to come from research and innovation and supports science and technological leadership to drive tangible improvements in Europe's social, economic and environmental welfare



The three pillars

- Investments in research, innovation and skills
- Reinforced policy interaction and stakeholder engagement
- Enhancement of markets and competitiveness

# How does the bioeconomy contribute to the Commission's political agenda

The bioeconomy is central in three out of 10 identified key priorities

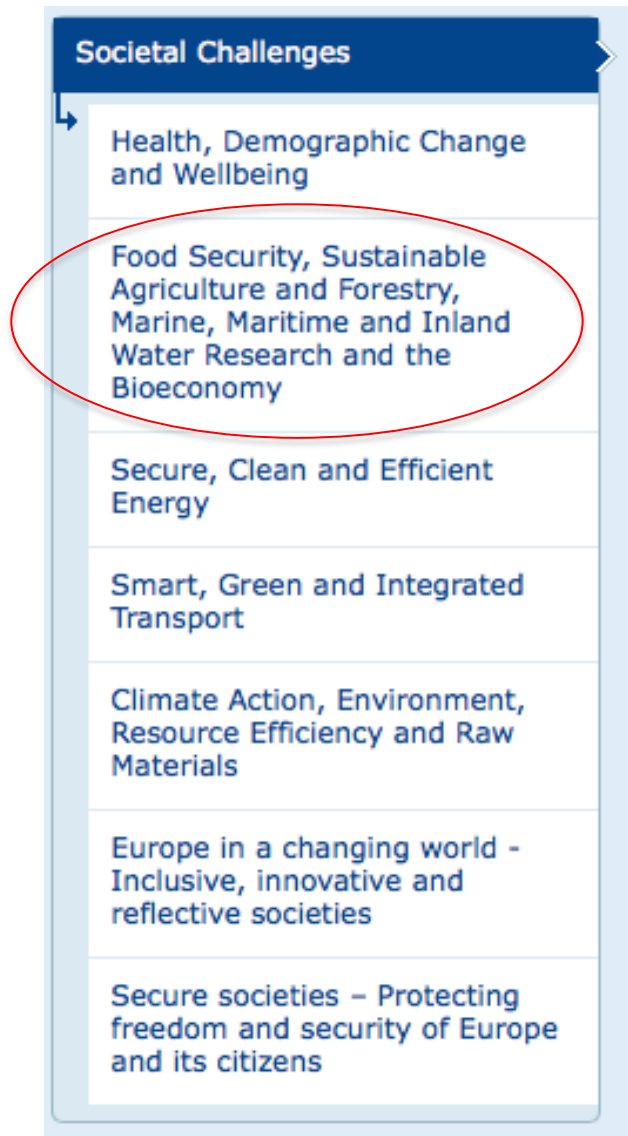


- A New Boost for Jobs, Growth and Investment
- A Resilient Energy Union with a Forward-Looking Climate Change Policy
- A Deeper and Fairer Internal Market with a Strengthened Industrial Base

In addition, marine issues and food security are two aspects of the bioeconomy where Europe can and should lead the global agenda

- the Commission works on ensuring a coherent approach to the bioeconomy through different programmes and instruments including the Common Agricultural Policy, the Common Fisheries Policy, Horizon 2020, European environmental initiatives, the Blue Growth initiative for the marine sector and the European Innovation Partnership on Sustainable Agriculture.

# Bioeconomy is part of SC2



Sustainable Food Security  
Blue Growth  
Rural Renaissance

The new €1,3bn of funding opportunities  
under Work Programme for 2018-2020

# R&D in bioeconomy



# Additional European research investment



## BBI Joint Undertaking

to develop **new bio-refining technologies**

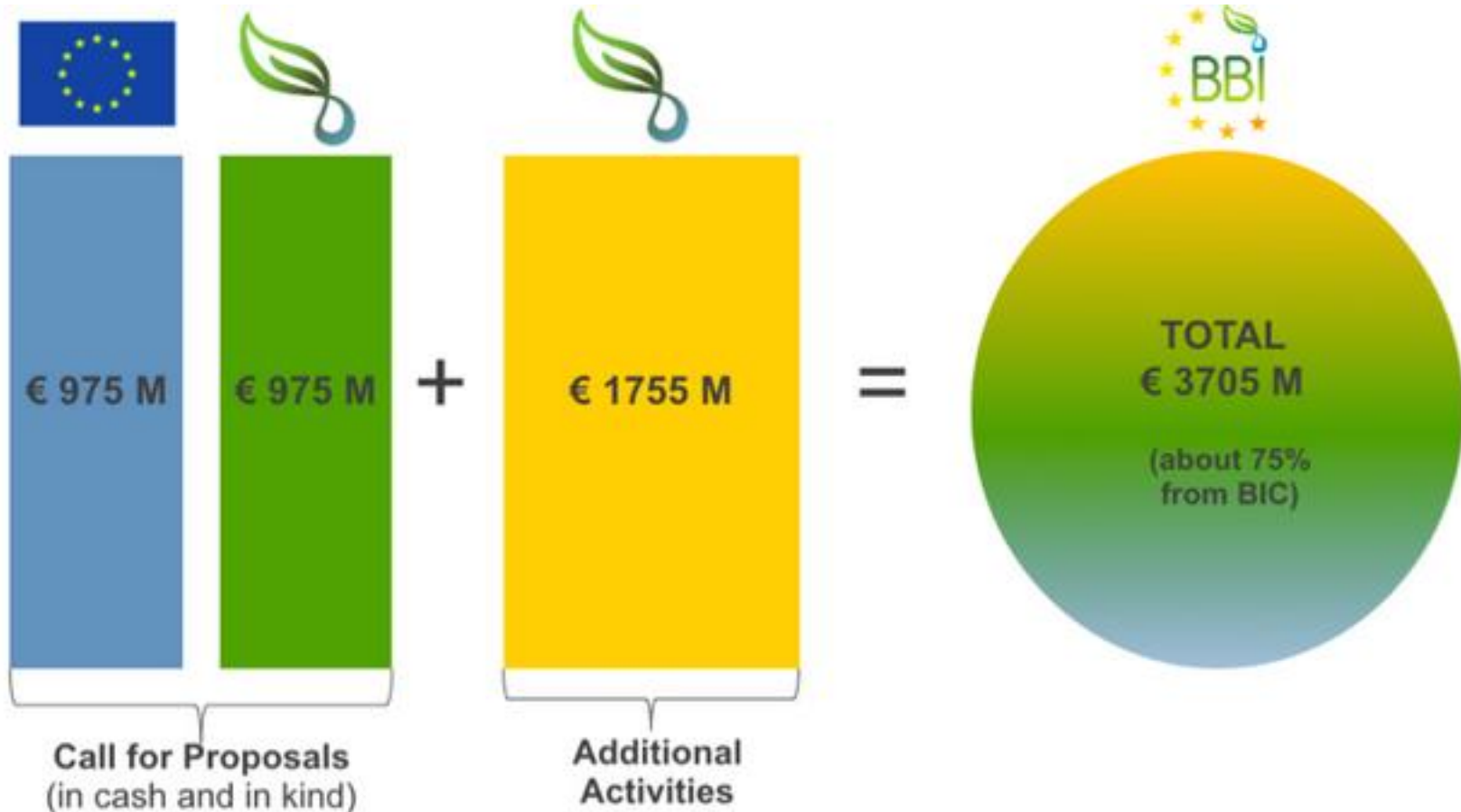
to sustainably **transform renewable natural resources**

into **bio-based products, materials and fuels**



- Established in June 2014 as one of the pillars of the [European Commission Bioeconomy Strategy](#)
- An instrument to support industrial research and innovation
- A Bioeconomy for Europe

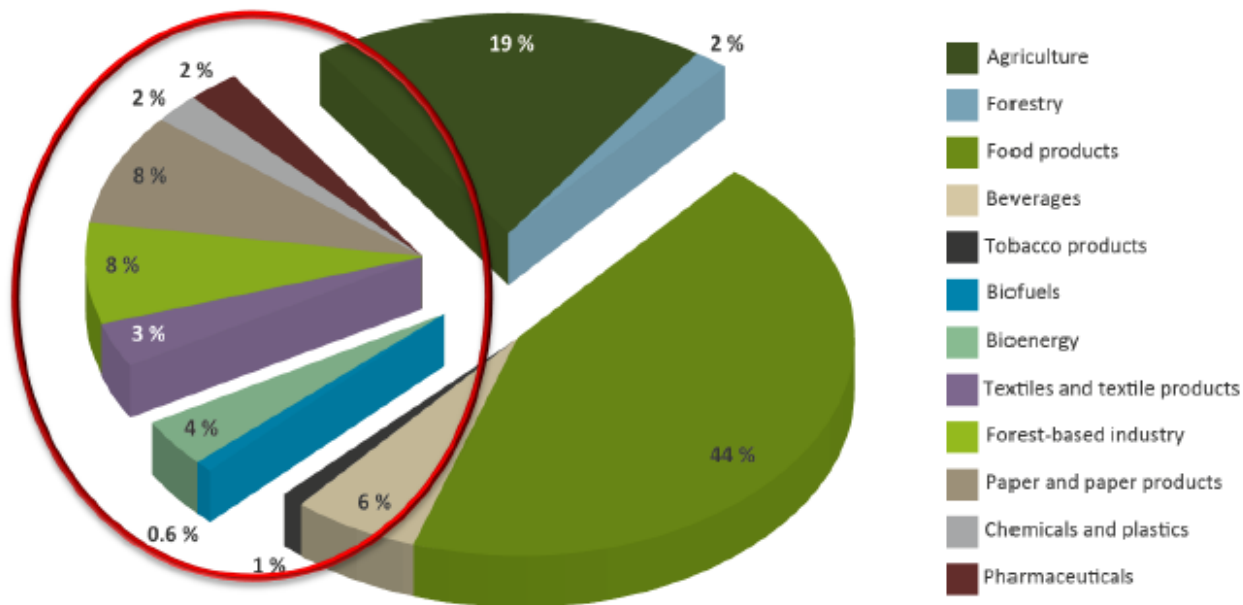
# Numbers





# BIOECONOMY TURNOVER

Total: 2.1 trillion Euro



The total European Bioeconomy, including the food, feed, beverages and primary sectors (agriculture and forestry) amounts to 2.1 trillion EUR turnover.



# A roadmap to develop Bioeconomy

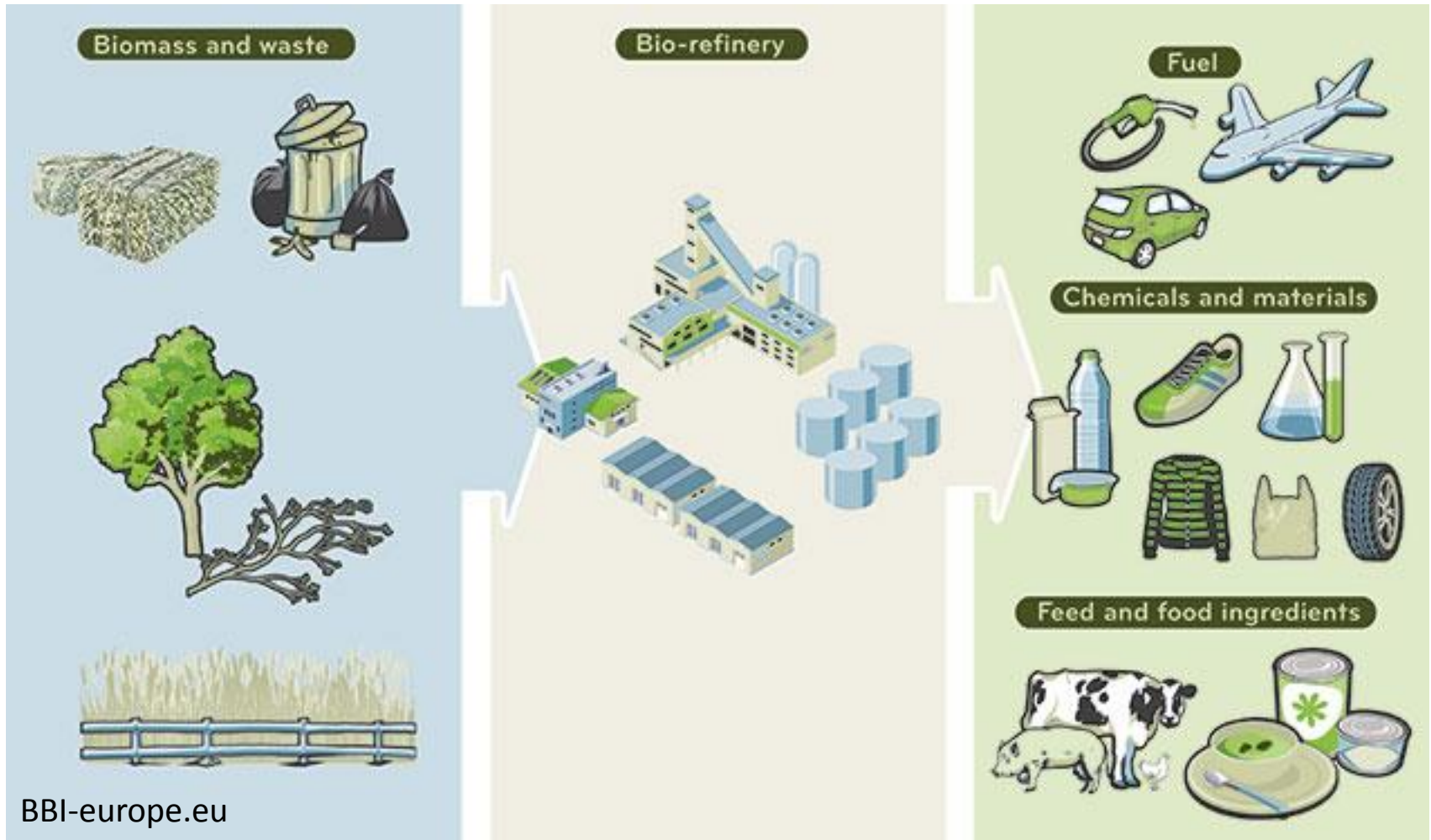


**Feedstock:** Foster a sustainable biomass supply and build new value chains

**Biorefineries:** Optimise efficiency through R&D and build flagship refineries

**Markets, products and policies:** Develop markets for bio-based products and encourage supportive policy frameworks

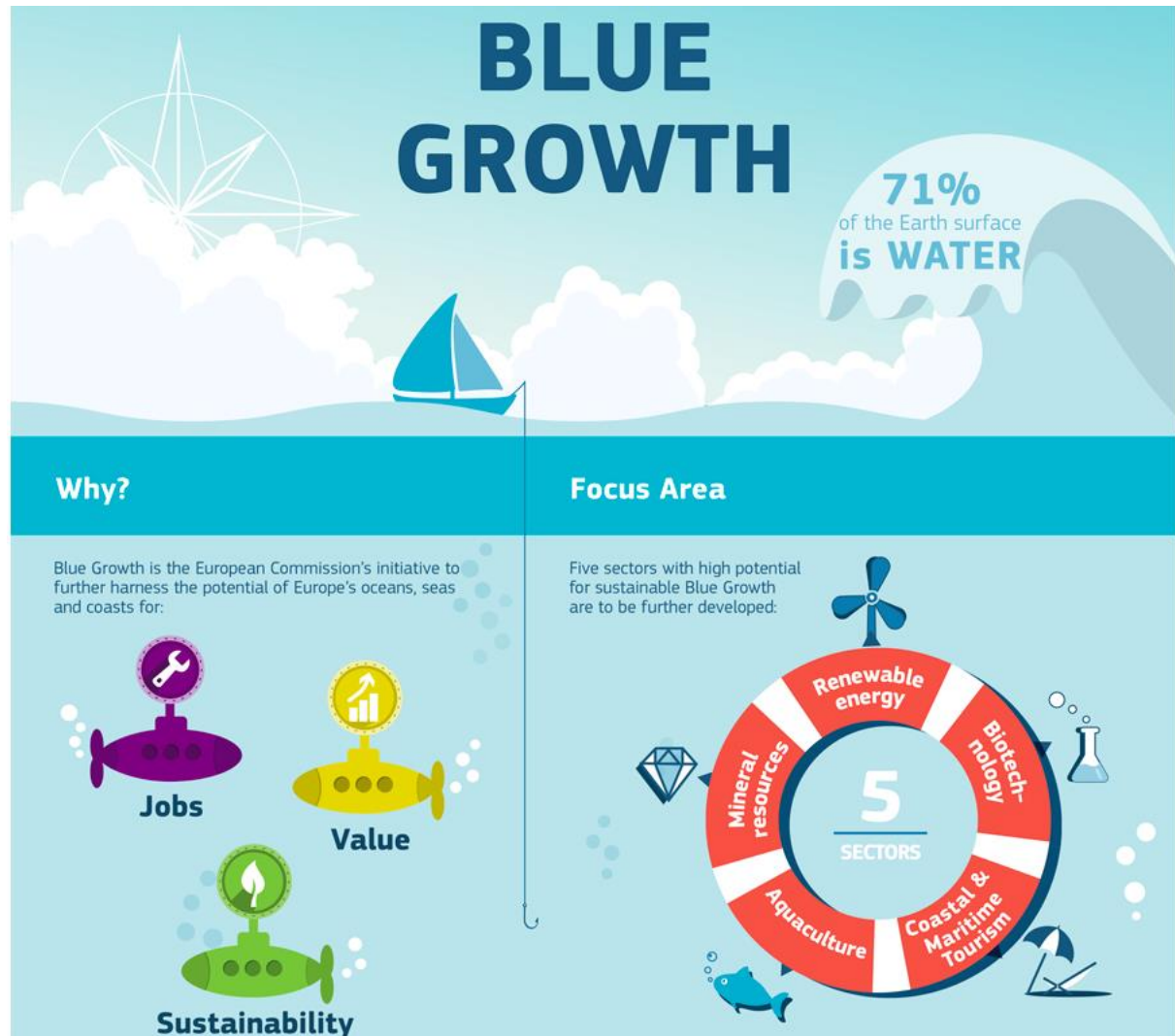
# Feedstocks, processing and products



# Blu-bioeconomy



A potential of 5.4 million jobs and a gross added value of just under EUR 500 billion per year



# Innovation and jobs creation potential bluebiotech

*Marine biotechnology is*

- a fast growing, knowledge and capital intensive enabler of innovation in the use of marine bioresources
- contributes to the wider bioeconomy by providing solutions to today's grand challenges of **food and nutrition security, sustainable economic growth and population health**

*Products from marine biotechnology  
research and innovation*



# Marine Biomass to boost bioeconomy

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## ***Sustainable food production***

Expanding global demand for marine lipids for use in functional foods, ingredients and in nutraceutical products marine biotechnology to extract Omega-3 from microalgal, fish and macro- algal sources.

## ***Cascading use of biomass***

New concepts of bioprocessing are emerging, utilizing close to 100% of the available biomass in sustainable multistream biorefineries. These processes deliver customized products, including the production of marine derived biomolecules, by the application of circular economy concepts to minimize waste and energy use.

## ***Academic-industry partnerships***

to identify novel bioactives from macroalgae, microalgae and cyanobacteria. target high-value compounds, developing novel processing technologies to extract and purify molecules for use in **food, cosmetics, animal health (aquaculture) and personal care products.**



# Future directions in research...

Brussels, 17th - 18th October 2017

## TOWARDS A SUSTAINABLE ECONOMY

| EU- Project |   |
|-------------|---|
| AlgaeBioGas | h   |
| PUFACHain   | h   |
| BISIGODOS   | <a href="http://www.bisigodos.eu/">http://www.bisigodos.eu/</a>   |
| D-Factory   | <a href="https://www.d-factoryalgae.eu/2-eng-the-project.html">https://www.d-factoryalgae.eu/2-eng-the-project.html</a> |
| InteSusal   | <a href="http://intesusal-algae.eu/2/">http://intesusal-algae.eu/2/</a>   |
| All GAS     | <a href="http://www.all-gas.eu/Pages/default.aspx">http://www.all-gas.eu/Pages/default.aspx</a>                         |
| BIOFAT      | <a href="http://www.biofatproject.eu/Project/">http://www.biofatproject.eu/Project/</a>                                 |
| DEMA        | <a href="http://www.dema-etoH.eu/en/">http://www.dema-etoH.eu/en/</a>   |
| SPLASH      | <a href="http://www.eu-splash.eu/">http://www.eu-splash.eu/</a>   |
| FUEL4ME     | <a href="http://www.fuel4me.eu/">http://www.fuel4me.eu/</a>   |
| CO2AlgaeFIX | <a href="https://www.co2algaefix.es/">https://www.co2algaefix.es/</a>   |

 **Algae Biorefineries  
for Europe**

**BISIGODOS**

 **D-Factory**

 **MIRACLES**  
SPECIALTIES FROM ALGAE

 **PUFA Chain**

# ...and market



JRC SCIENTIFIC AND POLICY REPORTS

Microalgae-based products for the food and feed sector: an outlook for Europe

## 5 micro-algae based components and 2 algae biomass products on the food and feed market worldwide

- Astaxanthin,  $\beta$  -carotene, Phycocyanin and two omega-3 fatty acids (EPA and DHA)  
 - Spirulina and Chlorella .

- production mainly takes place outside Europe
- the market position of Europe-based companies is growing

Figure 12 Major products and producers for food and feed

| Products currently on market (Form/Application) | Producers of current products                     | Micro-algae source                                  |
|---|---|---|
| Astaxanthin (Dietary supplement)                | Cyanotech (US, Hawaii) [51]                       | <i>Haematococcus Pluvialis</i> [51][52][54][66][67] |
|   | EID Parry (India) [53]                            |   |
|   | Mera Pharma (US/Hawaii) [66]                      |   |
|   | BioReal (Sweden) [71]                             |   |
|   | US Nutra (US) / Parry Nutraceuticals (India) [74] |   |
| Astaxanthin (Food Ingredient/Additive)          | AlgaTech (Israel) [65]                            |   |
|   | Blue Biotech (Germany ) [54]                      |   |
|   | Fuji Chemicals (Japan) [52]                       |   |
|   | Mera Pharma (USA/Hawaii) [66]                     |   |
|   | BioReal (Sweden) [71]                             |   |



# Numbers of Bioeconomy

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2.1 yearly **turnover** of 2.1 trillion euro

18.3 providing 18.3 million **jobs** in Europe

3.7 €3.7 billion **investments** in bio-based innovation from 2014-2020

5.4 Europe's seas, coasts and maritime sectors and regions potential of 5.4 million **jobs and a gross added value** of just under EUR 500 billion per year  
500

1.3 The new €1,3bn of funding opportunities  
under Work Programme SC2 for 2018-2020

3.45 A budget of EUR 3.45 million (**blue careers**)  
and EUR 1.7 million (**blue labs**)

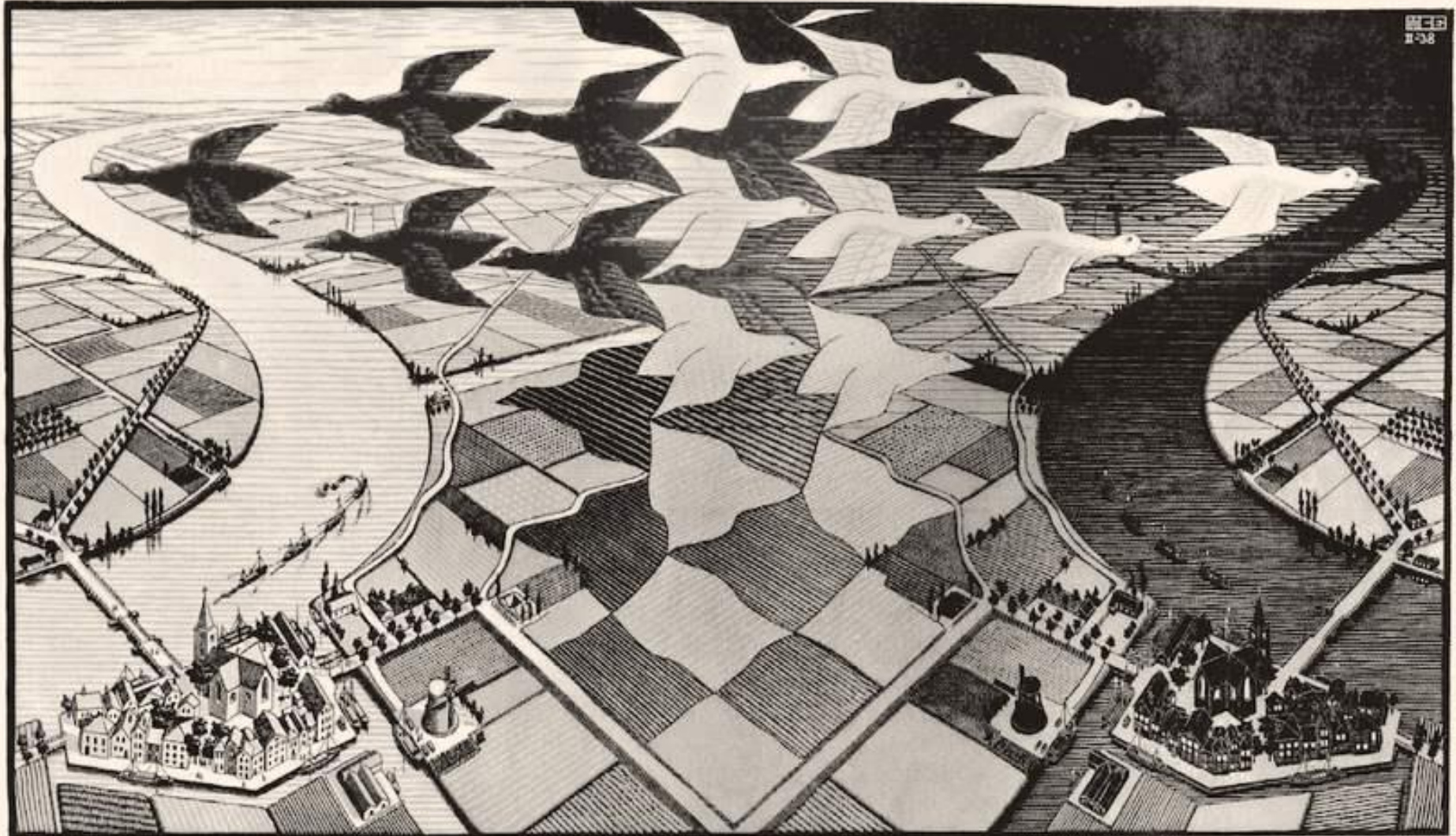
81 Million euros **BBI budget** for 2017

1.7

# Bridge to the Market



# La simultaneità dei mondi





# Bio-based CNR

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