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**F**ood, **A**griculture and **F**isheries, and **B**iotechnology  
K n o w l e d g e - B a s e d B i o - E c o n o m y ( K B B E )

# Research and Innovation for Biorefineries and the Bioeconomy

**High-Level Policy-Maker Conference  
on Biorefineries  
Brussels, Solvay Library, 5 October 2011**

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European Commission**

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# The Bio-Economy

RENEWABLE  
RAW MATERIAL



Enzymatic  
hydrolysis



# The Biorefinery Concept

Bio energy  
Bio materials

Fine chemicals  
Bulk chemicals

Food &  
Feed

END PRODUCTS





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# Bio-Economy Turnover and Employment 2009

Sector	Annual turnover (billion Euro)	Employment (thousand)	Data source
Agriculture	381	12000	COPA-COGECA, Eurostat
Food	965	4400	CIAA
Paper/Pulp	375	1800	CEPI
Forestry/Wood industry	269	3000	CEI-BOIS
Fisheries/Aquaculture	32 (2005)	400 (2005)	EUROSTAT
Bio-Based products			
➤ Chemicals and plastics	50 (estimation)	150 (estimation)	USDA, Arthur DLittle, Festel, McKinsey, CEFIC
➤ Enzymes	0.8 (estimation)	5 (estimation)	Amfep, Novozymes, Danisco/Genencor, DSM
➤ Biofuels	6	150	EBB, eBio
<b>Total</b>	<b>2046</b>	<b>21505</b>	

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# Bio-Economy Major objectives

## Implementing Europe 2020

### ► Moving to a low carbon economy

- Renewables vs. petrochemicals
- Avoiding and/or utilising biowaste and industrial by-products
- Setting-up biorefineries across the EU

### ► Building competitive bio-based industries

- Enzymes, fine and bulk chemicals
- Pharmaceuticals, cosmetics, solvents, lubricants
- Food additives and nutrients



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# FP7 - Activity 2.3. Biotechnology



**2.3.1. Novel sources of biomass and bioproducts**



**2.3.2. Marine and fresh-water biotechnology**



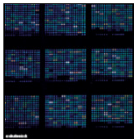
**2.3.3. Industrial biotechnology**



**2.3.4. Biorefinery**



**2.3.5. Environmental biotechnology**



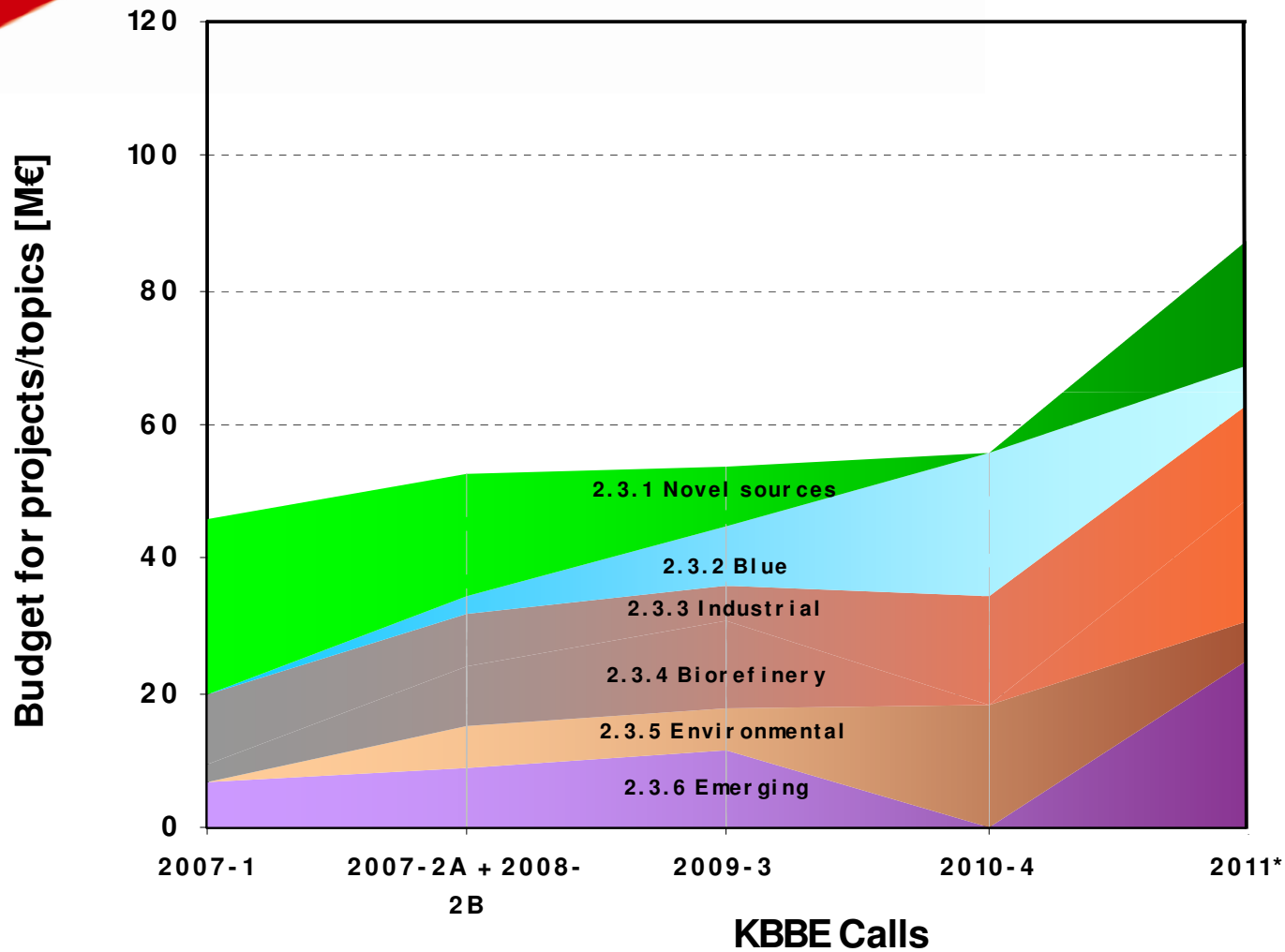
**2.3.6. Emerging trends in biotechnology**



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# FP7 - Activity 2.3 - Biotechnologies Financial weight/area/call



\* Considering proposed budget

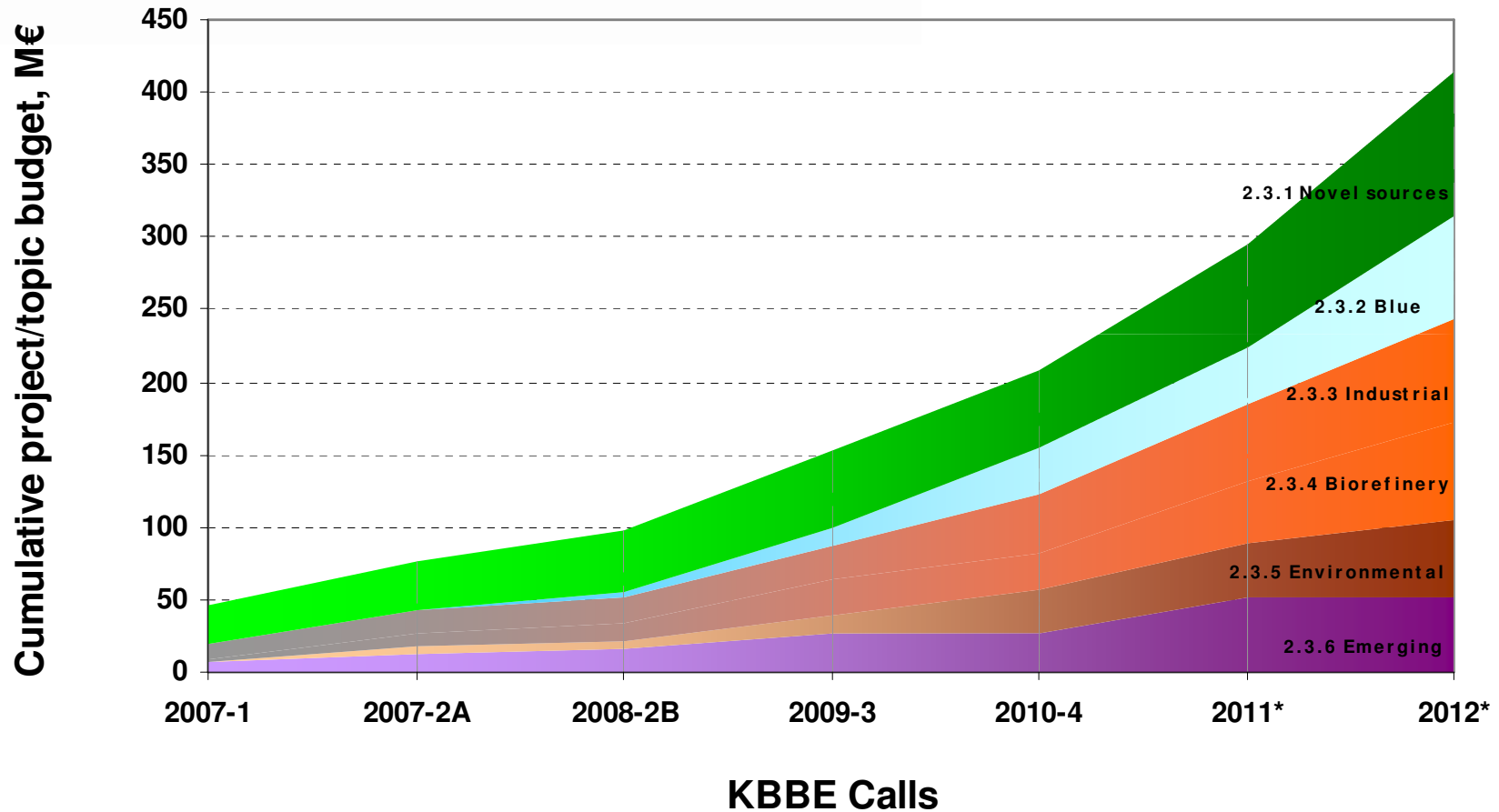


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# FP7 - Activity 2.3 - Biotechnologies

## Cumulative financial weight/area/call



\* Considering proposed budget



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# How does FP7 support the Bio-Economy? Example: Bio-refinery call

- ▶ **Call launched in 2009: EU contribution € 51.45 million, total budget € 79 million**
- ▶ **4 projects selected: Star-Colibri, EuroBioRef, Biocore and Suprabio**
- ▶ **Main objectives:**
  - **Multipurpose use and generation of biomass and biofuels/energy**
  - **Demonstration activities essential part of the projects**
  - **Assessment of environmental, economic and social sustainability along the whole value chain**
- ▶ **35 beneficiaries from industry/SME (of 80 in total): FP7 attracts much industrial interests**



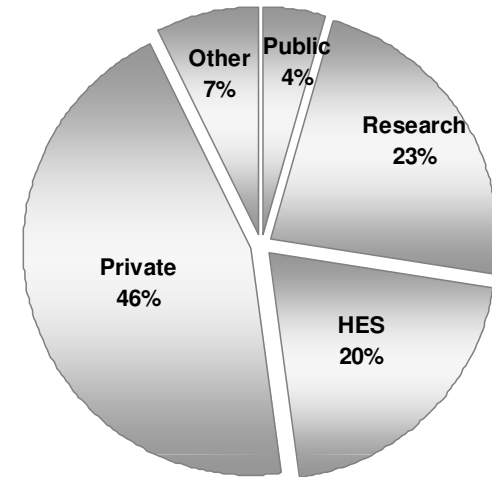
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# Biorefinery Joint Call

## ► Sustainable Biorefineries - €50million

- Value chain: biomass production to bioproducts.
- Integrated multi-disciplinary approach.
- Demonstrate performance, sustainability and feasibility at least at pilot scale.



### EUROBIOREF

EU biomasses

**Bio-jet fuels**

**Chemicals**

**Polymers**

**Materials**

<http://www.eurobioref.org/>

### BIOCORE

Agricultural residues  
and woods

**Second generation  
biofuels**

**Bulk chemicals  
Polymers**

**speciality molecules  
heat and power**

<http://www.biocore-europe.org/>

### SUPRABIO

Lignocellulose,  
microbial/organic  
waste, microalgae

**Butanediol**

**Omega oils**

**Lignochemicals**

[www.suprabio.eu](http://www.suprabio.eu) (online soon)



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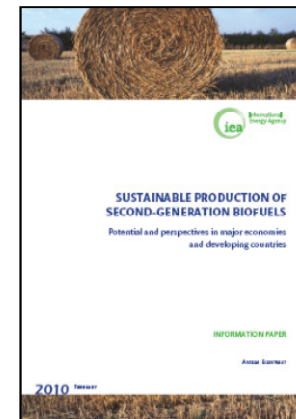
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# Industrial biotechnology

## From *oil-* to *bio-*refineries

**Biorefineries:** Integrated production energy (fuels), chemicals and materials from biomass

- ▶ **Sustainability** and resolving **conflicting uses: Bioresidues**, industrial crops, aquatic resources, long term CO<sub>2</sub>
  - IEA 2010: biofuels from 10% **agriculture and forest residues** could cover 4-6% of current transport demand
- ▶ Build-up from **existing processing facilities**
- ▶ Promote the use of biomass in biorefineries also
- ▶ for **bioproducts not for energy generation**
- ▶ **alone**
- ▶ **Joint Call Biorefineries**
- ▶ **(EUROBIOREF, BIOCORE, SUPRABIO)**





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# Biorefinery related activities in Call: KBBE 2012 Activity 2.3

**Publication date:** 20 July 2011  
**Indicative budget:** approx 305 million €, 115 M€ Activity 2.3  
**Deadline:** 15 November 2011

Area	Topics called	Funding Schemes
<b><u>Area 2.3.3: Industrial biotechnology</u></b>		
	<b>KBBE.2012.3.3-01: Overcoming hurdles for innovation in industrial biotechnology in Europe</b>	<b>CSA (coordinating)</b>
	<b>KBBE.2012.3.3-02: Support to standardisation for bio-based products</b>	<b>CP-FP</b>
	<b>KBBE.2012.3.3-03: Mastering integration and intensification of bioprocesses</b>	<b>CP-IP (SME 25%)</b>
<b><u>Area 2.3.4: Biorefinery</u></b>		
	<b>KBBE.2012.3.4-01: Conversion of bio-waste in developing countries – SICA (African ACP, Mediterranean Partner Countries)</b>	<b>CP-FP</b>
	<b>KBBE.2012.3.4-02: Biotechnology for novel biopolymers</b>	<b>CP-IP (SME 25%)</b>

**Earmarks 22 M€ to finance a limited number of large collaborative projects**



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# Bio-Economy

## Involving stakeholders and the public

**Results of the public consultation “A Bio-based Economy for Europe: state of play and future potential” showed a need for action on:**

▶ **Coherent policy framework:**

- Foster interdisciplinary cooperation in the Bio-Economy
- Increase the level of research and innovation funding

▶ **Research actions:**

- Support research into industrial applications
- Securing sufficient supplies of food and biomass

▶ **Development of bio-based markets and economic growth:**

- Improve access to finance for research and innovation
- Provide recognized standards for bio-based products

▶ **Communication**

- Improve consumer information on bio-based products
- Enhance communication on risks and benefits of the Bio-Economy



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# Innovating for Sustainable Growth: A Bio-Economy for Europe

**The realisation of the potential of the Bio-Economy is also to be reflected through (amongst others)**

- **Horizon 2020: EU's Framework Programme after 2013**
- **CAP after 2013**

***But also***

- **Lead Market Initiative on Bio-based Products**
- **Common Fisheries Policies**
- **Integrated Maritime Policy**
- **Roadmap for a resource efficient Europe**



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# Common Strategic Framework for Research and Innovation

## Policy objectives

- **Europe needs cutting-edge research and innovation to ensure competitiveness, jobs and growths**
- **Vital to tackle pressing societal challenges**
- **3% of GDP invested in R&D: headline target of Europe 2020**
- **But: Europe's performance lags behind USA and JP, and BRIC countries rapidly catching up**



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# Proposal for Multiannual Financial Framework

- ▶ **Adoption on 29 June 2011** Com(2011) 500
- ▶ **Time frame 2014 – 2020**
- ▶ **Overall amount for Horizon 2020: € 80,2 billion** in constant 2011 prices (€ 90 billion in current prices)
- ▶ **Bio-Economy and agri-food research the only area with an already allocated amount of € 4.5 billion (2.3 times the FP7 budget for KBBE)**
- ▶ **Total amount for Horizon 2020 represents a 46% increase over the FP7 budget**



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# Common Strategic Framework for Research and Innovation

## Increasing the impact

- From different priorities in each programme and initiative to common strategic priorities, focusing on societal challenges, competitiveness and research excellence
- From gaps between the stages (R&D, demonstration, market take-up etc.) to coherent support for projects and organisations across the innovation cycle from research to retail
- From strong focus on research and technological development to stronger support for innovation, including non-technological innovation and market take-up



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# Common Strategic Framework for Research and Innovation

*Europe 2020 priorities*

*International cooperation*

*European Research Area*

*Shared objectives and principles*

## Tackling Societal Challenges

- Health, demographic change and wellbeing
  - Food security, sustainable agriculture and the bio-based economy
  - Secure, clean and efficient energy
  - Smart, green and integrated transport
  - Supply of raw materials, resource efficiency and climate action
  - Inclusive, innovative and secure societies
- EIT will contribute to addressing these challenges*

## Creating Industrial Leadership and Competitive Frameworks

- Leadership in enabling and industrial technologies (Biotechnology,...)
- Access to risk finance
- Innovation in SMEs

## Excellence in the Science Base

- Frontier research (ERC)
- Future and Emerging Technologies (FET)
- Skills and career development (Marie Curie)
- Research infrastructures

*Simplified access*

*Common rules, toolkit of funding schemes*

*Coherence with other EU and MS actions*



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# Bio-Economy Commission Communication

