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## “Setting the Scene: Bioeconomy”

25 April, 2018

CASA-SCAR National Meeting in Hungary  
Ministry of Agriculture, Budapest

# What is the bioeconomy?

The next wave in our economic development.

**All sectors and systems that use, produce, process, are driven by biological resources:**



- ecosystems on land and sea;
- primary production systems: agriculture, forestry, aquaculture and fisheries;
- bio-based industry.



Using biological resources to produce "more and better, from less".

# The Bioeconomy



## 2012 EU Bioeconomy Strategy

COM/2012/060 Final; SWD/2012/011 Final



### Definition of the Bioeconomy Concept (EU BioE Strategy, 2012):

- The Bioeconomy encompasses the *production of renewable biological resources and the conversion of these resources and waste streams into value-added products, such as food, feed, bio-based products and bio-energy.*

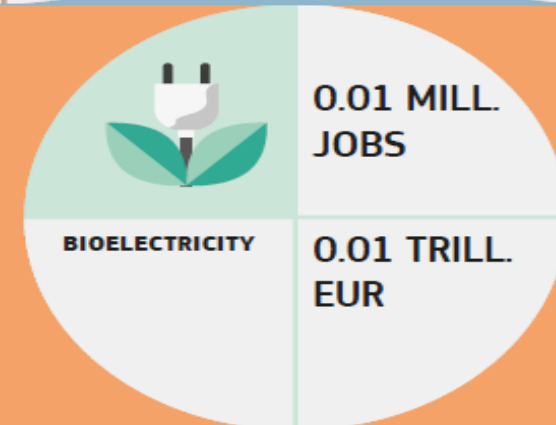
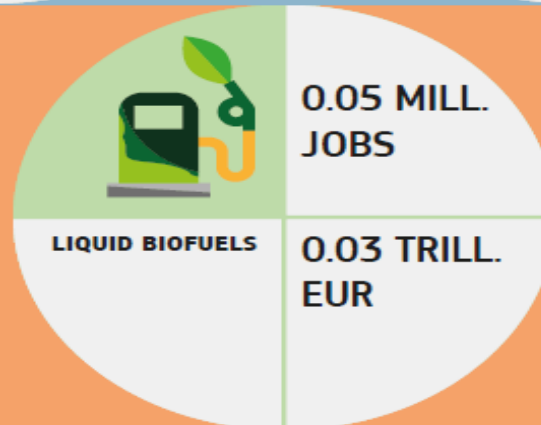
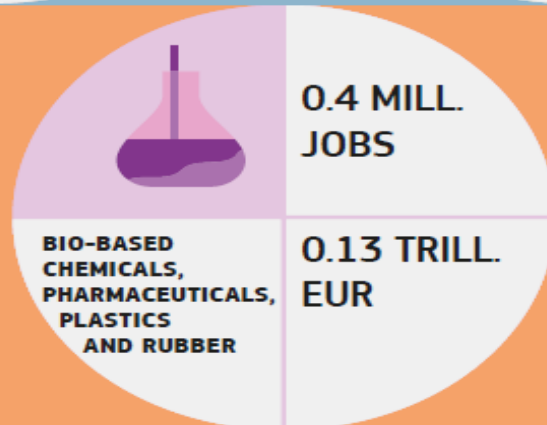
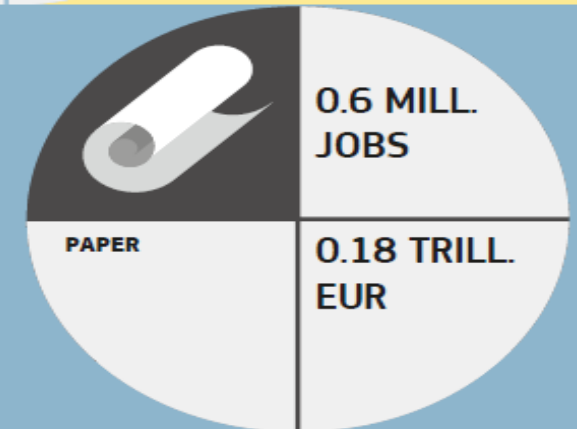
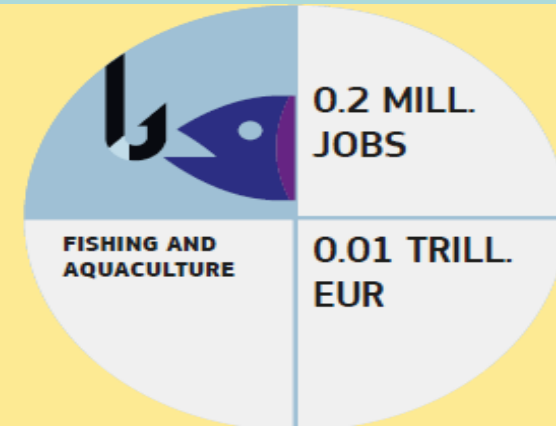
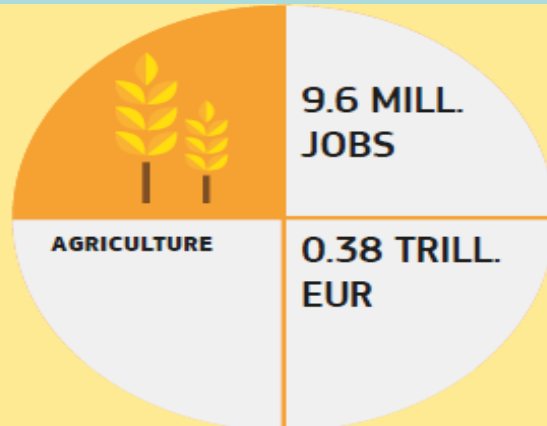
### Addressing cross-cutting societal and environmental challenges:

- increasing *global population*;
- rapid depletion of many *resources*;
- increasing *environmental pressures*;
- *climate change*.

### Aim of the Bioeconomy Strategy:

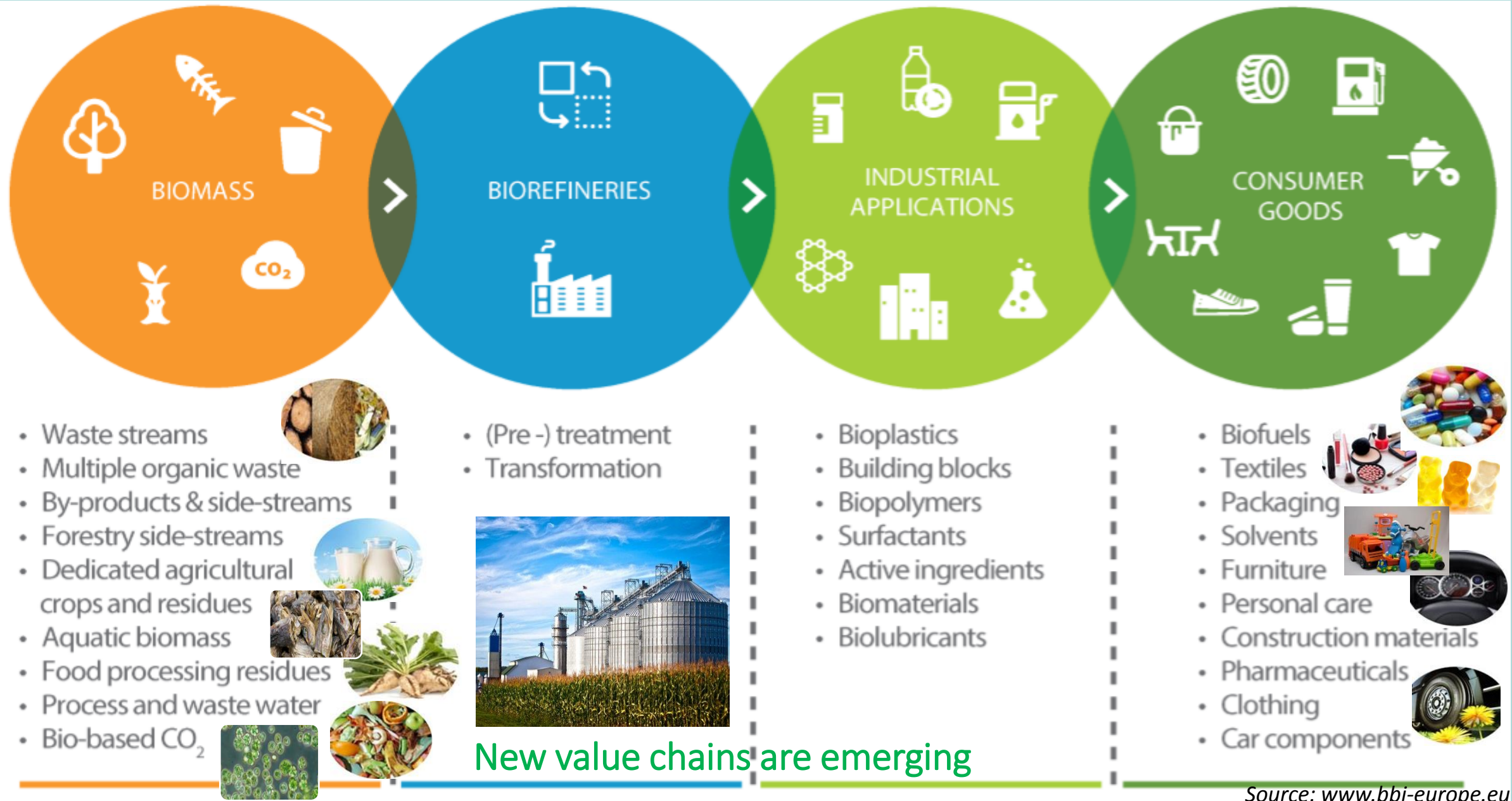
- To pave the way to a more *innovative, resource efficient and competitive society* that reconciles *food security* with the *sustainable use of renewable resources* for industrial purposes, while ensuring *environmental protection*.

# The Bioeconomy in the European Union





# Bio-based industries value chains



# Bioeconomy in everyday life

## The Innovation Opportunity

### CAR TYRE



What can you do with a dandelion? They are weeds for most people. In the right sort of quantity, dandelions are an alternative source for a raw material in high demand: natural rubber, the fundamental ingredient in products, such as car tyres. Up until now, the European rubber industry has been dependent on fluctuating Asian supplies or synthetic rubber. Today, producers have developed the first prototypes of dandelion tyres.

The product ...



... is environmentally friendly



... is cost-efficient



... is energy-saving



... is innovative



... reduces the use of fossil resources

# Bioeconomy in everyday life

## The Innovation Opportunity

The product ...



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### T-SHIRT



Dutch company Avantium has developed a 100% bio-based polyester by turning carbohydrates into chemical building blocks. The bio-polyester can be melted down and turned into thin fibers for spinning and weaving using the same technology used to make polyester clothing. T-shirts are one of the most versatile products.



# Bioeconomy in everyday life

## The Innovation Opportunity

### PAINTS



Until now, most additives in exterior paints were based on synthetic polymers, sourced, primarily, from oil. Within the BBI-funded project Exilva, Norwegian biorefinery specialist Borregaard has developed Microfibrillated Cellulose (MFC) as a natural paint additive. In doing so, it not only improves the CO<sub>2</sub> footprint of the product, but also strengthens the anti-cracking properties of paints.

The product ...



... is environmentally friendly



... is cost-efficient



... is energy-saving



... is innovative



... reduces the use of fossil resources



# Food & Nutrition Security



## Project

- Provide high quality scientific evidence to prevent vitamin D deficiency in European citizens and improve nutrition and public health through food.
- Adopted a triage approach to selecting the most critical issues for attention e.g. health and safety, exposure and nutritional requirements.
- Data and data availability to the authorities to enable safe progression of development and implementation of public health strategies for vitamin D deficiency prevention.

# Blue Growth

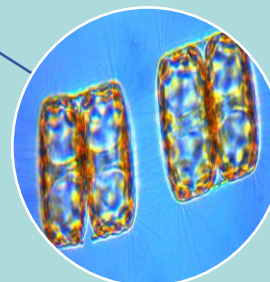


## Project

- Exploring the hidden potential: Novel bioactive compounds



- Research in some of the deepest, coldest and hottest places on the planet
- Screen samples of mud and sediment from huge previously untapped oceanic trenches



- Uncover marine microbes and new bioactive compounds to evaluate their potential as novel drug leads, and antibiotics

# Next generation bio-product Mill in Finland



**METSÄ GROUP** | Sales EUR **5.0** billion | Personnel **10,500**

**METSÄLIITTO COOPERATIVE** | Group's parent company | Owned by 122,000 Finnish forest owners



**METSÄ TISSUE**  
**Tissue and cooking papers**

Sales:  
**EUR 1.0 billion**  
Personnel:  
**2,800**



**METSÄ BOARD**  
**Paperboard**

Sales:  
**EUR 2.0 billion**  
Personnel:  
**3,100**



**METSÄ FIBRE**  
**Pulp**

Sales:  
**EUR 1.3 billion**  
Personnel:  
**850**



**METSÄ WOOD**  
**Wood products**

Sales:  
**EUR 0.9 billion**  
Personnel:  
**2,300**



**METSÄ FOREST**  
**Wood supply and forest services**

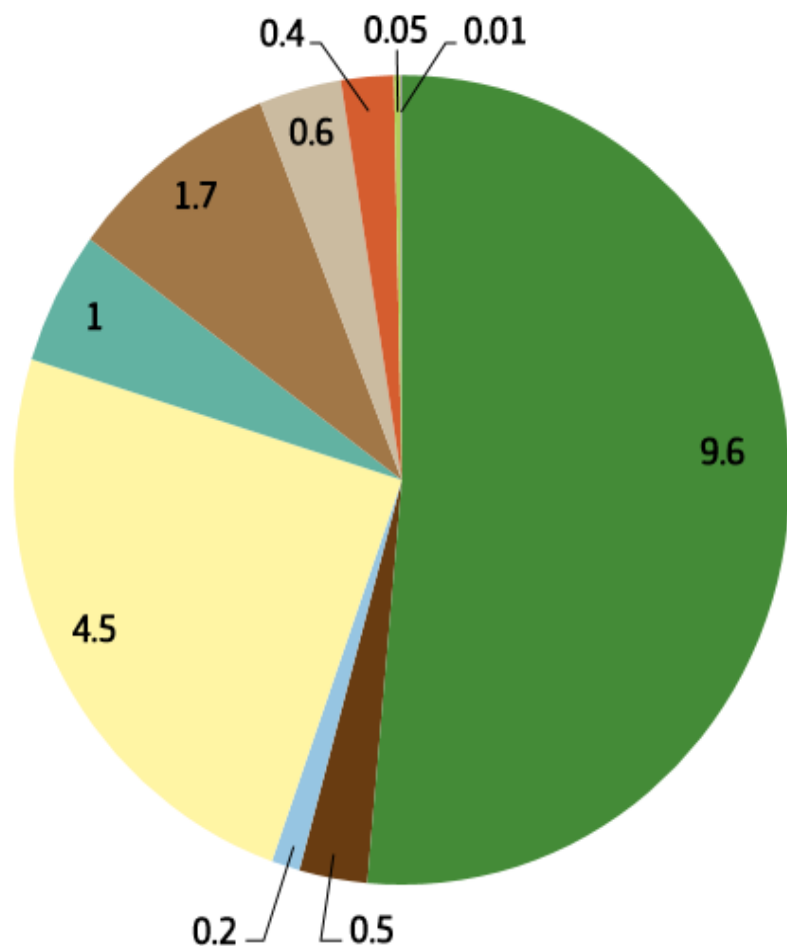
Sales:  
**EUR 1.6 billion**  
Personnel:  
**900**



Source photo: [metsaboard.com](https://metsaboard.com)

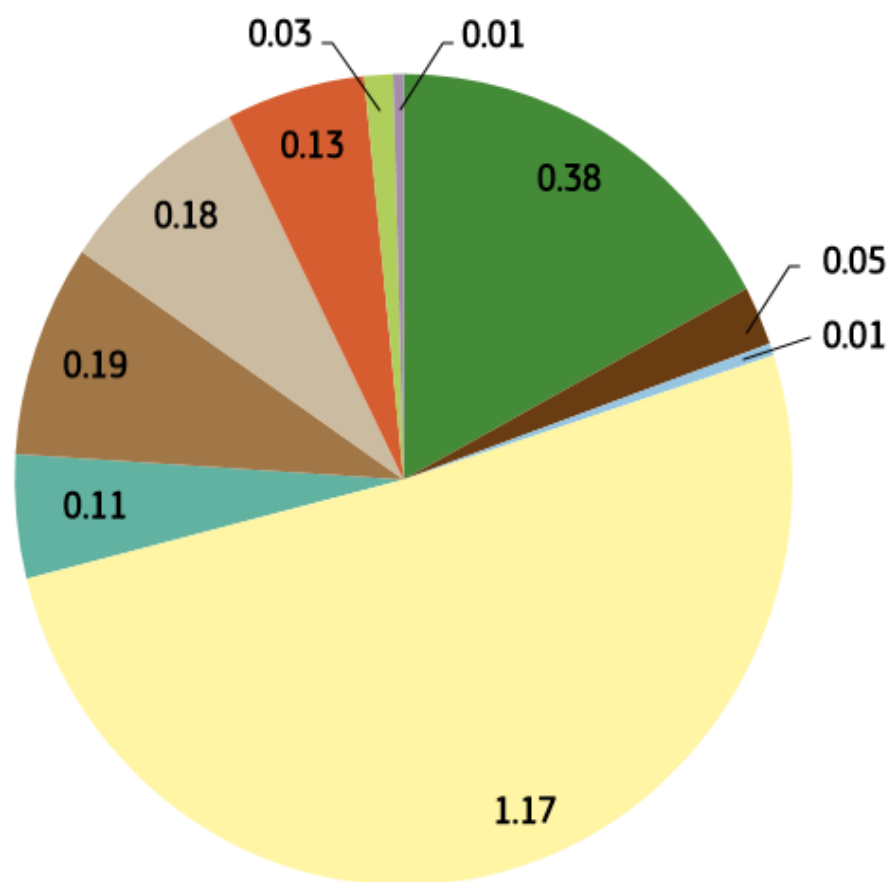


# The EU's Economic opportunity



Employment: **18,6** mill. jobs

*Employment [million persons employed]  
in the bioeconomy sectors of the EU (2014)*



Turnover: **2,2** trill. EUR

*Turnover [trillion EUR] in the bioeconomy sectors  
of the EU (2014)*

*Source: Bioeconomy Report 2016, Joint Research Centre, EC*

# Bioeconomy turnover in the EU28 Member States (2014)

Member State	Turnover		Member State	Turnover		Member State	Turnover	
	million EUR	1000 EUR per capita		million EUR	1000 EUR per capita		million EUR	1000 EUR per capita
Austria	52 992	6.2	Germany	406 793	5.0	Netherlands	112 001	6.7
Belgium	77 680	6.9	Greece	27 149	2.5	Poland	114 650	3.0
Bulgaria	12 747	1.8	Hungary	24 841	2.5	Portugal	38 623	3.7
Croatia	10 111	2.4	Ireland	43 612	9.5	Romania	36 563	1.8
Cyprus	2 343	2.7	Italy	293 071	4.8	Slovakia	12 445	2.3
Czech Republic	29 764	2.8	Latvia	6 526	3.3	Slovenia	6 502	3.2
Denmark	49 492	8.8	Lithuania	11 290	3.8	Spain	191 133	4.1
Estonia	5 824	4.4	Luxembourg	16 68	3.0	Sweden	62 298	6.5
Finland	48 793	9.0	Malta	282	0.7	United Kingdom	212 122	3.3
France	337 056	5.1						

# EU context

- **Communication on Bioeconomy – 2012**

Food security, sustainable management of natural resources, climate change, reduced fossil-dependence, jobs creation and EU competitiveness

- **EP Resolution – 2013, CoR Opinions – 2013,2017**

- **Renewed Industrial Policy; Circular Economy Action Plan**

- **Commission Work Programme 2018**

Continue to evaluate the bio-economy strategy of 2012 and we will examine how best to take it forward

- **Review of the Bioeconomy Strategy – 2017:** Good delivery, increasing importance of objectives still relevant, more focussed actions for evolved context (SDGs, circular)

- **Update of the EU Bioeconomy Strategy & Action Plan - 2018**





# EU Bioeconomy Action Plan (2012)

## Investment in R&I



- Horizon 2020:
  - 3.8 bn €
- Increase multi-disciplinary & cross-sectoral R&I
- Smart Specialisation
- EFSI

## Policy interaction & stakeholder engagement



- Bioeconomy Panel
- Bioeconomy observatory
- EU Policy coherence
- Development of regional and national bioeconomy strategies
- International cooperation

## Enhancement of markets and competitiveness in bioeconomy



- Sustainable intensification of primary production
- Expansion of new markets
- Increase EU competitiveness
- BBI JU: 3.7 bn €



## Bioeconomy Policies around the World



As of March 2018

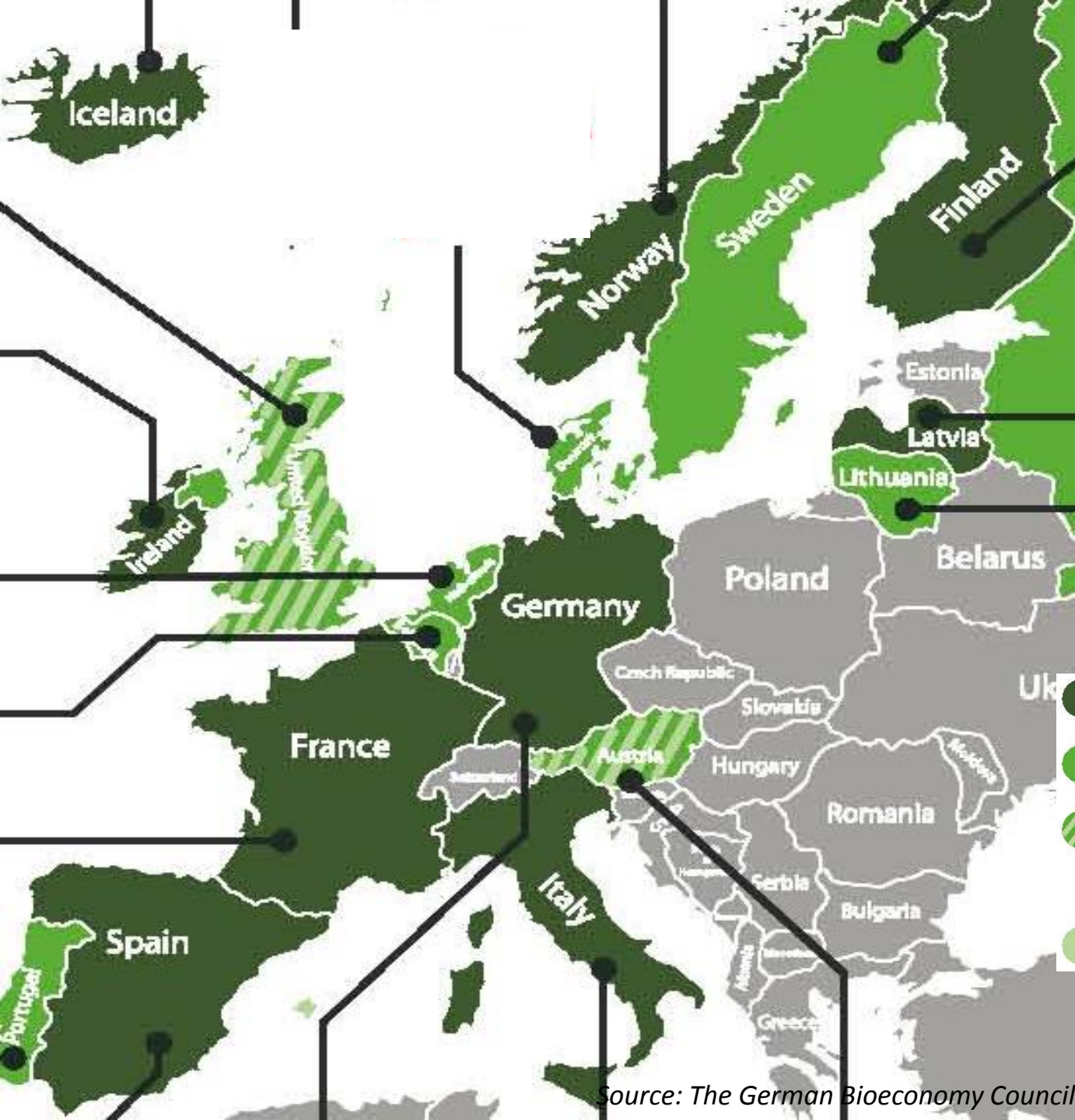
Source: The German Bioeconomy Council

Read an [article](http://books.google.com/books?id=73-7v0t0Lm0C) on [books.google.com](http://books.google.com/books?id=73-7v0t0Lm0C) (cached version)



# Bioeconomy Policies around the EU

- Member States & regions are working towards integrated bioeconomy strategies



- dedicated bioeconomy strategy
- bioeconomy-related strategy
- ▨ be-related strategy; dedicated be-strategy is under development
- ▨ dedicated be-strategy is under development

Source: The German Bioeconomy Council





# Deliver the EU Bioeconomy

Horizon 2020 research and innovation programme:  
SC 2 (3.8 bn € 2014-2020) "Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the bioeconomy"



**Sustainable  
Food Security  
(SFS)**



**Blue Growth  
(BG)**



**Rural  
Renaissance  
(RUR)**



**Bio-Based  
Innovation  
(BBI)**

Societal Challenge 2 Calls

# Bio-based Industries Joint Undertaking (BBI JU)



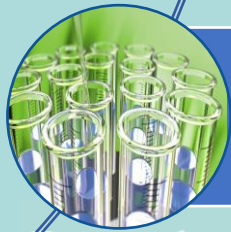
Public-Private Partnership between the European Commission & BIC supporting R&I for bio-based industries. EU body - operates under Horizon 2020 rules.



BBI Budget: € 3.7 billion (25% EU - 75% industry).  
Fund R&I projects from technology development to full scale.



Developing sustainable and competitive bio-based industries in Europe, based on advanced bio-refineries that source their biomass sustainably.  
(400 000 skilled jobs by 2020 rising to 700 000 by 2030. 80 % in rural areas.)



Demonstrate new technologies. Develop business models. Set-up flagship bio-refinery plants. De-risk investments. Organize the value chains. Bring critical mass to this “emerging” sector.

# Review of the 2012 EU Bioeconomy Strategy

## Main Findings

- BioE R&I investment doubled from FP7 to Horizon 2020
- BBI PPP developing transformative technologies for circular BioE
- Bioeconomy policies taken up in MS, regions, cities ...
- Further mobilisation of investment needed
- Better address policy coherence
- Current policy context (CE, SDGs, Paris,..) calls for a sustainable, circular bioeconomy
- Better monitoring and assessment frameworks needed (biomass supply/demand)





# Commission Communication: Updating the European Bioeconomy Strategy & Action Plan

- The Commission WP 2018 foresees the update of the EU Bioeconomy strategy as a major initiative, in response particularly to the renewed Industrial Policy, Circular Economy, as well as other EU and international policies such as the SDGs and the Paris Climate Agreement.
- Councils: AGRI-FISH (19 Feb)
- Roadmap: published 20 Feb - 20 March – 90 replies
- Adoption: Q III 2018 (tbc)
- Presidency Conferences: 22 Oct 2018, under AT Presidency; Sept 2019, under FI Presidency

COP21



SDGs Post-2015



# WHAT does the initiative aim to achieve?

- Deliver **SUSTAINABILITY** and **CIRCULARITY** in the EU Bioeconomy policy and practice
- Link the **BALANCED** use of resources and the protection / restoration of biodiversity, ecosystems and natural capital on land and water.
- Focus on **IMPACT** on few actions to embed in agriculture, marine, energy, environment, industrial, regional, education and R&I policies
- Boost **EU COMPETITIVENESS** in new bio-based industries and value chains
- Foster **EU REGIONAL** bioeconomies in rural, coastal, urban areas

## ... and HOW?

- **A SYSTEM** - wide approach, linking sustainable use, protection and restoration of biological resources on land and sea
- Enhancing **EU policy coherence** across sectors, addressing trade-offs
- Expanding beyond research and innovation, to **key EU policies, markets, standards...**
- **Co-leadership of actions** with DGs AGRI, MARE, ENV, GROW, ENER, JRC, REGIO, EMPL...
- Going **LOCAL**: Max local/regional actors opportunities in new value chains (CAP, CFP, ESIF)
- De-risking **investments, mobilising and scaling up innovation**



## 8 ACTION LINES



1. Strategic research and innovation to support this transition
2. Education and training for a skilled workforce
3. Strengthen the bio-based sectors
4. Mobilising investments, incl financial instruments
5. Creation of new markets and value chains, incl. regulatory frameworks
6. Exploiting the opportunities at local level
7. Protecting and restoring natural resources on land and sea
8. Monitoring and assessing progress, with indicators

# Bioeconomy development in EU regions

Results of the EC Study: “Mapping of EU Member States'/regions' Research and Innovation plans & Strategies for Smart Specialisation (RIS3) on Bioeconomy for 2014-2020” (2/2017)

- Almost all EU regions (98.6%) foresee R&I in bioeconomy in their RIS3 2014-2020, but drivers, capacities and approaches are different.
- Wide variety of how bioeconomy is understood and deployed in EU regions.
- Diversity in thematic orientation towards the bioeconomy complicates the understanding of regional realities.
- EU regions have different bioeconomy maturity levels, depending on the development stage of their regional bioeconomy ecosystem.

# Better deployment of the bioeconomy

The analysis shows that around 36% of regions in Europe have a low level of bioeconomy maturity.

Regarding a better deployment of the bioeconomy at national and regional level in Europe, five main areas of recommendations can be derived:

- Bioeconomy strategic planning and governance,
- Value chain/cycle development, in particular SME engagement,
- R&I on technologies, knowledge transfer and new bioeconomy skills,
- Coordinated funding and synergies between instruments,
- Public awareness and acceptance.



# The Bioeconomy, building the next economy now

**GDP and  
well-being**

**Towards:**

- Sustainable and circular development
- Non-fossil, post-petroleum society
- Flourishing local businesses, resources and employment

"The 21st century will be the century of biology, and the bioeconomy"  
Goran Persson,  
ex-Prime Minister of Sweden, 2015

"The Bioeconomy: a solution for complex and interconnected challenges". 2015  
"Faced with the current challenges of food security, climate change and industrial transformation, we have the responsibility to figure out how to best deal with the biological resources we have and how to put them to the best use." 2017  
Carlos Moedas, Commissioner for Research, Science and Innovation, European Commission

**Natural resource  
economy**

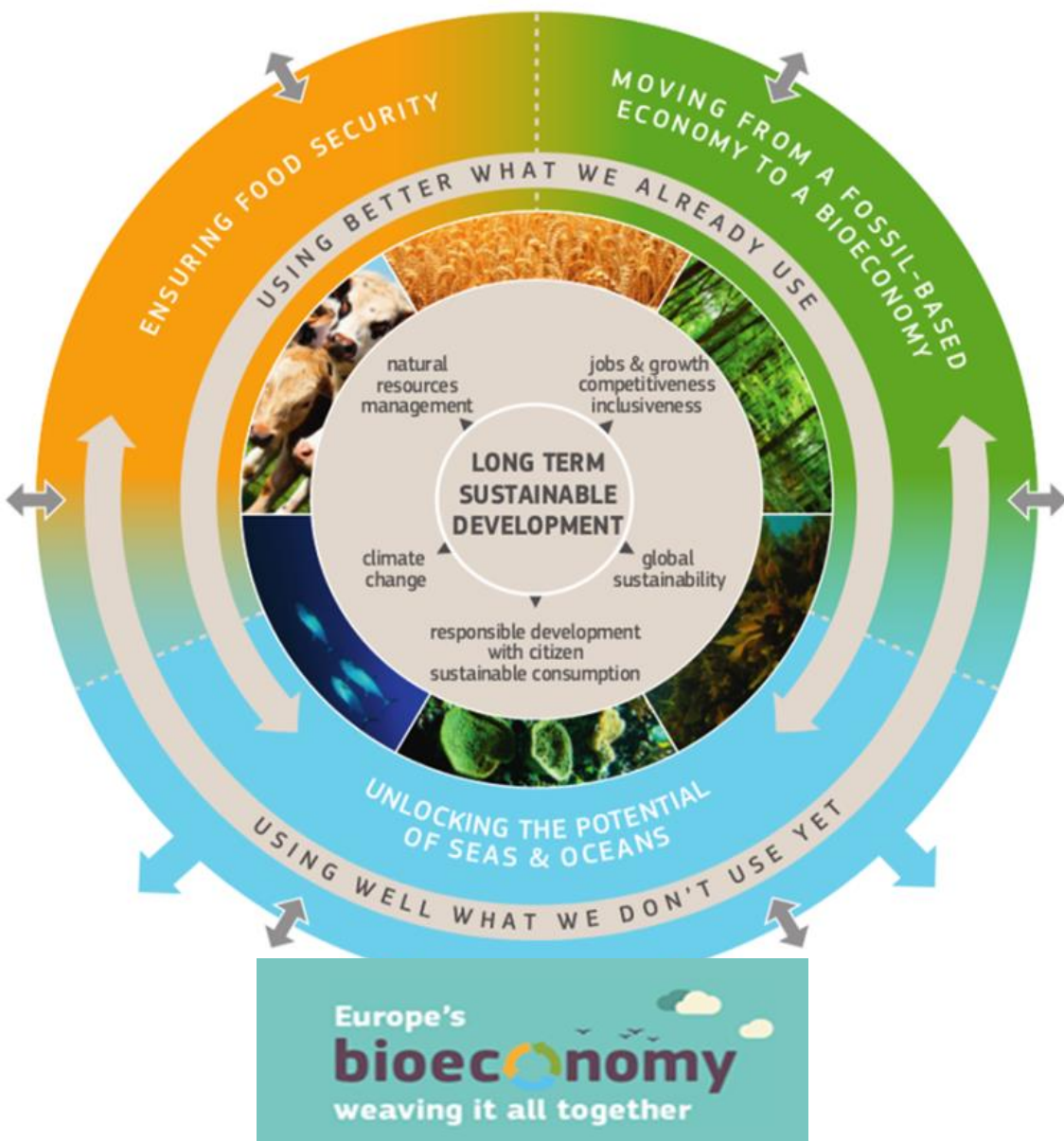
**Fossil economy**

**Bioeconomy**

"We are seeing a bioeconomy revolution sweeping the globe"  
UK Government paper on bioeconomy and waste, 2015

"We're at the beginning of a green rush where entirely new value chains are being created."  
John Bell, Director, Bioeconomy  
Directorate, European Commission, 2017

"The bioeconomy has emerged as an Obama Administration priority because of its tremendous potential for growth as well as the many other societal benefits it offers."  
US National Bioeconomy Blueprint, 2012



Thank you for your attention

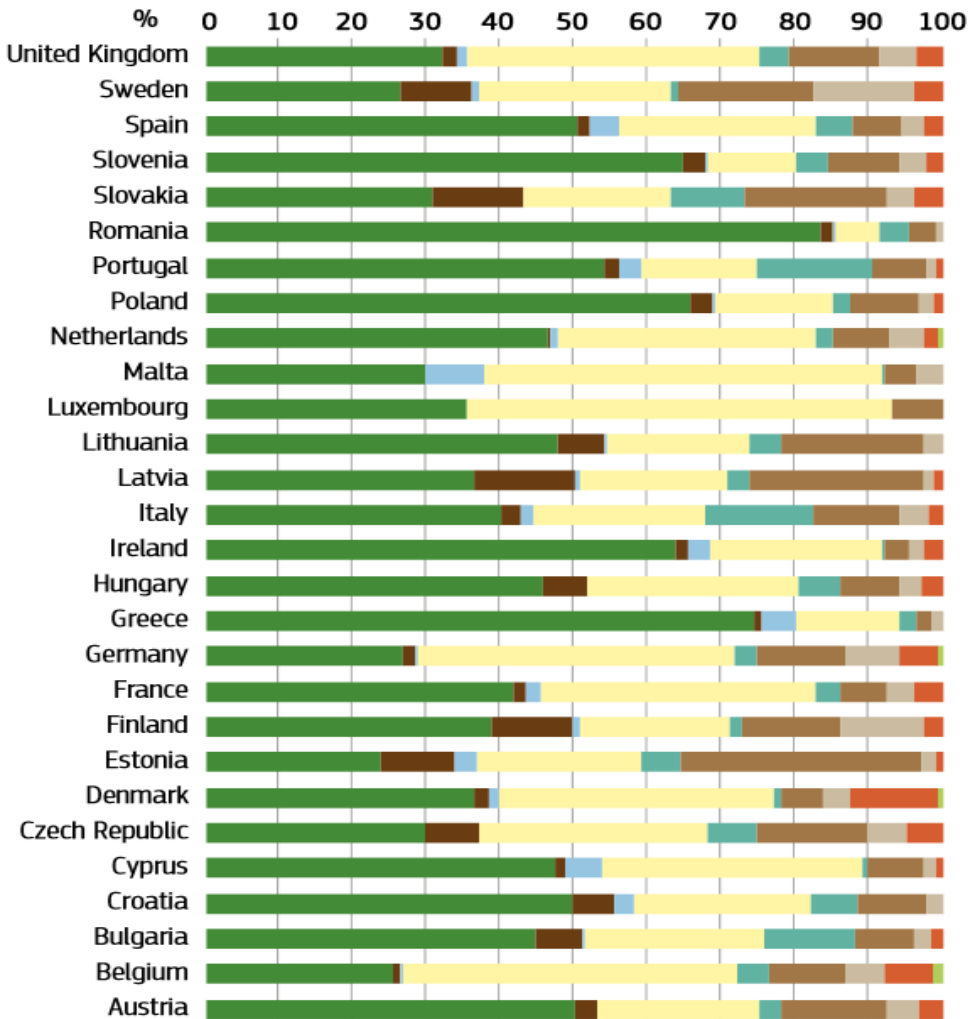
*A new opportunity for EU regions.  
Using biological resources from land and sea for a post-petroleum  
economy – the Bioeconomy.*

For more information:

[www.ec.europa.eu/research/bioeconomy](http://www.ec.europa.eu/research/bioeconomy)

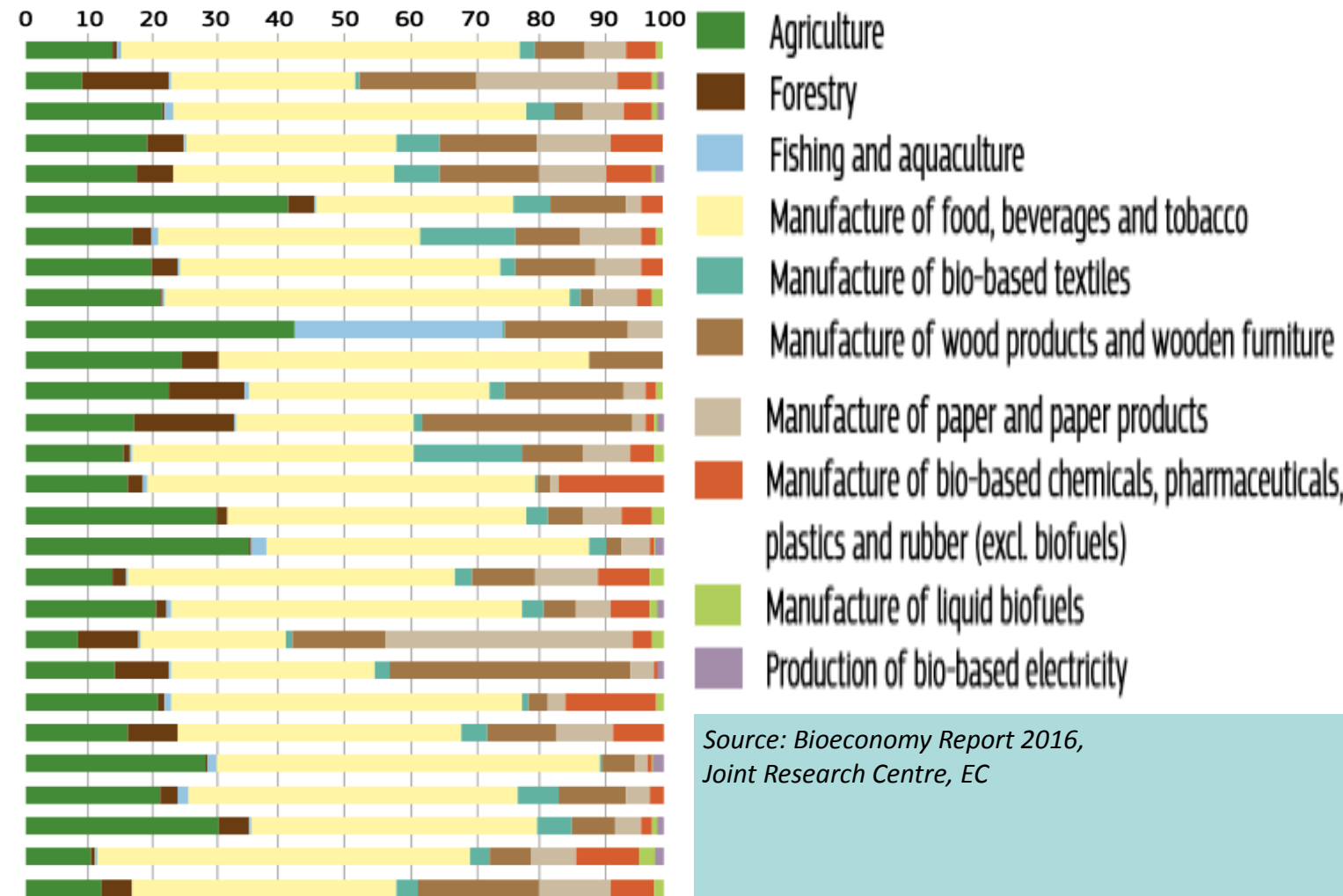


# Employment



Employment in the bioeconomy sectors of activity in the 28 EU Member States, in percentage

# Turnover



Turnover in the bioeconomy sectors of activity in the 28 EU Member States, in percentage

Source: Bioeconomy Report 2016, Joint Research Centre, EC