

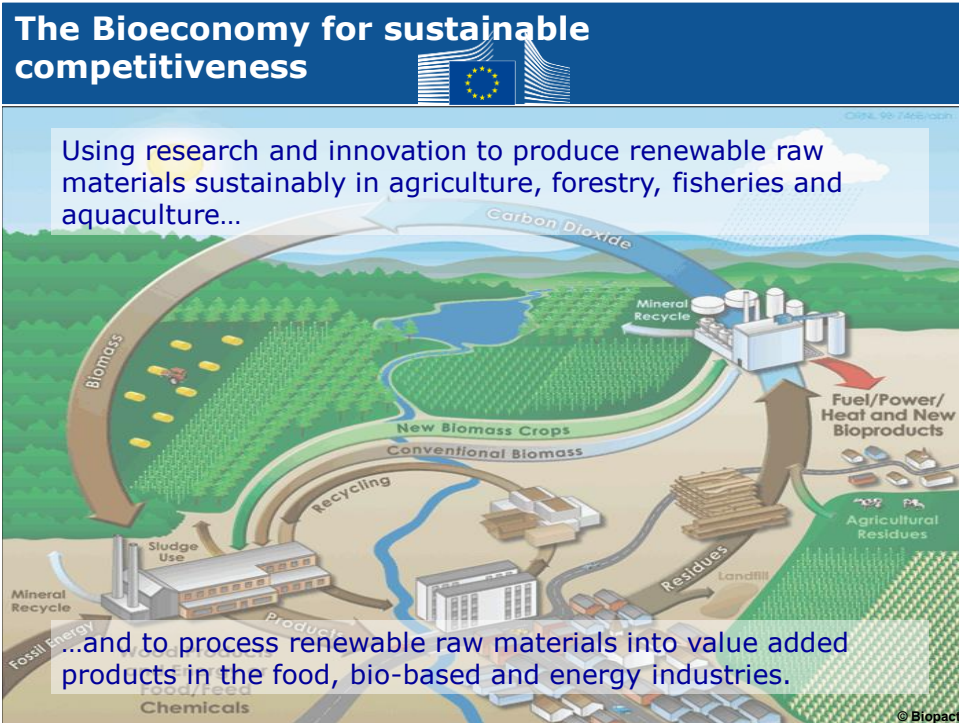
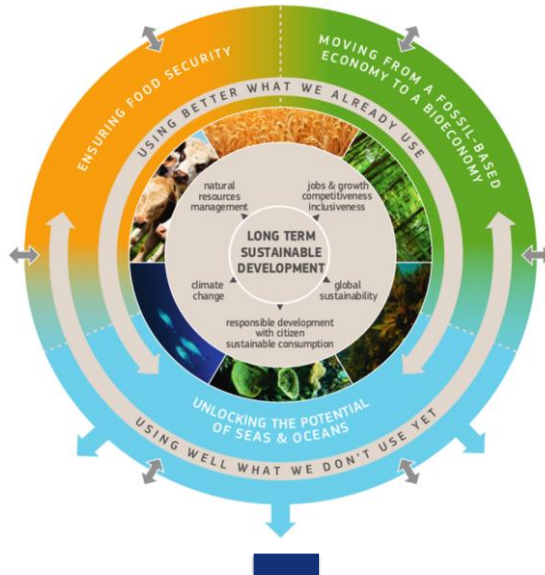
Content

EU Bioeconomy policies

***Research and Innovation:
Horizon 2020 and BBI JU***

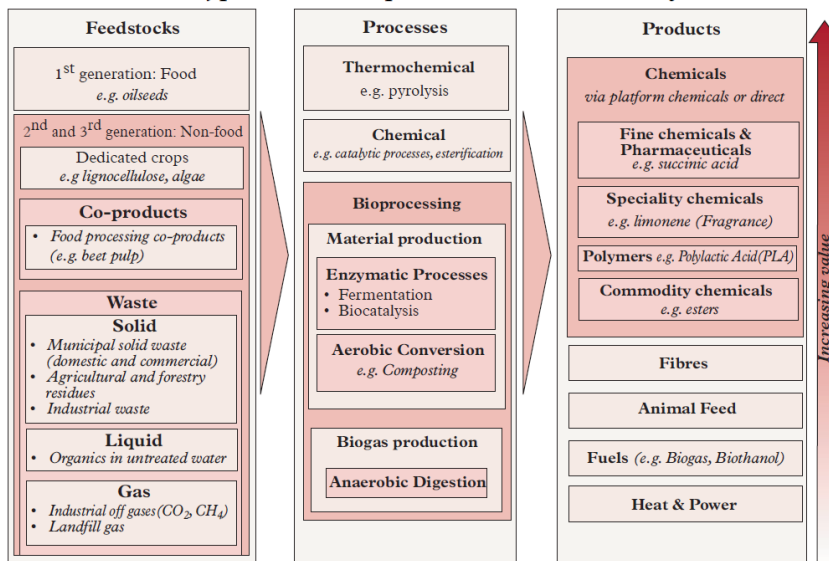
(Additional support beyond H2020 calls)







Feedstocks, processes and products in a bioeconomy



The Bioeconomy...

... is part of the circular post-petroleum economy

... has a huge potential for growth and jobs

... but is currently facing a hard time:

- low oil and gas prices
- strong competition with renewable energy
- high financial risks

... is not yet a sector, but at the cross-road between many different sectors

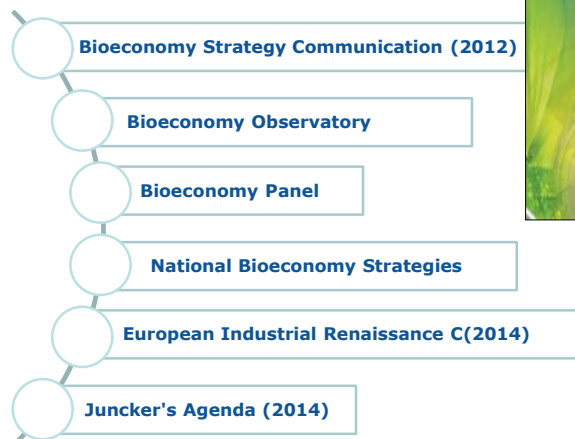


From bio-economy to bio-industry

- The EU bio-based industries sector has annual turnover of ~ 57 billion with 300,000 direct and indirect jobs
- Bio-based industries increase EU competitiveness through re-industrialisation and sustainable growth and strengthen rural economies
- Bio-economy has a huge potential for decarbonisation of the economy. How do we realise this potential?



2. EU Bioeconomy Policies





Bioeconomy Strategy – Enhancement of New markets in Bioeconomy Sectors (2012)

- **Establish a Public Private Partnership (PPP) on bio-based industries;** Promote the setting up of networks for integrated and diversified biorefineries;
- Sustainable intensification of primary production; improve understanding of biomass/biowaste availability and demand; develop **sustainability criteria/indicators and assessment approaches;**
- Support expansion of new markets, e.g. by developing **standards and labels for bio-based products; facilitate procurement for bio-based products;**
- Develop science-based approaches to inform consumers about product properties; encourage informed lifestyle choices.



Bioeconomy and the Junker's priorities (2014)



A new boost for jobs, growth and investment

- To mobilise up to € 300 billion in additional public and private investment in the real economy over the next three years.

A resilient Energy Union with a forward-looking climate change policy

- We need to diversify our energy sources, and reduce the high energy dependency of several of our Member States.

A deeper and fairer Internal Market with a strengthened industrial base

- We need to bring back industry's weight in the EU's GDP back to 20% by 2020 from less than 16% today.

A stronger global actor

- To combine national and European tools, and all the tools available to the Commission, in a more effective way than in the past.

A Union of democratic change

- Making the European Union as a whole more democratic.





Estonian strengths in the bioeconomy

Feedstock	<ul style="list-style-type: none">• Unused grass – over half of the grass cut is left unused (over 1 million tons dry matter)• Outstanding forestry resources
Life sciences	<ul style="list-style-type: none">• High level research potential in several fields of life sciences (Tartu, Tallinn)
Strategic thinking	<ul style="list-style-type: none">• Earlier strategies on biotechnologies and biomass• Drafting the National Bioeconomy Strategy



HORIZON 2020

Horizon 2020: Largest research and innovation programme globally

Research and Innovation



Societal Challenge 2 includes 'Bioeconomy'

2.4. Biobased industries and bioeconomy

Feedstock

- 2.4.1. Fostering a sustainable biomass supply and building new value chains

Biorefineries*

- 2.4.2 Optimising efficient processing through R&D and upscaling in large-scale demo/flagship biorefineries

Supporting market development

- 2.4.3 Developing markets for bio-based products and optimising policy frameworks

* Mainly implemented through the BBI-JU



Bio-Based Industries Joint Undertaking (BBI JU)

Public Private Partnership **supporting R&I for bio-based industries:**

- **Partners:** European Commission and Biobased Industries Consortium (BIC)
- **Budget:** € 3.705 billion (about 75% from industry)
- **Implementation:**
 - Principles of **openness, transparency and excellence**
 - Horizon 2020 rules for participation
- **Objectives:** At least **5 new bio-based value chains** for Europe based on **2nd generation/advanced biorefineries**.

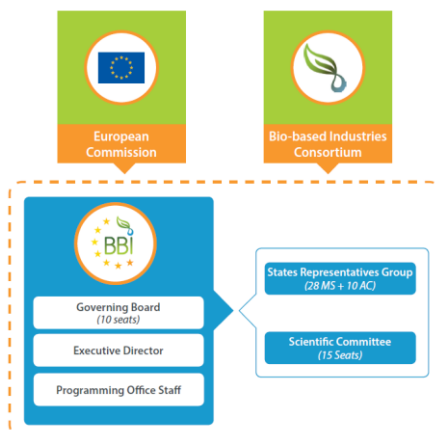
www.bbi-europe.eu





Bio-Based Industries Joint Undertaking (BBI JU)

Governance structure



Estonian in the States Representatives Group:

- Taavi KAND, Ministry of Rural Affairs
- (alternate) Argo SOON, Estonian Research Council

Council Regulation:

http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1402500920402&uri=OJ:JOL_2014_169_R_0008

Video of the BBI JU info day in Brussels on 21.4:

<https://webcast.ec.europa.eu/bio-based-industries-joint-undertaking-info-day>



Horizon 2020 – Activity 2.4. Sustainable and competitive bio-based industries

Call 2016 published on 19 April – Deadline 8 September 2016
See 'Research & Innovation Participant Portal'

Call: Bio Based Industries PPP

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-bbi-jti-2016.html#c.topics=callIdentifier/t/H2020-BBI-JTI-2016/1/1/1/default-group&callStatus/t/Forthcoming/1/1/0/default-group&callStatus/t/Open/1/1/0/default-group&callStatus/t/Closed/1/1/0/default-group&+identifier/desc>

BBI JU Annual Work Plan 2016 and the budget:

http://ec.europa.eu/research/participants/data/ref/h2020/other/wp/jtis/h2020-wp16-bbi_en.pdf

The proposal submission/evaluation of BBI JU is described in the 'Guide for Applicants' <http://www.bbi-europe.eu/sites/default/files/documents/BBI%20JU%20GfA%202016%20%282%29.pdf>





BBI 2016.R **Research** and Innovation actions

- R01: Valorisation of the organic content of **wastewater** as feedstock, contributing to the renewable circular economy
- R02: Develop consolidated bioprocesses for direct **fermentation** into bio-compounds for chemicals and materials
- R03: Improve control over microorganism growth in **bio-catalysis** operations in order to reduce/avoid contamination without antibiotics
- R04: **Flexible biorefining** technologies able to handle different feedstock, leading to new value chains or enlarging existing ones by using the same processing plant
- R05: Advanced biomaterials for smart **food packaging**
- R06: Bio-based alternatives to improve protection of **human health** and the environment

(continues)



BBI 2016.R **Research** and Innovation actions (continuation)

- R07: **Biopolymers** with advanced functionalities for high performance applications
- R08: Emerging technologies for conversion of the organic content of Municipal Solid **Waste** and improving waste-to-chemicals value chains
- R09: Exploiting **algae** and other aquatic biomass for production of molecules for pharma, nutraceuticals, food additives and cosmetic applications
- R10: Industrial **biotransformation** for the production of bio-based chemicals
- R11: Recover and **reuse enzymes** to reduce costs of existing industrial processes
- R12: Emerging technologies for separation and **purification** of fermentation products to obtain high grade bio-based molecules at industrial level





BBI-IA-DEMO Bio-based Industries Innovation actions – **Demonstration**

- D01: Improve sustainability of value chains based on **forest biomass** and increase productivity and profitability on supply side by adapting forests to climate changes
- D02: Improvement and adaptation of industrial **crop varieties** and novel sources of biomass to diversify biomass feedstock for biorefineries
- D03: Valorisation of **lignin** and other side-streams to increase efficiency of biorefineries and increase sustainability of the whole value chain
- D04: New and optimised **biorefinery approaches** enabling the creation of local value chains in underdeveloped or unexploited areas
- D05: Bio-based **polymers/plastic** materials with new functionalities for medical, construction, automotive and textile industries

(continues)



BBI-IA-DEMO Bio-based Industries Innovation actions – **Demonstration** (continuation)

- D06: Valorisation of the organic content of Municipal Solid **Waste** and contributing to the renewable circular economy
- D07: Optimise technical production routes to bio-based chemicals in bio- or chemo-**catalytic** processes
- D08: New sources of **proteins** for animal feed from co-products to address the EU protein gap
- D09: Biomass production on **unused land** for conversion into added-value products while 'boosting rural and industrial development'





BBI-IA-DEMO Bio-based Industries Coordination and Support actions

- S01: A **roadmap** for the chemical industry to a bioeconomy
- S02: Bioeconomy related open access **research infrastructure** and assessing its capabilities for industry driven development projects
- S03: Open-**innovation Platform** strengthening cooperation and joint development of bio-based industries and downstream sectors
- S04: Clustering and **networking** for new value chains



BBI-IA-DEMO Bio-based Industries Innovation actions – "Flagship**" actions**

- F01: Valorisation of by-products or **waste-streams** from the food processing industry into high added-value products for market applications
- F02: Converting bio-based feedstocks via chemical building blocks into **advanced materials** for market applications





BBI JU focus for action by the industry in 2017

The public contribution in the Annual Work Plan 2017 is around 79 M€.

The strategic orientations for 2017

1. Foster a sustainable biomass-feedstock supply to feed both existing and new value chains
2. Optimise efficient processing for integrated biorefineries
3. Develop innovative bio-based products for specific market applications
4. Create and accelerate the market-uptake of bio-based products and applications



Key takeaways

Bioeconomy concept is getting stronger in due to expected environmental, economic and social impacts, such as on jobs, climate change and food security.

It is part of important **EU Policies** such as circular economy, industrial renaissance and renewable energy and resource policies, also increasingly on **national level**, with research and innovation supported under...

...priorities of **Horizon 2020** – Societal Challenge 2 and in **complementary** industry-led programme **BBI JTI**

Framework conditions (e.g. standards, national policies and priorities, access to finance) need to be taken into account in order to deliver on the expectations of the Bioeconomy concept.



Thank you for your attention





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Horizon 2020 Access to Risk Finance - Basics

1) What support will be on offer?

- Risk-sharing (loans and guarantees); risk finance (equity)

2) For who or what?

- RDI-driven/ innovative SMEs & small midcaps
- Ambitious RDI projects (by companies, stand-alone projects, etc.)

3) To serve which purpose?

- Stimulate investment in R&D&I, notably by the private sector
- No market distortion: intervention only to address financing gaps (notably due to high risk), and as such help translate R&D results to the market

4) Key figures (2014-2020)

- 3bn€ from EU + 3 billion € from EIB group as risk buffers
- will result in total debt financing of > 24bn€ (of which >5.5bn€ for SMEs)
- expected overall economic impact incl. private investment = 48bn€





InnovFin Product Overview

SMEs	Mid-Caps	Large Caps	Advisory
InnovFin SME Guarantee (Guar.: 25K€ to 7.5 mio€)	InnovFin MidCap Guarantee (Guar.: 7.5 to 50 mio€)	InnovFin Large Projects (Loan: 25 to 300 mio€)	InnovFin Advisory
InnovFin SME Venture Capital	InnovFin MidCap Growth Finance (Loan: 7.5 to 25 mio€)		

- direct products** - EIB group is directly issuing a loan to a borrowing project (loan covers up to 50% of total project's costs)
- indirect products** - EIB group is offering (counter-)guarantees to an intermediary partner bank which then issues loans to borrowing projects ((counter-)guarantees cover up to 50% projects' costs)

Notes: "Guar." stands for guarantees & counter-guarantees; SMEs = SMEs and small Midcaps (= < 499 FTEs);
Link to flyersheets on InnovFin products: <http://www.eib.org/products/blending/innovfin/products/index.htm>



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Framework conditions: Regulatory barriers

Initiative InnovREFIT (Regulatory Fitness and Performance Programme)

- Favourable regulatory environment (EU and Member States)
- Access to and sustainability of biomass
- Market-pull measures
- Citizens and consumers expectations



Framework conditions: Access to finance

- **Guidelines on BBI-ESIF synergies** developed by BIC

- WHAT can be co-funded in a given project
- HOW to approach these synergies

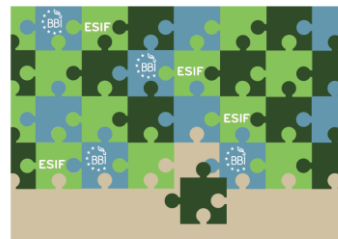
http://bbi-europe.eu/sites/default/files/documents/Guidelines_BBI_H2020.pdf

- **"Bioeconomy Investment Summit" in Brussels** on 9-10 November 2015 organized by the European Commission

Registration is free - will open by summer's end
http://ec.europa.eu/research/bioeconomy/news-events/news/20151109-programme_en.htm

Combining BBI (H2020) and European Structural and Investment Funds (ESIF) to deploy the European bioeconomy

- Guiding principles -



A PUBLIC-PRIVATE PARTNERSHIP
ON BIO-BASED INDUSTRIES

 Bio-based Industries
Consortium





Horizontal aspects related to bioproduct market



Standards bio-based products

The Commission submitted four mandates to the European standards bodies that were all accepted: Elaboration of a standardization programme for bio-based products, **bio-based polymers**, **bio-lubricants**, **bio-solvents** and **bio-surfactants**, development of horizontal standards for bio-based products.

European Standards and other standardization deliverables have been developed, or are being developed such as:

- ✓ Sustainability aspects (Final EN 16751 expected mid-2016)
- ✓ Life Cycle Assessment (Final EN 16760 expected mid-2016)

FP7 projects Open-Bio and KBBPPS are carrying out pre- and co-normative research **supporting the mandated work in CEN TC 411 'bio-based products'**.

<http://www.cen.eu/work/areas/chemical/biobased/Pages/default.aspx>





Labelling bio-based products

The **EU Eco-label** is a voluntary scheme that provides producers an opportunity to market their products or services with the label of environmental excellence provided that they fulfil the criteria on environmental performance. The aim is to distinguish the products that are among the best 25% performing products taking into account the most important environmental impacts.

An EU ECO-label on bio-lubricants is available & has been updated including also quantitative levels of bio-based contents

The formulated product shall have a **carbon content derived from renewable raw materials** that shall be:

- ≥ 50 % (m/m) for Category 1 - hydraulic fluids & tractor transmission oils
- ≥ 45 % (m/m) for Category 2 - greases & stern tube greases;
- ≥ 70 % (m/m) for Category 3 - chainsaw oils, concrete release agents, wire rope lubricants, stern tube oils & other total loss lubricants;
- ≥ 50 % (m/m) for Category 4 - two-stroke oils;
- ≥ 50 % (m/m) for Category 5 - industrial & marine gear oils.

Commission Decision 2011/381/EU on establishing the ecological criteria for the award of the EU Ecolabel to lubricants



Green Public Procurement

- A **voluntary instrument**, with key role to play in the EU's efforts to become a more **resource-efficient economy**. It can help stimulate a critical mass of demand for **more sustainable goods and services** which otherwise would be difficult to get onto the market. GPP is therefore a strong stimulus for **eco-innovation**.

- Aims at **Europe's public authorities**, who are major consumers, to use their purchasing power to choose environmentally friendly goods, services and works

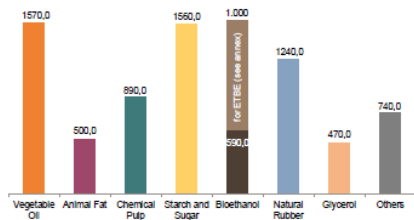
- Needs **clear and verifiable environmental criteria** for products and services. A number of European countries already have **national criteria**, and the challenge now, as GPP becomes more widespread, is to ensure that the criteria are compatible between Member States. A **level playing field** will boost the single market, ensuring that what is good for the EU is also good for the environment.

The Commission included Renewable raw materials (RRMs), biopolymers for packaging & other bio-based products (especially bio-based cutlery for large events because of a positive LCA) now also as part of the possible criteria into different GPP toolkits.





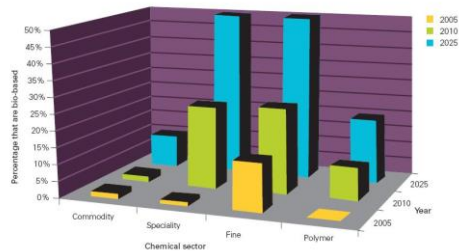
Renewables volume ktonnes,
EU chem. industry, 2011



- ✓ A total of 8.6 million tonnes per year of renewable raw materials is used in European chemical production
- ✓ The renewable share of the European chemical industry's raw material use thus amounts to 9% in 2011.

Source: CEFIC 2014

Market penetration bio-based
chemicals in world production



Projected bio-based chemicals in 2025's production

- ✓ more than 5% commodity
- ✓ almost half of speciality and fine chemical
- ✓ more than 15% polymer

Source: IB 2025, BERR 2009