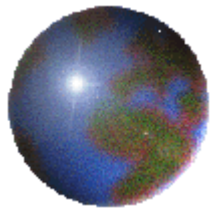


Fabbrica del Futuro
Bologna, Fondazione Golinelli, 25 Marzo, 2022



The Sustainable Bioeconomy in Europe and in Italy

Fabio Fava

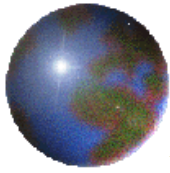
“National Bioeconomy Coordination Board”, CNBBSV, Presidency of Council of Ministers

Public Private Partnership “Circular Biobased Europe JU”; «European Bioeconomy Policy Forum», European Commission, Brussels

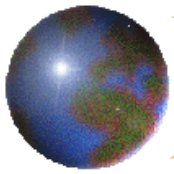
&

Alma Mater Studiorum-Università di Bologna, Italy

(E-mail: fabio.fava@unibo.it)



Our space-ship Earth

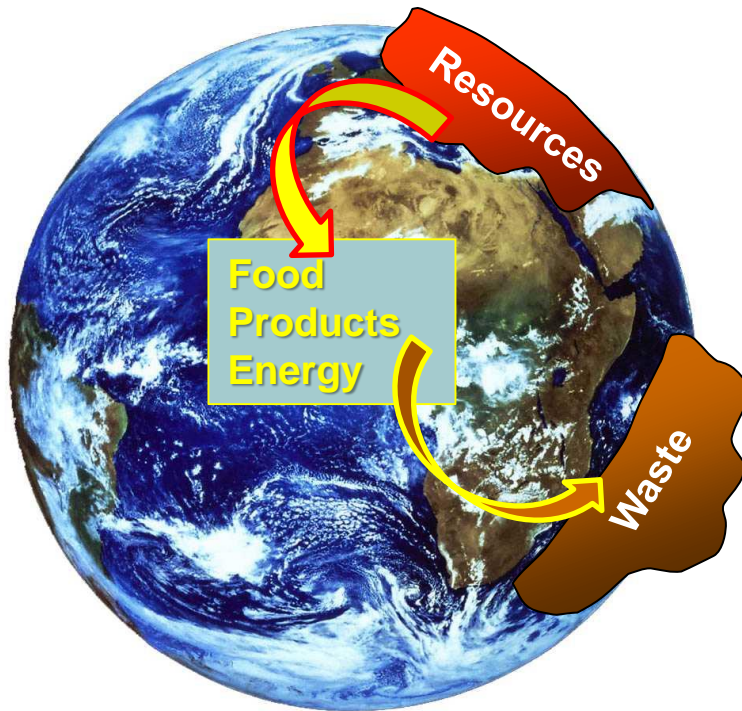


Space-ship Earth (a)

Passengers: 7.75 billions

but.....

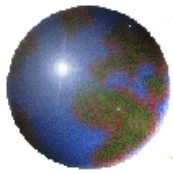
they will be 8 billions in 2025
and 9 billions in 2050
(UN 2018)



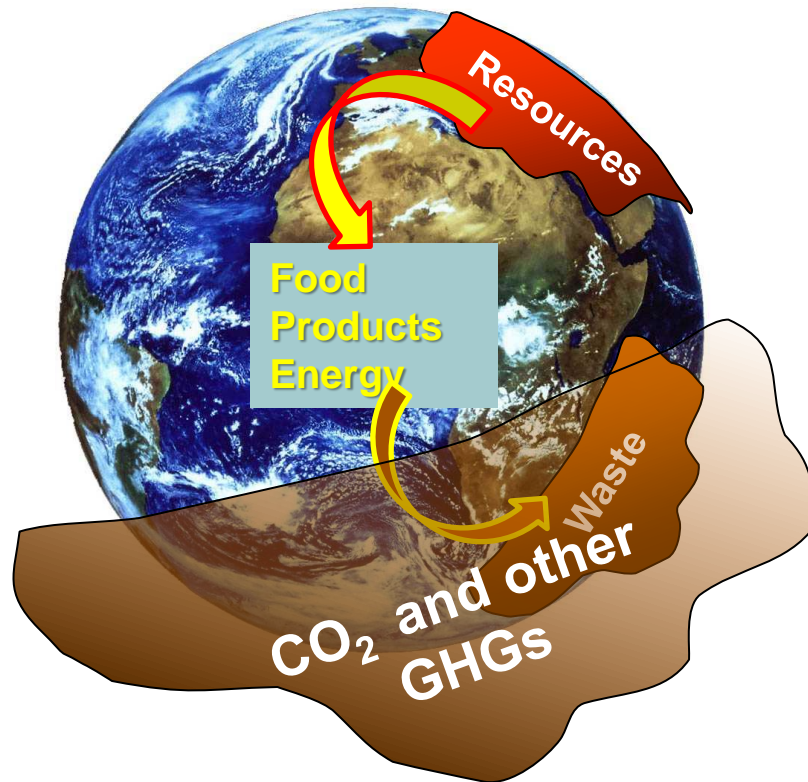
The Earth is only one and
has a finite amount of
resources and a confined
space for storing waste.....

...and the resource
availability and use,
population growth and
consumption habits are
different upon the
continents

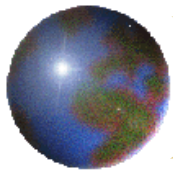
After Vincenzo Balzani, 2016



Space-ship Earth (b)



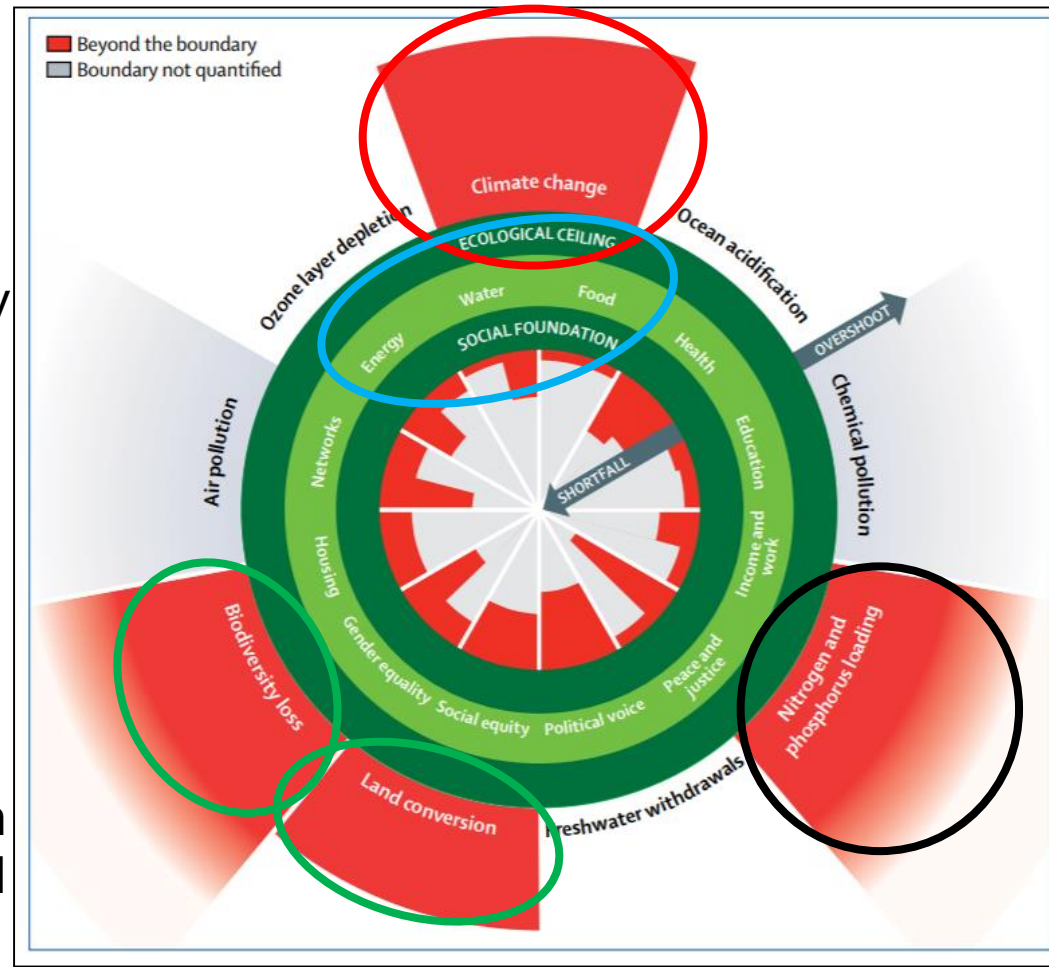
After Vincenzo Balzani, 2016



Need for a wider ecological transition

Global consumption of raw materials and annual waste generation are expected to increase by 100 and 70%, respectively, by 2050.

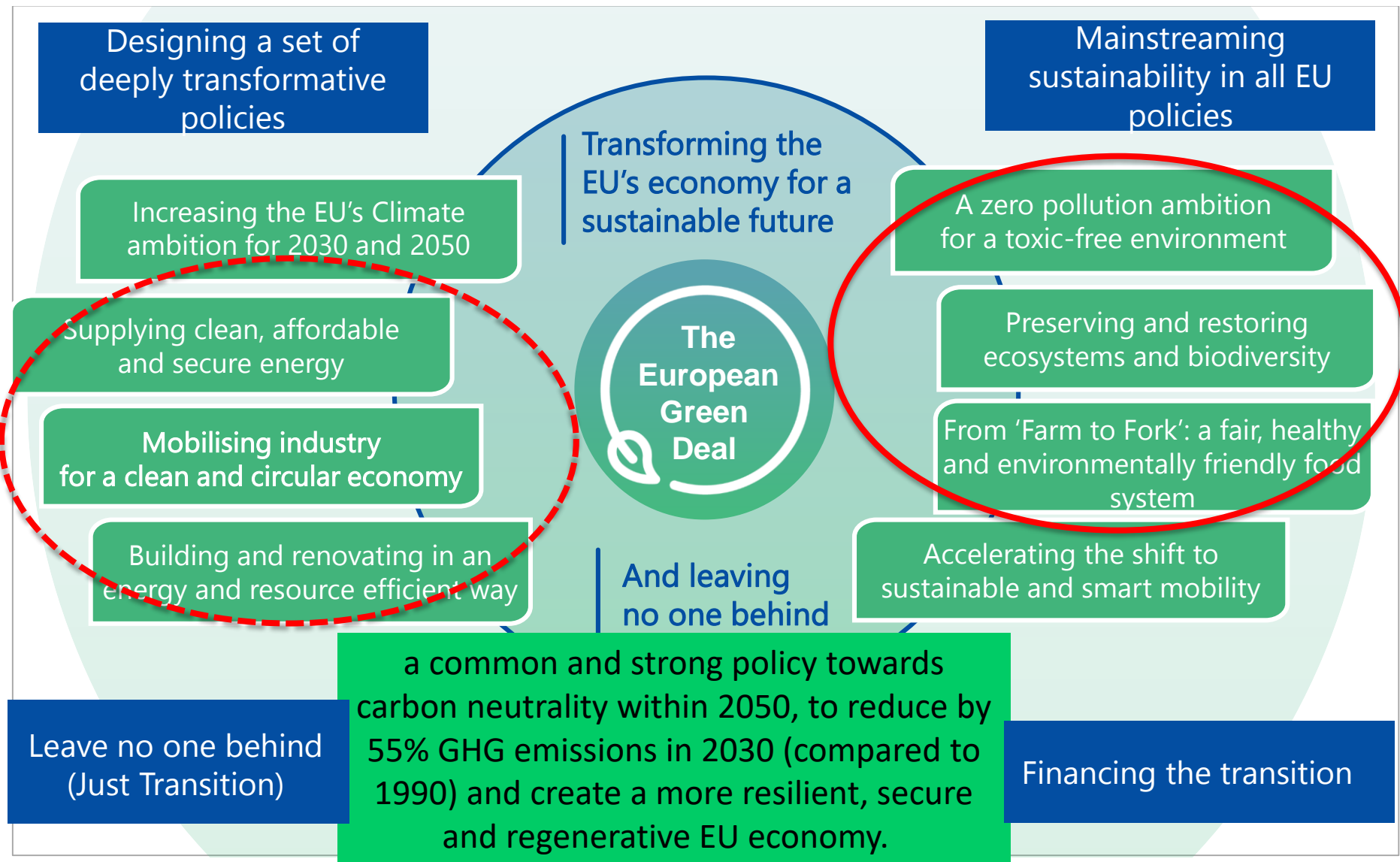
Half of total greenhouse gas emissions and more than 90% of biodiversity loss and water stress come from resource extraction and processing.



K.Raworth.
A Doughnut for the Anthropocene: humanity's compass in the 21st century, 2017.

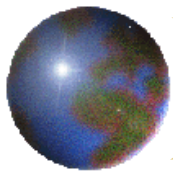
[www.thelancet.com/pdfs/journals/lanphl/PIIS2542-5196\(17\)30028-1.pdf](http://www.thelancet.com/pdfs/journals/lanphl/PIIS2542-5196(17)30028-1.pdf)

The European Green Deal

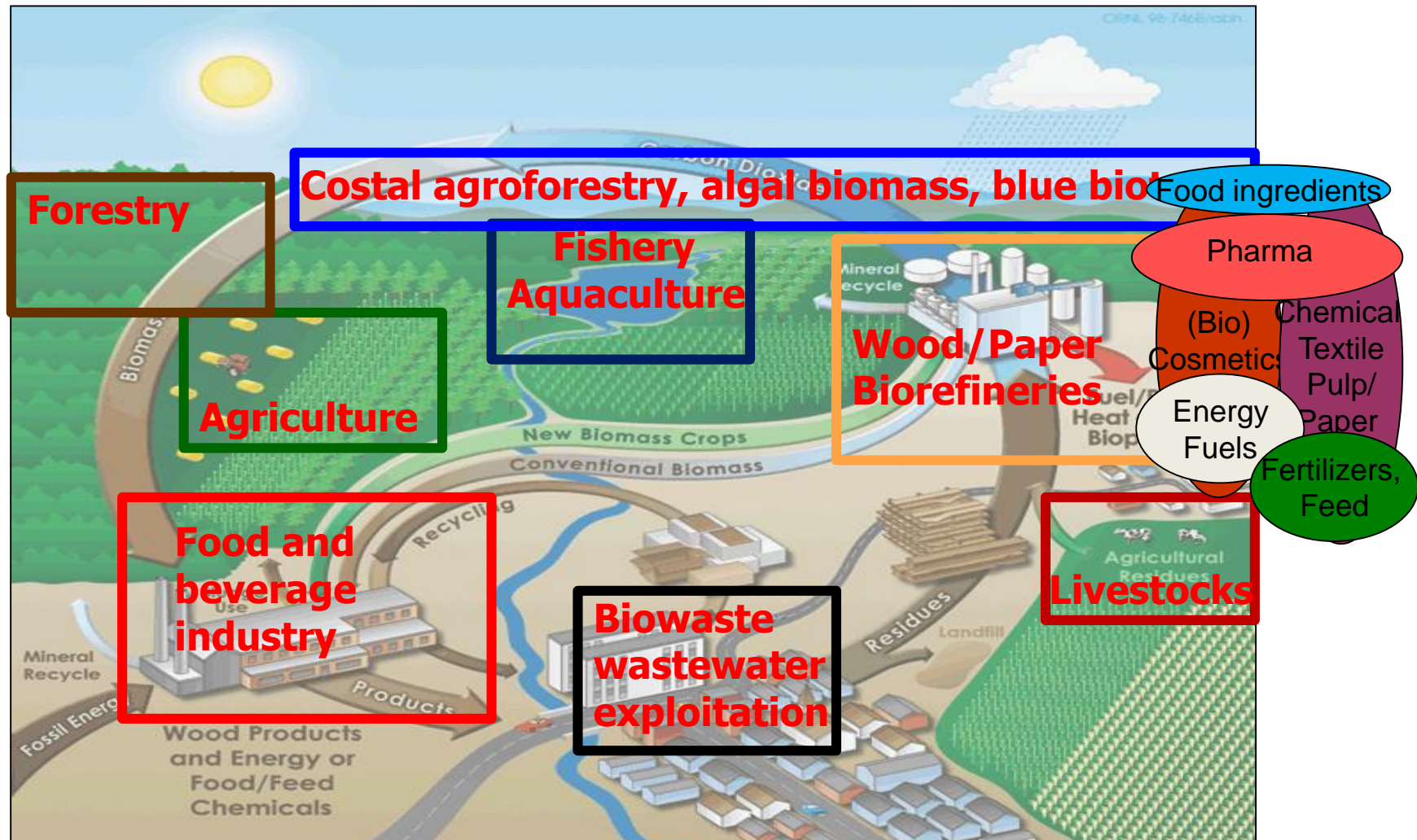




Bioeconomy in Europe and in Italy: its relevance, implementation and impacts



The EU Bioeconomy landscape



EU: $\approx 2,400$ Bln €/y and 18,5 Mln of jobs (2018)

Environmental and social benefits, for sustainable/regenerative/inclusive growth



Other Bioeconomy benefits

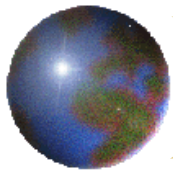
Environmental benefits

- Assimilates CO₂ via the “metabolisms” of forests, oceans and seas and soils;
- Produces chemicals and materials from non food biomass/biowaste with lower CO₂ emissions;
- Disposes sustainably impacting bio-waste and wastewater producing clean water, bio-products and organic matter to be used for restoring soils;
- Produces biodegradable products and plastics, preventing their accumulation in the environment and delivering organic carbon to the soil;
- Restores biodiversity and ecosystems, regenerates forest, rural, coastal and former industrial areas, preventing/containing future epidemics.

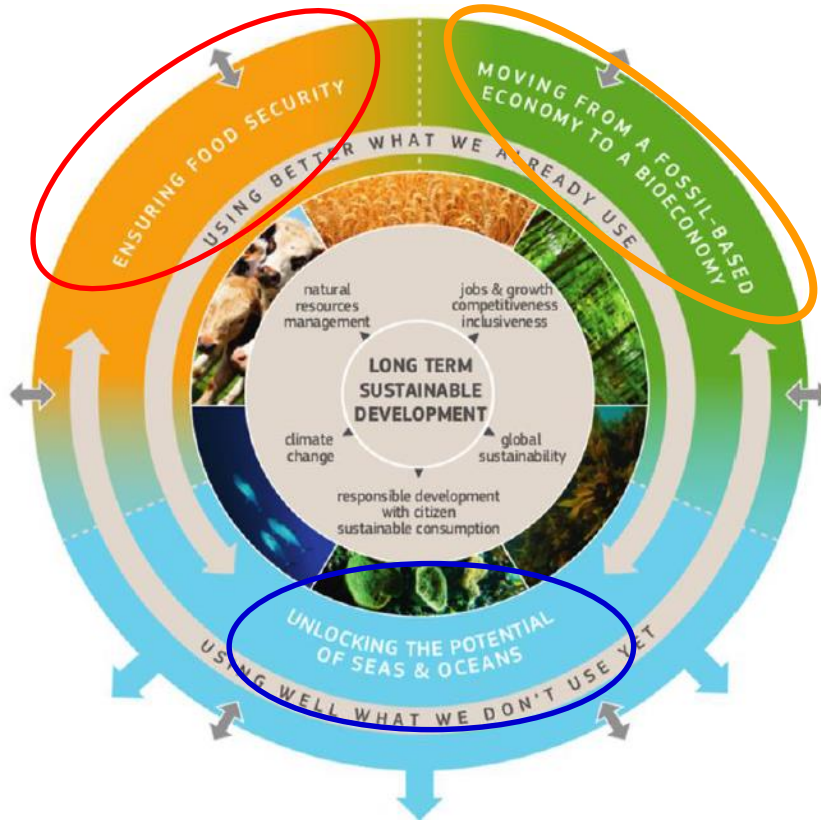
Social benefits

- Produces food, and for all, along with clean water and essential products;
- Guarantees healthy ecosystems services;
- Creates new jobs in rural and costal areas and abandoned lands.

Finally, it **displays high resilience**, given its value chains long and deeply routed in the territories.



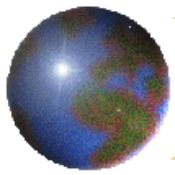
The 2012 European Bioeconomy Strategy



- Productive and resource-efficient primary production systems
- Sufficient supplies of safe and high quality food and bio-based products, including bioenergy
- Competitive and low carbon value chains.

Innovating for Sustainable Growth
A Bioeconomy for Europe

<http://bookshop.europa.eu/en/innovating-for-sustainable-growth-pbKI3212262/>



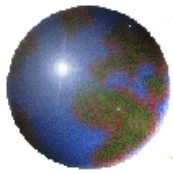
Bioeconomy in Horizon2020 (2014-2020)

Societal challenges



**Tackling
societal
challenges
for a better
society**

1. Health, demographic change and wellbeing (7.472 Bln)
2. Food security, sustainable agriculture and forestry, marine and maritime and inland water research, and the bioeconomy (3.851 Bln)
3. Secure, clean and efficient energy (5.931 Bln)
4. Smart, green and integrated transport (6.339 Bln)
5. Climate action, resource efficiency and raw materials (3.081 Bln)
6. Inclusive, innovative and reflective societies (1.310 Bln)
7. Secure societies (1.695 Bln)



Bioeconomy in Horizon2020 (2014-2020)

R&I funded:



**Agriculture
and
forestry**

**Agri-food
sector for
a safe and
healthy
diet**

**Aquatic
living
resources**

**Bio-based
industries**

**Marine
and
maritime
research
innovation**



A Public-Private Partnership on Bio-Based Industries



Realising the European Bio-economy Potential

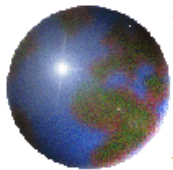
€ 3.3 Bilion 2014-2020

Supported by



<http://www.bbi-europe.eu/>

 Bio-based Industries
Consortium



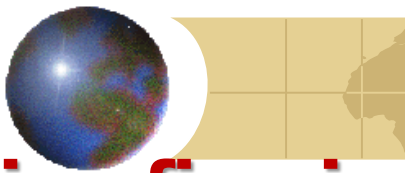
BBI JU actions in Europe: 2014-2020

~140 projects; ~ € 800 Mln EC + 2.5 Bln private contribution, SMEs 40% among beneficiaries

14 FLAGSHIPS

> 3.300 direct jobs
> 10.000 indirect jobs
Total Grant: € 272 million
€1.8 billion private investment



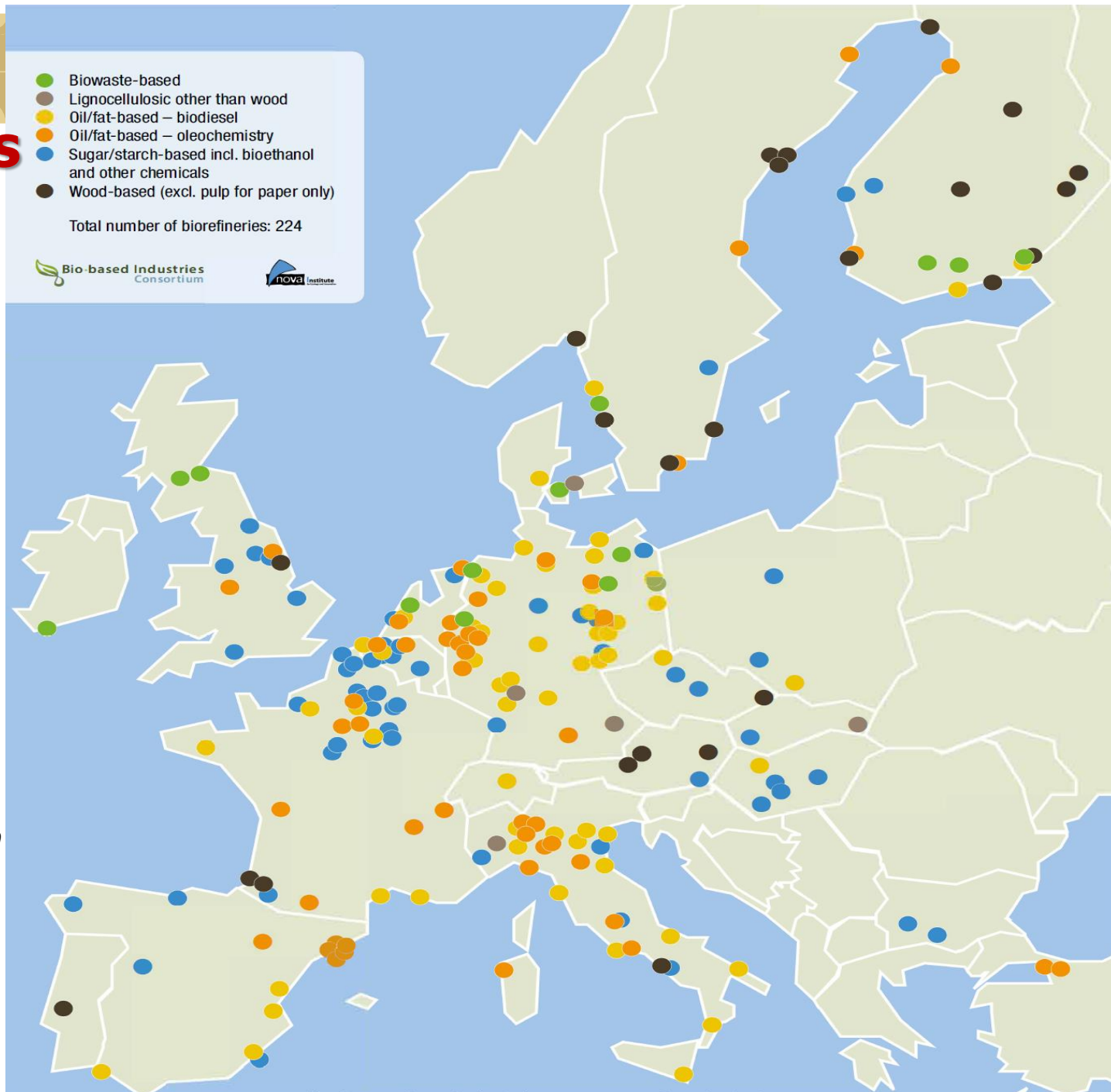


Biorefineries in Europe

- Biowaste-based
- Lignocellulosic other than wood
- Oil/fat-based – biodiesel
- Oil/fat-based – oleochemistry
- Sugar/starch-based incl. bioethanol and other chemicals
- Wood-based (excl. pulp for paper only)

Total number of biorefineries: 224

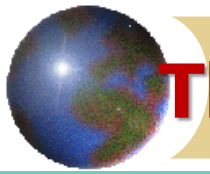
Bio-based Industries
Consortium



224 in Europe

**€ 300 Bln/y
turnover
1.44 Mln jobs**

*After BBI JU & Nova
& JRC, 2020*



The updated European Bioeconomy strategy



Brussels, October 22, 2018

<https://ec.europa.eu/research/bioeconomy/index.cfm?pg=policy&lib=strategy>

Rapidly deploying bioeconomies across Europe:

- set up an EU Bioeconomy Policy Support Facility for EU countries to develop **national/regional agendas;**
- **launch pilot actions** for the development of bioeconomies **in rural, coastal and urban areas, interconnecting the sectors.**

Scaling up and strengthening the bio-based sectors via a €100 million **Circular Bioeconomy** Thematic Investment Platform.

Protecting the ecosystem and understanding the **ecological limitations of the bioeconomy**

Horizon Europe (€ 95.5 Bln, 2021-27)



Pillar 1 Excellent Science

European Research Council

Marie Skłodowska-Curie
Actions

Research Infrastructures



Pillar 2 Global Challenges and European Industrial Competitiveness

Clusters

- Health
- Culture, Creativity and Inclusive Society
- Civil Security for Society
- Digital, Industry and Space
- Climate, Energy and Mobility
- Food, Bioeconomy, Natural Resources, Agriculture and Environment

Joint Research Centre



Pillar 3 Innovative Europe

European Innovation Council

European innovation
ecosystems

European Institute of
Innovation
and Technology

Widening Participation and Strengthening the European Research Area

Widening participation and spreading excellence

Reforming and Enhancing the European R&I system

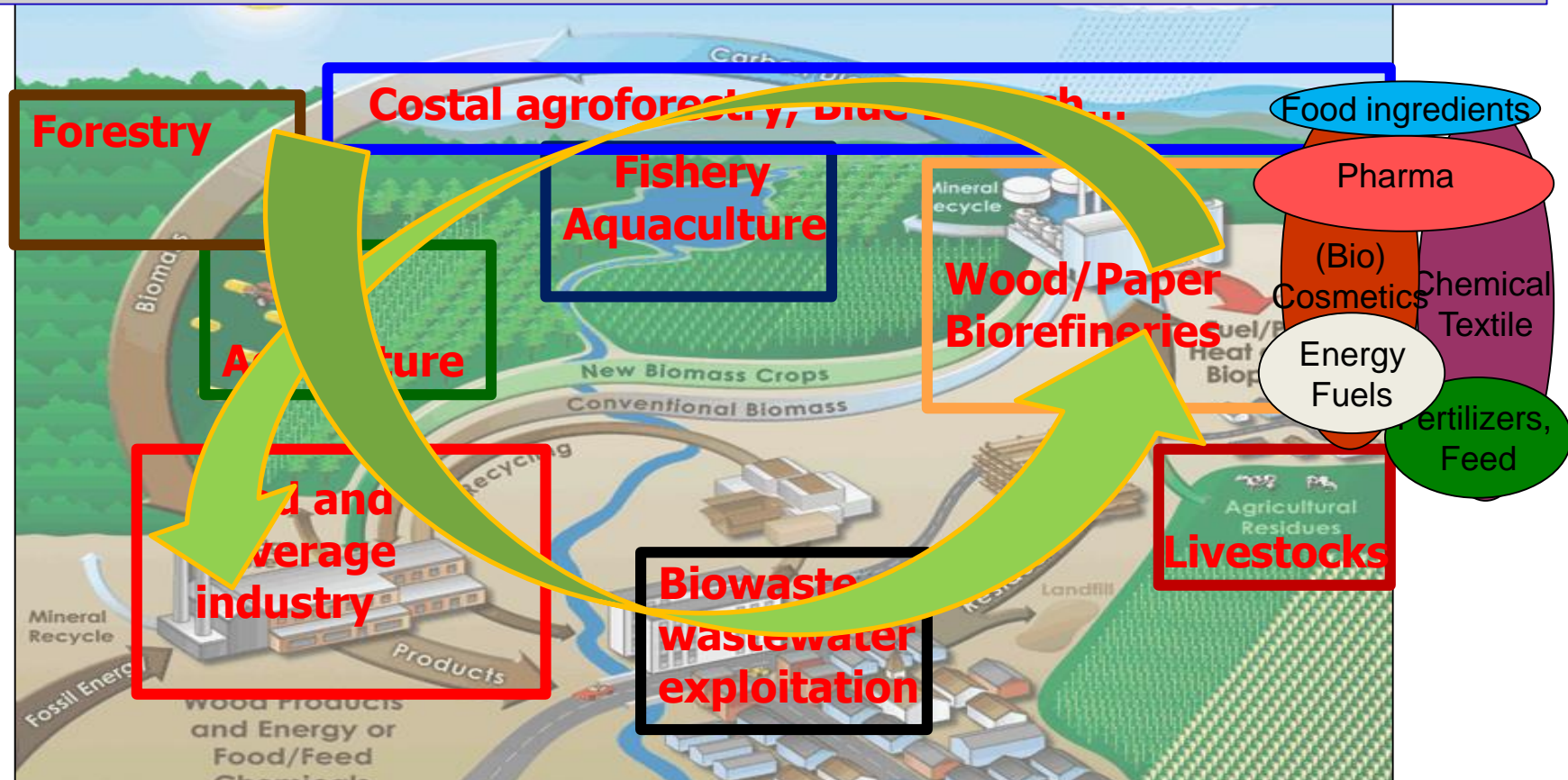
MISSIONS: Healthy Oceans Seas, Coastal and inland waters; Soil Health and Food

PARTNERSHIPS: biodiversity, agro-ecology & living-labs, agro-digitalization, water4all, animal health, sustainable food systems, blue economy, Circular Bio-based EU

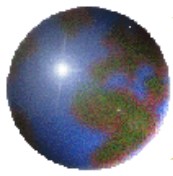


The Italian Bioeconomy landscape

Agriculture, 13M ha, 90% in rural areas; Abandoned land, 2M ha; **Food&Drink companies**, 58,000, 88% with < 9 employees; **Forestry**, 12M ha, poorly exploited; **Coastline**, 8,000 km, poorly exploited; **Cities**, 8,000...



In Italy: 330 Bil €/y, 2.0 Mil of jobs (2017) +1.8% (2018, 2019) -6.5% (2020)
In EU: 3rd turnover/jobs, often 2nd as presence in H2020 SC2 & BBIJU funded projects,
1st Biodiversity richness and number of quality products (DOP, IGP, etc)



IT Bioeconomy strategy (BIT II, 2019) & Implementation Action Plan (2021)



http://cnbbsv.palazzochigi.it/media/1774/bit_en_2019_02.pdf

“National Bioeconomy Coordination Board” CNBBSV, Presidency of Council of Ministers

Launched in March 2019 and confirmed with a decree in Jan. 2021 (with a 3 years mandate).



LA BIOECONOMIA CIRCOLARE: SUO RUOLO PER LA RIPRESA ECONOMICA, SOCIALE, SANITARIA ED AMBIENTALE DEL PAESE

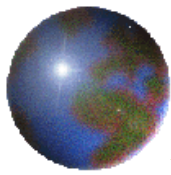
July, 2020

http://cnbbsv.palazzochigi.it/media/1958/bioeconomiecircolare_ripresapaese_cnbbsv_watermark-logged.pdf

Current formal composition:

- Min. Agriculture, Food, Forestry Policies;
- Min. Ecological transition;
- Min. Economical Develop.;
- Min. University & Research;
- Min. Education;
- X and XI Conferences of 21 Regions & Provinces;
- Agency territorial cohesion;
- Institute for Environmental Protection and Research;
- SVIMEZ;
- Italian Technology Clusters: Circular Bioeconomy SPRING, AgriFood CLAN, BlueGrowth BIG.

<http://cnbbsv.palazzochigi.it/en/areas-of-work/bioeconomy/>



BIT II IAP (2020-25) & recovery actions (a)

IMPLEMENTATION ACTION PLAN (2020-2025) FOR THE ITALIAN BIOECONOMY STRATEGY BIT II



January, 2021

Presidenza del Consiglio dei Ministri
CNBSV

<http://cnbbsv.palazzochigi.it/en/areas-of-work/bioeconomy/strategies-and-implementation-action-plan/>

NATIONAL FLAGSHIPS (investment: ~€2 Bln, ~50% from the private partners)

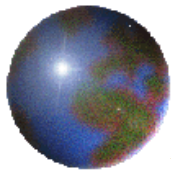
FLAGSHIP 1 – Creation of regional value chains (rural and costal areas) interconnected with multi-inputs and multi-products biorefineries (cluster SPRING)

FLAGSHIP 2 –Revamping of existing and novel infrastructures for the recovery and integrated valorization urban biowaste and wastewater/sludges (Cluster SPRING)

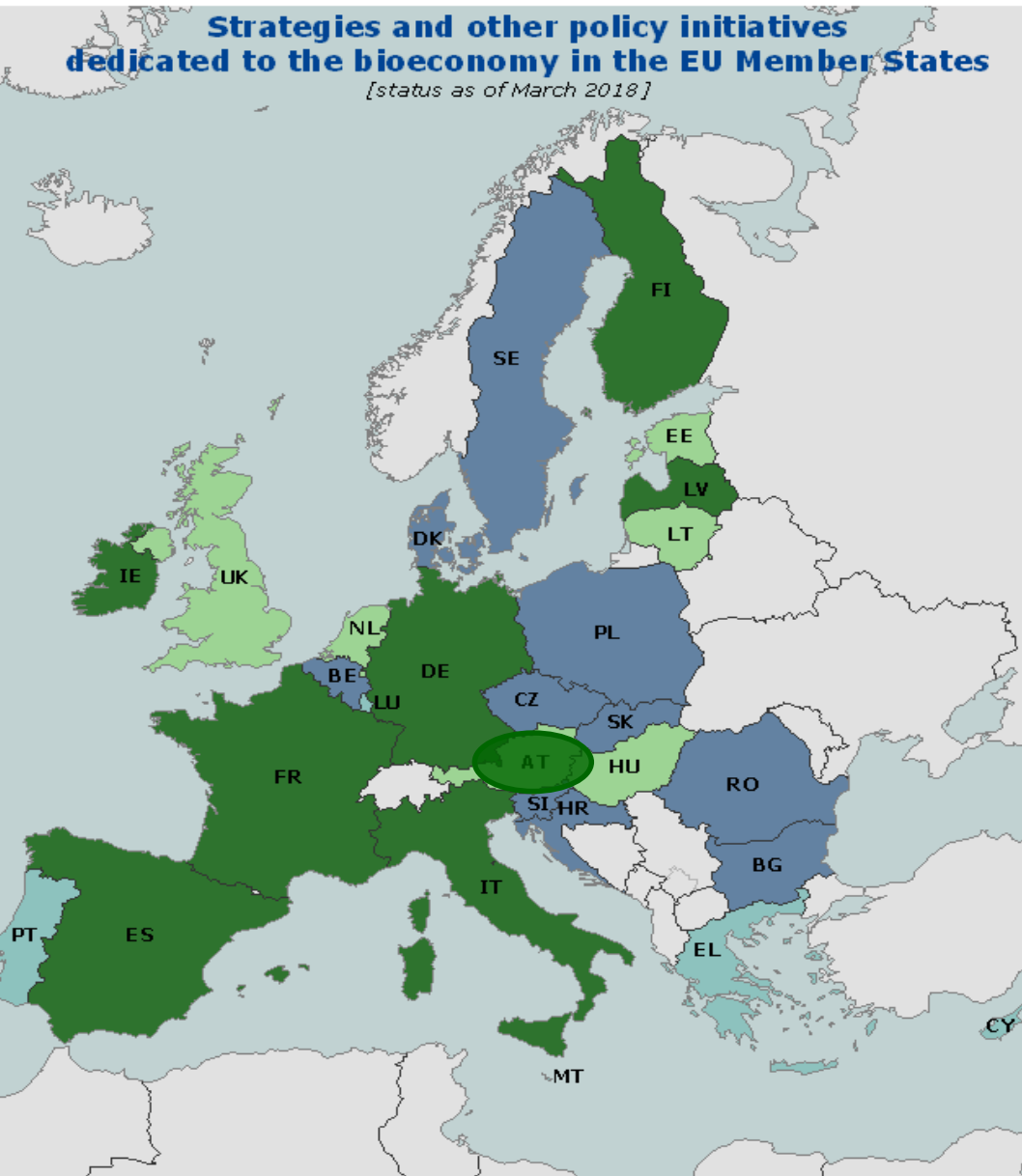
FLAGSHIP 3 – Reconversion of industrial sites/refineries in crisis through the bioeconomy (cluster SPRING)

FLAGSHIP 4 – More sustainable fishery and aquaculture also via the restoration of the marine ecosystems, in the Adriatic-Ionian macro region (cluster BIG)

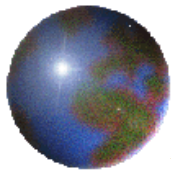
FLAGSHIP 5 – Circular and sustainable agro-food chains in the wine and meat production sectors (cluster CLAN)



The European MS Bioeconomy strategies



- **10MS** have a dedicated bioeconomy strategy (dark green)
- **5 MS** in the process of developing a strategy (Estonia, Hungary, Lithuania, the Netherlands, Sweden)
- **11 CEE MS** plan to develop one under the **Bioeast initiative** (Bulgaria, Croatia, Czechia, Hungary, Poland, Romania, Slovakia, Slovenia, Estonia, Lithuania, Latvia)
- **>50 regions** have a bioeconomy-related strategy. Almost all foresee R&I in their RIS3 (*CoR Opinion*)
- **Only a few cities have bioeconomy-related priorities in their policies**



The European Bioeconomy Policy Forum

- ✦ Launched 12 November 2020 (as an Action 2.3 of EU Bioeconomy Strategy)
- ✦ Complex policy landscape – forum for dialogue, Policy feedback: MS ↔ EU
- ✦ Support MS to deliver on EU Green Deal & leverage Recovery Fund
- ✦ Institutional cooperation: EuCom, Eu Parliament, Com Regions, Eu Econ Soc Com

Support **networking**
& **interaction** at MS
level

Enhance
cooperation & **best**
practice exchange

Shape a concrete
agenda of **joint**
actions

Increase the **visibility**
and **potential** of the
bioeconomy at EU &
MS level

Enable **policy**
feedback & analysis
in MS and the EU

Common
Position Papers

Policy Papers

Strategic
recommendations
& priorities

Best practice
case studies

Consultation
feedback

Meeting reports

Commission Expert Group to help implementing the Bioeconomy Policy Support Facility

Thank You!