Forest-based sector and bioeconomy in the EU

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The European Commission's science and knowledge service

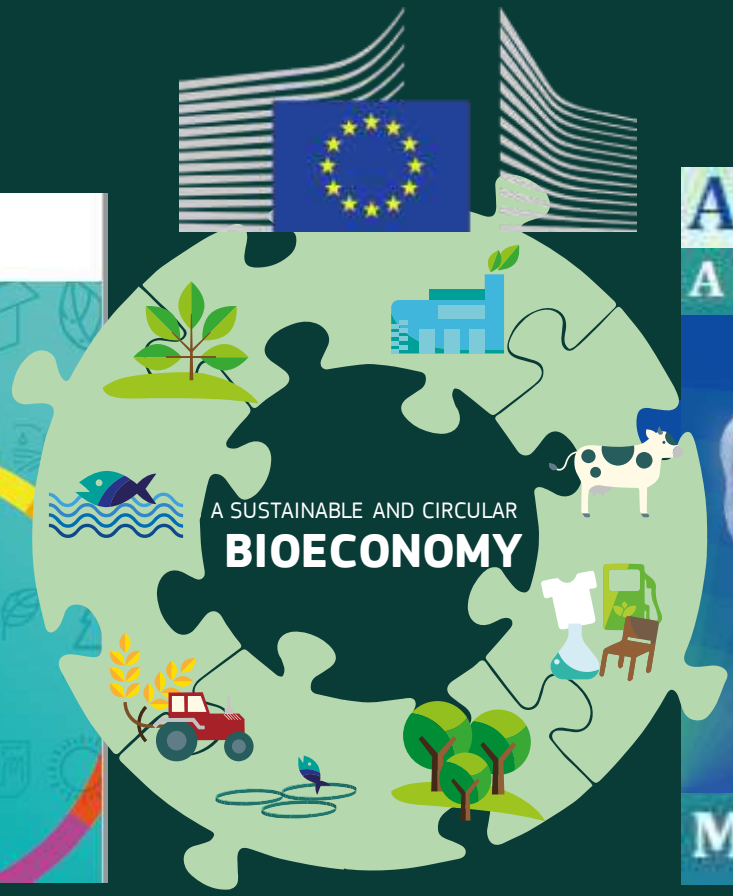
Joint Research Centre

SW4SW Workshop on Wood products in the sustainable bioeconomy

Rome, FAO HQ, 10-11.12.2019

European Commission

Policy context



Ensuring there is enough food for a growing population

Mitigating and adapting to climate change

Reducing our dependence on non-renewable resources

Strengthening European competitiveness and creating jobs

Managing our natural resources in a sustainable way

EU Bioeconomy strategy

2012: **Bioeconomy Strategy and Action Plan**

EC Communication (COM(2012)60)

2017: **Review of the Bioeconomy Strategy**

SWD(2017)374

2018: **Updated EU Bioeconomy Strategy and Action Plan**

(COM(2018)673 & SWD(2018) 431)

Implementing the European Bioeconomy Strategy

Bioeconomy Strategy

1 STRENGTHEN AND SCALE-UP THE BIO-BASED SECTORS, UNLOCK INVESTMENTS AND MARKETS

2 DEPLOY LOCAL BIOECONOMIES RAPIDLY ACROSS EUROPE

3 UNDERSTAND THE ECOLOGICAL BOUNDARIES OF THE BIOECONOMY

- **Enhance knowledge** on bioeconomy
- **Monitor progress** towards a sustainable bioeconomy
- **Promote good practices** to operate the bioeconomy within **safe ecological limits**
- **Enhance the benefits** of biodiversity in **primary production**

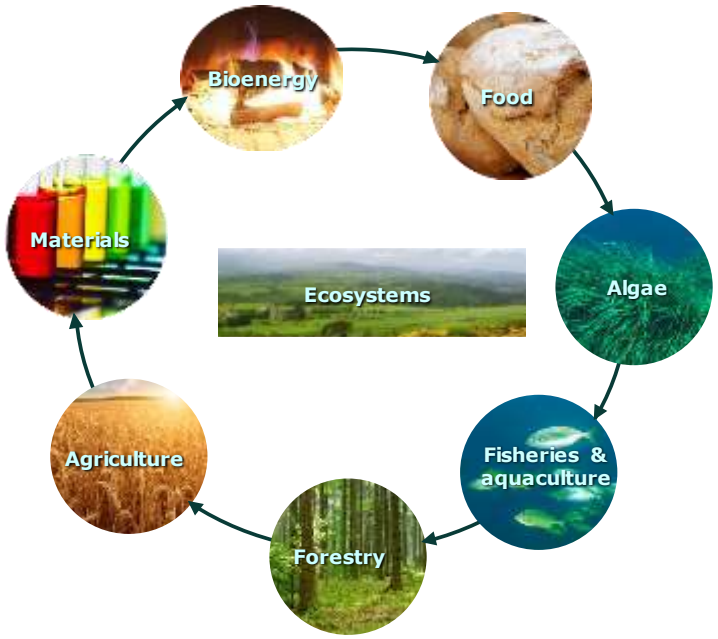
JRC leading

Knowledge Centre for Bioeconomy

European Commission

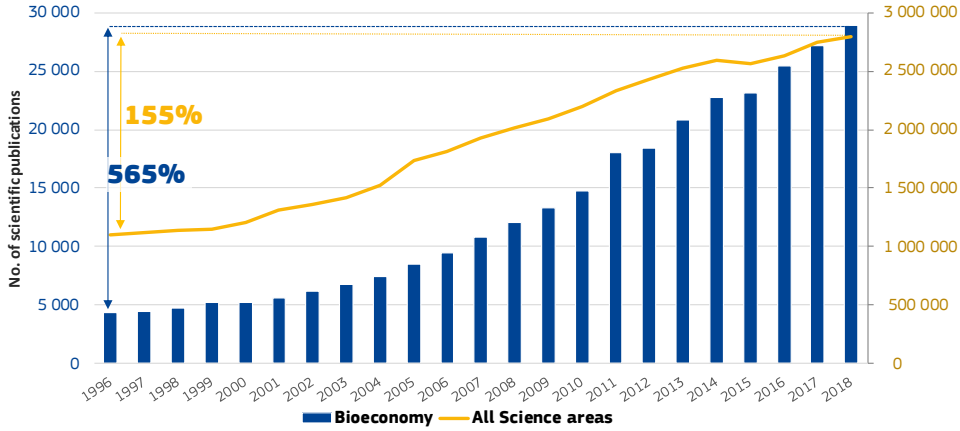
Knowledge Centre for Bioeconomy (KCB): why?

Cross-sectorial



Cross-policy

Increasing knowledge



3 UNDERSTAND THE ECOLOGICAL BOUNDARIES OF THE BIOECONOMY

Enhance knowledge on bioeconomy

Monitor progress towards a sustainable bioeconomy

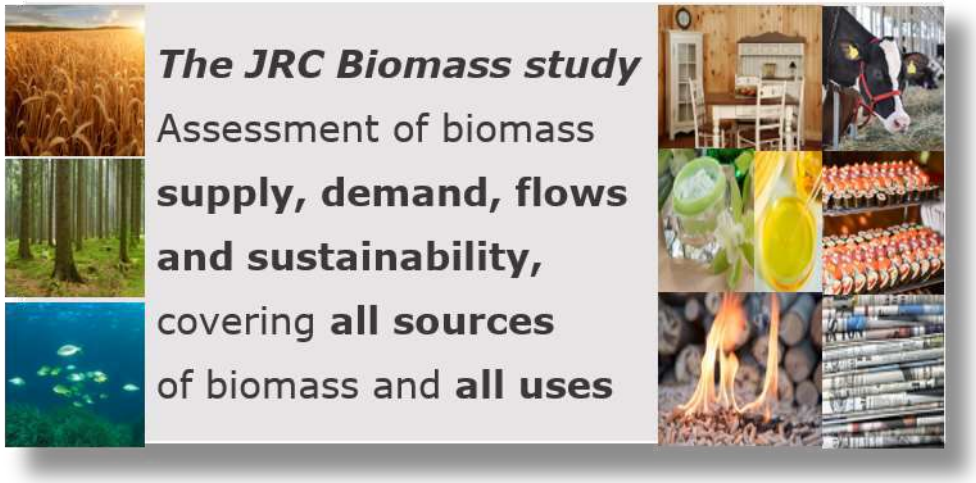
Knowledge Centre for Bioeconomy

JRC support to the EU bioeconomy strategy

Knowledge Centre for Bioeconomy

- Bringing together **knowledge** and **experts** from within and outside the EC
- **One-stop-access** to data, knowledge and intelligence on bioeconomy

https://ec.europa.eu/knowledge4policy/bioeconomy



- **To provide the knowledge-base and forward looking capacity on bioeconomy.** The Biomass assessment study
- **To monitor the progress** of the EU bioeconomy covering all sustainability dimensions and within the overarching framework of the SDGs

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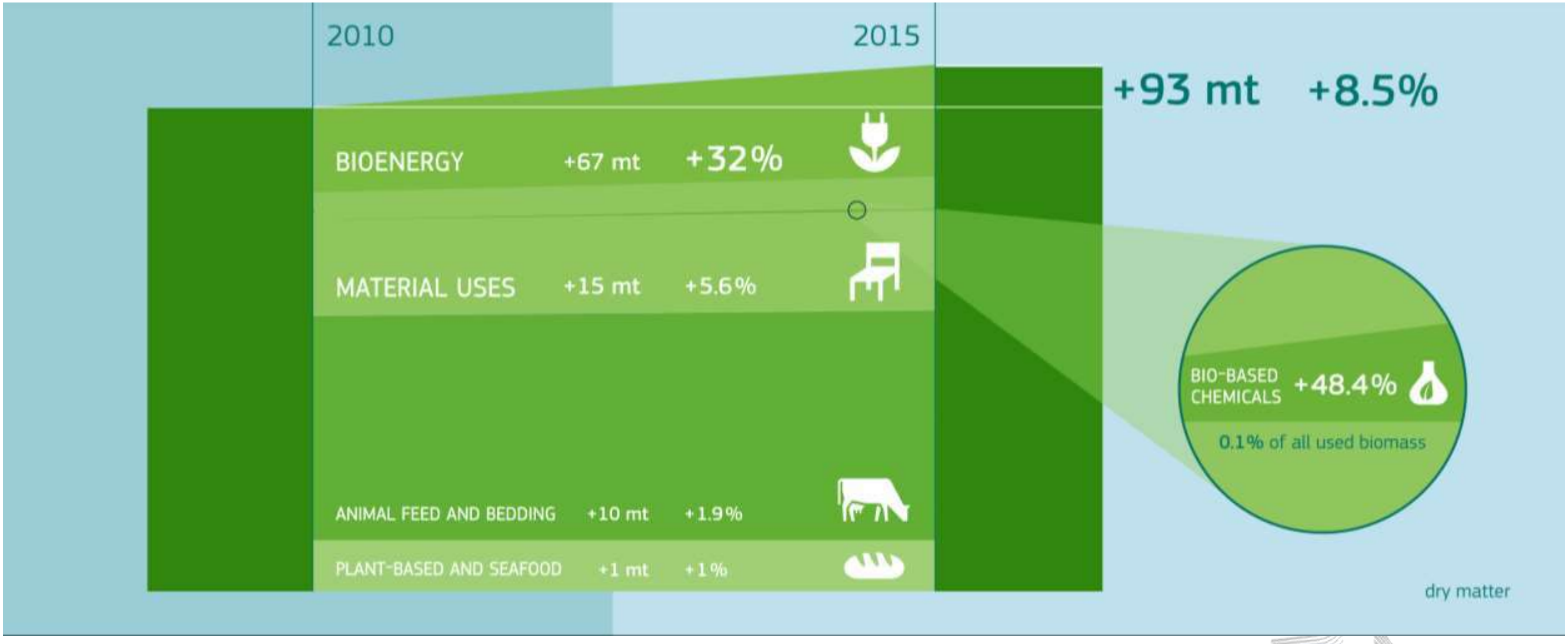
Biomass sourced and used in the EU

JRC Biomass Study (see Camia et al. 2018, Science for Policy Report, https://doi.org/10.2760/539520)

Evolution in biomass use 2010-2015



JRC Biomass Study (see Camia et al. 2018, Science for Policy Report, https://doi.org/10.2760/539520)

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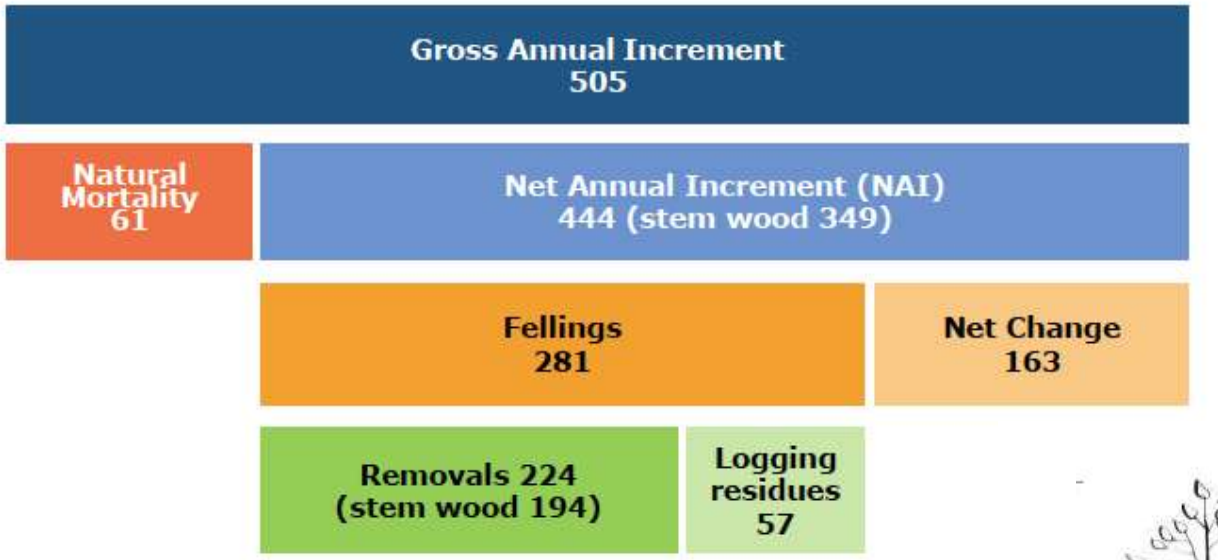
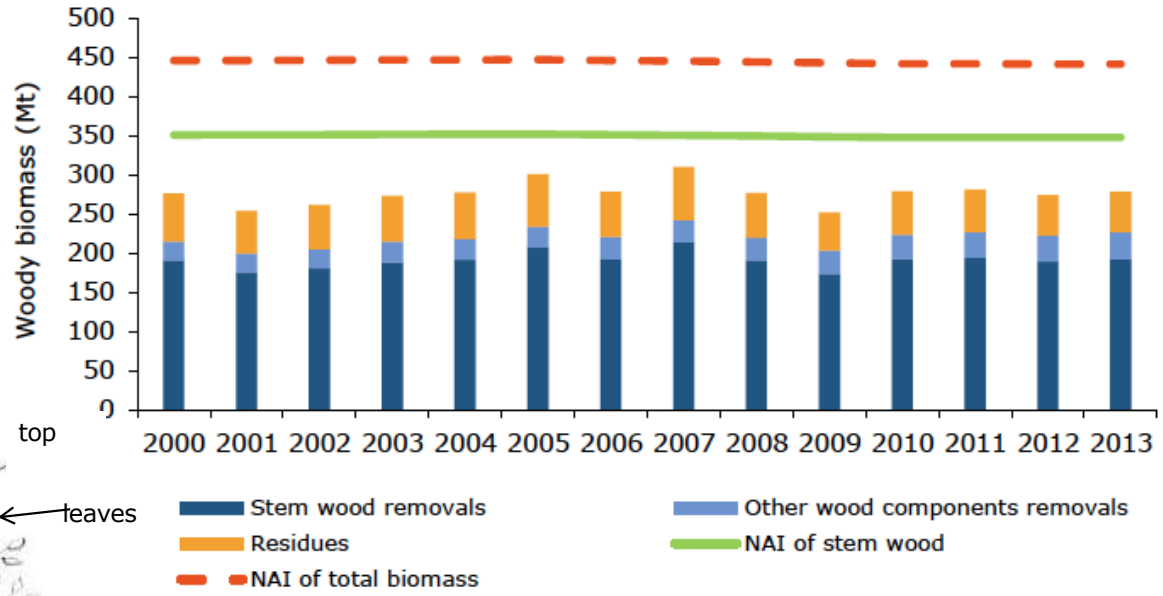
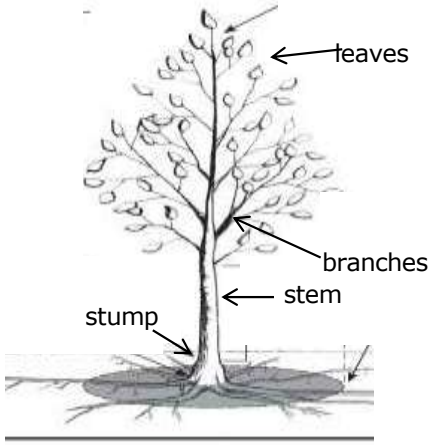
Woody biomass from forestry

Increment, fellings, and removals in EU28
(10 years averages in Mt/a dry matter)



Removals and net annual increment in EU28





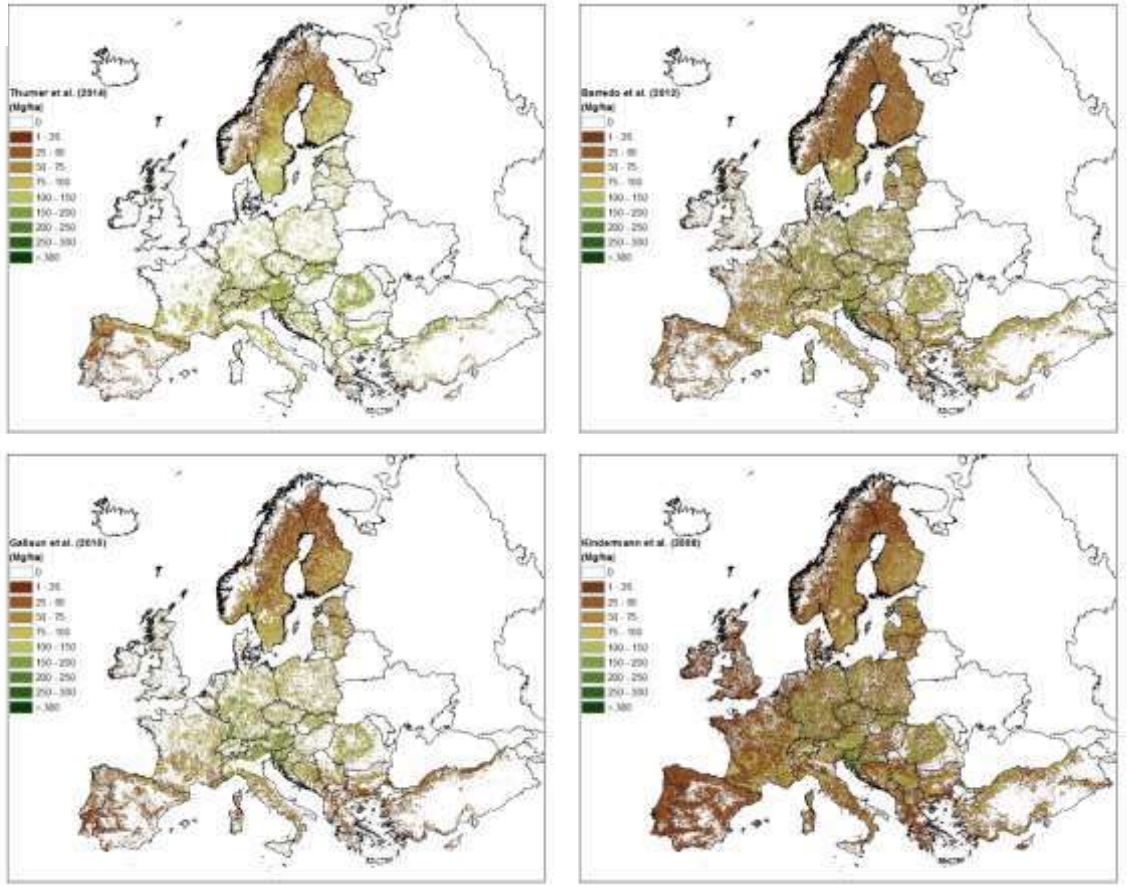
Source: EC Knowledge Centre for Bioeconomy, Brief on forestry biomass production
https://doi.org/10.2760/59347

Data sources: Eurostat and NFI

European Commission

Forest biomass maps of Europe

• Kindermann et al. 2008	1000 m
• Barredo et al. 2012	1000 m
• Thurner et al. 2014	1000 m
• Gallaun et al. 2010	500 m
• Santoro et al. 2018 (*GlobBiomass*)	100 m
• Baccini et al. 2018	30 m



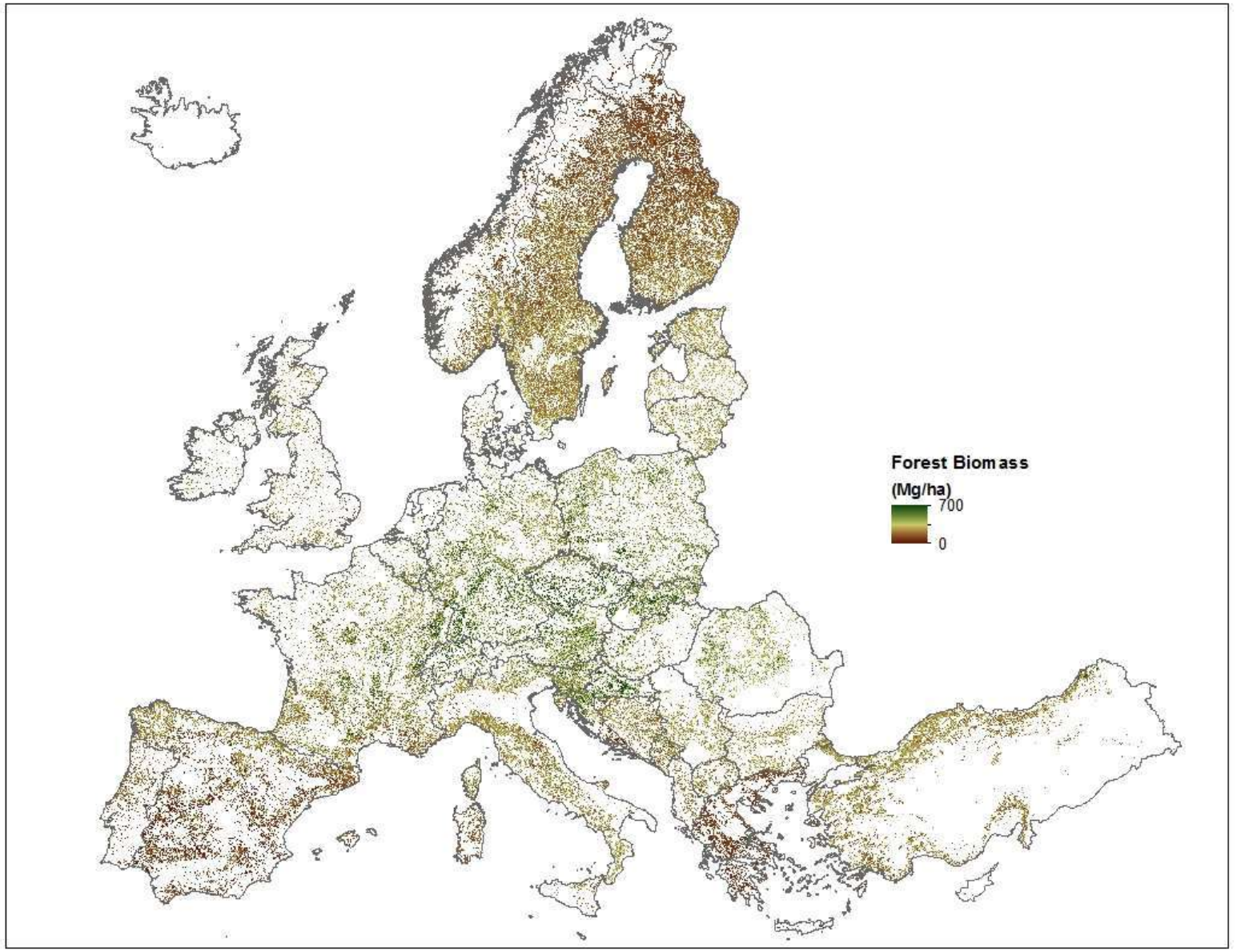
European Commission

A new, bias-corrected forest biomass map

- Recalibration of ESA GlobBiomass map
- Map at 100 m for year 2010
- Matching NFI statistics at sub-nation scale for:
  - Forest area
  - Biomass density

- Forest Available for Wood Supply

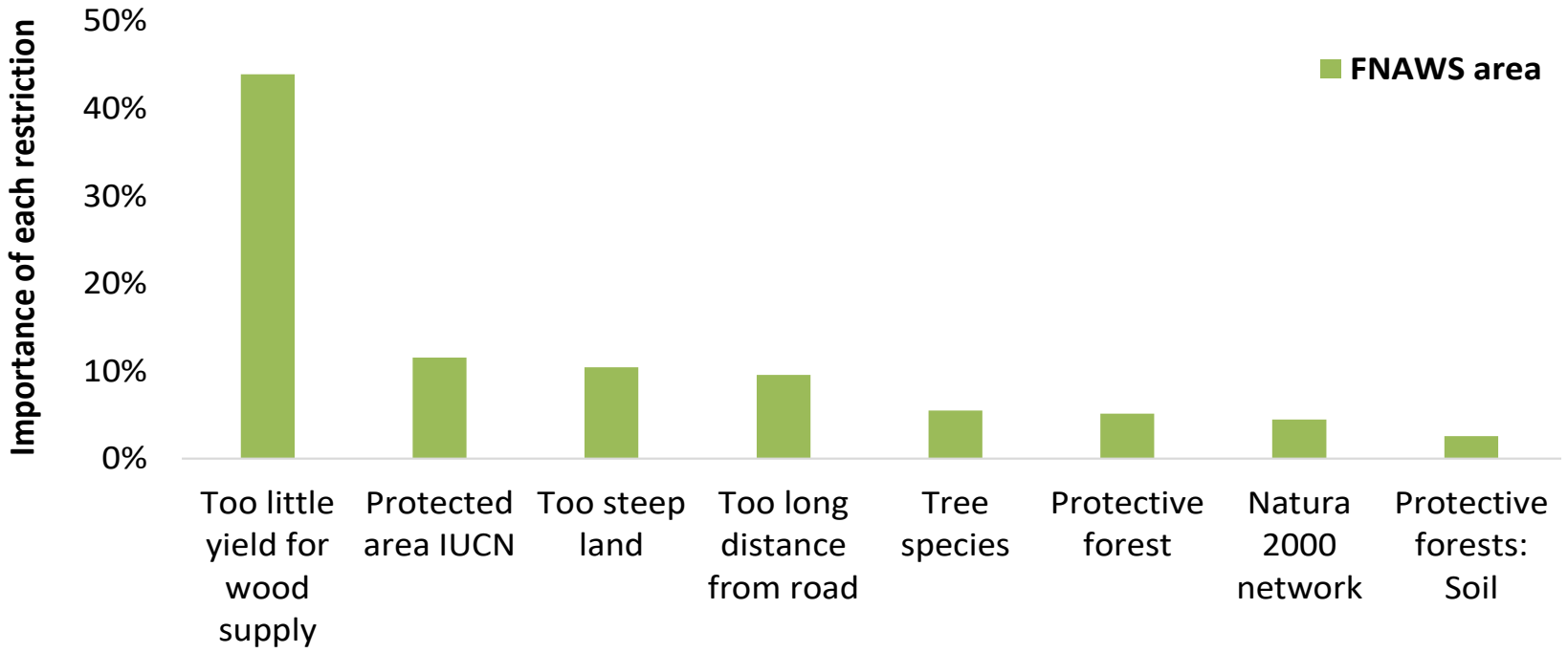
- Biomass Available for Wood supply



(Avitabile el al., JRC Technical Report in preparation)

Restrictions to forest availability for wood supply

- **Economic: Low productivity, accessibility, etc.**
- **Environmental: Protected area, protected species, etc.**
- **Social: Other uses or goods: recreational, cultural, etc.**



Country-specific thresholds defined

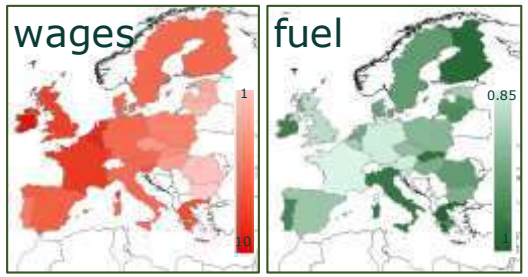
(Alberdi el al. 2019, Forest Policy and Economics, https://doi.org/10.1016/J.FORPOL.2019.102032)

European Commission

Mapping harvesting cost

Supply chains:
- mechanized (moderate slopes)
- manual (steep slopes)

Machinery cost
Country specific parameters



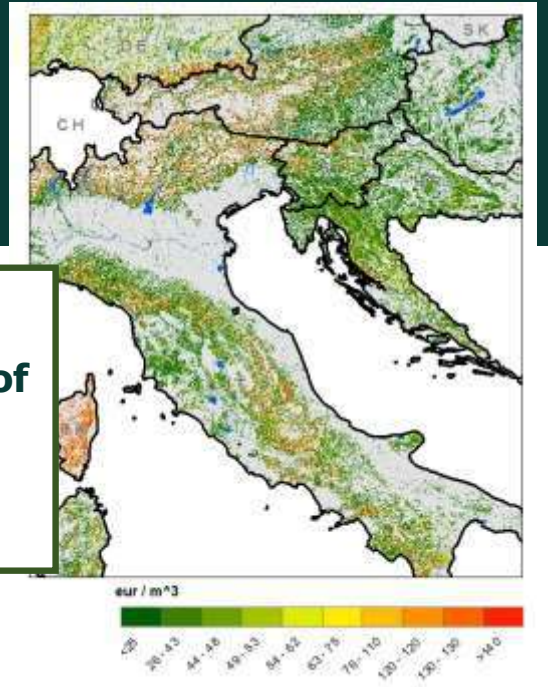
Analytical fixed costs

Purchase and maintenance of machinery

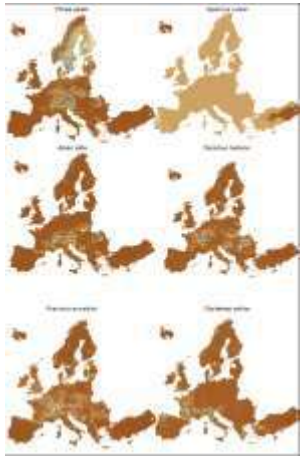
Analytical variable costs

Depend on location and tree size

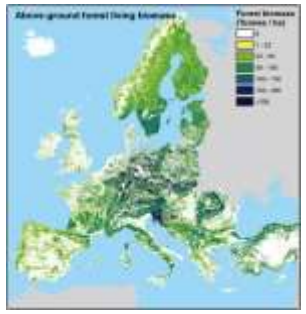
Mapping of costs



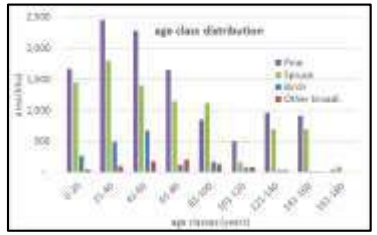
Species maps



Biomass map

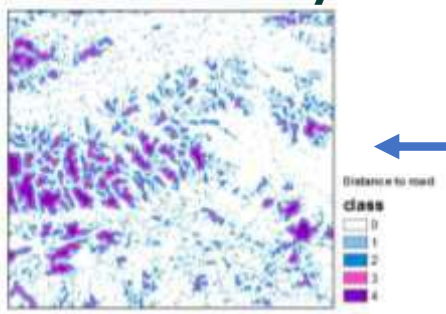


Age distribution

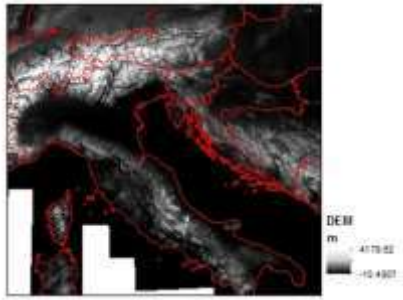


Tree size for 3 age classes
Juvenile
Adult
Mature

Accessibility



Elevation map



Slope & road network

$$\ln a = \alpha + \beta\rho$$

via allometric equations we derive average tree size

Work in progress!

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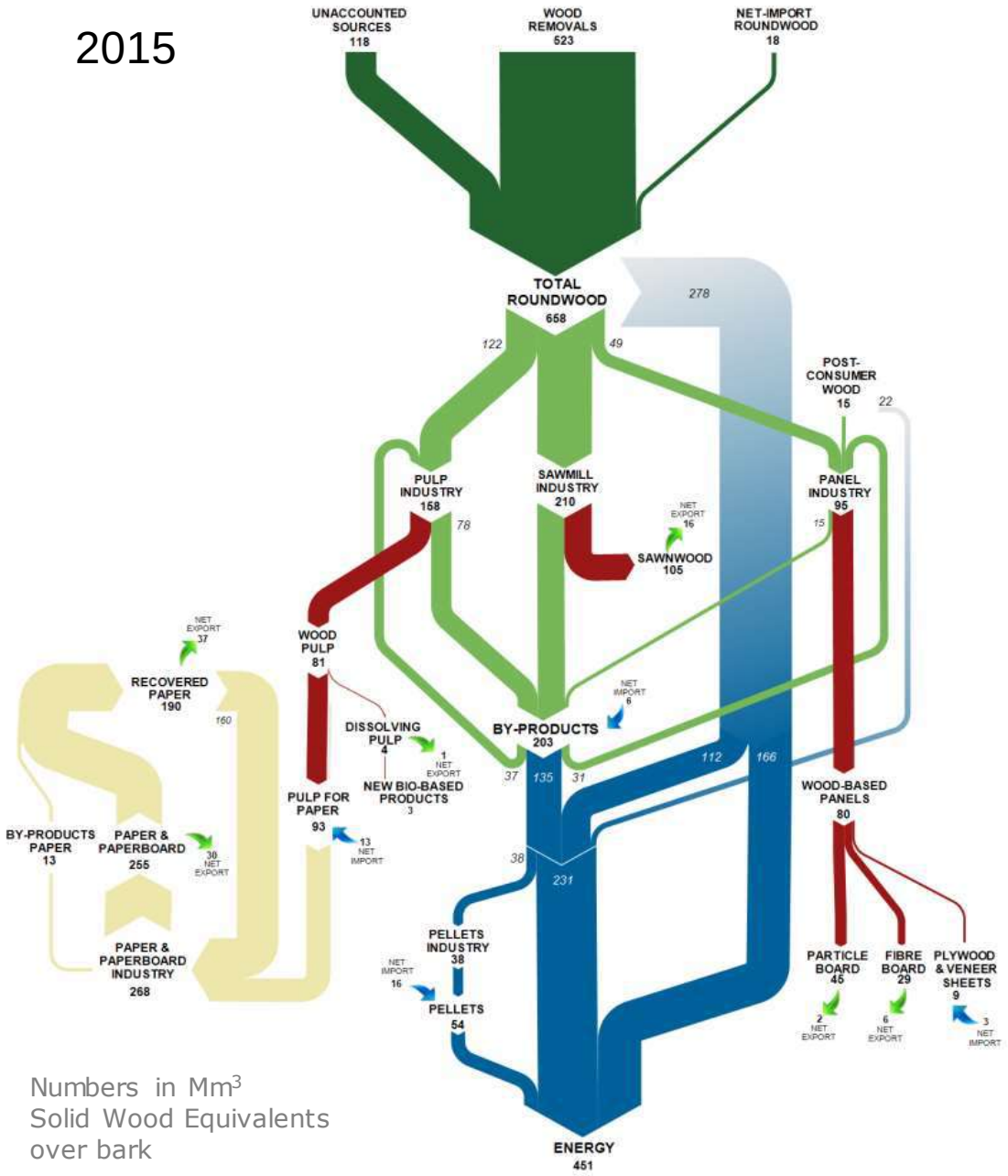
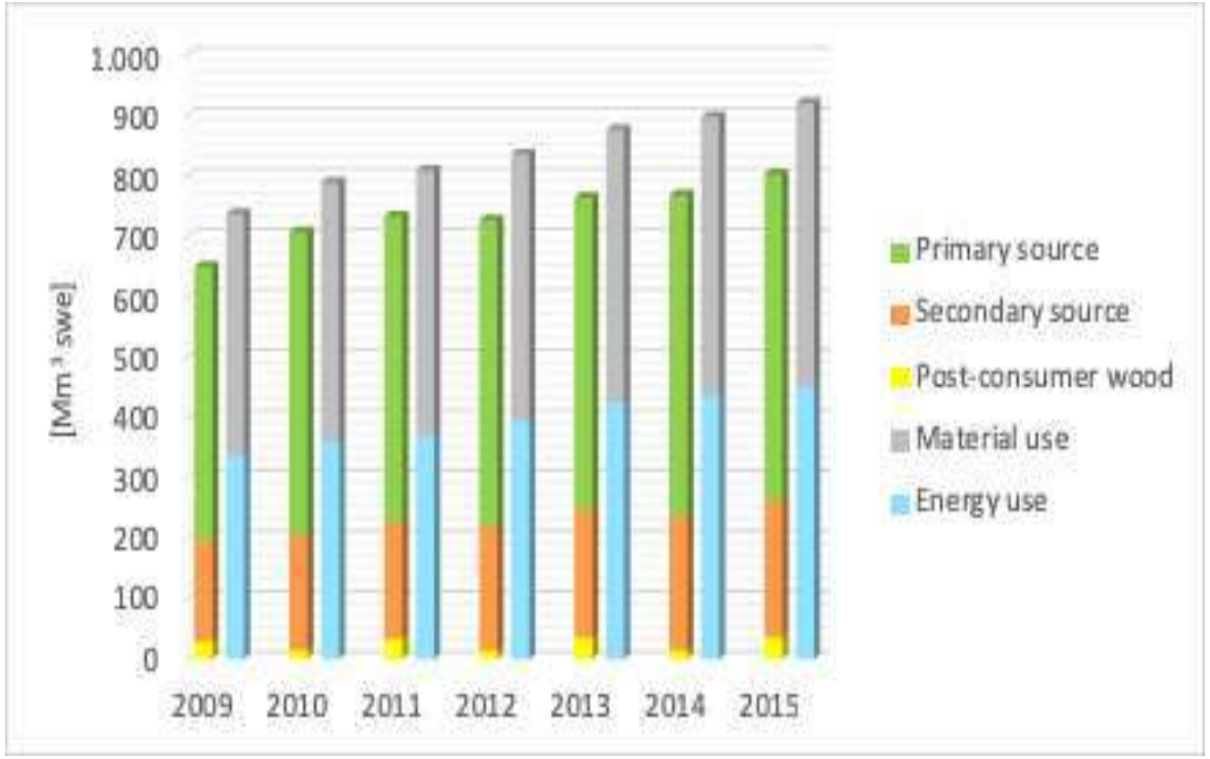
(Adapted from Fiorese el al., JRC Technical Report in preparation)

EU-28 Woody biomass flows

2015





Sources and uses of woody biomass in the European Union. The differences between total sources and uses are due to unbalances caused by uncertainties and gaps in the original datasets

Numbers in Mm^3
Solid Wood Equivalents
over bark

(Based on Cazzaniga el al. 2019, Technical brief, JRC https://doi.org/10.2760/227292)

European Commission

Economic and social dimensions of the EU bioeconomy

EU BIOECONOMY

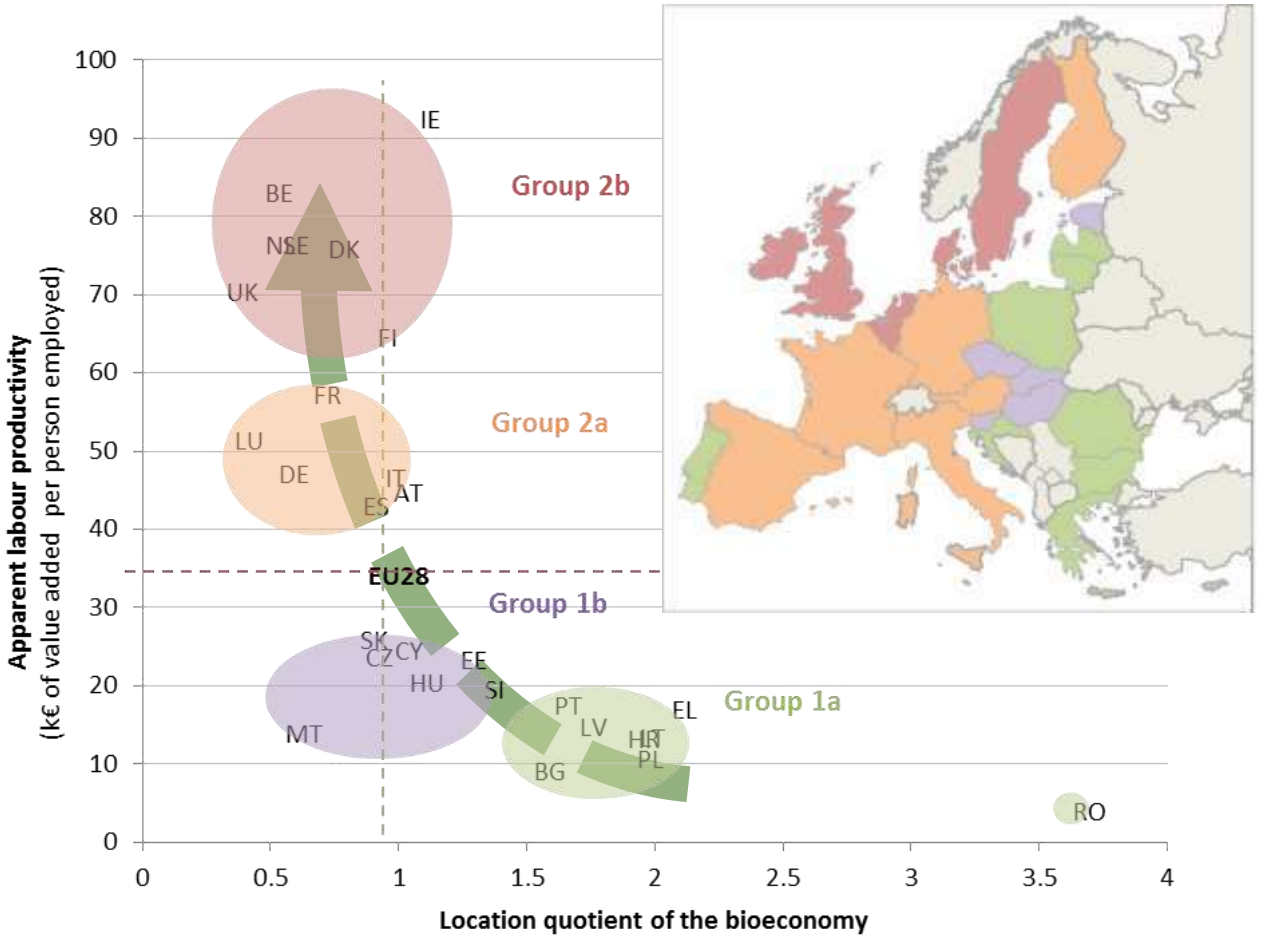
European Commission's Knowledge Centre for Bioeconomy

EMPLOYMENT (MILLION JOBS)	TURNOVER (TRILLION EUR)	VALUE ADDED (BILLION EUR)
18	2.3	621

	EMPLOYMENT (MILLION JOBS)	TURNOVER (BILLION EUR)	VALUE ADDED (BILLION EUR)
AGRICULTURE	9.2	380	174
FORESTRY	0.5	50	24
FISHING AND AQUACULTURE	0.2	12	7
FOOD, BEVERAGES AND OTHER AGRO-MANUFACTURING	4.5	1 153	233
BIO-BASED TEXTILES	1.0	103	28
WOOD PRODUCTS AND FURNITURE	1.4	174	47
PAPER	0.6	187	46
BIO-BASED CHEMICALS AND PHARMACEUTICALS, PLASTICS AND RUBBER	0.4	177	56
LIQUID BIOFUELS	0.03	12	3
BIOELECTRICITY	0.01	11	3

DATA 2015

Source: based on Ronzon & M'Barek, 2018
https://doi.org/10.3390/su10061745

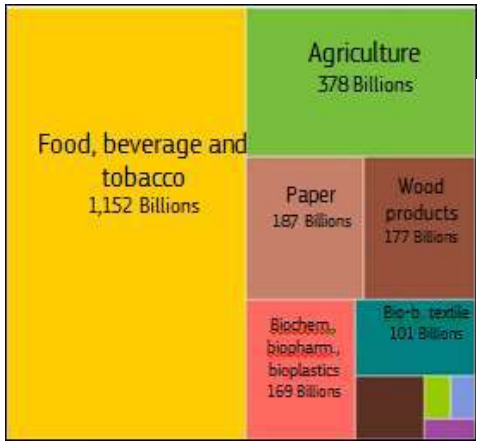


Based on Ronzon & M'barek, 2018;
https://doi.org/10.3390/su10061745

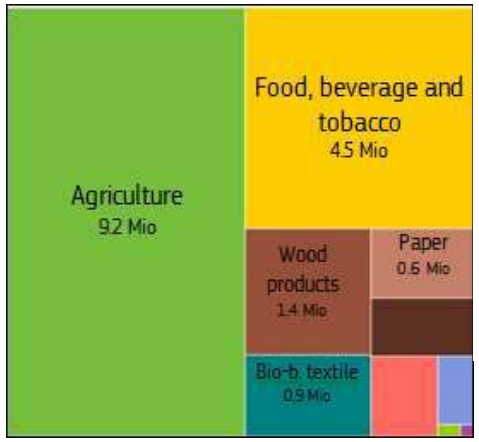
European Commission

Economic and social dimensions of the EU bioeconomy

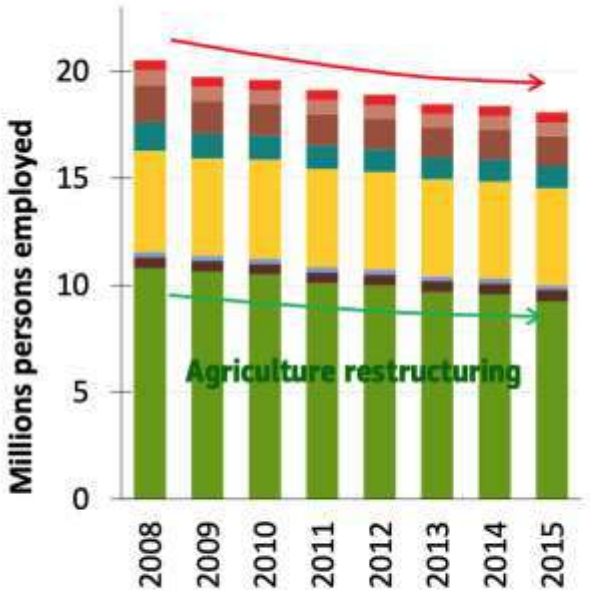
2.3 trillion € turnover



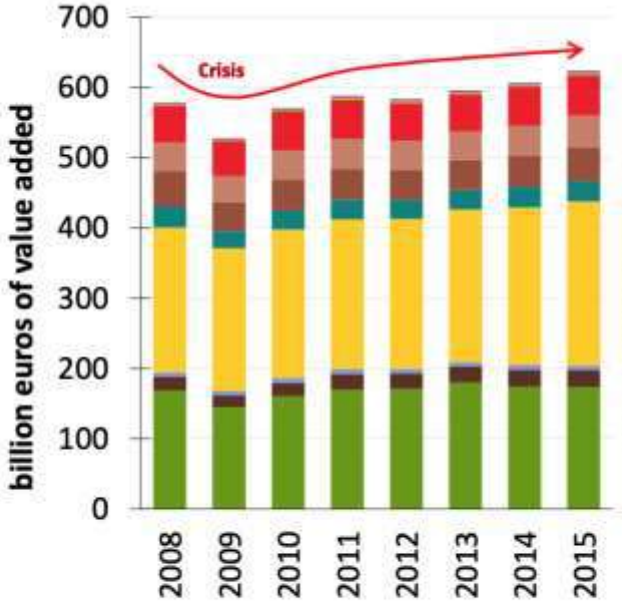
18 million persons employed



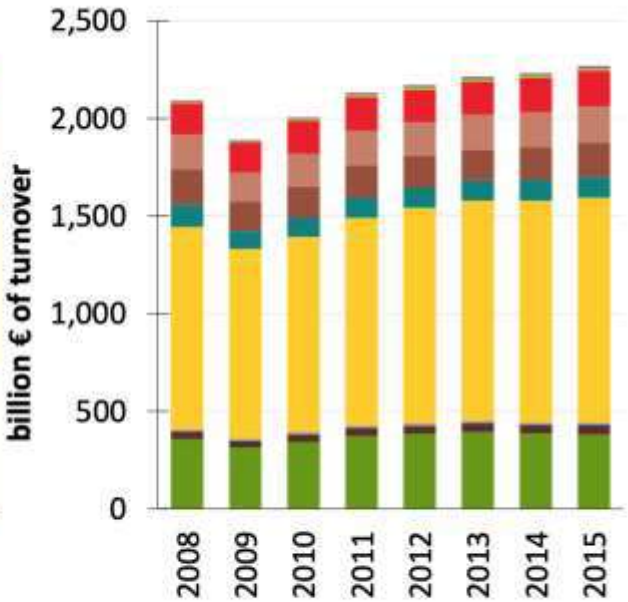
Persons employed



Value added



Turnover



Ronzon et al. (2017) Research Brief, JRC
http://publications.jrc.ec.europa.eu/repository/handle/JRC108733

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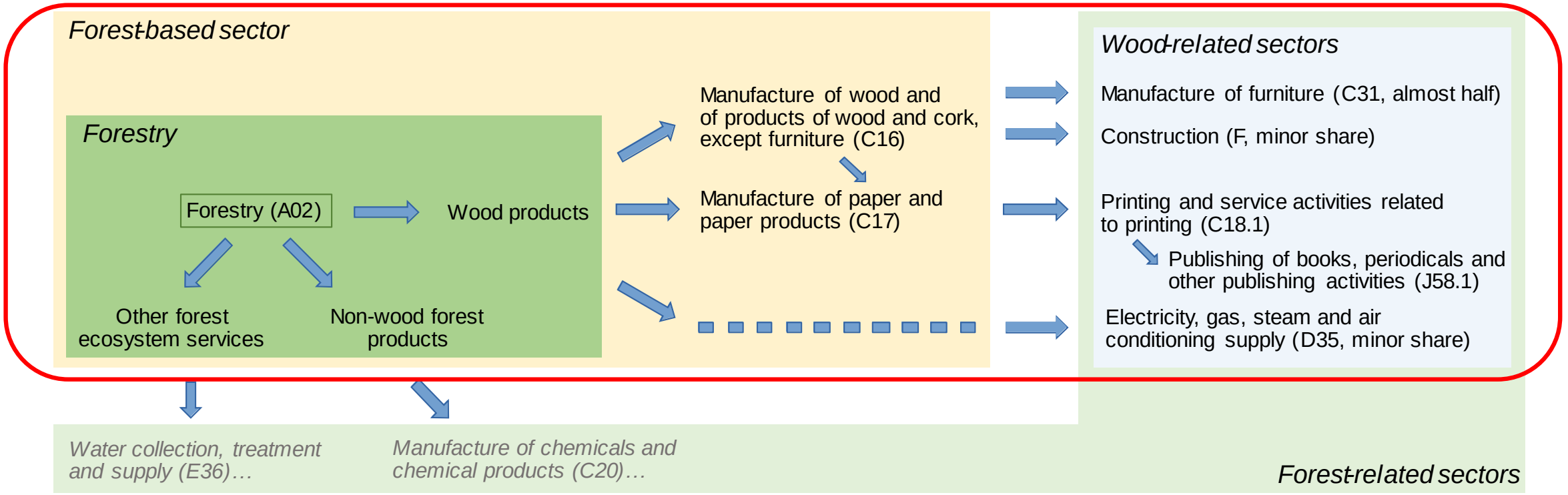
The forest-based sector and the economy



Supporting sectors

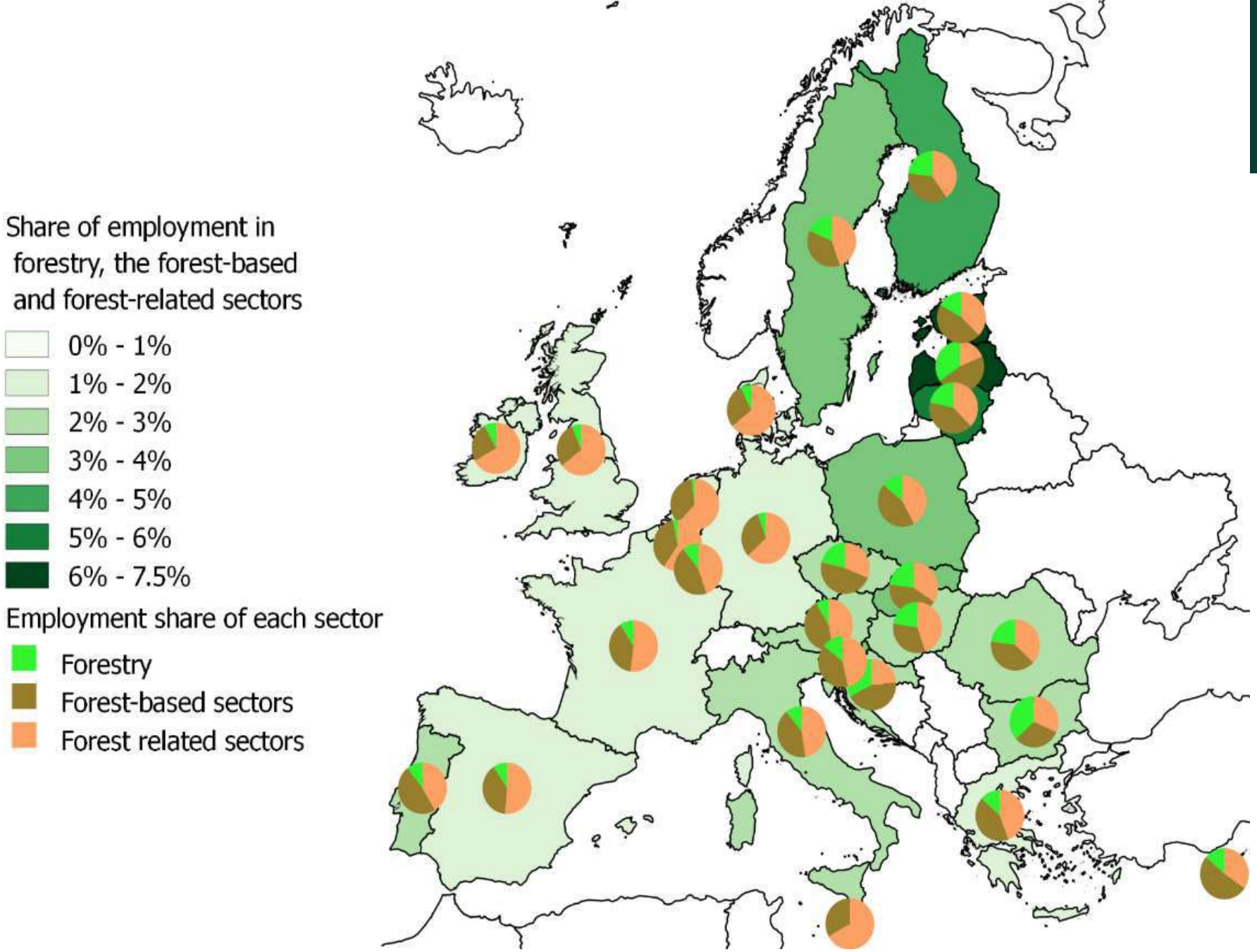
Manufacture of other machine tools (C28.49)
Manufacture of other special-purpose machinery n.e.c. (dryers for wood, paper pulp, paper or paperboard and other materials, manufacture of printing and bookbinding machines and machines for activities supporting printing on a variety of materials) (C28.99)

Manufacture of machinery for paper and paperboard production (C28.95)
Repair of machinery (C33.12)

Electricity, gas, steam and air conditioning supply (D35)
…

(Robert el al., submitted)

Employment in the forest-based sector



(Adapted from Robert el al., submitted)

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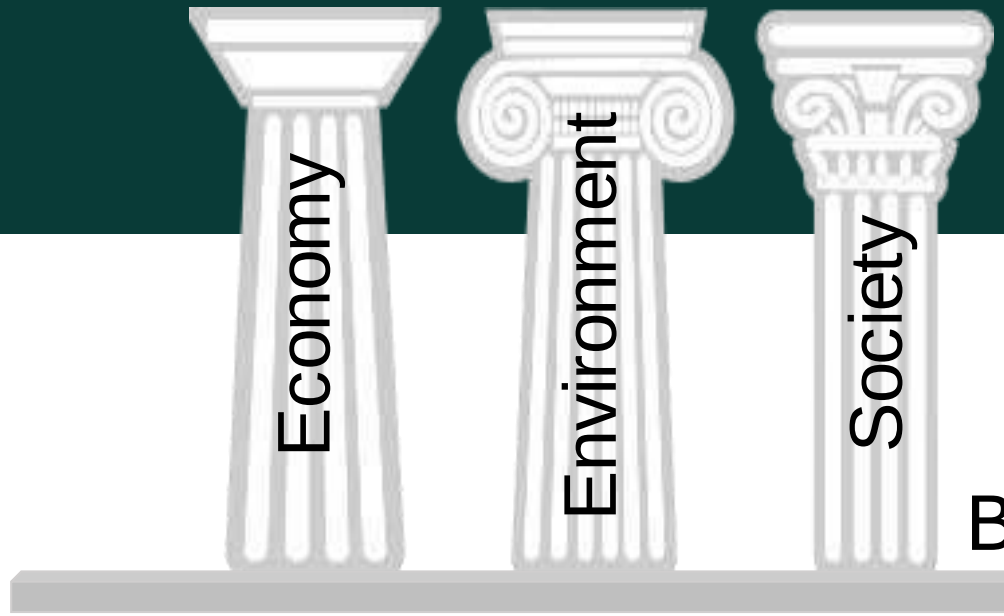
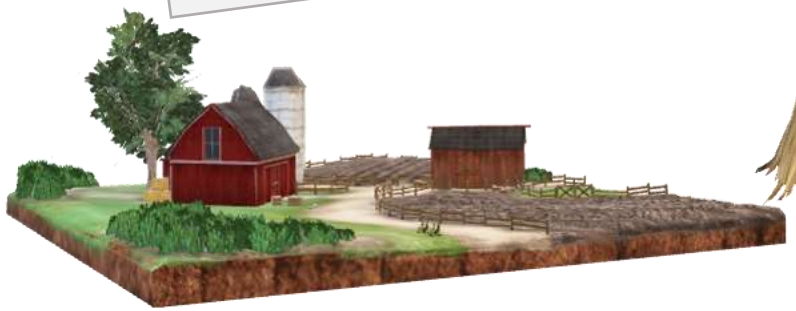
Monitoring the progress of the EU bioeconomy



Biophysical

Supply chain



Natural capital

Supply

Primary sectors: biomass supply including harvesting

Transformation

Manufacture & services sectors: biomass transformation

Uses

Consumers of manufactured goods & services

End of life

Disposal, cascading, recycling, reuse

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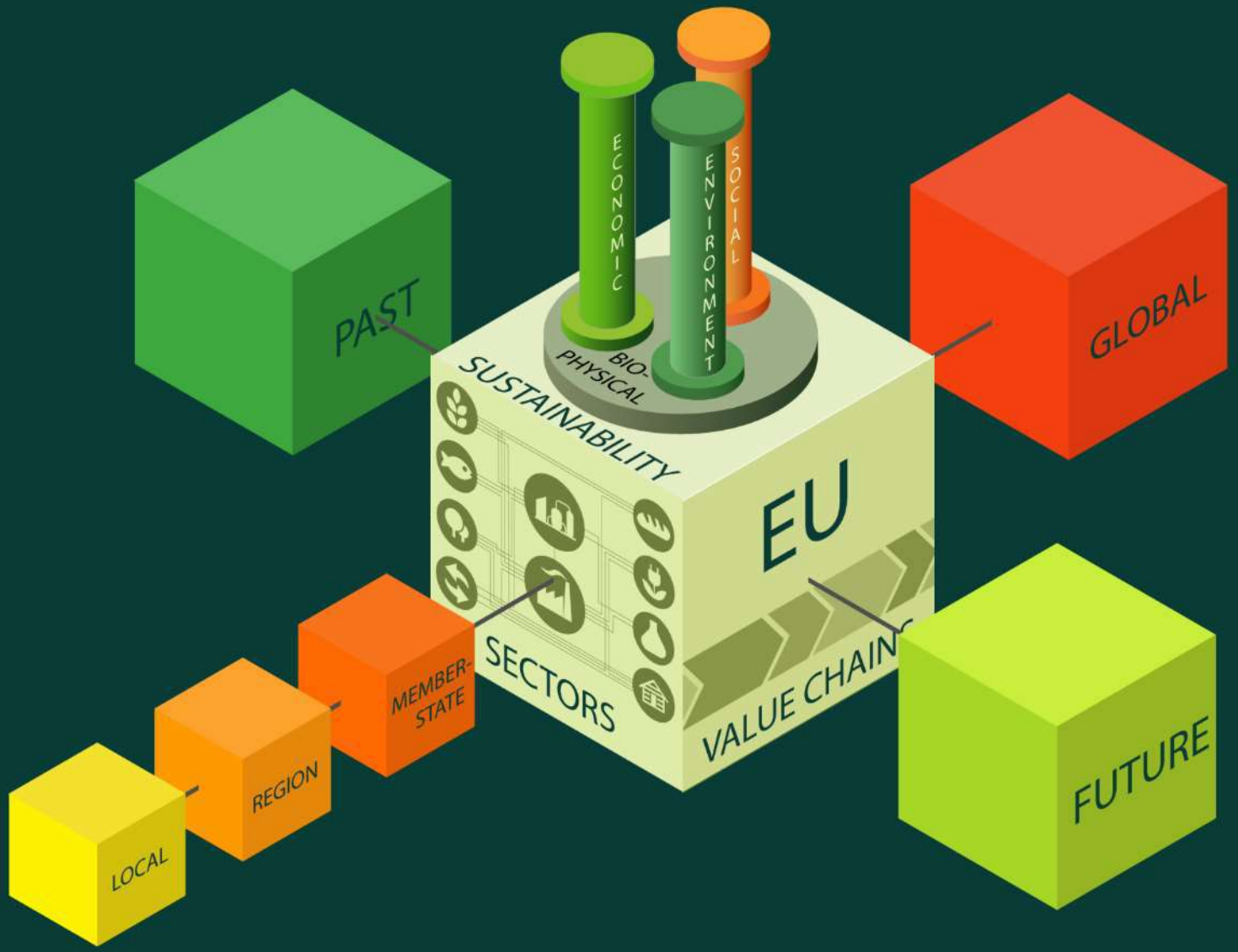
PAST
ECONOMIC
ENVIRONMENT
SOCIAL
BIO-PHYSICAL
GLOBAL
SUSTAINABILITY
EU
SECTORS
VALUE CHAIN
FUTURE
MEMBER-STATE
REGION
LOCAL

Thanks

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EC Knowledge Centre for Bioeconomy
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