



# Trade-offs in the bioeconomy

The role of policy-relevant research

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EC Joint Research Centre, Knowledge Centre for Bioeconomy  
12 December 2024

# The need for evidence to inform policy

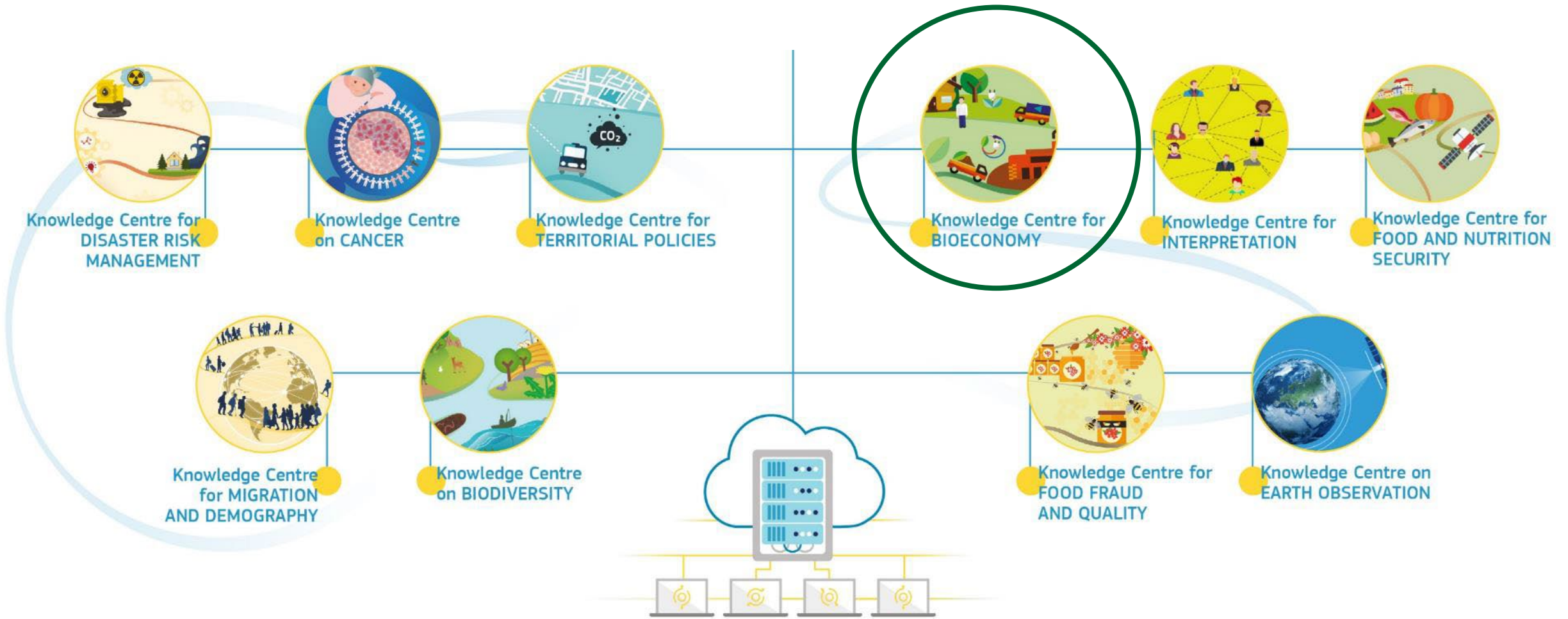


## Our purpose

The Joint Research Centre provides independent, evidence-based knowledge and science, supporting EU policies to positively impact society.

<https://joint-research-centre.ec.europa.eu/>

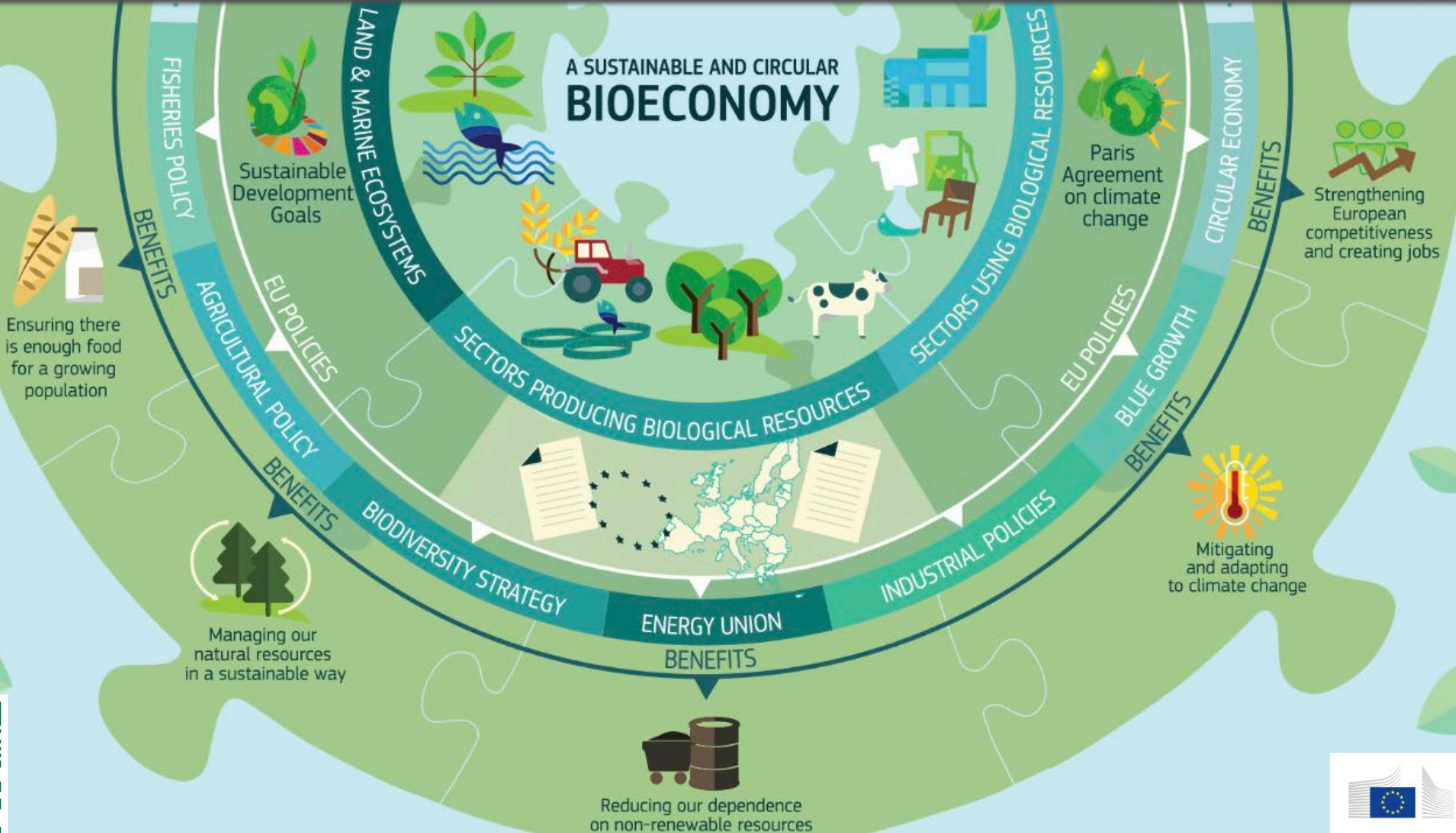
# Knowledge Centres



Find out more on [Knowledge4policy platform](#)

# The European Commission's Knowledge Centre for Bioeconomy

## A SUSTAINABLE AND CIRCULAR BIOECONOMY



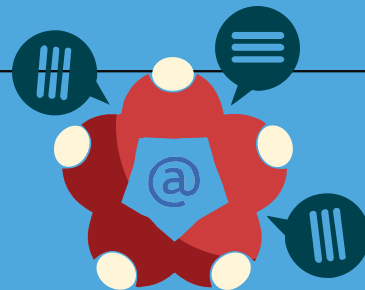
# Knowledge Centre for Bioeconomy



**Identifying** and **filtering** relevant information and making it accessible:



**Bringing together researchers, policymakers and other experts** in the field.



**Analysing, synthesising and communicating** available evidence.



**Enhancing** the **knowledge** base for policymaking.



# Bringing together researchers, policymakers and other experts: Community of Practice



## The Community of Practice – focus on 2024 events

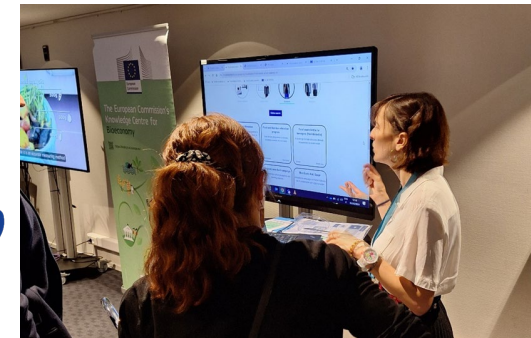


*KCB stand at Bioeconomy changemakers festival, March 2024, Brussels*



*Participants from various DGs and practitioners, Bio-based textile workshop, June 2024, Brussels*

European  
Consumer  
Food Waste  
Forum



*ECFWF public event, KCB tutorials stand and organising team (JRC & SANTE), June 2024, Brussels*

# Analysing, synthesising and communicating available evidence: Selected outputs



**Brief on jobs and growth in the EU bioeconomy**

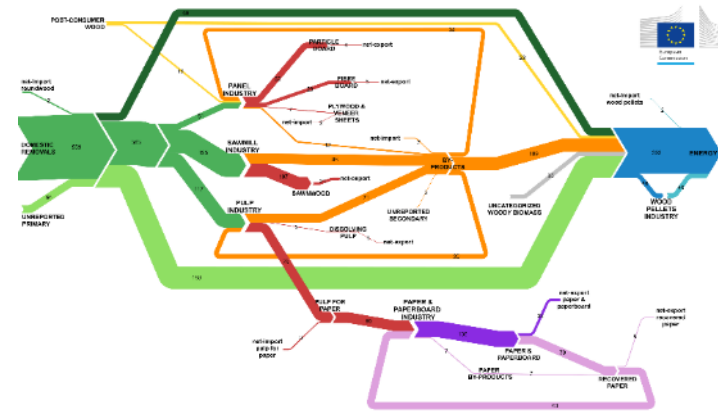
**Key messages**

- The biomass producing and converting sectors of the EU 652 billion of value added and employed 17.4 million people represent 4.7% of the EU's gross domestic product (see section 1).
- Concomitant growth in value added and reduction in unemployment in the agriculture sector. After a steep rise in comparison to the previous year, the EU bioeconomy shows (see section 2).
- The analysis of the COVID-19 crisis impact, based on employment and the gross value added in the primary between 2019 and 2020 by around 2% and 0.4%, respectively.
- Significant differences in the average labour productivity from EUR 21 000 per person in agriculture to EUR 13 pharmaceuticals, but also amongst Member States, ranging from Bulgaria to EUR 97 000 per person in Belgium (average of the national labour markets in the bioeconomy also in section 3).
- Since 2008, the bioeconomies in the EU Member States trajectories in terms of jobs and growth. While that is increased in all Member States, except Greece, the groups of Member States is widening. The concentration of the bioeconomy reduced remarkably in Croatia and Romania. It did not substantially change in the other Member States.

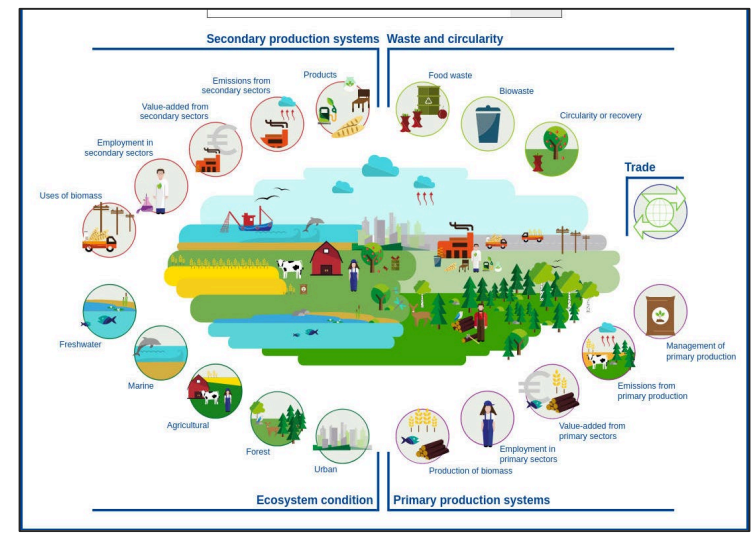
**EU BIOECONOMY**  
European Commission's Knowledge Centre for Bioeconomy

	EMPLOYMENT (MILLION PEOPLE)	VALUE ADDED (BILLION EUR)	VALUE ADDED (% GDP)
<b>AGRICULTURE</b>	8.8	193	29%
<b>FORESTRY</b>	0.5	25	4%
<b>FISHING AND AQUACULTURE</b>	0.2	6	0.9%
<b>FOOD, BEVERAGES AND OTHER AGRICULTURAL MANUFACTURING</b>	4.7	237	36%
<b>BIO-BASED TEXTILES</b>	0.8	25	4%
<b>WOOD PRODUCTS AND FURNITURE</b>	1.3	50	8%
<b>PAPER</b>	0.6	46	7%
<b>BIO-BASED CHEMICALS AND PHARMACEUTICALS, PLASTICS AND RUBBER</b>	0.5	65	10%
<b>LIQUID BIOFUELS</b>	0.03	3	0.5%
<b>BIOELECTRICITY</b>	0.03	5	0.8%

DATA 2020 EU-27  
© European Union, 2020



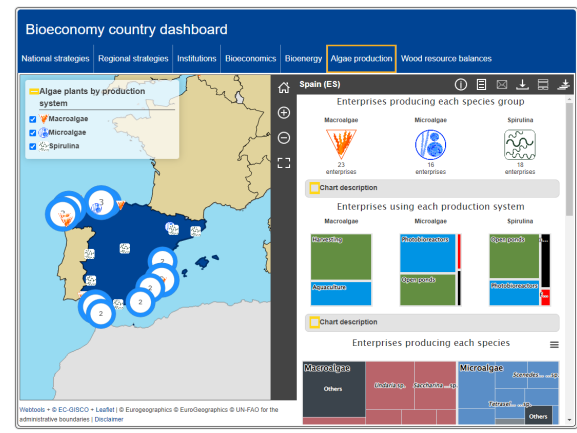
[https://knowledge4policy.ec.europa.eu/visualisation/interactive-sankey-diagrams-woody-biomass-flows-eu-member-states\\_en](https://knowledge4policy.ec.europa.eu/visualisation/interactive-sankey-diagrams-woody-biomass-flows-eu-member-states_en)



## EU Bioeconomy Monitoring System

- Extensive stakeholder consultations
- Work with Member States experts
- Collaboration with FAO
- Discussed at G7 workshop
- Collaboration with European Bioeconomy University (EBU)
- Reference monitoring system for EU

[https://knowledge4policy.ec.europa.eu/bioeconomy/topic/economy\\_en](https://knowledge4policy.ec.europa.eu/bioeconomy/topic/economy_en)

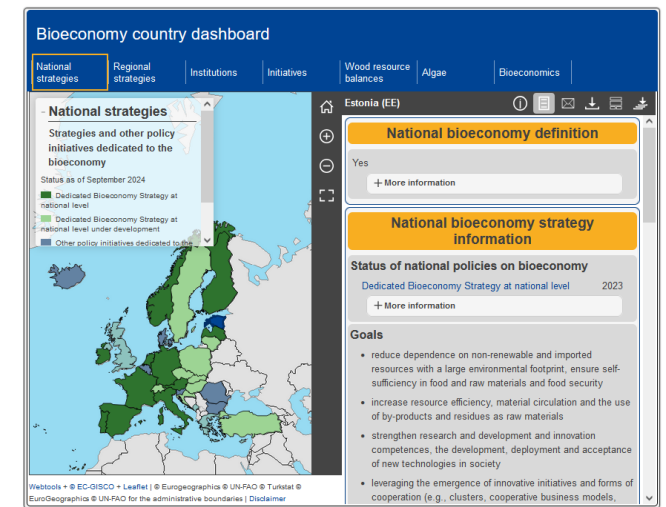
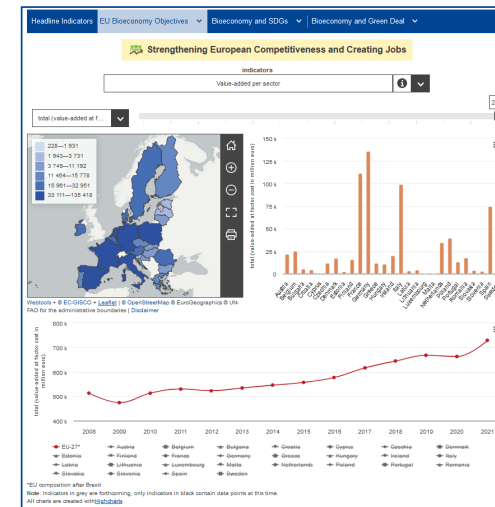


[https://knowledge4policy.ec.europa.eu/visualisation/bioeconomy-different-countries\\_en#algae\\_prod\\_plants](https://knowledge4policy.ec.europa.eu/visualisation/bioeconomy-different-countries_en#algae_prod_plants)

# Trends from the EU Bioeconomy Monitoring System

- Trends in the EU Bioeconomy – update 2024

- Online dashboards on bioeconomy data and policies in the Member States

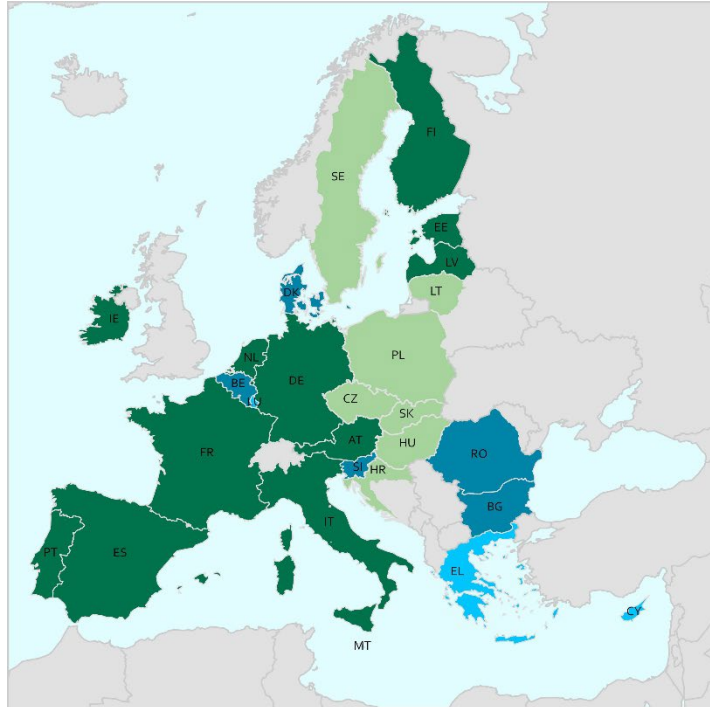


European Commission: Joint Research Centre, KOROSUO, A., BORZACCHIELLO, M.T., GIUNTOLI, J., LASARTE LOPEZ, J., M'BAREK, R., MUBAREKA, S.B. and CAMIA, A., Trends in the EU bioeconomy - update 2024, Publications Office of the European Union, Luxembourg, 2024, <https://data.europa.eu/doi/10.2760/0141556>, JRC140285.



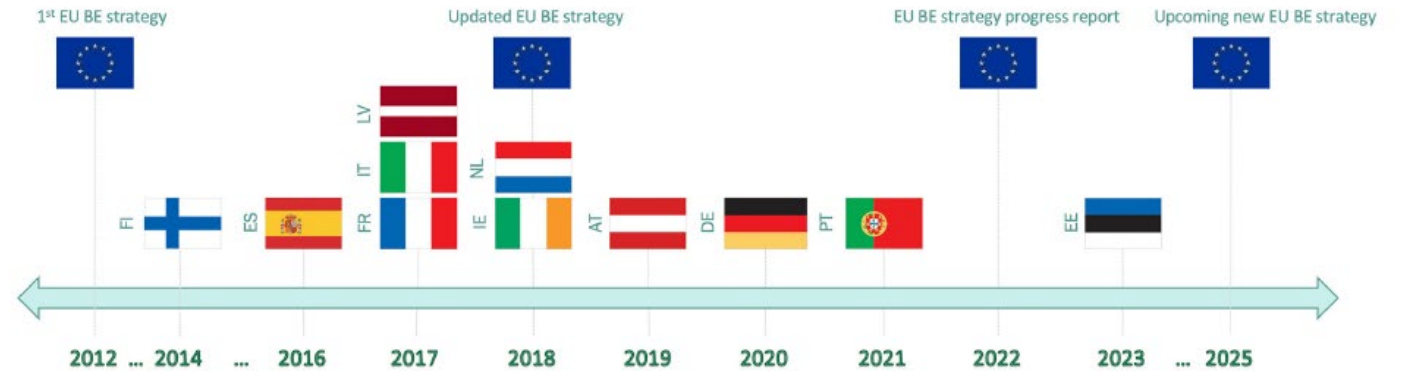


# Bioeconomy policy development in EU



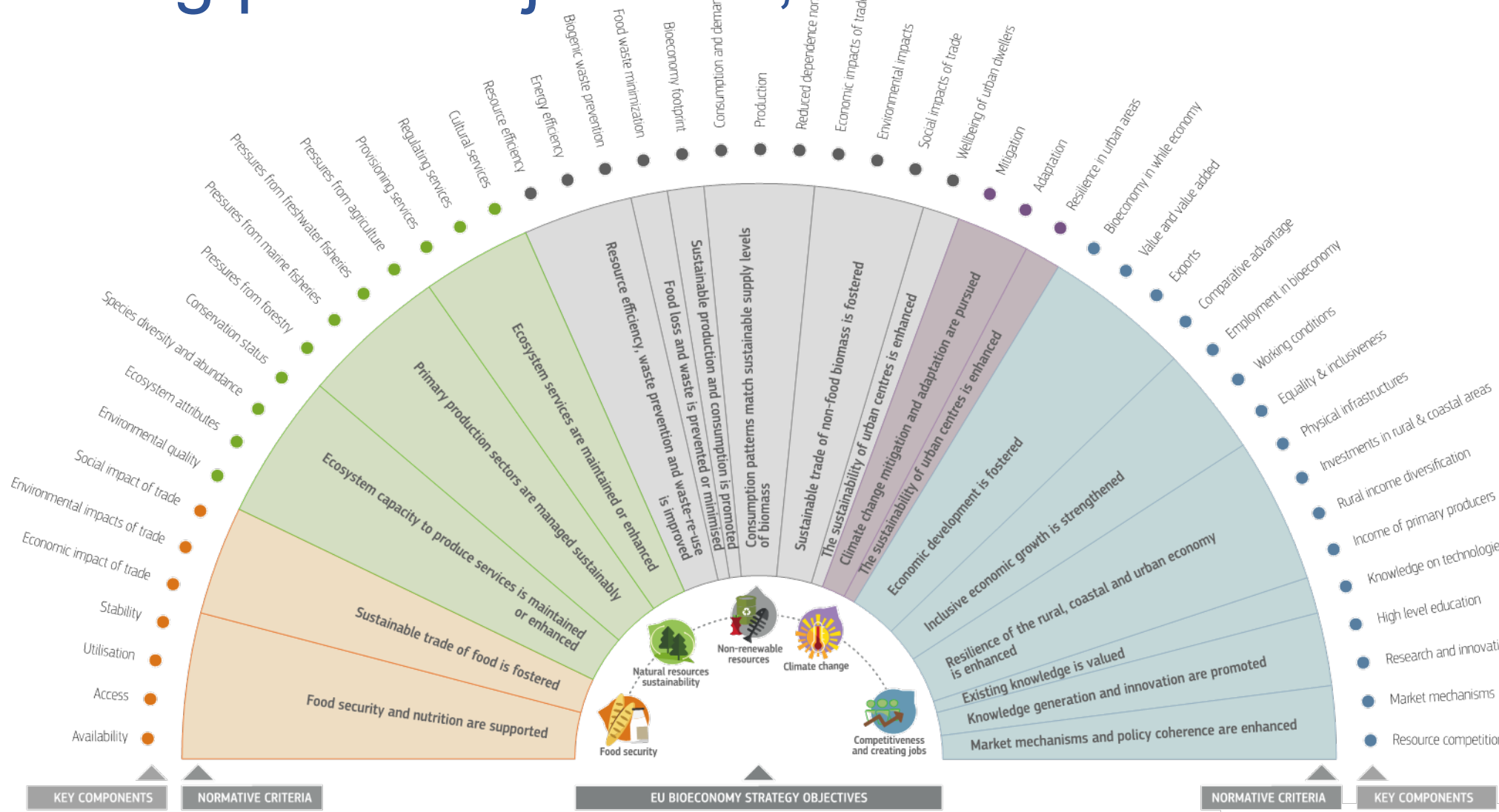
Source: EC's Knowledge Centre for Bioeconomy  
 Administrative Boundaries:  
 © EuroGeographics © UN-FAO © Turkstat

Figure 5. Timeline of national bioeconomy strategies' adoption in the EU-27



Source: European Commission's Knowledge Centre for Bioeconomy, 2024

# Starting point: objectives, not data

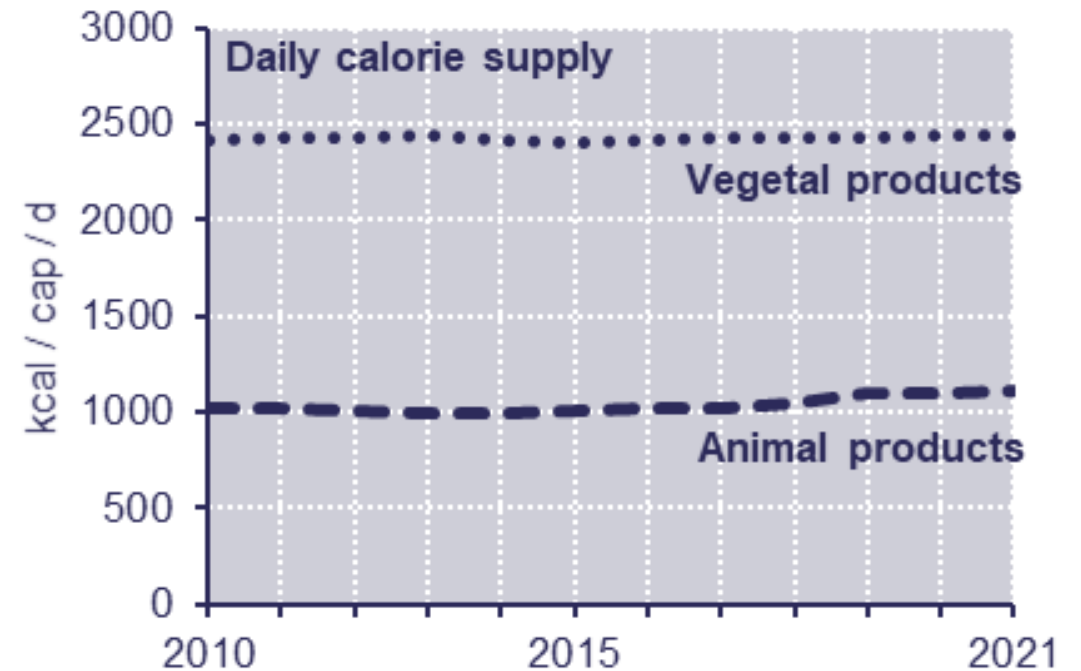


WHAT DOES A SUSTAINABLE AND CIRCULAR EU BIOECONOMY LOOK LIKE?



# Objective 1: Ensuring Food and Nutrition Security

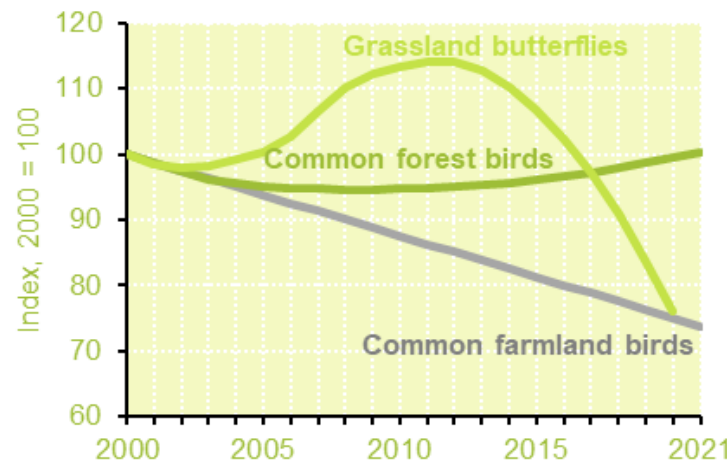
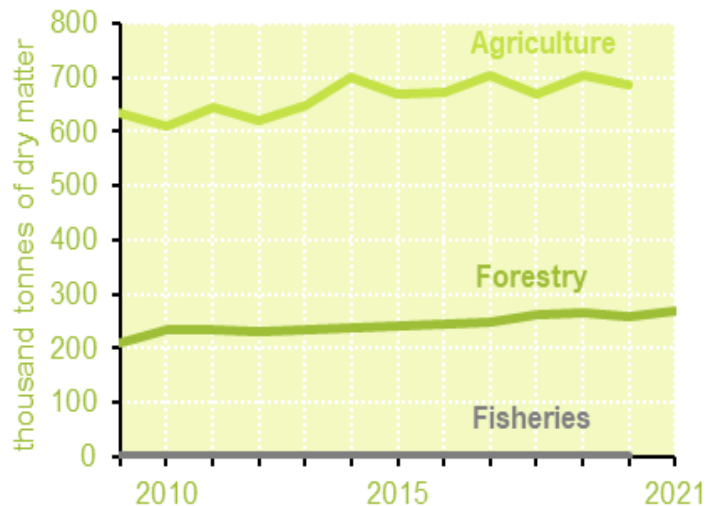
- **Stable supply and consumption of food**; some increase in calorie intake from animal products





# Objective 2: Managing Natural Resources Sustainably

- Overall **biomass production** from agriculture, fisheries, and forestry **is increasing**
- **Increased pressure on environment**
  - Intensification of farming and forestry (also driven by natural disturbances)
  - Decreasing species diversity



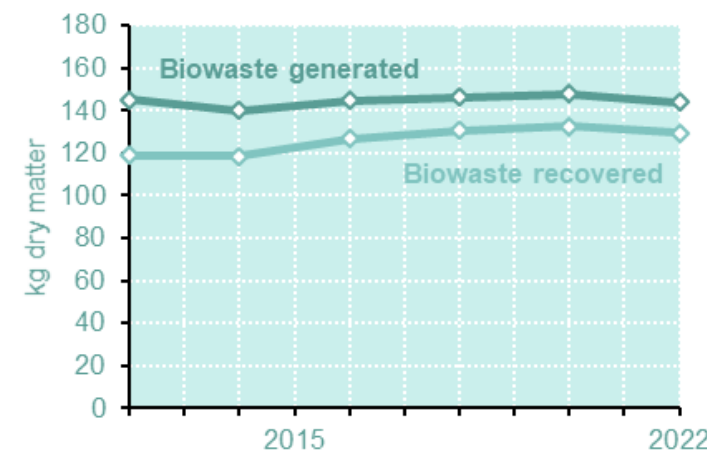
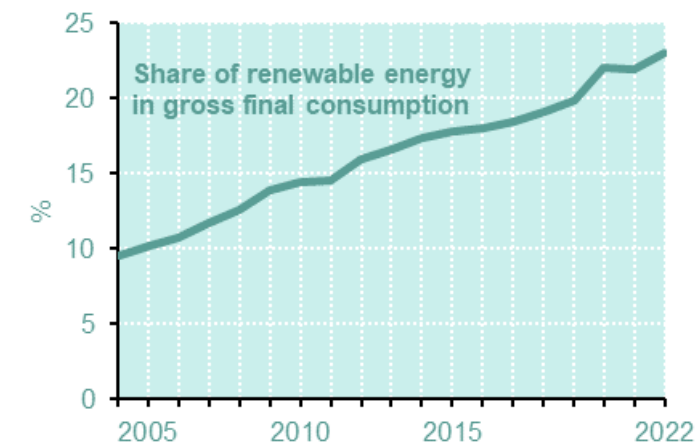
*A subset of indicators extracted from the EU-BMS*



# Objective 3: Reducing dependence on non-renewables



- **Increasing use of renewable energy sources**
  - 23% of gross final energy consumption in the EU from renewables; 59% of that from biomass
- **Increasing biowaste recovery rate: 90% in 2022 (up from 82% in 2012)**
  - Vast majority is paper, cardboard and wood waste
- **Food waste generation broadly stable in 2013-2021**
  - Half of food waste from household consumption

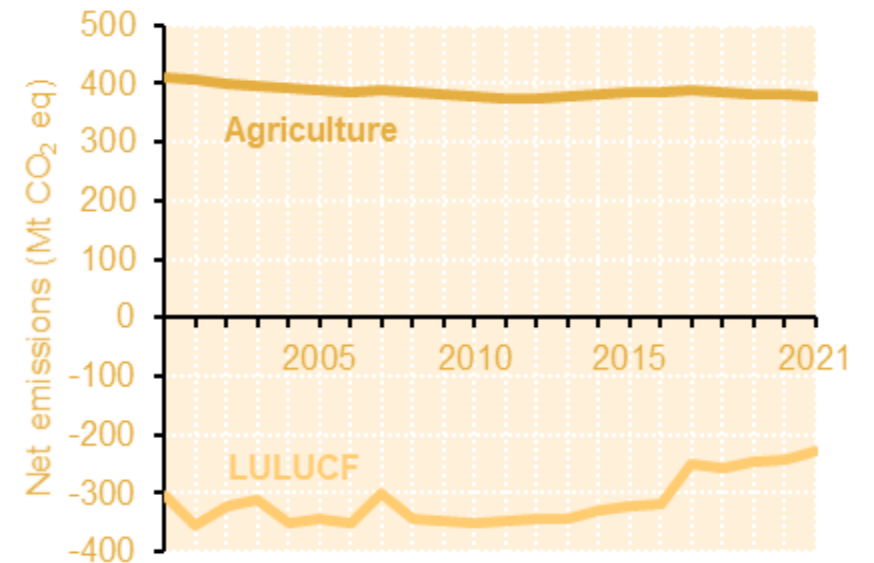




# Objective 4: Mitigating and Adapting to Climate Change



- **Declining climate change mitigation** especially from land use, land use change and forestry (LULUCF)
  - Increased harvests, increased disturbances (droughts, windthrow, wildfires)
- Further indicators to monitor **climate change adaptation** needed and under development

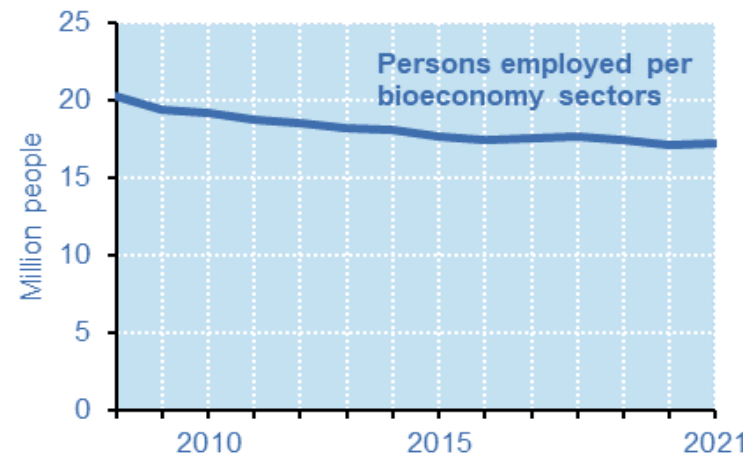
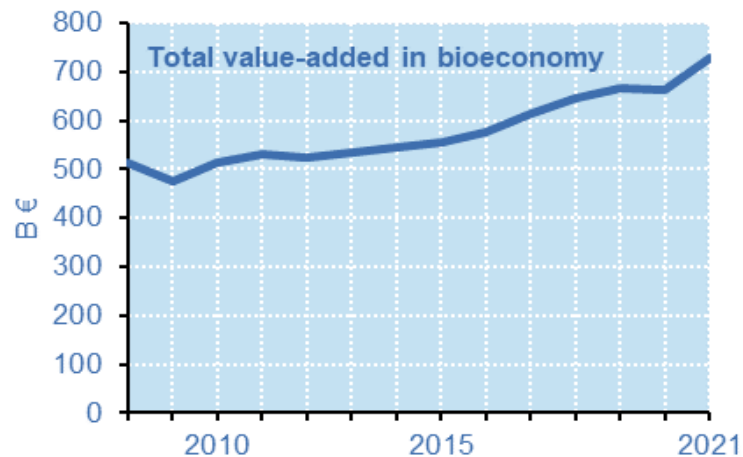




# Objective 5: Strengthening EU competitiveness & creating jobs

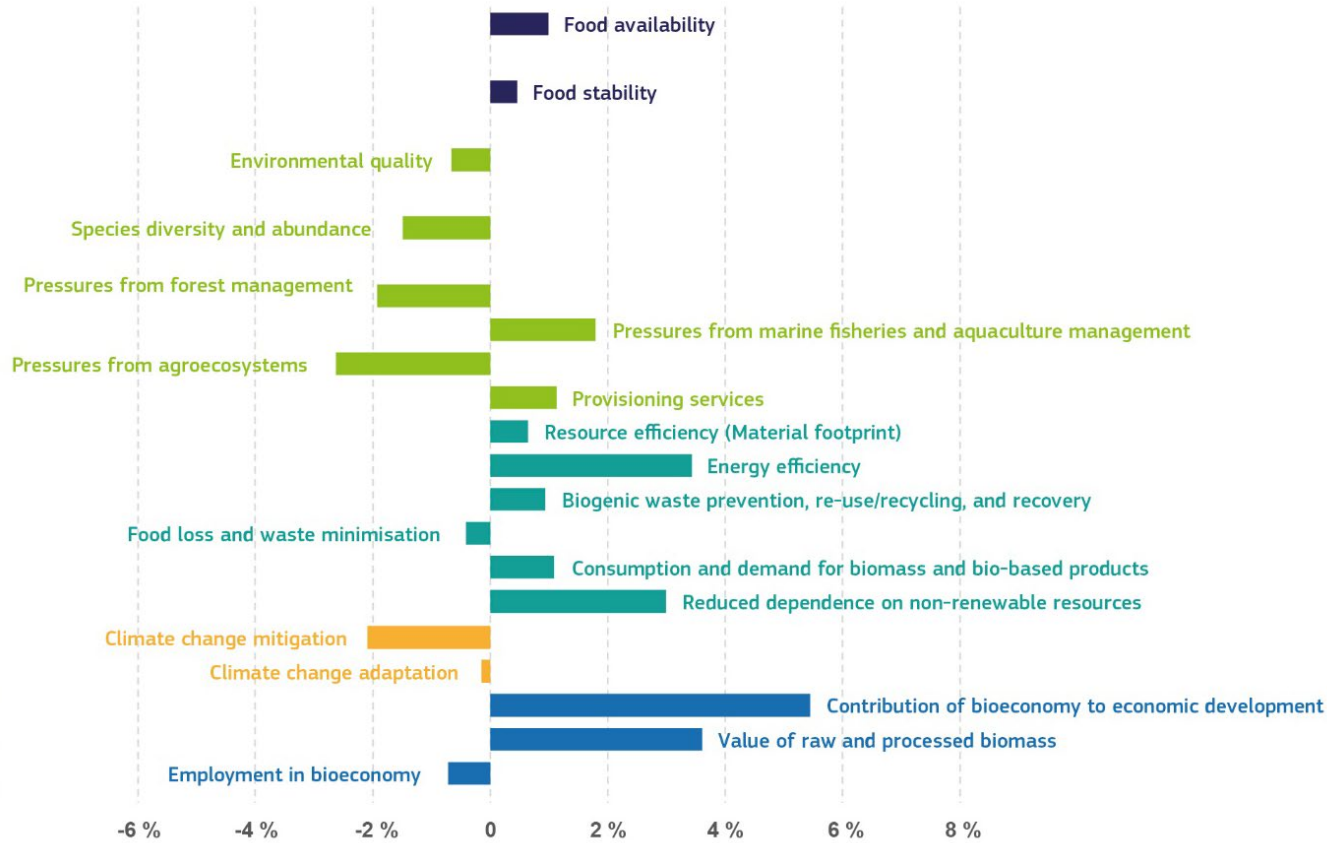


- **Total value added in the EU bioeconomy: 728 billion EUR in 2021** (54% increase since 2009)
  - 60% from agriculture and food industry
- Value added **improved on almost all bioeconomy sectors**
- **Declining employment in bioeconomy**, especially in primary production



*A subset of indicators extracted from the EU-BMS*

# Average 10-year progress towards bioeconomy objectives



1. Ensuring food and nutrition security
2. Managing natural resources sustainably
3. Reducing dependence on non-renewable, unsustainable resources
4. Mitigating and adapting to climate change
5. Strengthening European competitiveness and creating jobs







# Take home messages

## The EC Knowledge Centre for Bioeconomy



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

- A robust **knowledge base** and a fit-for-purpose **monitoring system** are crucial elements for adaptive and effective governance.
- The **EC's Knowledge Centre for Bioeconomy** and the **EU Bioeconomy Monitoring System** are key tools for the deployment of a sustainable EU Bioeconomy.
- EU Bioeconomy monitoring relies on data from the Member States – **continued development and collaboration** is key
- Bioeconomy is a **multi-faceted system** that requires a balanced approach across sectors and the economic, social and environmental dimensions of sustainability. This needs to be reflected in the monitoring system.

# Thank you



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