The role and added value of life cycle assessment in support to the Farm to Fork

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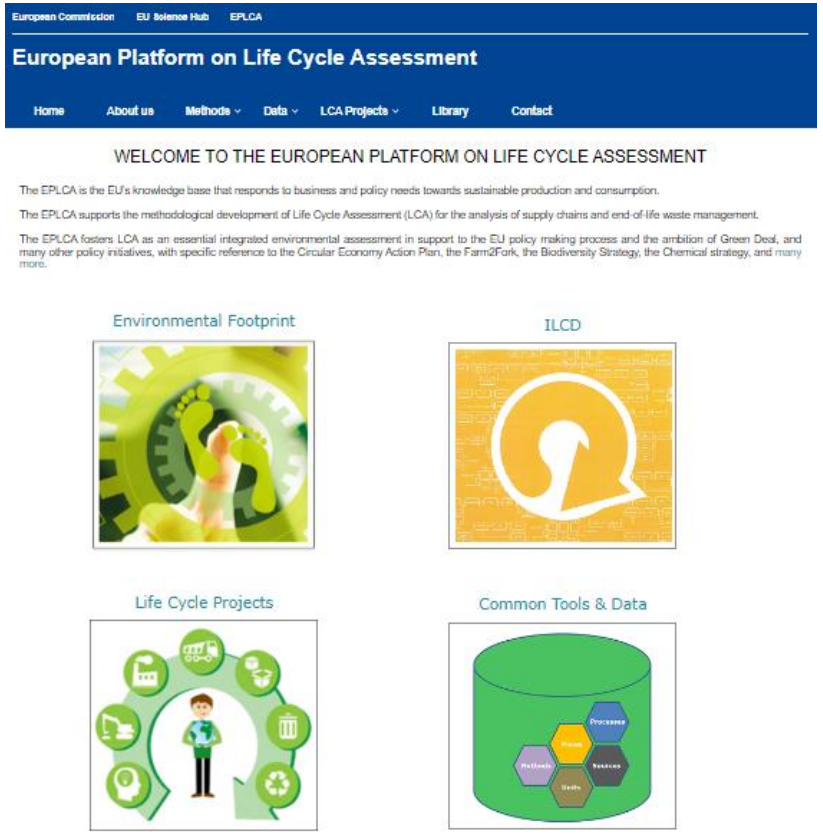
European Commission, Joint Research Centre

05/12/2022

The Joint Research Centre (JRC)



The JRC is the European Commission's science and knowledge service, providing scientific evidence throughout the whole policy cycle.

JRC supports EU policies and the development of methods to improve robustness and wide applicability of value chains assessment via life cycle assessment

https://eplca.jrc.ec.europa.eu/

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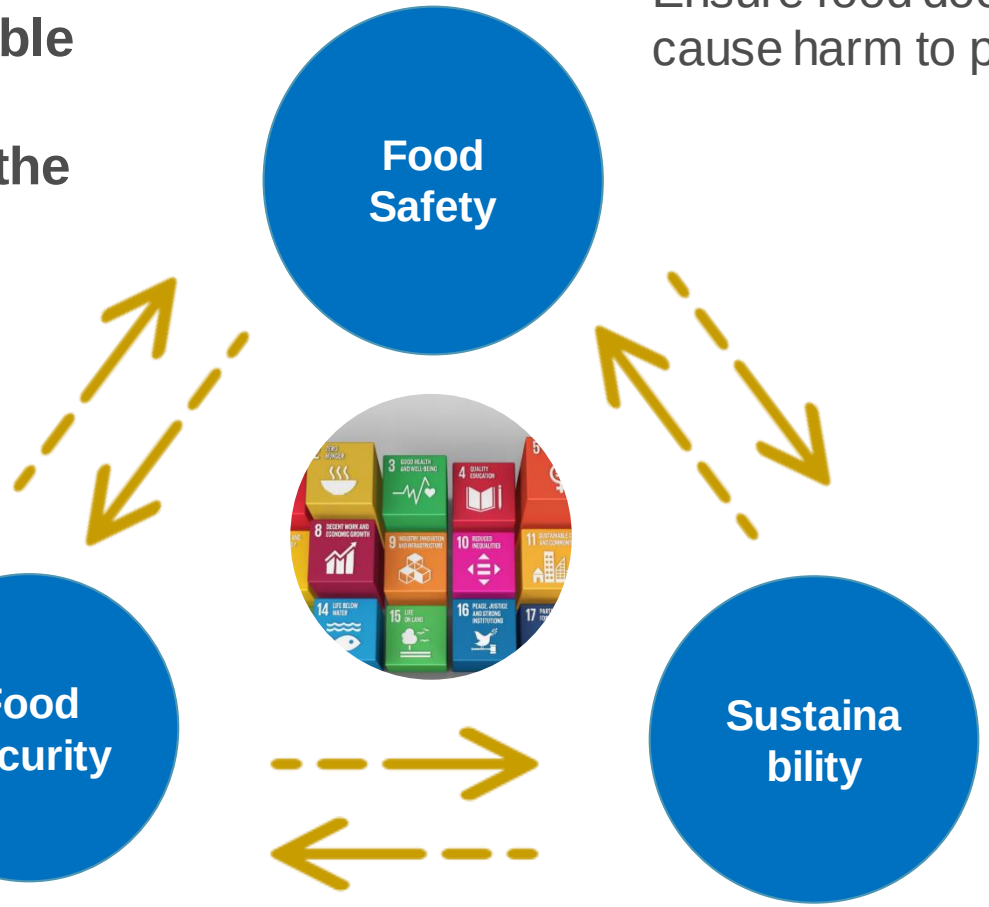
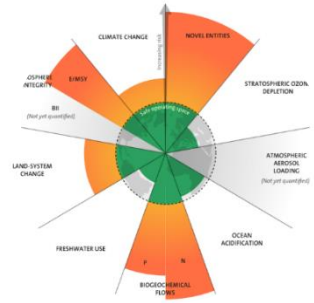
What we need to deliver to improve food sustainability?

- Contribute to **Sustainable development goals**
- Address **trade-offs of the food system**

- Ensure food does not cause harm to people





- Ensuring food system is within **planetary boundaries**
- Addressing **socio-economic impacts**

Sala, S., McLaren, S. J., Notarnicola, B., Saouter, E., & Sonesson, U. (2017). **In quest of reducing the environmental impacts of food production and consumption**. Journal of cleaner production, 140, 387-398.

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Key actions of the Farm to Fork and the role of LCA

Need for action(s)

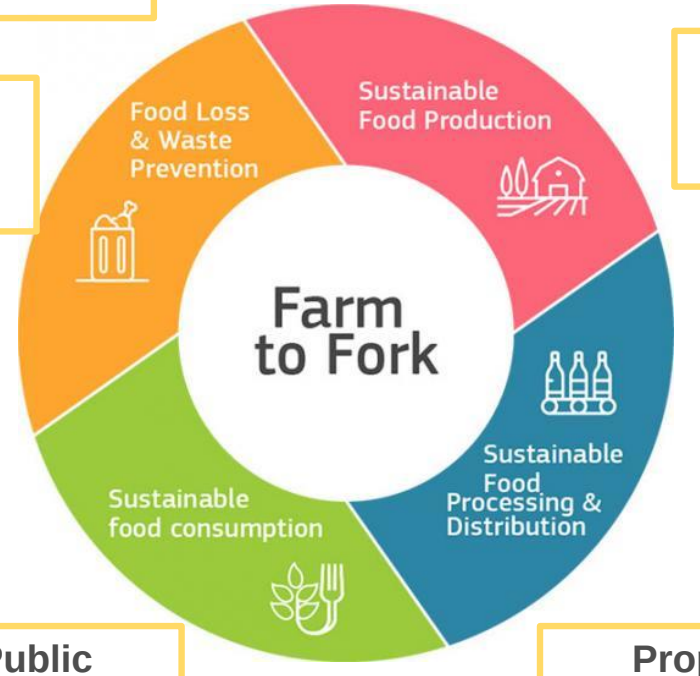
- Reduce environmental and climate [illegible] of the [illegible]
- [illegible]able
- Improve **synergies with sectoral legislations**

27 ACTIONS in the FARM TO FORK strategy

LCT & LCA

Proposal for a legislative framework for sustainable food systems

- **Monitoring framework for the F2F Strategy**
- **Consumers Food waste**
- **Assessment of organic production**
- **Food waste prevention targets for MSs**
- **Green Public Procurement Criteria**
- **Proposal for a sustainable food labelling framework**



https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en

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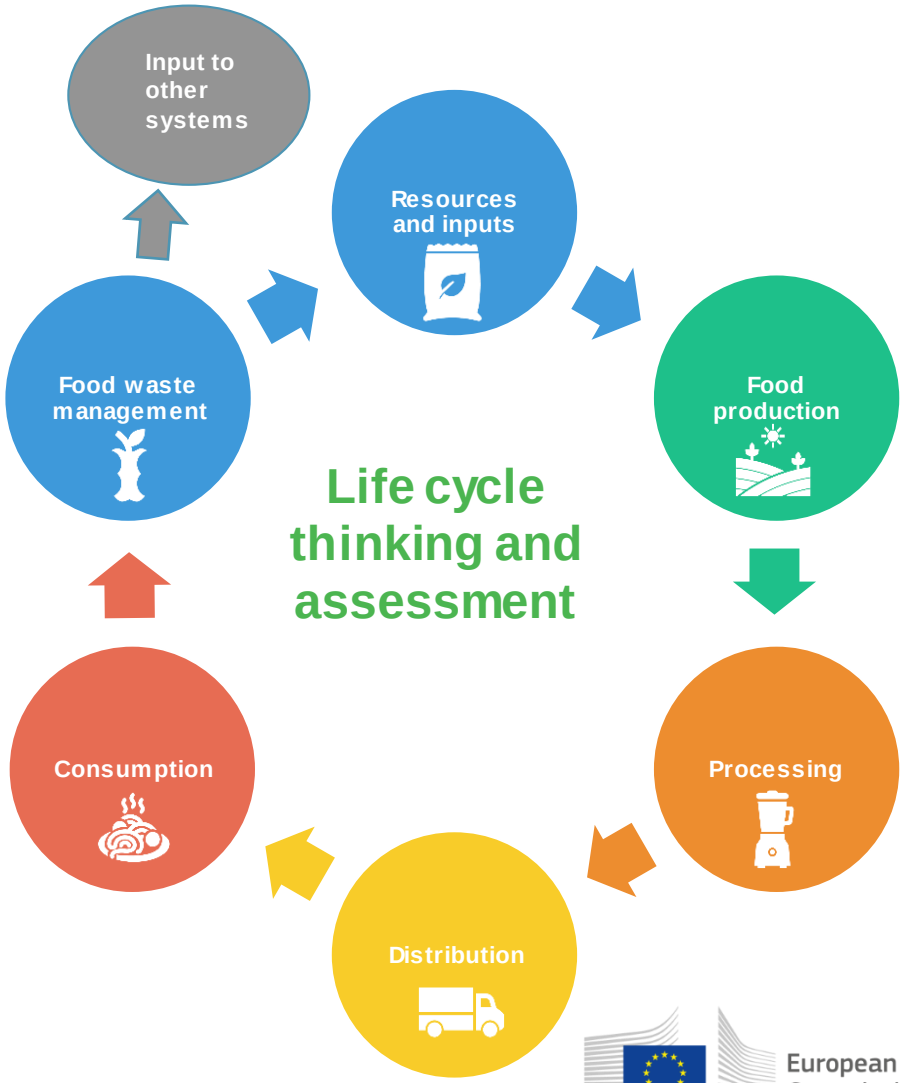
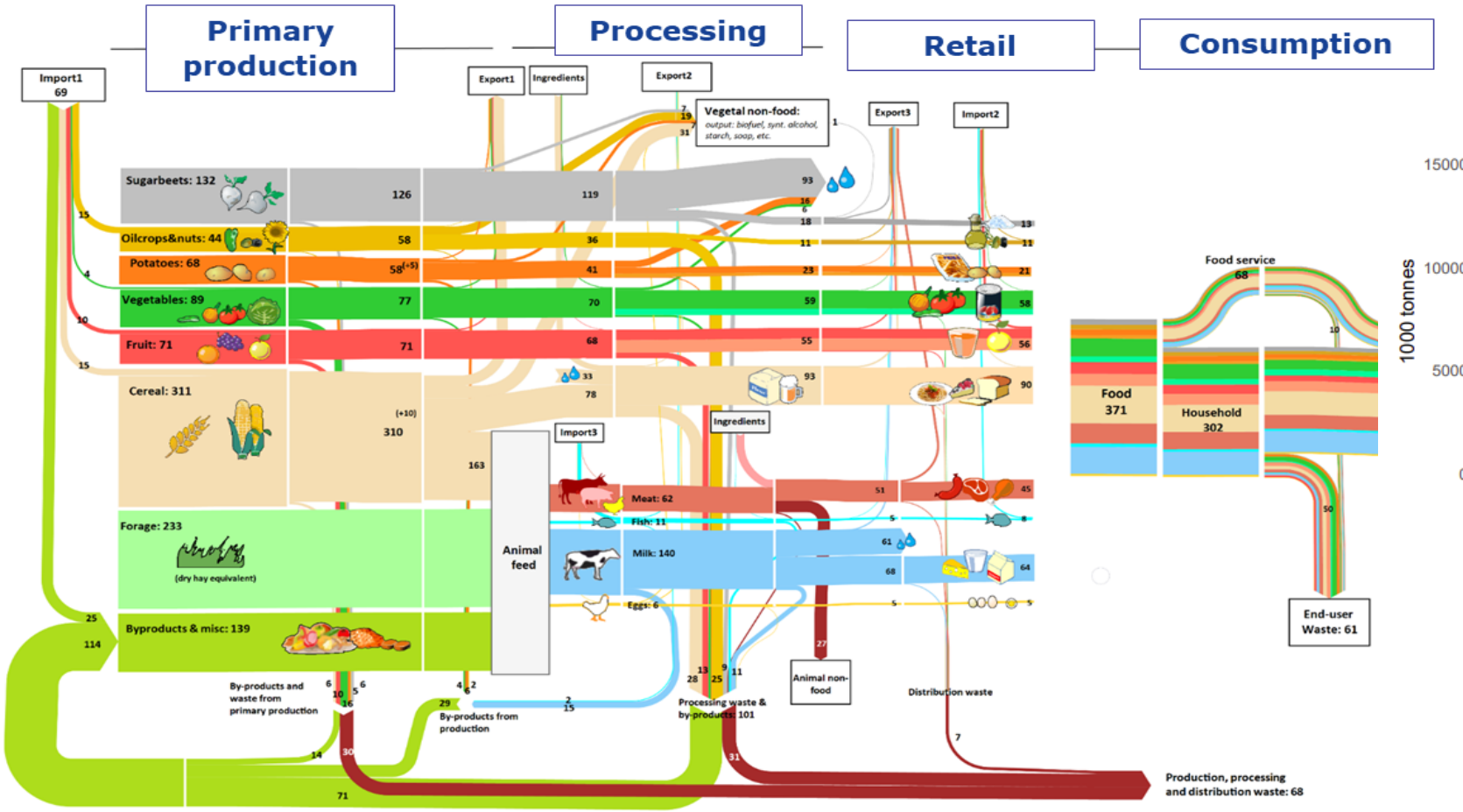
Life cycle thinking and assessment

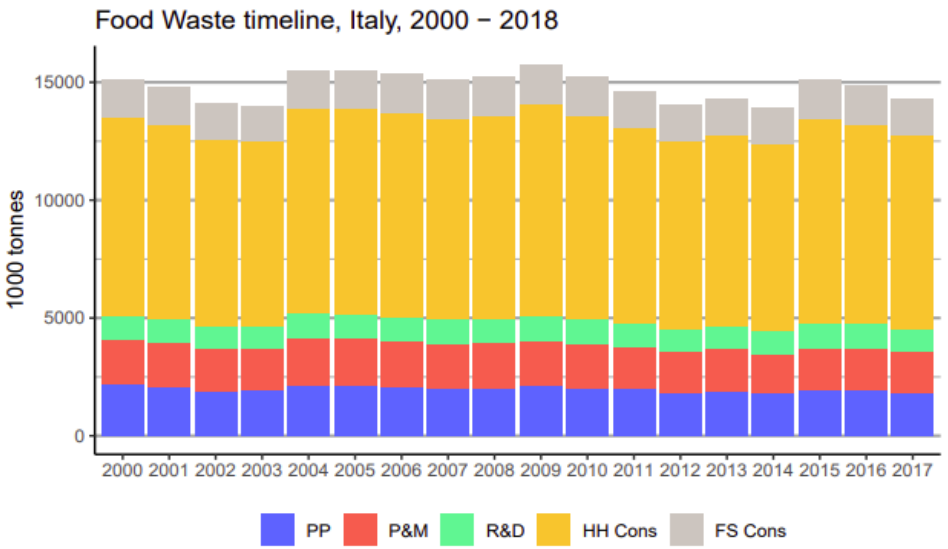
examples of LCT and LCA based support given by JRC to the Farm to Fork Strategy

- Life cycle thinking and assessment in support to food system analysis
  - Material flow analysis (MFA) & food waste streams accounting
  - Assessing food waste prevention targets
  - Assessing options for by-products valorization
  - Consumption footprint: impacts of EU food system at macro scale
  - Product environmental footprint



Mass flow analysis of food and food waste





Caldeira, C., De Laurentiis, V., Corrado, S., van Holsteijn, F., Sala, S. (2019) **Quantification of food waste per product group along the food supply chain in Europe: a Mass Flow Analysis.** Resources, Conservation and Recycling, 149: 479-488

De Laurentiis, V., Patinha Caldeira, C., Biganzoli, F. and Sala, S., (2021) **Building a balancing system for food waste accounting at national level**, Publications Office of the European Union, Luxembourg, doi:10.2760/316306

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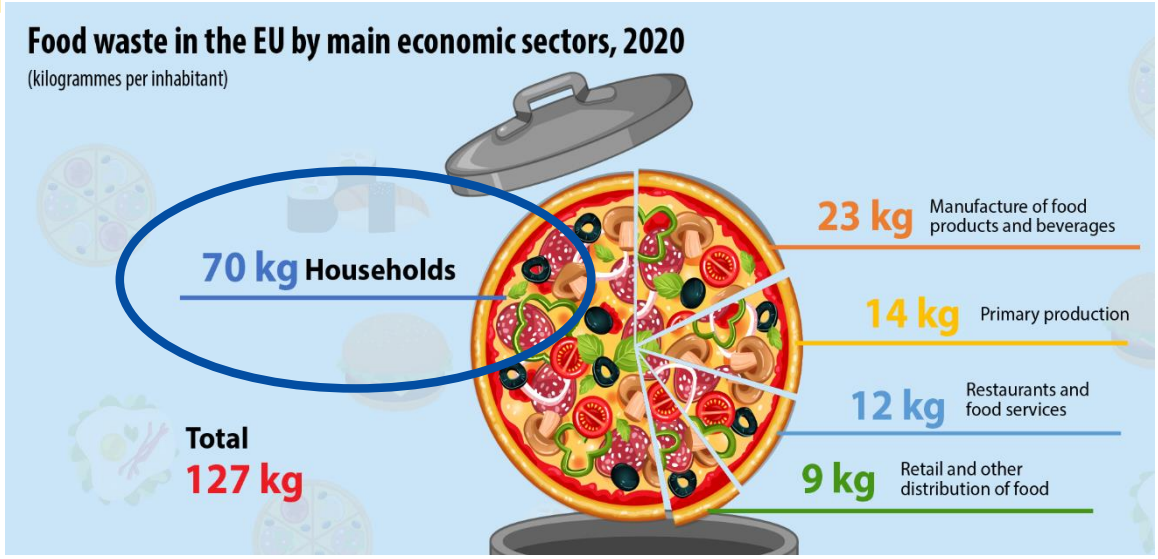
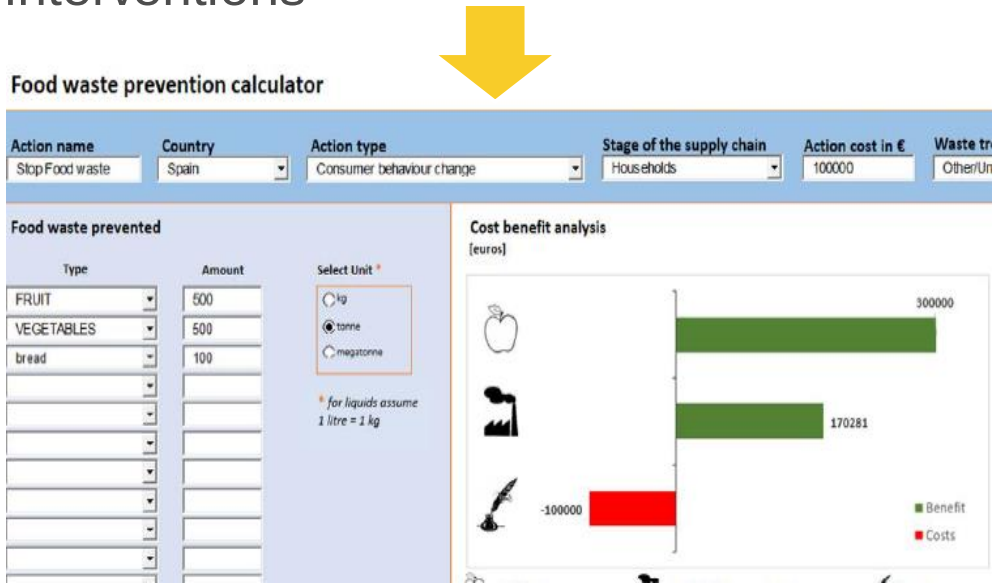
Food waste and consumers



- Assessing best practices in preventing consumer food waste→ targets for food waste reduction

- EC consumer food waste forum
  https://knowledge4policy.ec.europa.eu/projects-activities/european-consumer-food-waste-forum_en

LCA-based calculator to address impacts and trade-offs of food waste prevention interventions



Calculator downloadable here

Caldeira, C., De Laurentiis, V., Sala, S., (2019) **Assessment of food waste prevention actions: development of an evaluation framework to assess the performance of food waste prevention actions**, Publications Office of the European Union, doi:10.2760/9773

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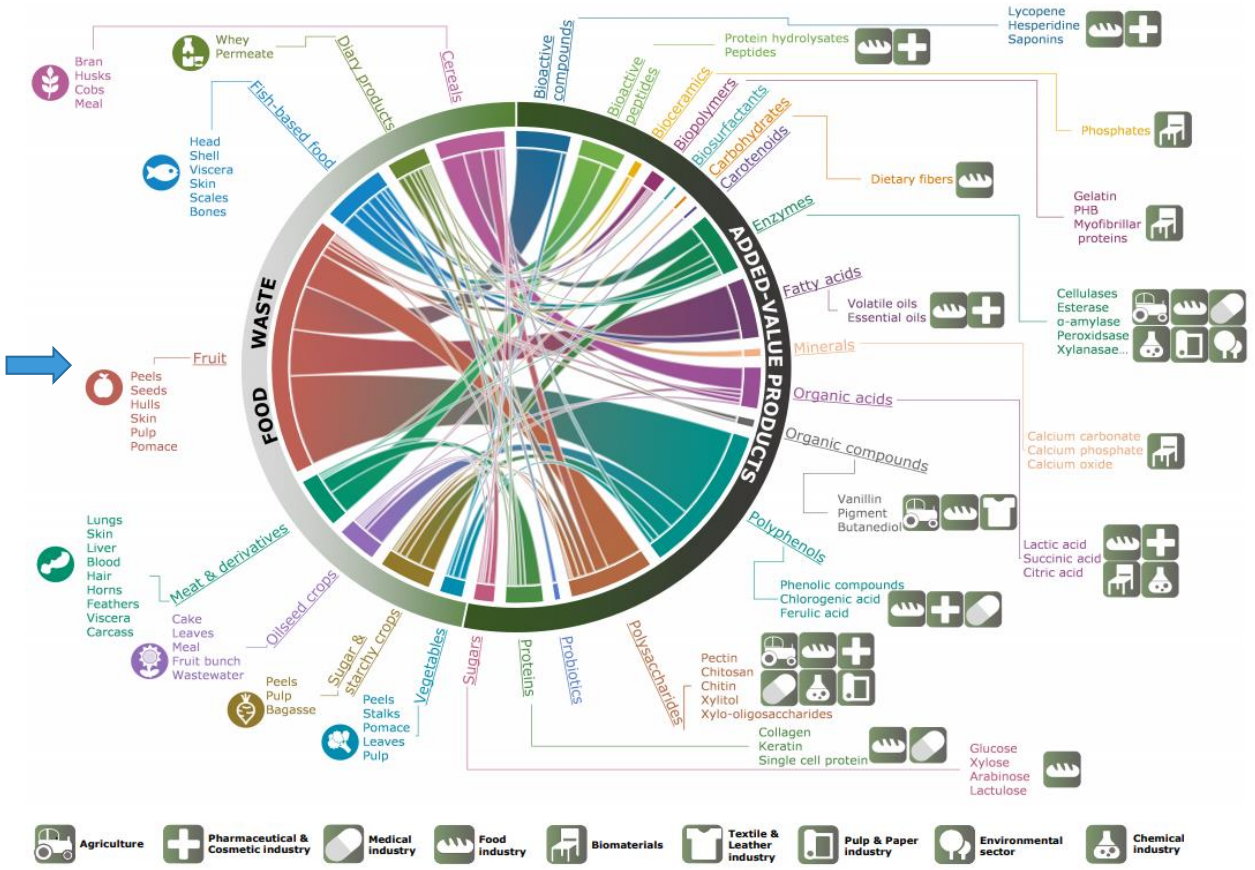
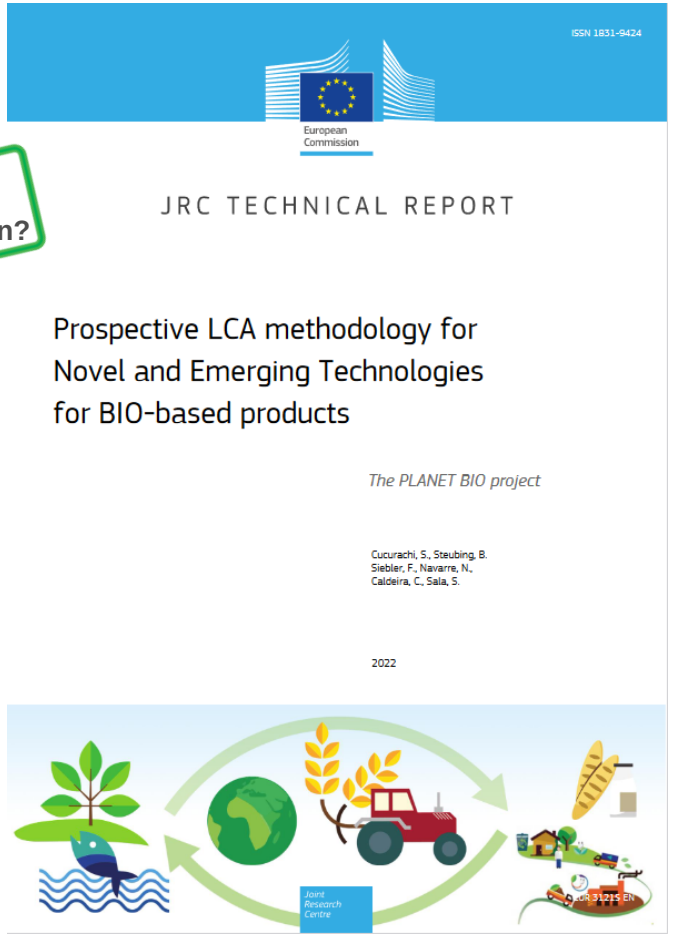
Bioeconomy: Opportunities for valorization of food waste and by products

Food waste/ by-products



Value added products



Caldeira, C., Vlysidis, A., Fiore, G., De Laurentiis, V., Vignali, G. and Sala, S., (2020). **Sustainability of food waste biorefinery: a review on valorisation pathways, techno-economic constraints, and environmental assessment**. Bioresource Technology, 312: 123575

Cucurachi, S., Steubing, B., Siebler, F., Navarre, N., Caldeira, C., & Sala, S. (2022). **Prospective LCA methodology for Novel and Emerging Technologies for BIO-based products.** Publications Office of the European Union, Luxembourg, doi:10.2760/167543

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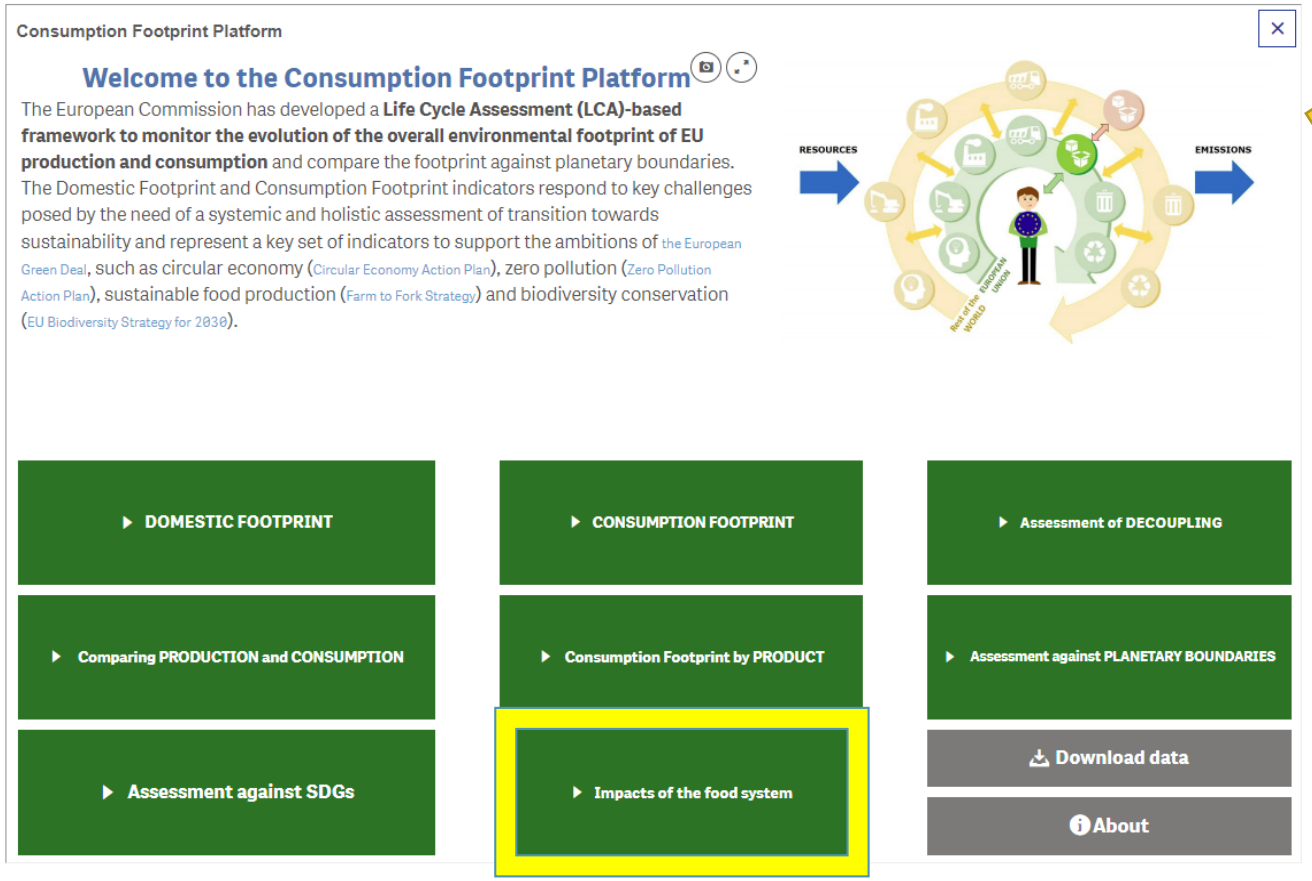
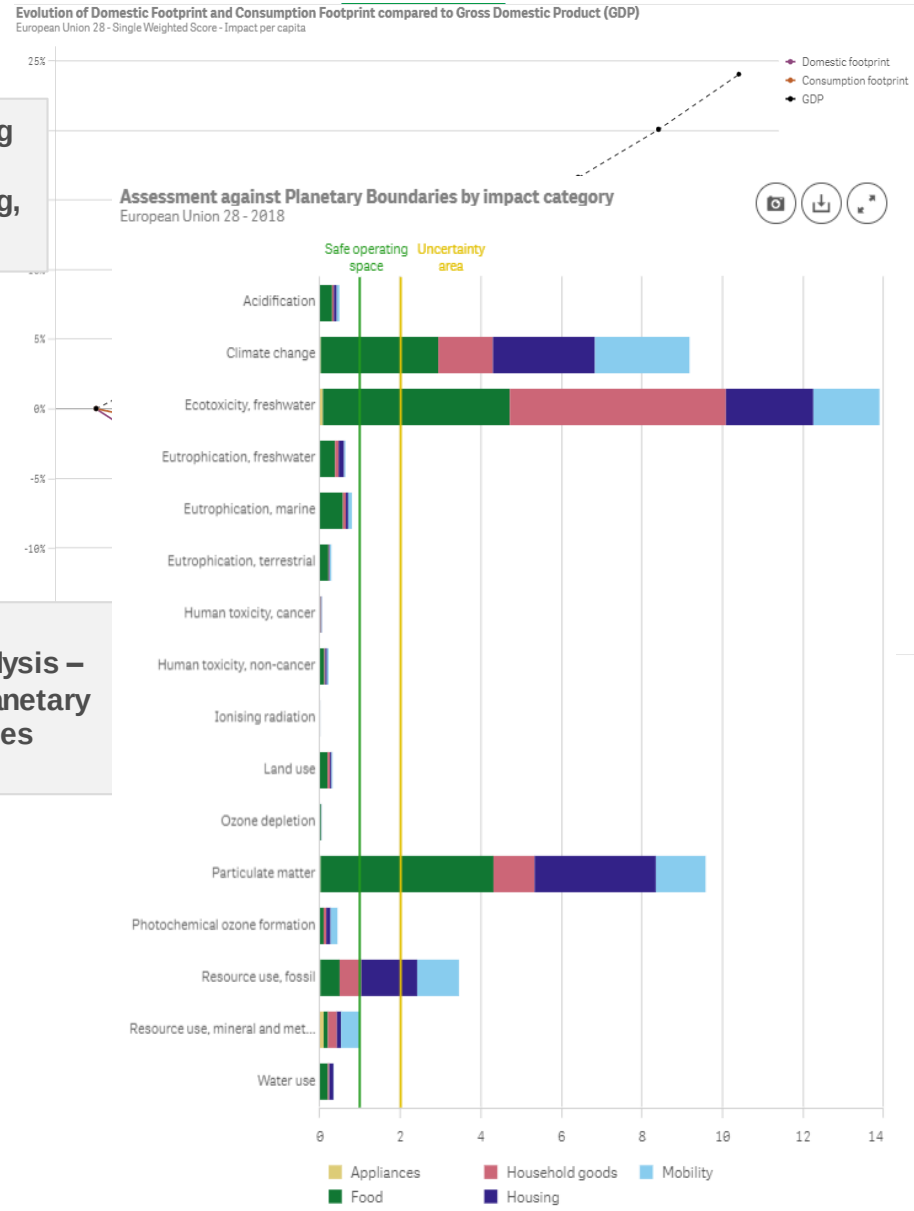
The environmental impacts of the EU food system: the Consumption footprint



Monitoring trends, decoupling, SDGs

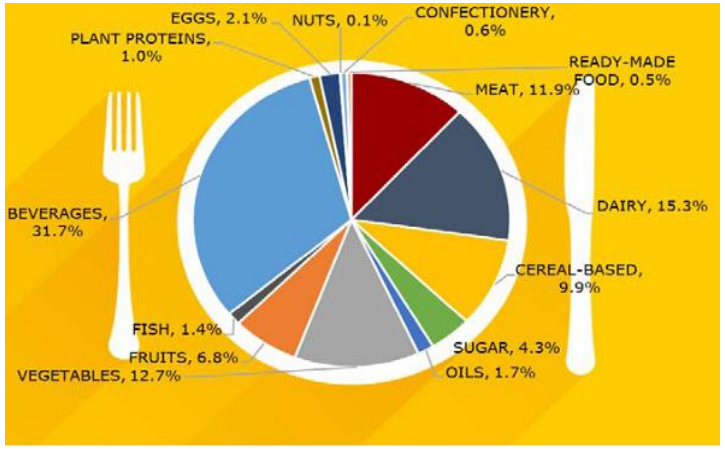
Hotspot analysis – products, planetary boundaries

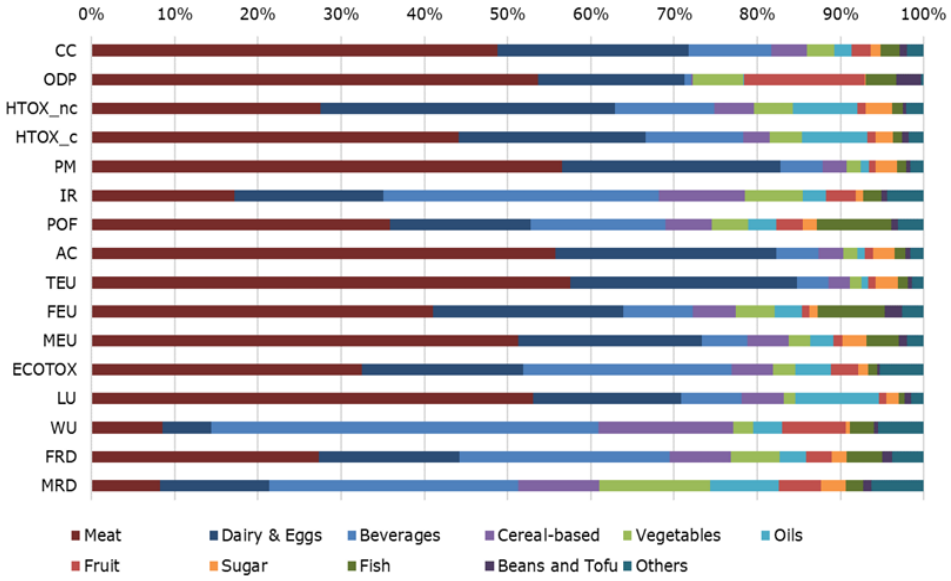


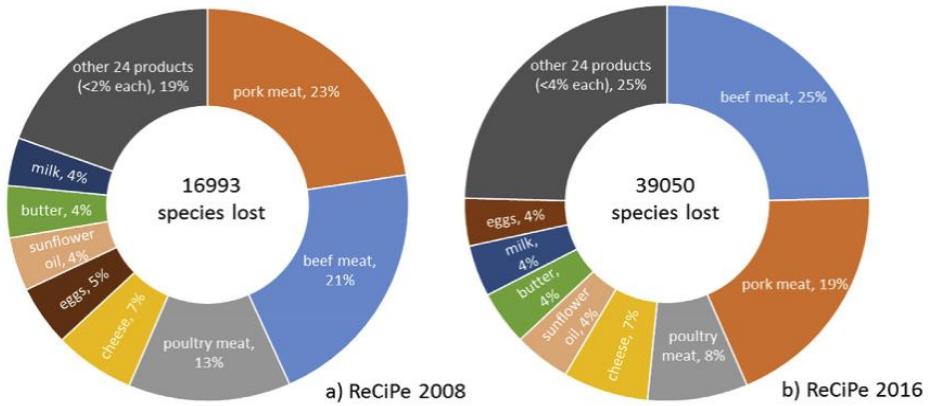
https://eplca.jrc.ec.europa.eu/sustainableconsumption.html
https://eplca.jrc.ec.europa.eu/ConsumptionFootprintPlatform.html

The environmental impacts of the food system –**the hotspots**

Main food products consumed in EU (% of mass)







- Hotspots by product groups
- Biodiversity impacts due to food consumption in Europe

https://eplca.jrc.ec.europa.eu/FoodSystem.htm
https://eplca.jrc.ec.europa.eu/sustainableconsumption.html

Crenna, E., Sinkko, T., & Sala, S. (2019). **Biodiversity impacts due to food consumption in Europe**. Journal of cleaner production, 227, 378-391.
Sanyé-Mengual, E., Valente, A., Biganzoli, F., Dorber, M., Verones, F., Marques, A., ... & Sala, S. (2022). **Linking inventories and impact assessment models for addressing biodiversity impacts: mapping rules and challenges**. The International Journal of Life Cycle Assessment 27: 813–833

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The environmental impacts of products and organisations: the PEF and OEF

Impacts on **16 environmental categories**

Objectives of Product and Organization Environmental footprint

1. Detailed guidance to **support the LCA comparison of products performance**

2. Guaranteeing the **reliability** of environmental information

3. Providing a **level playing field** for operators

https://ec.europa.eu/environment/eussd/smgp/ef_methods.htm

EC(2021) 9332 final **Commission Recommendation of 16.12.2021 on the use of the Environmental Footprint methods to measure and communicate the life cycle environmental performance of products and organisations**

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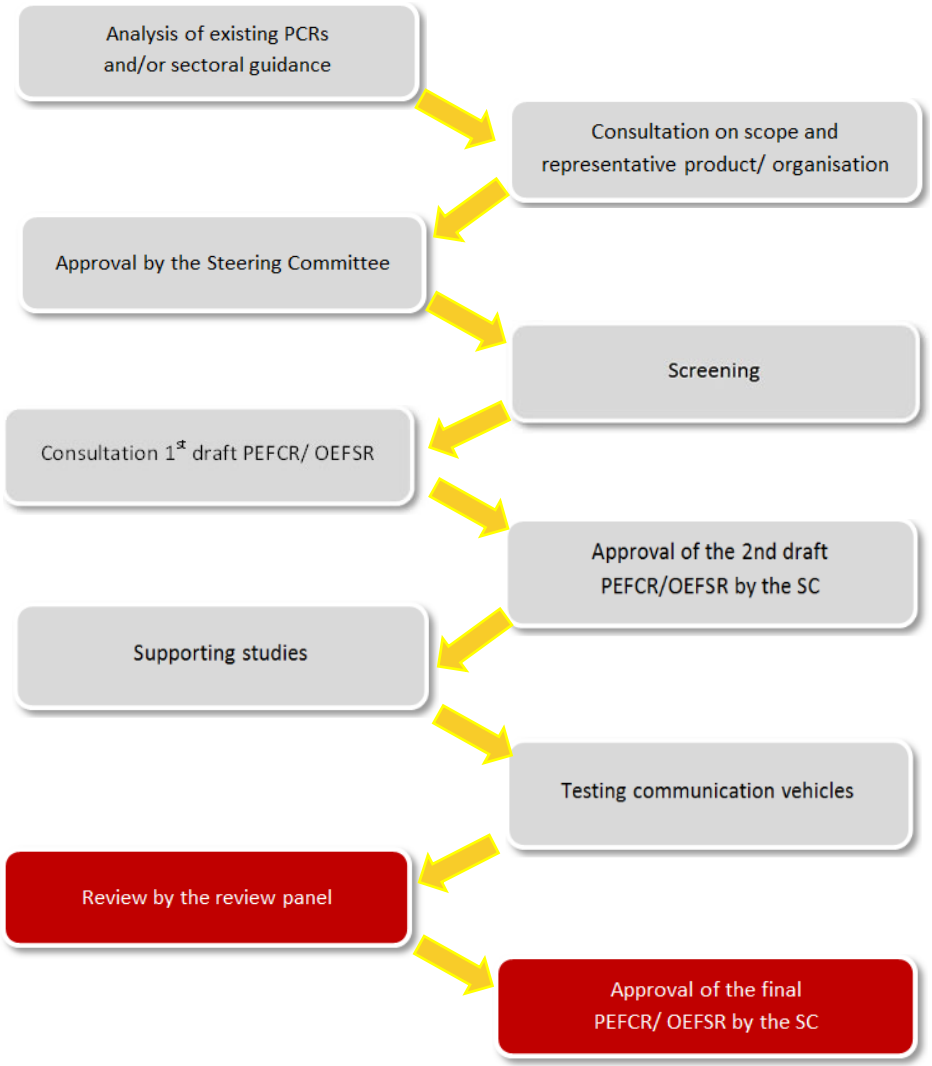
PEF pilots on food products

Pilot **process phases** towards Product environmental footprint category rules



PEFCRs **completed**


Beer


Packed water


Dairy products


Feed


Pasta


Wine


Pet food


Olive oil

PEFCR **ongoing**


Marine fish (wild caught marine fish and marine fish from marine open net pen aquaculture)

https://ec.europa.eu/environment/eussd/smgp/ef_pilots.htm#pilot

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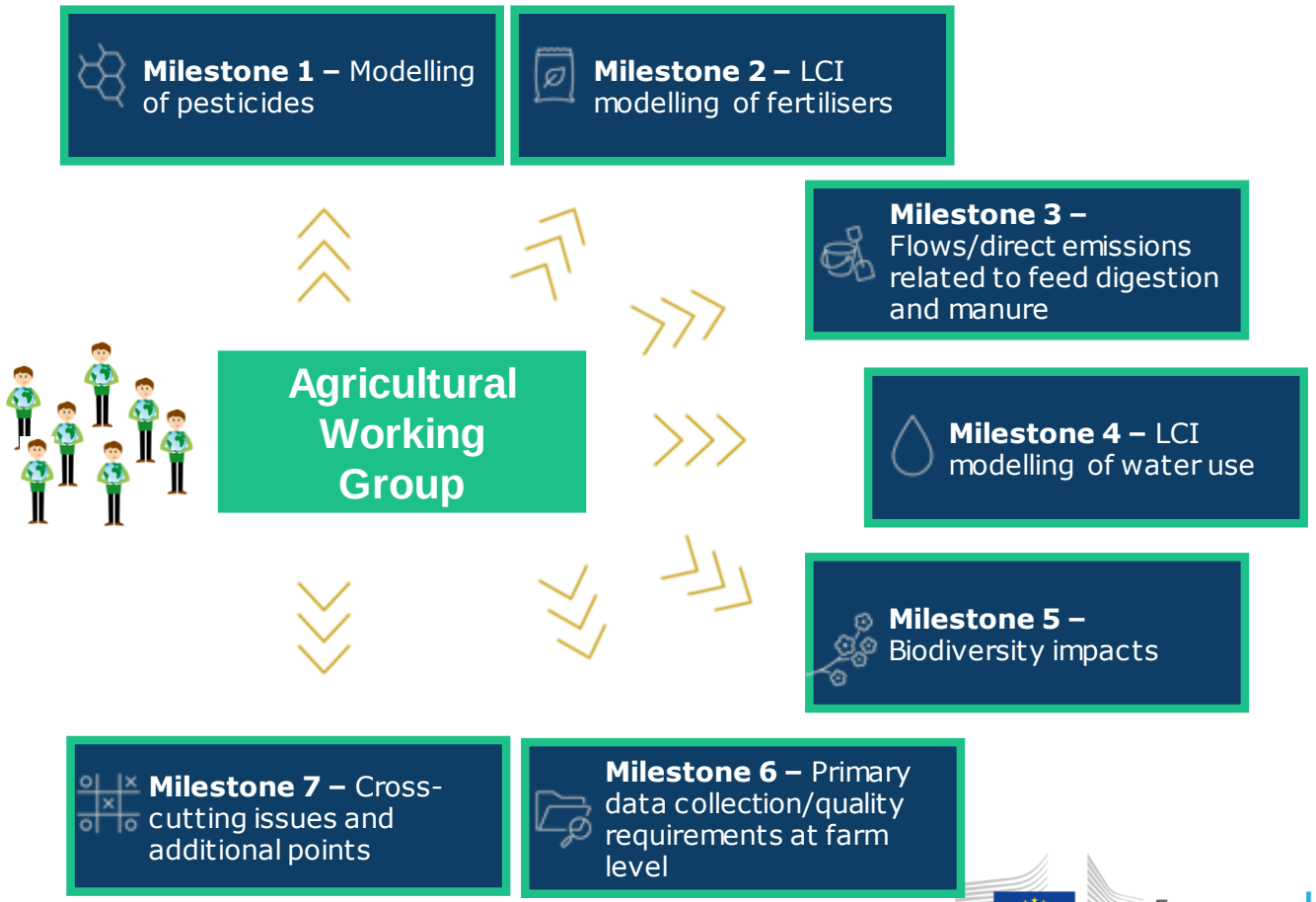
Agricultural working group of PEF

- Identification of consensual solutions for the methodological improvement of the EF on various agricultural modelling aspects
- Experts from different backgrounds and organisations
- Advancements and consultation reported to the PEF Technical Advisory Board



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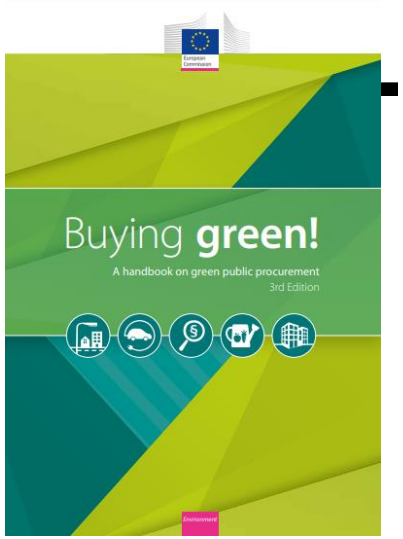
Sustainability labelling of food

- Proliferation of voluntary schemes
- Confusing for consumers
- Unclear sustainability requirements

- F2F strategy foresees the proposal of a uniform sustainability label framework "to empower consumers to make sustainable food choices"
- LCA/PEF can provide a blueprint for the design/assessment of sustainability labelling
- Currently being assessed within the Sustainable Food System Framework initiative

Green Public Procurement (GPP) of food products

F2F action for the definition of "the best modalities for setting minimum mandatory criteria for sustainable food procurement to promote healthy and sustainable diets, including organic products, in schools and public institutions"



GPP as a voluntary instrument

Product group	GPP criteria
Food procurement	Organic food products
	Marine and aquaculture food product
	Animal welfare
	More environmentally responsible vegetable fats
	Additional organic food products
Catering services	Food procurement
	Plant-based menus
	Food and beverage waste prevention
	Other waste: prevention, sorting and disposal
	Chemical products and consumable goods
	Energy and water consumption in the kitchens
	Food transportation
	Environmental management measures and practices
	Chemical products and consumable goods
	Energy and water consumption in the kitchens
	Food transportation (Air pollutant emissions, Greenhouse gas emissions, Refrigerants)
	Provision of low impact drinking water
	Purchase of new kitchen equipment and vehicles
	Environmental management measures and practices

LCA-based criteria

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Conclusions

- Food system transformation towards sustainability is essential to remain within planetary boundaries and achieve Sustainable Development Goals
- Policy is addressing this transformation through the Farm to Fork strategy and its objectives
- "Breaking down the silos" and embracing interconnectedness of policy domains and scientific fields
- LCA is increasingly important in supporting evidence-based policymaking in the food system: from the micro to the macro scale, from mass at stake to impacts

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Thank you

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