

# TRANSFORMATIVE INNOVATION AND SOCIO-TECHNICAL TRANSITIONS OF AGRICULTURE & FOOD SYSTEMS

**Keynote @ FOOD 2030 NETWORKS CONFERENCE**

**Transformative Food System Innovation**

**Brussels, 07th March 2024**



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# Current food and agricultural systems are unsustainable (I)



“Food in the Anthropocene represents one of the greatest health and environmental challenges of the 21st century”

EAT-Lancet Commission on healthy diets from sustainable food systems

„**more than 820 million people have insufficient food** and many **more consume low-quality diets** that cause micronutrient deficiencies and contribute to a substantial rise in the incidence of **diet-related obesity and diet-related non-communicable diseases**... Because much of the world's population is **inadequately nourished** and many **environmental systems** and processes are **pushed beyond safe boundaries** by food production, a **global transformation of the food system** is urgently needed.” (Willet et al 2019)

# Current food and agricultural systems are unsustainable (II)



**2 ZERO HUNGER**

**12 RESPONSIBLE CONSUMPTION AND PRODUCTION**

**UN environment programme** **International Resource Panel**

## Rethinking the way we eat

Food systems are responsible for:

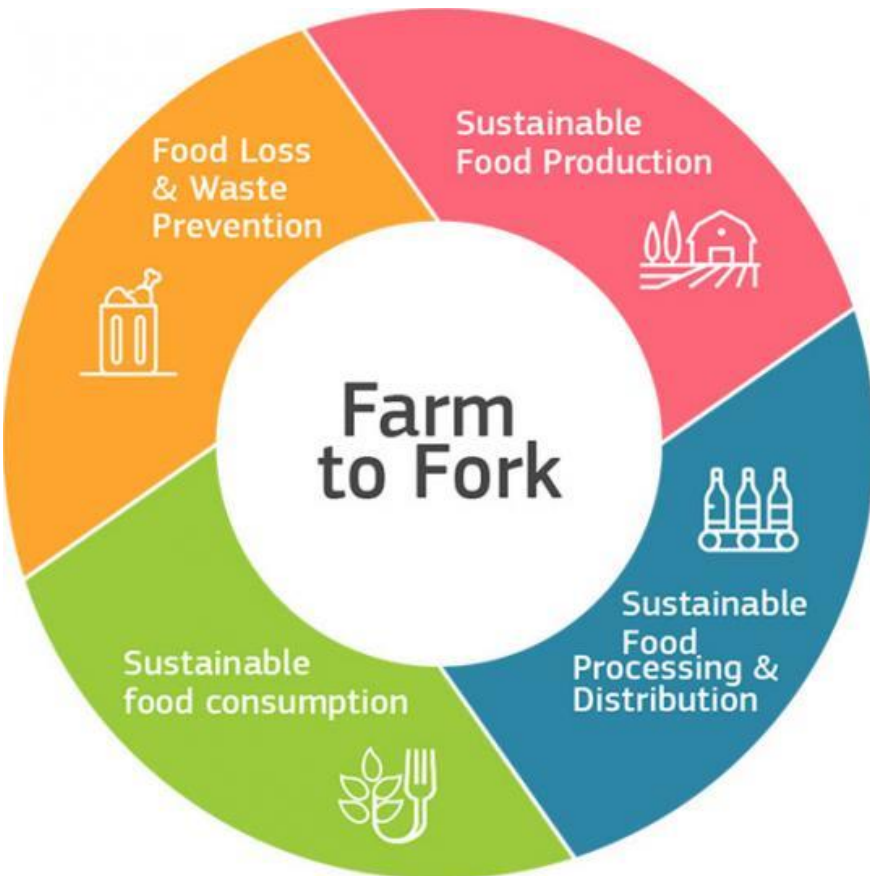
- 60%** of global biodiversity loss on land
- 33%** of degraded soils
- 24%** of the global GHG emissions
- 61%** of the depletion of commercial fish
- 20%** overexploitation of the world's aquifers

**60%** increase of global food production is needed to feed a future population of 9 billion people

At the same time **> 800 million** people are still hungry today.

Source: <https://www.genevaenvironmentnetwork.org/resources/updates/food-systems-and-the-environment/>

# EU Farm to Fork strategy: Ambitious plan for a transition to a sustainable food system



## Aims for a sustainable food system:

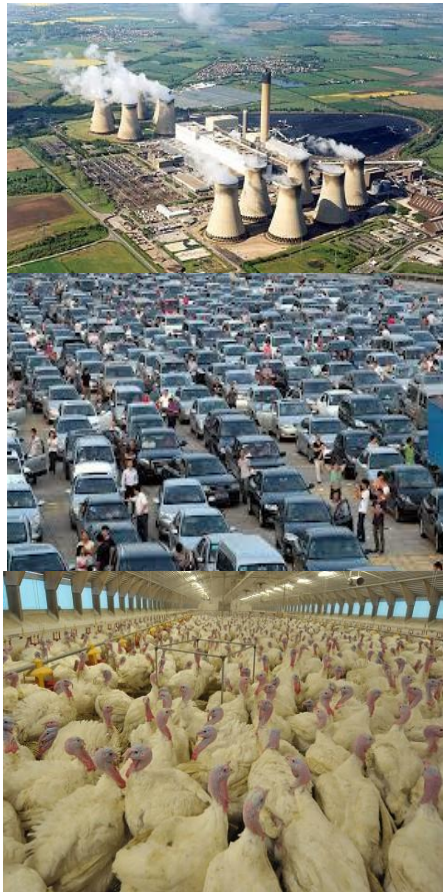
- have a neutral or positive env. impact
- mitigate climate change & adapt to its impacts
- reverse the loss of biodiversity
- ensure food security, nutrition and public health; access to sufficient, safe, nutritious, sustainable food for everyone
- preserve affordability of food while generating fairer economic returns, fostering competitiveness of the EU supply sector and promoting fair trade

Source: EC,  
[https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy\\_en](https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en)

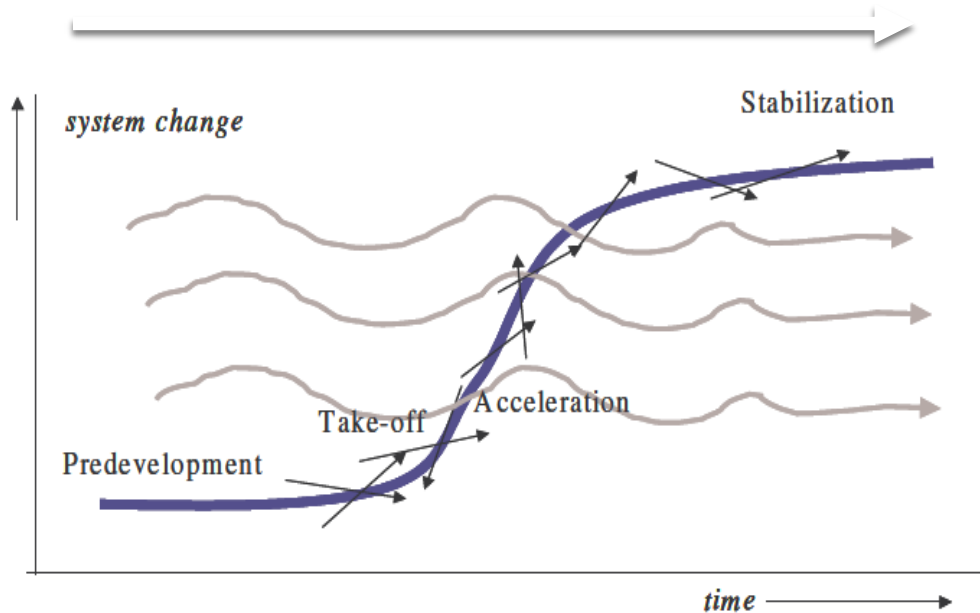
# Transitions towards a more sustainable world urgently needed



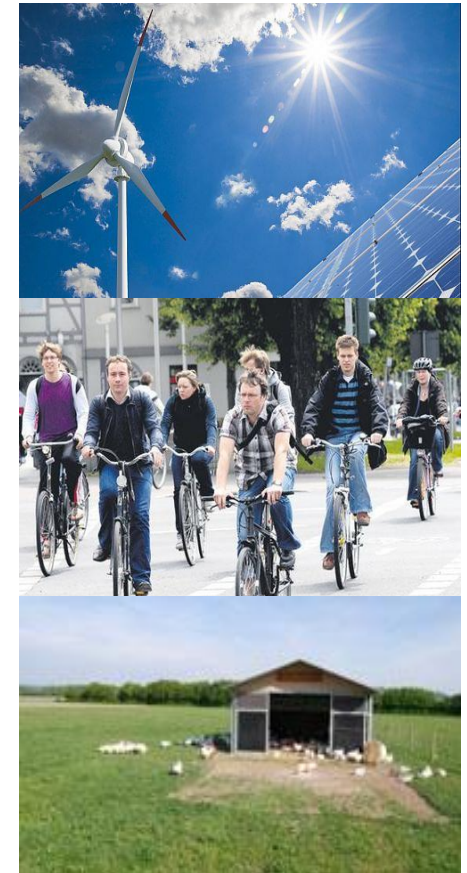
'Unsustainable' world



## Transition



More 'sustainable' world



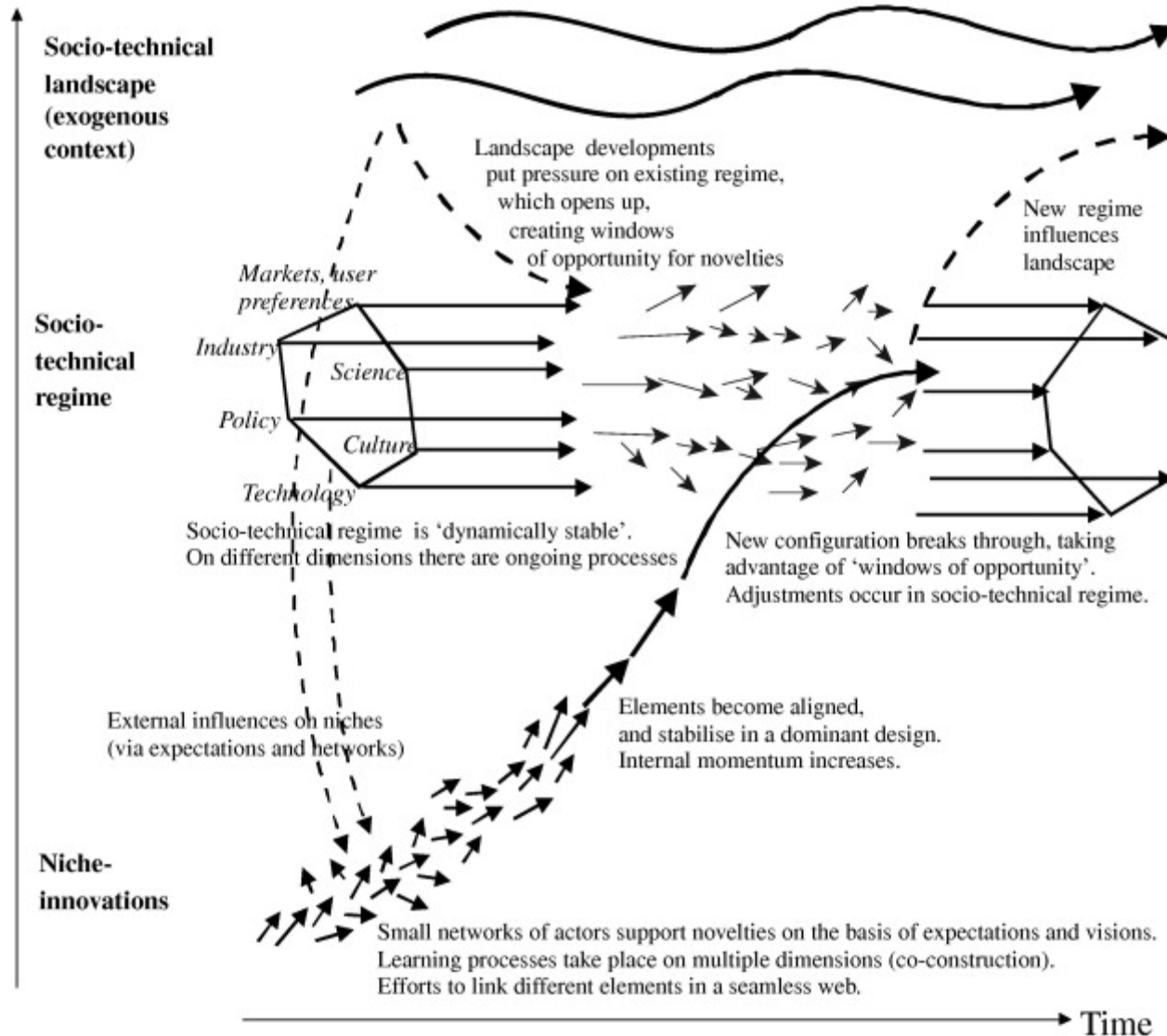
# What are socio-technical transitions?

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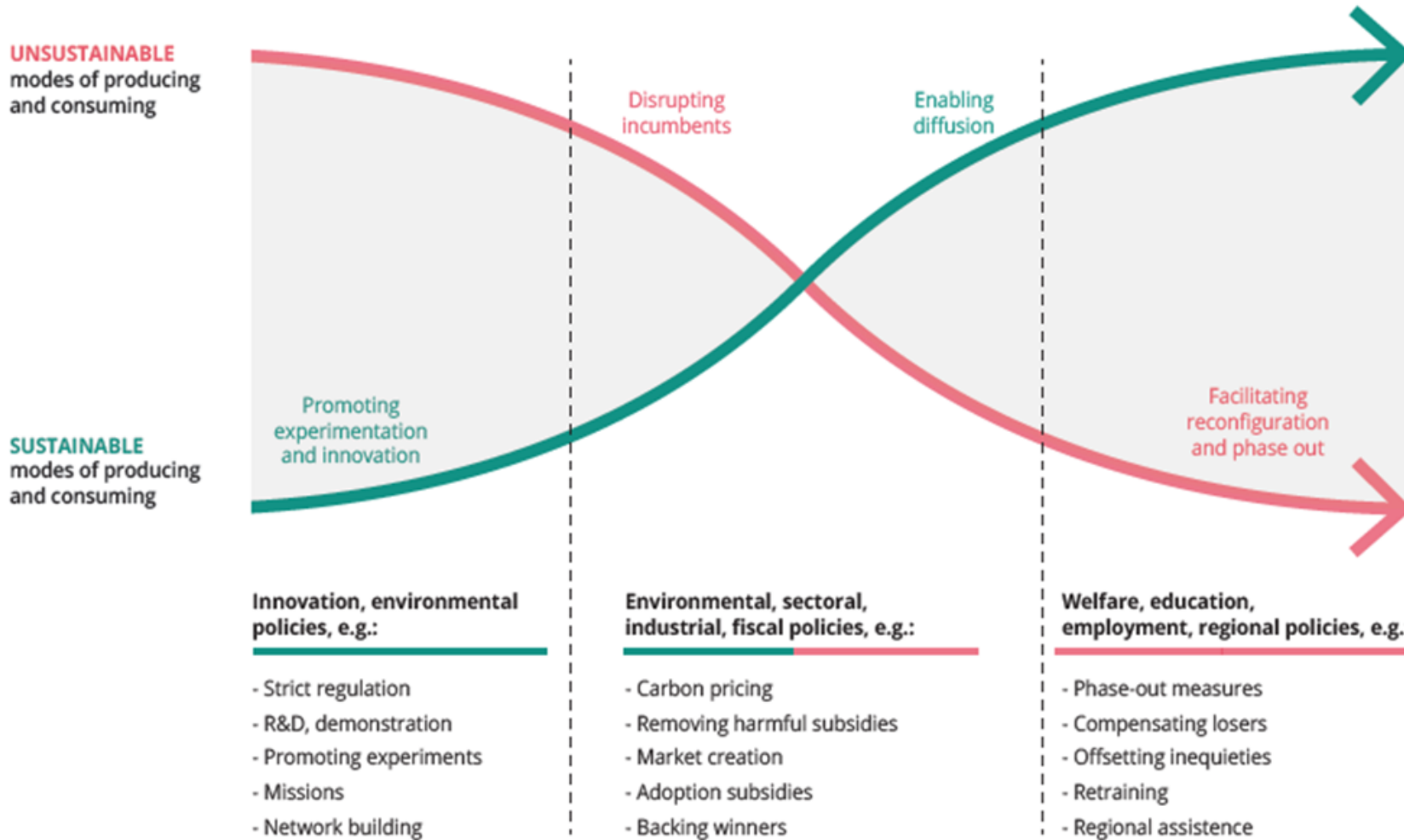
- A structural change in the way a societal need is fulfilled
- Usually take 30-50 years
  - Involving technical as well as non-technical changes
  - Are non-linear and multi-actor processes
  - Can be highly political (winners & losers)
  - system change as multi-level, co-evolutionary process

# How does change in socio-technical systems come about?



Source: Geels/Schot 2007

# The twin processes of innovation and phase-out in sustainability transitions





# What is a food transition?

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**food transition = change in our systems of food supply and consumption**

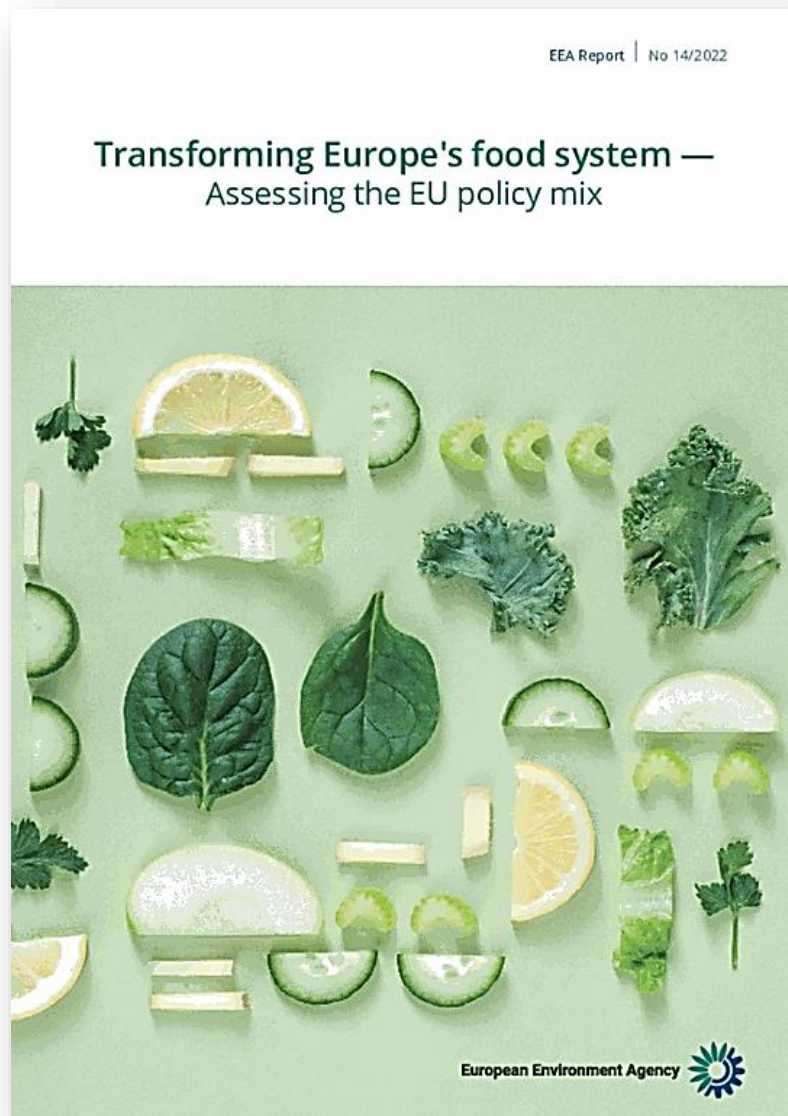
What are alternatives to current food and agricultural systems?

*Healthier diets, organic farming, agroecology, vertical farming, smart agriculture, regenerative farming, alternative proteins, cultivated meat, farmers markets, food sovereignty, food coops, ...*

**→ Contested pathways and goals!**



# Transforming Europe's food system



## Aim of the report

detailed and empirical assessment of EU food policy mix

## Questions

1. Is the current EU policy mix targeting the food system consistent with the transformative agenda of the European Green Deal?
2. If not, how could it be made more genuinely transformative?

# Methodology

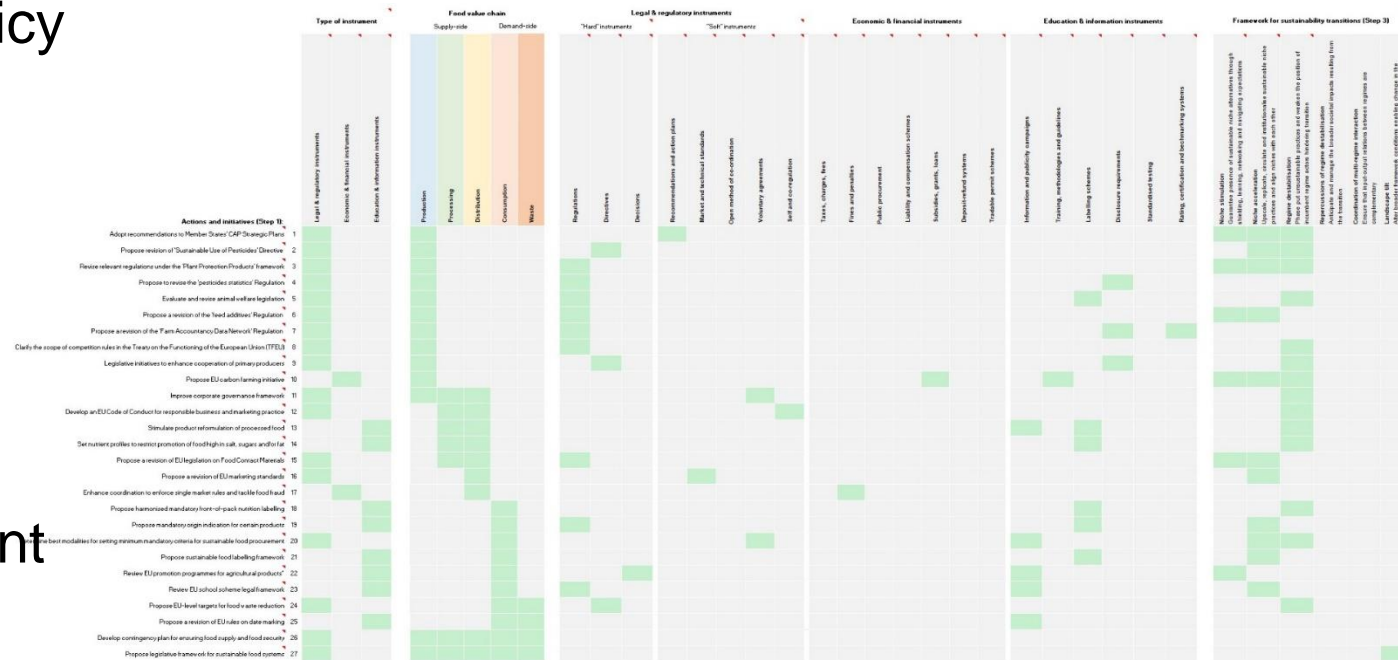


Mapping and assessment of EU policy in terms of actors, instrument types, transition dynamics (CAP, CFP, F2F, ...)

Preliminary messages about the strengths, limitations of the current policy mix

Stakeholder engagement

Further desk research



# Does EU policy provide sufficient support for transformative innovation? (I)

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## What policy should do:

- promote diverse forms of innovation (technical and social, incremental and radical)
- Support transformative coalitions of actors (beyond supply side)
- Orienting innovation processes and managing uncertainties (directionality, e.g. through missions)
- Support niche acceleration and scaling

# Does EU policy provide sufficient support for transformative innovation? (II)

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## Assessing the current mix:

CAP, CFP and F2F contain a variety of instruments aimed at stimulating and accelerating alternative niches, but:

- most are geared towards incremental technological improvements and limited change in social & behavioural practices
- most instruments promote niche acceleration indirectly e.g. through improving labelling, standards, setting minimum-criteria, etc, not by providing direct funding or incentives, few economic or financial instruments
- lack of stringent regulatory measures targeting crucial parts of the food value chain (e.g. processing and distribution)
- vague concerning directionality
- Little support for actors who develop social innovation

# Does EU policy provide sufficient support for transformative innovation? (II)

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## **Assessing the current mix:**

Analysis of broader EU policy support for food system innovation reveals a more promising picture: several cross-cutting strategies offer innovation support in an ambitious and more systemic fashion

e.g. Food 2030: multistakeholder dialogue on the role of R&I in future-proofing the food system, takes a food systems perspective

e.g. Horizon Europe: funding for R&I projects, also on social aspects such as dietary shifts, social innovation; more directionality through missions, e.g. 'A soil deal for Europe', but no specific mission to transform food system

# Does EU policy provide sufficient support for transformative innovation? (III)

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## **Towards a more transformative policy mix:**

- Improving multi-actor engagement: often still centred on farmers; include a broader and more diverse set of stakeholders throughout the food value chain, incl. retailers, municipalities, social entrepreneurs and citizens
- Connecting spaces for experimentation & translocal diffusion with missions: useful to have a food system transformation mission
- Better support for niche acceleration and scaling (e.g. closing the financing gap for small farmers and agri-food innovators; crowd-funding, mini bonds)
- Make use of opportunities to promote synergies with other EU policies and funding sources (e.g. cohesion policy) and programmes at regional and national level

# Additional actions to create a more transformative EU policy mix

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## **ROTATING PANEL SESSION I: What are the local, national and EU policies that we need for supporting transformative food system innovation?**

1. Create a strong EU legislative framework and targets for Europe's food system to guide reforms across EU policy areas and to inform policymaking at other levels of governance
2. Create new EU roles or institutions to improve coordination across policy areas and engage frontrunning stakeholders in decision-making
3. Promote the development of national food system strategies to translate EU-level goals into national contexts
4. Enable more direct EU support for community-level initiatives to boost multi-actor participation and vertical governance

(source: EEA 2022)



Thank you very much

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# Sources

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EEA (2022) Transforming Europe's food system – Assessing the EU policy mix, EEA report No 14/2022, <https://www.eea.europa.eu/publications/transforming-europes-food-system>.

Geels, F.W., Kern, F., Clark, W.C. (2023) Sustainability transitions in consumption-production systems, *Proceedings of the National Academic of Sciences*, 120 (47) e2310070120.

Geels, F. W., & Schot, J. (2007). Typology of sociotechnical transition pathways. *Research Policy*, 36(3), 399-417.

Willett, W., Rockström, J., Loken, B., Springmann, M., Lang, T., Vermeulen, S., ... & Murray, C. (2019). Our food in the Anthropocene: the EAT-Lancet Commission on healthy diets from sustainable food systems. *Lancet*, 393(10170), 447-492.

# Policy intervention points for socio-technical transitions



Intervention point	Policy rationale	Instruments (examples)
<i>Niche stimulation</i>	Guarantee the presence of sustainable niche alternatives through shielding, nurturing, learning, and expectations	R&D funding schemes and support for demonstration projects; tax exemptions; education policies and training programmes, etc.
<i>Niche acceleration</i>	Upscale, replicate, and institutionalise sustainable niche alternatives and align niches with each other	Incubators; standards and labels; promotion of entrepreneurship; advisory services; subsidies; public procurement; venture capital, etc
<i>Regime destabilisation</i>	Phase out unsustainable practices and weaken the position of incumbent regime actors	Subsidy removal and reforms; technology bans; carbon trading; pollution taxes; removal of tax deductions for incumbents
<i>Repercussions of regime destabilisation</i>	Anticipate and manage the broader social and economic disruption associated with sustainability transitions	Creative labour adjustment programmes; compensation schemes; education to support reskilling and unemployment, etc.
<i>Coordination of multi-regime interaction</i>	Ensure that input-output relations and multi-regime linkages are complementary and mutually supportive	Cross-cutting strategies that bring together siloed policy areas; processes such as impact assessment.
<i>Landscape tilt</i>	Alter broader framework conditions and give direction to innovation and socio-technical systems change	Overarching strategic frameworks such as the European Green Deal, long-term goals and roadmaps (e.g. 2050 targets, SDGs)

Source: Kanger et al. (2020)

# Diverse forms of innovation required for transitions



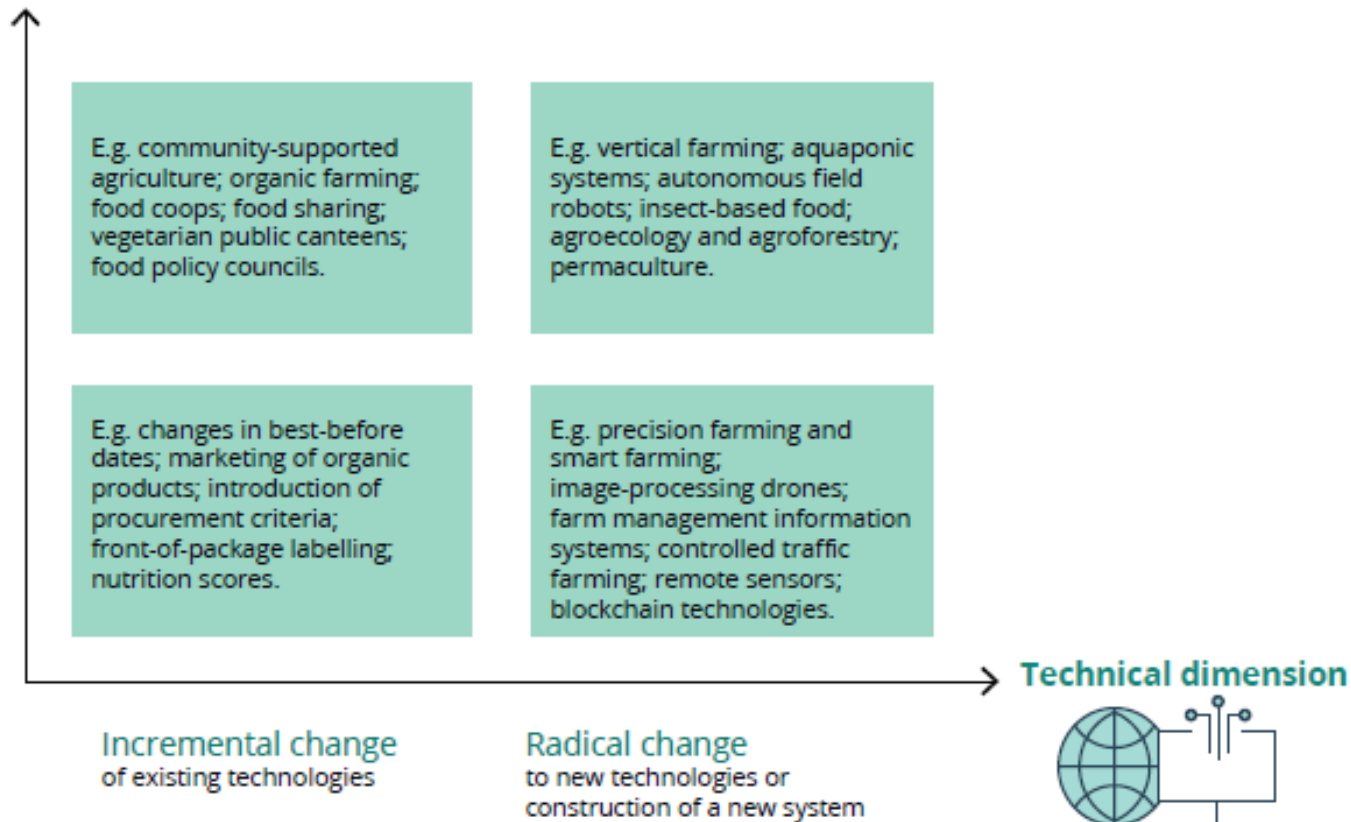
Figure 7.1 Classification of innovations in terms of incremental and radical social and technological change

## Social dimension

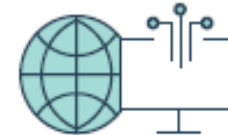


Substantial change  
in dominant social  
and behavioural practices

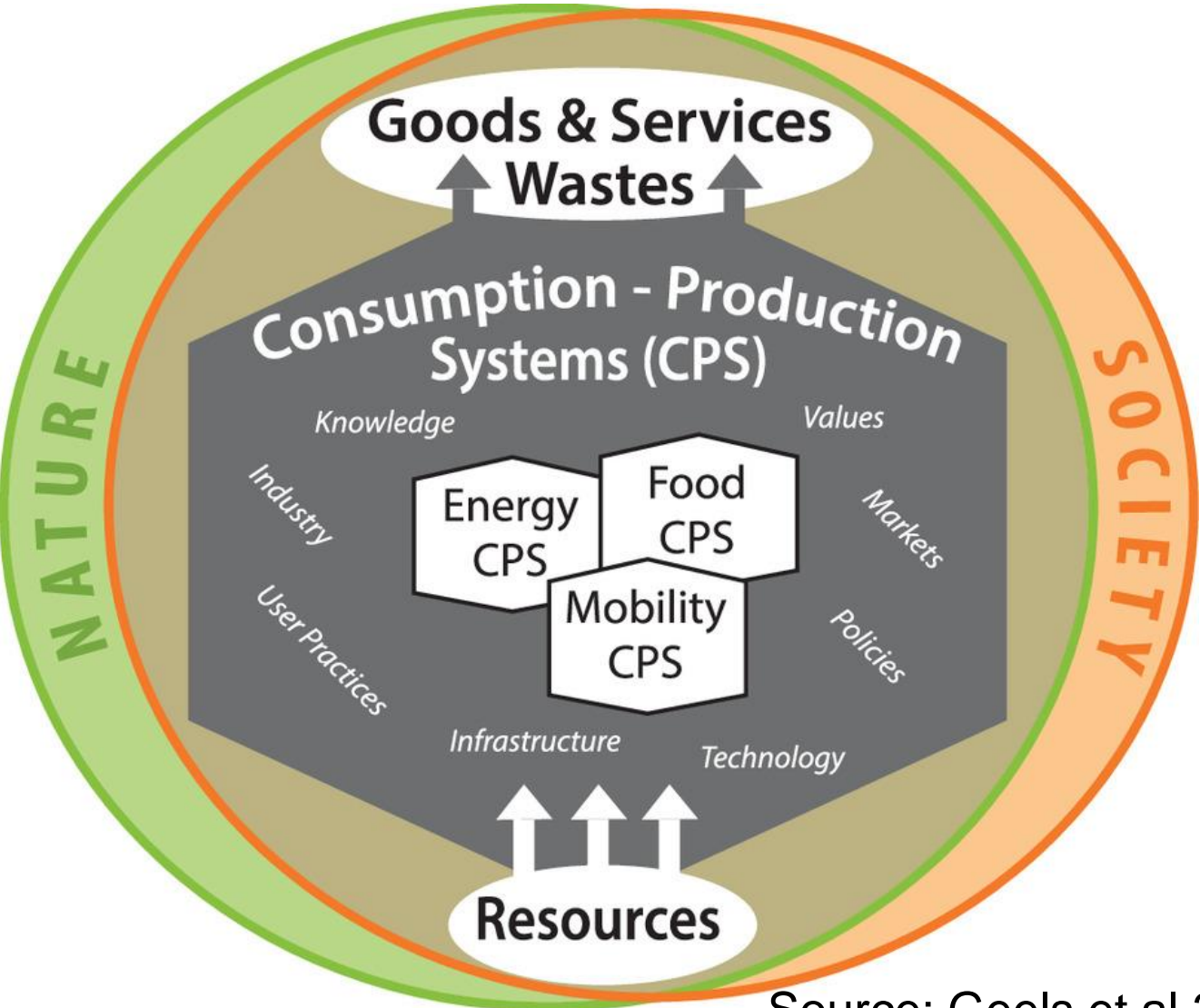
Limited change  
in dominant social  
and behavioural practices



## Technical dimension



# Transitions to sustainable food systems: radical changes in consumption-production systems



Source: Geels et al 2023