





EUROPEAN FOOD CHAIN SUPPLY TO REDUCE GHG EMISSIONS BY 2050









# EUROPEAN FOOD CHAIN SUPPLY TO REDUCE GHG EMISSIONS BY 2050

# Non-technical aspects to reduce emissions from farm gate to plate (WP3)

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ENOUGH webinar on results and highlights

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ENOUGH Webinar

1 Dec 2022

Online







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## Setting the scope - Research questions

What are the EU consumers' behaviours or social barriers to zero carbon emissions within the EU's food chain system?

- a) What consumer behaviours serve as barriers/drivers to the sustainable food chain?
- b) Are there other social issues that can impede EU's target of reducing emissions of the food chain?
- c) What are the knowns and unknowns of these social and behavioural issues?
- d) How to address the social and behavioural issues? Recommendations for pro-environmental behaviours towards low emission food chain.









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#### Literature review on social and behavioural issues



Literature Search Approach.









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### **Behavioural and Social Barriers: Dietary Preferences and Emission Reduction**

- Absence of cooking skills- individuals skills to prepare alternative protein meals.
- Food belief- perception that meat is healthy and biologically necessary.
- Food familiarity: prior experience, aversion and geographic context e.g. insectbased protein.
- **Taste experiences**: taste issues with plant protein; acceptance of taste leads to consumer reduce fear.
- Food neophobia: e.g. soy-based meat substitute poorly evaluated as harmful.
- Willingness: to reduce meat and dairy consumption across the population is relatively low (12.8%-25.5%).
- Low knowledge on impact of food system on environment.









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## **Behavioural and Social Barriers: Dietary Preferences and Emission Reduction**

- Social influence: Acceptance/rejection of alternative protein could be influenced by social pressure, messaging and occasion.
- Flexitarianism vs masculinity tendencies: peer pressure can be a barrier.
- Food culture and traditions: e.g. western cultures do not see insects food source as healthy.
- **Prices**: Alternative protein are more expensive than meat protein.
- Alternative protein labelling challenges: Too many and confusing ingredients.
- Sources of information: scientific vs commercial as consumers with health motives tend to trust scientific information than commercial.
- Confusion over labelling/Banning of meat label: 30% of US consumer do not recognise difference between traditional and cultured meat ingredient.











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# Categories of business models









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#### **Pay-per-use model**

• Cooling and Heating as a Service (CaaS & HaaS) model



- Customers only pay for the unit of cooling / heating consumed.
- Technology providers taking on the performance risk of the system.
- Technology providers is incentivised to install the most efficient equipment as they are responsible for the overall operation and maintenance.
- Payments for the heat / cold provided are determined upfront based on the assumed usage.
- cheaper for customers and more profitable for technology providers







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## **Business model innovation driving forces**



- Nosratabadi et al. reviewed 72 published documents
- Investigate how the Business Model Innovation (BMI) provides solutions to improve the Food Supply Chain (FSC) performance.
  - They reported the most essential factors as driving forces which push different actors throughout the FSC to change their business into innovative business models.









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## Sustainability performance analysis of all three business models

Environmental Performance	Social Performance	Economic Performance
Material and energy efficiency	Functionality over ownership	Social and economic benefits
Circularity in resource use and less waste	Encouraging stewardship	Sustainable scale-up
Renewable energy	Reduce overconsumption	Inclusive value creation

Performance level	Metrics
High performance	++
Medium performance	+
Low performance	-

- Sustainability performance of the business model is assessed using the framework below (Martinez et al., 2021).
- There are nine indicators, in total 3 each for environmental, social and economic performance of the business models.



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#### **1- Environmental performance**

Service Oriented Models	Direct Sale or Purchase Models	Lease or Rental Models
Energy efficiency (++)	Energy efficiency (-)	Energy efficiency (+)
Circularity in resource use (++)	Circularity in resource use (-)	Circularity in resource use (+)
Renewable energy (++)	Renewable energy (-)	Renewable energy (+)
2- Social performance		
Service Oriented Models	Direct Sale or Purchase Models	Lease or Rental Models
Functionality over ownership (++)	Functionality over ownership (-)	Functionality over ownership (+)
Encouraging stewardship (++)	Encouraging stewardship (-)	Encouraging stewardship (+)
Reduce overconsumption (+)	Reduce overconsumption (-)	Reduce overconsumption (+)
3- Economic performance		
Service Oriented Models	Direct Sale or Purchase Models	Lease or Rental Models
Social and economic benefits (++)	Social and economic benefits (-)	Social and economic benefits (+)

Sustainable scale-up (+)

Inclusive value creation (-)

Sustainable scale-up (++)

Inclusive value creation (++)

Sustainable scale-up (-)

Inclusive value creation (-)

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