



## **Foresight in FOX:** Opportunities and Challenges for Future Proof Business Models

**Björn Moller**

Senior Scientist / Fraunhofer Institute for  
Systems and Innovation Research (ISI)



## **Foresight in FOX**

### Opportunities and Challenges for future-proof business models

**Björn Moller**<sup>1</sup>, Ewa Dönitz<sup>1</sup>, Lorenzo Giacomella<sup>2</sup>, Anna Kirstgen<sup>1</sup>, Ariane Voglhuber-Slavinsky<sup>1</sup>, Erika de Keyser<sup>2</sup>, Liesbet Vranken<sup>2</sup>

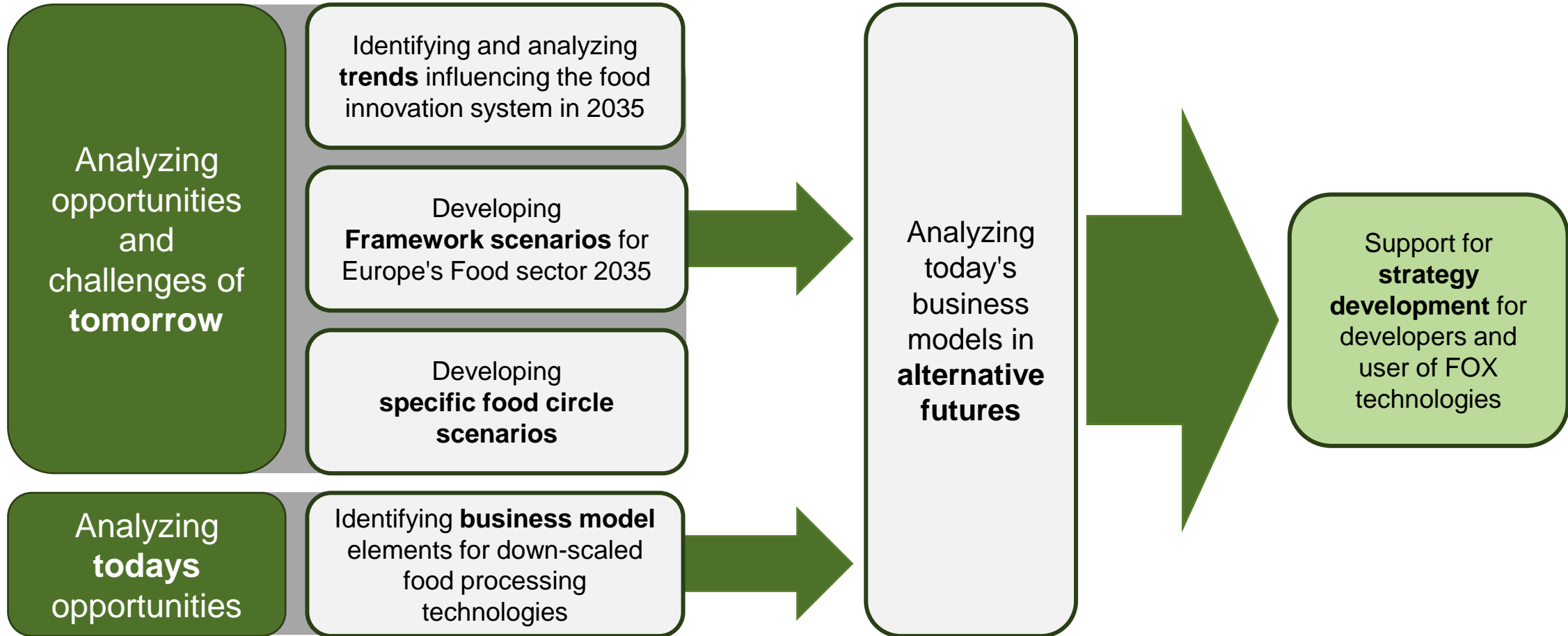
<sup>1</sup> *Fraunhofer Institute for Systems and Innovation Research ISI*

<sup>2</sup> *KU Leuven*





# FOX Foresight Process Concept





# Horizon Scanning

## Identification of trends

Fraunhofer ISI  
trend database  
and food and  
foresight studies

- previous and ongoing projects conducted for national and international industry clients
- results of public funded projects on national and European level
- desk research of food reports and foresight studies

100 food  
related  
trends

- Fraunhofer internal workshops with foresight experts

50 trends  
„to go“

- Prioritisation @ FOX kick off
- Feedback from external experts

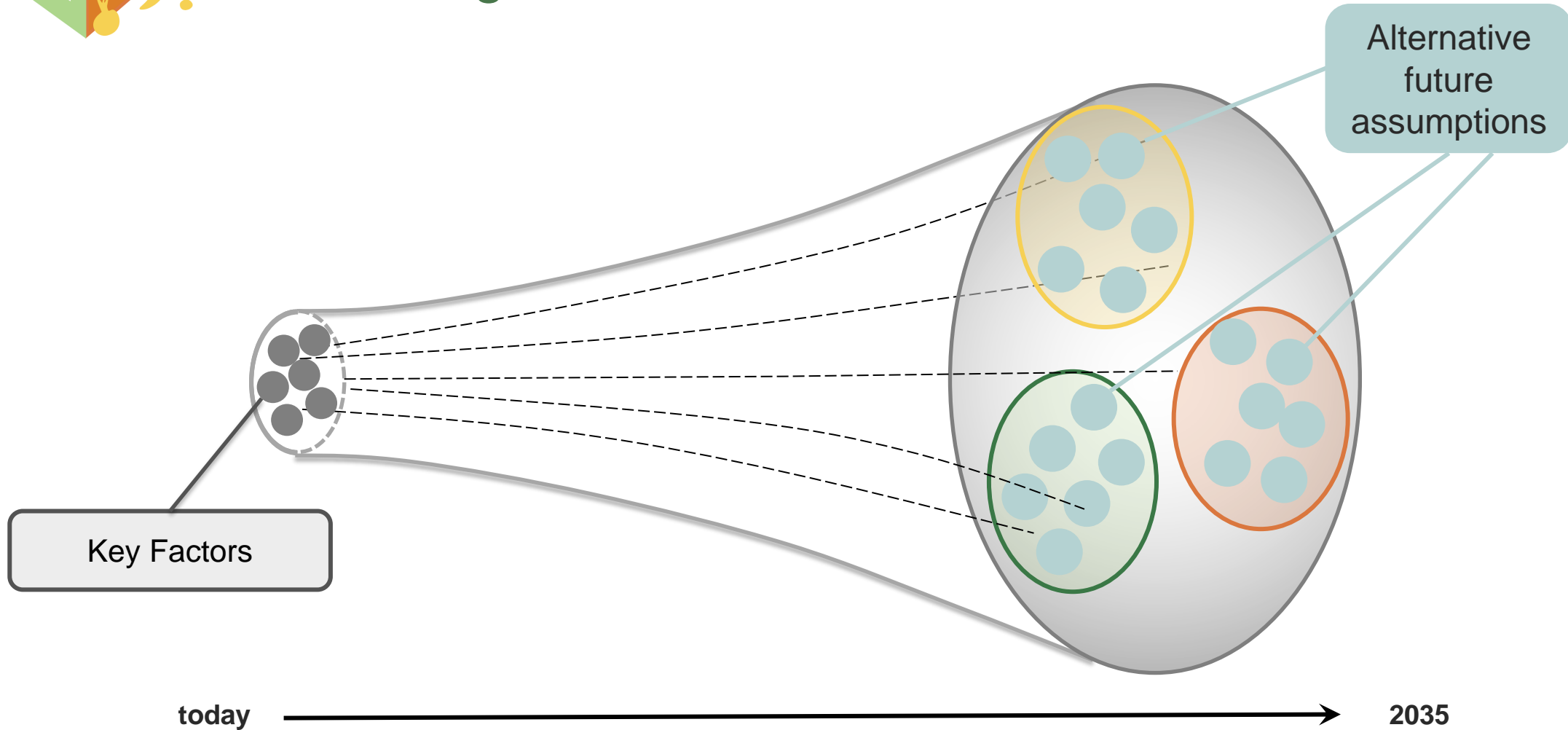
15 trends  
„à la carte“





# Scenario approach

## Working with alternative futures





# 18 key factors

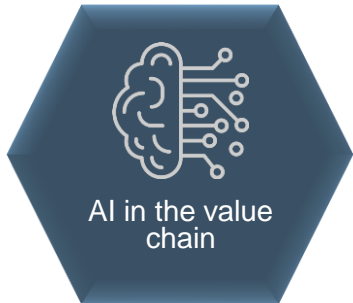






# Factor #6

## Artificial Intelligence in the value chain



**This factor discusses how intensive and at which steps of the food value chain, artificial intelligence will be used in 2035.**

- Even if food is an economic good that is very analogous – the industry behind it, is no longer. Digitalization has fully captured the food industry.
- Whether as sorting machines in logistics or as sales robots in supermarkets – the use of artificial intelligence will influence the food industry in many ways.
- AI could play a crucial role in the food supply sector. An example is technology that predicts in which cities which goods will be in demand, when and how often (predictive stock management). The correct number of orders and the appropriate route could then be automatically generated.

### Alternative future assumptions

Intelligent Value Chain

Use of AI at specific stages of the value chain

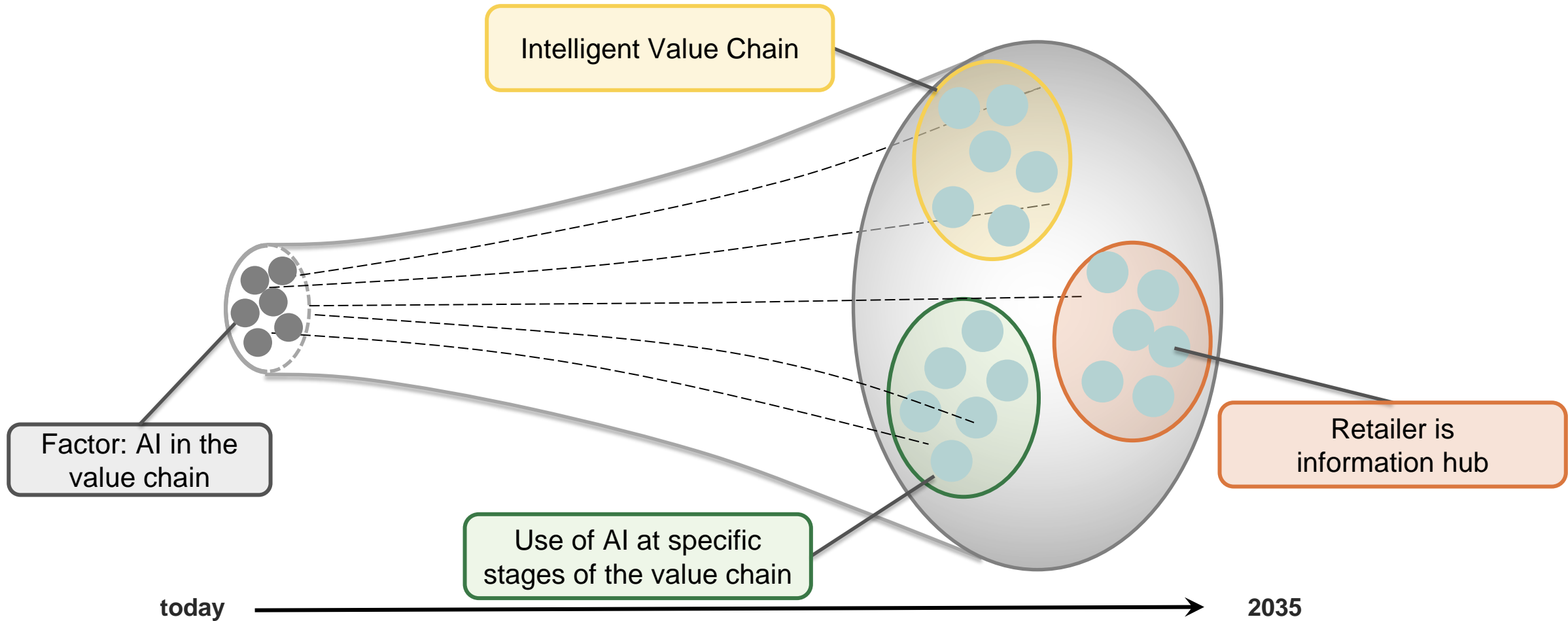
Retailer is information hub





# Scenario approach

## Working with alternative futures

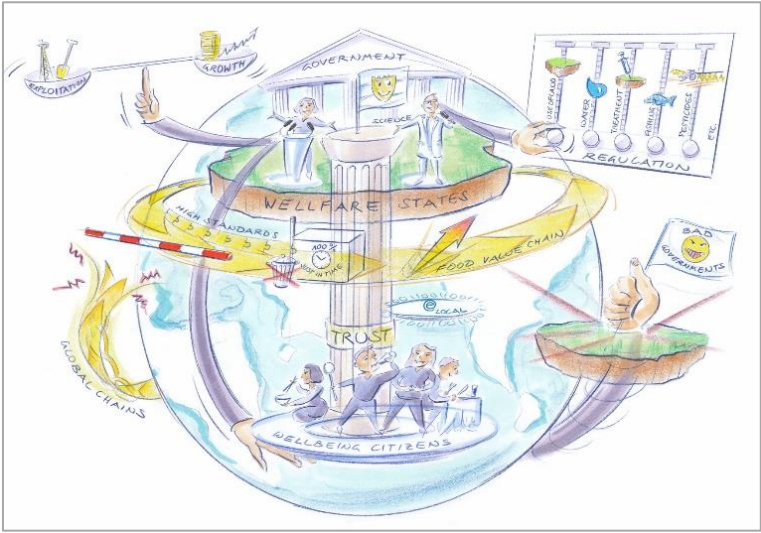




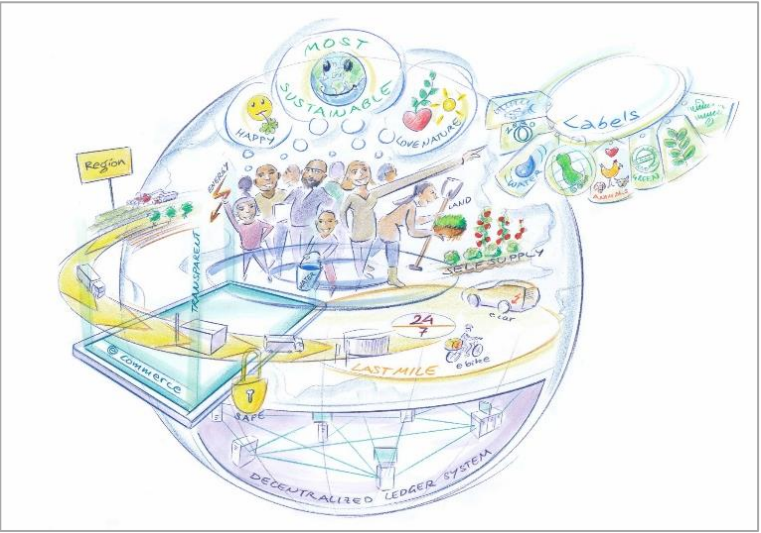
# 3 Scenarios for Europe's food sector

## Result from the FOX scenario process

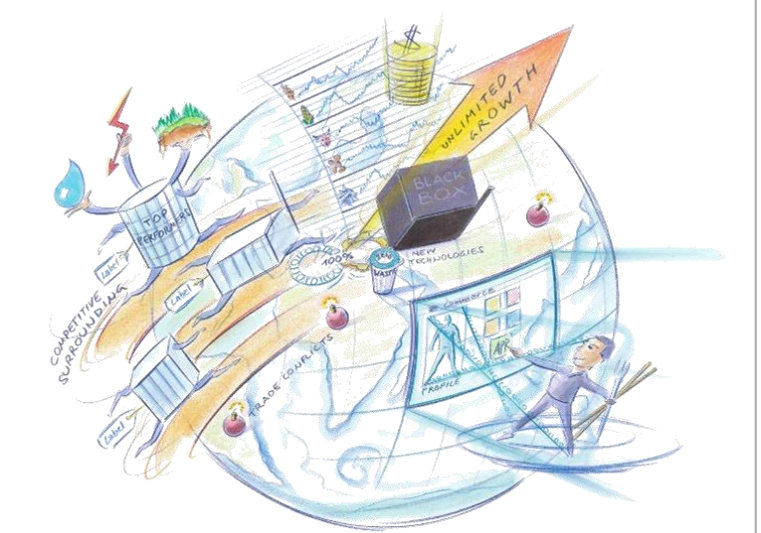
**Scenario 1:**  
Policy secures sustainability



**Scenario 2:**  
Society drives sustainability



**Scenario 3:**  
A CO<sub>2</sub>-currency and retailers dominate trade and consumption





# FOX Business Models

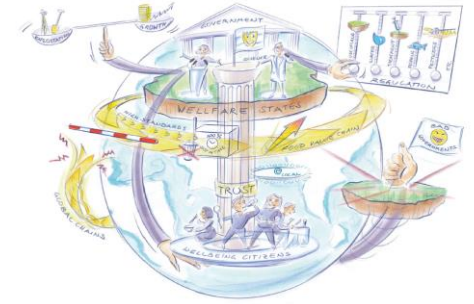
## BM Canvas for the 4 food circles



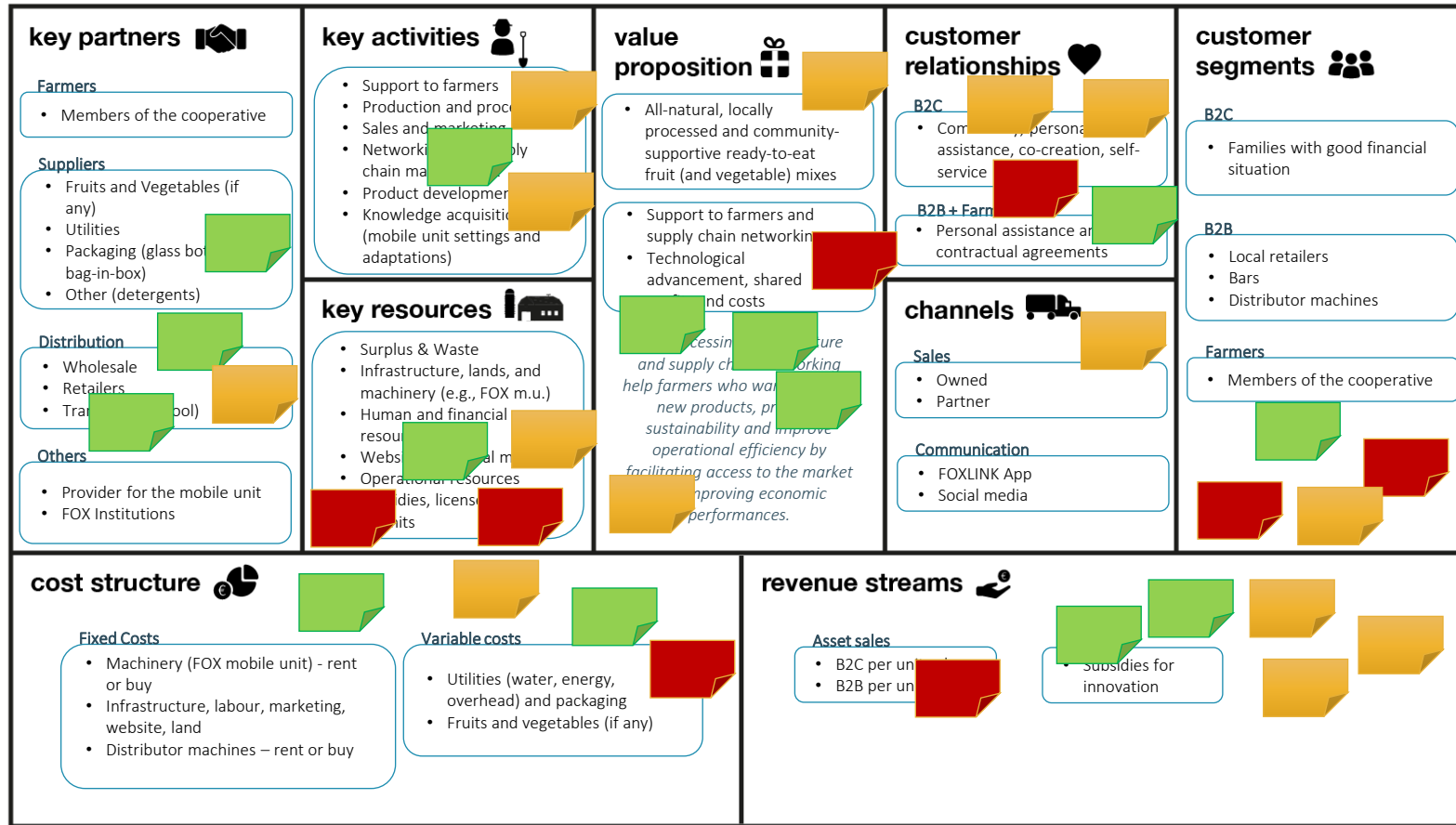


# Robustness Check

## Business Models and future scenarios



### Scenario 1: Policy secures sustainability



**How to proceed:**

- 1) Define the causal relationship between the relevant BM blocks and the stress factor
- 2) Assess the effects of the stress factor
- 3) Analyse results and formulate eventual improvements/actions

**Red:** The outcome of the stress factor makes a BM component no longer feasible.

**Orange:** The outcome of the stress factor makes a BM component no longer viable.

**Green:** The outcome of the stress factor affects the feasibility or viability of the BM component, in a positive way.



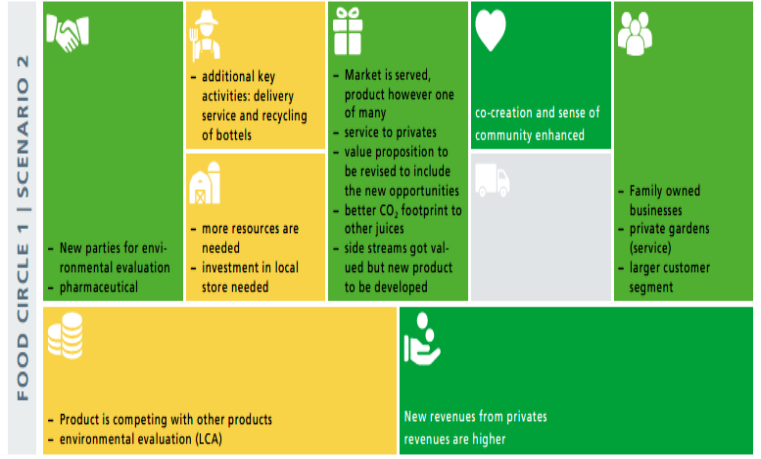
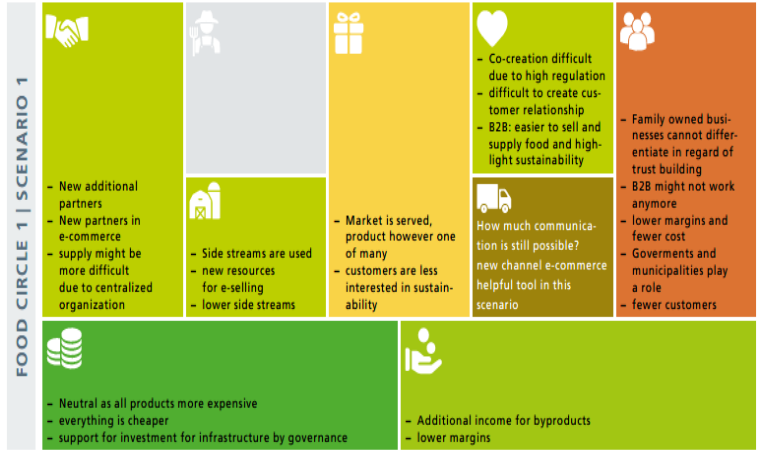
# Robustness Check BM Canvas Heat Map



**Scenario 1:  
Policy secures sustainability**

**Scenario 2:  
Society drives sustainability**

**Scenario 3:  
A CO<sub>2</sub>-currency and retailers  
dominate trade and consumption**





# FOX Foresight Process Highlights



## 5 Take away messages from the FOX foresight process







# Claim #1

## Different perspectives in the food sector



Especially in the agricultural and food sector, where the interests of market-dominating retail chains meet political sustainability strategies, it is crucial to **include many and different perspectives** in strategy-processes.



**Method:** Foresight and Multi-actor approach

**Statement:** In this foresight process, 54 experts from outside the project were involved in 10 workshops, several interviews and an online survey.

This made it possible to include not only technological but also political and social developments and approaches.

**Result:** Future scenarios that show the European Food Sector 2035 from different perspectives.







# Claim #2

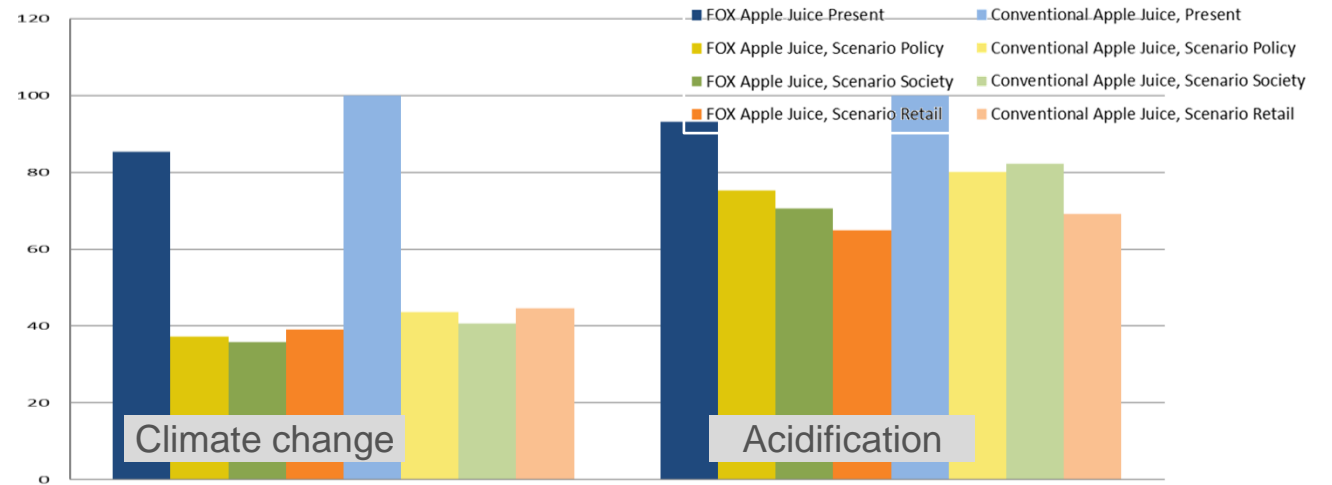
## Fox technology reduces footprint



Apple juice produced with fox technology shows a more favorable environmental footprint compared to conventional apple juice, **despite any changes in the overall conditions of the food sector, societal mindsets, or regulatory frameworks.**

**Method: Combination of qualitative foresight scenarios and LCA**  
 Future-proof analysis by consideration of qualitative aspects and alternative future developments in LCA

**Statement:** Obviously, in sustainable futures all products have lower environmental impact, but the one produced with FOX technology are better than conventional technology in all of the three scenarios.



A. Voglhuber-Slavinsky; A. Zicari; S. Smetana; B. Moller; E. Dönitz; L. Vranken; M. Zdravkovic; K. Aganovic; E. Bahrs, *Setting life cycle assessment (LCA) in a future-oriented context: The combination of qualitative scenarios and LCA in the agri-food sector*, European Journal of Futures Research





# Claim #3

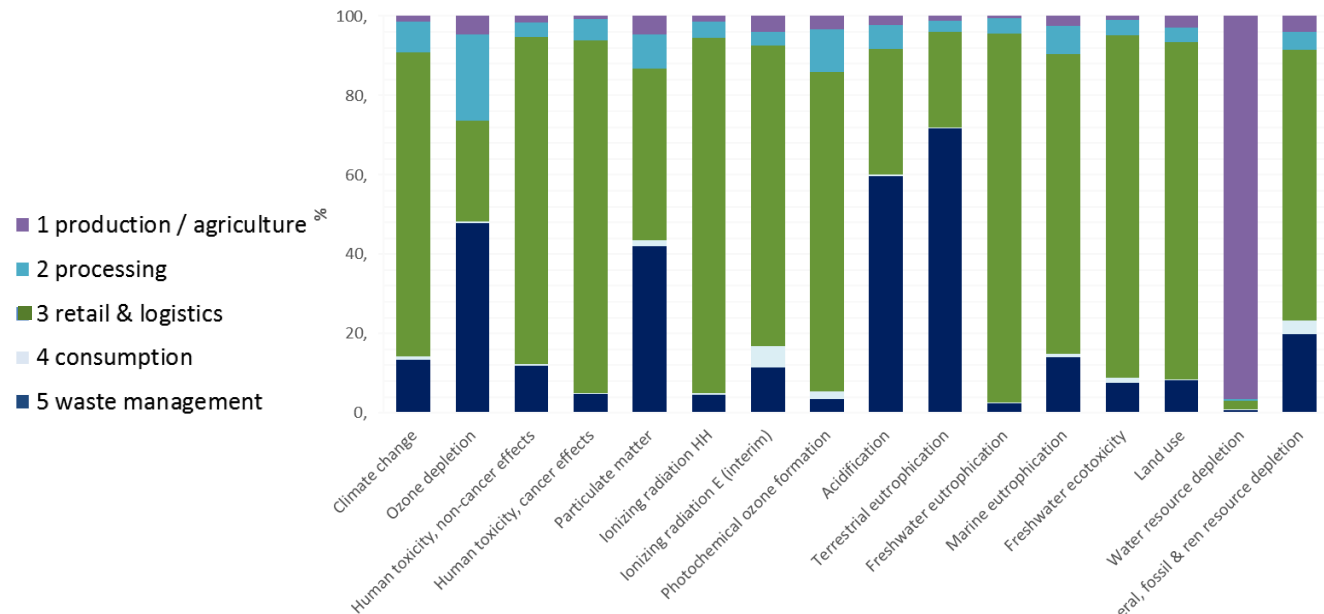
## Fox approach fosters sustainable food systems

The implementation of the Fox approach, which emphasizes local food circles, plays a critical role in **facilitating the transition towards sustainable food systems** (however, this depends strongly on the product).

### Method: Combination of qualitative foresight scenarios and LCA

Analysis of the life cycle assessment along the individual stages of the value chain

**Statement:** In most of the 16 impact categories, Retail & Logistic is responsible for the largest contribution in case of FC1. To achieve sustainable food systems, the biggest leverage is to keep supply routes and cold chains short and to source food locally.



A. Voglhuber-Slavinsky; A. Zicari; S. Smetana; B. Moller; E. Dönitz; L. Vranken; M. Zdravkovic; K. Aganovic; E. Bahrs, **Setting life cycle assessment (LCA) in a future-oriented context: The combination of qualitative scenarios and LCA in the agri-food sector**, European Journal of Futures Research







# Claim #5 Business Opportunities

The value proposition of the FOX approach received highly positive feedback, being considered future-resilient in almost all scenarios and food circles. This indicates that the unique value offered by the mobile food processing units resonates well with customers and is likely to remain relevant in the future.

## Method: Future Scenarios and Business Model Canvas

### Statement:

By combining future scenarios and the Business Model Canvas, it was possible to analyze the influence of different future assumptions of relevant topics on the individual areas of the business model. This shows that individual areas, such as cost structure, are promoted by one scenario and made more difficult in another.





# Dissemination (Selection)

## Scientific paper

- A. Voglhuber-Slavinsky; A. Zicari; S. Smetana; B. Moller; E. Dönitz; L. Vranken; M. Zdravkovic; K. Aganovic; E. Bahrs. **Setting life cycle assessment (LCA) in a future oriented context: The combination of qualitative scenarios and LCA in the agri-food sector**, European Journal of Futures Research (2022), accepted
- Voglhuber-Slavinsky, A., Derler, H., Moller, B., Dönitz, E., Bahrs, E., & Berner, S. (2021). **Measures to increase local food supply in the context of european framework scenarios for the agri-food sector**. Sustainability, 13(18), 10019.
- Moller, B., Voglhuber-Slavinsky, A., Pasch, K., & Dönitz, E. (2020). **Trends im europäischen Lebensmittelsektor für das Jahr 2035, Trends in the European food sector for the year 2035**, Der Lebensmittelbrief - Ernährung aktuell 3/2020

## Poster

- Voglhuber-Slavinsky, Ariane, Björn Moller, and Ewa Dönitz. **"Methodological challenges for combining qualitative future scenarios and LCA in the food and agricultural sector."** (2020). 12th International Conference on Life Cycle Assessment of Food

## Presentations

- Moller, B., Food Club 2022, Keynote lecture „Zukunft Food – Foresight Prozesse am Beispiel Ernährung (Future Food - Foresight processes using the example of food and nutrition)” Cologne 2022
- Moller, B., Pasch, K., Matser, A. **Europe's Food Sector in 2035** - Three scenarios for a sustainable food system (DG Agri lunch debate, 2021)
- Voglhuber-Slavinsky, Ariane, Björn Moller, and Ewa Dönitz, **The future of the European food sector: Trends and scenarios** (STS Conference Graz 2020)

## Other

- Moller, B, Berner, S. Davila, A. „**Short path in the food sector: Something has to change**“, Interview, Stauf magazine No 4 2021
- Voglhuber-Slavinsky, A., Prof. RAUTER, R., Seminar: **“Die steirische Cocktailtomate im Dezember! Lokale Lebensmittel in einer globalisierten Welt?”** (nach.gedacht.2021 - Wir denken Alpbach weiter! 09.10.2021, RESOWI-Zentrum, Graz)
- Voglhuber-Slavinsky, A., Interview with SWR2 Impuls: **So essen wir in der Zukunft** (2020)
- Voglhuber-Slavinsky, A., Interview with NDR 2, Impuls: **Wie ernähren wir uns in der Zukunft** (2020)

## Brochures

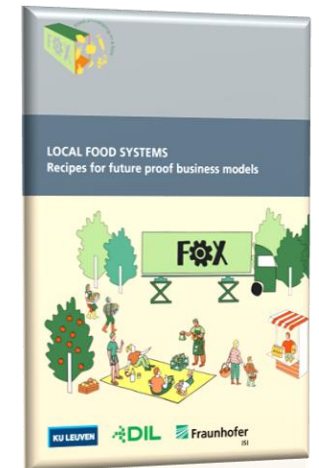
### 50 trends influencing Europe's food sector by 2035



### Three scenarios for Europe's food sector in 2035



### Local Food Systems



# Contact



**Dr. Björn Moller**

Business Unit Foresight for strategy development  
Competence Center Foresight

**Fraunhofer Institute for  
Systems and Innovation Research ISI**

Breslauer Strasse 48  
76139 Karlsruhe | Germany  
bjoern.moller@isi.fraunhofer.de



Innovative local processing  
for a sustainable future

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