Food Systems in European Cities

Deliverable 6.4 European Guidebook to Sustainable CRFS

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25	METAINST	STICHTING METABOLIC INSTITUTE	NL
26	NBL AS	NABOLAGSHAGER AS	NO

Document Control Sheet

Version	Date	Summary of changes	Partners
0.1	12th December 2023	First draft sent to WP6 working group for internal review	WP6 participants
0.2	22nd December 2023	First draft returned from WP6 working group	WP6 participants
0.3	8th January 2023	Revised draft circulated to GA (all FoodE partners)	All partners
0.4	19th January 2024	Final version including feedback returned from partners	All partners
0.5	22th January 2024	Revised version sent to project leader (UNIBO)	ILS
1.0	23rd January 2024	Final version submitted	UNIBO

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Executive Summary

As part of the FoodE scenario study, the so-called backcasting method was used to show possible development paths from the FoodE vision 2050 back to the present. To this end, the future vision was considered and, from there, action and development pathways were developed backward to the present. The scenarios were developed in a multi-stage, interdisciplinary process together with project partners from science and practice. In the first step, four innovation areas (political, social, economic, technical) of the FoodE visions of the future were developed during a first workshop in Tenerife in 2022, which are relevant to the scenario development. Building on this, the next step was to identify the actors and measures required to establish the innovation fields during a second workshop in Paris in 2023. Finally, all the perspectives have been brought together in the form of short narrative visions. The results of the backcasting scenario development were edited in a guidebook for practitioners. It presents the possible scenarios for the up-scaling of best practices and for the prediction of possible future paths of European city-regional food systems (CRFS).

1. Introduction

Cities and municipalities worldwide continue to grow at varying rates and are increasingly bearing the costs of food and nutrition insecurity. Often, cities face limited responsibility in ensuring access to sufficient, adequate, affordable, nutritious, and safe food for all their residents. Factors limiting access include fluctuations and rapid increases in food prices, disruptions in food supply due to natural disasters, and other impacts of climate change. Cities can develop sustainable food systems to promote sustainable production, processing, and marketing, ensure nutrition security for all, reduce food waste, and create livelihood opportunities for producers. Urban policies and planning have traditionally had less of a focus on food systems, but cities are increasingly involved in local, national, and international discussions on the future of food and nutrition security (FAO and RUAF 2017). The approach of City Region Food Systems focuses on the complexity of the food system approach within an urban region and its stakeholders. This approach has only recently been integrated into research (FAO 2022).

The City Region Food Systems (CRFS) approach goes beyond just food, encompassing individuals, goods, activities and services interconnected with the local ecosystem. It recognises the integration of leisure activities in rural agricultural landscapes, community building in gardens, and employment opportunities supported by local associations. The terms 'cities' and 'regions' emphasise the collaborative governance and active engagement of urban and regional institutions that foster environmental, social, and economic relationships (FoodE 2021a). CRFS encompasses alternative food networks, short supply chains, and urban-farm linkages, and integrates policies for sustainability. It is a multi-stakeholder approach in line with the Milan Urban Food Policy Pact (MUFFP 2021), the Sustainable Development Goals (UN 2022), and the New Urban Agenda (UN 2016). The CRFS aims to achieve sustainable improvements at the environmental, social, and economic levels, thus improving conditions in urban regions.

One central objective of the FoodE project is the involvement of different stakeholders, such as citizens, food system start-ups and small businesses, local and regional authorities, and educational and academic institutions (FoodE 2022b).

To achieve this objective, the FoodE consortium designed and implemented a wide range of initiatives, which are presented in the European Guidebook for Sustainable City-Region Food Systems. The guidebook provides recommendations and guidelines for policies to improve interactions between stakeholders in the food chain and empower local communities and cities to develop into sustainable food hubs.

The aim of Deliverable 6.4. is to shed light on how the results presented in the Guidebook have been achieved by explaining the methodology used. The Deliverable presents the scenarios for future developments for CRFS in European cities in the social, technical, political, and financial domains, which have been developed based on different working steps (see Figure 1).

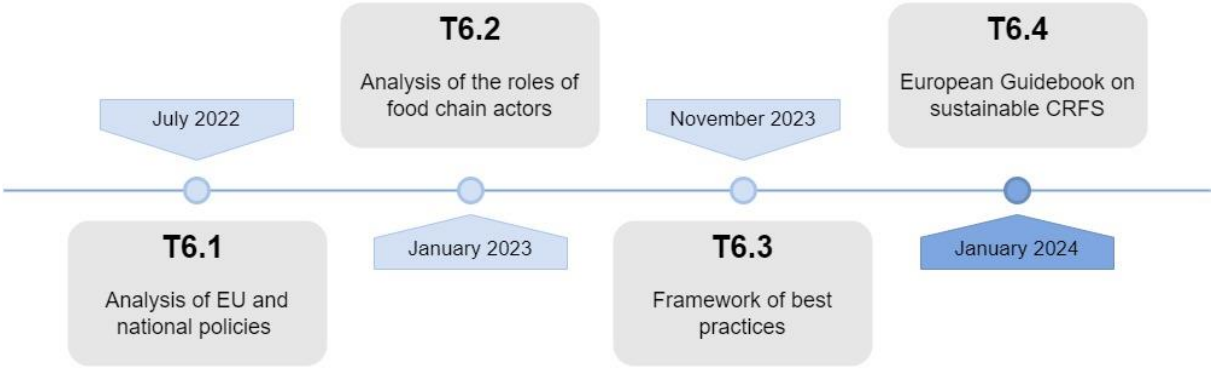


Figure 1: Structured and chronological overview of WP6. This report covers the fourth phase of WP6 (task and Deliverable 6.4) due in month 48 of the FoodE project (ILS/FoodE)

2. Methodology

As part of task 6.4, a scenario study was carried out. In order to achieve the FoodE vision for 2050, different courses of action were developed based on four dimensions (political, social, economic, technical). To this end, two workshops were held during the General Assemblies (GA) in Tenerife in 2022 and Paris in 2023, with the participation of all attending project partners.

2.1 Backcasting scenario

Many authors define a scenario as a representation of a possible future situation (picture of the future), including the development paths that lead to the future situation. Unlike a static picture of the future, which is merely a hypothetical future state, a scenario also describes the developments, dynamics, and drivers that lead to a specific picture of the future. In this regard, however, a scenario is not a comprehensive picture of the future. The function of a scenario is to focus perceptions on one or more specific, delimited slices of reality (IZT 2008).

The scenario study is fundamentally designed as a backcasting process. Backcasting can be a scenario transfer technique, but it is also understood as a separate type or component of the scenario technique. In simple terms, backcasting can be described as "the scenario process in reverse", using a desirable future or target situation to develop different options for action to achieve that target or vision (see Figure 2) (Alroth/Höjer 2007).

In all scenarios developed, it is assumed from a future perspective that the FoodE vision (see 2.2) has been successfully realised. The relevant framework of the scenario study results from the context of the FoodE vision and the objectives defined in the project proposal. Spatially, the study is limited to the scope of the European partners involved in the project. The time frame covers the development of future visions up to the year 2050. The scenarios show the vision of future food systems and how CRFS could develop by 2050. To this end, four areas of innovation (political, social, economic, and technical) have been analysed in terms of current and future developments.

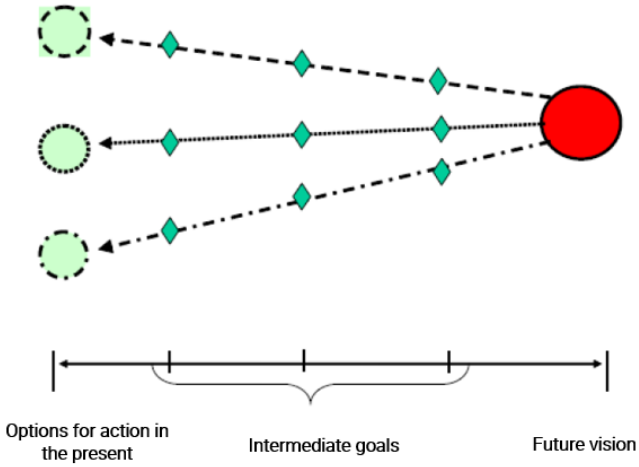


Figure 2: Scenario creation in the sense of the backcasting method (IZT 2008).

2.2 FoodE vision as formulated in the project proposal

A target vision is essential to start the backcasting scenario process. In this scenario study, the FoodE Vision 2050 developed in the course of the project application was used as a basis for the further elaboration of the target state assumed in the workshop.

"History class. A college, somewhere in Europe. Year 2050. "… and this is when it all started, dear students. It was the beginning of the XXIst century, and European citizens were struggling with an evolving climate change, social exclusion, and unfair food access. Grassroots initiatives were sprouting across countries, addressing the sustainability of regional food systems and combining state-of-the-art technologies with innovative social and management systems, resulting in the creation of innovative business models, where consumers engaged in food production and distribution, overall becoming active "prosumers". It was the case of the Mai Bine bistro, in Romania, where the most socially disadvantaged prepared meals from locally produced food, similar to the Polar restaurant in the Svalbard Islands, which implemented a circular economy system for introducing local vegetable production and supporting small-scale fishery. Those days, the life of fishermen was becoming harder also in remote islands, where they struggled against large-scale commercial fishing and the apparently unstoppable decline of the fish population. Following the successful example of the small-scale fishing cooperatives of the Canary Islands that were also supplying your colleagues at school with fresh locally-harvested seafood, fishermen in Norway and Italy managed to actively engage the local population in preserving fishing techniques that better preserved our sea. At the same time, agriculture was fighting with the growing pressure on land availability, water scarcity, production costs, and market instability. Innovative plant cultivation systems and farm business models started to emerge, also thanks to the improved exchange of information and tools for sustainability assessment that are today so common in your FoodE app. Beekeepers spread across cities, vertical and rooftop farms, urban agricultural parks, but also community gardens were then connected and shared experiences during the MyLocalFoodE festivals (the same that we will host in our city this year for the 30th edition). And the book we will start reading today was edited by students like you, who participated, together with their community in designing, monitoring, and assessing the food systems that you see today in all coastal, rural, and urban regions of Europe…"

2.3 Workshop for Developing Future Visions

The scenario study consists of several phases. In the first phase, a workshop at the General Assembly in Tenerife in October 2022 was conducted to get a first impression of what a future CRFS could look like. The project partners were asked to look at their previous research through a futuristic lens and to summarise the most relevant results following two key questions:

- *What would a future CRFS look like if this [pilot approach/business model/sustainability standard, currently niche] had become mainstream?*
- *If my vision is realized, what were the steps that got us there? What were the innovations that made it possible?*

Four innovation areas were defined for the next step. The workshop participants developed the vision for the future in groups assigned to the innovation areas (see Figure 3). The expertise of each of the project partners was taken into account to describe what a sustainable CRFS could look like in the political, social, economic, and technical fields. The results were documented and summarised using the online program Miro Board.

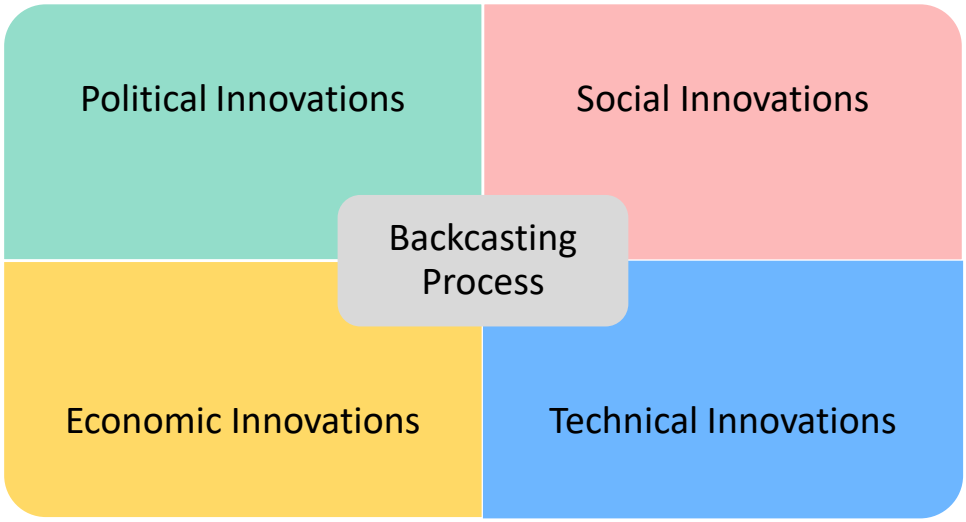


Figure 3: Backcasting scenario process for preparation of the European Guidebook to Sustainable CRFS (ILS/FoodE).

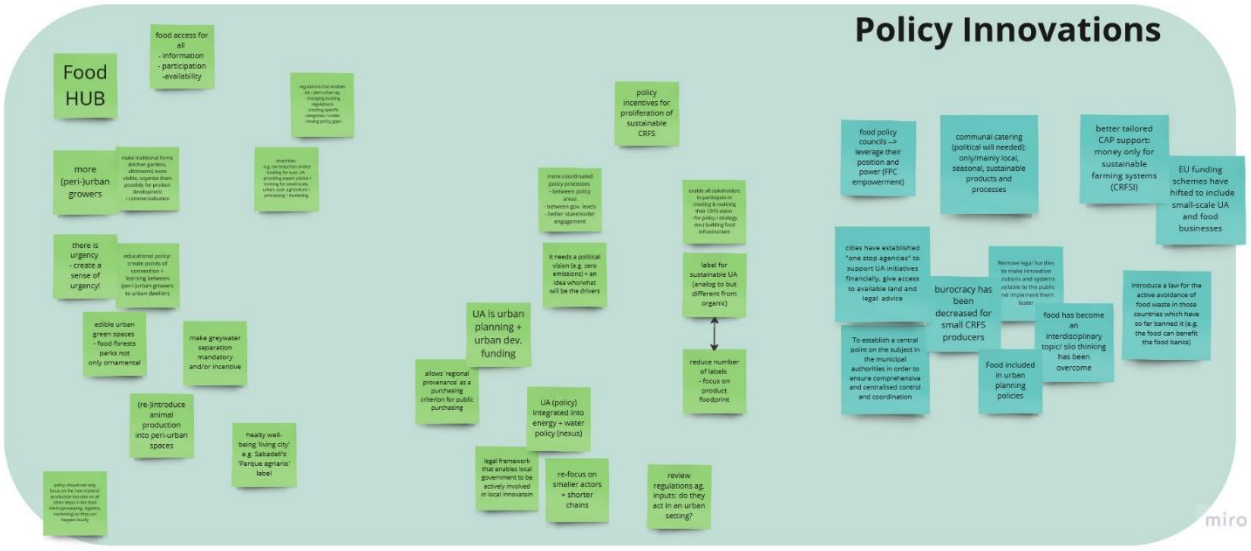


Figure 4: Developed future vision for policy innovations (ILS/FoodE).

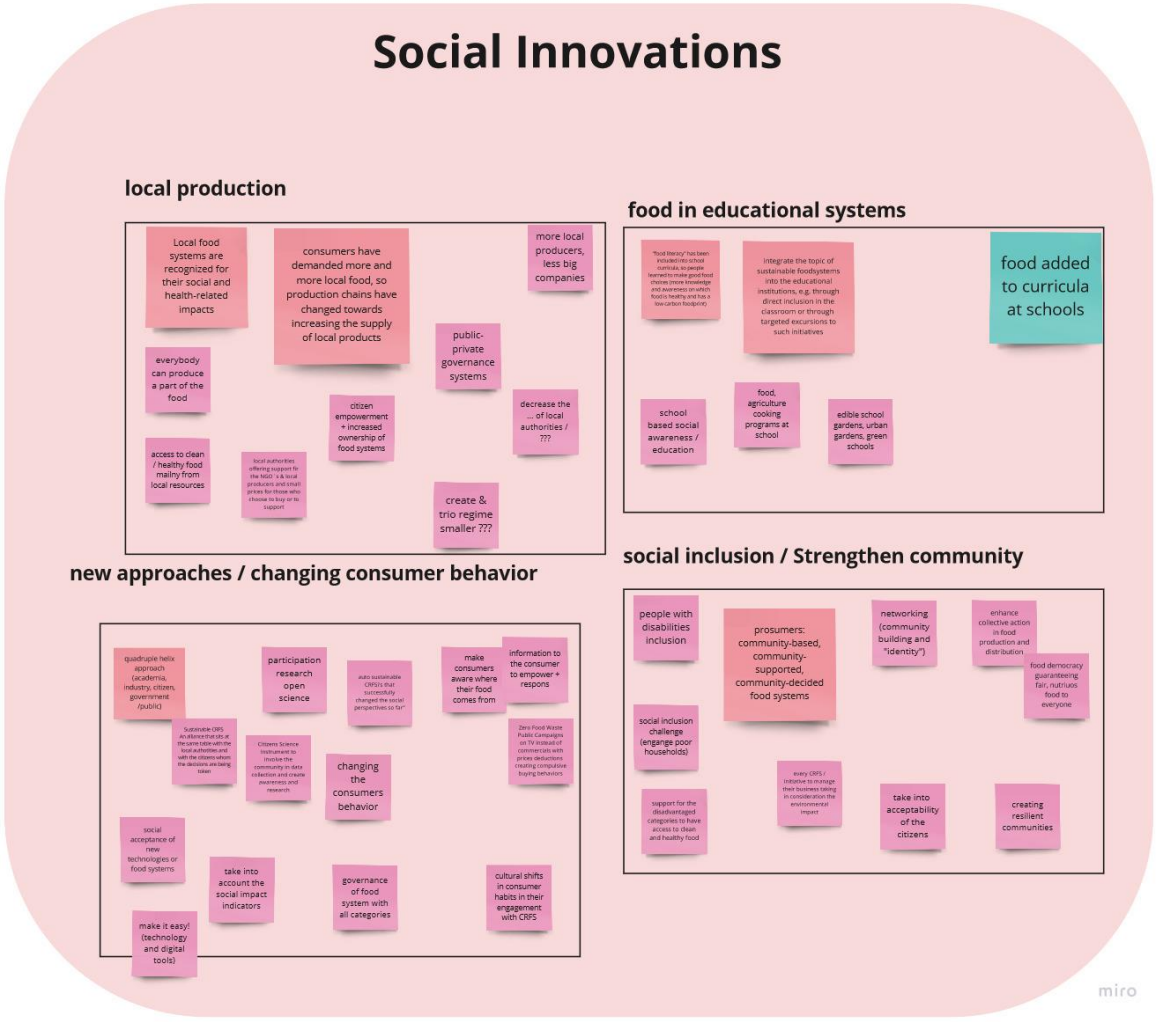


Figure 5: *Developed future vision for social innovations (ILS/FoodE).*

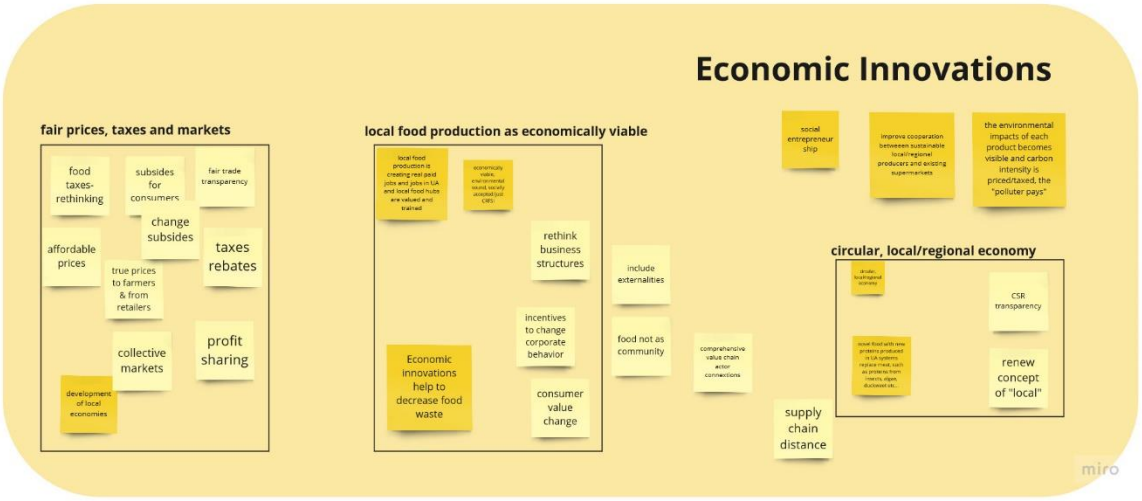


Figure 6: *Developed future vision for economic innovations (ILS/FoodE).*

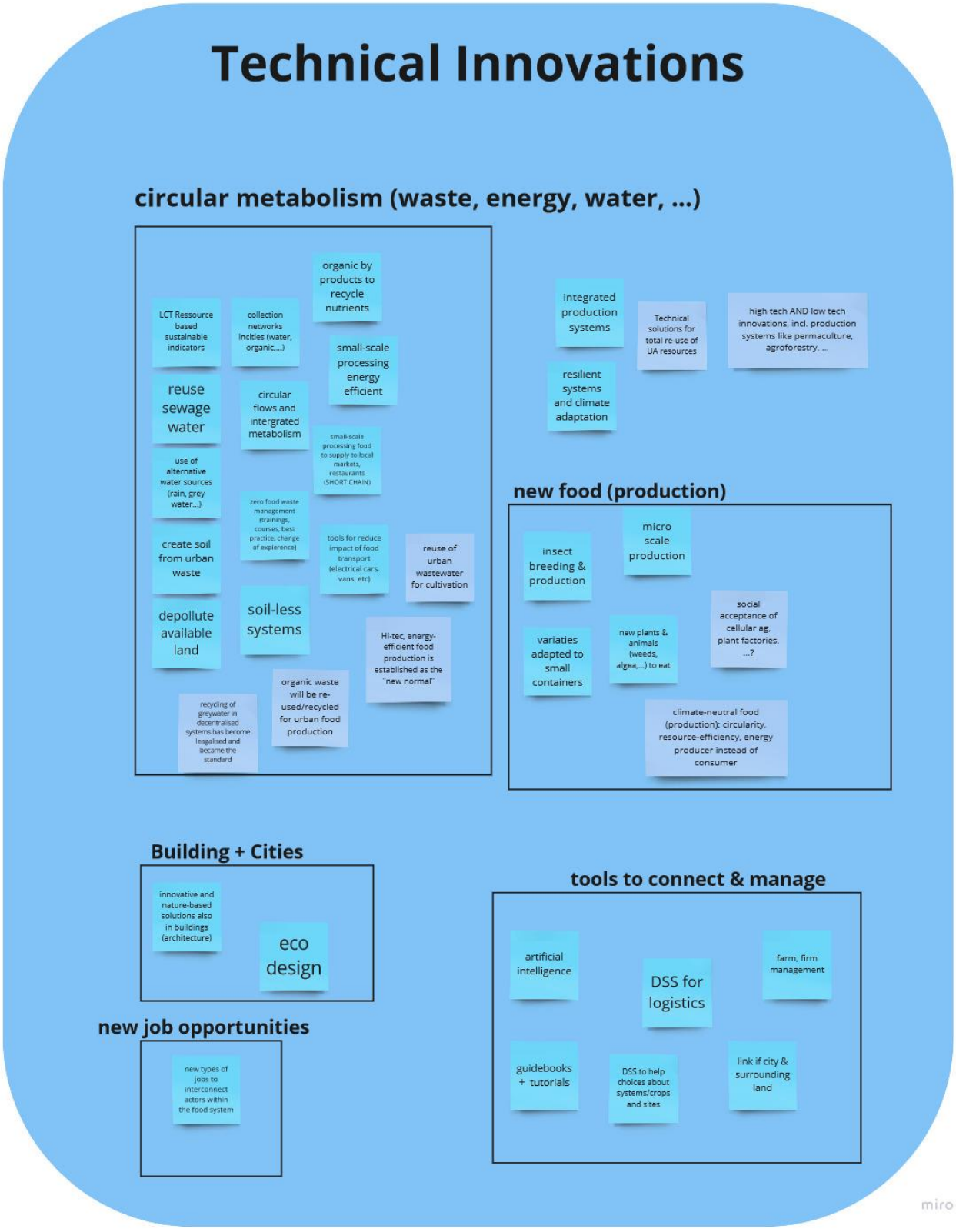


Figure 7: Developed future vision for technical innovations (ILS/FoodE).

2.4 Workshop for identifying stakeholders and actions

In a second workshop during the GA in Paris in April 2023, the visions for the future were developed in more detail. The following questions were used to identify relevant stakeholders who could implement the actions identified:

- *Which actors were instrumental in making this change?*
- *What actions did they take?*

The results of the first workshop were summarised in advance on four posters, again divided into the four innovations. The workshop participants were asked to identify the relevant stakeholders for the different visions of the future and assign them to the individual goals within the innovation field. They were then asked to develop further actions needed to achieve each target vision. The project partners assigned themselves to the innovation fields according to their interests and expertise. In a second round, the already developed results were added.

The project partners, who were participating online, used the Miro programme to identify the relevant actors and develop the necessary measures. The results of the online format were then brought together with those of the presence process.

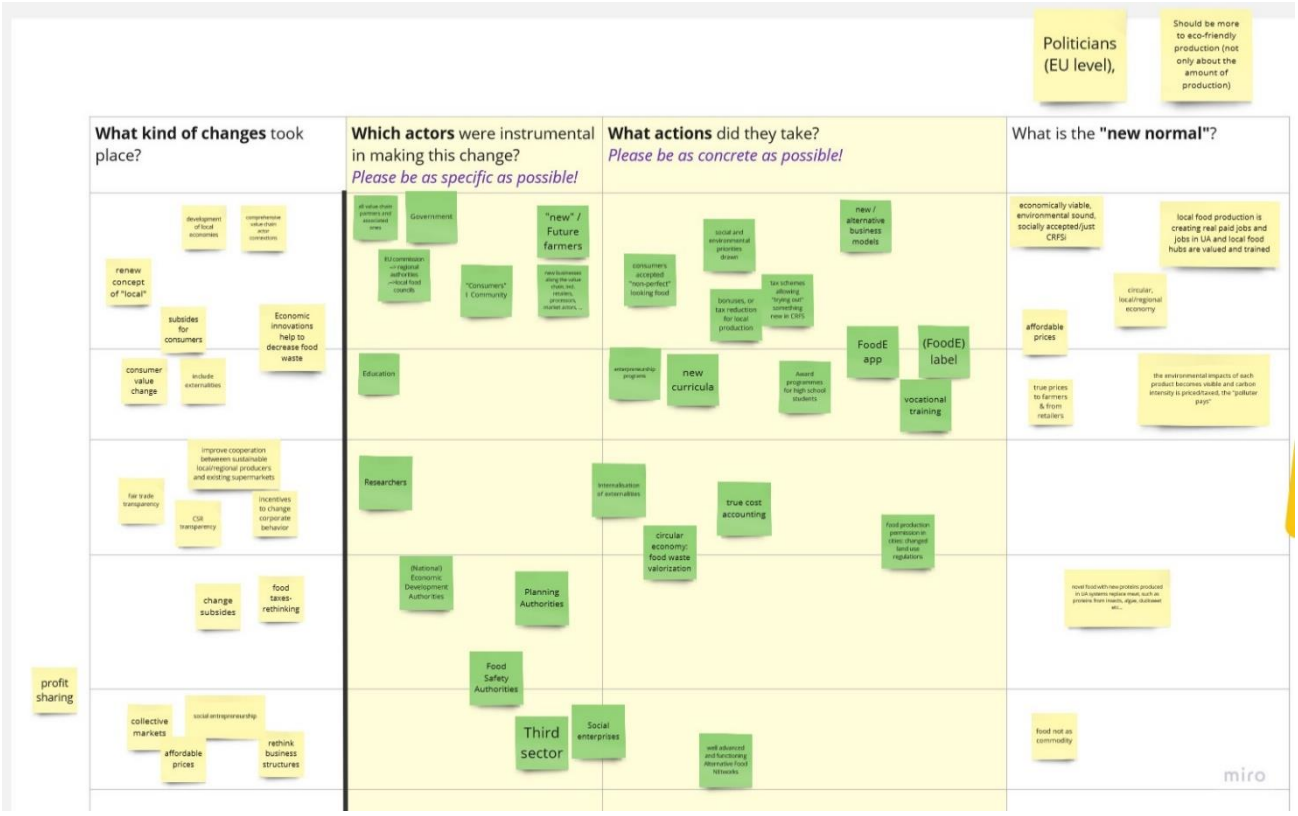


Figure 8: Results of economic innovation working group (ILS/FoodE).

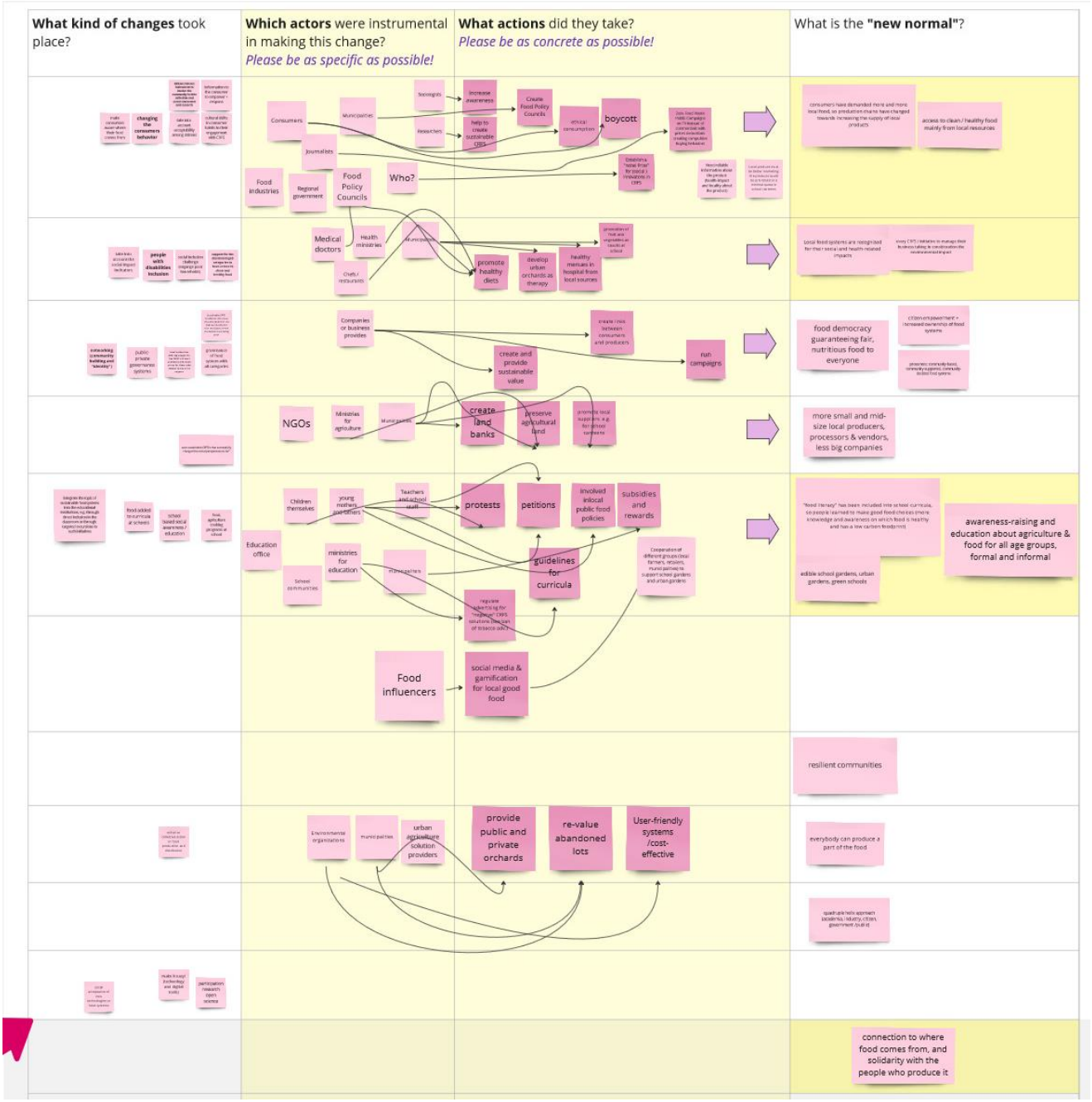


Figure 9: *Results of social innovation working group (ILS/FoodE).*

Figure 10: Results of technical innovation working group (ILS/FoodE).

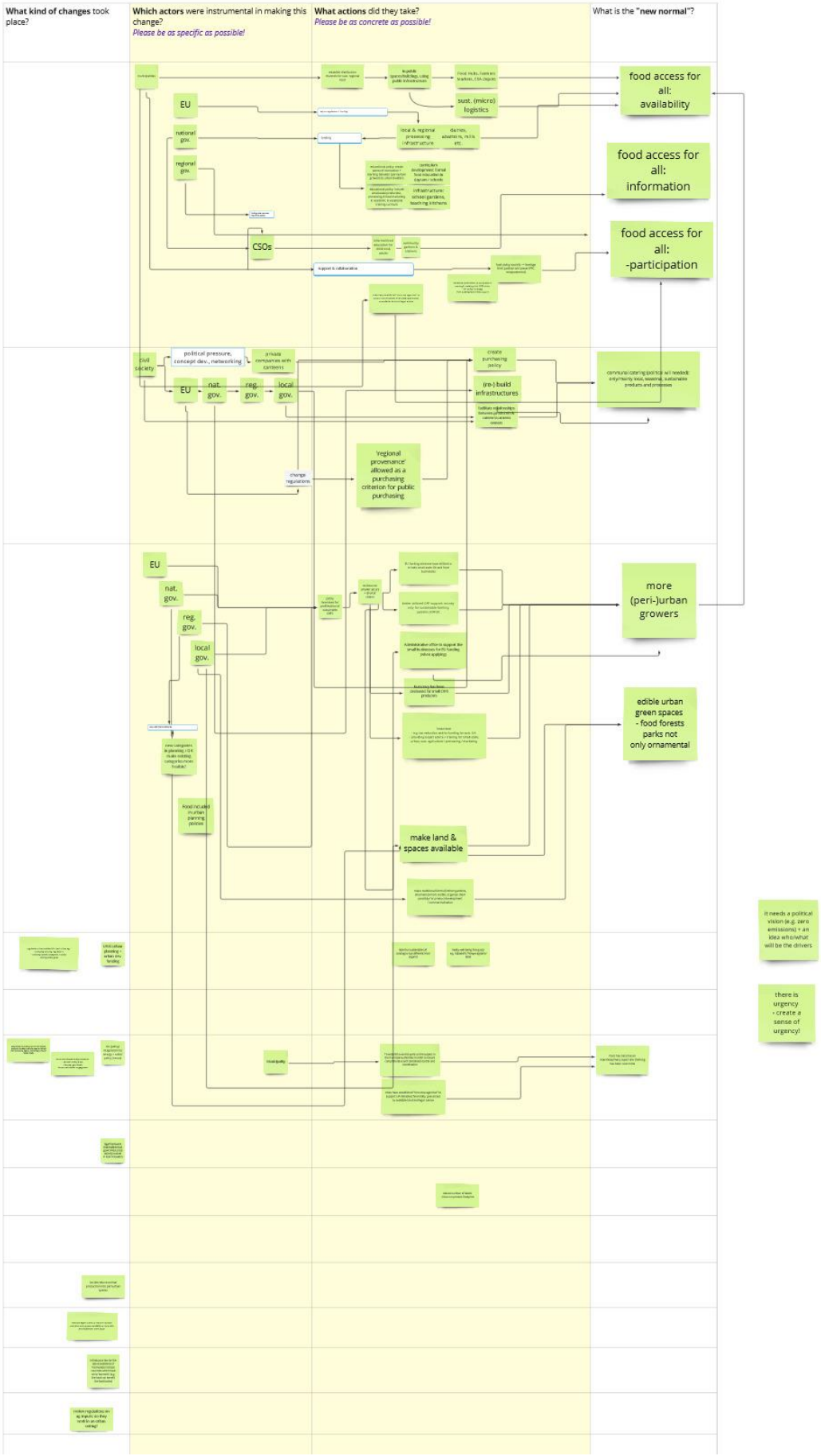


Figure 11: Results of policy innovation working group (ILS/FoodE).

2.5 Creation of European Guidebook

For the creation of the Guidebook, writing groups were organised to formulate the results of the scenario workshops in the four innovation fields. At the beginning of the process, an executive summary was prepared by each writing group to explain the vision. The vision scenarios resulted in four chapters of innovation fields (political, social, economic and technical) by summarising the results from the two workshops. The innovation chapters are written from the perspective of the year 2050.

In addition, partners that manage a FoodE Pilot were also asked to describe their projects on the basis of a set of pre-defined questions pointing out the innovative content and highlighting the key stakeholders and resources needed for implementation.

3. Overview of visions for the four innovations

The Guidebook provides an overview of the sustainable CRFS as the 'new normal' in 2050 and highlights different elements of the future CRFS. It describes the endpoints of different evolutionary paths and how they were achieved. The vision for 2050 has evolved through different political, social, economic, and technological pathways.

3.1 Policy innovation

In the FoodE vision of 2050, the transformation of the food system towards a sustainable CRFS is well underway. In many urban regions, most of the fresh food supply reaches citizens through short supply chains. Farmers are remunerated through a mix of transparent prices and targeted subsidies for providing fresh, healthy and diverse food, and for the ecosystem services and social and cultural value they create in the process. The importance of fresh, accessible, locally produced food is widely recognised in society. These are all the results of a major shift in the policy framework to make the food system sustainable.

3.2 Social innovation

In the FoodE vision, consumers will be able to eat local, healthy, and sustainable food, thanks to a shift in consumer demand, better support for local initiatives, and greater connectivity between producers and consumers. Local food initiatives will become safe spaces for self-development and a place to build stronger communities. Certification schemes will recognise the role of these initiatives in the social well-being of their users and employees, as well as in improving environmental quality and economic opportunities. In addition, food and agriculture will be central themes in school curricula to promote a better understanding of how and where food is produced. New actors and educational activities will be targeted at different population groups so that everyone can make informed decisions about their food choices.

3.3 Economic innovation

In the FoodE vision of 2050, food production will take place in short supply chains within city limits or in the surrounding countryside. The way food is produced is as diverse as the food itself. From long-established family farms in the countryside that have adapted their production to meet the needs of nearby city dwellers, to high-tech solutions that enable year-round production within buildings or other controlled environments in an urban context. The successful reconnection of urban and rural contexts has many benefits. Short transport routes reduce food miles, emissions and delivery costs, and directly improve consumers' control over the way their food is produced. In addition to product quality, environmental considerations regarding production methods and social factors such as working conditions have become increasingly important and are being promoted as key selling points.

3.4 Technical innovation

In FoodE vision of 2050, the EU achieved to be the first climate-neutral continent – based on an economy with net-zero greenhouse gas emissions. The vision of a circular food supply chain has become a reality, representing a sustainable and regenerative approach to food production,

distribution, consumption, and waste management. The principles underlying this system have evolved to meet the urgent challenges of our time. Several technological innovations have played a significant role in this transition.

4. Development of the European Guidebook to Sustainable CRFS

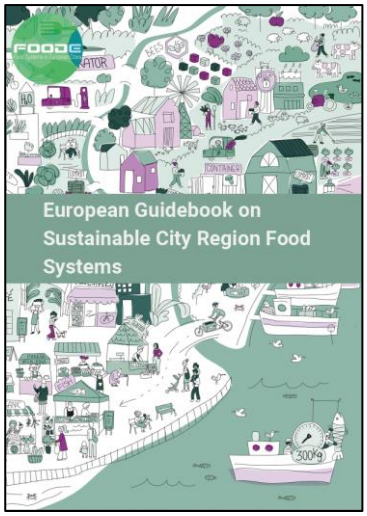
As a legacy document of the project, the European Guidebook to Sustainable CRFS pulls together all relevant results and insights from the project. It shows the vision of a sustainable food system for the city region.

The Guidebook is divided into two parts. The first part shows the innovations and visions of the FoodE pilots and how these can be replicated, while the second part illustrates the vision of a sustainable CRFS through four innovation chapters.

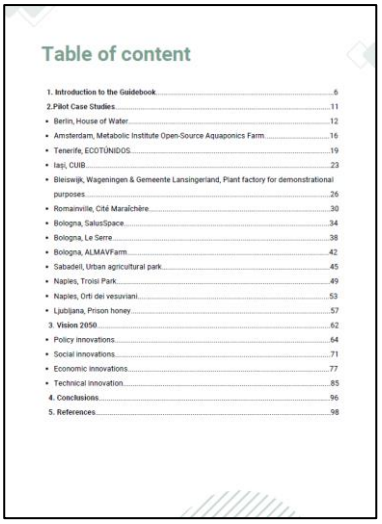
The innovation scenarios, describing the pathways of transformation, are broader in scope than the innovations from the FoodE pilots as they describe more general changes in the field of technology, economy, society, and policy that are needed for a sustainable CRFS to emerge.

In the narrative chapters, the future is described in a way that is imaginable for people and easy to understand as it is aimed at the general public.

The Guidebook can be downloaded here: https://foode.eu/wp-content/uploads/2024/01/FoodE-Guidebook-1.pdf / https://doi.org/10.58122/weg1-dd11



Cover of European Guidebook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Alroth, Sofia/ Mattias Höjer (2007): Sustainable energy prices and growth: Comparing macrooeconomic and backcasting scenarios, in: Ecological Economics 64 (2007), 722-731.

FAO (2022): The CRFS approach | Food for the cities programme | Food and Agriculture Organization of the United Nations. Online available: https://www.fao.org/in-action/food-for cities-programme/overview/crfs/en/ [retrieved on 08.12.2023].

FAO and RUAF (2017): City region food systems. What and why – RUAF Urban Agriculture and Food Systems

FoodE (2022)a: What are City/Region Food Systems (CRFS) - Foode

FoodE (2022)b: Project partners - Foode

IZT – Institut für Zukunftsstudien und Technologiebewertung (Hrsg.) (2008): Methoden der Zukunfts- und Szenarioanalyse. Überblick, Bewertung und Auswahlkriterien. Kosow, Hanna; Gaßner, Robert. *WerkstattBericht, 103.* https://www.researchgate.net/publication/262198781_Methoden_der_Zukunfts-und_Szenarioanalyse_Uberblick_Bewertung_und_Auswahlkriterien [retrieved on 29.11.2023].

Milan Urban Food Policy Pact (MUFFP) (Hg.) (2021): Milan Urban Food Policy Pact. Online available: https://www.milanurbanfoodpolicypact.org/ [retrieved on 08.12.2022].

United Nations (UN) (Hg.) (2016): The New Urban Agenda: Key Commitments. Online available: https://www.un.org/sustainabledevelopment/blog/2016/10/newurbanagenda/ [retrieved on 08.12.2023].