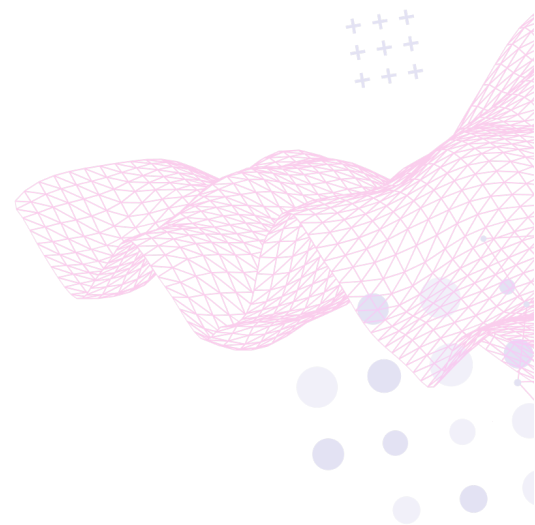# FutuResilience
Policy Roadmap

Matias Barberis, Philine Warnke, Kerstin Cuhls, Evangelia Petridou

Contributors: Elina Griniece, Alasdair Reid, Jörgen Sparf, Ron Iphofen, Erica Gaudino

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Contents

1. Introduction

The FutuResilience project aimed to strengthen Europe's economic and social resilience by improving the ability to respond quickly and effectively to future crises. Knowledge valorisation for policy uptake was at the core of the project's approach, supported by an ecosystem of 10 'FutuResilience Labs'. These labs acted as spaces for policy experimentation, designed to foster challenge-based resilience policies.

Over the course of more than a year, each lab began by defining concrete challenges, mapping key stakeholders and exploring how these challenges might evolve over time. To do this, they applied a range of foresight tools, including scenarios, backcasting, future visioning and speculative design. Stakeholders within the labs worked together to develop evidence-based policy actions, drawing on diverse sources of evidence such as scientific research, policy recommendations, local studies and citizen insights. As a result, the labs supported the valorisation and uptake of tools and evidence to create policy solutions that strengthen resilience and improve preparedness for future crises.

1.1 Roadmap goals

This policy roadmap **supports the adoption of co-creation mechanisms** that help policymakers and stakeholders prepare for a range of possible future scenarios. It presents a set of approaches to enable participatory processes for **developing policy instruments which foster societal resilience**. These approaches are organised according to the sequential stages of policy formulation — from engaging stakeholders and framing policy problems, to analysing underpinning factors and, finally, designing policy responses. The intention is to offer clear, practical guidance that helps organisations move from experimentation to real-world policy action.

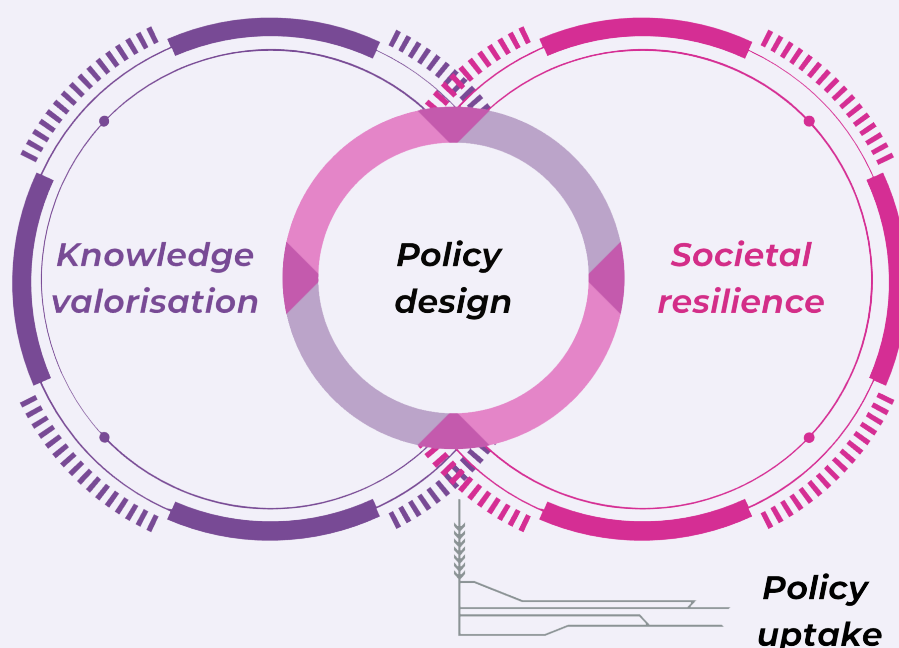*Figure 1 Policy design under FutuResilience approach*

The roadmap applies key insights from the FutuResilience co-creation and testing activities, translating them into concrete steps that can be used to improve resilience-building efforts. It highlights methods for working collaboratively, tools for anticipating emerging challenges and approaches that make policies more inclusive, adaptive and forward-looking.

1.2 Navigating the roadmap

This policy roadmap is designed to be read following two complementary pathways: **knowledge valorisation** and **societal resilience**. At the beginning, the roadmap provides a brief introduction to these concepts, including an explanation of knowledge valorisation, the role of policy experimentation and a definition of archetypes of knowledge valorisation for policy uptake; followed by a concise overview of societal resilience.

The subsequent sections present a series of approaches that support key steps in policy design—from problem framing and stakeholder engagement to future-oriented approaches for analysing factors and designing policies that foster societal resilience. These sections can be read through the lens of the two pathways.

The **main navigation pathway** follows the sequence of approaches that support knowledge valorisation through participatory, co-creation processes. Each strategy is grounded in the insights from the FutuResilience activities and illustrates how existing knowledge and tools can be activated and expanded collectively.

Within each strategy, a **secondary reading pathway** highlights how knowledge is mobilised in practice towards enhancing societal resilience across a diversity of challenges. This includes:

⊕ **Strategy definition** supporting design of policies for societal resilience.

⊕ **Examples** that illustrate real applications, specifying the policy challenge addressed, the relevant resilience profiles and the core resilience dimensions involved.

⊕ **Tools and evidence** sections that showcase how existing knowledge, data and practical resources can be valorised within participatory processes addressing complex policy issues, leveraging on concrete examples from the FutuResilience labs.

⊕ **Reflection questions** that help stakeholders understand how a strategy or tool could be applied in their own context.

As you move through the roadmap, these two pathways are intertwined: the approaches describe **what to do,** while the accompanying tools, evidence and examples show **how it can be done** and **what types of knowledge** can be leveraged at each stage. Across these sections, you will also find **testimonials**, offering stakeholder perspectives that illustrate the perceived value and impact of each strategy, as well as **key messages**, which summarise essential insights from experts on the relevance and added value of each topic.

The document concludes with a **set of policy recommendations** dedicated to strengthening knowledge valorisation and enhancing societal resilience. They offer guidance for organisations seeking to transition from experimentation to effective real-world policy action.

	Evidence	Type of data, practices or community insights supporting policy design
	Tool example	Practical methods, approaches or tools that help analyse the evidence
	Testimonial	Statements from stakeholders illustrating the strategy impact
	Key messages	Takeaways from experts in the filed on the relevance of the topic

2. Knowledge valorisation for policy uptake

Knowledge valorisation is the process of transforming data, know-how and research results into social and economic value — not only by developing products and services, but also by shaping evidence-based policies. For policymakers, this means that research outputs can directly inform policymaking, leading to more evidence-based, forward-looking strategies. Valorisation encourages co-creation across sectors: between academia, industry, civil society and governments, ensuring that policies reflect societal needs and include multi-sectoral evidence (scientific, citizens insights, studies applied to local context, usually in national language, etc.).

> **Key message:** *"The FutuResilience project is relevant for the knowledge valorisation policy. It is about the uptake of research results to inform public policy in different areas, engaging with citizens, using experimentation as policy tool and building resilience." (Iphigenia Pottaki, DG RTD)*

2.1 Experimentation for policy testing

Knowledge valorisation supports policy experimentation by creating the structures and practices that allow for iterative, real-world testing of research-informed ideas. Policy experimentation represents an opportunity to design policies for societal resilience and future preparedness. Policy experimentation allows governments to test new adaptive strategies in a controlled way, helping to reduce uncertainty while encouraging systemic learning.

Policy experimentation is a structured and evidence-driven approach that enables policymakers to test, refine and improve policy interventions before implementing them. It constitutes a purposeful and coordinated process, partly a research method, partly an approach to governing, in which different solutions to policy problems are tested (Huitema et al., 2018). A defining characteristic of policy experimentation is its structured learning process, intentionally designed to generate insights through methodologies such as randomised controlled trials (RCTs), A/B testing, rapid cycle evaluations and human-centred design approaches (European Commission, 2024). Policy experimentation has the potential to offer benefits to practitioners:

1. It reduces uncertainty and financial risk by allowing spatially, sectoral, or temporally limited policy trials before major reform implementation, thus minimising the costs of unsuccessful interventions to the broader polity.

2. As a research method, it fosters evidence-based decision-making by generating data that regarding the viability of policy solutions, how to optimise programme delivery, or when to discontinue ineffective interventions (Bravo-Biosca, 2019).

3. It builds organisational capacity and institutional learning by establishing new logics of public administration and creating recursive processes of continuous improvement across government systems (Eneqvist, 2022).

> **Key message:** *"Regions and municipalities are ideal for local policy experiments, requiring a balance of risk-taking and entrepreneurial collaboration to overcome a compliance-driven culture and encourage innovation." (Arnault Morisson, Science Po Paris)*

Over time, embedding valorisation in policy cycles enhances the adaptive capacity of governments: they become less reactive and more willing to experiment, learn and adopt evidence-based solutions for long-term societal challenges. The different tools and methods proposed in this roadmap contribute to mainstreaming knowledge valorisation within the first two phases of the policy cycle: agenda setting and policy formulation, as depicted in the graphic below.
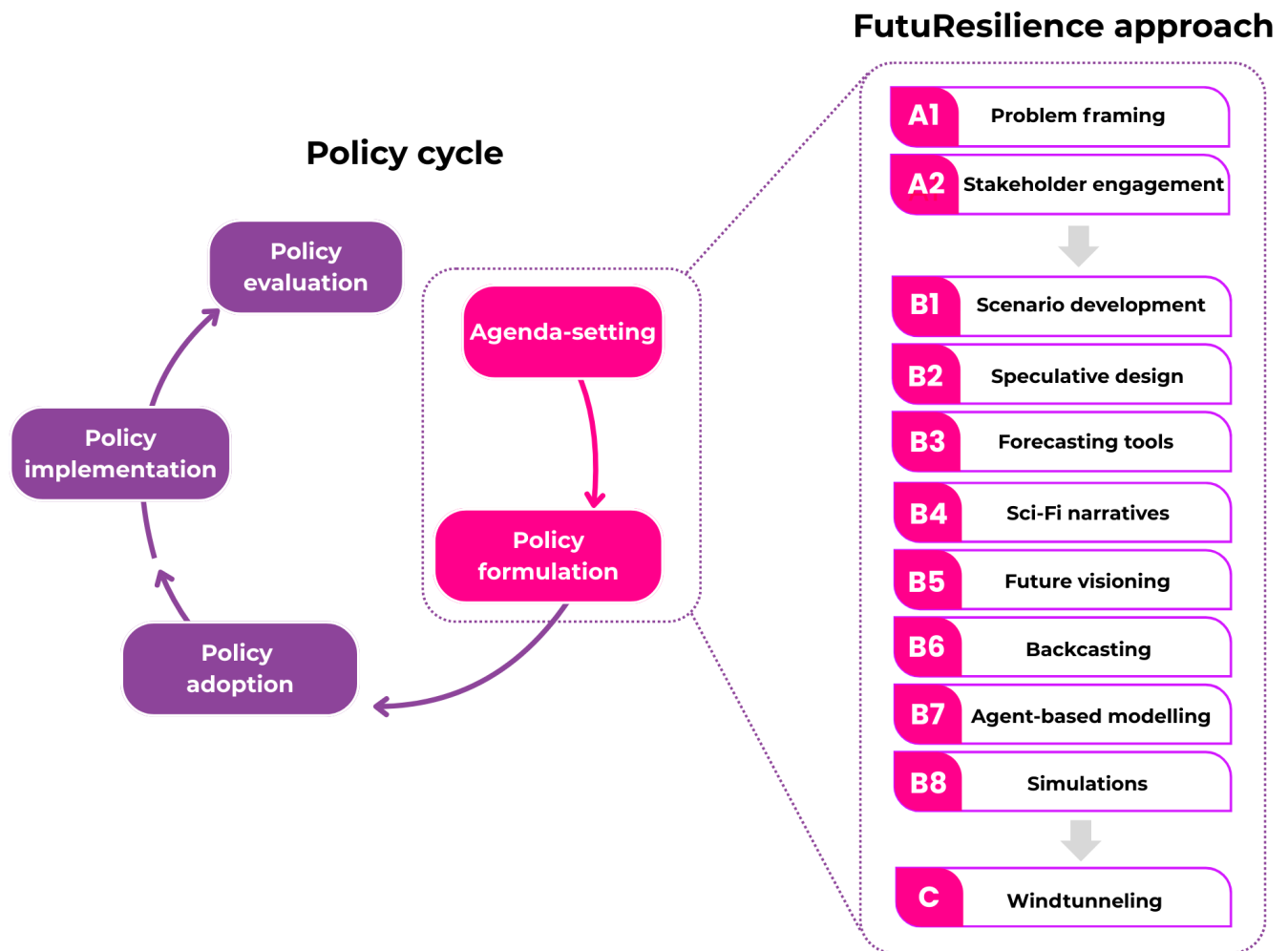
Policy cycle

FutuResilience approach

A1	Problem framing
A2	Stakeholder engagement

B1	Scenario development
B2	Speculative design
B3	Forecasting tools
B4	Sci-Fi narratives
B5	Future visioning
B6	Backcasting
B7	Agent-based modelling
B8	Simulations

C	Windtunneling

Policy evaluation — Policy implementation — Policy adoption — Agenda-setting — Policy formulation

Figure 2 The FutuResilience approach within the policy cycle

Problem framing is the first stage of the policy cycle where the desirable and undesirable conditions are identified and cast in a way that suggests a need for policy intervention. The approaches used are generally interpretative, analytical and highly collaborative, focusing on constructing a compelling and politically viable narrative. During this phase, it is relevant to gather information on the problem's existence, complexity, severity and scope, as well as diverse perspectives from experts views, practitioners and citizens, ensuring all voices are heard.

During the stakeholder engagement phase, there are systematic, strategic and iterative interactions, focusing on identifying, analysing and consulting with all relevant parties to gather knowledge, build consensus and ensure policy legitimacy of the defined problem framing. Stakeholder engagement phase focuses on identifying who is affected by the defined policy problem and how to involve them in the policy process to address it.

Although contemporary governance frameworks often present policymaking as a clean, staged and rational cycle, real-world practice diverges significantly. Policymaking is frequently shaped by non-linear dynamics, including political cultures, institutional arrangements, stakeholder values and pre-existing problem framings. These forces make the process inherently complex, contested and adaptive rather than sequential. As a result, policymaking is better understood through a path-dependence perspective, in which decisions are continuously shaped by prior trajectories while evolving in response to shifting structural conditions and emerging societal challenges. In this context, policymaking should not be conceptualised as a closed, linear cycle but rather as an ongoing, iterative process in which problem definitions, priorities and strategies must be continuously revisited, reframed and analysed.

Mainstreaming ethics in knowledge valorisation for policy uptake

Most political leaders and administrators claim to be proponents of 'evidence-based policymaking'. However, what does it mean? Knowledge is most valued and valuable when based on rigorous and reliable evidence-gathering: 'good' research, that must be both methodologically and ethically sound. Key ethical values and principles in research practice include honesty, transparency, integrity, justice and respect for the rights of communities and individuals. Such principles might be regarded as universal and to be a challenge to policies based upon established political biases or ideologies (Iphofen and O'Mathuna, 2022). The knowledge gained from good research must resonate with policymakers' aims and intentions to be effective. Ethically sound evidence gathering draws upon professional expertise, societal stakeholders, participatory practices and reliable data and data sources. The key to discovering 'what works' is to enable policy-testing either within the community or lab spaces that recognise a multiplicity of stakeholders' perspectives, similarities, differences and priorities.

Reflection Questions:

Have we been fully transparent about how the evidence was gathered and for what purpose? Have we communicated uncertainties, limitations and potential biases in the evidence? How could this contribute to or affect policymaking? Have stakeholders had a fair opportunity to challenge our interpretations of the evidence?

2.2 Archetypes of Knowledge valorisation for policy uptake

The archetypes are recurrent models that describe how diverse forms of knowledge (scientific, citizen, experiential, data-driven, organisational) are transformed into policy-relevant value through specific configurations of evidence, stakeholders, tools and decision processes. Based on the work performed by the FutuResilience Labs and further analytical research, the project has identified the following archetypes of knowledge valorisation for policy uptake:
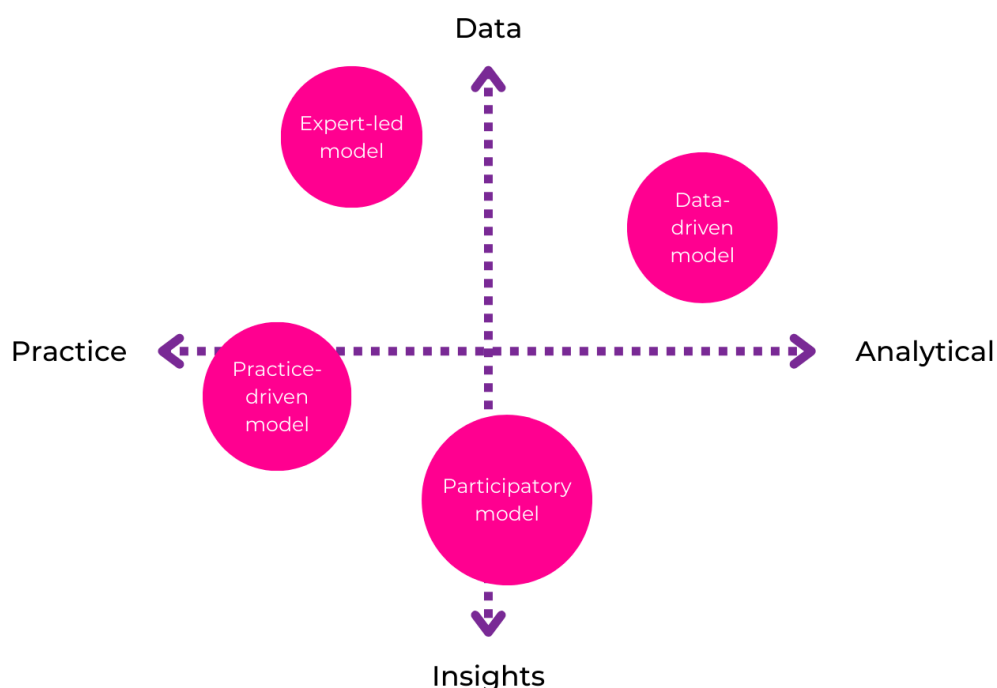

Figure 3 Archetypes of Knowledge Valorisation for policy uptake

The valorisation process emerges through the translation of scientific research into policy options through expert interpretation, validation and synthesis. In this model, legitimacy derives primarily from scientific rigor: evidence is usually tested ex-ante through expert analysis and presented to policymakers, usually acting as end-users, in the form of structured briefs or pre-digested documents. This process is normally driven by research-oriented institutions (higher education, research centres, think tanks, etc.).

EXPERT-DRIVEN MODEL

The valorisation process is achieved through the development and use of data platforms or predictive models (e.g. forecasting tools, dashboards, agent-based modelling, etc.). In this model, policy actions or strategies can be virtually tested through simulations, or data-based simulations can support decision-making. This model usually is supported by scientific evidence, could include a degree of discussion with stakeholders and looks to continuously inform decision-making. This process if usually driven by research-oriented institutions in collaboration with policymakers.

DATA-DRIVEN MODEL

PARTICIPATORY MODEL

The valorisation process emerges from iterative co-creation between authorities, key stakeholders and citizens, integrating transdisciplinary evidence (scientific, local, experiential and tacit knowledge) into policy design. In this model, there is a strong emphasis on legitimacy, inclusiveness and contextual relevance, while policy actions are discussed and eventually tested, in real conditions. This process is normally driven by intermediary organisations connecting research, policy and citizens (non-for-profit, living labs, local associations - could also include research-oriented institutions as highlighted in the expert-driven model). It often includes private-sector data providers or software developers.

PRACTICE-DRIVEN MODEL

The valorisation process entails the flow of information, organised discussions and knowledge exchange among technical staff and practitioners working on concrete policy areas. Knowledge is mostly exchanged across governance levels, sectors or institutional working areas through networks, communities of practice or field insights (e.g. interdepartmental meetings). This model includes a strong emphasis on the "learning by doing" approach and intermediary levels of policymaking play a substantial role. Indeed, this process is usually driven by public sector in collaboration with intermediary organisations acting as facilitators.

The following table summarises how the different approaches presented in this policy roadmap contribute to one or more archetypes for knowledge valorisation.

APPROACH	DATA-DRIVEN	EXPERT-LED	PARTICIPATORY	PRACTICE-DRIVEN
A1. PROBLEM FRAMING			●	●
A2. STAKEHOLDER ENGAGEMENT			●	●
B1. SCENARIO DEVELOPMENT			●	●
B2. SPECULATIVE DESIGN			●	●
B3. FORECASTING TOOLS		●		●
B4. SCI-FI NARRATIVES			●	
B5. FUTURE-VISIONING		●		●
B6. BACKCASTING				●
B7. AGENT-BASED MODELLING	●			
B8. SIMULATION	●			●
C. WINDTUNNELING		●		●

3. Future resilience in the policy arena

Societal resilience refers to the built-in capacity of a community, institution or system to manage, adapt and respond to new and changing challenges and shocks. It goes beyond simply withstanding or quickly recovering from adverse events. Instead, resilience includes the notions of adaptation to the long-term, learning and, when necessary, transforming rules, practices and institutions (Roth et al., 2021; Sutton et al., 2023).

For this reason, resilience is a proactive and forward-looking process. Resilience in public policy refers to the resilience of the policy process, or alternatively, to the outcome of this this process. A resilient process is one that can withstand and adapt in the face of challenges. An **inclusive** public policy process is necessarily a more **resilient** process because it incorporates diverse perspectives and considers the populations it serves.

The relationship between capacities and vulnerabilities, risk and resilience, affects the ways individuals, communities and countries at the national and subnational levels experience, respond to and recover from, adverse events. This dynamic is influenced by interrelated factors such as governance structures, access to technology, values and norms and social relations. However, insights from extraordinary events rarely result in policy change. Empowering communities and fostering citizen contributions is essential to enhance preparedness and involves strategies including participatory decision-making to prioritise risks and solutions and inclusive planning to tailor strategies to specific societal needs. Multi-level governance arrangements that clarify responsibilities, establish accountability mechanisms and ensure alignment between different governance tiers are also important in translating resilience-enhancing policy designs into operational reality.

> **Key message:** *"Robustness is among the key drivers for policies on resilience - and that implies considering dimensions of policy design such as organisational, instrumental and political aspects of the policy ecosystem." (Giliberto Capano, University of Bologna)*

3.1 Challenge-based approach

Societal resilience cannot be addressed with a one size fits all approach. The starting point for thinking about societal resilience is to understand the range of possible challenges and crises lying ahead that a community may experience. Resilience thinking implies i) understanding the community-specific threats and uncertainties; ii) analyse the specific local vulnerabilities, and iii) identify local capacities to face existing and emerging challenges. Resilience building is a collective process, in which multiple differences, often contradictory perspectives, collate into the definition of adaptation and transformational strategies against concrete challenges or shocks.

When following such a challenge-based approach it is important, however, to go beyond current expectations about possible threats and challenges which is usually limited due to cognitive biases and present-day framings. Systematic approaches (e.g. STEEPL Radar, emerging issue analysis or wild card brainstorming) can help to expand a community's perception of the future evolution of its environment ('peripheral vision'). Such strategies, also defined in the following section, can thus provide a solid starting point for a challenge-based approach to societal resilience.

> **Key message:** *"Transformative innovation policies can foster sustainability while strengthening resilience. But context matters! Place-based policies need to consider localised innovation opportunities and specific territorial vulnerabilities." (Michal Miedzinski, Joint Research Centre)*

Profiling resilience strategies

A resilience profile summarises how each FutuResilience Lab contributes to strengthening different dimensions of resilience through its policy design and proposed solutions. It provides a structured way to understand the emphasis of core solutions supporting resilience building efforts – or in other words, what areas requires transformative interventions based on the analysed challenges?

The five resilience dimensions used are:

⊕ **Social resilience:** enhancing social cohesion and inclusion, improving dialogue and community engagement, promoting equality and human rights and strengthening well-being and social support systems, particularly for vulnerable or marginalised groups.

⊕ **Environmental resilience:** addressing environmental risks and climate-related pressures such as heat, flooding, water scarcity, pollution and biodiversity loss, while promoting sustainable practices, circular approaches and the transition to renewable energy.

⊕ **Economic resilience:** supporting economic stability and adaptive capacity through sustainable financing, preparedness for labour market shocks, closing skills gaps, enabling post-crisis recovery and safeguarding public revenue bases.

⊕ **Institutional resilience:** Improving coordination across government levels, strengthening public-private collaboration, enabling anticipatory and adaptive policymaking, updating regulatory frameworks and enhancing crisis-response and emergency management systems.

⊕ **Infrastructure resilience:** ensuring the robustness and adaptability of critical systems, including housing, healthcare and education facilities, transport and energy networks, digital infrastructure and cybersecurity capacities.
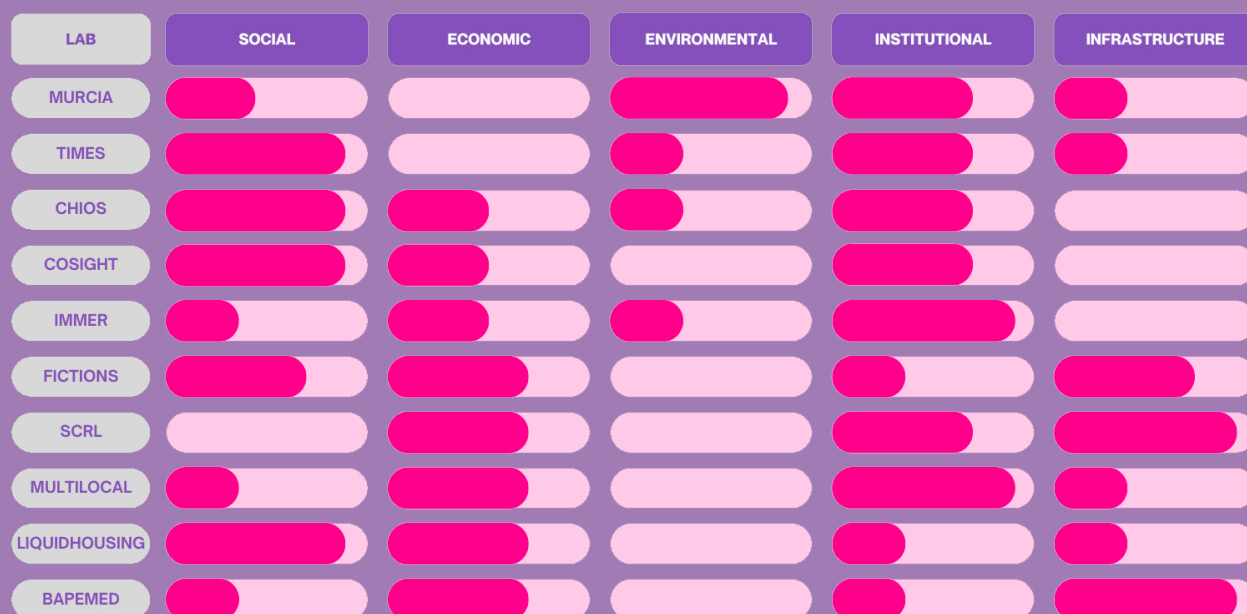
*F*igure 4 FutuResilience Labs 'Resilience profile'[1]

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1   Resilience profiles were constructed using a fixed total of seven points per lab, allocated across the five dimensions. A maximum of three points could be assigned to any single category, ensuring no over-representation of one dimension. Scores were based on a content analysis of the final lab reports, considering: (1) the thematic focus (e.g. floods, cybersecurity), (2) the nature of policy solutions proposed (e.g. citizen-centred design, regulatory reform, technological measures), and (3) the methodological set-up and stakeholder mix of each lab.

3.2 The power of futures thinking

Foresight entails structured dialogues on alternative futures among diverse stakeholders and experts, here within a certain arena of change. Participants jointly explore, imagine and anticipate possible developments to prepare for change or shape a preferable future. Foresight taps into collective intelligence in a structured and systemic way. Participants envision the long-term and think back from the long-term to the short- and medium-term implications.

Strategic Foresight embeds **future insights into policymaking, strategic planning and preparedness.** Foresight is not about predicting the future; it explores different possible futures alongside the opportunities and challenges they might present (Cuhls, 2019) and thus opens the imagination for different possible futures. Ultimately, Foresight helps policy and decision makers to act in the present to shape the future.

In addition to fostering preparedness through revealing anticipatory intelligence, Foresight underpins societal resilience on a deeper level through the participatory process. First, by challenging anticipatory assumptions and strengthening actors' sensitivity to weak signals of change, Foresight expands a community's view of the present and its potential for change. Such an enriched "peripheral vision" (Day and Schoemaker, 2004) will enable them to reflect on and react to emerging shifts earlier and deeper. Secondly, it underpins the capacity for a coordinated mobilisation of very diverse capacities that is required in crises situations by forming new linkages across silos, areas of change and activity domains.

Key message: *"Uncertainty is at the heart of crisis management and resilience. It is essential to acknowledge and be transparent about the different types of uncertainty inherent in expertise, whether they concern numbers, words, models, or data." (Jörgen Sparf, Mid-Sweden University| NTNU Social Research)*

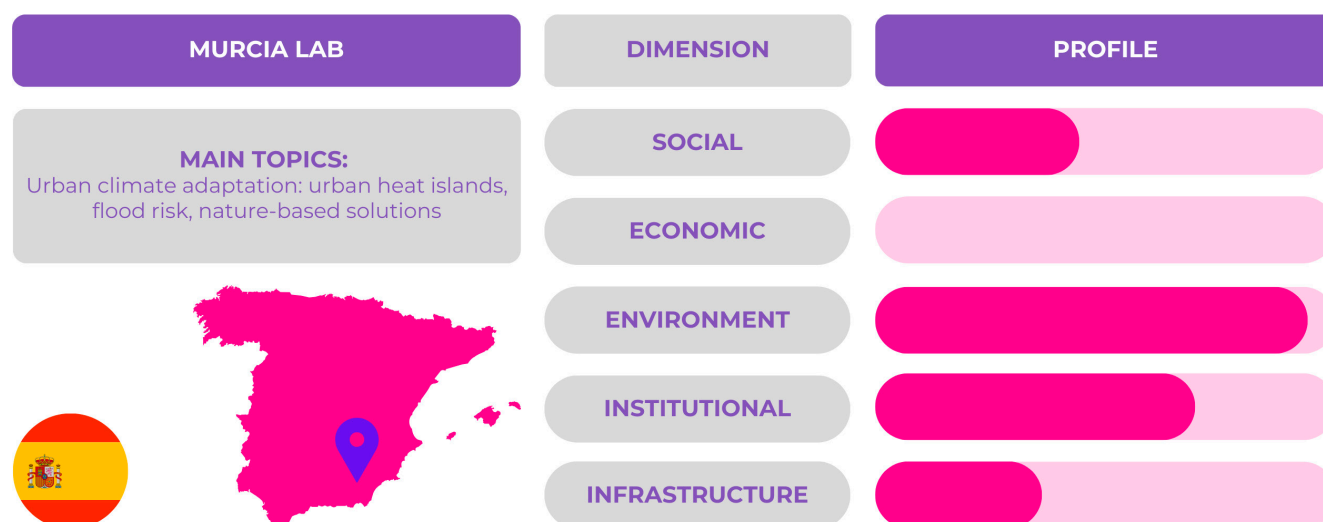# 4. Approaches towards designing policies for societal resilience

4.1 A1: Problem framing

What does problem framing mean?

Framing a problem is a key phase of policy design: it means defining what the issue is, why it matters and determines which aspects of a situation are emphasised. It sets the stage for every subsequent design decision.

Problem framing is predicated on the idea that problems are not *a priori* defined in a way that is universally accepted. The causes of complex, wicked problems (Rittel and Webber, 1973) are ambiguous and the viability of appropriate solutions is contested. Elected officials, public servants, or any other actors in the public discourse may cast an issue as one kind of problem or as completely another. Problem framings are not mutually exclusive; they may overlap or they may diverge significantly. Either way, the framing of the problem determines the range of policy solutions that may be considered an appropriate remedy.

The case of MURCIA Lab

MURCIA LAB	DIMENSION	PROFILE

MAIN TOPICS:
Urban climate adaptation: urban heat islands, flood risk, nature-based solutions

- SOCIAL
- ECONOMIC
- ENVIRONMENT
- INSTITUTIONAL
- INFRASTRUCTURE

The MURCIA Lab provided an innovative way to understand the problem from a twofold perspective. On the one hand, it collected evidence on key climate related issues (urban heat islands, local floods and city compactness) using existing available climate-related mapping and, on the other hand, it also directly involved the end-users of urban policies: the citizens. Once the evidence was collected, the problem framing moved to the policy design and engaged municipal technical staff and relevant local stakeholder in discussing key factors based on citizens perspectives and technical evidence (e.g. local regulations, previously adopted measures, etc.)

Relevant tools

The MURCIA Lab developed vulnerability maps, highlighting critical infrastructural vulnerabilities. Supporting the mapping, the lab implemented community mapping, providing street-level community knowledge that enriches and validates vulnerability assessments. The community mapping was conducted using an adapted version of the **Place Standard Tool** through a questionnaire on the characteristics of public space design factors that influence the urban microclimate.

Figure 5 Crowdmapping exercise in the MURCIA Lab (data collection and results)

What evidence was relevant for framing the problem?

The MURCIA Lab problem framing relied on a suite of spatial analyses that mapped neighbourhood-level vulnerability to heat, flooding and urban form, including satellite-based thermal simulations (Landsat 8–9), combined with cadastral data, Light Detection and Ranging (LIDAR) data, National Flood Zone Mapping System (SNCZI) and prior UPCT studies. Additionally, for the factor analysis – as part of the framing phase – previous EU funded research included in the FutuResilience Knowledge Base was used in combination with a questionnaire targeting municipal technical staff.

⊕ **Challenge:** The complexity of climate change adaptation led to an increasing number of variables during certain phases of the process (two neighbourhoods, three climate impacts, several working groups, multiple scenarios). As a result, several moments required reducing the number of variables under consideration (selecting key factors, limiting the number of policies, etc.) to keep the workshop dynamics feasible in terms of time and complexity. à Diverse tools in section B could provide alternatives to narrow down variables.

> *Citizens were able to assess microclimatic conditions—shade, pavement materials, exposure, thermal comfort—providing insights that complemented and challenged the technical maps. This hybrid method helped policymakers understand not only where risks occur but how they are experienced by the community. At the same time, it enhanced public awareness of climate risks and empowered residents to articulate local problems with precision. (Fernando García Martín, Universidad Politécnica de Cartagena)*

Reflection questions

Policymakers

- Who is most affected by how the problem is currently defined, and whose perspectives are missing from the definition?
- How does the current problem framing align or conflict with existing policies, regulations, or political priorities? Are there other problems that are not getting attention and if so, why?

Private sector

- How is the policy issue affecting or influencing business core activities?
- How could reframing the problem open up new partnerships, innovations, or business models?

Civil society

- What lived experiences, stories, or patterns do we observe that reveal what the problem looks and feels like on the ground?
- Whose voices have historically been excluded from shaping how this problem is understood?
- Are there some aspects of an issue that receive more attention than others?
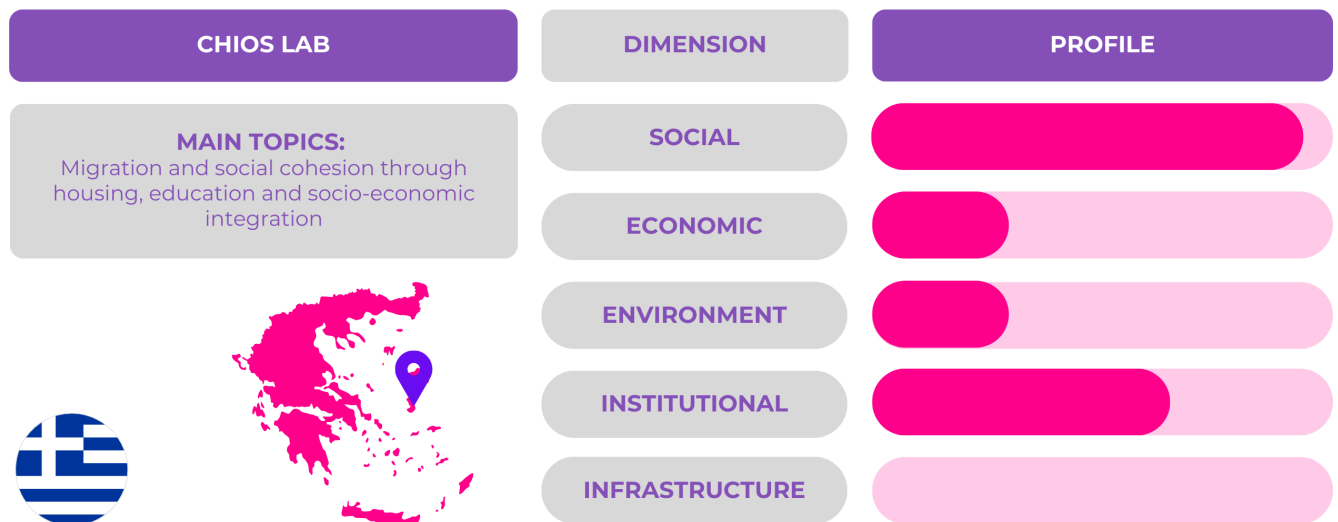
4.2 A2: Stakeholder engagement

Why is important to engage stakeholders in policy design?

Being inclusive in involving diverse perspectives and engaging stakeholder takes time and resources. This begs the question: why should public authorities spend these resources? The benefits of including stakeholders in policymaking outweighs the costs of doing so.

First, stakeholder engagement enriches the policymaking process with important knowledge of stakeholders situated perspectives. People are experts in their own lives and can contribute with valuable perspectives, knowledge and visions regarding in making important decisions about public policy.

Second, stakeholder engagement increases diversity, equity and inclusion in public policy. It is the democratic duty of public authorities to deliver public goods to everyone. The inclusion of diverse perspectives not only can improve the quality public policies, but it can also increase the trust that citizens have in the public sector. In times of increase distrust and mid- and dis-information such trust is crucial for the democratic polity and have positive consequences not only for a specific but for the democracy in general.

The case of CHIOS Lab

CHIOS LAB	DIMENSION	PROFILE
MAIN TOPICS: Migration and social cohesion through housing, education and socio-economic integration	SOCIAL	
	ECONOMIC	
	ENVIRONMENT	
	INSTITUTIONAL	
	INFRASTRUCTURE	

The CHIOS Lab illustrates a distinctive way of setting up the scene for participatory processes towards policy testing. The lab started with a stakeholder analysis, incorporating both strategic planning and local insight. A series of online meetings was held to gain a basic understanding of the migration crisis and the specific context in which the pilot studies would be conducted. These sessions served as a foundation for building trust among key partners and allowed identifying early perspectives, outlining initial challenges and aligning the methodological approach. Furthermore, the lab used a combined ethnographic approach – through a dedicated person that spent time in place having informal conversations with local stakeholders – followed by a questionnaire in local language.

Relevant tools

The stakeholder analysis was built **classifying the stakeholders** based on two dimensions: Influence (power) and Interest (level of affectedness). Influence refers to a stakeholder's authority or capacity to affect project decisions, allocation of resources, or overall outcomes. Interest indicates the degree of concern or involvement a stakeholder has in relation to the project. Each stakeholder was assessed by project team members on a scale from 1 to 10 for both Influence and Interest and subsequently grouped into six distinct categories. The analysis helped tailor the engagement strategy and focus resources effectively.
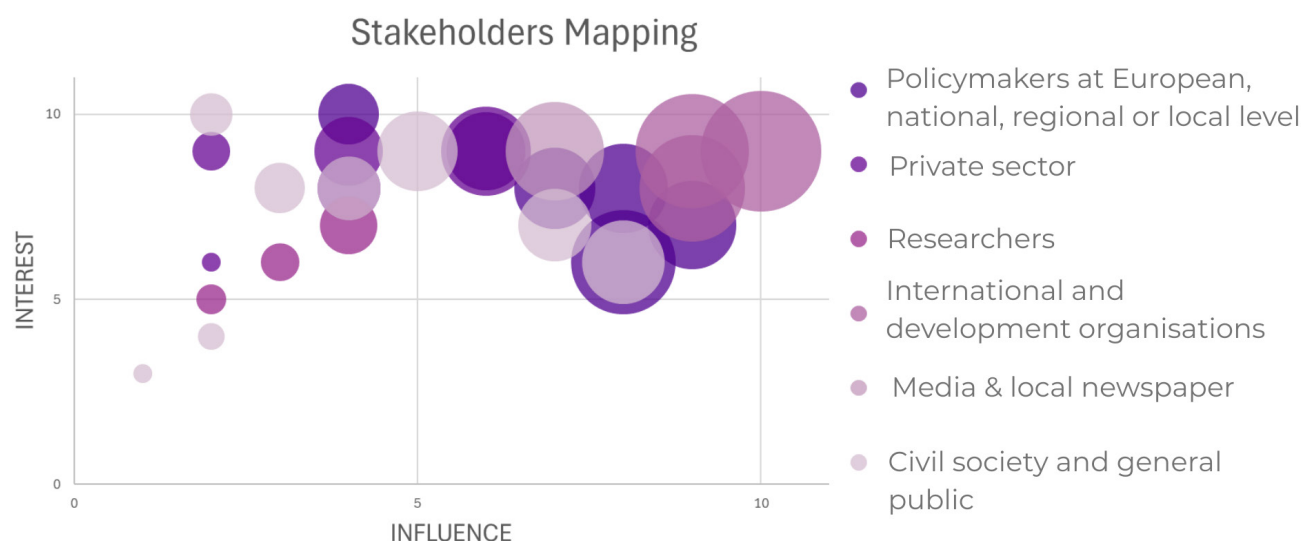

Figure 6 Representation of Stakeholders mapping for CHIOS Lab

What evidence was collected through initial engagement phases?

The CHIOS lab built on direct evidence informed by stakeholders through the interviews to core stakeholders and online questionnaire in the local language geared towards citizens. The design of the data collection was based on evidence about migration from the United Nations and the Greek Ministry of Migration and Asylum as well as the FutuResilience Knowledge Base through projects such as ASILE project (2022), the TransSOL project (2018) and REBUILD project (2020).

During the data collection process, participants reflected on past and future threats, especially around the 2015 migration influx, their responses, the island's characteristics, responsible agencies and collaboration needs. Also, they answered targeted questions based on their specific roles, such as private sector, residents, or those involved in refugee support.

> *These methods contributed to engaging stakeholders at local, regional and national levels to test 15 policy measures across a range of future scenarios. This approach ensured that policy proposals were not only well-grounded in theory but also practical and resilient in real-world contexts. Policymakers responded positively to the approach, as it went beyond abstract evidence and enabled them to see the practical implications of decisions under uncertainty. (Jenny Sikala, Municipality of Chios)*

Reflection questions

Policymakers

- How can we create accessible, inclusive engagement formats that allow meaningful participation—not just token input? Are there mechanisms to integrate their feedback?

- Are you reaching all the relevant stakeholders? Are there populations that consistently do not participate? If so, why?

- How do we ensure long-term, not one-off, engagement throughout the policy cycle?

Private sector

- What concerns or expectations do other stakeholders have about our role, influence, or potential conflicts of interest?

Civil society

- Which communities or actors must we engage to ensure the process reflects diverse lived experiences and justice perspectives?

- How can we build alliances with other organisations to expand outreach and amplify stakeholder voices?
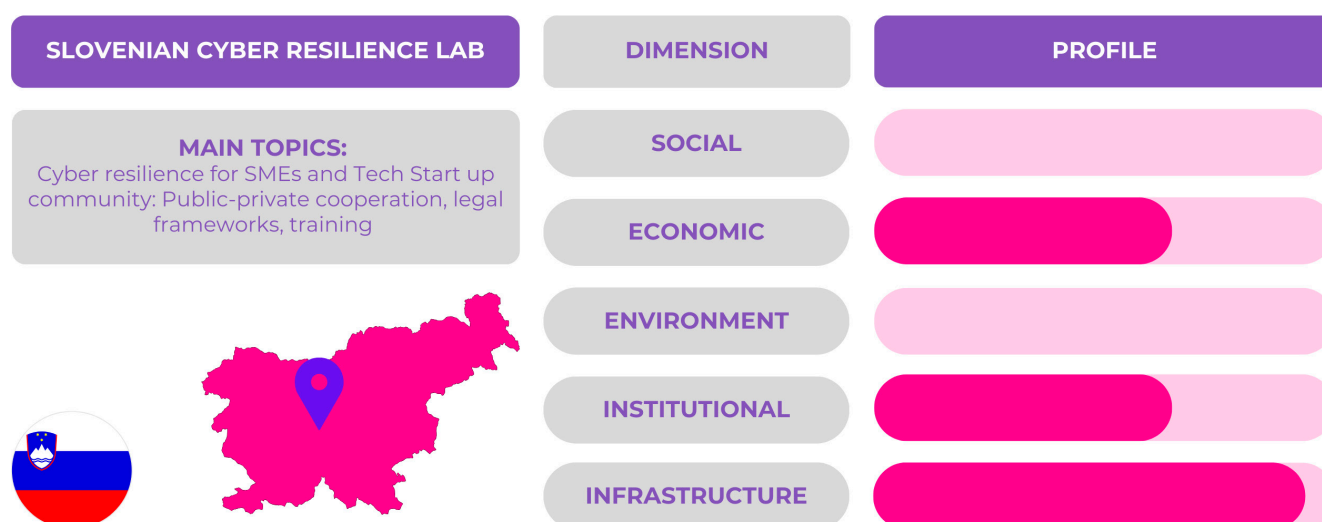
4.3 B1: Scenario development

Why scenario development is key for policy testing?

Scenario development is one of the oldest and most established foresight approaches. The core idea is to sketch a range of alternative futures that span the wide realm of future possibilities (done through a process of identification of the most impactful and most uncertain drivers of change – known as 'key uncertainties' – across the whole spectrum of change domains such as society, technology, economy, environment, policy, ethical & legal aspects). For testing strategies or policy options in situations of high uncertainty it is especially useful to develop scenarios of possible external framework conditions ('context scenarios').

By thinking through the effectiveness and applicability of the policy in different scenarios we can get an idea how robust the policy is against different possible framework conditions, how it might have to be adapted and what are signposts to monitor to understand when such adaptations are required.

The case of SCRL Lab

SLOVENIAN CYBER RESILIENCE LAB	DIMENSION	PROFILE
MAIN TOPICS: Cyber resilience for SMEs and Tech Start up community: Public-private cooperation, legal frameworks, training	SOCIAL	
	ECONOMIC	
	ENVIRONMENT	
	INSTITUTIONAL	
	INFRASTRUCTURE	

The Slovenian Cyber Resilience Lab (SCRL) was launched to enhance the cybersecurity resilience of Slovenian small and medium-sized enterprises (SMEs), R&D communities and start-up ecosystems. Recognising the growing cyber threats, the lab aimed to bridge the gap between the cybersecurity needs of these businesses and the available solutions, while also engaging policymakers to develop effective cybersecurity policies. Working with scenarios allow them to prepare robust, while flexible policy responses to strengthen cyber resilience at national level.

Relevant tool

The lab team prepared an outline for four general Future of Cybersecurity scenarios, revolving around future geopolitical and economic development. The scenario drafts were then consolidated with stakeholders in a series of short, online brainstorming sessions. During these sessions, participants worked refining and further developing the scenarios from a scenario grid, while performing a SWOT analysis focusing on: what are consequences and threats in the given scenario? Which of the current scenario features may appear as weakness? Are we prepared to deal with the evolving scenario?

A new cold war
Scenario A

Regionalisation and disintegration

Multicrisis
Scenario B

Competitive Slovenia

Weak economy

Age of collaboration
Scenario D

Old Europe
Scenario C

SCALE:
1 = Low
2 = Medium
3 = High

Globalisation recalibrated

Figure 7 Scenarios developed for the Slovenian Cyber Resilience Lab

⊕ **Challenge:** while building scenarios, participants may tend to interpret the expected evolution of the problem as a worsening of the situation in the coming years and decades → To address this issue, guidance on the scenario development should be sought, alternative imaginary methods could be used such as backcasting or future visioning.

What evidence was used supporting the scenario development?

The SCRL carried out a study on the Slovenian Start Up community. The study examined SME's ability to implement a cybersecurity measure. The factors were identified via a systematic literature review (through the Futu-Resilience Knowledge Base and additional scientific literature). This data fed into a structured survey that was distributed among Slovenian start-ups and small tech companies, providing insights into barriers and boosters for adopting cybersecurity measures. These results were then discussed with stakeholders to create a consolidated list of factors, assessed by their impact and uncertainty, as well as discuss their potential future development.

> " *These methods made the discussions more interactive and helped policymakers connect cybersecurity issues with their own responsibilities. We also learned that evidence from real-world experience - such as experiences from start-ups and information on economic impacts - was just as important as scientific data in shaping useful and realistic policies. Even beyond the policy results, our work impacted new projects and encouraged public discussion about the importance of cybersecurity for economic stability. (Luka Jelovčan, SGB Security Consulting)*

Reflection questions

Policymakers

- Do you systematically consider different framework conditions when developing policies?
- Are you aware of the critical assumptions underlying your strategic choices?
- How can we design scenarios that remain relevant even as political or institutional conditions shift?

Private sector

- Which external trends and uncertainties could create new risks or opportunities for our industry? Will your company still be competitive when circumstances change?
- What assumptions about markets, customers, or competitors are we making—and how do different scenarios test those assumptions?

Civil society

- What future conditions would strengthen or weaken the rights, wellbeing, or agency of the communities we represent?
- What emerging threats or opportunities could affect marginalised groups in ways that other stakeholders might overlook?
- What are the expectations and assumptions your organisation members, or other civil society groups hold about the future?
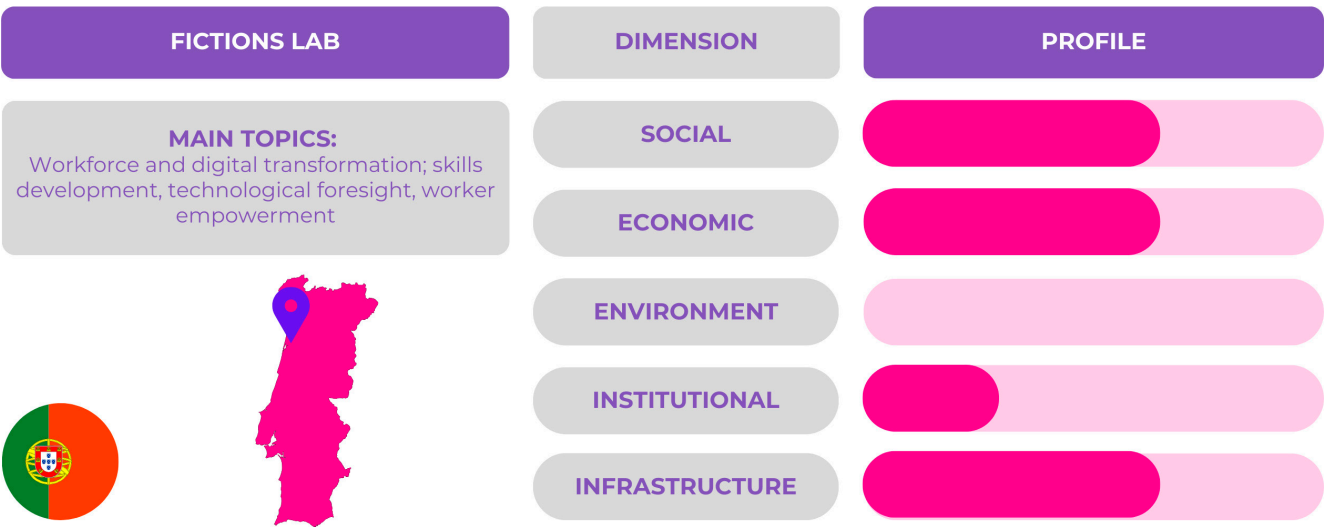
4.4 B2: Speculative design

Why speculative design?

Speculative design is a design approach that explores **possible futures** rather than focusing on immediate, practical solutions. It uses design as a tool to **stimulate discussion, question assumptions and imagine alternative scenarios**—often addressing social, technological, or ethical implications (Cardenas Cardova et al., 2025). It often involves creating artifacts, prototypes, or narratives that represent hypothetical futures.

Participatory speculative design is especially suitable for mobilising the voices of actors who are less comfortable with abstract policy level debates and thereby bringing the highly relevant tacit knowledge of communities of practice into the policy arena. It also helps to unlock insights about more emotional reactions to different futures which is often neglected in more analytical approaches to scenario building but highly relevant to consider in strategic decisions.

The case of FICTIONS Lab

FICTIONS LAB	DIMENSION	PROFILE
MAIN TOPICS: Workforce and digital transformation; skills development, technological foresight, worker empowerment	SOCIAL	
	ECONOMIC	
	ENVIRONMENT	
	INSTITUTIONAL	
	INFRASTRUCTURE	

The FICTIONS Lab implemented a participatory speculative design approach with manufacturing workers. It entailed a series of workshops to discuss the future implications of technologies in their work environment to gather direct insights. As result, the operators generated policy recommendations for various stakeholders based on their experiences and discussions throughout the workshops.

Relevant tools

A key tool as part of speculative design is the use of **technology prototypes**. The FICTIONS lab developed a prototype for the workers addressing issues pre-identified by them across different scenarios workshops and a survey. The idea was to reflect with participants about the potential impact that such technology might have.
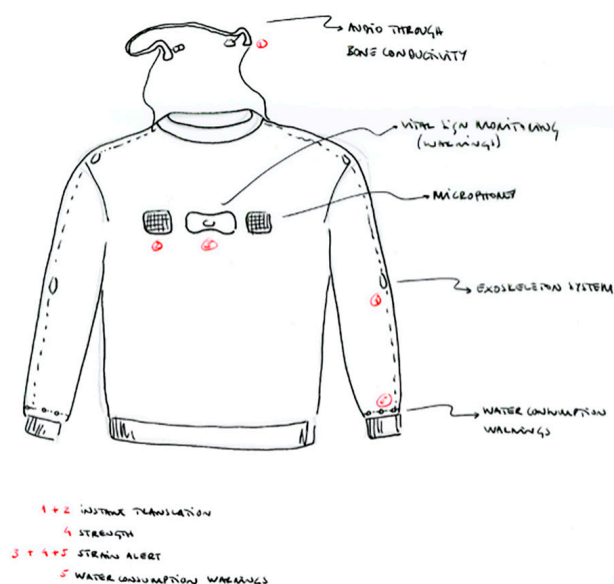
Figure 8 Prototype developed for the FICTIONS lab

The prototype and the exercises led participants to reflect about the implications of technology from a mundane level (e.g. how to wash the garment, how hot would it be to work in, whether materials would endure harsh working conditions, or whether there would be electromagnetic interferences) to a policy level (e.g. implications it might have for occupational safety and health regulation).

⊕ **Challenge:** Factory workers could feel uncomfortable drawing, so we provided pre-designed images they could simply cut and use. In the last workshop, we prioritised writing when developing artefacts, as we found it was the medium they felt most comfortable using for expression. à It is important to understand the public of participatory design to achieve expected results.

What evidence was used during the process?

As preparatory work, the FICTIONS team explored the FutuResilience Knowledge Base and examined 10 relevant documents in the field. Furthermore, the team launched a survey on attitudes towards digital technologies at work next to operators working in three industrial units related to metal work and woodwork. The survey design followed a previous study methodology used for studying the role of skills for the future of work. These results fed the different workshop activities of speculative design until the development of the prototype. For the prototype, the team mapped technology readily available or soon to be available which could solve the issues raised by participants, as well as enact the solutions they have forwarded.

> *Creating design fictions to spark reactions among participants had a significant impact and immersion, these materials were visually styled and feel real. The methodology yielded positive results, from knowledge gains to capacity building among factory operators, while also facilitating the sharing of their future visions as specialists of their workplace. (Ana Correia de Barros, Fraunhofer AICOS)*

Reflection questions

Policymakers

- How can speculative design outputs (artefacts, stories, provocations) help us communicate complex future issues to stakeholders?
- What new regulatory questions or ethical dilemmas emerge when we imagine extreme or alternate futures (e.g. through prototypes)?

Private sector

- How can speculative artefacts help us test customer reactions to future possibilities before committing resources?
- What future products, services, or business models could emerge from speculative design beyond current market logic? What could be our role in the imagined futures?

Civil society

- What futures do the communities we represent hope for, fear, or imagine—and how can speculative design help express those visions?
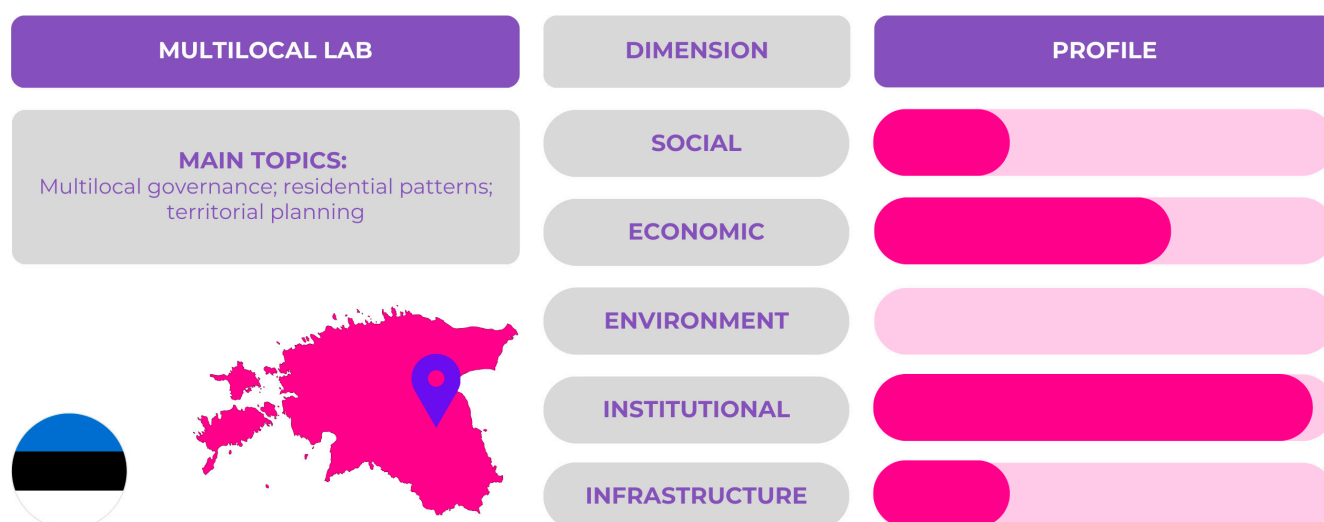- Could fictional artefacts help to spark the debates you would like to initiate?

4.5 B3: Forecasting tools

What is the role of forecasting tools in policy design?

Foresight does not predict the future but rather recognises its uncertainty and sets up dialogues that systematically engage with different possible, imaginable and desirable futures. As an input into these debates, foresight processes often use forecasting techniques. Forecasting extrapolates assumptions about certain aspects of a complex system into the future and derives impacts on other aspects.

While the evolution of an entire complex system cannot be predicted, the development of specific aspects and the interaction between a few factors of change can very well be analysed. Including data on scenarios and factors often helps communicate the findings. Forecasting techniques also lend themselves to visualisations that help to grasp quantitative dynamics that are often difficult take in for human minds. Important remark: reality is much more 'messy' and unknown factors may distort the picture in unexpected ways.

The case of MULTILOCAL Lab

MULTILOCAL LAB	DIMENSION	PROFILE
MAIN TOPICS: Multilocal governance; residential patterns; territorial planning	SOCIAL	
	ECONOMIC	
	ENVIRONMENT	
	INSTITUTIONAL	
	INFRASTRUCTURE	

The MULTILOCAL Lab addressed the governance challenges emerging from shifting residential mobility and the rise of multilocal living arrangements. Building on these patterns, the lab worked on developing an innovative, demography-based digital tool to support strategic decision-making and spatial planning.

Relevant tools

The MULTILOCAL Lab designed a Local Tax Calculator, that enables municipalities to simulate future scenarios and assess the financial implications of demographic and economic changes. It combines demographic forecasting with income-based tax modelling, fostering evidence-based decisions and fosters sustainable long term financial planning.
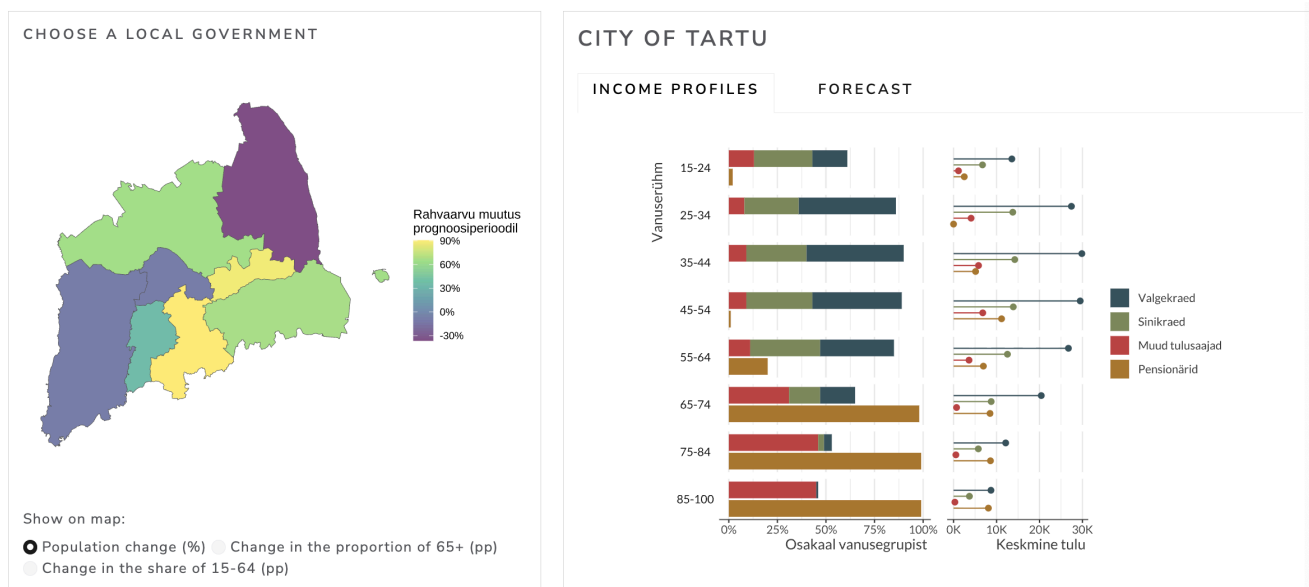
Figure 9 MULTILOCAL Lab Forecasting Tool interface

What evidence was used for building the tool?

The tool employs a structured framework incorporating key demographic and economic factors that influence income tax revenue at the municipal level. A literature review identified current trends and data-driven analysis used multiple national sources—registry data, census data and desk research—to examine residential and daily mobility trends in the Tartu urban region over four years. Local demographic and economic data were integrated to ensure proposals reflected real-world challenges.

⊕ **Challenge:** The use of demographic projections and income profiles derived from administrative datasets. Any future measuring redefinition in one source can create misalignment and require recalibration. Forecasting tools must be adaptable and robust to data discontinuities. → Adoption of more qualitative approaches could help make the analysis more robust and better integrate insights into policy design.

> *With the digital simulation tool, we were able to bridge the gap between abstract analysis and concrete decision-making, grounding the tool in real-life population data and allowing for scenario-based simulations. The lab also fostered a shared language and understanding of future uncertainties, which is crucial for advancing resilience thinking in local governance. (Kristi Post, University of Tartu)*

Reflection questions

Policymakers

- Would you like to simulate the consequences of certain taken or possible decisions and experiment with different possibilities? What key uncertainties or variables should our forecasts focus on to inform policy decisions?

- Do you think using highly visual forecasting tools would help you to foster a shared understanding of future challenges among your stakeholders?

Private sector

- Would it help your long-term strategy development if policy makers would use forecasting tools to explain the reasoning behind their decisions?

- Which types of data or insights from our operations could meaningfully contribute to shared forecasting models? How can we collaborate with other stakeholders to ensure forecasts reflect realistic market and technological dynamics?
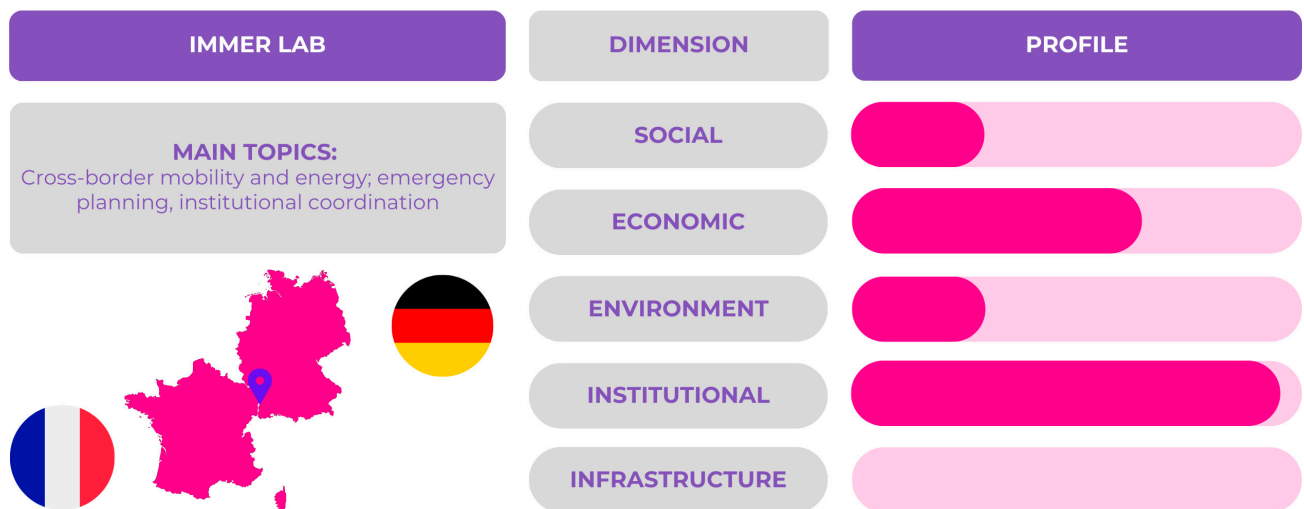
Civil society

- Do you think that putting concrete numbers and visuals on certain scenarios you are promoting or warning against would help to communicate your arguments?

- How can forecasting tools help us anticipate social, environmental, or ethical challenges?

4.6 B4: Science-Fiction narratives

How can Science-Fiction support the policymaking process?

Science fiction literature – or ad-hoc prepared future fictional narrations – can be exploited to find unusual thinking, imaginative stories (they do not need to be realistic), narrations about potential technologies or disasters that we do not consider in everyday life or societal challenges that are unknown today. This kind of literature triggers our imagination and can make us think about unusual or unexpected situations or events. Scenarios can be written and illustrated based on these findings. They were used to trigger the discussion on preparing for potential shocks.

The case of IMMER Lab

IMMER LAB	DIMENSION	PROFILE
MAIN TOPICS: Cross-border mobility and energy; emergency planning, institutional coordination	SOCIAL	
	ECONOMIC	
	ENVIRONMENT	
	INSTITUTIONAL	
	INFRASTRUCTURE	

The IMMER Lab focused on the Upper Rhine region, situated along the French German border, bringing together two different administrative systems, in which numerous actors are involved – public authorities, private companies and civil society. During crises, efficient cooperation is a must to address unforeseen events that can quickly affect both sides. The use of three different, drastic future narratives was effective in revealing a rich variety of issues and finding practical solutions along with a high level of engagement and commitment from the actors involved.

What are relevant tools?

The IMMER Lab used three **scenarios** derived from **science-fiction**: 'Fluvial tsunami', 'Societal collapse' and 'Blackout' were used to guide a factor analysis, envision implications and identify first solutions as a basis for policy design. Participants in workshops were asked to describe the world after such crises in a specific time period:

⊕ 2050: the moment on which the crisis occurs (emergency issues are raised), here the fictional scenarios were central for the analysis.

⊕ 2051: concerns follow-up problems that occur if the crisis persists over a longer term. Here, challenges that are normally ignored, come to the forefront. Here, fictional alarm apps were introduced – a smartphone alert ("this is not an exercise") placed the participants emotionally into a stress situation.

⊕ Back to the present of 2025: the implications or lessons for the present: what can we do today to best prepare for problems "discovered" in the future? How can we build up the capabilities of the future, those, we want to have to react when the time comes and they are needed even though we do not know if we will ever need them? How can we convince the different actors that these capabilities are necessary to be prepared? For this last analysis, the lab applied role-playing through a persona (a mayor, a CEO, etc.) who was asked for advice in such situations.

Figure 10 Science-Fiction Scenarios for 2050 in Strasbourg-Kehl Area

⊕ **Learning point:** This method of fictitious science-fiction-based narrations with emotional effects evoked by alert apps offers a better understanding of the issues at stake after having "experienced" situations in several dimensions (technical, political or even emotional ones). This kind of scenarios serves as effective provocations for encouraging both individual and collective reflection on potential critical system failures and fostering preparedness for resilience in different disasters if needed. Personas were used to simulate leadership in the different situations laying bare the questions that are raised by policymakers or company leaders.

What evidence is used to work with narrative futures?

Building the fictional scenarios required gathering data from core stakeholders on both sides of the Rhine. Semi-structured interviews with actors in the region helped identify the most feared crises over the next 25 years, including energy instability, communication and mobility disruptions, climate risks and cyberattacks.

> **"** *The chosen format of dystopian science fiction stories was fully accepted by all stakeholders involved. Not exclusively designed for policy makers but for communities in general, narrative foresight must be conceived as an exercise of community building, particularly among heterogenous actors. (Emmanuel Muller, Kehl University of Applied Sciences)*

Reflection questions

Policymakers

[?] Which potential risks or unintended consequences highlighted in these stories are relevant to our context?

[?] What values and priorities are revealed in these scenarios, and how might they conflict with our policy objectives?

[?] How can policymakers collaborate across borders in the case of disasters or preventing crises after a disaster?

Private sector

[?] Which scenarios suggest new opportunities for innovation or competitive advantage?

[?] What assumptions about consumer behaviour, regulation or societal trends should we test or challenge in these narratives?

[?] Is it necessary to work with dystopian futures or can we have similar effects with more positively perceived futures?

Civil society

[?] How do these narratives help us envision futures and prepare for them including diverse voices, perspectives and needs?

[?] How could we use these scenarios to educate or mobilise communities around emerging issues, beyond co-creation activities?
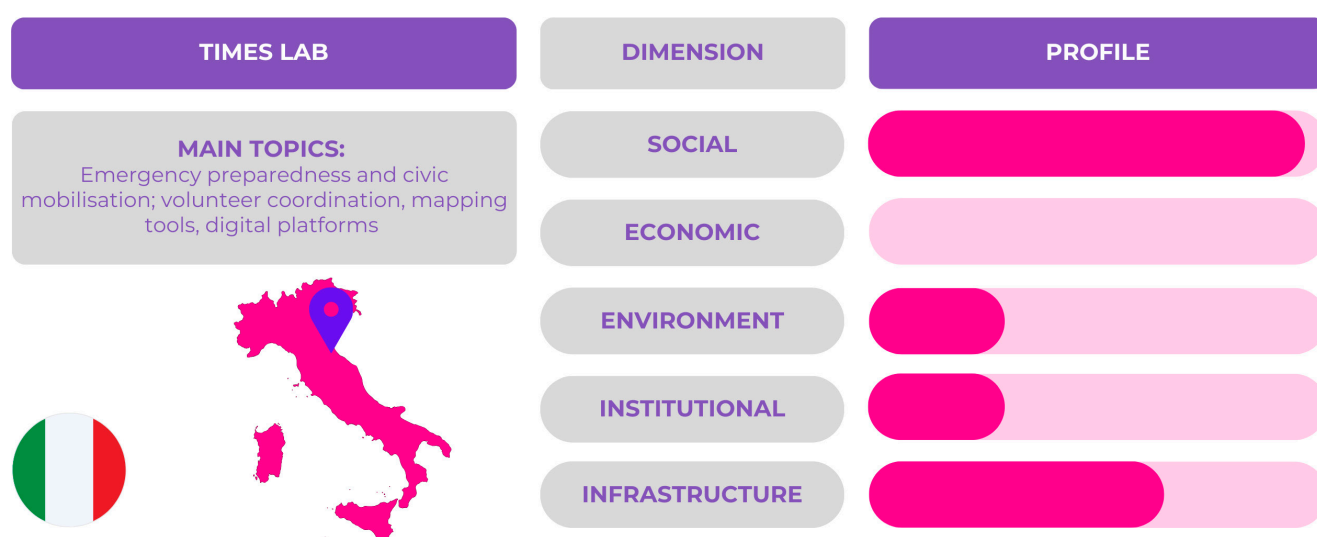
4.7 B5: Future visioning

What is future visioning?

Just like scenario development futures visioning is at the core of the portfolio of Foresight approaches. While scenarios usually describe possible futures, visioning is dedicated to carving out a **shared desirable future** for a group of actors involved in the visioning process, e.g. describing what they aspire to achieve in the world. Accordingly, in a visioning process it is crucial to exchange on values, hopes and ambitions and to mobilise personal emotions and desires. Accordingly, in foresight, visions are sometimes called '**futures of the heart'** in contrast to the more analytical scenarios as 'futures of the head'. Visioning requires protected spaces and often employs creativity techniques that inspire people and empower them to share their more personal values. A vision can give orientation in daily decision making, motivate people to rise raise their ambitions and help to coordinate their actions. A full strategy process combines visioning with scenario development and backcasting.

The case of TIMES Lab

TIMES LAB	DIMENSION	PROFILE
MAIN TOPICS: Emergency preparedness and civic mobilisation; volunteer coordination, mapping tools, digital platforms	SOCIAL	
	ECONOMIC	
	ENVIRONMENT	
	INSTITUTIONAL	
	INFRASTRUCTURE	

The TIMES Lab aimed, among other objectives, to strengthen local community preparedness for future crises by analysing the social aspects of risk management, mapping community resources and enhancing community skills. It was designed with a strong participatory approach to develop a real community capacity building process. Future visioning played a key role in engaging the community to help ideate policy actions by illustrating how today's decisions could influence future responses.

Relevant tools

Among other tools, the TIMES Lab proposed the 'Newspaper of Tomorrow' – a participatory storytelling exercise where participants co-created a fictional newspaper from 2050, imagining a positive future for emergency management, particularly in flood scenarios. When we talk about civic preparedness for future crises, it is key to use first a positive approach for local actors to avoid feeding fear, anguish and eco-anxiety (emerging as a critical factor during framing phase).

Cesena Tomorrow

3rd December 2050

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Subheadline:
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Article's body

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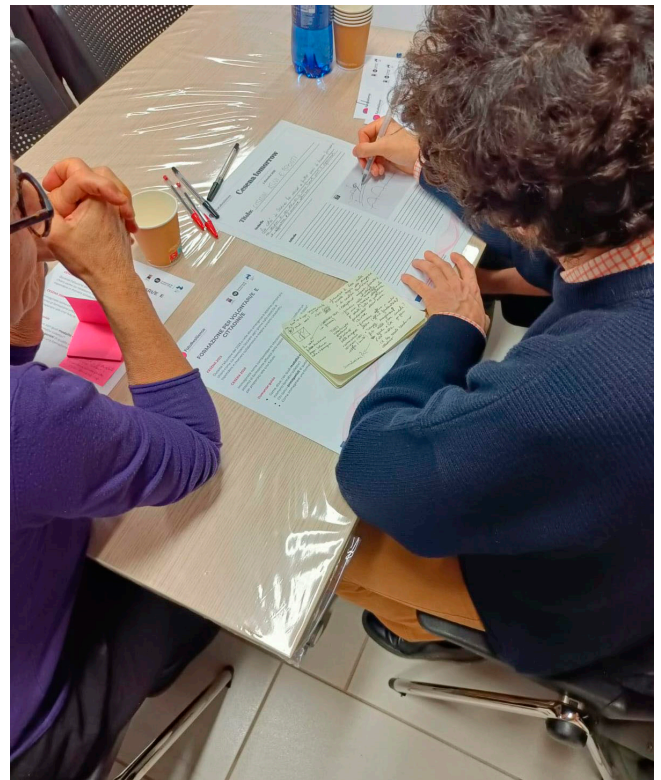
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Figure 11 The "Newspaper of Tomorrow" applied in TIMES Lab

What evidence is relevant in the process?

The initial phase of the TIMES lab involved extensive data collection through interviews to experts in floods and crisis management, focus groups (with representatives from associations, affected people from neighbourhoods and municipality technical staff) and questionnaires to citizens on the role of spontaneous volunteering during the 2023 flood. Results from this data was used to understand critical factors on the volunteering process such as communication, logistics, management and training, topics that were presented and discussed with participants before performing the 'Newspaper of Tomorrow' exercise.

⊕ **Learning point:** From the early phases of interviews and data collection, the emotional dimension of the flood experience emerged as central. For the ideation phase in preparation of the 'Newspaper of Tomorrow' exercise, it was useful to use images, photos, postcards, messages in bottles and other creative tools to tell the good things people learned from a traumatic experience. Additional tools such as collective voting (e.g. Mentimeter) allow participants to process and share their experiences in a more comfortable, anonymised way. Emotional dynamics should be carefully considered when designing participatory processes related to extreme events that have affected a specific community.

> *Using medium- and long-term scenarios to positively shape future pathways that improve our preparedness for crises is a useful tool for planning interventions — including cross-sectoral ones — that align with a single strategic objective. (Sofia Burioli, Municipality of Cesena)*

Reflection questions

Policymakers

- How might unintended consequences or policy trade-offs appear in the desired future?
- What are areas where a shared vision would help you to better achieve your goals?
- What are the values you share within your government or ministry that contributes to reach the desired future? Is there a need to coordinate expectations with other stakeholders?

Private sector

- Which innovations, business models or partnerships must emerge to make this future plausible?
- What market, technological or societal disruptions could either accelerate or derail this vision?

Civil society

- How can we use this vision to inspire collective action, alliances, or policy change today?
- Which social, political or economic changes would need to occur to bring this vision to life?
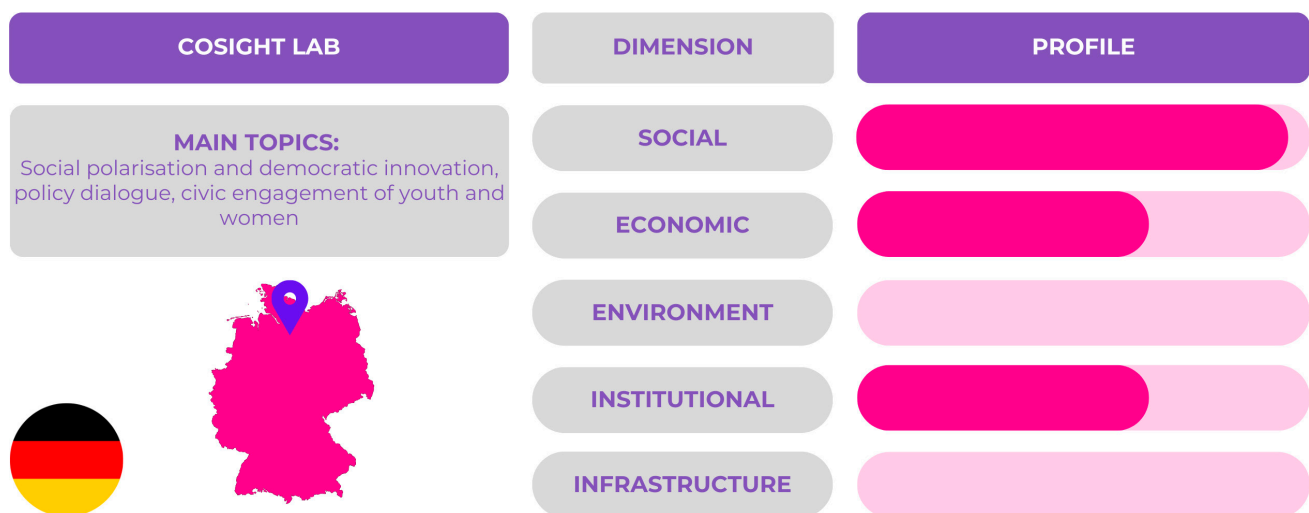
4.8 B6: Backcasting

What is Backcasting?

As the name is already indicating, Backcasting is looking back to the present from a point in the future. Backcasting is a **foresight technique** that starts with defining a desirable future state or outcome and works backward to identify the necessary steps to achieve that outcome or desirable state. It is useful in planning interventions in complex situations where straightforward planning is challenging. It contributed to improving focus and prioritisation of recommendations.

The desirable future state has ideally been formulated through a participative visioning process but could also e.g. follow from political goals such as the UN Sustainable Development Goals or the Paris Global Warming Limitation Targets or specific organisational goals (see Vergragt and Quist 2011). In some cases, different pathways towards the desirable goal are developed (see, for instance, Heinonen and Lauttamäki, 2012). In a fully-fledged Foresight based strategy process, backcasting is often combined with context scenario development as in many cases the way a certain goal can be achieved depends heavily on the framework conditions.

The case of COSIGHT Lab

COSIGHT LAB	DIMENSION	PROFILE
MAIN TOPICS: Social polarisation and democratic innovation, policy dialogue, civic engagement of youth and women	SOCIAL	
	ECONOMIC	
	ENVIRONMENT	
	INSTITUTIONAL	
	INFRASTRUCTURE	

The COSIGHT Lab focused on resilience and societal crises in the context of integration. A special emphasis was on identifying policy issues that are unaddressed and thus a potential cause for future problems. One of those issues identified was the (currently missing) integration of 'forgotten' and formally low-qualified groups – particularly women and young people with (often second generation) immigration backgrounds – into the local labour market. For both groups, a vision was formulated. Backcasting served as means to reflect on the main strategies and steps to achieve the desired futures formulated in a vision by starting from the goal and then working backwards to the present.

Relevant tools

The COSIGHT Lab proposed **backcasting** as a tool for "Working backwards from a vision 2035 towards the present" so as to discuss more concrete actions bridging needs and policymaking options. Participants used a timeline as a visual tool to summarise and communicate these steps. In a flyer, short-term, medium-term and long-term actions were summarised to describe the ways that could collectively lead to the desired outcomes – reflected in previous workshops.
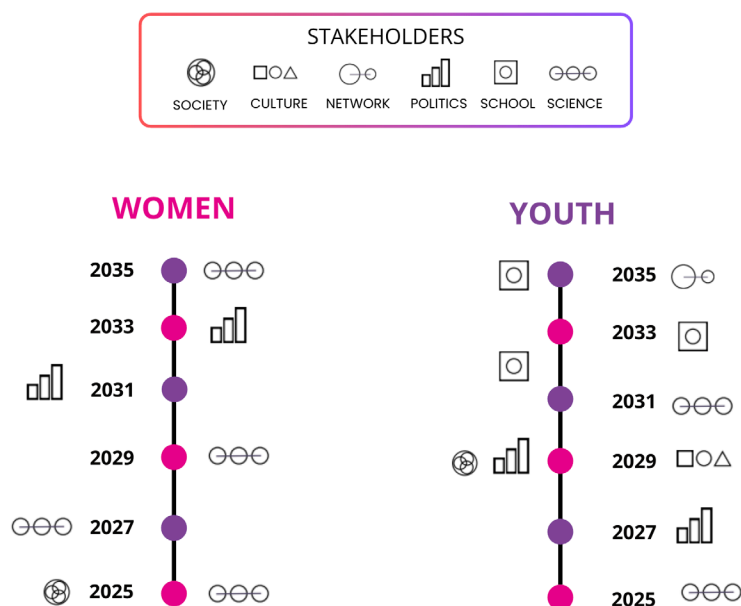
Figure 12 COSIGHT Lab backcasting

⊕ **Learning point:** Backcasting was helpful because it showed where the intersection between the different stakeholders lies in terms of a desirable state in the future - despite all the differences in perception of what is currently happening, what is perceived as sufficiently addressed or not sufficiently solved in terms of integration. The different steps are lined up on the timeline and mark a kind of strategy towards the desired outcome.

What evidence was relevant while working with the Backcasting exercise?

The COSIGHT Lab built on three strands of evidence: first of all, locally produced studies and local statistics on integration in Hamburg, interviews conducted with FutuResilience and local experts and in-depth interviews with Hamburg citizens, providing valuable insights into their perspectives on integration and the resilience factors identified by the expert group. Examples and experiences discussed in workshops added to the analysis. For instance, real cases for integration were introduced and served as additional evidence for future potential, including a living testimonial invited to participate in the lab activities.

> " *Surprisingly, prior to lab work, there was no network connecting the various stakeholders (from academia, NGOs and government authorities) working in the field of labour market integration for low-skilled refugee women and young people with a migrant background. Thanks to the lab initiative and workshops, the idea and intention for impact partnerships roundtable was born and is now a running process. (Marina Beermann, Cociety)*

Reflection questions

Policymakers

- How can we maintain the spirit of working backwards from a vision or goal and from the present towards a vision or goal?
- Which existing policies or institutional structures might hinder progress toward our desired future, and how could they be reformed?
- What mechanisms will allow us to monitor progress and adapt policies as we move toward the envisioned future?

Private sector

- What unique capabilities, data, networks or resources can we contribute to co-creating the steps needed to reach that future?
- Which current business practices, incentives or assumptions must we re-think to support the envisioned long-term outcome?

Civil society

- What structural barriers must be addressed to make the envisioned future possible?
- Which actions should we advocate for in the early stages of the backcasting pathway?
- How can we hand over to external (different) networks when the original labs capacities are too limited for the long-term task?
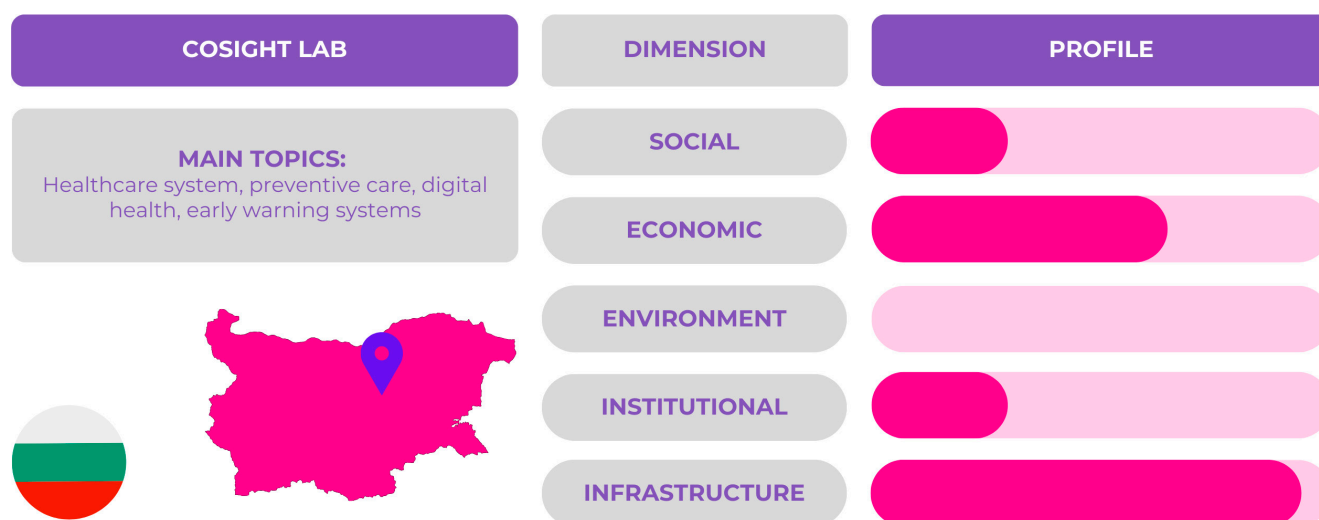
4.9 B7: Agent-based modelling

What is the relevance of agent-based modelling in future-oriented policies?

Agent-based modelling (ABM) offers a bottom-up simulation framework that reflects diverse behaviours and helps policymakers test interventions before implementation. For policymakers, the key implication is that ABM can bridge complexity and practice: it translates dynamic and decentralised real-world interactions into actionable insights. It enables the design of adaptive and equitable policies that respond to local vulnerabilities while anticipating long-term impacts.

The case of BAPEMED Lab

COSIGHT LAB	DIMENSION	PROFILE
MAIN TOPICS: Healthcare system, preventive care, digital health, early warning systems	SOCIAL	
	ECONOMIC	
	ENVIRONMENT	
	INSTITUTIONAL	
	INFRASTRUCTURE	

An ABM was co-developed in the BAPEMED Lab to explore scenarios to identify effective solutions by analysing demographic trends, the burden of chronic diseases and the role of technology. The research intended to strengthen Bulgaria's ability to respond to future health crises, improve health outcomes for citizens and potentially set a benchmark for other nations facing similar challenges in transitioning to personalised and technology-driven healthcare systems.

Relevant tools

A computational ABM model (based on the NetLogo system as a development environment and observer interface) provided a simulation that can be used for experimental, trial and error, and getting feedback, allowing to develop policy recommendations.
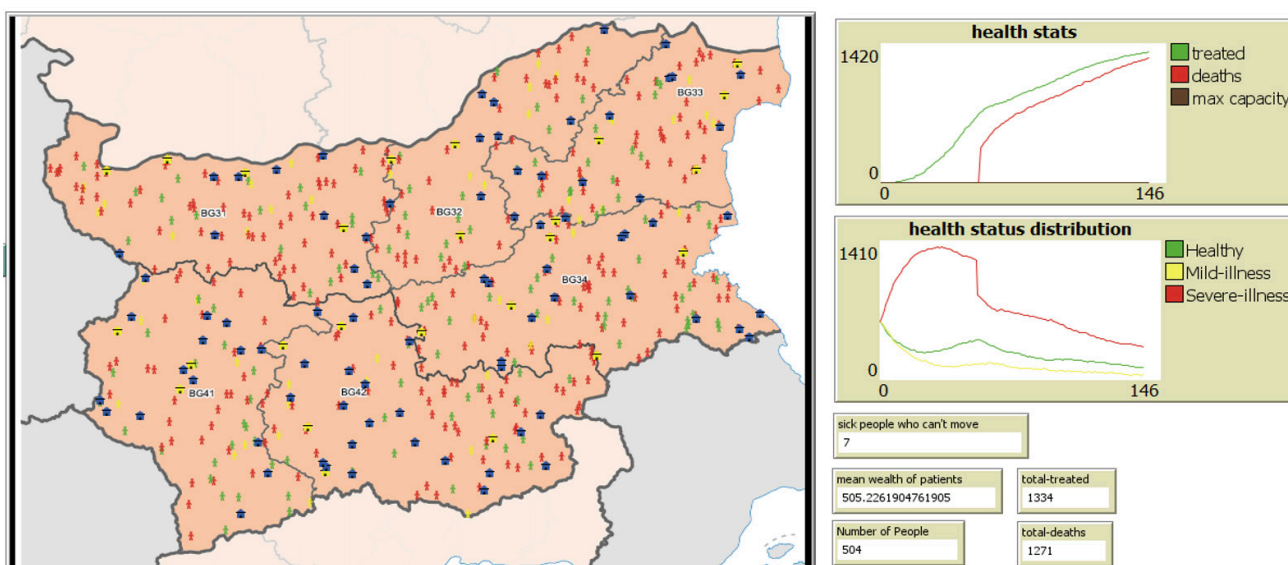
Figure 13 BAPEMED Modelling interface on NetLogo

The model applied in BAPEMED Lab revealed how socioeconomic inequality and hospital capacity interact, leading to unequal healthcare outcomes. It also evidenced that wealth and insurance status heavily determined treatment access and survival outcomes. Finally, it highlighted that public hospitals often became overloaded, while private institutions remained underutilised due to access barriers. As result, the simulation allowed testing of policy interventions like insurance expansion or subsidy schemes, providing insights into mitigating systemic inefficiencies and reducing mortality and healthcare inaccessibility.

What evidence contributed to the model development?

The simulation model was designed to represent and explore the dynamics of healthcare accessibility and outcomes within the geographic and socio-economic context of Bulgaria. The participatory co-development of models ensured that diverse knowledge inputs — from citizens, professionals and policymakers — are embedded into scenario design. This not only increases the legitimacy of the models but also strengthens trust and dialogue among stakeholders.

The model developed integrates key elements of health system functioning—including public and private hospital infrastructure, patient demographics, financial disparities and insurance coverage— to evaluate how these factors interact to shape individual and systemic health outcomes. The data sources included: OECD database, Institute for Health Metrics and Evaluation database, Bulgaria's National Health Information System, outputs from foresight workshops and stakeholder feedback.

⊕ **Challenges:** It is difficult to validate ABM results against real-world outcomes, especially when detailed data (e.g. on health systems or waste behaviours) is incomplete or unavailable. Additionally, small changes in how agents are modelled (e.g. behaviour, risk perception, priorities) can produce very different results, requiring careful scenario design and transparency about uncertainties à Scenario Development could contribute to address this gap.

❝❝ *The scenario work and agent-based modelling was highly valuable in illustrating the long-term risks of Bulgaria's reactive healthcare model and the urgent need to strengthen early-detection systems, health information infrastructure and workforce capacity. These insights fully align with our mission and confirm that investing in robust health data systems and preventive care pathways are essential for resilience and critical for improving outcomes and reducing long-term healthcare costs in Bulgaria. (Silviya Kostova, NM Genomix JSC)*

Reflection questions

Policymakers

- ☑ What policy levers or interventions should be included in the model to explore their potential impact?
- ☑ How can we ensure that assumptions built into the model reflect diverse social realities?
- ☑ What forms of transparency or participatory validation are needed to ensure that the model serves the public interest?

Private sector

- ☑ How might participating in model design help us identify collective risks, shared value opportunities, or system bottlenecks?

Civil society

- ☑ How comfortable are we with the simplifications required in modelling? How can we contribute to complement with more citizen-based inputs?
- ☑ In what ways might the model challenge our own narratives or expectations about social dynamics?

4.10 B8: Simulations

How could simulations contribute to policymaking?

A simulation at its most abstract form is a narrative: a carefully constructed story that is an abstraction of the social world (Mar and Oatley, 2007). Simulations can be a form of experiment— a way to carefully construct a policy scenario and try it out with different stakeholders in a safe environment. Immersive simulations can serve as highly effective platforms for policy experimentation, offering a level of flexibility and realism that strengthens participants' engagement with complex issues.

A simulation, if perceived as a narrative, accommodates the consideration of several policy solutions, in isolation or in mixes. It also gives space to stakeholders to experiment with policy solutions not in the abstract, but in a realistic situation, appealing to reason as well as emotions. This way, a group can narrow down these policy solutions that work best based on the assumptions of the simulation.

The FutuResilience Simulation Exercise

The *FutuResilience Simulation Exercise* constituted an observational simulation study to examine how decision-makers engage with evidence-based policy tools before and after extraordinary events. It consisted of a video shown to participants, followed by an immersive simulation at the RCR Lab at Mid Sweden University. The purpose of the exercise was to immerse the participants in the role of decision-makers in a fictitious town ('Veilburgh'), providing emotional and intellectual stimuli to enhance a discussion about how best to design a policy aimed at societal resilience. Participants were divided in groups that differed only to the degree of specificity of the range of the policy solutions which they considered in their deliberations.

The simulation was organised to foster strategic, consensus-driven thinking, encouraging participants to transition from identifying resilience challenges to proposing actionable, stakeholder-oriented policy solutions. Participants consistently prioritised long-term considerations over immediate responses, which ran counter to what is typically observed in crisis settings. They tended to favour comprehensive, wide-ranging solutions rather than incremental steps. Moreover, decision-making was strongly shaped by emotions and underlying values, with research serving mainly as a supportive rather than a driving force.

Relevant tool

The RCR Simulation Lab is an immersive simulation environment, which may be used to simulate different scenarios through the projection of film, still photography and virtual environments in 360 degrees. In addition to 360-degree projection, the 8X8 simulation room features three-dimensional surround sound, a vibrating floor, scent and smoke machines, a range of temperature settings from 17-27 degrees Celsius, infrared heating and professional stage lighting.

The immersion successfully created a highly realistic and engaging environment, supported by detailed elements such as rain ponchos (as simulated crisis was a severe storm-weather event), radio chatter and strong actor performances. It conveyed a clear sense of urgency while encouraging participants to think beyond immediate crisis response and consider longer-term implications—an approach that is uncommon in traditional crisis simulations. Importantly, it also illuminated the interconnected nature of the issues at hand without directing participants towards any predetermined conclusions.

Figure 14 Simulation of flooding in Southbank, neighbourhood of fictional Veilburgh city

What evidence could support building simulation exercises?

A successful simulation must be carefully constructed to be realistic and believable. The backstory and scenario must be anchored in real environments. This fictional setting was chosen to provide a neutral and relatable context for all participants, who came from diverse national and regional backgrounds.

For the policy solutions, the research team extracted case-relevant policy instruments from the FutuResilience Knowledge Base. These were assessed by the task group according to the goal of the validation and applicability to the simulation case and covering three standard types of policy interventions (regulation, information, expenses). However, during the exercise, some participants had the possibility to bring to the table their own expert-knowledge to co-define policy solutions. As result, different strategies were applied, with notably experiencing policy cards as complex but relevant supporting documents for policy design.

> *I think the simulation […] was actually really cool. I mean, we've I've never done anything like that before. And [I am] someone that works in scenario planning. One of the things that we always strive, to emphasise, when we're training people and organisations on how to work in this way, introducing different tools, frameworks, and so on is […] to make it as vivid as possible. (Patrick Gallen, Copenhagen Institute for Future Studies)*

Reflection questions

Policymakers

- What assumptions about public institutions or systems need to be embedded and questioned within the simulation?
- [In interaction with facilitators] How are you choosing the policy solutions to incorporate in the simulation?

Private sector

- How might our participation influence the scenarios being simulated? How do we ensure this influence benefits the broader system, not just our interests?

Civil society

- What aspects of our community lived experience need to be authentically represented in an immersive simulation, and why?
- In what ways might the immersive experience challenge our own narratives about social issues or future possibilities?
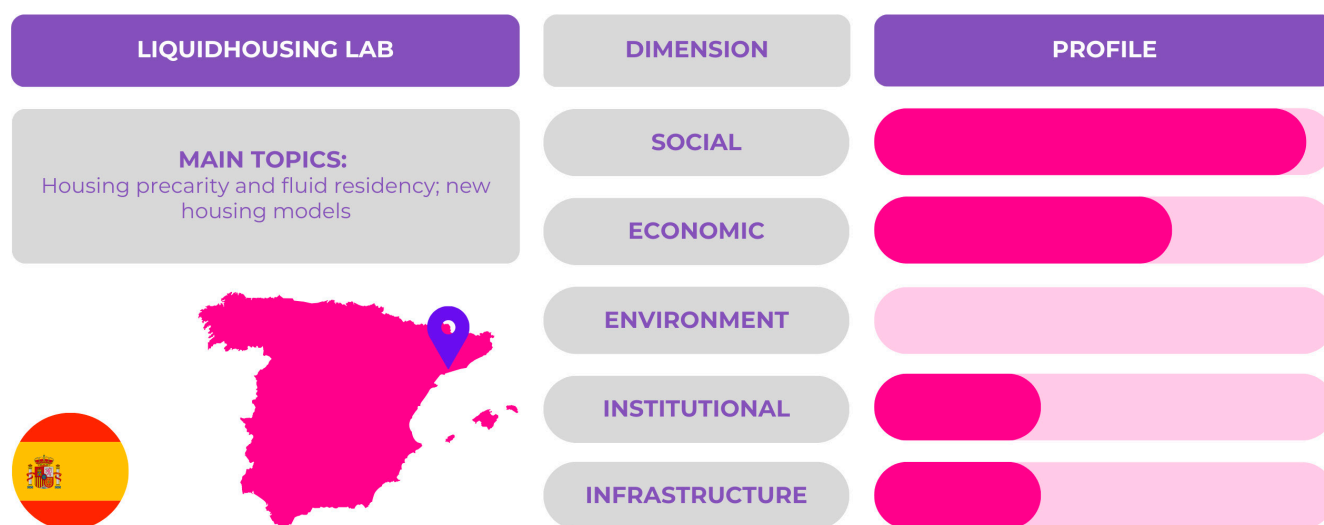
4.11 C: Policy design

What does policy design for resilience mean?

Policy design, with its focus on consequential, evidence-based policy making, constitutes a mechanism through which governments may systematically strengthen societal resilience (Capano & Woo, 2017). Effective policy design integrates adaptive capacity—the ability of systems and institutions to adjust to changing conditions and moderate potential damage—as a central organising principle. This integration operates through multiple pathways: deliberate institutional arrangements that enable flexibility and responsiveness, the embedding of redundancy and diversity within governance structures and the cultivation of multi-level governance frameworks that facilitate coordination across local, national and regional scales (Broadhurst, 2022; United Nations Development Program, 2025).

Crucially, resilience-enhancing policy design demands stakeholder participation in decision-making processes, as inclusive engagement fosters positive policy perceptions and generates collectively constructed understanding of both risks and policy alternatives (Folke, 2006).

Beyond reactive shock management, strategic policy design cultivates the underlying conditions necessary for societal adaptation and transformation (Capano & Woo, 2017). The distinction between simple restoration and transformative adaptation becomes particularly salient where policies incorporate foresight methods and innovation capacities that help policymakers anticipate plausible futures and design future-proofed strategies (Ruhl, 2011; Howlett et al., 2018). Robust policy design—in which policies maintain intended functions even under adverse circumstances—requires attention to both policy content and implementation processes, including adequate resource allocation, organisational capacity for rapid implementation and access to expert knowledge (Capano & Woo, 2017).

The case of LIQUIDHOUSING Lab

LIQUIDHOUSING LAB	DIMENSION	PROFILE
MAIN TOPICS: Housing precarity and fluid residency; new housing models	SOCIAL	
	ECONOMIC	
	ENVIRONMENT	
	INSTITUTIONAL	
	INFRASTRUCTURE	

The LIQUIDHOUSING Lab addresses as a core policy problem the growing complexity of the cities 'liquid housing' phenomenon, where the boundary between secure housing and provisional shelter has become increasingly unclear. The erosion of effective public housing policies has pushed authorities towards offering progressively weaker forms of tenure, leaving many residents without stability or adequate living conditions. The lab policy design was based on scenario development and the lab produced over 20 policy recommendations by applying wind-tunnelling as an analytic tool.

Relevant tools

Wind-tunnelling is a foresight and policy evaluation method used to test how well policies perform under different future scenarios (van der Heijden, 1997). Just like airplane wings are tested to function in a wide range of different wind conditions, policies need to be resilient vis a vis different possible context developments. The wind-tunnelling exercise helps to ensure this but also allows decision makers to identify the critical assumptions behind their policy decisions so they can define indicators that need to be observed as a basis for adapting strategies should important framework conditions change.
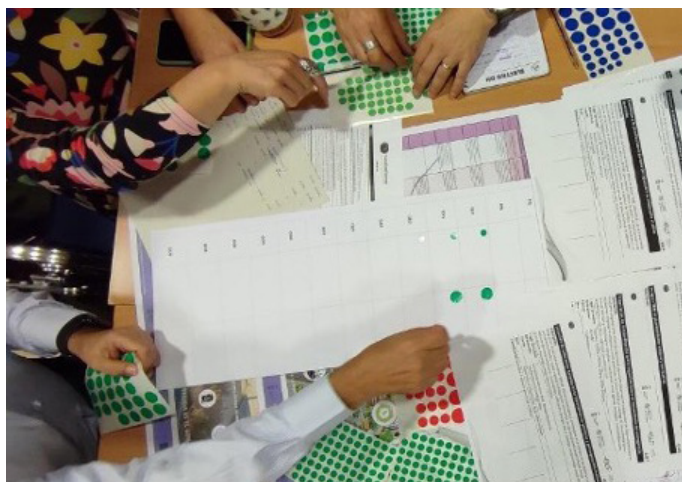
LEGEND:	🟢 CORE STRATEGY	🔵 SUPPORT STRATEGY	🔴 COUNTER-PRODUCTIVE STRATEGY	
Stategic option	**Scenario A**	**Scenario B**	**Scenario C**	**Scenario D**
Policy card 1	🟢	🟢	🔵	🟢
Policy card 2	🟢	🟢	🔵	🟢
Policy card 3	🔵	🔴	🔵	🔵
Policy card 4	🟢	🟢	🔵	🟢
Policy card 5	🟢	🟢	🔵	🔵
Policy card 6	🟢	🔵	🔵	🔵
Policy card …	🔵	🔴	🔵	🔵
Policy card 19	🟢	🟢	🟢	🟢
Policy card 20	🔵	🟢	🟢	🟢

Figure 16 Implementation of wind-tunnelling for policy stress-testing

During the policy workshop, participants perceived policies differently across scenarios, placing them into three categories: structural, supportive, or counterproductive. Some policies are consistently identified as structural across all scenarios, while others are structural only under more adverse conditions, making them essential for resilience. Several policies repeatedly play supportive roles, while a few shows divergent assessments, reflecting how scenario evolution influences their perceived relevance and impact.

⊕ **Learning point:** participants proposed additional measures beyond the presented cards, which emphasises the need for flexibility on the sources of ideas à Valorisation practices should go beyond scientific evidence to integrate community insights, examples such as crowdmapping (see A1: Policy Framing) could contribute to develop ideas from early stages.

What evidence was used for preparing the scenarios?

Policies were sourced from the FutuResilience Knowledge Base, other European initiatives (FEANTSA, Housing Associations, Pilot project "Promoting protection of the right to housing") and Spanish regional practices (España 2050; Housing Law of the Basque Country; etc.).

> ❝❝ *Policymakers showed openness to diverse forms of evidence beyond traditional scientific research, such as direct testimonies from individuals experiencing precarious housing and the application of scenario-building exercises in workshops. This plurality of evidence significantly enhanced both the credibility and the practical relevance of the proposed policy recommendations. (Héctor Simón-Moreno, University Rovira i Virgili)*

Reflection questions

Policymakers

- How can you operationalise the distinction between policy robustness (maintaining function under stress) and policy adaptation (transforming in response to shocks) within your specific governance context?

- What mechanisms exist—or must be created—within your institutional arrangements to ensure that stakeholder participation in policy design generates authentic collective learning rather than symbolic consultation?

- To what extent does your current policy implementation infrastructure possess the organisational capacity, resources and access to expert knowledge necessary to deliver resilience-enhancing policies at local, regional and national scales simultaneously?

Private sector

- How might the policy affect our sector under different future conditions, and where can we help identify blind spots?

Civil society

- What unintended consequences or distributional impacts might emerge across different futures? How is this reflected across diverse societal groups?

- How can the civil society remain involved throughout the policy iteration process, not just in the consultation stages? How can we embed solutions for inclusion and active participation in the policy design itself? [Also for policymakers, linked to Stakeholder Engagement]

5. Policy recommendations

In terms of Knowledge Valorisation for policy uptake, the FutuResilience project team highlight the following core recommendations:

⊕ **Promote knowledge valorisation** in diverse sectors, topics and areas where strong investment was made. This should be supported by cross-sector learning through open-access repositories, thematic knowledge platforms and curated evidence summaries that highlight what works, for whom and under what conditions.

⊕ Build **capacities for knowledge translation** among policymakers and practitioners, for instance through the role of policy scientists and implementation science. This could enable the 'translation' of policy solutions in text forms that are relevant to and accessible by policymakers.

⊕ Foster participatory **research-to-policy models** that integrate lived experiences, non-expert insights and community-based evidence into formal knowledge streams. This promotes 'transdisciplinary knowledge generation', enabling acceptance of and trust in diversity and structured integration of non-expert knowledge.

⊕ Design **'Valorisation Sandboxes'** as experimentation spaces to test novel approaches, through structured, time-bound environments where policymakers, researchers, innovators and citizens jointly test policy actions, regulatory flexibilities and new governance models before broader implementation.

⊕ Reinforce the role of **intermediary organisations** to support valorisation, with pre-defined skills and competences as well as capacity to mobilise diverse stakeholders in the process of co-creating challenge-driven solutions.

Building on the work done by the FutuResilience labs in building strategies for societal resilience, we propose several **cross-cutting policy recommendations to foster societal resilience**:

⊕ Promote **anticipatory governance** by strengthening coordination across sectors and levels of policy, fostering collaboration within the science–policy–society triangle and reducing siloed approaches to decision-making. For instance, deliberative multi-stakeholder assemblies could support the institutionalisation of participatory processes. In addition, the assignment of specific roles in resilience-building efforts within existing governmental institutions could enhance multilevel liaison.

⊕ Introduce **scenario-based stress testing** to examine how policies perform under a range of future conditions and to enhance the transformative capacity and robustness of institutions. For instance, stress testing of policy adaptations that could take place when some variable changes (e.g. accelerated unemployment or an increased number of cyber threats) could be embedded as core part of policy design.

⊕ **Prioritise actions based on impact and feasibility** to direct resources where they are most needed, while keeping adaptation strategies flexible and regularly updated in response to changing circumstances. For instance, a living 'navigation' chart or tool (e.g. dynamic dashboards) could facilitate the updating of priorities as new data or emerging risks appear and allow for faster exploration of policy alternatives.

⊕ Develop **capacity-building processes** that equip institutions and all levels of governance with the competencies needed to recognise emerging risks, interpret complex system dynamics and act proactively. For example, mandatory periodic training on resilience and multi-hazard preparedness and mitigation or peer-learning processes across governance levels, could improve the understanding and encourage 'lateral' thinking on core policy issues, while facilitating the exchange of good practices. Partnering with universities or research institutions specialising in resilience could further strengthen capacity-building processes.

⊕ Identify and **mobilise community capacities** to support society's ability to manage challenge-based and systemic disruptions, engaging diverse actors in exploring alternative futures rather than concentrating solely on immediate crisis response. For instance, collective community mapping or promoting community 'future resilience' exercises as core part of planning could serve as a dual strategy for raising awareness and fostering whole-of-society approaches in policy design.

⊕ **Invest in education** and lifelong learning to embed resilience, critical thinking and digital literacy across society, thereby strengthening long-term adaptive capacity and social preparedness. For example, introducing modules on resilience or territorial risk management in school curricula could improve literacy across the population in the long run. Moreover, partnering with grassroots organisations in training programmes could widen the educational reach and engage other sectors of society.

⊕ Shift from isolated **pilot projects to scalable interventions** by supporting participatory, integrated approaches backed by continuous local budgets and EU funding streams, ensuring initiatives can be sustained over time. For instance, promoting expert support to help local initiatives become scalable (e.g. tailoring and replicating to other regions or rescaling to higher governmental levels) or enabling participatory budgets with cross-sectoral or multilevel partnerships as an implementing requirement.

⊕ **Align economic incentives with resilience goals** by adjusting regulatory frameworks and investment criteria to encourage socially, environmentally and economically sustainable practices. This should go hand-in-hand with prioritising high-impact and feasible solutions that align with core societal needs. For example, incentives could be provided to private sector when they include resilience design in their core activities (e.g. lower carbon emission, promoting inclusive market solutions, etc.). This could include public recognition of work (e.g. resilience champions) or tax reduction. Offering micro-grants for community entrepreneurship when market objectives contribute to strengthening societal resilience could also enhance private sector engagement in resilience-building efforts.

Resilience dimensions in policy design

Across the policy roadmap, the different examples were categorised in terms of main resilience theme and evaluated across five dimensions (See BOX 2: "Profiling resilience strategies"). The graph below illustrates how the five resilience dimensions (social, environmental, institutional, economic and infrastructure) are represented across the FutuResilience labs during the definition of needs and the process towards policy design.[2]

The following recommendations are examples of the policy design from the labs supporting resilience under the different domains – with a degree of replicability to other contexts – and should serve to enhance societal resilience against multiple, interconnected and overlapping challenges. The list should not be considered exhaustive, but examples of solutions. Further solutions could be navigated in the FutuResilience Knowledge Base.

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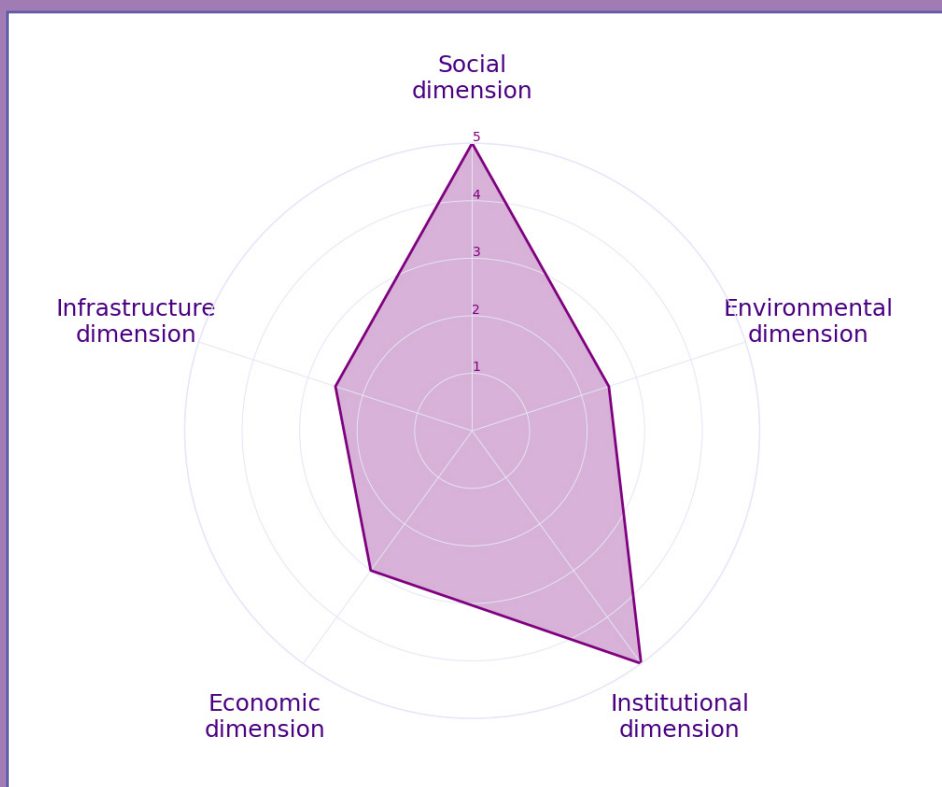
2   The methodology for the analysis: each lab was assigned one or more labels based on its topics and activities; these labels were then grouped into the five dimensions. The frequency with which each dimension appears across the labs was assessed and translated into a score from 1 to 5 (where 1 indicates that the dimension is present in only one of the two labs, and 5 indicates that it appears in all labs).

Social dimension

⊕ Strengthen education and skills while promoting social integration and cohesion by expanding life-long-learning programmes, digital-literacy curricula and community-based mentoring that bring together diverse groups.

⊕ Improve the role of media actors in disseminating quality information through training on crisis reporting, partnerships with authorities for verified alerts and strengthened public-service and community media.

⊕ Develop accessible tools to inform and alert the population using multilingual, inclusive early-warning systems, local alert networks and unified platforms that share real-time guidance.

Economic dimension

⊕ Promote targeted actions for different societal groups by supporting apprenticeships, entrepreneurship schemes and inclusive hiring incentives tailored to women, youth and multicultural communities.

⊕ Reskill and upskill the labour force through rapid-response training, short-cycle certifications with industry partners and flexible learning models reaching remote or underserved areas.

⊕ Support diversified and distributed fiscal policies by enabling adaptive social protection, inclusive tax incentives for small and micro businesses and targeted subsidies for essential services.

Environmental dimension

⊕ Promote investment strategies for adaptation interventions by incentivising nature-based solutions and locally driven adaptation plans with long-term viability.

⊕ Enhance predictive systems for extreme weather events through high-resolution modelling, community monitoring networks and cross-border data sharing to strengthen emergency preparedness.

⊕ Enhance ecosystem restoration and risk-mitigation planning by restoring degraded landscapes, protecting biodiversity corridors and integrating ecosystem services into local and regional resilience strategies.

Institutional dimension

⊕ Establish clear communication channels and decision-making protocols by defining unified crisis-response structures, transparent information dashboards and mechanisms for institutional learning.

⊕ Promote cross-border collaboration for crisis management by creating interoperable platforms, running joint simulations and aligning regulatory approaches where feasible.

⊕ Facilitate the participation of third sector and social-economy entities by formalising their roles in preparedness plans, funding community-driven solutions and involving them in co-designing policies.

Infrastructure dimension

⊕ Modernise core data infrastructure with unified standards by creating interoperable registries, adopting strong privacy-by-design frameworks and enabling open yet secure data environments.

⊕ Implement interoperability with quality-control mechanisms by certifying critical data systems, auditing data and cybersecurity performance and supporting integration between legacy and new technologies.

⊕ Support flexible public-service provision through mobile and digital service units, adaptive scheduling and one-stop access points that reflect people's real needs and mobility patterns.

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6. 1 Further resources

⊕ FutuResilience Toolbox: **https://futuresilience.eu/toolbox**

⊕ Using the Future. Contributions to the Field of Foresight: **https://www.cifs.dk/read-listen/reports-knowledge/using-the-future**

⊕ Access to the FutuResilience Knowledge Base: **https://futuresilience.eu/knowledge-base**

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