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## TWIN TRANSITION AND CHANGING PATTERNS OF SPATIAL MOBILITY: A REGIONAL APPROACH

### MOBI-TWIN D3.2 SCENARIOS FOR ASSESSING THE EFFECTS OF SPATIAL MOBILITY ON EU REGIONS DURING THE TWIN TRANSITION

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<b>Task</b>	Task 3.2: Scenario development for assessing the effects of changing spatial mobility patterns on EU regions
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<b>Abstract</b>	<p>A report outlining specific scenarios that illustrate how various regional typologies - defined by the Regional Attractiveness Index developed in T2.3 - may be impacted by spatial mobility. The analysis examines potential impacts on demographic trends, social structure, welfare system, and labour market, considering the level of digital and green transition. The report provides a detailed presentation of four different scenario types, focusing on their core dimensions (spatial mobility and twin transition) and assessing their probability to happen.</p>
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## EXECUTIVE SUMMARY

This report outlines a methodological approach to the **scenario building** as well as analysis of how different EU regional typologies, defined by the Regional Attractiveness Index (T2.3), may be impacted by changing spatial mobility patterns during the Twin Transition (digital and green). It focuses on demographic, social, welfare, and labour market impacts while considering regional differences in digitalisation and transition capacity. **The main objective** was to develop four scenarios to assess the effects of changing spatial mobility patterns on EU regions, based on the various forms of spatial mobility and the level of the regional digital transition as defined in the literature. These scenarios were designed to support strategic planning and policy development by highlighting emerging opportunities, risks, and transformation trajectories across the EU regions. The scenarios were applied to five pilot regions: *Central Macedonia, Groningen, Castilla-La Mancha, North & East Finland, and Lombardy*.

**The scenario typology was based on different developmental pathways**, each representing distinct regional trajectories under the Twin Transition: **Leapfrog** – rapid progress overcoming barriers; **Dark Horse** – unexpected regional success; **Snail's Pace** – slow, gradual change and **Lion's Den** – challenging, high-risk conditions. Each scenario considers the interplay of spatial mobility (e.g. commuting, migration) with regional capabilities for digitalisation and environmental transition. The analysis also incorporates EU-level risk mitigation policies and potential restrictions on freedom of movement.

### Key findings:

- Spatial mobility influences how regions experience and respond to the twin transition.
- Policy intervention is essential to support vulnerable or "left behind" regions, particularly those with low digital infrastructure or declining populations.
- Scenarios serve as strategic foresight tools, enabling regions and policymakers to anticipate challenges, harness hidden potential, and design inclusive transition pathways.

**The scenarios are to be used as inputs to the MOBI-TWIN model** ([D3.1](#) - Methodological report describing the MOBI-TWIN model) to estimate the effects of spatial mobility on EU regions - including left-behind, metropolitan, and rural areas – **as well as contribution to [D3.3](#)** - The effects of spatial mobility during Twin Transition on selected left-behind and demographically declining areas in terms of demographics, society, welfare system and labour market, and [D3.4](#) - The effects of spatial mobility during twin transition on regional inequality and sustainability in the identified EU regional typologies.

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## LIST OF TERMS AND ABBREVIATIONS

Delphi Survey	A structured method for collecting expert opinions through questionnaires to evaluate the probability and impact of various developments
eDelphi	An online platform used to conduct Delphi surveys for expert validation and consensus-building
EU	European Union
RAI	Regional Attractiveness Index - an index developed to classify EU regions based on their attractiveness, considering environmental quality, digital connectivity, job accessibility, and other factors
RRI	Responsible Research and Innovation
SME	Small and medium-sized enterprises
Spatial Mobility	The movement of people across regions, influenced by various economic, social, and environmental factors
Twin Transition	The combined process of green (environmental) and digital transformations reshaping economic, social, and demographic landscapes

## 1 INTRODUCTION

The Twin-Transition - encompassing both green and digital transformations - is fundamentally reshaping the economic, social, and demographic landscapes of European regions. MOBI-TWIN highlights that these global processes require continuous redefinition of regional attractiveness, as shifts in environmental quality, digital connectivity, and job accessibility influence human mobility patterns.

Understanding these dynamics is essential for anticipating how different European Union regions will navigate the twin transition and for designing effective, place-based policies that promote resilience and inclusivity. To this end, Task 3.2 focused on developing and accessing four future scenarios that explore how changing spatial mobility patterns and levels of regional digitalisation, and the green transition might impact demographic, social, welfare, and labour market structures across regional typologies defined by the Regional Attractiveness Index (T2.3).

The scenarios - **Leapfrog, Dark Horse, Snail's Pace, and Lion's Den** - reflect diverse development pathways, from rapid progress overcoming barriers to challenging environments marked by high risks. EU policies affecting freedom of movement, as they have been identified in T4.2, are integrated into the scenario narratives to capture regulatory influences on mobility flows.

The methodology includes an extensive literature review to define key concepts, collaborative co-creation sessions with MOBI-TWIN partners to develop scenario narratives, and an online Delphi survey engaging stakeholders across pilot regions and broader European networks to evaluate the probability and impact of each scenario. Following the survey, the findings were further validated through regional workshops, ensuring their contextual relevance (September - October 2025).

This deliverable presents the outcomes of these activities, providing a robust **framework for understanding potential futures of EU regions under the twin transition**. The scenarios developed here will inform subsequent modelling efforts within MOBI-TWIN, supporting policymakers and stakeholders in navigating uncertainty and fostering balanced regional development.

### 1.1 DOCUMENT STRUCTURE

This deliverable (D3.2) presents the **scenario-based analysis developed in Task 3.2: Scenario development for assessing the effects of changing spatial mobility patterns on EU regions**. **The task contributes to Specific Objective SO3.2: Scenario building for assessing the effects of changing spatial mobility patterns on EU regions through workshops in selected EU regions** - of the MOBI-TWIN project and builds upon earlier work, particularly the findings from Task 1.3 related to the development of the complete MOBI-TWIN dataset, the Regional Attractiveness Index developed in Task 2.3, and the analysis of EU policies

and risk mitigation measures affecting freedom of movement between regions as they have been identified in T4.2.

The report is divided into six sections:

- Section 1: Outlines the purpose of the report, its relation to other MOBI-TWIN outputs, and presents the scope and structure.
- Section 2: Describes the methodology based on the scenario co-creation process through consortium-level participatory workshops, the expert validation phase using the eDelphi platform, and additional stakeholder feedback.
- Section 3: Introduces the four scenario types (Leapfrog, Dark Horse, Snail's Pace, Lion's Den), along with the main structural dimensions considered.
- Section 4: Presents detailed narrative descriptions and expert probability assessments for each of the four scenarios (Leapfrog, Dark Horse, Snail's Pace, Lion's Den) across the five pilot regions: North & East Finland (Finland), Central Macedonia (Greece), Lombardy (Italy), Groningen (the Netherlands), and Castilla-La Mancha (Spain). It synthesizes key insights, highlights regional dynamics in spatial mobility and transition capacity, and outlines links to upcoming project tasks.
- Section 5: Explores how key Responsible Research and Innovation (RRI) pillars have been addressed throughout the scenario development process. This section highlights how RRI principles were embedded in the design, implementation, and validation of scenarios.
- Section 6: Summarizes the dominant scenario trends and associated risks across regions. It identifies priority areas for further research - policy resilience, demographic shifts, infrastructure, scenario monitoring, and cross-regional learning - and connects these to the next project phases and policy development.
- Section Annexes: Includes the concept note and agendas for co-creation workshops, overall concept and accompanying guidelines for the MOBI-TWIN scenarios, an example of the Delphi questionnaire for one of the pilot regions (North & East Finland), materials used in broader validation workshops and summaries of these workshops as well as aggregated Delphi estimates by pilot region and key population groups - including demographics, education, and labour market outcomes by skill level and employment type - as influenced by each scenario.

## **2** **METHODOLOGY**

The task developed **four scenarios to assess how changing spatial mobility patterns affect EU regions during the twin transition**, using literature data on the various forms of spatial mobility and the level of the regional digital transition. The scenarios represent **different regional development paths**:

- Leapfrog, illustrating improvement of the current situation with fast movements overcoming obstacles;
- Dark Horse, implying a victory of a region that no one expected;
- Snail's Pace, referring to conditions that are evolving very slowly;
- Lion's Den, indicating the existence of dangerous or threatening circumstances.

The four scenario labels used in the MOBI-TWIN project - **Leapfrog, Dark Horse, Snail's Pace, and Lion's Den** - are original to the project but conceptually aligned with established scenario typologies commonly used in strategic foresight, such as *transformation, disruption, stagnation, and crisis*. This typology aligns with the archetypal scenario framework outlined by the United Nations Development Programme (UNDP 2022), which distinguishes between trajectories of continuation, collapse, equilibrium, and transformation as recurring patterns in long-term development pathways.

These labels were deliberately selected to represent distinct regional development trajectories in response to evolving patterns of spatial mobility, levels of digitalisation, and progress toward the green transition.

By using metaphorical labels, the project makes complex scenario dynamics more accessible to stakeholders, while preserving conceptual rigour through alignment with well-established foresight archetypes. Furthermore, by linking each scenario to the specific characteristics of regional typologies - as defined by the **Regional Attractiveness Index** - the MOBI-TWIN project ensures both scientific transparency and contextual relevance in its foresight process.

The methodology was structured around **three core elements**:

- Defining the conceptual scope of spatial mobility and regional digital transition based on literature review and project inputs;
- Co-creation of scenario narratives through structured engagement with MOBI-TWIN partners;
- Delphi survey to evaluate the probability and impact of each scenario on different types of EU regions, followed by a series of broader stakeholder workshops in the pilot regions.

The **scenario development followed a structured foresight methodology inspired by established future studies practices**. Scenarios were not treated as forecasts, but as plausible, internally consistent narratives constructed to **explore how regional typologies might evolve under uncertain future conditions**. The process included defining a clear time horizon (**2030**), identifying a core strategic question, and conducting a trend and uncertainty analysis to determine the most critical forces shaping spatial mobility and regional development. Key drivers such as technological advancement, EU policy evolution, and demographic shifts were assessed for their relevance and uncertainty. The most impactful and uncertain factors were used to structure the scenario matrix, guiding the development of four distinct narratives. This approach ensured methodological consistency, strategic relevance, and supported the project's aim of scenario learning to inform future modelling and policy design. A **detailed description of the scenario development process**, including all core steps, is provided in **Annex 2**.

A comprehensive description of the methodology used to develop these scenarios is provided below.

## 2.1 CONCEPTUAL FRAMEWORK DEVELOPMENT

In the initial stage, key concepts of spatial mobility and regional digital transition were defined through an extensive literature review and analysis of project inputs. The aim was to identify and clarify the various forms and dynamics of spatial mobility, as well as the differing levels and trajectories of digital transition across EU regions.

The review focused on identifying the **main drivers, trends, and typologies of spatial mobility** - including internal migration, cross-border commuting, remote work, digital nomadism, and other emerging forms of regional movement. In parallel, the analysis of digital transition examined differences in technological infrastructure, digital skills, innovation capacity, and policy readiness among regions, drawing on existing studies and MOBI-TWIN outputs ([D1.1](#), [D1.2](#), [D2.1](#), [D4.3](#)). This approach aligns with recent insights on regional attractiveness and competitiveness in a shifting global environment, as highlighted by the OECD (2023).

The phase aimed to establish a shared understanding and clear terminology, ensuring a consistent conceptual framework to guide scenario development. Particular focus was placed on the interaction between digital transition and mobility patterns, setting the foundation for identifying key variables and regional typologies used in later stages.

## 2.2 COLLABORATIVE SCENARIO DEVELOPMENT

Two online **co-creation meetings** (MOBI-TWIN Project, 2025) were held with the MOBI-TWIN consortium to **collaboratively develop the scenario narratives**. To support these sessions, a set of preparatory materials was produced, including a concept note (Annex 1, Annex 2) outlining the scenario framework, detailed workshop agendas, and tailored guiding questions to structure the discussions.

**The first co-creation meeting (24 January 2025)** featured a **guided brainstorming session**, where project partners contributed insights and thematic inputs drawn from ongoing MOBI-TWIN activities. These contributions helped define the overall vision, parameters, and rough narratives for each scenario, considering emerging regional trends and challenges across demographic, socio-economic, geographic, skills, and labour market dimensions (MOBI-TWIN Project, 2025).

**The second co-creation meeting (4 February 2025)** focused on refining and validating the scenario narratives through structured co-creation exercises. Consortium members reviewed the preliminary narratives in breakout groups and proposed adjustments collaboratively. The objective was to reach a shared understanding of the assumptions, key dynamics, and storyline of each scenario, resulting in consolidated versions ready for expert evaluation in the next stage of the project.

## 2.3 SCENARIO VALIDATION THROUGH DELPHI SURVEY

As the next step, the **online Delphi survey** ([via eDelphi.org](https://www.edelphi.org)) was launched to **assess the probability for each scenario to happen**, alongside its impact on EU regions. The process engaged stakeholders from MOBI-TWIN's pilot regions and broader European networks (it

included experts from public and private sector, academic or research institutions, policy makers, community leaders, etc.). The survey design adhered to the RRI principles outlined in Task 4.1, ensuring inclusivity and transparency throughout the process (as described in [D4.1](#)). The survey questionnaire was structured into the following sections: **Demographic Information, Economic Perspectives, and Scenario-Based Open Questions**, resulting in **84 questions per pilot region**.

Below, there is a dashboard (Figure 1) with the panel of Delphi Survey on Spatial Mobility Scenarios in the context of the twin transition in EU regions developed for the five pilot regions.



The screenshot shows the eDelphi.org dashboard. At the top, there are navigation links for 'Suomeksi', 'In English', and 'Delphi.org'. Below the navigation, there are tabs for 'PANEL', 'ADMINISTRATION', and 'CONTACT US'. The main content area is divided into three panels: 'DOCUMENTS', 'QUERIES', and 'BULLETINS'. The 'QUERIES' panel is active and displays a list of survey queries with their creation dates and 'CONTINUE ANSWERING' buttons.

Query Title	Created	Action
Delphi Survey on Spatial Mobility Scenarios - Castilla-La Mancha (Spain)	May 19, 2025	CONTINUE ANSWERING
Delphi Survey on Spatial Mobility Scenarios - Central Macedonia (Greece)	May 19, 2025	CONTINUE ANSWERING
Delphi Survey on Spatial Mobility Scenarios - Groningen (Netherlands)	May 19, 2025	CONTINUE ANSWERING
Delphi Survey on Spatial Mobility Scenarios - Lombardy (Italy)	May 19, 2025	CONTINUE ANSWERING
Delphi Survey on Spatial Mobility Scenarios - North and East Finland (Finland)	May 5, 2025	CONTINUE ANSWERING

**Figure 1. Dashboard with the panel of Delphi Survey on Spatial Mobility Scenarios.**

Stakeholders from the five pilot regions were initially identified with the consortium partners' support. Development of a contact list template for stakeholder identification helped facilitate targeted survey invitations. In total 91 confirmed participants were invited to participate in the survey, from the following countries: 17 from Finland, 19 from Greece, 14 from Italy, 18 from Netherlands, 20 from Spain, 2 from Germany and 1 from Estonia. The supporting materials for the Delphi survey, including short guidelines for using and filling out the Delphi survey (Annex 3), regional typology-based scenarios, and a document on statistics related to regional mobility flows (based on [D1.2](#)) were developed and shared with participants. The survey was conducted in a single round between 28 May – 6 June 2025. An example of the set of questions for the pilot region of North and East Finland, developed and used for the Delphi survey, is presented in Annex 4. Same type of questionnaire was developed for the remaining four pilot regions.

In the end, **60 experts completed the survey**, with responses distributed as follows: **13 from Spain, 12 from Finland, 12 from the Netherlands, 12 from Italy, and 11 from Greece**.

This expert input provides a solid basis for scenario validation and reflects a credible cross-section of views from relevant fields, ensuring a scientifically grounded perspective on the likelihood and impact of each scenario.

**To support further analysis in WP3, aggregated estimates of Delphi responses** - including expected population increases and decreases by pilot region and key population groups - are presented in Annex 5. These results are summarised across the most relevant dimensions (e.g. **demographics, education, labour market**) and **by scenario**. This annex provides a detailed, structured view of the expert input, supporting its integration into modelling exercises.

## 2.4 SCENARIO VALIDATION THROUGH LOCAL STAKEHOLDER WORKSHOPS

To ensure that the scenarios reflect local lived realities, the **results from the Delphi survey were validated through workshops with stakeholders from the pilot regions**. The participants, identified with the support of project partners, included representatives of local and regional administrations, students, community groups, and members of the general public. This approach ensured wide coverage of stakeholder typologies and reflects the project's commitment to inclusiveness within the Responsible Research and Innovation (RRI) framework (as described in [D4.1](#)).

**The five workshops (one per pilot region) took place in September–October 2025 (following the submission of the version 1.0 of this deliverable)** and guided participants through the Delphi results to gather reflections, validation, and additional insights tailored to each regional context. These sessions provided an opportunity to discuss the findings in more depth, gather contextual knowledge, and strengthen the regional relevance and societal resonance of each scenario.

**The workshops brought together 52 participants** in total, with geographical distribution as follows: 12 from Italy, 11 from Finland, 10 from Greece, 10 from Spain and 9 from the Netherlands. The template of the workshop agenda, later adapted to each pilot region, and summaries of all the workshops, are presented in Annex 6 and Annex 7.

## 3 SCENARIOS: CONCEPTUAL FRAMEWORK

The conceptual framework provides a **structured basis for exploring the potential futures** of EU regions within the context of the twin transition - digital and green transformations. It integrates **key elements that collectively shape the development and analysis** of the four scenario types, reflecting diverse regional pathways influenced by evolving mobility patterns and broader socio-economic changes.

**Key components** of the framework include:

- Four scenario types: Four distinct regional development trajectories, each representing different ways regions may respond to and evolve under shifting spatial mobility and transformation dynamics.

- Main variables considered: A comprehensive set of demographics, social, welfare, and labour market factors that drive and characterize regional change.
- Role of digitalisation: Examination of how digital transition impacts regional labour markets, skills development, and economic opportunities, acting as a critical enabler or barrier in regional evolution.
- Impacts: Consideration of both short- and long-term effects on pilot regions, assessing how various factors influence regional resilience and growth prospects.
- External Factors: Recognition of the influence of policies, economic shifts, and potential disruptions that can alter regional trajectories and shape scenario outcomes.

This framework guides the **development of scenarios** by aligning the analysis with relevant drivers and contextual conditions, ensuring a comprehensive understanding of regional futures amid the twin transition.

### 3.1 DESCRIPTION OF THE FOUR SCENARIO TYPES

The **four scenarios developed in this task (T3.2)** illustrate distinct regional development pathways under the twin transition, shaped by spatial mobility and digital transformation:

- Leapfrog: characterized by rapid progress, this scenario envisions regions overcoming existing barriers through swift mobility and innovation, resulting in significant improvements in economic and social conditions.
- Dark Horse: defined by unexpected regional success, this pathway describes regions that have been previously overlooked but manage to leverage emerging opportunities to achieve substantial growth.
- Snail's Pace: this scenario depicts slow and gradual change, where regions evolve at a slow rate, facing persistent structural challenges and limited mobility.
- Lion's Den: representing a challenging environment marked by elevated risks and threats, this scenario describes regions struggling with adverse conditions that hinder development and restrict mobility.

### 3.2 MAIN VARIABLES: DEMOGRAPHIC, SOCIAL, WELFARE, AND LABOUR MARKET STRUCTURES

The **scenarios focus on four key variables** influencing regional outcomes:

- **Demographic structure:** encompasses population dynamics including migration flows, age distribution, and shifts in population density, all of which affect regional growth and labour availability.

- **Social structure:** includes factors such as community cohesion, social inclusion, educational attainment, and access to essential services, which shape social resilience and quality of life.
- **Welfare system structure:** covers the capacity and sustainability of social protection mechanisms, healthcare provision, and public services that support vulnerable populations and overall regional wellbeing.
- **Labour market structure** considers employment levels, sectoral composition, job accessibility, and the skills profile of the workforce, reflecting the economic adaptability and competitiveness of regions.

These variables are closely interlinked and **interact dynamically with spatial mobility trends** and the degree of regional digitalisation. Together, they play a **critical role in determining the resilience, development trajectory, and attractiveness of EU regions** in the context of ongoing demographic and technological transformations.

### 3.3 ROLE OF DIGITAL AND GREEN TRANSITIONS IN SHAPING REGIONAL LABOUR MARKETS AND TRAJECTORIES

**Digital and green transitions** together form the twin forces transforming **regional development across Europe**. **Digitalisation** is reshaping labour markets by expanding access to employment, enabling remote and platform-based work, and increasing the demand for new digital skills. **Regions with strong digital infrastructure** and human capital are better positioned to attract businesses, retain talent, and adapt to economic change - enhancing their flexibility, innovation capacity, and overall competitiveness. In contrast, regions with limited digital readiness risk stagnation, reduced job opportunities, and increased outmigration, potentially exacerbating territorial inequalities.

Parallel to this, the **green transition drives a shift towards climate neutrality, circular economy models, and sustainable energy systems**. It influences not only employment structures - by fostering demand for green skills in renewable energy, sustainable construction, and low-carbon logistics - but also broader regional development, including mobility patterns, environmental quality, and sectoral composition.

Together, these **twin transitions can catalyse innovation and spatial mobility**. The green transition can boost innovation capacity in left-behind areas by leveraging local assets, while digitalisation opens remote labour market opportunities. This interplay may reverse traditional migration patterns, with some regions transitioning from 'sending' to 'receiving' status based on improvements in economic structure, living conditions, and environmental quality.

However, regions lagging in both digital and green capacities face compounded vulnerabilities, risking wider territorial disparities. The MOBI-TWIN framework highlights that digitalisation alone cannot secure inclusive growth; it must be integrated with green transition policies to build resilient, future-ready labour markets and regional economies. Understanding how these forces co-evolve is key to designing tailored, region-specific pathways for sustainable and equitable development.

Beyond labour markets, **digital and green transitions also significantly reshape regional welfare systems and social structures**. The digitalisation of government services enhances the efficiency and accessibility of tax administration, benefits distribution, and public service delivery, contributing to more responsive and inclusive welfare frameworks. This is particularly important for addressing social inequalities and ensuring vulnerable populations can benefit from regional development. Moreover, the social fabric of regions - characterised by demographic trends, social cohesion, and inclusion - is influenced by these transitions, as digital and green innovations affect mobility, access to services, and community resilience. Incorporating these dimensions alongside labour market impacts provides a more comprehensive understanding of how twin transitions shape sustainable and equitable regional development.

### 3.4 SHORT- AND LONG-TERM IMPACTS ON THE PILOT REGIONS

The four scenarios developed within the MOBI-TWIN project highlight a range of potential **short- and long-term effects across the five pilot regions**: *North & East Finland, Central Macedonia, Lombardy, Groningen, and Castilla-La Mancha*. These regions differ significantly in terms of demographic trends, labour market conditions, spatial mobility patterns, and levels of digital readiness - factors that strongly influence their responses to the twin transition.

The insights presented in this section draw from an integrated analytical process combining several sources: the scenario narratives co-created in T3.2, regional data analysis, and the results of the Delphi survey conducted with external European experts. This approach ensures that the observed patterns and projections reflect both qualitative foresight and expert-informed plausibility.

**In the short term**, all regions may face rapid shifts in population inflows and outflows, driven by new patterns of remote work, changes in commuting behaviours, or temporary mobility linked to secondary housing or cross-border employment. These shifts could bring both pressures and opportunities: labour market adjustments are expected, including changes in employment structures and skills demand, while social service systems may experience strain or reconfiguration in response to altered needs in health, education, and housing.

**In the long term**, more structural transformations are anticipated. Demographic profiles will evolve, with some regions facing population ageing and continued decline (e.g. *North & East Finland, rural areas in Groningen*), while others may benefit from renewed

attractiveness and population recovery (e.g. *Castilla-La Mancha, Central Macedonia*). Economic structures are likely to adapt as digitalisation changes the geography of employment and productivity. This will impact regional labour markets differently depending on existing capacities and digital infrastructure. *Lombardy* is expected to see slow, fragmented development, limited by structural barriers and policy inertia despite its strong institutional base. Social cohesion could be challenged in areas experiencing inconsistent development or limited access to public services, while other regions might see greater integration and resilience if inclusive and proactive policies are applied.

The scenario analysis helps to identify specific risks (e.g. depopulation, labour market mismatch, digital divides) and opportunities (e.g. new forms of regional attractiveness, increased accessibility, economic diversification) for each region. For example:

- North & East Finland may benefit from expanded remote work and temporary migration, but risks deepening demographic imbalance without sustained digital and social investment.
- Central Macedonia could leverage digitalisation and improved labour dynamics to stabilise population trends and foster regional regeneration.
- Lombardy faces complex challenges related to urban sprawl, crisis recovery, and service equity, but may also lead innovation-driven adaptation to twin transition pressures.
- Groningen presents internal contrasts that require targeted mobility and digital strategies to balance university-centred growth with rural population loss.
- Castilla-La Mancha stands to gain from increased decentralised living and commuting trends but must address infrastructure and service accessibility to sustain growth.

These differentiated impacts underscore the importance of a place-based approach to regional policy planning. The scenario outcomes were further validated through regional stakeholder workshops, providing additional insight into how each region can prepare for and respond to changing spatial mobility patterns and twin transition dynamics.

Detailed insights from the scenario development, along with possible trajectories for each pilot region, are further elaborated in the following section.

### 3.5 EXTERNAL FACTORS AND POSSIBLE IMPACTS ON THE TRAJECTORY

Building on the four scenarios developed through a structured process - combining a **literature review, co-creation, Delphi survey** and additional local stakeholder workshops- this section explores how complementary external factors may influence regional development trajectories and spatial mobility patterns.

**Several external factors may influence the trajectory** of regional development and spatial mobility patterns, including:

- EU policies and regulations: legislative and funding measures that affect freedom of movement, investments in digital infrastructure, and support for regional development initiatives.

- Global economic trends: market fluctuations, shifts in trade dynamics, including trade tariffs, and technological innovations that can reshape regional economies and labour markets.
- Societal disruptions: major events such as the COVID-19 pandemic and Brexit, which have profoundly impacted mobility behaviours, employment patterns, and social dynamics.
- Environmental challenges: climate change and related environmental pressures that influence living conditions, resource availability, and the overall attractiveness of regions.

These external factors can accelerate, impede, or alter the trajectories outlined in the scenarios, introducing additional layers of complexity and uncertainty to the future development paths of regions.

## 4 SCENARIOS: NARRATIVES AND PROBABILITIES

This section outlines the development of specific scenarios that **explore how changing spatial mobility patterns will impact EU regions by 2030** across various dimensions, including demographics, social structures, welfare systems, and labour markets. Building on regional typologies defined by the [Regional Attractiveness Index \(T2.3\)](#), the scenarios are designed to capture a range of potential future developments, each reflecting different levels of regional growth and challenges in the five pilot regions.

The four scenarios - serve as narratives that explore both optimistic (*Leapfrog*, and *Dark Horse*) and pessimistic outcomes (*Snail's Pace*, and *Lion's Den*), shaped by factors such as spatial mobility and the level of digital transition in the labour market. Through a [Delphi Survey](#) with experts across the EU, the probability of these scenarios happening was estimated, providing key insights into their likely impacts on regional dynamics and guiding future policy considerations.

The following sub-sections present the **four scenario types for each pilot region**, developed through collaborative co-creation with the consortium. **Probability assessments for each scenario**, based on the Delphi survey conducted with key stakeholders as well as on additional local stakeholders' feedback, are also included.

### 4.1 NORTH & EAST FINLAND (FINLAND)

This section outlines four possible scenarios for the future development of North and East Finland by 2030, developed as part of the MOBI-TWIN framework and adapted to the regional context through two rounds of workshops with consortium experts. Ranging from innovation-led growth to slow recovery or decline, each scenario highlights key opportunities and challenges that could influence the region's long-term trajectory:

**Leapfrog: North & East Finland at the Forefront: Driving community building for technological and economic growth**

*By 2030, North & East Finland has become a model for tackling mobility and demographic challenges efficiently. This success comes from strong community efforts, local initiatives, and national and international support. Key factors include thriving local businesses, social spaces in urban and rural areas, and incentives for young families and remote workers. Green industries and technological innovations have improved infrastructure and the environment, attracting both new and existing residents. AI solutions enhance transportation, healthcare, education, and natural resource protection.*

*To sustain progress, continued financial, political, and community support is essential. Despite risks like geopolitical instability or economic downturns, the region has great potential to evolve into a sustainable, advanced economy with an attractive quality of life.*

**Dark Horse: North & East Finland's Transformation: Shaping a digital and sustainable future**

*By 2030, North and East Finland experienced a surprising revival, driven by green technology and digital innovation. Despite past population decline, the region attracted remote workers, digital nomads, and young professionals drawn by affordable living, strong internet, and new industries like green tech and data centres.*

*This growth was supported by better digital infrastructure, municipal policies, and a shift from mining to technology-based industries. While EU and Estonian support helped, challenges remain, especially due to geopolitical risks from nearby Russia. Still, the region showcases how digital and green initiatives can create long-term, stable growth.*

*To secure future prosperity, ongoing investment in innovation, regional collaboration, and resilience against external threats will be key to maintaining this momentum.*

**Snail's Pace: North & East Finland's Strengths: Driving progressive evolution**

*By 2030, the region is slowly recovering from geopolitical challenges through investments in the local economy and infrastructure. Trade at the eastern border has been gradually replaced by more active cooperation with Estonia and other EU countries, but language barriers, social welfare, and tax issues have prevented a full transition.*

*The region still struggles to retain university graduates and young professionals, as well as to connect education with local employment opportunities. To address this, the digitalisation of the region is progressing, with increased support for the IT sector to meet the needs of both industries and residents. However, this process is moving slowly, especially in remote areas. Renewable energy production has grown, focusing on hydro, wind, and solar power, with positive environmental impacts. The mining sector is also adopting more advanced technologies, and while the green transition is slow, changing local attitudes are expected to speed up progress over time.*

*To overcome these challenges, the region must accelerate educational reforms, improve labour market connections, and expedite digital infrastructure development, fostering collaboration with EU partners to ensure a quicker and more sustainable recovery.*

**Lion's Den: North & East Finland at the Crossroads: Striving for stability by 2030**

*By 2030, North & East Finland, once struggling with population decline, industrial stagnation, and geopolitical risks, faces an uncertain future. The decline of industries like mining and manufacturing has led to an aging population and labour shortages, especially in healthcare and technology. Although temporary workers and seasonal migration have helped the economy, long-term stability is still uncertain.*

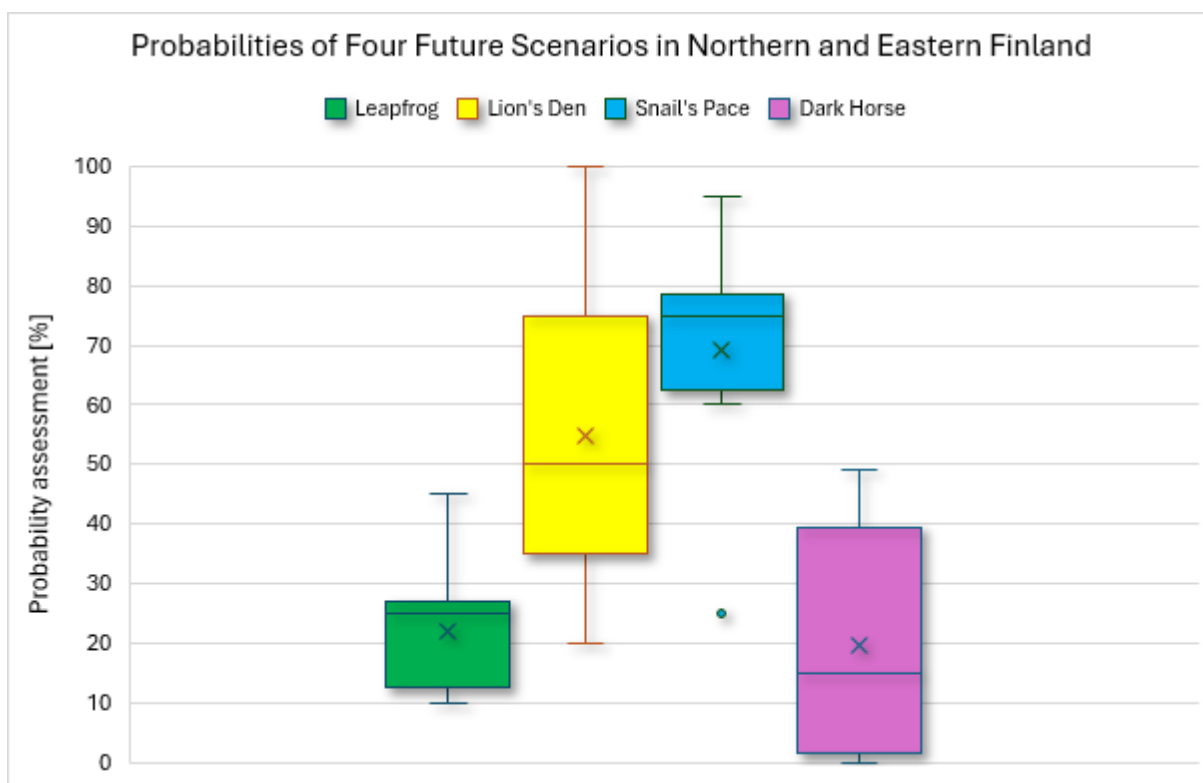
*Geopolitical risks, particularly due to its location near Russia, make investments scarce and contribute to instability. As Finland works towards energy and technology self-sufficiency, North & East Finland struggles to attract new industries, leaving its economy heavily reliant on sectors like forestry and agriculture.*

*However, there is hope. Agricultural innovation, driven by a changing climate, could offer new growth opportunities. If Finland focuses on green technologies and renewable energy, the region might find a way forward. But this will require bold decisions, long-term investment, and efforts to retain young talent to rebuild the workforce.*

## 4.2 SYNTHESIS OF SCENARIO PROBABILITY ASSESSMENT FOR NORTH & EAST FINLAND

### ***Probability of different scenarios occurring***

The four scenarios present distinct possibilities for the future development of North & East Finland. Based on current trends and the assessments of experts who participated in the Delphi survey, the expected relevance and plausibility of each scenario vary significantly across the region. Below is a synthesis of the average probability percentages assigned by these experts to each scenario, as illustrated in Figure 2 and detailed in Table 1.



**Figure 2. The probability of four different scenarios occurring in North and East Finland.**

Table 1 details the average probability of each scenario for North and East Finland and highlights key features based on expert insights.

**Table 1. Scenarios: Probabilities and key features based on expert insights (Delphi survey on North and East Finland).**

No.	Scenario type	Key Scenario Features based on experts' insights	Probability
1.	<i>Leapfrog</i>	<ul style="list-style-type: none"> <li>- Unlikely to occur broadly, particularly in Eastern Finland.</li> <li>- Some potential in specific areas of Northern Finland but still limited.</li> <li>- Key barriers include inadequate investment levels and persistent policy challenges.</li> <li>- Structural disparities between regions reduce the likelihood of uniform advancement.</li> <li>- Overall, rapid and transformative change is constrained by systemic limitations.</li> </ul>	<b>22.1%</b>

2.	<i>Lion's Den</i>	<ul style="list-style-type: none"> <li>- Most likely in Eastern Finland due to proximity to geopolitical tensions, especially the war in Ukraine.</li> <li>- Regional policy misalignments further increase vulnerability in the East.</li> <li>- Northern Finland is somewhat insulated but not immune to global economic instability.</li> <li>- High probability of external shocks disrupting regional development.</li> <li>- Reflects serious exposure to both geopolitical and economic risks.</li> </ul>	<b>54.9%</b>
3.	<i>Snail's Pace</i>	<ul style="list-style-type: none"> <li>- Most probable outcome for both North and East Finland.</li> <li>- Development is expected to be slow and incremental due to structural and demographic challenges.</li> <li>- Existing infrastructure provides a foundation, but not a launchpad for rapid growth.</li> <li>- Reflects current trends rather than transformation - steady but sluggish progress.</li> <li>- Dominant scenario due to lack of strong momentum or coordinated innovation.</li> </ul>	<b>69.1%</b>
4.	<i>Dark Horse</i>	<ul style="list-style-type: none"> <li>- Unlikely in the near term, but possible through unforeseen catalysts.</li> <li>- Potential triggers include geopolitical realignments or green tech breakthroughs.</li> <li>- Could alter trajectories if combined with strategic action or external support.</li> <li>- Presently held back by structural rigidity and limited short-term capacity for rapid adaptation.</li> <li>- A moderate but improbable chance of sudden, transformative change.</li> </ul>	<b>25.0%</b>

### Key findings

According to the Delphi survey results, in the next five years, **North and East Finland are most likely to follow a Snail's Pace development path**, with a **69.1% probability**. This outcome is reinforced by structural and demographic constraints such as an aging population, limited transportation infrastructure, declining access to education, and regional policies that continue to favour southern and western parts of the country. Without significant public or private investment, these regions are expected to see only slow, gradual progress.

The **Lion's Den scenario**, with a **54.9% probability**, poses a serious risk - especially in Eastern Finland, where **geopolitical tensions, the prolonged war in Ukraine**, and the closure of the Russian border continue to disrupt regional stability and economic

prospects. In addition, **economic stagnation, healthcare challenges, and declining trust in national regional policy** further amplify vulnerabilities.

A **Dark Horse scenario (25.0%)** remains a **distant but possible outcome**, contingent on several unpredictable factors. These include a **rapid end to geopolitical instability**, a shift toward strategic **national investment in the green and digital transition**, or **climate-driven demographic shifts**, such as the relocation of people from southern Europe. Technological innovation or renewed **EU and NATO-driven interest** in the region's strategic value could also unlock unexpected momentum.

The **Leapfrog scenario (22.1%)** is **the least likely**, primarily due to insufficient national support and the lack of coordinated regional development strategies - especially in the East. However, **Northern Finland shows some localized potential** for accelerated growth, particularly in sectors like **green energy, tourism, and defence-related industries**.

The **local stakeholder workshop** participants largely agreed that the **Snail's Pace is the most likely scenario**, driven by demographic decline, limited government action, and weak political representation, particularly in Eastern Finland. New technologies and digitalisation (e.g., AI for transport, data centres, digital services, and advanced manufacturing) are emerging in several areas, potentially moderating the pace of decline under this scenario. **Lion's Den is considered realistic** by some (visible decline in small municipalities, empty storefronts, outmigration, real geopolitical risks due to the impacts of the war in Ukraine) but is disputed by others who believe Finland's education system, social structure and local communities provide resilience.

**Dark Horse and Leapfrog are viewed as less probable** in the near term, although local renewable energy (particularly wind power) and data center projects are seen as replicable trends that may emerge across multiple municipalities, offering development opportunities in different parts of the region. Horizontal partnerships between municipalities, active mayors, and seasonal residents with investment links could also open new collaboration opportunities and strengthen local development pathways. Leapfrog and Dark Horse scenarios could be made more plausible if technological innovation in industries like mining reduces environmental impacts while boosting local revenues. As forestry remains a major opportunity, moving from low-value to high-value added wood products could align with the green transition and create stronger local business ecosystems. Extraction from biobased materials is also seen as promising as it requires lower investment than large biocarbon plants and could provide scalable regional pathways.

The participants also pointed out the **regional divergence** as Eastern Finland is perceived as more vulnerable than Northern Finland due to lack of tourism-based economic drivers, weaker policy support and advocacy. Some stakeholders suggested creating a special economic area in Eastern Finland with lower tax rates to stimulate investment and competitiveness, but it requires strong political will.

**In summary**, North and East Finland's future is expected to unfold through **gradual, imbalanced growth**, punctuated by **the risk of external shocks**. Without significant policy reforms, enhanced investment, and improvements in geopolitical stability, transformative change remains unlikely. However, with strategic foresight and coordinated efforts, the

region holds latent potential to navigate these challenges and capitalize on emerging opportunities.

### 4.3 CENTRAL MACEDONIA (GREECE)

This section explores four distinct scenarios for Central Macedonia's development by 2030, developed as part of the MOBI-TWIN framework and adapted to the regional context through two rounds of workshops with consortium experts. Each scenario is shaped by varying economic, technological, social, and environmental trends. The following summaries outline the key features and implications of each scenario:

#### ***Leapfrog: Central Macedonia's Digital Revolution: Driving progress through innovation***

*By 2030, Central Macedonia thrives as a diverse and growing region with a strong economy that attracts newcomers while retaining its residents. Smart agriculture, driven by technology and automation, boosts sustainable tourism, exports, improved transport, and better quality of life. More families and workers benefit from a thriving construction sector, affordable housing, better education, healthcare, and cultural activities. Local businesses flourish, taking advantage of the rural work-life balance. Digitalised public services and entrepreneurship further drive progress.*

*To sustain growth, policies must provide funding and promote smart agriculture and new technologies. Strategic planning will help turn environmental challenges into opportunities, encouraging safer equipment, renewable energy, export growth, and tech-based skill development.*

#### ***Dark Horse: Central Macedonia's Dark Horse: Unlocking digital and green growth potential***

*By 2030, Central Macedonia emerges as a surprising success in Greece's economic transformation. Once struggling with population decline and an aging workforce, the region thrives thanks to investments in green technology and digital services. Thessaloniki becomes a hub for tech and finance, attracting skilled workers and young families.*

*This growth is driven by EU support for digitalisation, incentives for green businesses, and improved healthcare for the elderly. The region also appeals to retirees and remote workers, reversing its population decline.*

*To maintain stability, Central Macedonia works to diversify its economy, promoting sustainable agriculture, digital innovation, and strong public-private partnerships. With ongoing investment in renewable energy and high-tech industries, it positions itself as a leader in Greece's digital and green transition.*

#### ***Snail's Pace: Central Macedonia's Journey: Overcoming demographic and economic challenges***

*By 2030, Central Macedonia adopts a mix of top-down and bottom-up strategies to drive change, aiming for sustainable growth and more mobility options. EU policies guide regional and local actions, focusing on economic sustainability and digitization challenges. Open*

forums are created to gather residents' views on the region's demographic and economic situation.

However, adapting education and training systems to meet the rapidly changing technological and socio-economic landscape, as well as supporting labour mobility, is progressing slowly. The region needs more development programs to attract both skilled and unskilled workers to meet market demands.

While gradual changes could improve the region's economy, reverse demographic decline, and foster growth, slow progress may prevent the region from fully benefiting from these opportunities and leave it vulnerable.

To overcome this, the region must prioritize faster integration of technology into education, create targeted policies for labour mobility, and establish stronger partnerships with businesses to align skills with market needs, ensuring a quicker response to evolving challenges.

### **Lion's Den: Central Macedonia's Fight for Revitalization by 2030**

By 2030, Central Macedonia may face a crisis if current trends continue. Economic decline, demographic changes, and environmental challenges have already hurt key industries like agriculture and manufacturing. With an aging population and young professionals leaving, the workforce is shrinking, leading to social instability.

This has resulted in fewer job opportunities, strained public services, and a workforce unprepared for sectors like digital technology and renewable energy. As people leave for better prospects, depopulation and land degradation are worsening.

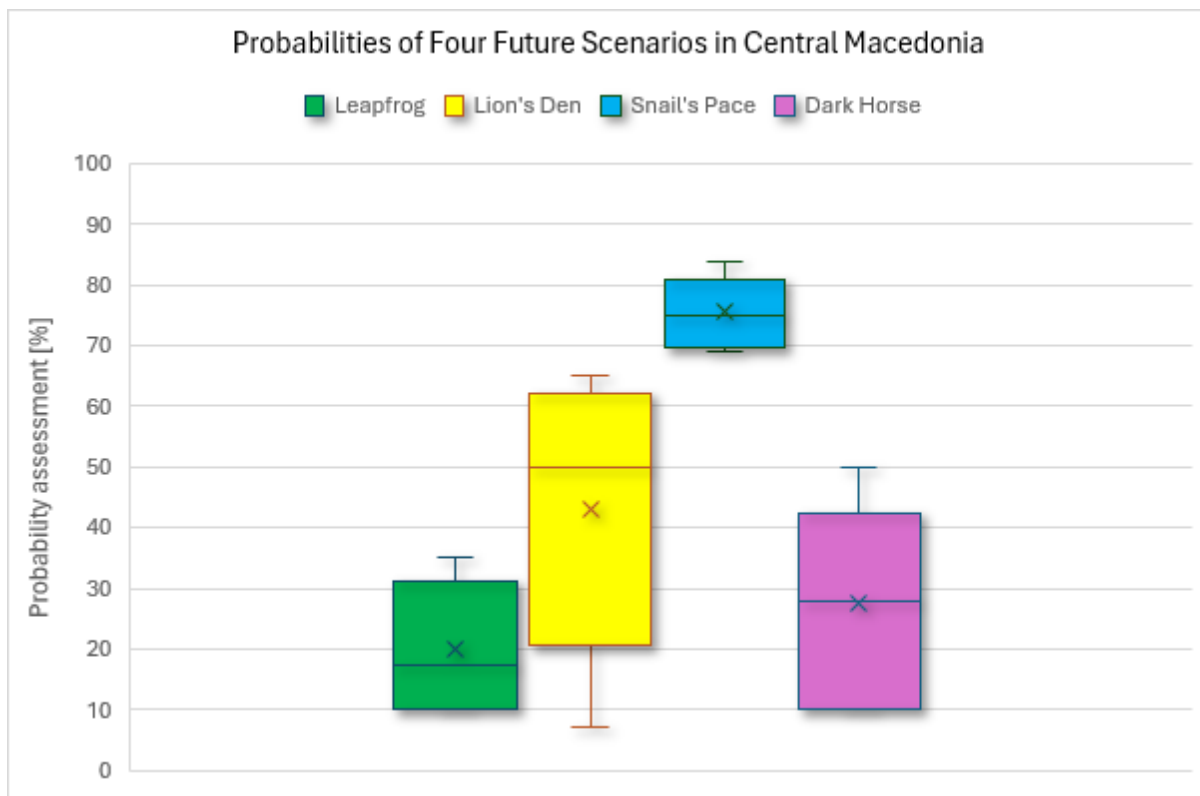
The region's future depends on its ability to diversify and attract new investments. Climate change, political instability, and economic recessions could trap the area in stagnation without quick action.

To prevent this, policies should focus on improving infrastructure, adapting to technology, and keeping the workforce in place. Investing in digital and renewable sectors and creating innovation hubs is crucial. However, without support from local, national, and EU levels, Central Macedonia could fall behind in a fast-changing world. Resilient strategies must be put in place now to ensure a sustainable future.

## 4.4 SYNTHESIS OF SCENARIO PROBABILITY ASSESSMENT FOR CENTRAL MACEDONIA

### **Probability of different scenarios occurring**

The four scenarios present different potential outcomes for the future development of Central Macedonia. Based on current trends and expert evaluations in the Delphi survey, the probability of each scenario occurring varies across the region. Below is a summary of the average probability percentages for each scenario, as shown in the graph below (Figure 3) and detailed in Table 2.



**Figure 3. The probability of four different scenarios occurring in Central Macedonia.**

Table 2 details the average probability of each scenario for Central Macedonia and highlights key features based on expert insights.

**Table 2. Scenarios: Probabilities and key features based on expert insights (Delphi survey on Central Macedonia).**

No.	Scenario type	Key Scenario Features based on experts' insights	Probability
1.	<i>Leapfrog</i>	<ul style="list-style-type: none"> <li>- Involves rapid and unexpected advancements but remains unlikely in the near term.</li> <li>- Some progress seen in digital infrastructure and green tech investment.</li> <li>- Structural challenges persist, including slow policy implementation and bureaucratic inertia.</li> <li>- Over-reliance on agriculture and tourism limits diversification and innovation.</li> <li>- Demographic issues like aging and outmigration constrain long-term transformation.</li> </ul>	<b>19.3%</b>

2.	<i>Lion's Den</i>	<ul style="list-style-type: none"> <li>- Driven by external shocks such as geopolitical instability and climate or energy crises.</li> <li>- Traditional industry base makes the region vulnerable to global market volatility.</li> <li>- Limited economic resilience increases exposure to disruptions.</li> <li>- Risks are compounded by weak adaptation mechanisms and economic fragility.</li> <li>- A highly likely scenario without significant structural reform.</li> </ul>	<b>43.0%</b>
3.	<i>Snail's Pace</i>	<ul style="list-style-type: none"> <li>- Most probable scenario, reflecting gradual, variable development.</li> <li>- EU funding and digital initiatives offer some growth potential.</li> <li>- Institutional inertia and limited infrastructure slow progress.</li> <li>- Demographic decline continues to be a key obstacle.</li> <li>- Transition to green and digital economy expected to be slow and fragmented.</li> </ul>	<b>75.5%</b>
4.	<i>Dark Horse</i>	<ul style="list-style-type: none"> <li>- Possible transformative shift fueled by unexpected catalysts.</li> <li>- Potential triggers include foreign investment, tech breakthroughs, or returning skilled workers.</li> <li>- Hampered by limited venture capital and sluggish policy response.</li> <li>- Structural rigidity and lack of ecosystem support reduce near-term likelihood.</li> <li>- Moderate chance for change if key enablers align unexpectedly.</li> </ul>	<b>27.7%</b>

### Key findings

Based on Delphi expert assessments, **Central Macedonia is most likely to follow a Snail's Pace development trajectory over the next five years**, with a **75.5% probability**. Progress is expected to be slow due to persistent structural barriers - such as **slow-moving policy execution, bureaucratic inertia, limited innovation**, and **infrastructure gaps**, especially outside Thessaloniki. Demographic challenges, such as an **aging population** and **youth outmigration**, compound these issues by shrinking the skilled workforce and **limiting capacity for rapid digital and green transitions**.

The **Lion's Den scenario carries a 43.0% probability** and represents a moderate risk stemming from external shocks. **Geopolitical instability in South-Eastern Europe, energy price volatility, and climate change impacts** (e.g., floods, droughts) threaten traditional sectors and overall regional stability. These factors could disrupt agricultural productivity,

trade flows, and investment, increasing vulnerability. However, mitigating factors like EU support, diversification of trade partners, and emerging green technologies provide some resilience.

The **Dark Horse scenario holds a 27.7% probability** and embodies the potential for transformative change driven by unexpected innovations or factors. Drivers include **emerging high-tech startups** (agrotechnology, digital health, sustainable mobility), **stronger links between universities (e.g., Aristotle University of Thessaloniki) and industry**, increased foreign direct investment, return of skilled diaspora, and improved governance. Nonetheless, significant barriers remain in the form of slow policy adaptation, limited venture capital, and institutional rigidity, which constrain near-term momentum.

The **Leapfrog scenario** is the least likely, with a **19.3% probability**, reflecting the current **lack of sufficient infrastructure, political consensus, and institutional capacity** for rapid and transformative growth. While innovation investments, digital entrepreneurship, and upgraded infrastructure (including transport, digital, and energy networks) could catalyse change, slow policy implementation, bureaucratic hurdles, and weak regional cooperation hamper progress.

The **local stakeholder workshop participants expressed a strong consensus about the Snail's Pace being the most likely scenario**. Key drivers include the limited effectiveness of government action, persistent demographic decline in specific areas due to heterogenous regional characteristics, and relatively weak political influence compared to other Greek regions. **Lion's Den** is considered less realistic by some yet contested by others. Participants underlined Central Macedonia's strong agricultural base, the role of higher education institutions, and the growth of new ICT businesses choosing the region as a destination/residence. These factors are seen as potential sources of resilience. Overall, participants generally regarded this negative scenario as less likely than Leapfrog or Dark Horse.

The regional capacity to adapt varies by sector. Certain sectors such as advanced agriculture, sustainable tourism, and renewable energy (particularly solar and hydro-energy) as well as upskilling on using AI and other digital solutions may create conditions for **Leapfrog or Dark Horse**, while others remain vulnerable to external shocks. Achieving positive scenarios requires stronger citizen engagement in decision-making, to counterbalance the current top-down governance approach.

**In summary, Central Macedonia's development path is expected to be stepwise and uneven**, dominated by steady but slow growth with occasional disruptions from external shocks. The region faces a challenging balance of seizing EU-funded opportunities while addressing internal structural constraints. The likelihood of rapid transformation or unexpected breakthroughs remains limited but not impossible, contingent on overcoming significant economic, policy, and demographic obstacles.

## 4.5 LOMBARDY (ITALY)

This section outlines four potential scenarios for Lombardy's development by 2030, developed as part of the MOBI-TWIN framework and adapted to the regional context

through two rounds of workshops with consortium experts. Each scenario is shaped by different economic, social, and environmental dynamics. Each scenario is briefly described below:

***Leapfrog: Lombardy at the Brink: Facing economic diversification and green industry growth***

*By 2030, Lombardy thrives economically and demographically, leveraging Milan's strengths while promoting regional self-sufficiency. Job opportunities grow due to digitalisation, affordable transport, and economic diversification.*

*A focus on sustainable farming, green energy, cultural heritage, and improved infrastructure help bridge gaps between Milan, smaller towns, and rural areas. New tech hubs and startups attract both local and foreign talent, while strong public-private partnerships and community initiatives drive progress.*

*Despite challenges like high energy costs and climate change, Lombardy stands out as a model of innovation and sustainable growth. To sustain growth, Lombardy should invest in green technologies, education, and infrastructure, while fostering public-private collaboration and adapting to emerging industries.*

***Dark Horse: Lombardy's Unexpected Shift: Embracing change in Milan and beyond***

*By 2030, Lombardy transforms from a pandemic-stricken region into a thriving hub of economic and social change. Milan, Italy's economic centre, sees a shift as more residents move to nearby suburbs, driven by remote work opportunities and better transportation.*

*The region's green energy and digital sectors expand, attracting international talent and strengthening Lombardy's role in Europe's digital future. However, to sustain this growth, it must avoid over-reliance on these industries and ensure economic benefits reach all residents. By balancing innovation, sustainability, and inclusivity, Lombardy positions itself as one of Europe's most dynamic and adaptable regions.*

*Looking ahead, continued investments in emerging technologies, regional cohesion, and inclusive policies will be essential for maintaining growth and ensuring long-term prosperity.*

***Snail's Pace: Lombardy's Olympic Opportunity: Leveraging the games to drive progress***

*By 2030, the Olympic Games have clearly boosted the region's economy and infrastructure investments. Transport improvements initially focused on reducing congestion in Valtellina, which had poor connections. These upgrades later helped tackle broader traffic issues in the region. The Games also created more jobs, attracted tourists, and spurred investments in housing, digital infrastructure, renewable energy, and agriculture.*

*However, as time passes, the labour market, investments, and tourism slow down, leading to a decline in the regional economy. The region must now seek new sources of growth. Social and market acceptance of these shifts could attract talent and drive innovation. For gradual change to succeed, communities need to trust the information and intentions behind the proposed changes. An open decision-making process and regular upskilling of the population and businesses in digital and tech skills are key for Lombardy's ongoing development.*

***Lion's Den: Lombardy on the Edge: Facing demographic and economic pressures***

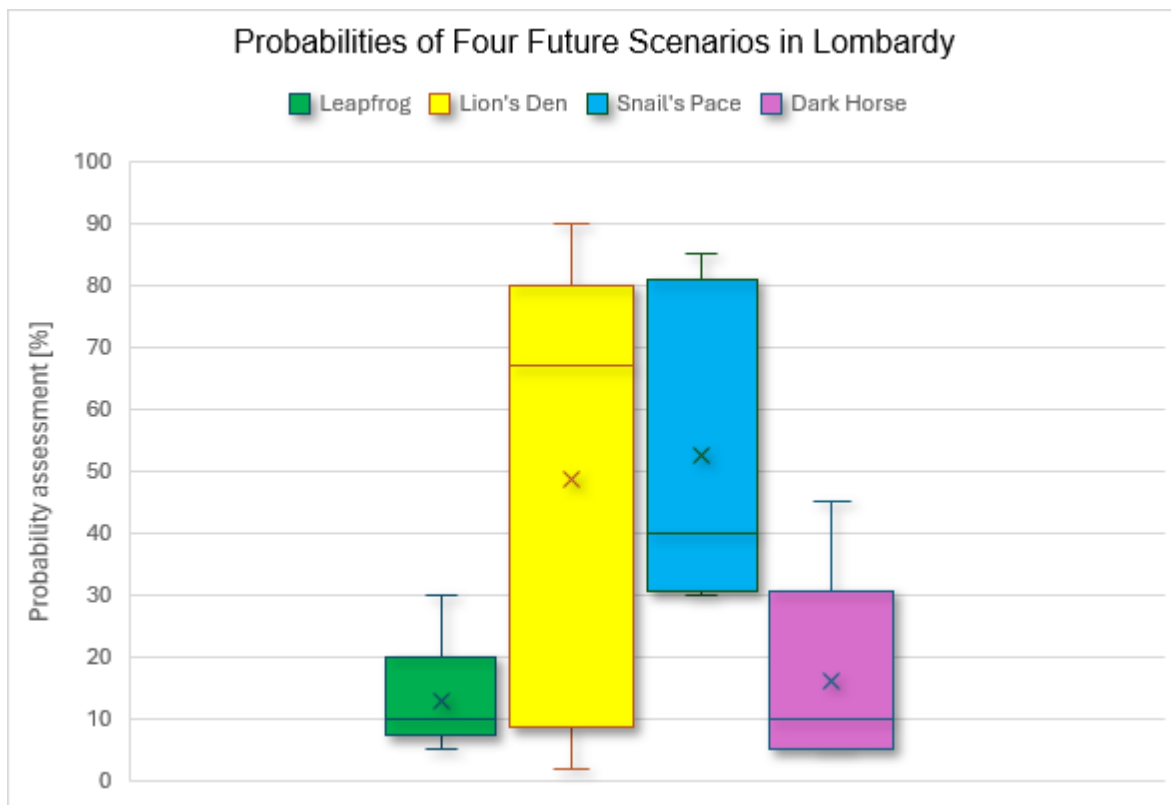
*By 2030, Lombardy is facing serious demographic and economic challenges. The aging population is putting a strain on healthcare and social services, requiring more resources. Meanwhile, many young professionals are leaving, reducing the workforce and hindering innovation. Traditional manufacturing is declining, and there hasn't been enough progress in digital and green industries, leading to economic stagnation. The effects of the COVID-19 pandemic have worsened rural depopulation and increased the gap between urban and rural areas. Job insecurity, especially in temporary roles, is deepening social divides and causing unrest. Without quick action on digital and green transitions, regional development, and policies addressing demographic changes, Lombardy risks falling behind in the global economy and facing long-term instability.*

*To tackle these issues, Lombardy must invest in digital and green technologies, retain young talent, and focus on balanced regional development to bridge the urban-rural gap.*

## 4.6 SYNTHESIS OF SCENARIO PROBABILITY ASSESSMENT FOR LOMBARDY

***Probability of different scenarios occurring***

The four scenarios outline different potential pathways for Lombardy's future development. According to expert assessments via Delphi survey and current regional trends, the probability of each scenario materializing differs considerably. The average likelihood of each scenario, as estimated by experts, is summarized in the graph below (Figure 4) and detailed in Table 3.



**Figure 4.** The probability of four different scenarios occurring in Lombardy.

Table 3 details the average probability of each scenario for Lombardy and highlights key features based on expert insights.

**Table 3. Scenarios: Probabilities and key features based on expert insights (Delphi survey on Lombardy).**

No.	Scenario type	Key Scenario Features based on experts' insights	Probability
1.	<i>Leapfrog</i>	<ul style="list-style-type: none"> <li>- Characterized by rapid and unexpected advancements in technology and infrastructure.</li> <li>- Signs of digital innovation exist, but structural barriers limit scalability.</li> <li>- Obsolete industrial sectors, high taxes, and bureaucratic inefficiency hinder transformation.</li> <li>- Milan shows leadership, but regional challenges dilute its impact.</li> <li>- Demographic decline and labour market rigidities constrain momentum.</li> </ul>	<b>12.7%</b>

2.	<i>Lion's Den</i>	<ul style="list-style-type: none"> <li>- Driven by external shocks like geopolitical tensions and climate change.</li> <li>- National policy inertia exacerbates regional vulnerability.</li> <li>- Productivity stagnates amid an aging population and inflexible systems.</li> <li>- Public and private sectors struggle to adapt to accelerating risks.</li> <li>- A high-risk trajectory without major, coordinated interventions.</li> </ul>	<b>40.8%</b>
3.	<i>Snail's Pace</i>	<ul style="list-style-type: none"> <li>- Represents slow, incremental progress with limited systemic change.</li> <li>- Investments and innovation occur, but at a modest, uneven rate.</li> <li>- Persistent economic and demographic headwinds remain unresolved.</li> <li>- Policy actions are largely reactive rather than transformative.</li> <li>- Most probable future, shaped by small-scale, localized improvements.</li> </ul>	<b>52.6%</b>
4.	<i>Dark Horse</i>	<ul style="list-style-type: none"> <li>- Emerges from unexpected breakthroughs or favourable shifts.</li> <li>- Milan retains innovative strength but is hampered by high costs and inequality.</li> <li>- Unlocking potential would require inclusive regional investment strategies.</li> <li>- Mid-sized cities, housing, and wage reforms are key enablers.</li> <li>- Possible but unlikely without bold, coordinated efforts.</li> </ul>	<b>16.2%</b>

### **Key findings**

Based on Delphi expert assessments, **Lombardy is most likely to follow a Snail's Pace development trajectory** over the next five years, with a **52.6% probability**. Progress is expected to be slow and inconsistent, driven more by external factors than coordinated policy efforts. While the region retains strong institutional and industrial capacities, structural barriers such as **outdated industrial bases, policy inertia, demographic stagnation**, and **rising living costs** continue to hinder transformation. Without substantial public investment or strategic reform, improvements in infrastructure, productivity, and quality of life will likely be modest.

The **Lion's Den scenario** holds a **40.8% probability**, reflecting a **high risk of disruption from external forces and weak policy response**. Global instability, climate risks, and low

national productivity compound regional vulnerabilities. The **lack of effective regional and national governance**, combined with the private sector's slow adaptation to global shifts, increases the likelihood of economic turbulence and competitiveness decline. While not inevitable, this scenario could unfold in the absence of decisive policy shifts and institutional renewal.

The **Dark Horse scenario (16.2%)** reflects the potential for unexpected breakthroughs, possibly driven by Milan's innovation capacity and stronger regional investment. However, housing costs, wage imbalances, and underdeveloped mid-sized cities limit this scenario's near-term viability.

The **Leapfrog scenario, with a 12.7% probability**, is the least likely. Despite some progress in digital innovation, systemic barriers—such as bureaucratic inefficiency, outdated industries, and rising living costs—make rapid transformation within five years improbable. The participants of the **local stakeholder workshop strongly agree that Snail's Pace is the most likely trajectory for Lombardy** due to incremental innovation, uneven investments, and continued demographic and structural constraints. Some speakers also referenced existing signals of heterogeneous development (housing pressures in Milan vs. weaker services in intermediary/rural areas) that make this scenario the most plausible. The **Lion's Den** scenario likelihood was also considered significant because of ageing population, limited short-term levers on migration, national fiscal constraints (public debt) and exposure to external shocks (geopolitical tensions, trade tariffs, climate). Some participants argued Snail's Pace could evolve into Lion's Den absent coordinated intervention.

The **Dark Horse and Leapfrog** likelihood was perceived as low to moderate as demography is a binding constraint. The participants underlined that the ageing population and declining natural population growth create pressure on health and social services. Together with the out-migration of young people, these pressures further constrain labour supply, innovation, and increase welfare costs. The speakers also perceived fragmented governance transformations and lack of integrated spatial vision that could harness investments. The Milano-Valtellina corridor and the Milano-Cortina Olympics were cited as concrete examples where short-term or sectoral approaches risk undermining longer-term integrated regional development. Green and urban projects often stall because of administrations and private actors lack common process instruments to assess, negotiate and monitor initiatives effectively.

Several participants also emphasised the **internal heterogeneity in Lombardy**: Milan, the wider metropolitan ring, productive mid-size towns, alpine and rural areas have different dynamics and needs. This heterogeneity is not only territorial, but also economic: highly innovative multinationals co-exist with SMEs that struggle to keep pace with digital and green upgrades, deepening internal disparities and widening the skills gaps and mismatches.

**In summary, Lombardy's development is expected to proceed in stages**, with steady improvements tempered by persistent structural and policy challenges. While external shocks may drive volatility, the region's potential for breakthrough transformation remains limited unless strong and inclusive public strategies are implemented to unlock it.

## 4.7 GRONINGEN (THE NETHERLANDS)

This section outlines four potential development scenarios for Groningen by 2030, developed as part of the MOBI-TWIN framework and adapted to the regional context through two rounds of workshops with consortium experts. Each scenario is shaped by distinct combinations of economic transition, energy policy, demographic dynamics, and social resilience. These scenarios reflect the strategic decisions and external uncertainties that are likely to influence the region's future trajectory.

### **Leapfrog: Groningen on the Rise: Driving innovation, sustainability, and economic mobility**

*By 2030, Groningen focuses on mobility and attracting skilled workers for regional growth. Investments in education, research, and partnerships between universities, communities, transport companies, and start-ups are expanding. Social welfare policies promote inclusivity, supporting economic growth and making the region more appealing for living, studying, and working.*

*Groningen's economy thrives beyond its university, leveraging education and innovation to strengthen demographics, the labour market, and infrastructure. To boost the economy and manage energy costs, reopening natural gas extraction alongside renewable energy is considered. Environmental concerns are addressed with scientific oversight, advanced technology, and sustainable practices, enhancing the region's appeal and cohesion. To maintain growth, Groningen should continue investing in innovation, sustainable practices, and strategic partnerships to attract talent and enhance regional resilience.*

### **Dark Horse: Groningen's Emerging Hub: Preparing for the future**

*By 2030, Groningen unexpectedly thrives amid global challenges like climate change and economic shifts. Its renowned university attracts international students and skilled professionals, drawn by affordable living and high quality of life. Green spaces and a safer inland location make it appealing as coastal populations relocate due to rising sea levels.*

*New industries in technology, green energy, and sustainability drive economic growth, with Dutch companies moving in for lower costs. This brings more jobs and a younger, educated population. The rise of tech hubs and start-ups further accelerates growth.*

*To ensure long-term success, Groningen must diversify its economy, continue innovating, and address environmental challenges while maintaining sustainability.*

### **Snail's Pace: Groningen's Slow Burn: Navigating sustainable economy, mobility, and quality of life**

*By 2030, Groningen focused on making digital services more accessible, ensuring that digital skills and training were seen as essential and affordable for innovation and improving daily life and social connections. The updated mobility plans included a strong public transport system, smart transport solutions like shared rides, and more space for pedestrians, cyclists, and low-speed cars. These improvements helped build social networks and foster a sense of community.*

*Building strong relationships, especially with newcomers, is crucial for local culture and acceptance of change, but it takes time. The main challenge is limited investment and slow decision-making in funding the regional economy. Some businesses are hesitant to move away from their established infrastructure and methods, creating a dependence on old technologies. To address this, financing should focus on the long-term potential of these changes, even if the progress is gradual*

### ***Lion's Den: Groningen's Crossroads: Navigating depopulation and economic transformation***

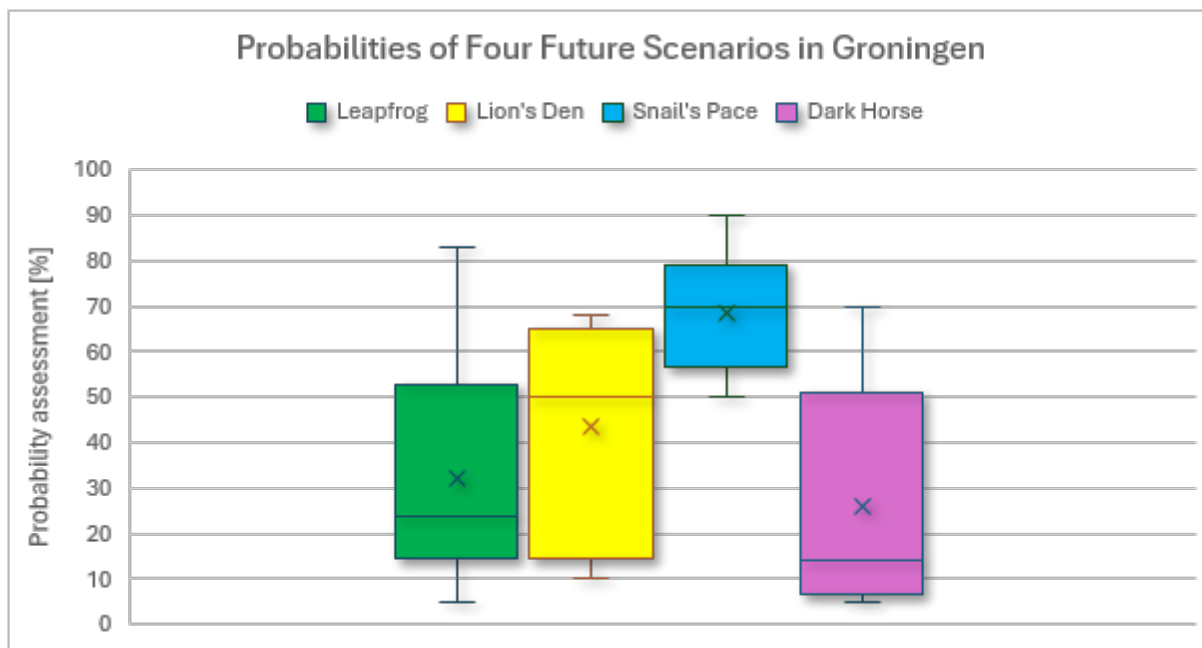
*By 2030, Groningen faces serious challenges from a shrinking population and economic instability. As the population ages and young people move to cities for better jobs, rural areas are at risk of economic collapse. The once strong agricultural and energy sectors are shrinking without transitioning to digital or green industries. Businesses are closing, services are disappearing, and the economy is stagnating. Meanwhile, housing prices in cities rise, deepening social divides and encouraging more migration. Groningen's future depends on bold policies promoting green energy, integrating migrants into the workforce, and investing in infrastructure. However, climate change and economic instability threaten the region's prosperity. Without action, urban-rural divides will continue to grow.*

## 4.8 SYNTHESIS OF SCENARIO PROBABILITY ASSESSMENT FOR GRONINGEN

### ***Probability of different scenarios occurring***

The four scenarios represent distinct pathways for the future development of Groningen, each shaped by varying assumptions related to economic transition, energy policy, demographic change, and social resilience. Drawing on expert evaluations collected through the Delphi survey, and informed by current regional trends, the assessed likelihood of each scenario differs significantly.

Figure 5 presents the average probability assigned to each scenario by participating experts, while Table 4 provides a detailed overview of scenario-specific features based on these expert insights.



**Figure 5.** The probability of four different scenarios occurring in Groningen.

Table 4 details the average probability of each scenario for Groningen and highlights key features based on expert insights.

**Table 4. Scenarios: Probabilities and key features based on expert insights (Delphi survey on Groningen).**

No.	Scenario type	Key Scenario Features based on experts' insights	Probability
1.	<i>Leapfrog</i>	<ul style="list-style-type: none"> <li>- Rapid progress driven by innovation, green energy, and digitalisation.</li> <li>- Boosted by infrastructure investments, university expansion, and cross-border cooperation.</li> <li>- Structural barriers remain: peripheral location, limited political influence, and competition from other Dutch regions.</li> <li>- Requires strong public support and strategic, long-term planning.</li> </ul>	<b>32.3%</b>

2.	<i>Lion's Den</i>	<ul style="list-style-type: none"> <li>- External shocks (e.g. geopolitical instability, education funding cuts, climate events) worsen vulnerabilities.</li> <li>- University and infrastructure underinvestment weaken resilience.</li> <li>- Affordability and quality of life offer some protection.</li> <li>- Risk of disruption grows due to policy neglect and global uncertainties.</li> </ul>	<b>43.5%</b>
3.	<i>Snail's Pace</i>	<ul style="list-style-type: none"> <li>- Development remains slow and uneven.</li> <li>- Structural issues: limited connectivity, aging population, cautious governance.</li> <li>- Progress driven by small-scale investments and subsidies.</li> <li>- Knowledge sector and livability persist as regional strengths, but no major transformation occurs.</li> </ul>	<b>68.4%</b>
4.	<i>Dark Horse</i>	<ul style="list-style-type: none"> <li>- Sudden breakthroughs from new university programs or revival of gas infrastructure under green rules.</li> <li>- Local civic innovation and national investment outside the Randstad spark change.</li> <li>- Potential for Groningen to emerge as a dynamic regional hub.</li> <li>- Scenario remains uncertain but plausible with the right conditions.</li> </ul>	<b>26.0%</b>

### **Key findings**

In accordance with the Delphi survey results, over the next five years, **Groningen is most likely to experience gradual, steady development rather than rapid, transformative change**. The **Snail's Pace scenario**, with an estimated likelihood of **68.4%**, aligns closely with **current regional trends and structural realities**. Despite Groningen's strong university presence, emerging green and digital sectors, and relatively high quality of life, persistent constraints such as its peripheral location, limited infrastructure, and moderate national policy focus will continue to slow progress. National investments remain concentrated in major metropolitan hubs like the Randstad, leaving Groningen with incremental improvements in innovation ecosystems and infrastructure - such as the ongoing development of the Lelylijn rail - but no dramatic breakthroughs.

The prospect of a **Leapfrog scenario** - where Groningen would rapidly outpace expectations through unexpected advancements - is considerably less likely, estimated at about **32.3%**. While niche innovations in hydrogen, AI-healthcare, or digital nomadism may yield moderate surprises, a full leap requires significant disruptive shocks or accelerated

momentum that are not currently in sight. The end of natural gas revenues further reduces the chance of an economic boost from that source.

External risks encapsulated in the **Lion's Den scenario** - such as geopolitical instability, climate pressures, or cuts to higher education funding - pose real but moderate threats, at **43.5%** likelihood. Groningen's affordability and social stability help shield it from immediate uncertainty, but underinvestment and potential policy shifts mean resilience-building measures in education, mobility, and housing will be vital to mitigate these vulnerabilities. Lastly, a **Dark Horse scenario**, where unforeseen factors catalyse significant change, remains a possibility but is relatively unlikely in the short term (around **26.0%**). This could involve strategic expansions of local universities, new national investments outside the Randstad, or regional energy collaborations. However, structural challenges and limited connectivity make rapid transformation uncertain without coordinated long-term planning. The **local stakeholder workshop participants validated** the outcomes of the Delphi survey: the **Snail's Pace was confirmed as the most likely path for Groningen** while the **Lion's Den** is regarded as material risk due to the earthquake hazard, fractured trust in the governance and strong disparity between the city of Groningen and rest of the region. The **Dark Horse and Leapfrog** are considered as less probable overall for the whole region. Nonetheless, limited upside cases may emerge, especially in areas like hydrogen and data infrastructure that primarily benefit the city of Groningen and a few other locations.

Participants also emphasised that the distinction between the city of Groningen and the wider province applies across all four scenarios, as the city and rural areas appear to follow different trajectories. Furthermore, organisation of cross-municipal projects that visibly link the University assets, skilled professionals and exploitation of existing infrastructure (digital, transport, housing, energy assets) could strengthen talent retention and "money landing" (improving procedures, attitudes, experiences to translate regional funds into regional/local projects).

In summary, Groningen's **near-term future indicates a continuation of gradual, incremental growth that aligns with its recent development patterns**. While the region's assets in innovation, infrastructure, and human capital will continue to underpin progress, significant breakthroughs are unlikely given the current policy environment and investment levels.

## 4.9 CASTILLA-LA MANCHA (SPAIN)

This section presents four future scenarios for Castilla-La Mancha by 2030, developed as part of the MOBI-TWIN framework and adapted to the regional context through two rounds of workshops with consortium experts. Each scenario is shaped by distinct trajectories in agriculture, demographic change, climate adaptation, and economic development. The narratives highlight strategic areas where policy interventions and targeted investments will be pivotal in influencing long-term regional outcomes:

***Leapfrog: Castilla-La Mancha's Strategic Shift: Navigating growth with or without relying on Madrid's proximity***

*By 2030, Castilla-La Mancha transformed from a vulnerable region into a leader in economic and demographic growth. Investments in rural areas, a strong social safety net, and efficient regional transportation - beyond just connections to Madrid - helped strengthen local communities. The region became a logistics hub linking Madrid to the rest of Spain, modernized its agricultural sector with advanced technology, and expanded sustainable tourism. Digitalisation and renewable energy potential attracted newcomers, including remote workers.*

*The "smart villages" approach fostered collaboration between residents and institutions, reducing urban-rural inequalities, improving rural life, and addressing climate resilience and sustainable energy. A better quality of life reversed population decline, with the previous year marking the first gain in population in many years, boosting a green, multi-sector economy. To maintain these achievements, long-term strategies and political agreements are essential. A focus on sustainability, green industries, and regional connectivity will ensure Castilla-La Mancha remains a strong and attractive region for the future.*

#### ***Dark Horse: Castilla-La Mancha's Green and Digital Rise: Navigating regional transformation***

*By 2030, Castilla-La Mancha has thrived as a centre for green energy and digital innovation, attracting young, eco-conscious newcomers from cities. Investments in wind power and digital farming have boosted the economy, while better transport and remote work options strengthen ties to Madrid. However, challenges persist, such as dependence on short-term projects and regional competition. To ensure lasting growth, the region must maintain political stability, diversify its economy, and invest strategically, serving as a model for rural development.*

*A key focus for the future will be improving communication and transport infrastructure within the region itself, not just with Madrid, to ensure better connectivity between urban and rural areas.*

*Looking forward, continued focus on sustainable industries, regional collaboration, and long-term planning will be crucial to secure Castilla-La Mancha's future as a leading example of rural prosperity and innovation.*

#### ***Snail's Pace: Castilla-La Mancha's Struggle: Facing economic and demographic shifts***

*By 2030, Castilla-La Mancha's rural areas continue to decline due to an aging population and the migration of young, educated workers to cities like Madrid. This leads to isolation and economic stagnation in these areas. A lack of funding for infrastructure upgrades, especially transportation, makes public services unsustainable, further widening the gap between rural and urban areas. Provincial capitals experience some growth but struggle to accommodate new residents. Local industries are slow to adopt new technologies, and the insufficient innovation stifles economic progress. As a result, capital cities cannot effectively bridge the gap between rural areas and urban opportunities.*

*With fewer young people staying or returning, the shrinking workforce limits the region's ability to implement modern solutions or attract investment. This cycle of depopulation and stagnation seems impossible to break, leaving Castilla-La Mancha stuck in a state of decline and uncertainty.*

*To reverse this trend, targeted investments in infrastructure, technology adoption, and incentives for young entrepreneurs are needed, alongside policies that encourage the return of skilled workers and improve access to rural opportunities.*

### ***Lion's Den: Castilla-La Mancha's Challenge: Confronting economic decline and demographic change by 2030***

*By 2030, Castilla-La Mancha is facing challenges due to its aging population and proximity to Madrid. While some areas have grown through urban sprawl, others still rely on traditional industries and agriculture, which are losing competitiveness. Rural areas suffer from outmigration as younger people move to Madrid for better jobs and amenities. At the same time, the aging population increases the demand for social and healthcare services.*

*Migration is not only limited to Madrid, second-tier cities like Albacete, Ciudad Real, Cuenca, Guadalajara, and Toledo also disrupt population balance, further challenging rural areas and smaller towns.*

*Despite these challenges, Castilla-La Mancha sees potential in the ongoing transformation of its economy and infrastructure. Efforts to improve transportation, digital infrastructure, and renewable energy are showing promise. However, outdated agricultural practices still hold back the region, risking continued economic stagnation and inequality without intervention.*

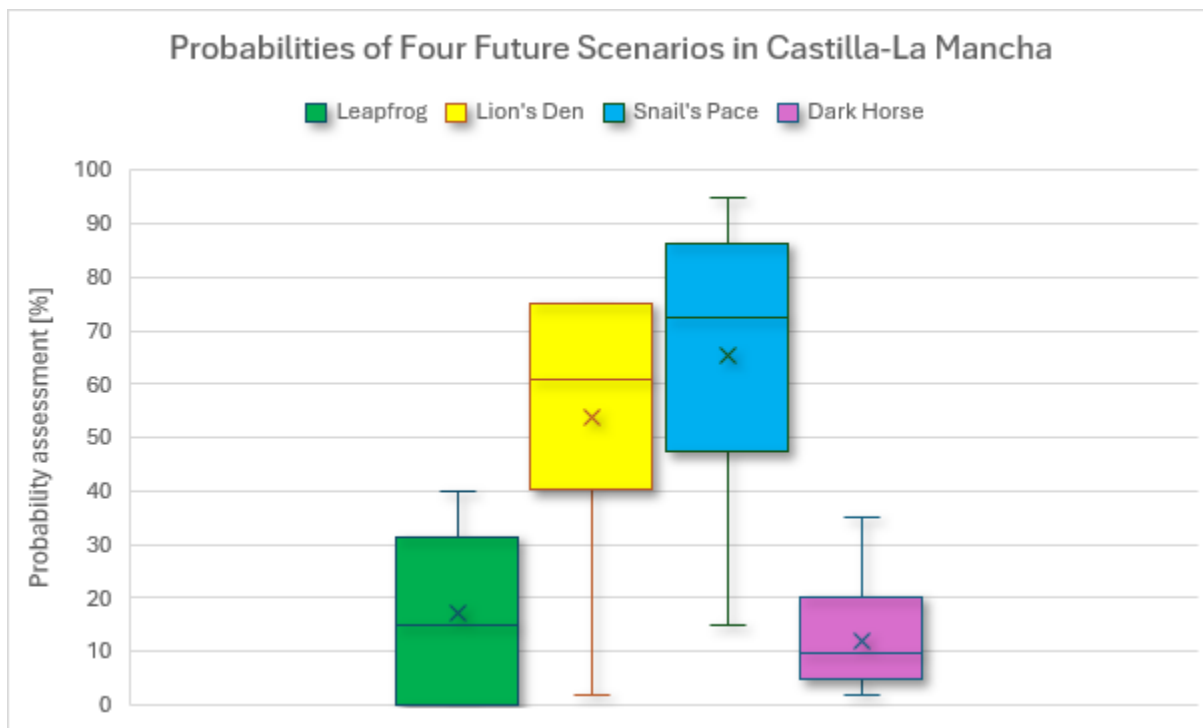
*The local government has started implementing green policies and promoting digitalisation, but progress is slow. Many residents still experience limited opportunities, poor services, and social isolation. The region's future depends on modernizing its economy, embracing new technologies, and building a sustainable rural-urban balance that attracts residents and investors for long-term prosperity.*

## 4.10 SYNTHESIS OF SCENARIO PROBABILITY ASSESSMENT FOR CASTILLA-LA MANCHA

### ***Probability of different scenarios occurring***

The four scenarios outline different potential pathways for Castilla-La Mancha's future development. Based on expert assessments gathered through the Delphi survey and an analysis of current regional trends, the likelihood of each scenario materialising varies significantly.

Expert estimates of the average probability for each scenario in Castilla-La Mancha are presented in Figure 6 and detailed in Table 5, which also outlines the key features identified through expert insights.



**Figure 6.** The probability of four different scenarios occurring in Castilla-La Mancha.

Table 5 details the average probability of each scenario for Castilla-La Mancha and highlights key features based on expert insights.

**Table 5. Scenarios: Probabilities and key features based on expert insights (Delphi survey on Castilla-La Mancha).**

No.	Scenario type	Key Scenario Features based on experts' insights	Probability
1.	<i>Leapfrog</i>	<ul style="list-style-type: none"> <li>- Rapid progress driven by innovation, digitalisation, and green transition.</li> <li>- Strengths in renewables, logistics, and smart tourism sectors.</li> <li>- Challenges include rural depopulation, aging population, low innovation, and competition from Madrid.</li> <li>- Requires strong public investment, long-term planning, and improved rural governance.</li> <li>- Considered unlikely without these supportive conditions.</li> </ul>	<b>17.0%</b>

2.	<i>Lion's Den</i>	<ul style="list-style-type: none"> <li>- External shocks (economic, geopolitical, climate) worsen internal vulnerabilities.</li> <li>- Demographic decline, weak innovation, regional disparities, and reliance on traditional sectors.</li> <li>- Youth migration to Madrid accelerates talent loss.</li> <li>- Likely scenario without decisive policies for resilience and cohesion.</li> </ul>	<b>53.6%</b>
3.	<i>Snail's Pace</i>	<ul style="list-style-type: none"> <li>- Slow, disparate development with aging demographics and limited diversification.</li> <li>- Weak institutional coordination hinders progress.</li> <li>- Some local improvements via EU and national funds.</li> <li>- Most likely scenario without systemic reforms.</li> </ul>	<b>65.5%</b>
4.	<i>Dark Horse</i>	<ul style="list-style-type: none"> <li>- Unexpected surge from investments in green hydrogen, defence, or remote work infrastructure.</li> <li>- Castilla-La Mancha's assets could support growth.</li> <li>- Limited institutional capacity and innovation make it unlikely.</li> <li>- Requires coordinated action and favourable external factors.</li> </ul>	<b>12.1%</b>

### **Key findings**

**Based on the Delphi expert assessments, Castilla-La Mancha is most likely to follow a Snail's Pace development trajectory** over the next five years, with a **65.5% probability**.

Progress is expected to remain slow and uneven, shaped by structural limitations and reactive policymaking. The region's dependence on traditional sectors, demographic stagnation, territorial imbalances, and institutional fragmentation constrain transformative change. While EU and national funds may enable localized progress - especially in better-connected areas - **systemic challenges such as rural depopulation, weak innovation, and low economic diversification** will likely reinforce a path-dependent trajectory. Without a coherent and sustained territorial strategy, transformative development remains out of reach.

**The Lion's Den scenario holds a 53.6% probability**, reflecting the **significant risk posed by external disruptions and structural vulnerabilities**. Demographic decline, youth outmigration, aging populations, and weak innovation ecosystems leave Castilla-La Mancha exposed to market volatility, climate risks, and the centripetal pull of Madrid. Without strong and adaptive governance, regional competitiveness and social cohesion

may erode further. This scenario is especially plausible if international shocks intersect with ongoing internal weaknesses and policy inertia.

**The Leapfrog scenario has a 17,0% probability**, and though unlikely, it is not impossible. Significant breakthroughs could emerge from strategic investment in renewables, smart tourism, and digitalisation, but would require coordinated policies, improved governance, and long-term planning—conditions not yet in place.

**The Dark Horse scenario is the least likely at 12.1%**, imagining an unexpected surge driven by large-scale investment in sectors like green hydrogen or defence. However, limited institutional capacity and infrastructure gaps make such a turnaround difficult in the near term.

On alignment with Delphi survey probabilities, the participants of **local stakeholder workshop accepted the Snail's Pace as an appropriate scenario** at the regional scale, given long running demographic decline in large rural zones, gender imbalance and the concentration of growth near the Madrid interface. On the **Lion's Den**, the participants accepted the vulnerability of the region due to both internal weaknesses such as youth outmigration, low innovation besides a few nodes and external shocks, including climate change and energy price volatility.

For the **Leapfrog**, the potential is seen as real but the governance's capacity to coordinate and embed value chains, deeper human capital investments, stronger links between renewables and industry as well as stable financing remains limited. The gravitational pull of Madrid is recognised as a structural risk, although the flows of population can go in both directions. The suggested framing was to turn proximity into an advantage by improving door-to-door regional connectivity, supporting hybrid work with services in secondary towns, as well as using housing policy and mid-sized urban anchors to retain talent. For the **Dark Horse**, the participants confirmed its probability in line with the Delphi survey results and mentioned the under-valued opportunities across the green transition such as advanced storage and data centers, component manufacturing, alongside tourism linked to natural and cultural assets. The participants also cautioned that without reliable services, quality jobs and stronger governance in the most depopulated areas, a surprise upswing would be hard to achieve and sustain beyond a few enclaves.

The discussion converged on the need for a **granular approach and territory-by-territory demand tailored packages**. For example, in terms of digitalisation, it is not enough to simply provide Internet access or open a small centre given the very low population densities. It is more plausible to focus on creating locally anchored employment and services, using renewable energy value chains and year-round rural tourism offers as immediate levers, rather than assuming that connectivity alone will reverse out-migration. On the green transition, the participants highlighted that the bulk of investment is a private capital, which shows the resilience of the factor. They acknowledged the importance of the sector but warned that even well-endowed municipalities, rich in energy revenues, continue to lose inhabitants, which illustrates the limits of an economic lever when deeper structural challenges are not tackled.

In summary, **Castilla-La Mancha is expected to continue along a slow-growth path, driven by structural inertia, demographic challenges, and limited innovation**. While the region holds underutilized assets that could support transformative change, realizing

alternative development paths will require decisive, strategic, and sustained policy interventions. In the absence of such shifts, vulnerability to external shocks and incremental, uneven progress are the most likely outcomes.

## 5 INTEGRATION OF RELEVANT RRI PILLARS

MOBI-TWIN places the societal dimension of spatial mobility at the core of its research activities. It aligns the project's activities with the pillars of Responsible Research and Innovation (RRI) (European Commission 2013, 2022) - *science education, gender equality, governance, open science, public engagement and ethics* - to ensure that outcomes, outputs and impacts meet as much as possible the needs of society ([MOBI-TWIN D4.1](#)).

The RRI pillars mainstreamed into the activities described in this report are *gender equality, open science and public engagement*.

### ***The integration of the Gender dimension***

The Delphi survey was designed to capture differentiated impacts across population groups, with particular attention to gender. It included a dedicated set of questions focused on gender-disaggregated projections at the regional level. To directly assess sex and gender-related impacts, participants were asked to anticipate population changes by gender identity under each scenario type. These questions were carefully structured to include non-binary and gender-diverse individuals, aligning with the project's inclusive and respectful approach to gender identity. In designing the survey, gender sensitivity was also reflected in the expert panel itself, which included participants of different genders to help ensure diverse perspectives and lived experiences were considered throughout. The responses provided valuable region-specific insights into how various gender groups may be differently affected by future mobility patterns and digital transition processes.

### ***The integration of Open Science***

Open science principles guided the T3.2 activities from the initial stage and were embedded at every stage of the methodological process. The initial literature review and project input analysis were documented transparently, establishing a clear conceptual framework accessible to all consortium members. Preparatory materials for the co-creation meetings were shared internally for further feedback to promote collaborative development of scenario narratives.

Following the two co-creation workshops, all data, assumptions, and refined scenario descriptions were systematically compiled and organized. The Delphi survey was conducted with a transparent methodology, and its findings will be openly published at a later stage. The outcomes - including the detailed final report and survey results - will be deposited in an open-access repositories, ensuring full transparency, enabling peer

review, and facilitating broad dissemination to the research community, policy makers, and the public.

### ***The integration of Public engagement***

Public engagement was a central component of Task 3.2 and was operationalised through a structured and inclusive stakeholder consultation process. The Delphi survey, launched via the eDelphi platform, brought together stakeholders from across the five MOBI-TWIN pilot regions, including representatives from government and the public sector, policy-making bodies, the private sector, academic and research institutions, international organizations, civil society, community leaders, social services, and groups representing vulnerable populations.

Stakeholder identification followed a carefully designed mapping process and the use of a standardised contact list template, ensuring targeted outreach while promoting balanced geographic and sectoral representation. Specific attention was given to engaging underrepresented groups and vulnerable populations, in alignment with the project's commitment to RRI principles.

The survey was developed to ensure clarity and user-friendliness, accompanied by detailed supporting materials - including usage guidelines, regional scenario descriptions based on typologies, and relevant statistical documents - to facilitate meaningful participation. A total of 60 stakeholders completed the survey, providing valuable insights that directly informed the validation and refinement of the scenario narratives. This participatory approach ensured that the scenarios reflect diverse regional experiences and expert perspectives across demographic, economic, and social dimensions.

Building on this engagement, follow-up regional stakeholder workshops were held in September–October 2025. These sessions provided a space for dialogue around the survey findings, allowing stakeholders to assess the scenarios' regional relevance and share contextual insights. This process not only strengthens the regional grounding of the scenario outcomes but also supports MOBI-TWIN's broader objective of fostering co-creation, public engagement, knowledge exchange, and stakeholder empowerment beyond the core research activities of the project.

## **6 CONCLUSION**

Across the regions analysed - North and East Finland, Central Macedonia, Lombardy, Groningen, and Castilla-La Mancha - a consistent pattern emerges, slow and unbalanced development is the most likely near-term trajectory. The **Snail's Pace scenario dominates expert assessments in all pilot regions**, with probabilities ranging from around **52% in Lombardy to over 75% in Central Macedonia and 69% in North and East Finland**. This path is characterized by phased progress hampered by structural barriers such as aging populations, limited infrastructure, weak innovation ecosystems, and regional policy fragmentation.

External shocks, reflected in the **Lion's Den scenario**, present a significant risk in all regions, with **probabilities between roughly 40% and 55%**. Geopolitical tensions, climate impacts, economic volatility, and demographic pressures amplify vulnerabilities, threatening regional stability and economic prospects. These shocks can disrupt traditional sectors, worsen social cohesion, and expose institutional weaknesses.

While less likely, the **Leapfrog and Dark Horse scenarios remain important possibilities**. **Leapfrog scenarios**, with probabilities typically **below 20%**, envision rapid, transformative growth driven by innovation, green transition, and strategic investments. Such outcomes require strong public support, coordinated policies, and overcoming entrenched institutional hurdles. **Dark Horse scenarios (often 12–27%)** describe unexpected breakthroughs triggered by innovations, external investments, or geopolitical shifts. Though unlikely in the short term, these scenarios highlight the potential for accelerated change if favourable conditions align.

These findings are grounded in Delphi survey results and scenario validation local stakeholder workshops, offering an evidence-based foundation for regional foresight and policy design.

**Stakeholder workshops confirmed and enriched these findings**, emphasizing strong regional heterogeneity, with cities and innovation hubs advancing faster than rural areas. Demographic decline and talent retention are key challenges, while opportunities in green transition, digital infrastructure, and tourism require coordinated governance. Trust, social cohesion, and transparent governance are essential, especially in crisis-affected regions. Bottom-up, locally tailored strategies and qualitative factors - such as seasonal residents, immigrants, retirees, and remote workers - support local vitality. **Snail's Pace remains the default, but targeted interventions can enable Leapfrog or Dark Horse outcomes.**

#### **Areas for further research and the next steps:**

Given these insights, further research should focus on:

- **Policy design for resilience and innovation:** identifying effective governance frameworks and investment strategies to build regional resilience against external shocks and unlock innovation-led growth.
- **Demographic and social dynamics:** deepening understanding of migration trends, aging populations, and skills retention to inform workforce development and social cohesion policies.
- **Infrastructure and connectivity:** exploring targeted infrastructure upgrades - transport, digital, and energy networks - that can catalyse more balanced regional development.
- **Scenario monitoring and early warning systems:** developing tools to track indicators relevant to the Lion's Den and Dark Horse scenarios, enabling timely policy responses to emerging risks or opportunities.
- **Further refining the four scenarios in the long term:** exploring heterogeneity, intra-regional divergence within each region beyond 2030 (metropolitan ring,

mid-size towns, rural areas) for spatially differentiated scenarios storylines and considering their different needs and dynamics in policymaking and practical implications.

- **Cross-regional learning:** facilitating knowledge exchange across the studied regions to share best practices in overcoming structural constraints and leveraging EU or national funds effectively.

These research directions align with the next phases of the project, emphasizing actionable **policy recommendations, scenario refinement, and stakeholder engagement to support sustainable, inclusive regional development.**

The scenarios developed in this deliverable are to be directly used as inputs to the **MOBI-TWIN model**, as described in [D3.1 \(Methodological report describing the MOBI-TWIN model\)](#), to estimate the effects of spatial mobility across different types of EU regions – including **left-behind, metropolitan, and rural areas**. Furthermore, the insights generated here will inform two additional deliverables: [D3.3 – The effects of spatial mobility during twin transition on selected left-behind and demographically declining areas](#), particularly in terms of demographics, society, welfare system, and labour market; [D3.4 – The effects of spatial mobility during twin transition on regional inequality and sustainability in the identified EU regional typologies](#).

These connections ensure that the scenario-based foresight work developed here feeds directly into the project's core modelling, analysis, and policy evaluation components, maintaining continuity across tasks and work packages.

To complement the expert-driven Delphi assessment, the scenarios were also validated and enriched through **stakeholder workshops** in each pilot region in September and October 2025. These sessions engaged **a broader set of participants**, including regional actors and members of the public, to ensure the scenarios reflect local realities, identify region-specific risks and opportunities, and strengthen the relevance of policy implications. The workshops will also support ongoing efforts under Task 4.1 to promote inclusive engagement and RRI practices within the MOBI-TWIN project.



## 7 REFERENCES

- [1] Dahl, S., Ballas, D., Vilarchao, E., Glowacka, N., Järv, O., López-Tamayo, J., Panori, A., Psycharis, Y., Matsaganis, E., Mariotti, I., Rossi, F., Alfieri, L., Montanari, M.G. (2024). [Deliverable no. D4.3 Review of EU policies and risk mitigation measures affecting freedom of movement between regions](#). *MOBI-TWIN project*.
- [2] European Commission, DG for Research and Innovation (2022). Approaches to inclusive gender equality in research and innovation (R&I). Retrieved on 27/07/2025 from: <https://data.europa.eu/doi/10.2777/004694>
- [3] European Commission, DG for Research and Innovation (2013). Options for Strengthening Responsible Research and Innovation: Report of the Expert Group on the State of Art in Europe on Responsible Research and Innovation. Retrieved on 27/07/2025 from: <https://op.europa.eu/en/publication-detail/-/publication/1e6ada76-agf7-48fo-aa86-4fb9b16dd10c>
- [4] OECD Regional Development Studies, Rethinking Regional Attractiveness in the New Global Environment (2023). Retrieved on 27/07/2025 from: [https://www.oecd.org/en/publications/rethinking-regional-attractiveness-in-the-new-global-environment\\_a9448db4-en.html](https://www.oecd.org/en/publications/rethinking-regional-attractiveness-in-the-new-global-environment_a9448db4-en.html)
- [5] MOBI-TWIN Project (2025). MOBI-TWIN: Two co-creation workshops on regional mobility and the future of EU demographics. Retrieved on 27/07/2025 from: <https://mobi-twin-project.eu/mobi-twin-two-co-creation-workshops-on-regional-mobility-and-the-future-of-eu-demographics/>
- [6] Panori, A., Kakderi, C., Komninos, N., Mariotti, I., Rossi, F.M., Alfieri, L. (2023). [Deliverable no. D1.1 State-of-the-art report on the drivers, forms and effects of spatial mobility on EU regions](#). *MOBI-TWIN project*.
- [7] Panori, A., Jarv, O., Kakderi, C., Väisänen, T., Malekzadeh, M., Havusela, M., Inkeröinen, O., Vilarchao, E., Glowacka, N. (2024). [Deliverable no. D2.1. Report on current mobility flows and existing regional attractiveness measures in the EU](#). *MOBI-TWIN project*.
- [8] United Nations Development Programme (UNDP). (2022). The Creative Approach: Archetype Scenarios. In Futures of Development. UNDP Future Development Series. Retrieved 21/10/2025 from <https://www.undp.org/future-development/chapter-2-identifying-development-challenges/creative-approach-creative-approach-overview/creative-approach-archetype-scenarios/>
- [9] Väisänen, T., Malekzadeh, M., Havusela, M., Inkeröinen, O., Järv, O. (2024). [Deliverable no. D1.2. Complete Mobi-Twin dataset](#). *MOBI-TWIN project*.

[10] Vilarchao, E., Ipolyi, I. M. (2023). [Deliverable no. D4.1 Alignment of MOBI-TWIN with RRI principles – First](#). *MOBI-TWIN project*.

## ANNEX 1

### Concept note on co-creation workshops

The present document outlines the structure and content of two **MOBI-TWIN co-creation workshops** organised respectively on **24 January** and **4 February 2025**. All consortium partners were required to take part in both workshops. Each workshop was half a day long (three hours) and took place online.

This document also includes an Annex (Annex 2 in this document) which describes the **rationale and methodology of the future scenarios** and provides **specific guidelines for their development**. These guidelines adhere to the overall rationale and methodology for scenarios, but they are concurrently tailored to the objectives of MOBI-TWIN. The core methodology mentioned and described in this concept note draws to the [European Foresight Platform](#) (listed as a scientific tool under EC's science hub), as well as to [EULAC FOCUS D6.2 - Methodological guideline for the scenario building process](#).

#### 1. Overview

The workshops aimed at supporting the **development of four specific scenarios** regarding the ways on which different regional typologies as identified in the **Regional Attractiveness Index (MOBI-TWIN D2.1)** will be **affected by spatial mobility in terms of their demographic, social, welfare system and labour market structure**, considering the level of digitalisation in their labour market structure. The scenario building also relies on the outcomes of the **EU policies analysis and risk mitigation measures** affecting freedom of movement between regions (*MOBI-TWIN D4.3*; will be published soon on [MOBI-TWIN website](#)).

In turn, the **scenarios will feed the MOBI-TWIN model (T3.1)** – which will simulate spatial mobility flows to estimate their effects on EU regions (left behind, metropolitan and rural areas) in subsequent WP3 tasks (**T3.3 and T3.4**).

Four different types of scenarios were developed:

- *A – Leapfrog*
- *B – Dark horse*
- *C – Snail's pace*
- *D – Lion's den*

**During Workshop 1 (24 January 2025)**, the partners brainstormed and collaboratively developed the concept of each scenario (big vision, possible parameters, rough narratives) - to explore potential future pathways for regional development considering emerging trends and challenges. Relevant exercises were done, the ideas for the scenario

development were collected and discussed collectively. The overall aim of this Workshop was to end up with roughly formulated four scenarios, each of them including the demographic, socio-economic, geographic, skills and labour market dimensions.

**During Workshop 2 (4 February 2025)**, the draft, more consolidated scenarios were presented for further discussion and fine-tuning. Amendments collaboratively took place during the meeting.

After Workshop 2, the T3.2 partners led by ESF, incorporated and adjusted feedback received, for further refinement of the scenarios as well as for their feasibility check and validation through the Delphi survey involving around 60 experts in migration all over Europe. The survey took place in May-June 2025. After the survey and based on feedback collected, the scenarios were finalised and will be presented in detail in the relevant deliverable (D3.2, due 31 August 2025).

## 2. Workshop 1 (24 January 2025, 10:00 am – 1:00 pm/CET)

The MOBI-TWIN consortium received the present concept note prior to Workshop 1. The concept note was explained in detail by ESF representatives at the beginning of the meeting, together with the agenda and expected outcomes.

### 2.1 Objectives of the Workshop

To collaboratively develop four spatial mobility scenarios, with guided brainstorming, to explore potential future pathways for regional development considering emerging trends and challenges.

### 2.2 Expected Outcomes

Ideas and strategies developed for each of the four scenarios, focusing on how regional typologies might respond to spatial mobility changes, while identifying potential risks, opportunities, and key regions for further analysis.

### 2.3 Agenda of the Workshop

1st Co-Creation Meeting		
10:00-10:05	<b>Introduction &amp; Overview:</b> <i>Brief overview of the T3.2 and its objectives</i> <i>Explanation of the co-creation process and goals of the meeting</i>	ESF

10:05-10:10	<b>Introduction to key variables:</b> <i>Overview of the key variables that will inform the scenario development:</i> <ul style="list-style-type: none"> <li>- Regional Attractiveness Index</li> <li>- Demographics</li> <li>- Social and welfare systems</li> <li>- Economic and labour market structure</li> <li>- Mobility and transportation</li> <li>- Digital transition and technology</li> <li>- Environmental and Climate Factors</li> <li>- EU Policies</li> </ul>	ESF	
10:10-10:15	<b>Outline of the four scenarios to be developed (shared understanding of the objectives and scenarios):</b> <i>Leapfrog</i> <i>Dark Horse</i> <i>Snail's Pace</i> <i>Lion's Den</i>	ESF	
<b>Break-up Groups (60* minutes each)</b> <i>*In each group, participants will use the pre-defined questions to brainstorm and develop the content for their assigned scenario</i>  Each group will be responsible for: <ul style="list-style-type: none"> <li>- <i>Identifying key drivers for each scenario (e.g., demographic changes, economic shifts, technological disruptions)</i></li> <li>- <i>Defining specific regional challenges and opportunities</i></li> <li>- <i>Understanding how these factors intersect and affect the region's development trajectory</i></li> </ul>			
10:15-11:15	<b>Breakout Group 1:</b> <b>Scenario 1: Leapfrog</b> – Improvement through rapid progress overcoming obstacles <b>Objective:</b> <i>Explore how regions could achieve rapid progress despite obstacles, leveraging innovation or emerging trends.</i>	<b>Breakout Group 2:</b> <b>Scenario 2: Dark Horse</b> – Unexpected victory from a region no one expected <b>Objective:</b> <i>Examine the possibility that an unexpected region could outperform others due to hidden advantages or unforeseen developments.</i>	ESF, all
<b>Break (15 minutes)</b>			

11:30-12:30	<b>Breakout Group 3:</b> <b>Scenario 3: Snail's Pace</b> – Evolution happening very slowly <i><b>Objective:</b> Address the challenges where mobility systems and regional development progress slowly due to barriers or resistance.</i>	<b>Breakout Group 4:</b> <b>Scenario 4: Lion's Den</b> – Dangerous or threatening circumstances <i><b>Objective:</b> Explore the risks and challenges that could jeopardize progress in certain regions, focusing on threats to mobility and regional prosperity.</i>	ESF, all
12:30-12:50	<b>Breakout Group presentations</b> <b>5 minutes per group</b> <b>Each group presents their draft scenario, covering:</b> <ul style="list-style-type: none"> <li>- Key drivers and trends identified</li> <li>- Narrative of the scenario (short-term and long-term outcomes)</li> <li>- Possible challenges and opportunities</li> <li>- Specific policies and interventions that could shape or improve the scenario's outcome</li> </ul> <i>*After each presentation, participants will have the chance to ask questions or provide feedback on the scenario.</i>		ESF, all
12:50-13:00	<b>Synthesis and next steps:</b> Overview of the next steps in the scenario development process Define follow-up tasks and deadlines Information about the 2 <sup>nd</sup> co-creation meeting		ESF, all
<b>End of the meeting</b>			

## 2.4 Tools

During the workshop, the facilitator filled in the **pre-developed template on each scenario**, with support from the group participants. This template was then used for the presentations of each group work outcomes at the plenary, but also as a basis for consolidating the draft scenarios for the Workshop 2 activities.

## 3. Workshop 2 (4 February 2025, 10:00 am – 1:00 pm / CET)

In the period between Workshop 1 and Workshop 2, the representatives of ESF and other T3.2 partners relied on the ideas and feedback received to create a more detailed version of each of the four scenarios. Particular emphasis was placed on the narratives they developed.

During the Workshop, after a short introduction the consortium was separated into the breakout rooms. While being in the breakout rooms, everyone collaboratively refined and proposed amendments for the scenarios.

### 3.1 Objectives of the Workshop

To refine and finalize the four regional scenarios, incorporating feedback and ensuring robustness through impact analysis and resilience testing.

### 3.2 Expected Outcomes

- Four scenarios are refined, while incorporating resilience insights and key external factors.
- Consensus on the final scenario content is achieved.
- Clear next steps for integrating scenarios into the MOBI-TWIN model are agreed.

### 3.3 Agenda of the Workshop

2nd Co-Creation Meeting		
10:00- 10:10	<p><b>Welcome &amp; main thoughts from the 1<sup>st</sup> co-creation meeting</b></p> <p><i>Brief introduction to the meeting objectives</i></p> <p><i>Overview of the co-creation process and importance of fine-tuning the scenarios</i></p>	ESF
10:10- 10:20	<p><b>Recap of key insights from the 1<sup>st</sup> meeting:</b></p> <p><i>Review of the four scenarios: Leapfrog, Dark Horse, Snail's Pace, and Lion's Den</i></p> <p><i>Fine-tuning content and reaching consensus</i></p>	ESF
<p><b>Break-up Groups</b></p> <p><i>*Participants will be split into two groups, each working on refining two scenarios.</i></p> <p><i>Group Assignments:</i></p> <p><i>Group 1: Leapfrog &amp; Dark Horse</i></p> <p><i>Group 2: Snail's Pace &amp; Lion's Den</i></p>		
10:20- 11:00	<p><b>Fine-tuning of scenarios: Group exercise 1 (Scenario refinement):</b></p> <p>Each group will continue to build upon the content developed in the first meeting, addressing the following:</p> <ul style="list-style-type: none"> <li>- <i>Review the key drivers, trends, and outcomes identified</i></li> <li>- <i>Identify and fill in any gaps or missing elements from the scenarios</i></li> <li>- <i>Refine assumptions made for each scenario, particularly around the role of mobility, demographics, economic trends, and EU policies</i></li> <li>- <i>Consider the short- and long-term impacts on the region and evaluate the feasibility of the scenario</i></li> </ul>	ESF, all

11:00-11:50	<p><b>Fine-tuning of scenarios: Group exercise 2 (Scenario impact &amp; resilience testing):</b> *the same group assignment</p> <p><i>To evaluate how each scenario could evolve under different external conditions and test its resilience to both positive and negative shocks, ensuring that the scenarios are robust and adaptable.</i></p> <p><b>Scenario impact analysis (25 mins)</b></p> <ul style="list-style-type: none"> <li>- Each group will assess the impact of one external factor (e.g., EU policy change, global economic shift, environmental crisis, technological innovation) on their assigned scenarios.</li> <li>- The group should discuss how this factor could influence the trajectory of the scenario—either accelerating or hindering the projected developments.</li> </ul> <p><b>Testing Resilience (25 mins)</b></p> <ul style="list-style-type: none"> <li>- Groups will test their scenario's resilience by imagining one positive and one negative shock. Consider both disruptions (e.g., technological leap, political changes) and crises (e.g., economic recession, environmental disaster).</li> <li>- Identify whether the scenario remains feasible or shifts significantly under these conditions.</li> </ul>	ESF, all
<b>Break (15 minutes)</b>		
12:05-12:35	<p><b>Breakout Group presentations:</b></p> <p><b>*15 minutes per group</b></p> <p>*Each group will present the refined version of their assigned scenarios</p> <p><u>Presentations should cover:</u></p> <ul style="list-style-type: none"> <li>- Refined narrative and key developments</li> <li>- Concrete examples of how mobility, digitalisation, demographics, and EU policies impact the region in their scenario</li> <li>- Short-term and long-term outcomes</li> <li>- Critical factors (positive or negative) that could shift the scenario's trajectory</li> <li>- Resilience of the scenario to changes and external disruptions</li> </ul>	ESF, all
12:35-13:00	<p><b>Consensus exercise: Finalizing scenarios:</b></p> <p><i>Review of the four scenarios (making necessary adjustments)</i></p> <p><i>Agreement on the final versions of the scenarios</i></p> <p><i>Next steps</i></p>	ESF, all
<b>End of the meeting</b>		

### 3.4 Tools

During the workshop, the facilitator filled in the ***pre-developed template/document on each scenario***, with support from the group participants. This template was then be used for the presentations of each group work outcomes at the plenary, but also as a basis for making the scenarios ready for the Delphi survey.

## ANNEX 2

# Future scenarios: Overall concept and accompanying guidelines for the MOBI-TWIN scenarios

A scenario is a 'story' illustrating visions of possible future or aspects of possible future. It is perhaps the most emblematic Foresight or future studies method. Scenarios are not predictions about the future but rather similar to simulations of some possible futures. They are used both as an exploratory method, or as a tool for decision-making. An early definition provided for the future scenarios is the following:

*"Scenario sets provide vividly contrasting narrative descriptions of how several uncertain aspects of the future might evolve. The scenarios are projections of a potential future. They are a combination of estimations of what might happen and assumptions about what could happen, but they are not forecasts of what will happen. A projection should be interpreted as one view of the future that is based upon specific information and a set of logical assumptions."* (Fahey and Randall, 1998).

Drawing to the above definition, it should be highlighted that a future scenario is a tool, in other words a means and not an end. The major outcome that emerges after using the scenario as a "tool" is the triggering of a learning process ("scenario learning"). This scenario learning can then provide indications for new decisions and/or new activities, based on possible futures.

Specific core procedures (core steps) must be followed during the scenario building process. We depict (Figure 1) and describe below the specific stages and processes that should be followed for developing the scenarios in MOBI-TWIN.

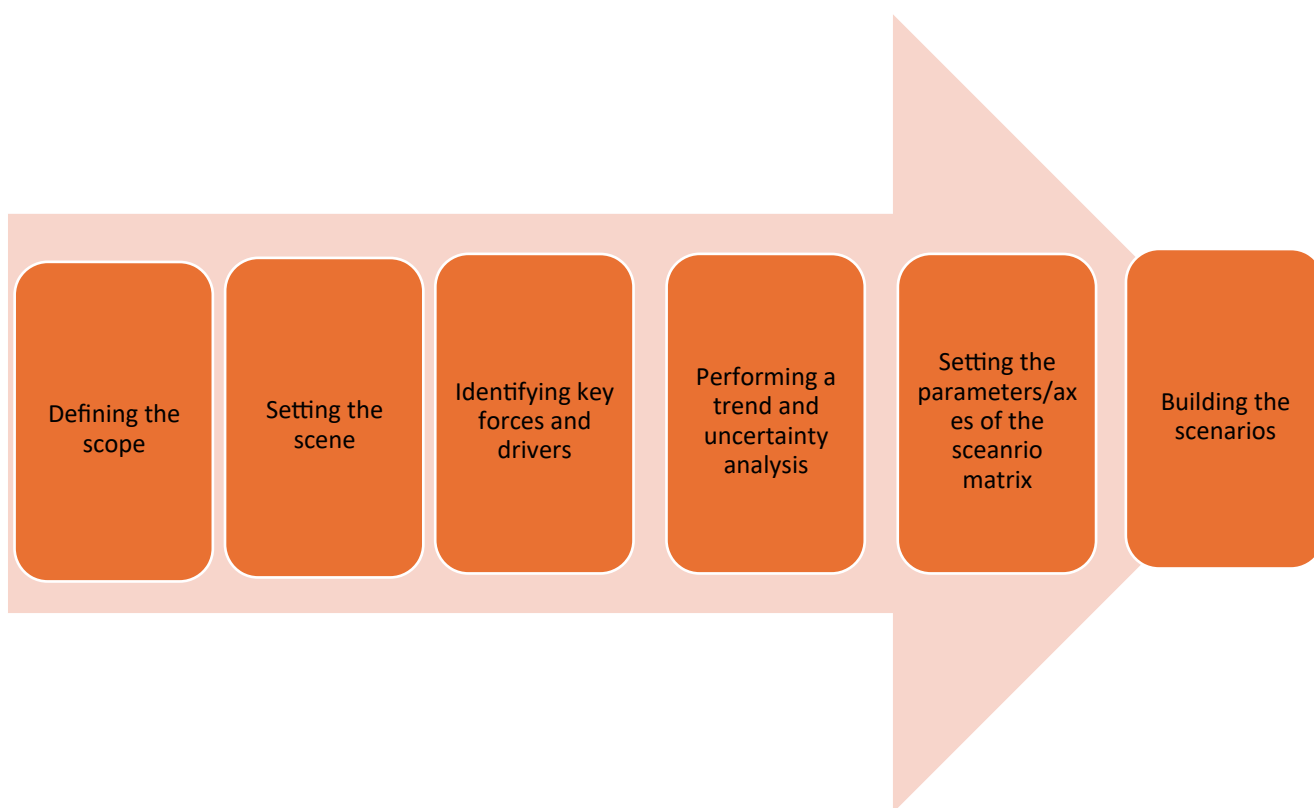


Figure 1. The core steps in the scenario building process

### Step 1: Defining the scope

During this first step, all consortium partners have to answer a few core questions related to the building of the four scenarios. First, the frame of the scenarios needs to be set by setting a time horizon; the time horizon refers to the end date of the scenario and the years it covers. The next important aspect that needs to be decided refers to the focal issue/big question that is addressed by the scenarios. If it is deemed as necessary, additional key questions can be answered – complementarily to the core question.

With reference to the EU policies mapped and analysed in the [D4.3](#), the time horizon was defined as the year 2030, as agreed with the WP3 lead.

The core question that needs to be addressed is the following:

***“What is the big vision for how regional typologies might respond to spatial mobility changes? What are potential risks and opportunities?”***

Regarding the MOBI-TWIN scenarios, a few additional key questions should be answered to complement the core question. These additional questions are:

- How will EU policies and technological advancements affect the mobility and development of different regional typologies (e.g. rural, metropolitan)?

- What opportunities can regions leverage to enhance attractiveness and resilience through mobility and digital transition?

### Step 2: Setting the scene

While setting the scene, core background information that can support the scenario building process should be collected. This information needs to be related to the core questions that one seeks to answer.

In the MOBI-TWIN case, such background information relates to EU policies, the Regional Attractiveness Index and EU-large scale survey on individual factors affecting spatial mobility choices related twin transition.

Such information has already been collected during previous WP1, WP2 and WP4 activities – and the corresponding reports were developed and can be used by the MOBI-TWIN partners. If possible, the already existent data could be enriched with any additional information. Indicatively, such additional information referring to the regional typologies and policy context could be mentioned.

### Step 3: Identifying key forces and drivers

This is an analytical phase where the scenario team identifies key forces and drivers. Key forces are those which determine success or failure of the decision / key question (in our case: factors which determine the migration flows). Key forces can be either positive or negative and mostly have to do with the macro-environment. For instance, a key force in the MOBI-TWIN case could be external factors like EU policies, economic conditions, technological advancements, climate change, demographic shifts, and geopolitical trends, which collectively shape regional development and spatial mobility patterns across the EU. In other words, the key forces of the macro-environment can be seen as the major uncontrollable, external forces.

After identifying the key forces, the scenario team should then identify the key drivers. The drivers can be seen as more context based. It is noted that the list of drivers should include the social, economic, geographic, economic, environmental and political drivers and values. The drivers encourage the realisation of the target future vision.

### Step 4: Performing a trend and uncertainty analysis

After identifying the key forces and drivers, partners should then cluster these – in case there are thematically common factors. All these can be now broadly characterised as 'trends.

Afterwards, the scenario team must perform a trend and uncertainty analysis to all the identified actors. This analysis signifies that all the factors will be rated based on their

importance/relevance towards the big vision, as well as on their uncertainty. The rating will take place on a scale of 1-10 (where 1 is the least important and the least uncertain). The results of this ranking can be visualized in an importance/uncertainty grid – please see Figure 2 below.

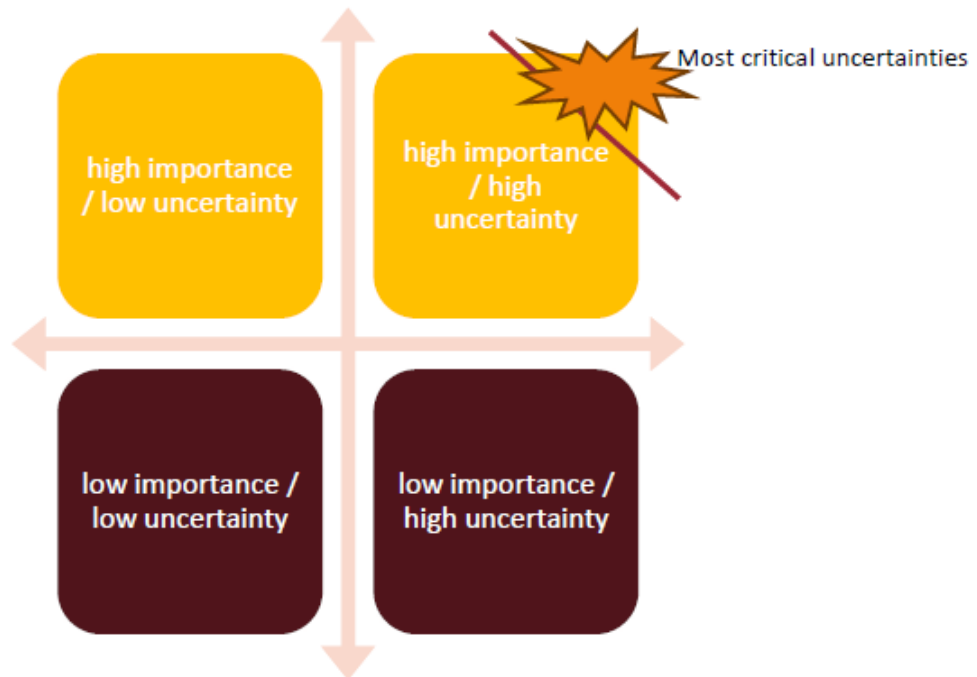


Figure 2. Importance/uncertainty grid

### Step 5: Setting the parameters/axes of the scenario matrix

Right after developing the importance/uncertainty analysis, partners need to choose the two most important and most uncertain factors (i.e. the two most critical uncertainties). These two factors will form the two axes of the scenario matrix. The one of them (and its 'extremes') will determine the vertical axis, while the other will determine the horizontal axis. For instance, if we choose "level of digital transformation" for the vertical axis we will have "high digital transformation" (on the top of the axis) and "low digital transformation". Other parameters could be suggested and discussed with the partners, depending on the feedback received.

The high-impact and high-uncertainty factors (i.e. the most critical uncertainties) have the potential to shape different futures and are therefore used in different extremes of the scenarios (i.e. they constitute the two axes). Concurrently, the factors having a high impact/importance and low uncertainty based on the rating can also shape the different futures and should also be included in the future scenarios.

### Step 6: Building the scenarios

After defining the axes of the scenario matrix, the scenario team will start developing the narratives for the scenarios. **As mentioned above, four scenarios will be created.** The key trends behind each scenario should be considered (based on the scenario matrix developed).

The MOBI-TWIN partners will describe how different regional typologies are affected by spatial mobility, and the developed narrative should illustrate the demographic, socio-economic, geographic, skills and other dimension agreed on by the consortium partners.

The title of each scenario could also be chosen in a way that reflects these characteristics, to complement the general titles indicated in the Grant Agreement. Finally, the feasibility of the scenarios will then be verified by the expert community through the Delphi survey.

The box below provides some additional 'hints' for developing the narrative of a future scenario.

#### **The important features of scenarios**

- **A highly descriptive title:** Short enough to be memorable; descriptive enough to be transmitting the essence of what is happening in the scenario.
- **Compelling 'storylines':** Scenarios are narratives of how events might unfold between now and the selected time-horizon, they should provide the dynamics (logics) assigned to it. In simple terms the scenario should tell a story that should be remarkable, convincing, logical, and plausible.
- **Plausibility:** A scenario must be plausible. This means that it must fall within the limits of what might conceivably happen.
- **Consistency:** Scenario must not have any built-in inconsistency that could undermine the credibility of the scenario.
- **Decision-making utility:** Each scenario, and all scenarios when they constitute a set, should contribute specific insights into the future that will lead to the decision focus that was selected. In the MOBI-TWIN case, the scenarios will more precisely lead to a specific model design process, rather than to decision-making.
- **A table of comparative descriptions:** This provides planners and decision makers with a sort of 'line item' description that details what might happen to each key trend or factor in each scenario. This implies going back to the list of key drivers developed in Step 2 and including them. Basically, the table provides the back-up material that gives the scenarios their nuances and texture. **(optional).**

## ANNEX 3

# Delphi Survey on Spatial Mobility Scenarios in the context of the Twin Transition in EU regions

## Short guidelines for using and filling out the Delphi survey

This **Delphi survey**, conducted as part of the [MOBI-TWIN project](#), aims to evaluate the probability of the **scenarios co-created by the consortium to happen, i.e. to assess how regional typologies** - based on the [Regional Attractiveness Index](#)—**may be impacted by spatial mobility and digital transition**. The scenarios will **explore different future pathways**, such as fast growth, unexpected success, slow evolution, and potential risks to regions.

**The outcome of the survey** will be translated into tangible improvements and **feasibility assessment of each scenario and its potential consequences for EU regions**, particularly focusing on **left-behind, metropolitan, and rural areas**. This will, in turn, **support policy recommendations, risk mitigation measures, and model estimations** in subsequent phases of the project.

### What is the Delphi survey?

The Delphi method is an online survey technique used to gather expert opinions through multiple rounds. Current survey is limited to one round. **Your responses will help build consensus and contribute to academic prosperity on a specific topic.**

### Accessing the survey:

- ✓ Get familiar with the materials on scenarios provided.
- ✓ Click the link provided in your invitation.
- ✓ Ensure a stable internet connection.

### How to fill out the survey:

- ✓ **Read** each question carefully.
- ✓ **Rate** each item using the provided scale (*from -100 to 100 or from 0 to 100*).
- ✓ **You have an opportunity to elaborate** on each question by adding a comment in the section: "elaborate on this topic (add a comment)". This is optional but will be greatly appreciated.

**PLEASE NOTE:** How to use the slider in this survey:

For the questions in:

**Section A:** *Demographic Information*

**Section B:** *Economic Perspectives*

please use the slider ranging from **-100% to 100%**, which means:

- Use negative values (e.g., - 30%) if you expect a decrease  
Move the slider left for a decrease (e.g., - 30%)  
Due to system setting, it will appear as “- 30”
- Use positive values (e.g., +30%) if you expect an increase  
Move the slider right for an increase (e.g., +30%)  
Due to system setting, it will appear as “30”
- Use 0% if you expect no change

For the questions in:

**Section C:** *Scenario-Based Questions*

**Please explain your reasoning (max. 200 words) in the ADD A COMMENT section**

Additionally, in case of questions with the slider:

please use the slider ranging from **0% to 100%**, which means:

**0% is 'extremely unlikely' and 100% is 'extremely likely'**

**Please ensure that you save all your answers!**

### **Rounds & feedback**

The survey consists of only one **round**.

After completing the round, you will see a summary of group responses.

Participation in this single round is crucial for accurate results.

### **Time commitment**

The single round may take **60–70 minutes** to complete.

You will have **10 days** to complete the round.

### **Timeline**

**28 May – 6 June 2025**

The survey results will be summarised in the upcoming public document “**D3.2 Scenarios for assessing the effects of spatial mobility on EU regions during twin transition**” due by the end of August 2025, that will be shared with you.

### **GDPR**

Participation in this survey is voluntary. By participating in it you acknowledge and give permission to ESF to gather the data and process it for the purpose stated above. All data

gathered via this survey will be processed in accordance with the General Data Protection Regulation (EU) 2016/679. Data from all participants are aggregated to rule out any potential breach of confidentiality. Your contact details will not be shared with third parties and will only be used to inform you about survey updates. All data gathered via this survey will be used for internal use only.

More information on Delphi privacy policy you can access [here](#).

### **Thank You!**

We are sincerely grateful for your time, thoughtful responses, and valuable insights. Your participation in this Delphi survey plays a critical role in shaping the direction of this research. By sharing your expertise, you are contributing to meaningful knowledge that can inform future practice, policy, or innovation in the field.

**ANNEX 4**

## Set of Delphi Survey Questions – North and East Finland Pilot Region

1. Do you think the young population (up to 24 years old) of North and East Finland will increase or decrease after the Leapfrog scenario has materialized? By how much (%) compared to today?
2. Do you think the middle-aged population (25 to 64 years old) of North and East Finland will increase or decrease after the Leapfrog scenario has materialized? By how much (%) compared to today?
3. Do you think the older population (over 65 years old) of North and East Finland will increase or decrease after the Leapfrog scenario has materialized? By how much (%) compared to today?
4. Do you think the population with primary education in North and East Finland will increase or decrease after the Leapfrog scenario has materialized? By how much (%) compared to today?
5. Do you think the population with secondary education in North and East Finland will increase or decrease after the Leapfrog scenario has materialized? By how much (%) compared to today?
6. Do you think the population with tertiary education in North and East Finland will increase or decrease after the Leapfrog scenario has materialized? By how much (%) compared to today?
7. Do you think the male population of North and East Finland will increase or decrease after the Leapfrog scenario has materialized? By how much (%) compared to today? (For the purposes of this question, "Male" refers to those assigned male at birth)
8. Do you think the female population of North and East Finland will increase or decrease after the Leapfrog scenario has materialized? By how much (%) compared to today? (For the purposes of this question, "Female" refers to those assigned female at birth)
9. Do you think the population of people assigning themselves to other genders (i.e., not male or female) in North and East Finland will increase or decrease after the Leapfrog scenario has materialized? By how much (%) compared to today? (For the purposes of this question, "Other" refers to individuals who do not identify strictly as male or female)

10. Do you think the parent population of North and East Finland will increase or decrease after the Leapfrog scenario has materialized? By how much (%) compared to today?
11. Do you think the non-parent population of North and East Finland will increase or decrease after the Leapfrog scenario has materialized? By how much (%) compared to today?
12. Do you think the young population (up to 24 years old) of North and East Finland will increase or decrease after the Lion's Den scenario has materialized? By how much (%) compared to today?
13. Do you think the middle-aged population (25 to 64 years old) of North and East Finland will increase or decrease after the Lion's Den scenario has materialized? By how much (%) compared to today?
14. Do you think the older population (over 65 years old) of North and East Finland will increase or decrease after the Lion's Den scenario has materialized? By how much (%) compared to today?
15. Do you think the population with primary education in North and East Finland will increase or decrease after the Lion's Den scenario has materialized? By how much (%) compared to today?
16. Do you think the population with secondary education in North and East Finland will increase or decrease after the Lion's Den scenario has materialized? By how much (%) compared to today?
17. Do you think the population with tertiary education in North and East Finland will increase or decrease after the Lion's Den scenario has materialized? By how much (%) compared to today?
18. Do you think the male population of North and East Finland will increase or decrease after the Lion's Den scenario has materialized? By how much (%) compared to today? (For the purposes of this question, "Male" refers to those assigned male at birth)
19. Do you think the female population of North and East Finland will increase or decrease after the Lion's Den scenario has materialized? By how much (%) compared to today? (For the purposes of this question, "Female" refers to those assigned female at birth)
20. Do you think the population of people assigning themselves to other genders (i.e., not male or female) in North and East Finland will increase or decrease after the Lion's Den scenario has materialized? By how much (%) compared to today? (For the purposes of this question, "Other" refers to individuals who do not identify strictly as male or female)

21. Do you think the parent population of North and East Finland will increase or decrease after the Lion's Den scenario has materialized? By how much (%) compared to today?
22. Do you think the non-parent population of North and East Finland will increase or decrease after the Lion's Den scenario has materialized? By how much (%) compared to today?
23. Do you think the young population (up to 24 years old) of North and East Finland will increase or decrease after the Snail's Pace scenario has materialized? By how much (%) compared to today?
24. Do you think the middle-aged population (25 to 64 years old) of North and East Finland will increase or decrease after the Snail's Pace scenario has materialized? By how much (%) compared to today?
25. Do you think the older population (over 65 years old) of North and East Finland will increase or decrease after the Snail's Pace scenario has materialized? By how much (%) compared to today?
26. Do you think the population with primary education in North and East Finland will increase or decrease after the Snail's Pace scenario has materialized? By how much (%) compared to today?
27. Do you think the population with secondary education in North and East Finland will increase or decrease after the Snail's Pace scenario has materialized? By how much (%) compared to today?
28. Do you think the population with tertiary education in North and East Finland will increase or decrease after the Snail's Pace scenario has materialized? By how much (%) compared to today?
29. Do you think the male population of North and East Finland will increase or decrease after the Snail's Pace scenario has materialized? By how much (%) compared to today? (For the purposes of this question, "Male" refers to those assigned male at birth)
30. Do you think the female population of North and East Finland will increase or decrease after the Snail's Pace scenario has materialized? By how much (%) compared to today? (For the purposes of this question, "Female" refers to those assigned female at birth)
31. Do you think the population of people assigning themselves to other genders (i.e., not male or female) in North and East Finland will increase or decrease after the Snail's Pace scenario has materialized? By how much (%) compared to today? (For the purposes of this question, "Other" refers to individuals who do not identify strictly as male or female)

32. Do you think the parent population of North and East Finland will increase or decrease after the Snail's Pace scenario has materialized? By how much (%) compared to today?

33. Do you think the non-parent population of North and East Finland will increase or decrease after the Snail's Pace scenario has materialized? By how much (%) compared to today?

34. Do you think the young population (up to 24 years old) of North and East Finland will increase or decrease after the Dark Horse scenario has materialized? By how much (%) compared to today?

35. Do you think the middle-aged population (25 to 64 years old) of North and East Finland will increase or decrease after the Dark Horse scenario has materialized? By how much (%) compared to today?

36. Do you think the older population (over 65 years old) of North and East Finland will increase or decrease after the Dark Horse scenario has materialized? By how much (%) compared to today?

37. Do you think the population with primary education in North and East Finland will increase or decrease after the Dark Horse scenario has materialized? By how much (%) compared to today?

38. Do you think the population with secondary education in North and East Finland will increase or decrease after the Dark Horse scenario has materialized? By how much (%) compared to today?

39. Do you think the population with tertiary education in North and East Finland will increase or decrease after the Dark Horse scenario has materialized? By how much (%) compared to today?

40. Do you think the male population of North and East Finland will increase or decrease after the Dark Horse scenario has materialized? By how much (%) compared to today? (For the purposes of this question, "Male" refers to those assigned male at birth)

41. Do you think the female population of North and East Finland will increase or decrease after the Dark Horse scenario has materialized? By how much (%) compared to today? (For the purposes of this question, "Female" refers to those assigned female at birth)

42. Do you think the population of people assigning themselves to other genders (i.e., not male or female) in North and East Finland will increase or decrease after the Dark Horse scenario has materialized? By how much (%) compared to today? (For the purposes of this question, "Other" refers to individuals who do not identify strictly as male or female)

43. Do you think the parent population of North and East Finland will increase or decrease after the Dark Horse scenario has materialized? By how much (%) compared to today?

44. Do you think the non-parent population of North and East Finland will increase or decrease after the Dark Horse scenario has materialized? By how much (%) compared to today?

45. Do you think the total number of high-skilled self-employed professionals (freelancers, entrepreneurs, etc.) in North and East Finland will increase or decrease after the Leapfrog scenario? By how much (%) compared to today?

46. Do you think the average earnings of high-skilled self-employed professionals (freelancers, entrepreneurs, etc.) in North and East Finland will increase or decrease after the Leapfrog scenario? By how much (%) compared to today?

47. Do you think the total number of high-skilled workers (managers, professionals, technicians, and associate professionals with tertiary education, as per ISCO codes 1, 2, and 3) in North and East Finland will increase or decrease after the Leapfrog scenario? By how much (%) compared to today?

48. Do you think the average earnings of high-skilled workers (managers, professionals, technicians, and associate professionals with tertiary education, as per ISCO codes 1, 2, and 3) in North and East Finland will increase or decrease after the Leapfrog scenario? By how much (%) compared to today?

49. Do you think the total number of medium- and lower-skilled workers (clerical support workers, service and sales workers, and skilled agricultural, forestry and fishery workers, as per ISCO codes 4, 5, and 6) in North and East Finland will increase or decrease after the Leapfrog scenario? By how much (%) compared to today?

50. Do you think the average earnings of medium- and lower-skilled workers (clerical support workers, service and sales workers, and skilled agricultural, forestry and fishery workers, as per ISCO codes 4, 5, and 6) in North and East Finland will increase or decrease after the Leapfrog scenario? By how much (%) compared to today?

51. Do you think the total number of low-skilled blue-collar workers (such as plant and machine operators, assemblers, and elementary occupations as per ISCO codes 7, 8, and 9) in North and East Finland will increase or decrease after the Leapfrog scenario? By how much (%) compared to today?

52. Do you think the average earnings of low-skilled blue-collar workers (such as plant and machine operators, assemblers, and elementary occupations as per ISCO codes 7, 8, and 9) in North and East Finland will increase or decrease after the Leapfrog scenario? By how much (%) compared to today?

53. Do you think the total number of high-skilled self-employed professionals (freelancers, entrepreneurs, etc.) in North and East Finland will increase or decrease after the Lion's Den scenario? By how much (%) compared to today?

54. Do you think the average earnings of high-skilled self-employed professionals (freelancers, entrepreneurs, etc.) in North and East Finland will increase or decrease after the Lion's Den scenario? By how much (%) compared to today?

55. Do you think the total number of high-skilled workers (managers, professionals, technicians, and associate professionals with tertiary education, as per ISCO codes 1, 2, and 3) in North and East Finland will increase or decrease after the Lion's Den scenario? By how much (%) compared to today?

56. Do you think the average earnings of high-skilled workers (managers, professionals, technicians, and associate professionals with tertiary education, as per ISCO codes 1, 2, and 3) in North and East Finland will increase or decrease after the Lion's Den scenario? By how much (%) compared to today?

57. Do you think the total number of medium- and lower-skilled workers (clerical support workers, service and sales workers, and skilled agricultural, forestry and fishery workers, as per ISCO codes 4, 5, and 6) in North and East Finland will increase or decrease after the Lion's Den scenario? By how much (%) compared to today?

58. Do you think the average earnings of medium- and lower-skilled workers (clerical support workers, service and sales workers, and skilled agricultural, forestry and fishery workers, as per ISCO codes 4, 5, and 6) in North and East Finland will increase or decrease after the Lion's Den scenario? By how much (%) compared to today?

59. Do you think the total number of low-skilled blue-collar workers (such as plant and machine operators, assemblers, and elementary occupations as per ISCO codes 7, 8, and 9) in North and East Finland will increase or decrease after the Lion's Den scenario? By how much (%) compared to today?

60. Do you think the average earnings of low-skilled blue-collar workers (such as plant and machine operators, assemblers, and elementary occupations as per ISCO codes 7, 8, and 9) in North and East Finland will increase or decrease after the Lion's Den scenario? By how much (%) compared to today?

61. Do you think the total number of high-skilled self-employed professionals (freelancers, entrepreneurs, etc.) in North and East Finland will increase or decrease after the Snail's Pace scenario? By how much (%) compared to today?

63. Do you think the total number of high-skilled workers (managers, professionals, technicians, and associate professionals with tertiary education, as per ISCO codes 1, 2, and 3) in North and East Finland will increase or decrease after the Snail's Pace scenario? By how much (%) compared to today?

64. Do you think the average earnings of high-skilled workers (managers, professionals, technicians, and associate professionals with tertiary education, as per ISCO codes 1, 2, and 3) in North and East Finland will increase or decrease after the Snail's Pace scenario? By how much (%) compared to today?

65. Do you think the total number of medium- and lower-skilled workers (clerical support workers, service and sales workers, and skilled agricultural, forestry and fishery workers, as per ISCO codes 4, 5, and 6) in North and East Finland will increase or decrease after the Snail's Pace scenario? By how much (%) compared to today?

66. Do you think the average earnings of medium- and lower-skilled workers (clerical support workers, service and sales workers, and skilled agricultural, forestry and fishery workers, as per ISCO codes 4, 5, and 6) in North and East Finland will increase or decrease after the Snail's Pace scenario? By how much (%) compared to today?

67. Do you think the total number of low-skilled blue-collar workers (such as plant and machine operators, assemblers, and elementary occupations as per ISCO codes 7, 8, and 9) in North and East Finland will increase or decrease after the Snail's Pace scenario? By how much (%) compared to today?

68. Do you think the average earnings of low-skilled blue-collar workers (such as plant and machine operators, assemblers, and elementary occupations as per ISCO codes 7, 8, and 9) in North and East Finland will increase or decrease after the Snail's Pace scenario? By how much (%) compared to today?

69. Do you think the total number of high-skilled self-employed professionals (freelancers, entrepreneurs, etc.) in North and East Finland will increase or decrease after the Dark Horse scenario? By how much (%) compared to today?

70. Do you think the average earnings of high-skilled self-employed professionals (freelancers, entrepreneurs, etc.) in North and East Finland will increase or decrease after the Dark Horse scenario? By how much (%) compared to today?

71. Do you think the total number of high-skilled workers (managers, professionals, technicians, and associate professionals with tertiary education, as per ISCO codes 1, 2, and 3) in North and East Finland will increase or decrease after the Dark Horse scenario? By how much (%) compared to today?

72. Do you think the average earnings of high-skilled workers (managers, professionals, technicians, and associate professionals with tertiary education, as per ISCO codes 1, 2, and 3) in North and East Finland will increase or decrease after the Dark Horse scenario? By how much (%) compared to today?

73. Do you think the total number of medium- and lower-skilled workers (clerical support workers, service and sales workers, and skilled agricultural, forestry and fishery workers, as per ISCO codes 4, 5, and 6) in North and East Finland will increase or decrease after the Dark Horse scenario? By how much (%) compared to today?

74. Do you think the average earnings of medium- and lower-skilled workers (clerical support workers, service and sales workers, and skilled agricultural, forestry and fishery workers, as per ISCO codes 4, 5, and 6) in North and East Finland will increase or decrease after the Dark Horse scenario? By how much (%) compared to today?

75. Do you think the total number of low-skilled blue-collar workers (such as plant and machine operators, assemblers, and elementary occupations as per ISCO codes 7, 8, and 9) in North and East Finland will increase or decrease after the Dark Horse scenario? By how much (%) compared to today?

76. Do you think the average earnings of low-skilled blue-collar workers (such as plant and machine operators, assemblers, and elementary occupations as per ISCO codes 7, 8, and 9) in North and East Finland will increase or decrease after the Dark Horse scenario? By how much (%) compared to today?

77. Considering the current and projected economic, technological, and policy trends in North and East Finland, how likely is it that a Leapfrog scenario (where the region experiences rapid, unexpected advancements outpacing expectations) will unfold in the next 5 years?

78. What are the key factors—such as innovation, infrastructure, or policy—that could drive or prevent a Leapfrog scenario in North and East Finland over the next 5 years? (max. 200 words)

79. In the context of North and East Finland, what is the likelihood that a Lion's Den scenario (where external forces disrupt existing systems or create market volatility) will emerge in the next 5 years?

80. What regional or global conditions could either amplify or mitigate the risk of a Lion's Den scenario in North and East Finland over the next 5 years? Please elaborate on the major drivers (max. 200 words)

81. Based on current trends in North and East Finland, do you foresee a Snail's Pace scenario (where development is slow and incremental) in the next 5 years?

82. What specific policies, economic factors, or infrastructure challenges in North and East Finland might contribute to a Snail's Pace scenario, preventing rapid advancement in the next 5 years? (max. 200 words)

83. What is the likelihood of a Dark Horse scenario (where an unforeseen or underestimated factor leads to significant change) occurring in North and East Finland over the next 5 years?

84. In your opinion, what are the most likely unexpected factors or players in North and East Finland that could lead to a Dark Horse scenario, significantly altering the trajectory of development? (max. 200 words)

**ANNEX 5**

## Aggregated Delphi survey results by region, scenario, and population groups

The tables below present aggregated projections from the Delphi survey, showing expected changes in population groups and related variables for five pilot regions (North & East Finland, Central Macedonia, Lombardy, Groningen, and Castilla-La Mancha) under different scenarios. Values are expressed as percentages relative to current levels. Experts provided their estimates on a scale from -100 (maximum decline) to +100 (maximum growth). Positive values indicate expected population increases, while negative values indicate expected population decreases. These projections reflect consensus-based trends rather than precise predictions.

**Table 1. Demographic projections by scenario (North and East Finland)**

Scenario	Population Group		
	Young (0-24) [%]	Middle-aged (25-64) [%]	Older (65+) [%]
Leapfrog	-0.17	5.92	11.50
Lion's Den	-22.89	-15.13	5.13
Snail's Pace	-9.88	-4.25	12.25
Dark Horse	1.25	7.25	11.88

**Table 2. Education level projections by scenario (North and East Finland)**

Scenario	Population Group		
	Primary Education [%]	Secondary Education [%]	Tertiary Education [%]
Leapfrog	-6.00	1.45	5.55
Lion's Den	-6.63	-6.88	-12.63
Snail's Pace	-8.13	-4.88	-5.75
Dark Horse	0.00	7.88	11.00

**Table 3. Labour market projections by skill level and employment type (North and East Finland)**

Scenario	Population Group			
	High-skilled self-employed [%]	High-skilled employed workers [%]	Medium- and lower-skilled employed workers [%]	Low-skilled blue-collar workers [%]
Leapfrog	7.14	5.00	5.43	4.00
Lion's Den	-9.43	-10.29	-8.71	-2.29
Snail's Pace	-6.14	-4.14	-3.00	-2.29
Dark Horse	7.71	9.57	5.57	3.86

**Table 4. Demographic projections by scenario (Central Macedonia)**

Scenario	Population Group		
	Young (0-24) [%]	Middle-aged (25-64) [%]	Older (65+) [%]
Leapfrog	8.70	15.60	-4.18
Lion's Den	-13.88	-8.86	11.00
Snail's Pace	-6.29	-3.57	5.14
Dark Horse	9.00	9.00	5.17

**Table 5. Education level projections by scenario (Central Macedonia)**

Scenario	Population Group		
	Primary Education [%]	Secondary Education [%]	Tertiary Education [%]
Leapfrog	-10.30	4.10	16.00
Lion's Den	-4.29	-5.00	-14.71
Snail's Pace	-4.00	-2.14	-1.43
Dark Horse	3.50	3.50	11.67

**Table 6. Labour market projections by skill level and employment type (Central Macedonia)**

Scenario	Population Group			
	High-skilled self-employed [%]	High-skilled employed workers [%]	Medium- and lower-skilled employed workers [%]	Low-skilled blue-collar workers [%]
Leapfrog	14.57	12.57	2.86	-6.71
Lion's Den	-8.67	-9.33	-5.83	-5.00
Snail's Pace	-2.33	-3.83	-5.17	-6.83
Dark Horse	11.80	10.00	-1.67	-6.00

**Table 7. Demographic projections by scenario (Lombardy)**

Scenario	Population Group		
	Young (0-24) [%]	Middle-aged (25-64) [%]	Older (65+) [%]
Leapfrog	5.67	8.11	11.63
Lion's Den	-9.38	-0.50	11.25
Snail's Pace	-8.86	-6.86	2.00
Dark Horse	0.29	2.43	10.29

**Table 8. Education level projections by scenario (Lombardy)**

Scenario	Population Group		
	Primary Education [%]	Secondary Education [%]	Tertiary Education [%]
Leapfrog	-3.11	0.11	10.43
Lion's Den	-6.14	-5.00	0.86
Snail's Pace	-6.00	-4.29	1.71
Dark Horse	-4.29	-1.14	12.00

**Table 9. Labour market projections by skill level and employment type (Lombardy)**

Scenario	Population Group			
	High-skilled self-employed	High-skilled employed	Medium- and lower-skilled	Low-skilled blue-collar

	[%]	workers [%]	employed workers [%]	workers [%]
Leapfrog	16.29	11.86	8.43	7.71
Lion's Den	-2.71	-3.00	-4.57	0.86
Snail's Pace	-3.00	-1.00	-0.29	0.00
Dark Horse	12.14	13.14	7.57	11.14

**Table 10. Demographic projections by scenario (Groningen)**

Scenario	Population Group		
	Young (0-24) [%]	Middle-aged (25-64) [%]	Older (65+) [%]
Leapfrog	4.42	7.27	11.36
Lion's Den	-22.50	-10.30	4.00
Snail's Pace	5.67	6.20	8.90
Dark Horse	21.30	14.20	14.20

**Table 11. Education level projections by scenario (Groningen)**

Scenario	Population Group		
	Primary Education [%]	Secondary Education [%]	Tertiary Education [%]
Leapfrog	1.75	5.92	19.75
Lion's Den	-8.40	-11.56	-15.90
Snail's Pace	3.50	7.90	8.20
Dark Horse	4.00	0.30	18.70

**Table 12. Labour market projections by skill level and employment type (Groningen)**

Scenario	Population Group			
	High-skilled self-employed [%]	High-skilled employed workers [%]	Medium- and lower-skilled employed workers [%]	Low-skilled blue-collar workers [%]
Leapfrog	24.40	13.00	7.10	10.33
Lion's Den	-10.80	-14.70	-10.10	-12.10
Snail's Pace	-0.40	8.70	3.80	-1.60
Dark Horse	15.50	15.20	9.70	8.90

**Table 13. Demographic projections by scenario (Castilla-La Mancha)**

Scenario	Population Group		
	Young (0-24) [%]	Middle-aged (25-64) [%]	Older (65+) [%]
Leapfrog	0.58	2.17	9.92
Lion's Den	-21.27	-11.82	17.45
Snail's Pace	-12.73	-8.91	9.55
Dark Horse	8.73	9.82	5.00

**Table 14. Education level projections by scenario (Castilla-La Mancha)**

Scenario	Population Group		
	Primary Education	Secondary Education [%]	Tertiary

	[%]		Education [%]
Leapfrog	<b>-6.00</b>	<b>2.64</b>	<b>18.09</b>
Lion's Den	<b>-0.10</b>	<b>-2.45</b>	<b>7.09</b>
Snail's Pace	<b>2.00</b>	<b>0.64</b>	<b>3.82</b>
Dark Horse	<b>-1.82</b>	<b>6.18</b>	<b>10.91</b>

**Table 15. Labour market projections by skill level and employment type (Castilla-La Mancha)**

Scenario	Population Group			
	High-skilled self-employed [%]	High-skilled employed workers [%]	Medium- and lower-skilled employed workers [%]	Low-skilled blue-collar workers [%]
Leapfrog	<b>14.30</b>	<b>12.00</b>	<b>-0.30</b>	<b>-2.80</b>
Lion's Den	<b>-9.50</b>	<b>-5.10</b>	<b>-6.33</b>	<b>-5.33</b>
Snail's Pace	<b>-0.60</b>	<b>-4.10</b>	<b>-2.70</b>	<b>-5.50</b>
Dark Horse	<b>12.90</b>	<b>13.40</b>	<b>8.30</b>	<b>5.20</b>

**ANNEX 6**

## Agenda for the Stakeholder workshop

[Pilot region]

Date: [Date]

Time: [Time]

Location: [Meeting link]

Target Audience: Local/Regional stakeholders (regional/local governments officials, local community groups, general public)

**Objective:** *Validate and discuss Delphi survey results and scenario implications for the pilot region.*

<b>Workshop agenda</b>
<p><b>Welcome &amp; introduction (5 minutes) / Presenter [To be added]</b></p> <ul style="list-style-type: none"> <li>- Brief overview of MOBI-TWIN project</li> <li>- Objectives of the workshop</li> <li>- Relevance of the regional perspective</li> </ul>
<p><b>Presentation of four future scenarios: Leapfrog, Dark Horse, Snail's Pace, Lion's Den (10 minutes) / Presenter [To be added]</b></p> <ul style="list-style-type: none"> <li>- How each scenario affects the regional typology (based on Regional Attractiveness Index)</li> <li>- Interlinkages with spatial mobility, digitalisation, labour market, and EU policies</li> </ul>
<p><b>Presentation of Delphi survey methodology &amp; results (10 minutes) / Presenter [To be added]</b></p> <ul style="list-style-type: none"> <li>- Short introduction to Delphi method</li> <li>- Summary of key findings</li> <li>- Scenario probability and impact levels</li> <li>- Regional-specific responses</li> </ul>
<p><b>Stakeholder feedback &amp; validation discussion (60 minutes) focusing on the Delphi results and findings / Facilitator [To be added]</b></p> <ul style="list-style-type: none"> <li>- Guiding questions will be provided before to the workshop</li> </ul>
<p><b>Wrap-up &amp; next steps (5 minutes)</b></p> <ul style="list-style-type: none"> <li>- Summary of key insights and feedback</li> <li>- Explanation of how input will be integrated</li> <li>- Open floor for final questions or comments</li> </ul>

*End of the workshop*

**ANNEX 7**

## Summary of the Stakeholder workshops

### *North & East Finland (Finland)*

**Date of Workshop: 12.09.2025**

**Participants: 11 external participants**

**Facilitator / Presenter: ESF**

#### **Stakeholder feedback & validation discussion**

##### ***Scenario probability assessment:***

Participants identified **Snail's Pace** as the most likely scenario, with strong agreement across the group. Key drivers include lack of government action, demographic decline, and weak political representation, particularly in Eastern Finland.

The **Lion's Den** scenario was considered realistic by some, especially in small towns facing visible decline, empty storefronts, and outmigration. However, it was disputed by others, who emphasized Finland's education system, social structures, and local networks as sources of resilience. Overall, some participants suggested that Lion's Den is less likely than Leapfrog or Dark Horse.

**Dark Horse** and **Leapfrog** were generally seen as less probable in the near term, although participants noted that innovation, strong local leadership, and tourism-driven municipalities could enable more positive trajectories in selected areas.

Regional divergence emerged as a central theme: Northern Finland benefits from tourism and active local governance, whereas Eastern Finland faces deeper structural challenges. Local renewable energy and data center projects were highlighted as replicable trends, offering development opportunities across multiple municipalities.

While Lion's Den was framed as a negative scenario, participants recognized real geopolitical risks - particularly proximity to Russia and the impacts of the war - but also identified resilience factors, including local cooperation and security systems.

##### ***Key insights from discussion:***

**A general trend of slow decline and stagnation dominates Northern and Eastern Finland.** Eastern Finland is particularly vulnerable due to limited tourism-driven economic activity and weaker policy support, whereas Northern Finland shows relative resilience thanks to tourism and active local governance. Lion's Den may apply unevenly: highly probable in small municipalities, but less likely as a general national scenario. Optimistic

assumptions, such as replacing Russian trade with Estonian trade, were deemed overly positive.

Regional development outcomes were noted to vary significantly within short distances, influenced by local leadership, active mayors, and sectoral strengths. South-Savo municipalities, including Pieksämäki, Mikkeli, and Savonlinna, were cited as examples of collaborative efforts toward shared visions, strengthening political influence and coordinated development. New technologies and digitalization, such as AI for transport, digital services, and data centers, are emerging in Kainuu and South-Savo, potentially moderating decline under the Snail's Pace scenario.

Green transition projects - for example, large-scale wind power in Pieksämäki and initiatives to attract green transition companies - show promise, although economic benefits may leak away due to global ownership of firms. Stakeholders also noted infrastructure constraints, such as electricity supply limitations, which could restrict feasibility and block planned investments.

In the context of Lion's Den, South-Savo demonstrates strong "security of maintenance" systems in logistics and crisis management, providing confidence for new business development despite risks. Areas near the Russian border, including Ilomantsi, Lappeenranta, and Imatra, face accelerated depopulation and declining attractiveness, creating stark contrasts with more resilient urban centers like Savonlinna.

Opportunities identified include forestry, shifting from low-value to high-value wood products, extraction from biobased materials, the defence industry, and dual-use technologies such as AI and advanced manufacturing. Seasonal residents and remote workers were recognized as potential contributors to social capital, economic activity, and innovation, provided their integration is deliberately facilitated.

Stakeholders emphasized the importance of horizontal partnerships between municipalities, active mayors, and seasonal citizens with investment links to strengthen local development pathways. They also noted that focusing solely on negative scenarios can create self-fulfilling prophecies; planning should balance Snail's Pace, Lion's Den, and more positive trajectories like Dark Horse, leaving room for hope and adaptive strategies. Ultimately, Snail's Pace, though often perceived negatively, may represent a stable and adaptive path, particularly for regions exposed to geopolitical risks near the Russian border.

### ***Agreed priorities or concerns:***

**Demographic decline and outmigration remain central risks, particularly in small municipalities and border regions.** Weak government action and limited public investment threaten long-term economic resilience. Overgeneralizing "North and East Finland" as a single region was discouraged, highlighting local variation in economic drivers, governance capacity, and infrastructure.

There was some scepticism regarding geopolitical assumptions, especially concerning trade relations with Russia, as geopolitical shocks were seen as uncontrollable risk factors affecting border regions. Areas close to the Russian border face accelerated depopulation, creating structural challenges that undermine resilience and regional attractiveness.

Concerns were raised that foreign-owned green transition companies may fail to provide lasting local economic foundations, and that energy infrastructure limitations, including electricity supply constraints, could impede projects like wind power and data centers. Stakeholders stressed that strong political will and strategic policymaking - for example, tax incentives or regional economic zones - are needed to unlock investment opportunities and support sustainable development.

At the regional level, participants observed that local decision-making often prioritizes unrealistic growth aspirations, underscoring the need for coordination with national and regional authorities. Scaling up bio-based material extraction and defence-related industries were identified as potential opportunities, but require strategic alignment to maximize benefits.

The discussion also highlighted that green transition strategies are unlikely to succeed without sufficient population attractiveness, community engagement, and participation of local stakeholders. Building horizontal partnerships between municipalities, as well as vertical networks linking local, regional, and national actors, was emphasized as essential to mobilize resources and scale positive development examples. Finally, stakeholders noted that shifts in housing and lifestyle preferences, including nomadic living and reduced home ownership, could undermine long-term settlement strategies if not carefully addressed.

### ***Suggestions for improvements / follow-up actions:***

**Participants proposed several strategic actions to enhance regional development** and strengthen scenario planning. They emphasized the need to explore case studies of municipalities with strong local leadership in order to identify replicable success factors that could inform broader regional strategies. Recognizing the diversity of Northern and Eastern Finland, stakeholders recommended further engagement with smaller municipalities to capture ground-level realities and better reflect local conditions.

Attention was drawn to sector-specific trends, including tourism, education, and innovation, which could shift development probabilities in specific subregions. Emerging digitalization and green transition initiatives, such as AI, data centers, and wind power, should be incorporated into scenario modeling, accounting for infrastructure constraints like electricity availability. Regional collaboration efforts, particularly among South-Savo municipalities, were highlighted as potential counterbalances to decline.

Stakeholders encouraged factoring in resilience measures, such as security of maintenance systems in logistics and preparedness, when assessing negative scenarios like Lion's Den. They also noted opportunities in forestry, emphasizing a shift toward higher-value and sustainable wood products as part of Leapfrog and Dark Horse scenarios, as well as extraction from biobased materials and defence industry expansion as potential growth pathways under more optimistic trajectories.

Policy recommendations included assessing the feasibility and political implications of creating a special economic zone with tax incentives for Eastern Finland and developing strategies to integrate seasonal and remote-working residents into community life, leveraging their contributions to regional resilience. Stakeholders also suggested

analyzing how “shining star” municipalities communicate successes, and whether these examples could support replication of positive practices elsewhere.

Finally, participants underlined the importance of considering population thresholds, incentive schemes, and cultural/lifestyle changes—including nomadic living and reduced home ownership—when designing long-term settlement and green transition strategies. They emphasized that scenario exercises should not only serve as a warning of potential negative futures but also as a tool to identify opportunities and guide proactive regional development.

***Other comments / reflections:***

**Participants highlighted the importance of integrating circular economy**, business vitality, and livelihood perspectives into regional development planning. Students and researchers contributed valuable insights on governance, partnerships, and labour mobility, linking demographic trends with policy and institutional design. Stakeholders stressed using scenario work to inform ongoing projects and guide future-oriented strategies.

Examples from South-Savo and Kainuu showed how local initiatives and infrastructure planning, including energy and green transition projects, can shape regional trajectories. Border regions require special attention due to heightened vulnerabilities, while forestry and technological innovation in extractive industries offer concrete opportunities. Seasonal residents and remote workers were recognized as growing contributors to regional development, calling for policies to leverage their engagement.

Given the diversity across Northern and Eastern Finland, differentiated strategies are needed to address challenges like depopulation and geopolitical risks, while supporting opportunities such as local “shining star” municipalities. Horizontal partnerships between municipalities, local leaders, and seasonal citizens were highlighted as underutilized opportunities for collaboration. Even the “negative” Snail's Pace scenario can provide stability and adaptive pathways for some municipalities in uncertain geopolitical contexts.

**Submitted by: ESF**

## *Central Macedonia (Greece)*

**Date of Workshop: 10 September 2025**

**Participants: 10 external stakeholders**

**Facilitator / Presenter: AUTH**

### **Stakeholder feedback & validation discussion**

#### ***Scenario probability assessment:***

Participants identified **Snail's Pace** as the most likely scenario, with strong consensus. Key drivers include the limited effectiveness of government action, persistent demographic decline in certain areas due to heterogeneous regional characteristics, and relatively weak political influence compared to other Greek regions.

**Lion's Den** was considered less realistic by some, yet contested by others. Stakeholders highlighted Central Macedonia's strong agricultural base, the presence of higher education institutions, and the growth of new ICT businesses as sources of regional resilience. Overall, some participants regarded this negative scenario as less likely than Leapfrog or Dark Horse.

**Dark Horse** and **Leapfrog** were generally seen as less probable in the near term, although participants noted that innovative initiatives, strong regional leadership, and tourism-related opportunities could foster more positive development trajectories in selected areas of Central Macedonia.

#### ***Key insights from discussion:***

**Participants agreed that the twin transition-digital and green - is progressing at a slow pace**, with benefits currently concentrated in sectors able to integrate technology-driven changes. The region's capacity to adapt was noted to vary across sectors: while some industries could create conditions for Leapfrog or Dark Horse trajectories, others remain vulnerable to external shocks, making the Lion's Den scenario more plausible.

Across all scenarios, stakeholders emphasized the importance of a bottom-up approach, ensuring that local realities and social dimensions are adequately considered. The Dark Horse scenario, representing unexpected rapid success, was identified as particularly challenging to align with local social structures. While some participants saw Dark Horse as the most desirable scenario, especially when paired with skills development, others cautioned that such rapid change could introduce uncertainty and discomfort among residents.

#### ***Agreed priorities or concerns:***

**Sustainable development was highlighted as the overarching goal**, achievable only through active citizen participation, which can generate positive spillover effects across

the region. A potential risk under the Dark Horse scenario was noted: the emergence of skills mismatches and imbalances in labour supply and demand.

Establishing the conditions necessary to achieve Dark Horse was identified as a key priority, requiring a new mindset and potentially a gradual combination with elements of the Snail's Pace scenario to ensure a socially acceptable and manageable transition.

***Suggestions for improvements / follow-up actions:***

**Participants noted that achieving a Leapfrog scenario requires stronger citizen involvement in decision-making**, helping to counterbalance the current top-down governance approach. A Dark Horse trajectory was seen as a potential driver for attracting young and educated individuals to Central Macedonia by creating a more dynamic and opportunity-rich environment.

Stakeholders also highlighted that investment in re-skilling and the adoption of advanced agricultural techniques could support the conditions necessary for a successful Dark Horse scenario, ensuring that the region can capitalize on innovation and emerging economic opportunities.

***Other comments / reflections:***

**The 2030 time horizon was seen as constraining the feasibility of extreme scenarios**, reinforcing the continued relevance of the Snail's Pace trajectory due to the region's slow transition processes. Despite this, the Dark Horse scenario remains possible and should not be regarded as entirely unexpected.

Overall, the green transition was noted to currently follow a Snail's Pace dynamic, highlighting the importance of bottom-up initiatives to reinforce and accelerate progress in the coming years.

**Submitted by: AUTH**

## ***Lombardy (Italy)***

**Date of Workshop: 30 September 2025**

**Participants: 12 external stakeholders**

**Facilitator / Presenter: WR**

### **Stakeholder feedback & validation discussion**

#### ***Scenario probability assessment:***

Participants assessed the likelihood of different development trajectories for Lombardy by 2030. **Snail's Pace**, characterized by slow and fragmented progress, was considered the most plausible scenario, with the Delphi survey indicating ~52.6% probability. Participants emphasized that incremental innovation, uneven investments, and persistent demographic and structural constraints make this trajectory likely, citing heterogeneous development patterns such as housing pressures in Milan compared with weaker services in rural and intermediary areas. **Lion's Den**, representing high-risk stagnation and decline, was also seen as plausible (~40.8%), with factors such as demographic ageing, limited fertility and migration levers, national fiscal constraints, and exposure to geopolitical and climate shocks increasing the risk of stagnation. Several participants noted that without coordinated intervention, Snail's Pace could evolve into Lion's Den. **Dark Horse**, an inclusive and unexpected success scenario, was regarded as possible but unlikely (~16.2%) without deliberate, coordinated public action to diffuse benefits beyond Milan. Finally, **Leapfrog**, representing rapid, planned transformation, was considered the least probable (~12.7%) due to structural barriers, including bureaucracy, ageing labour force, sectoral rigidity, and financing constraints. Overall, participants validated the Delphi assessment, acknowledging the risk of stagnation while noting limited upside possibilities if governance and policy interventions improve.

**Overall interpretation:** Participants largely validated the Delphi assessment (majority weight on slow/disparate progress and material risk of stagnation) while acknowledging limited but real upside possibilities if policy and governance change. Several participants stressed that, without coordinated action, Snail's Pace could drift into Lion's Den.

#### ***Key insights from discussion:***

**Lombardy's internal heterogeneity emerged as a critical factor.** Milan, the metropolitan ring, mid-size towns, alpine, and rural areas display very different dynamics. Even within marginal areas such as Valtellina and Oltrepò Pavese, opportunities, services, and integration levels differ sharply. Participants stressed that scenario narratives should reflect these coexisting outcomes, as economic disparities persist alongside innovation hubs and struggling SMEs. Demography was identified as a critical constraint, with ageing populations, falling natural balance, and outmigration of young people creating pressure on labour supply, innovation capacity, and welfare systems. Universities face shrinking cohorts, prompting internationalization and asset repurposing as both a risk and an opportunity.

Financial constraints were noted as a major limiting factor, with high public debt and tight fiscal space reducing the feasibility of rapid green and digital transformations. The region's

geopolitical exposure and integration into global markets further increase vulnerability to external shocks, reinforcing the plausibility of the Lion's Den scenario. Participants also pointed to governance fragmentation and the absence of a long-term spatial vision, noting that sectoral policy fragmentation and limited metropolitan coordination hinder durable outcomes. Overreliance on private actors without sufficient public coordination exacerbates territorial inequalities, while bureaucratic hurdles impede implementation. Rising housing costs and living expenses in Milan contribute to talent flight and inequality, and limited climate adaptation measures highlight vulnerabilities to future shocks. Opportunities exist around the Milano - Cortina Olympics and tourism, but require long-term, inclusive planning rather than fragmented, short-term investment. Some participants noted that the 2030 horizon may be too short to capture deeper structural transformations.

***Agreed priorities or concerns:***

**Stakeholders emphasized several priority actions for the region.** Strengthening inter-municipal and metropolitan governance and spatial planning is essential to maximize the legacy of the Olympics and other investments. Demographic pressures should be addressed through youth retention, skills development, housing affordability policies, and welfare sustainability measures. Improving public-private coordination is critical to align private investment with public goals and ensure equitable coverage. Additionally, stakeholders highlighted the need to enhance infrastructure connectivity beyond Milan, including public transport, cycling networks, and digital connectivity, particularly for intermediary and rural areas.

Concerns were raised regarding the feasibility of rapid transformation scenarios like Leapfrog and Dark Horse, which require political will and fiscal capacity that may be lacking. Stakeholders warned that territorial inequalities and polarization could worsen if not addressed, while short implementation horizons and bureaucratic inertia reduce the probability of scaling pilot initiatives effectively.

***Suggestions for improvements / follow-up actions:***

**Stakeholders recommended refining scenarios to reflect internal heterogeneity,** breaking down implications by sub-territory, such as central Milan, the metropolitan ring, medium cities, and rural or alpine areas. Broadening engagement to include citizens from diverse socio-economic backgrounds was suggested to capture lived mobility experiences and expectations. Participants also requested a clearer, policy-ready pathway from scenario findings to actionable recommendations, including prioritization, feasibility assessments, and governance arrangements.

***Other comments / reflections:***

**Participants noted that the Olympic investments represent significant opportunities** but require integrated planning to avoid the common "short-term spike, long-term fade" pattern. Emerging pressures from digital infrastructure, including logistics platforms and

data centers, must be considered due to land and energy demands and modest labour contributions relative to their footprint. Several participants emphasized the need to consider longer-term structural transformations, given that demographic change, industrial upgrading, and social innovation operate over multi-decade timescales. Finally, stakeholders welcomed access to the consolidated report and requested a short executive brief for wider circulation, supporting ongoing dialogue and engagement.

**Submitted by: WR**

## *Groningen (The Netherlands)*

**Date of Workshop: 6 October 2025**

**Participants: 9**

**Facilitator / Presenter: RUG**

### **Stakeholder feedback & validation discussion**

#### ***Scenario probability assessment:***

**Snail's Pace** emerged as the most likely trajectory for Groningen, with the Delphi survey indicating a probability of 68.4%. The scenario reflects slow, uneven progress, and participants stressed that these probabilities must be interpreted with strong spatial heterogeneity. Groningen concentrates resilience and innovation potential, while outer municipalities tend to advance more slowly, highlighting contrasting regional dynamics.

**Lion's Den** was recognized as a tangible risk, not due to earthquake hazards per se, but because fractured trust and governance challenges in damage management have produced persistent stress in areas outside the city. In locations where trust and delivery problems continue, the Lion's Den trajectory remains plausible.

**Dark Horse** and **Leapfrog** were viewed as less probable for the province as a whole. Limited upside cases may nonetheless appear, particularly in sectors such as hydrogen and data infrastructure, which primarily benefit the city of Groningen and a few select municipalities. Some participants suggested that the Delphi probability for Dark Horse (26%) may be somewhat inflated and recommended lowering the likelihood assigned to both extreme scenarios.

#### ***Key insights from discussion:***

**The city of Groningen and the surrounding province follow distinct trajectories.** While the city, home to roughly one-third of the provincial population, hosts the University and most start-ups, outer municipalities experience slower change and weaker connections to these innovation and knowledge assets.

Despite available funding, uptake in outer areas remains limited - "money exists but does not land" - due to procedural hurdles, local attitudes, and past negative experiences with compensation. The Snail's Pace scenario reflects cultural and behavioural patterns, including reluctance to request support and a cautious stance toward change, rather than a shortage of resources.

Social stress and perceptions of risk are amplified by ruptures of trust following the handling of earthquake damage, particularly outside the city, feeding the plausibility of the Lion's Den scenario.

Leapfrog opportunities exist in sectors like hydrogen and data centers, but these niches are low-employment and geographically concentrated, potentially widening intra-provincial inequalities. Across the province, talent remains a binding constraint, with

shortages in both high-skill and blue-collar occupations and limited retention of international graduates.

***Agreed priorities or concerns:***

**Stakeholders observed that the city of Groningen and the wider province should be treated as distinct policy geographies** in scenario analysis and reporting. Strengthening social cohesion and repairing trust in areas affected by earthquake governance legacies was highlighted as a priority. Ensuring that available funds translate into tangible local projects requires simplifying access and supporting intermediary actors to improve "money landing." Talent development and retention across the full skills spectrum emerged as critical, with a focus on creating incentives for graduates and international residents to remain in the region. Finally, stakeholders noted that any positive outcomes are likely to be spatially concentrated, emphasizing the importance of monitoring distributional effects to avoid widening inequalities.

***Suggestions for improvements / follow-up actions:***

**Suggested improvements and follow-up actions focused on fostering broad prosperity** and enhancing social cohesion through bottom-up engagement, rather than concentrating solely on monetary outcomes. Targeted skill programs in hydrogen, energy, and digital infrastructure, complemented by blue-collar training, were identified as key to building local capacity. Existing infrastructure - such as cables, energy assets, and station upgrades - should be leveraged, with careful evaluation of employment intensity and local spillovers. Finally, stakeholders proposed revisiting scenario probabilities at the next checkpoint: maintaining Snail's Pace as the baseline (~65–70%), lowering Dark Horse and Leapfrog probabilities for province-wide outcomes, and closely tracking Lion's Den risks in the most vulnerable areas.

***Other comments / reflections:***

**Stakeholders noted that several areas outside Groningen perceive themselves as 'left-behind'** a sentiment closely linked to the earthquake recovery and rehabilitation process. While brief screen-sharing interruptions occurred during the session, these did not affect the substance or outcome of the discussion.

**Submitted by: RUG**

## Castilla-La Mancha (Spain)

**Date of Workshop: 25 September 2025**

**Participants: 10 external stakeholders**

**Facilitator: UB**

### **Stakeholder feedback & validation discussion**

#### ***Scenario probability assessment:***

The workshop validated the Delphi-based scenario probabilities while emphasizing Castilla-La Mancha's internal heterogeneity. **Snail's Pace** emerged as the most plausible trajectory at the regional level, reflecting persistent demographic decline, slow population growth, and very low densities in rural and mountainous areas. **Lion's Den** was considered a material risk for large rural territories, where youth emigration, limited innovation diffusion, and exposure to climate and energy-price shocks could accelerate decline.

While officials highlighted the potential for **Leapfrog**, driven by ongoing energy transition and tourism investments, academics urged caution, noting institutional capacity gaps and the need for integrated interventions. **Dark Horse** was seen by some as underestimated in the Delphi survey; private-sector investment in renewables, tourism, and data infrastructure could enable positive, though spatially concentrated, outcomes. Overall, the group emphasized that probabilities must be interpreted with strong attention to spatial differentiation, as corridors near Madrid and certain comarcas may follow faster or more surprising trajectories than the aggregate regional picture suggests.

#### ***Key insights from discussion:***

**A major consensus was that Castilla-La Mancha is highly heterogeneous**, and all four scenarios could co-exist across different territories. Rural areas face persistent demographic headwinds, including ageing, masculinization, out-migration, and extremely low densities, whereas areas adjacent to Madrid exhibit higher growth potential. Investment in renewables and tourism has already created jobs, fiscal returns, and local economic activity, but academics warned that without integrated, comarca-level packages - including digital connectivity, mobility, housing, care services, and entrepreneurship support - fragile areas will continue to shrink.

The gravitational pull of Madrid was recognized as both a risk and an opportunity: while it concentrates growth, proximity can be leveraged by improving connectivity, hybrid work options, and urban-rural linkages. Stakeholders also highlighted qualitative factors, such as long-term seasonal residents, immigration, and retirees, as potential drivers of rural vitality if supported by complementary policies in housing, social integration, and local services.

#### ***Agreed priorities or concerns:***

**The workshop identified the need for a territory-by-territory approach**, warning that generic regional measures fail to address stark internal contrasts. Priorities include

stabilizing depopulated zones through housing provision, care services, youth retention, and entrepreneurship support. Ensuring that renewable-energy and tourism investments generate local social and economic returns was repeatedly stressed. Tourism strategies should diversify focus toward remote comarcas, including Alto Tajo and Serranía de Cuenca. Strengthening institutional capacity and coordination was deemed essential to embed value chains, manage transitions, and monitor outcomes.

Concerns were raised regarding the environmental and social impacts of green infrastructure, such as farmland degradation, expropriation, and effects on protected fauna. Additionally, demographic and economic disparities may persist if investments are not carefully managed, and the pull of Madrid could exacerbate concentration effects without complementary regional strategies.

***Suggestions for improvements / follow-up actions:***

**Stakeholders recommended refining scenario probabilities** to account for current policy momentum, private-sector investment, and observed local trends. They emphasized integrating qualitative factors - including seasonal residents, immigrants, retirees, and remote work conditions - into scenario assessments.

A clear call was made to prioritize real, tangible projects in specific comarcas rather than symbolic measures. Follow-up workshops should include representatives from local municipalities and sectoral actors to ensure grounded insights. Monitoring and evaluating the spatial distribution of benefits from energy and tourism projects were highlighted as necessary to prevent uneven outcomes and support resilient local development.

***Other comments / reflections:***

**The discussion underscored the importance of distinguishing between short-term tourism and long-term seasonal residents for rural vitality.** Immigration was recognized as a key resilience factor, though integration challenges remain. Retirees and near-retirees were highlighted as a potential demographic niche capable of contributing to rural repopulation if complemented by services and social opportunities. Remote work has conditional potential but requires supportive housing and community policies.

Private-sector investment in energy and tourism was noted as critical for regional dynamism, yet academics emphasized that such investments alone cannot reverse demographic decline. Environmental concerns were raised regarding renewable-energy projects impacting farmland and ecosystems. The final consensus stressed that sustained cross-sectoral coordination, linking tourism, energy, demographic, and social policies, is essential to achieve resilient, inclusive, and locally anchored futures in Castilla-La Mancha.

**Submitted by: UB**



## TWIN TRANSITION AND CHANGING PATTERNS OF SPATIAL MOBILITY: A REGIONAL APPROACH

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