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ISABEL

MINIMIZE COSTS AND MAXIMIZE BENEFITS IN THE TRANSITIONARY EUROPEAN REGIONAL LABOUR MARKETS

mInimize coSts and mAximize Benefits in the transitionary European regional Labour markets

Deliverable Nº 6.2

Living lab methodological framework

WP6: Living Labs on JCD and reskilling policies

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Abstract

This deliverable outlines the Living lab methodological framework which is a structured approach for establishing and operating these experimental environments. It covers the planning, implementation, and evaluation stages, each of which is carefully crafted to foster collaboration, generate useful information, and improve methods through iterative feedback. Applying the quintuple helix model of private organizations, policymakers, universities, civil society, and environmental concerns, the deliverable seeks to introduce a holistic framework that can tackle the specific socio-economic contexts of various regions. This deliverable is essential in an attempt to guide the operations of the Living Labs so that they will provide valuable inputs towards the ISABEL project goals. It offers a clear demarcation for engaging the stakeholders, carrying out controlled social innovation experiments, and ongoing improvement in the strategies to make the transition socially and spatially equitable. Finally, the Living lab methodological framework is meant to create an ecosystem beyond the normal limits, facilitating collaboration and innovation in the area of employment generation and skill development.

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Executive summary

Deliverable 6.2 outlines the design, planning, and methodological foundations for the Living Labs (LLs) that constitute the core operational mechanism of ISABEL's Work Package 6. As the first major output of Task 6.2, this deliverable establishes a robust and flexible framework through which the project will organize, coordinate, and assess controlled social innovation experiments across six diverse European regions. The aim is to ensure that Living Labs become effective engines for understanding and addressing the uneven impacts of job creation and destruction associated with the green transition, while advancing the project's commitment to spatial justice and place-based development.

The Living Lab framework presented in this deliverable builds on the quintuple helix model, bringing together private organizations, public authorities, research institutions, civil society, and environmental actors and establishes their relevance and realism through innovation by taking into account the socio-economic and ecological realities of each individual territory. Additionally, the LL Framework provides the necessary mechanisms to bridge the conceptual contributions made in WP2 with the practical, context-sensitive development and implementation of methodologies to anticipate labour market changes and monitor their applicability, testing them in and adapting them to real-life situations. As such, the LL Framework transforms living labs into a new kind of iterative learning ecosystem that combines the participation of stakeholders, continuous feedback from actual practice, and instruction for and subsequent implementation of labour market transition methodologies.

In Deliverable 6.2, there is a structured approach to developing the Living Labs over the first year. The focus will be on developing methods of co-exploration and co-design. During the first 12 months of development, each region of the Living Labs collaborate with key stakeholders from the region for a co-design and co-exploration process to identify the local challenges faced by residents and to map out the labour market, including identifying key parameters that create and destroy jobs, and to determine what methods and formats are needed for developing the Living Labs. A shared baseline will be established through interviews, focus groups, workshops and online collaborative tools that will allow the partnership to develop hypotheses and scenarios that will be used for future experimentation as well as ensure that the Living Labs are developed in response to the specific needs of the region, while also fitting within the larger framework of ISABEL.

The document outlines how experimental activities will be conducted in real-life settings, how solutions will be tested and assessed, and how feedback loops will ensure that findings continually inform both local actions and the broader methodological development of the project. In this sense, Deliverable 6.2 does not only define the activities during the first year; it also structures the transition towards the more operational, pilot-driven work that follows. Deliverable 6.2 establishes that Living Labs are dynamic, responsive to place, and have an inherent methodological foundation to support the primary mission of ISABEL. It describes clearly the roadmap for implementation, clarifies roles of all stakeholders involved in this process and includes principles of spatial equity and iterative learning in the design and operation of all Living Labs thereby ensuring that they will be able to produce actionable knowledge and to build regional resiliency characteristics of European labour markets and support a transition to equitable and inclusive labour markets throughout Europe.

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Abbreviations

JCD	Job Creation and Destruction
FGI	Focused Group Interviews
GDP	Gross Domestic Product
LL	Living Lab

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1. Introduction

1.1 ISABEL Living Labs Design

Living Labs are dynamic, open innovation ecosystems where innovation unfolds in real-life, operational environments. By using a systematic co-creation approach, they integrate research and innovation activities across communities, involving citizens and end-users at the center of the innovation process. This unique approach ensures that Living Labs not only generate groundbreaking ideas but also create solutions that are deeply rooted in real-world needs.

Living Labs are particularly well-suited for addressing "wicked problems"—complex and multifaceted challenges that are difficult to define, have no clear solution, and involve numerous stakeholders with conflicting interests. Examples of problems include climate change, urbanization, and social inequality, among others. These issues require collaborative and adaptive approaches, making the Living Lab methodology highly effective. Through their multi-stakeholder and user-centred design, Living Labs offer a structured environment for tackling such challenges in a way that integrates diverse perspectives and adapts to evolving needs.

Definition of Living Labs: "*user-centred, open innovation ecosystems based on a systematic user co-creation approach, integrating research and innovation processes in real-life communities and settings*" (ENoLL, 2025).

Living Labs, as dynamic innovation ecosystems, create significant value through their unique characteristics. These ecosystems foster value creation not only at the project level but also extend their influence on organizational and community levels. The most visible and measurable aspects of this value creation typically manifest within individual Living Lab projects, yet their impact can reach far beyond specific initiatives, creating ripples across multiple sectors and stakeholders. Living Labs are instrumental in driving innovation, societal transformation and the co-creation of solutions that meet real-world challenges.

Their characteristics—such as active user involvement, multi-stakeholder participation, orchestration, cocreation, real-life experimentation, and a multi-method approach—create tangible and lasting impacts that benefit communities, industries, and regions. Through their collaborative and user-centric approach, Living Labs facilitate the development of solutions that are not only innovative but also deeply aligned with the needs and aspirations of the communities they serve. The governance model of a Living Lab is a critical component that influences its strategic direction, operations, and long-term sustainability. The governance structure must ensure coordination and collaboration among diverse stakeholders, including local governments, academic institutions, private entities, and citizens (macro level). Effective governance promotes inclusivity, adaptability, and shared decision-making, all of which are essential for the success of Living Labs across various domains.

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A key feature of Living Lab governance is the early and continuous involvement of all stakeholders in the decision-making process as well as in the operational activities. This ensures that the diverse perspectives and needs of different participants are integrated into the project design and implementation. To facilitate this, a comprehensive governance framework should be established, which clearly defines the roles and responsibilities of each stakeholder, provides mechanisms for coordination, and supports transparent communication.

The ISABEL project aims at fostering a fair transition of labour market across various European regions by addressing the problems and opportunities stemming from job creation and destruction (JCD) processes in the context of the green and digital transitions. A key element within ISABEL is the establishment of Living Labs as dynamic spaces for engaging local actors, policymakers, and end-users in the co-creation of policy proposals and innovation that are tailored and context-specific. These living labs are a critical element in addressing and acting on the socially and geographically uneven effects of JCD in the green and digital transitions. They are spaces where stakeholders, such as researchers, policymakers, industry, and local communities, come together to experiment and co-design in real-world settings. The general aim is to create and assess innovative approaches to reskilling and upskilling employees in order not to leave any region or socio-economic group behind during the transition phase.

The Living Labs Design Roadmap outlines the structured approach for establishing and operating these experimental environments. It covers the planning, implementation, and evaluation stages, each of which is carefully crafted to foster collaboration, generate useful information, and improve methods through iterative feedback. Applying the quintuple helix model of private organizations, policymakers, universities, civil society, and environmental concerns, the roadmap seeks to introduce a holistic framework that can tackle the specific socio-economic contexts of various regions. The roadmap is essential in an attempt to guide the operations of the Living Labs so that they will provide valuable inputs towards the ISABEL project goals. It offers a clear demarcation for engaging the stakeholders, carrying out controlled social innovation experiments, and ongoing improvement in the strategies to make the transition socially and spatially equitable. This roadmap is meant to create an ecosystem beyond the normal limits, facilitating collaboration and innovation in the area of employment generation and skill development.

1.2 Living Labs Rational and Context

Since Living Labs (LLs) are dynamic environments where stakeholders co-create and test solutions in real-world settings, their location should be strategic place based and context-driven. Rather than a fixed physical space, LLs should adapt to the needs of the region, stakeholders, and experimental goals. The following aspects should be taken into account:

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1. **Active User Involvement:** Actively involving users from the outset of the innovation process ensures that their needs, preferences, and feedback are integrated throughout the project. This early and ongoing engagement helps to identify flaws and barriers in solutions before they are finalised, resulting in more user-aligned and relevant outcomes. By incorporating users in the co-design and testing stages, LLs increase the creativity and desirability of innovations, making them more likely to be adopted. This approach also enhances the innovation's impact as it responds directly to the practical needs of the users.

2. **Involving Multiple Stakeholders:** The inclusion of diverse stakeholders —including government, academia, businesses, and civil society— brings multiple perspectives, resources, and expertise into the innovation process. This broader perspective enhances problem-solving capabilities, fosters collaboration across disciplines, and creates solutions that are more sustainable and

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3. **Orchestration:** Effective orchestration ensures seamless coordination among diverse stakeholders, maintaining alignment with the shared objectives of the Living Lab. This collaborative leadership reduces fragmentation and enhances efficiency, allowing for better risk management and smoother integration of various contributions. Strong orchestration promotes a flexible, adaptive environment where innovations can evolve rapidly in response to changing conditions. This ensures that the innovation process remains coherent and goal-oriented, even when managing complex, multi-stakeholder projects. The result is an accelerated innovation cycle with greater adaptability and better alignment with community needs.

4. **Co-Creation:** Co-creation is at the heart of LLs, fostering deep collaboration among all relevant stakeholders in the innovation process. By engaging stakeholders in the co-design, development, and testing phases, LLs ensure that the resulting innovations reflect a shared vision and are more likely to meet the diverse needs of the community. This active participation enhances creativity, ownership, and commitment to the innovation, which reduces the risk of rejection and improves adoption rates. Furthermore, by aligning the interests and objectives of different groups, LLs are able to accelerate time-to-market and ensure that innovations are fit for purpose and supported by the community.

5. **Real-Life Experimentation:** One of the key advantages of LLs is their ability to cocreate, co-design and test solutions in real-life settings, outside of controlled environments. This experimentation provides highly relevant and realistic feedback that can significantly improve the outcomes of innovation, in the early problem-oriented stages as well as in the solution-oriented stages. By engaging users and stakeholders directly in these real- world trials, LLs ensure that solutions are tested for practicality and effectiveness in actual use cases. This real-world validation of concepts helps mitigate potential risks early in the process, ensuring that the solutions developed are market-ready and applicable in everyday contexts. Additionally, this real-life testing provides a strong evidence base that can be used to demonstrate the viability of the innovation to stakeholders and investors.

6. **Adopting a Multi-Method Approach:** The multi-method approach within LLs combines various innovation techniques and tools that are tailored to the specific goals of each project. This flexibility enables LLs to respond to complex challenges by selecting methods that align with the problem at hand and the needs of the stakeholders involved. By incorporating diverse methods, such as qualitative research, quantitative analysis, and experimental testing, LLs boost creativity and problem-solving capacity, ensuring that the solutions developed are not only effective but also adaptable. This approach also enhances the validity and reliability of the results, making the innovations more trustworthy and applicable to real-world settings.

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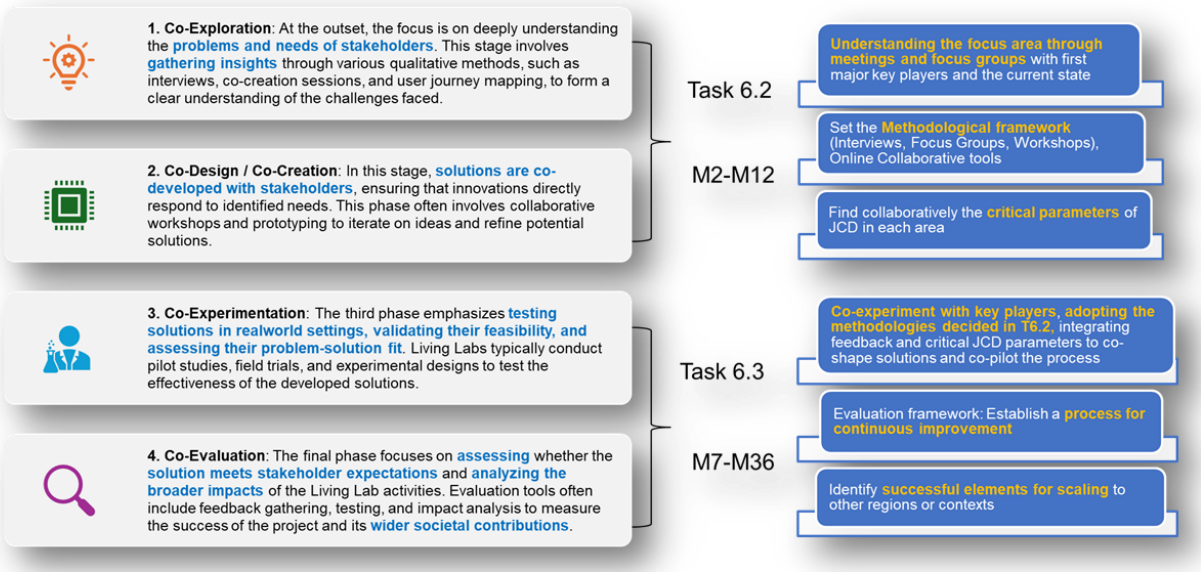
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2. ISABEL's Roadmap for LLs in each Region & Connection to WP6 – Living Labs on JCD and Reskilling Policies

It is critical to link the needs of local communities to the wider goals of the ISABEL project in ensuring that the solutions developed by the LLs are informed by contextual factors and aligned with European objectives. To achieve this, all activities carried out within each region should respond not only to immediate labour market needs but also to broader objectives such as eco-innovation, eco-entrepreneurship, and smart specialization strategies. Consequently, this will entail an assessment of the extent to which each region's activities will reduce the incidence of job loss as well as increase opportunities for the creation of new, sustainable forms of employment with decent working conditions, main aims of ISABEL.

The development of solutions through the processes of co-creation and experimentation will provide the opportunity to assess the potential for the transferability and scaling of those solutions across other regions, including an analysis of the conditions under which the success of those solutions can be replicated. In addition, clear impact pathways must be established by all LLs to provide a means of translating findings into actionable policy recommendations, targeted training programs, and strategic partnerships that support the long-term economic resilience of each Living Lab. Finally, the LLs must document their contribution to long-term sustainability beyond the duration of the project, ensuring that the mechanisms, collaborations, and knowledge generated become embedded within regional structures in order to continue to support just and inclusive transitions in the years ahead.

The stages of the Living Labs implementation will be split into 2 stages.



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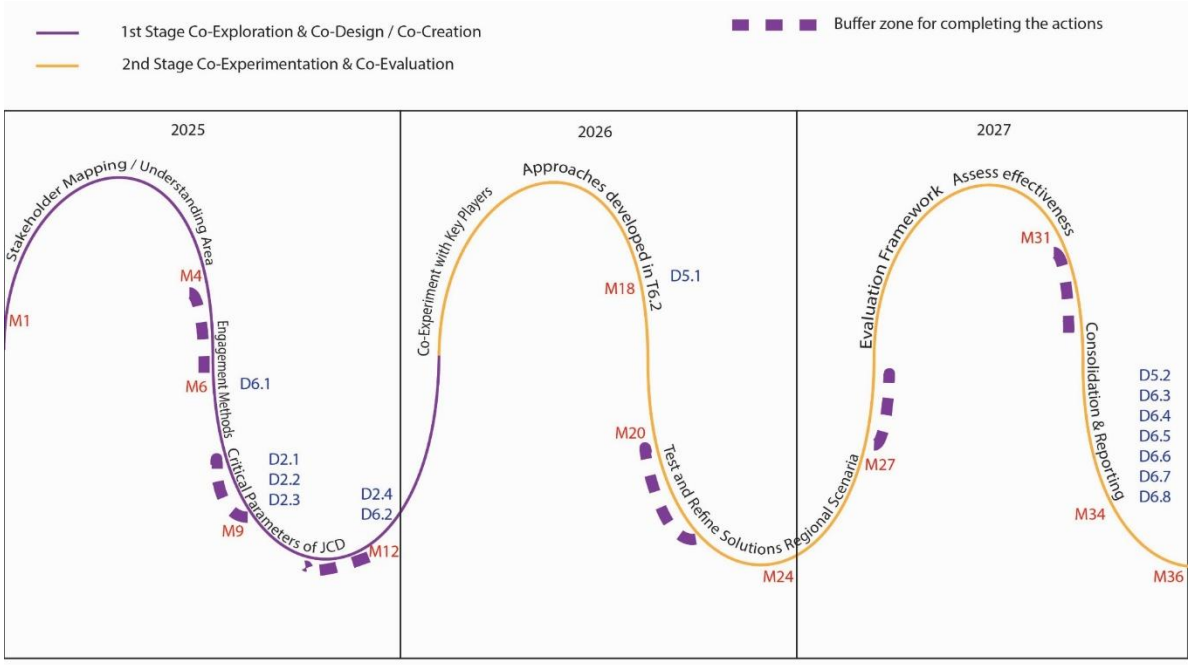
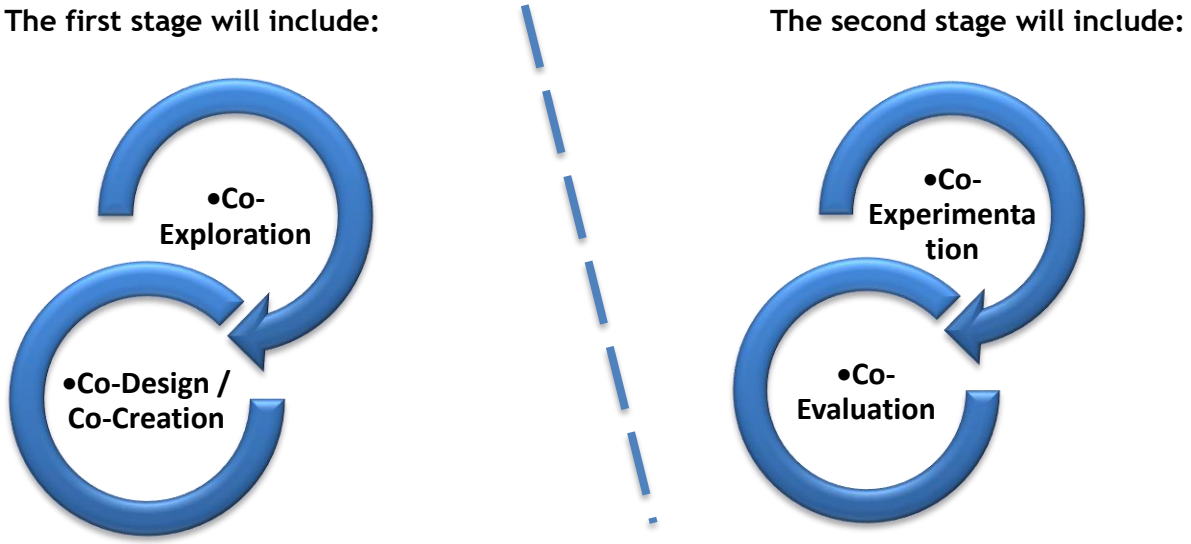


Figure 1. ISABEL's Living Lab timetable



2.1 Living Labs 1st Stage

The first stage signals the start of T6.2 Living lab plan and design and includes the co-exploration:

Co-Exploration: At the outset, the focus is on deeply understanding the problems and needs of stakeholders. This stage involves gathering insights through various qualitative methods, such as interviews, co-creation sessions, and user journey mapping, to form a clear understanding of the challenges faced.

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The main actions to achieve the first stage in each region require the following:

1. **Understanding the focus area through meetings and focus groups** with first major key players and the current state

2. Set the **Methodological framework** (Interviews, Focus Groups, Workshops), Online Collaborative tools

3. Find collaboratively the **critical parameters** of JCD in each area

Table 1: Actions for the first stage of the Living Labs.

Stage 1 Actions			
Action	**Objective**	**Implementation Steps**	**Expected Outcome**
1. Understanding the Focus Area	Establish a clear understanding of the regional context, key players, and current state of JCD.	- Identify Key Stakeholders: Map major regional actors (government, businesses, NGOs, academia, etc.).	• Key stakeholders identified and engaged. • Regional context and challenges documented. • Gaps and opportunities outlined.
2. Set the Methodological Framework	Define the tools and methods for stakeholder engagement and data collection.	- Select Engagement Methods: Choose appropriate approaches (e.g., interviews, focus groups, workshops, surveys).	• Standardized approach for data collection. • Digital tools in place for collaboration. • Clear methodology for Living Lab activities.
3. Find Collaboratively the Critical Parameters of JCD in Each Area	Identify key factors influencing JCD in each region through stakeholder participation.	- Host Stakeholder Workshops: Engage stakeholders in defining regional JCD priorities.	• Key JCD parameters identified for each region. • Stakeholders actively involved in problem definition. • Foundation set for Co-Design & Co-Creation phase.

In Stage 1, Living Labs retain flexibility in selecting data collection techniques in order to reflect regional specificities and stakeholder availability. At the same time, to ensure balanced participation and comparability across regions, the ANNEX I provides the methodological framework requirements that partner should adhere to.

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Interview templates with common developed questions that are tailored for each stakeholder group that each partner will use in order to have comparative results are presented in Annex II and constitute the common analytical framework for all data collection techniques and may be adapted for use in focus groups and workshops. This will address the systemic nature of labour market transformations and the time required for observable change. To standardise analysis and support cross-regional comparison, all partners synthesise their findings using a common results matrix incorporating:

- Stakeholder category, date, and interview type
- Key emerging themes
- Main insights, concerns, and opportunities
- Region-specific observations

This approach ensures methodological coherence while offering practical support to partners with varying levels of prior experience in Living Lab research.

2.2 Living Labs 2nd Stage

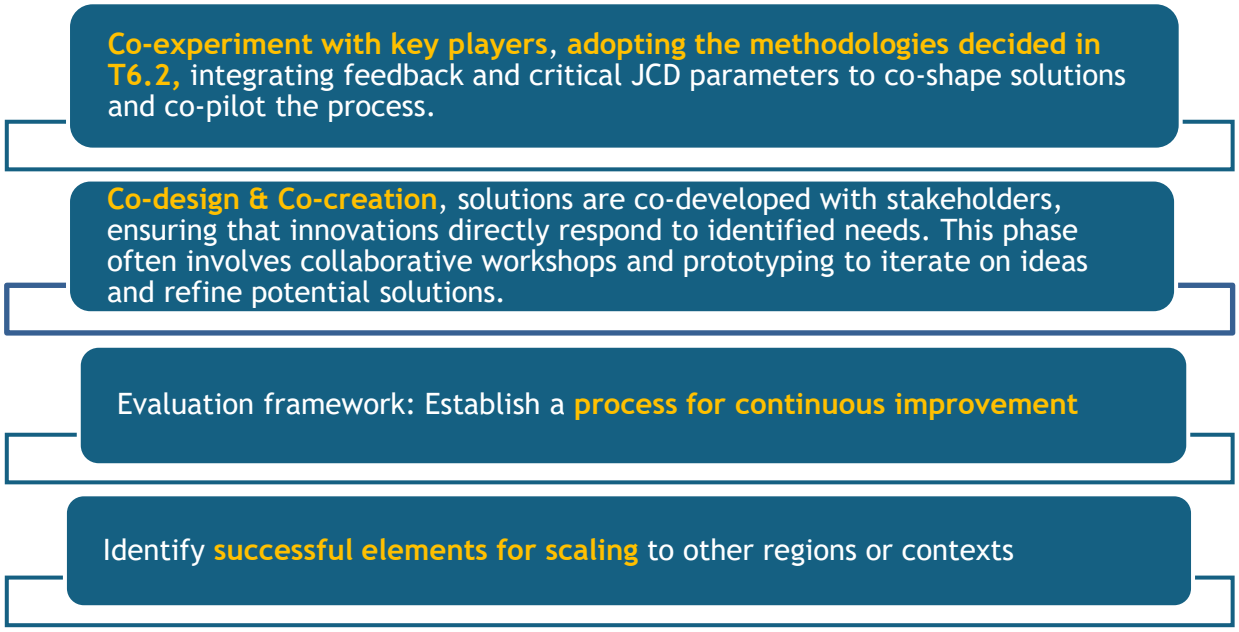
The second stage, also linked to Task 6.3 includes the following:

Co-Design / Co-Creation: In this phase, solutions are co-developed with stakeholders, ensuring that innovations directly respond to identified needs. This phase often involves collaborative workshops and prototyping to iterate on ideas and refine potential solutions.

Co-Experimentation: The third phase emphasizes testing solutions in real world settings, validating their feasibility, and assessing their problem-solution fit. LLs typically conduct pilot studies, field trials, and experimental designs to test the effectiveness of the developed solutions.

Co-Evaluation: The final phase focuses on assessing whether the solution meets stakeholder expectations and analyzing the broader impacts of the Living Lab activities. Evaluation tools often include feedback gathering, testing, and impact analysis to measure the success of the project and its wider societal contributions.

The main **actions to achieve the second stage** in each region require the following:



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Table 2: Actions for the second stage of the Living Labs.

Stage 2 Actions			
Action	**Objective**	**Implementation Steps**	**Expected Outcome**
1. Co-design & Co-creation	Solutions are co-developed with stakeholders, ensuring that innovations directly respond to identified needs.	- Collaborative workshops -Interviews, Focus groups -prototyping to iterate on ideas and refine potential solutions.	• Continuous stakeholder engagement. • Assessment and integration of feedback and identified needs.
2. Co-Experiment with Key Players	Test and refine solutions in real-world settings, ensuring they align with stakeholder needs and JCD parameters.	- Apply Agreed Methodologies: Implement the approaches developed in T6.2 (e.g., pilot studies, field trials, workshops).	• Solutions tested in real-world conditions. Stakeholders actively engaged in refining innovations. Data gathered to inform evaluation and scaling.
3. Establish an Evaluation Framework	Create a structured process to assess effectiveness and improve solutions continuously.	- Define Key Metrics & Indicators: Establish evaluation criteria (e.g., user satisfaction, environmental impact, social acceptance).	• A systematic framework for assessing LL success. • Continuous improvement loop established. • Evidence-based adjustments made to solutions.
4. Identify Successful Elements for Scaling	Pinpoint key success factors and develop strategies for replication in other regions.	- Analyze What Worked: Identify elements that contributed to successful outcomes (e.g., effective collaboration models, policy enablers).	• Scalable solutions identified. • Best practices documented for replication. • Policy alignment for regional/national scaling.

Stage 2 of the Living Labs explicitly acknowledges the systemic nature of labour market transformations and the fact that observable changes in employment structures, skills systems and governance arrangements often require time horizons extending beyond the project duration. Moreover, proposed solutions will be frequently shared with, or transferred to end-users to achieve the co-creation, co-development process of the LLs.

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For these reasons, the project focus of the Living Labs is on the development and documentation of "potential" experiments and possible focus of Living Lab in each region rather than on demonstrating definitive long-term impacts. Each Living Lab is required to develop their regional case studies through the LLs as described in chapter 3, which together form a structured repository of solutions tailored to different regional contexts. Evaluation and scaling activities therefore prioritise process quality, feasibility, stakeholder validation and transferability conditions, providing a realistic and policy-relevant basis for future implementation beyond the project's direct control.

Given the systemic nature of labour market transformations and the shared responsibility for implementation with regional actors, the LLs will adopt a structured approach based on the development of potential co-experiments. These co-experiments represent implementation-ready models and solutions, rather than fully realised interventions, and are designed to inform future policy action and regional uptake beyond the project's direct timeframe. Each region has its own strengths to provide and needs to address under the umbrella of JCD field and each region has its own experimental narrative as described in section 3. However, all potential co-experiments in the LLs will be documented using a standardised matrix capturing key information, including:

- Title of the Co-Experiment
- Linked hypothesis and targeted JCD challenge
- Participating and implementing entities
- Description of the proposed activity
- Anticipated short-term and long-term outcomes
- Indicative implementation costs and resource needs
- Potential for expansion, transfer or scaling

Together, these matrices form a project-level repository of solutions, providing ISABEL with a structured database of context-sensitive models addressing job creation, job destruction and skills transitions across diverse regions. To strengthen the relevance and feasibility of the proposed co-experiments, end-user representatives (e.g. workers, employers, public authorities) are involved in their assessment through workshops, focus groups or targeted feedback sessions. This evaluation focuses on perceived usefulness, implementability and contextual fit, rather than on the demonstration of long-term impacts.

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3. Living Labs

This chapter gives an overview for each region and ISABEL activities in each Living Lab, which involves engaging local stakeholders, conducting interviews and focus groups, and developing tailored policy recommendations based on the unique characteristics and needs of each region. The LLs aim to address the challenges of job creation and destruction in the context of the green and digital transitions and ensure that no region or socio-economic group is left behind.

3.1 Living Lab 1: Regional Case Study Western Macedonia (Greece)

The importance of Western Macedonia in the EU broader context

Western Macedonia, with its GDP being equal to 44% of the EU27 gross domestic product (euro per inhabitant), located in Greece, whose GDP per capita in PPS is below the EU27 average. Western Macedonia had the third highest unemployment rate in 2022 across the EU NUTS2 regions (17.7%), underscoring the region's relative economic vulnerability, despite the significant improvement in unemployment since its peak at 31% following the 2008 global economic crisis. The capacity of the coal-fired power plant is 2,305MW with 4,650 direct jobs in coal activities (around 5% of regional employment), with around 1,000 being under immediate risk . Over the past decade, job losses have been notable, particularly in coal mining, the food manufacturing, construction, construction and wearing apparel. Concurrently, job creation has been observed, especially in the retail sector. Despite historical trends of higher unemployment rates for women compared to men in this region, unemployment remains elevated, particularly for men –especially those with medium skills – exceeding levels observed in the 2010s.



Figure 2. Region Western Macedonia.

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Experiment description in the Region of Western Macedonia

By developing an LL, policymakers and representatives of employers' and workers' organizations will be involved in mapping the regional needs, providing valuable information for developing tailored policy recommendations based on local specificities. This will be done through semi-structured interviews and focus groups to identify the most important industries/sectors for focused upskilling and reskilling programs. Furthermore, the LL will serve as a platform for industry and academic collaboration to create specialized training programs that address the skill gaps that have been identified. Stakeholders will be involved in the formulation of plans to diversify the local economy, with an emphasis on advancing innovative and sustainable sectors, using a participatory approach. The project will also evaluate how well these techniques work to improve overall economic resilience and lower unemployment rates, especially for those with medium-level skills. Ultimately, the Living Lab hopes to function as a dynamic platform for addressing the particular economic difficulties the region faces and promoting equitable growth by combining the forecasted data, involving stakeholders.

Possible Focus of Living Lab in Western Macedonia (Greece)

Focus on the transition from coal-dependent industries to more sustainable sectors. Evaluate the impact of job losses in coal mining and related industries, and explore strategies for reskilling and upskilling workers to fit into emerging green sectors. Engage local stakeholders to map regional needs and develop tailored policy recommendations.

The LL will serve as a platform for industry and academic collaboration to create specialized training programs that address the skill gaps identified. Stakeholders will be involved in the formulation of plans to diversify the local economy, with an emphasis on advancing innovative and sustainable sectors.

3.2 Living Lab 2: Regional Case Study Silesia (Poland)

The importance of the Silesia Region in the EU broader context

Silesia, with its GDP being equal to 47% of the EU27 gross domestic product (euro per inhabitant), located in Poland, whose GDP per capita in PPS is below the EU27 average. In Silesia Province, unemployment is exceptionally low, falling below the Polish national average in 2022 (2.2% versus 2.9%). Long-term unemployment stands at less than 1%, consistent with trends observed in most regions in Poland. Over the past two decades, there has been a continuous decline in unemployment, starting from around 20% in the early 2000s. The total hard coal-fired power plant capacity is 5,414 MW (around 80% is likely to retire by 2030) related to 76,554 jobs (around 6% of regional employment), of which a significant part is under threat in the 2020s (Kapetaki et al., 2021). Upper Silesia region anticipates around 41,000 job losses (Alves Dias et al., 2018). Over the last decade, job losses have been notable, apart from coal mining, in agriculture, construction, as well as wholesale and retail. In parallel, job creation has been noted, particularly in motor vehicles, the manufacture of rubber and plastics, computer programming, warehousing, and public administration. Unemployment rate remains low across all skills groups, with a predominant share of the workforce in Silesia Province being medium-skilled.

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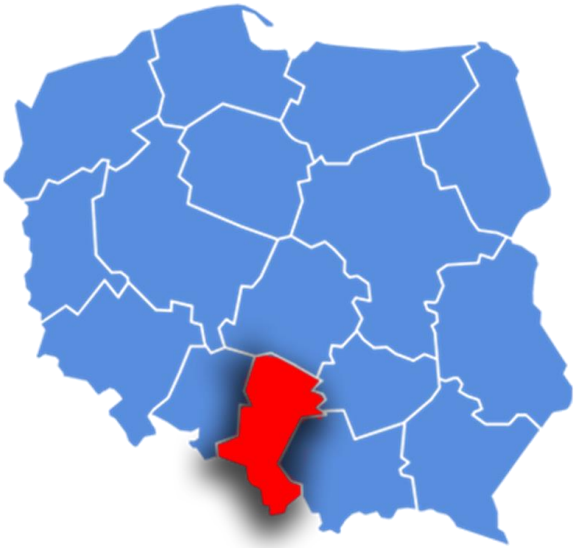


Figure 3. Silesia.

Experiment description in Silesia

By developing an LL, ISABEL will cooperate with the regional policymakers (predominantly with Provincial Labor Office in Katowice), representatives of employers' & workers' organisations, of the education system, and of regional labour market institutions. In this way, we will build a multidimensional exchange platform of knowledge and experience about the situation in the region. This will allow to properly identify industries, professional and social groups with different professional development prospects related to the observed changes in the region. Focused Group Interviews (FGI) will be conducted with representatives of stakeholders and employees in order to map supply and demand side perspectives and perceived challenges in labour market transition within selected industries. On this basis, during workshops we will develop innovative programs for the necessary support for further development and/or recovery from the crisis for key industries in the region's future development emphasising sustainability through a participatory approach. This will be done through FGI and workshops with engaging diverse participants, which will ensure free flow and access to information, but also develop ideas and practical solutions for regional policy, economy and market.

Possible Focus of Living Lab in Silesia (PL)

Address the challenges of transitioning from a region heavily reliant on coal mining to diversified economic activities. Assess the impact of job losses in coal mining and other traditional sectors, and identify opportunities for job creation in new industries. Collaborate with local stakeholders to develop innovative support programs for key industries and social groups.

The LL will build a multidimensional exchange platform of knowledge and experience about the situation in the region, conducting Focused Group Interviews (FGI) with representatives of stakeholders and employees to map supply and demand side perspectives and perceived challenges in labour market transition.

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3.3 Living Lab 3: Regional Case Study Asturias (Spain)

The importance of the Asturias Region in the EU broader context

Asturias, with its GDP being equal to 72% of the EU27 gross domestic product (euro per inhabitant), located in Spain, whose GDP per capita in PPS is below the EU27 average. Asturias had the 9th highest unemployment rate among the Spanish NUTS2 regions (12.6% in 2022, down from 24.1% in 2013). The regional labour market has been traditionally dependent on coal mines, which allowed for the proliferation of thermal power plants and a strong presence of steel-related industries. Coal mining was heavily subsidised directly and indirectly by the Spanish authorities, by imposing tariffs on imported coal and by forcing electric generating companies to burn domestic coal in their plants.

However, in the late 80s and early 90s, this public-support policies started to be dismissed gradually, until the almost complete elimination of the coal mining and the end of thermal power plants. This "early green transition" generated a rise in the unemployment levels (traditionally much lower than the Spanish average but nowadays in the same level), a decline in the regional income and a dramatic change in the economic specialisation and the spatial distribution of activity across the municipality of the region. The skills that were valued in heavy industries are not helpful anymore in a regional economic structure much more oriented toward other activities. At the moment, the coal-fired power plant capacity is 1,571MW (hard coal), being likely to retire until 2030, with 1,980 direct jobs in coal activities, 25% of which being significantly affected by 2030.



Figure 4. Asturias.

Experiment description in Asturias

By developing a Living Lab, ISABEL consortium will cooperate with the regional delegation of the national Public Employment Service (SEPE) in Asturias to map mismatches between vacancies and unemployed. SEPE-Asturias has detailed microdata of (i) new contracts made by the companies located in the region, (ii) companies' demands of occupational profiles and (iii) characteristics of the unemployed persons registered as job-seekers in SEPE offices. By combining and exploiting

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these datasets, teams of ISABEL and SEPE officials will identify which are the industries and occupations that are more exposed to risks or with better prospects to expand as a consequence of the changes in the final demand across industries. This will allow for identifying, through the application of MRIO analysis, the "winner" and "loser" sectors, which present different requirements in their occupations mix. As a consequence, occupational profiles can be evaluated as "risky" or "resilient", for example. The collaboration with SEPE and the joint exploitation of their databases will allow to track those new contracts (job creation) and jobs removed (job destruction) through the years of the development of the project, in order to check and validate if the methodology proposed for the taxonomy of occupational profiles made helps predict potential risks or opportunities that can be applicable to other regions.

Possible Focus of Living Lab in Asturias (Spain)

Examine the effects of the early green transition on the regional economy, particularly the decline in coal mining and thermal power plants. Identify industries and occupations at risk and those with growth potential. Collaborate with the regional Public Employment Service to map mismatches between vacancies and unemployed individuals and develop strategies for reskilling and upskilling.

The LL will identify which industries and occupations are more exposed to risks or have better prospects to expand as a consequence of changes in final demand across industries, allowing for the evaluation of occupational profiles as "risky" or "resilient."

3.4 Living Lab 4: Regional Case Study Sjælland (Denmark)

The importance of the Sjælland Region in the EU broader context

Sjælland, with its GDP being equal to 119% of the EU27 gross domestic product (euro per inhabitant), located in Denmark, whose GDP per capita in PPS is above the EU27 average. The region is based on traditional industries and a workforce with traditional skills like vocational training. Employment in manufacturing was 11.6% in 2022, slightly down from 11.9% in 2013, indicating a slow and gradual transformation. Region Sjælland covers both municipalities that are relatively successful in transforming the economy towards more sophisticated production such as Roskilde and Kalundborg - the latter being an important production site for Novo Nordisk, which result in large demand of labour with many competences.

Other municipalities in the region have faced significant challenges of adjusting to a post fordist production structure which has resulted in relatively high unemployment, depopulation and lack of jobs and labour with high end competences. Thereby, Sjælland is a region with a diverse and unequal economic structure. Related to natural resources, Asnæsværket, the largest power plant in Denmark (1,057MW output), with around 300 workers, having coal as basic source, is located in the region. Other power plants are found in the region that are dependent upon coal and will face transformations in the coming years towards more environmental and sustainable production of energy, with the ban of coal being set for 2025 in the country. This could pose challenges for the labour market of the region which has the lowest unemployment rate in Denmark in 2022 (3.9%).

Part of the future transformations could be already portrayed by the Symbiosis project (Asnæsværket and Novo Nordisk are part of the project), which involves large manufacturing firms in the area of Kalundborg, collaborating to share excess water, energy, and materials,

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saving waste. Moreover, large parts of the region's economy are linked to agricultural production, with two sugar beet production plants, which used to be heavily dependent on coal, which is expected to be replaced by gas.

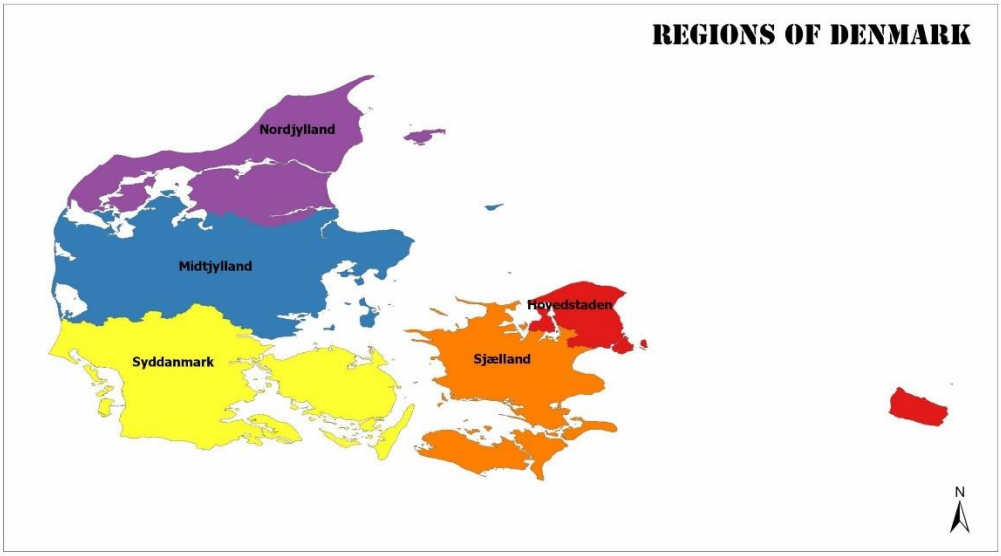


Figure 5. Sjælland.

Experiment description in Sjælland

The Living Lab will engage local stakeholders to assess regional needs, yielding valuable insights for crafting customized policy recommendations based on local specificities. Focus groups and semi-structured interviews with workers (from the supply side) and firms (from the demand) and local stakeholders will pinpoint key industries and social groups that require targeted upskilling and reskilling programs. Additionally, the Living Lab will act as a collaborative platform for industry-academic partnerships, suggesting specialized training initiatives to address identified skill gaps. Stakeholders will play a crucial role in formulating plans to diversify the local economy, emphasizing innovation and sustainability through a participatory approach. ISABEL will evaluate the effectiveness of these strategies, aiming to enhance resilience and employment rates, particularly for individuals with medium-level skills.

Possible Focus of Living Lab in Sjælland (Denmark)

Explore the transition from traditional industries to more sophisticated production and sustainable energy sources. Assess the impact of the ban on coal and the shift towards environmental and sustainable energy production. Engage local stakeholders to identify key industries and social groups requiring targeted upskilling and reskilling programs.

The LL will act as a collaborative platform for industry-academic partnerships, suggesting specialized training initiatives to address identified skill gaps. Stakeholders will play a crucial role in formulating plans to diversify the local economy, emphasizing innovation and sustainability.

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Region of Belgrade, with its GDP being equal 32% of the EU27 gross domestic product (euro per inhabitant), is located in Serbia, whose GDP per capita in PPS is below the EU27 average. The regional unemployment rate was 7.8% in 2022, the lowest in Serbia, and down from 18.7% in 2015. However, the regional economic and labour structure is complex with many intra-regional differences, comprising a vibrant services-oriented core metropolitan area and peripheric municipalities where either agriculture or coal mining and energy production are main economic activities. We mostly focus on the single-industry town of Lazarevac, where the Kolubara lignite mines, the centre of coal-mining industry in Serbia is located.

Kolubara surface basin (that extends beyond Lazarevac) employs almost 12,000 workers (down from 25,000 in 2004) and produces some 75% of total amount of lignite in Serbia. Some 40% of total employment in Lazarevac is in Kolubara mines. In terms of wages, relative position of Lazarevac within Serbia and the City of Belgrade region has significantly deteriorated, with average wage dropping during the last decade from 150% to only 110% of Serbian average, as well as from 126% to 85% of the City of Belgrade regional average. Similar but less striking dynamics is observed regarding employment. The profound challenges that await Lazarevac and other coal-mining regions have prompted Government to ask European Bank for Reconstruction and Development to develop a diagnostic study, followed by the Action plan for just transition, which is in the process of preparation.

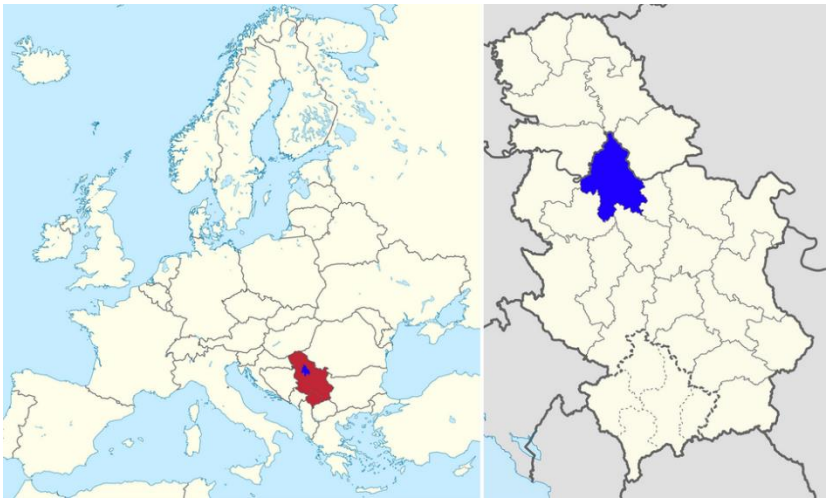


Figure 6. Belgrade.

Experiment description in Belgrade

By developing a Living Lab, policymakers at various levels, representatives of employers' and workers' organisations as well as professionals from public employment service and private employment agencies will be involved in mapping the regional needs and providing valuable information for developing tailored policy recommendations based on local specificities. The focus will be on identifying occupational shortages in Lazarevac and its commuting vicinity, as well as business opportunities for the creation of good green jobs in the region.

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Possible Focus of Living Lab in Belgrade (Serbia)

Focus on the transition of the coal-mining town of Lazarevac and its surrounding areas. Assess the impact of job losses in coal mining and energy production, and identify business opportunities for creating green jobs. Collaborate with local stakeholders to map occupational shortages and develop tailored policy recommendations.

The LL will involve policymakers, representatives of employers' and workers' organizations, and professionals from public employment services to map regional needs and provide valuable information for developing tailored policy recommendations based on local specificities.

3.6 Living Lab 6: Regional Case Study North Eastern Scotland (UK)

The importance of North Eastern Scotland in the EU broader context

North Eastern Scotland, with its GDP being equal to 158% of the EU27 gross domestic product (euro per inhabitant), located in the UK, whose GDP per capita in PPS is above the EU27 average. This region reported a relatively low unemployment rate of 4% in 2023Q2. Scotland stands at the forefront of global efforts toward achieving net zero, boasting one of the most ambitious transition plans worldwide. In 2012, Scotland launched the Climate Justice Fund with an initial allocation of £12 million, dedicated to supporting some of the world's most vulnerable populations in building resilience against the impacts of climate change. The Fund saw a threefold increase in 2021, with a renewed pledge of £36 million to be expended over the subsequent parliamentary term. At COP26 in the same pivotal year, Scotland earmarked £2 million from the Climate Justice Fund to specifically address loss and damage stemming from climate change.

Scotland has committed to reducing emissions of all major greenhouse gases by at least 75% by 2030, relative to a 1990/1995 baseline. Specifically targeting 2030, the nation aspires to derive 50% of its energy for heat, transport, and electricity from renewable sources. Importantly, the Scottish Government introduced the Just Transition Fund—a £500 million, 10-year initiative designed to expedite the energy transition in the Northeast of Scotland (where it reported an unemployment rate of 4.3% in the 2nd quarter 2023). This Fund aims to position the region as a global leader in the journey toward a net-zero economy. Noteworthy achievements include hosting the world's first floating windfarm, Hywind Scotland, alongside the world's largest, Kincardine, operating just south of Aberdeen. In addition to pioneering wind energy, Scotland stands as a leader in tidal energy projects. It hosts the world's first offshore tidal energy array and boasts the world's most powerful tidal turbine, a hub for cutting-edge hydrogen demonstration projects (e.g. H100 project in Fife).

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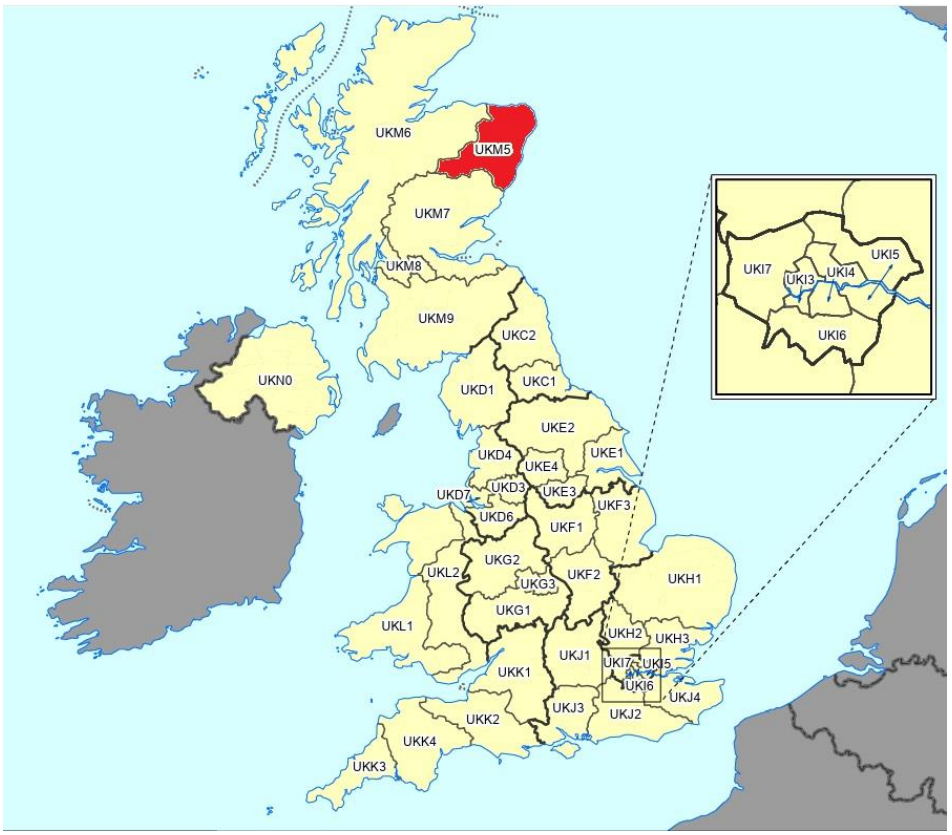


Figure 7. North Eastern Scotland.

Experiment description in North Eastern Scotland

By developing a Living Lab, with the help of Skills Development Scotland, policymakers and representatives of employers' and workers' organizations will be involved in mapping the regional needs, providing valuable information for developing tailored policy recommendations based on local specificities. This will be done through semi-structured interviews and focus groups.

Possible Focus of Living Lab in North Eastern Scotland (UK)

Evaluate the impact of Scotland's ambitious transition plans towards net zero on the regional economy. Assess the creation of new green jobs in wind, tidal, and hydrogen energy projects. Engage local stakeholders to map regional needs and develop tailored policy recommendations for reskilling and upskilling workers.

The LL will involve Skills Development Scotland, policymakers, and representatives of employers' and workers' organizations to map regional needs and provide valuable information for developing tailored policy recommendations based on local specificities.

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4. Conclusion

Up to this point, the stakeholders mapping has been made for each partner region and the first analysis of the regional needs in connection with the added value of the project to the region and its LLs. Continuous engagement of the stakeholders will be done throughout the project lifetime. The first co-exploration phase has been finalized the remaining period will be a sequence of interviews, focus groups and workshops presenting the analysis and upcoming project results as they will be co-developed based on the end-users needs. Through the LLs the whole process will be co-created and the feedback for the developed strategies will be attained through the continuous regional engagement with the stakeholders. Annex I provides the created guide for the interviews to be conducted per each stakeholder group from each partner country.

The Living Lab framework developed within ISABEL has been designed from the outset to be scalable and transferable beyond the participating regions, while remaining sensitive to regional specificities. Rather than promoting uniform solutions, the project establishes a replicable methodological architecture that other regions can adopt and adapt to their own socio-economic, institutional and labour market contexts. Scalability is potentially enabled through the use of standardised yet flexible tools, including common stakeholder engagement scenarios, structured data collection and analysis matrices, and shared templates for documenting hypotheses and potential co-experiments. These elements allow regions with differing capacities, governance arrangements and levels of experience to implement the Living Lab approach in a coherent and comparable manner.

Because the Living Labs documentation of assumptions, contextual constraints, enabling conditions and stakeholder validation explicitly combines these factors, it results in the generation of knowledge that informs regional authorities, social partners and economic actors who may not be within the direct operational jurisdiction of the project consortium about how to implement similar initiatives in their countries. Identification of potentially transferable elements (e.g., coordination mechanisms, governance arrangements, participatory practices and policy-relevant insights) represents an immediate opportunity to scale up. These can be incorporated into current regional strategies, labour market policies and skills ecosystems and/or further developed within future initiatives and through additional funding sources. In this way, ISABEL contributes not only to the participating regions but also offers a methodological blueprint for other European regions seeking to address job creation, job destruction and skills transitions in a structured, participatory and context-aware manner.

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Annexes

ANNEX I: Methodological Framework

1. Purpose

The interviews aim to collect local stakeholders' qualitative insights on perceptions, barriers, and opportunities related to regional labour market transformation in the context of the green and digital transition. The focus is on understanding how different socio-economic actors experience, perceive, engage with, and can contribute to maximizing benefits of job creation and minimizing costs of job destruction, particularly within the context of regional Living Labs.

2. Key Principles

- Transparency & ethics – Ensure informed consent and confidentiality.
- Comprehensiveness – Cover all key stakeholder categories relevant to the ISABEL framework.
- Comparability – Apply a harmonised interview guide and reporting template among partners.

3. Target Groups

Category	Indicative Participants	Focus of Exploration
Employers	Company owners, managers, industrial leaders	Business perspectives on green transition, upskilling needs, and investment barriers
Workers	Employees	Skills, job security, participation in transition initiatives
Trade Unions	Representatives from local or regional unions	Labour rights, social protection, and participation in just transition processes
Environmental Players	NGOs, environmental associations, activists	Environmental priorities, sustainability measures, and social dialogue
Educational Providers	Schools, universities, VET institutions	Role in reskilling and education for transition-related jobs
Business Associations	Business federations, Chambers of commerce, SME networks	Support mechanisms for firms, local innovation ecosystems
Employment Services	Public employment agencies	Matching workforce skills to transition-related opportunities
Government & Policy Makers	Local, regional, and national authorities	Governance frameworks, incentives, coordination, and policy alignment

4. Methodological Approach

- Type: Semi-structured interviews, group interviews and focus groups (1–3 participants per category where feasible).
- Duration: Approx. 45–60 minutes max.
- Recording: Audio (with consent) and field notes.
- Optional: Short pre-interview demographic and role information.

5. Ethics and Data Protection

- Obtain signed consent from all participants (optional).
- Store data securely within project-approved repositories.
- Ensure compliance with GDPR and institutional ethics policies.

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6. Data Analysis

• Use thematic analysis to identify recurring patterns and differences among stakeholder categories.
• Employ a shared coding matrix across countries for comparability.
• Indicative themes: implications of the twin transition for work, education & training, environmental and social justice.

7. Supporting Material

• Interview Guide Template (EN + local version)
• Participant Consent Form and GDPR compliance

For internal circulation within the ISABEL consortium only.

Participant Consent Form A *(anonymity for workers & employers)*

ISABEL Project – Informed Consent Form for Interview Participants
Project Title: ISABEL – Integrated System for Advancing Balanced and Equitable Labour Transitions
Coordinator: University of Western Macedonia (ENTRA Lab)
Partner conducting the interview: _____
Researcher(s): _____
Date: _____

Purpose of the Interview

You are invited to participate in an interview conducted within the framework of the ISABEL Project, which aims to explore perceptions, barriers, and opportunities related to the green and digital transition in regional labour markets. Your insights will contribute to a better understanding of how different stakeholders experience and engage with these changes.

Voluntary Participation

Your participation is entirely voluntary. You may refuse to answer any question or withdraw from the interview at any time without any consequences.

Confidentiality and Data Protection

• The information you provide will be kept strictly confidential and used only for research purposes within the ISABEL project.
• Any personal identifiers will be removed from the data. Your responses will be anonymized in reports and publications.
• All data will be securely stored in project-approved repositories and managed in accordance with the EU General Data Protection Regulation (GDPR 2016/679).
• Only authorized project researchers will have access to the raw data.

Recording and Data Use

☐ I agree that the interview may be audio-recorded for research purposes.
☐ I do not agree to audio recording; notes may be taken instead.

The recordings and transcripts will be used solely for analysis and reporting within the ISABEL project and will not be shared outside the consortium.

Consent Statement

I have read and understood the information above. I freely consent to participate in this interview and for my anonymized responses to be used for research and reporting purposes within the ISABEL project.

Participant Name:	

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Signature:	
Researcher Name:	
Signature:	

Participant Consent Form B *(non-anonymity for other groups)*

ISABEL Project – Informed Consent Form for Interview Participants
Project Title: ISABEL – Integrated System for Advancing Balanced and Equitable Labour Transitions
Coordinator: University of Western Macedonia (ENTRA Lab)
Partner conducting the interview: _____
Researcher(s): _____
Date: _____

Purpose of the Interview

You are invited to participate in an interview conducted within the framework of the ISABEL Project, which aims to explore perceptions, barriers, and opportunities related to the green and digital transition in regional labour markets. Your insights will contribute to a better understanding of how different stakeholders experience and engage with these changes.

Voluntary Participation

Your participation is entirely voluntary. You may refuse to answer any question or withdraw from the interview at any time without any consequences.

Confidentiality and Data Use (Non-Anonymized Option)

• The information you provide will be used **for research, reporting, and dissemination purposes** within the ISABEL project.
• Your **name, organizational affiliation, and professional role** may be mentioned in project outputs (reports, policy briefs, presentations, or public materials) **if you explicitly consent below**.
• Data will be stored securely within project-approved repositories and managed in accordance with the **EU General Data Protection Regulation (GDPR 2016/679)**.
• Only authorized project researchers will handle your data.

Recording and Quotation Consent

☐ I agree that the interview may be **audio-recorded** for research purposes.
☐ I do **not** agree to audio recording; notes may be taken instead.
☐ I consent to being **identified by name and affiliation** in project reports, presentations, or publications.
☐ I consent to **direct quotations** from my interview being attributed to me by name and role.
☐ I prefer that **any quotations remain unattributed**, but my general contributions may be acknowledged.

Consent Statement

I have read and understood the information above. I freely consent to participate in this interview and for my anonymized responses to be used for research and reporting purposes within the ISABEL project.

Participant Name:	
Signature:	
Organization / Position:	

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ANNEX II: Living Labs tailored interviews guides for each stakeholder group

Interview guide government organisations

A. Current Labor Market

1. Could you briefly describe your organisation's role in the national and regional labour market?
2. How would you describe the current labor market conditions in the region?
3. Which industries and job types are currently most prominent, and how has this changed over the past decade?

B. Employment and Skills

4. What major positive and what negative changes have you observed in local employment in recent years? (number of jobs created/lost, skills, tasks)
5. How are the green and digital transitions affecting tasks in your region? ("Green jobs", automation)
6. Are they replacing or changing tasks?
7. How are the green and digital transitions affecting skills in your region? ("Green jobs", automation, new skills etc.)
8. Which new or changing skills are becoming important, and which are becoming obsolete?
9. Do these transitions create mismatches between company needs and workforce skills?
10. How are the green and digital transitions affecting occupations in your region? ("Green jobs", automation, new skills etc.)
11. Are they replacing or changing occupations?
12. What are the medium-term effects of job creation and destruction at the local level?
13. How do changing consumption patterns (e.g., environmentally aware consumer behavior) influence the labor market?

C. Social Implications

14. Are working conditions in new "green" or digital jobs generally better than before?
15. Which population groups (by age, gender, skill level, or background) are most likely to lose their job and struggle with re-employment?
16. Which groups are likely to benefit most from new opportunities?

D. Local Responses and Policy

17. How do local or regional authorities collect feedback from employers and workers to design skills policies?
18. What mechanisms exist to monitor or forecast job creation and destruction?
19. Are training and retraining programs aligned with the needs of green and digital industries?
20. What are the main labour market policies that the government implements to address job losses and skill mismatches and promote fair employment opportunities and how effective they are?
21. What strategies and local policies does the region implement to address job losses and skill mismatches and promote fair employment opportunities and how effective they are?
22. What barriers exist in adapting to emerging occupations and closing skill gaps?
23. Is institutional support (e.g., public employment services, partnerships) sufficient and inclusive, particularly for vulnerable groups?

Interview guide business associations

A. Current Labor Market

1. Could you briefly describe your organisation's role in the national and regional labour market?
2. How would you describe the current labor market conditions in the region?

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3. Which industries and job types are currently most prominent, and how has this changed over the past decade?

B. Employment and Skills

4. What major positive and what negative changes have you observed in local employment in recent years? (number of jobs created/lost, skills, tasks)
5. How are the green and digital transitions affecting tasks in your region? ("Green jobs", automation)
6. Are they replacing or changing tasks?
7. How are the green and digital transitions affecting skills in your region? ("Green jobs", automation, new skills etc.)
8. Which new or changing skills are becoming important, and which are becoming obsolete?
9. Do these transitions create mismatches between company needs and workforce skills?
10. How are the green and digital transitions affecting occupations in your region? ("Green jobs", automation, new skills etc.)
11. Are they replacing or changing occupations?
12. How does AI change work, its nature and the tasks of workers?
13. What are the medium-term effects of job creation and destruction at the local level?
14. How do changing consumption patterns (e.g., environmentally aware consumer behavior) influence the labor market?

C. Social Implications

15. Are working conditions in new “green” or digital jobs generally better than before?
16. Which population groups (by age, gender, skill level, or background) are most likely to lose their job and struggle with re-employment?
17. Which groups are likely to benefit most from new opportunities?

D. Local Responses and Policy

18. How do local or regional authorities collect feedback from employers and workers to design skills policies?
19. Are training and retraining programs aligned with the needs of green and digital industries?
20. What are the main labour market policies that the government implements to address job losses and skill mismatches and promote fair employment opportunities and how effective they are?
21. What strategies and local policies does the region implement to address job losses and skill mismatches and promote fair employment opportunities and how effective they are?
22. What barriers exist in adapting to emerging occupations and closing skill gaps?
23. Is institutional support (e.g., public employment services, partnerships) sufficient and inclusive, particularly for vulnerable groups?

Interview guide environmental players

A. Current Labor Market Context

1. Could you briefly describe your organisation’s role?
2. How would you describe the current labor market conditions in your region, and how have they evolved over the past decade?
3. Which sectors or industries are most prominent today, and how are they adapting to environmental and sustainability goals?

B. Employment, Skills, and Environmental Transitions

4. What positive and negative trends have you observed in employment and skills development in recent years?
5. How is the green transition influencing employment, skills, and occupations in your region?
6. Which sectors or job types are most affected?
7. Which new or changing skills are becoming essential, and which are declining?

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8. How does the regional skill base align with environmental goals and the needs of companies? Are there any gaps?
9. How do digitalization and changing consumption patterns (e.g., more sustainable consumer behavior) interact with environmental transformation in shaping jobs and skills?

C. Social and Environmental Implications

10. Are working conditions in new green jobs generally better than before?
11. Which groups (e.g., older workers, migrants, women, low-qualified) are most at risk of being excluded from green or digital opportunities?
12. Which groups stand to benefit most from the new, environmentally driven employment opportunities?

D. Local Responses and Policy

13. What mechanisms exist to identify, track, or forecast environmentally driven job and skill changes?
14. How do you cooperate with employers, educators, or public authorities to align training with sustainability and green economy goals?
15. What are the main policy measures or local strategies supporting a fair and inclusive green transition?
16. Are current institutional supports and training programs adequate to meet environmental transition needs?
17. Are particular groups underserved by current policies or initiatives?

Interview guide educational providers

A. Current Labor Market

1. Could you briefly describe your organisation's role in the national and regional labour market?
2. How would you describe the current labor market conditions in the region?
3. Which industries and job types are currently most prominent, and how has this changed over the past decade?

B. Employment and Skills

4. What major positive and what negative changes have you observed in local employment in recent years? (number of jobs created/lost, skills, tasks)
5. How are the green and digital transitions affecting tasks in your region? ("Green jobs", automation)
6. Are they replacing or changing tasks?
7. How are the green and digital transitions affecting skills in your region? ("Green jobs", automation, new skills etc.)
8. Which new or changing skills are becoming important, and which are becoming obsolete?
9. Do these transitions create mismatches between company needs and workforce skills?
10. How are the green and digital transitions affecting occupations in your region? ("Green jobs", automation, new skills etc.)
11. Are they replacing or changing occupations?
12. What are the medium-term effects of job creation and destruction at the local level?
13. How do changing consumption patterns (e.g., environmentally aware consumer behavior) influence the labor market?

C. Social Implications

14. Are working conditions in new "green" or digital jobs generally better than before?
15. Which population groups (by age, gender, skill level, or background) are most likely to lose their job and struggle with re-employment?
16. Which groups are likely to benefit most from new opportunities?

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D. Local Responses and Policy

17. How do local or regional authorities collect feedback from employers and workers to design skills policies?
18. What mechanisms exist to monitor or forecast job creation and destruction?
19. Are training and retraining programs aligned with the needs of green and digital industries?
20. What are the main labour market policies that the government implements to address job losses and skill mismatches and promote fair employment opportunities and how effective they are?
21. What strategies and local policies does the region implement to address job losses and skill mismatches and promote fair employment opportunities and how effective they are?
22. What barriers exist in adapting to emerging occupations and closing skill gaps?
23. Is institutional support (e.g., public employment services, partnerships) sufficient and inclusive, particularly for vulnerable groups?

Interview guide employers

A. Company Profile and Context

1. Could you briefly describe your organisation (type, size, location, headquarters or branch, and main activity)?
2. What are the main changes (market, regulation, technology, sustainability) currently shaping your business?
3. How have the green and digital transitions affected your sector and your company so far — and how do you expect them to evolve in the next 3–5 years?

B. Jobs and Employment

4. What is the number of employees in your company currently and 24 months ago, including both full-time and part-time workers
5. How many jobs have been created and eliminated in your company in last 24 months?
6. In the past 24 months, who filled the newly created jobs in your company (at your location), in terms of gender, ethnicity and disabilities status?
7. In the past 24 months, how many new jobs were created in your company (at your location) within each occupational groups (managers, professionals, technicians, etc.)?
8. In the past 24 months, who lost their job in your company (at your location), in terms of gender, ethnicity and disability status?
9. In the past 24 months, how many new jobs were eliminated in your company (at your location) within each occupational groups (managers, professionals, technicians, etc.)?
10. Which external factors (e.g., regulation, automation, AI, market trends) have most affected your workforce?
11. How has your company adopted green transition aspects? (efforts to reduce greenhouse gas emissions, improve energy efficiency, transition to renewable energy sources, adopt circular economy principles, and comply with environmental regulations or climate-related targets)
12. How has your company adopted digital transition aspects? (use of automation, artificial intelligence (AI), data analytics, digital tools and platforms, robots, ICT technologies, cloud computing)
13. How are the green and digital transitions influencing your company's employment — are new jobs emerging, existing ones disappearing or current jobs changing?
14. How does AI change work, its nature and the tasks of workers?
15. Have any occupations been extinct due to the green and digital transition? If yes, which?
16. Which occupations have changed the most in terms of skills or tasks, and how?
17. How do employees generally perceive these transitions — positively, or with concern?
18. Do new jobs tend to offer better working conditions?
19. How have changes in consumer behavior (e.g., demand for greener products) affected your employment plans?

C. Skills and Training

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20. Which new skills or tasks have emerged in your organization due to green or digital transitions?
21. Which skills or tasks have become less important or obsolete?
22. Are there any noticeable skills gaps or mismatches when hiring or training staff?
23. Has it been easy for you to satisfy the emerging skills demand? Are there any noticeable mismatches or gaps?
24. How do you support employees to adapt — through internal training, partnerships, or external programs?
25. Do you collaborate with training institutions or local authorities to ensure training aligns with emerging needs?
26. Looking ahead, do you expect overall employment in your company to grow, shrink, or transform?

Interview guide employment services and labour offices/agencies

A. Current Labor Market

1. Could you briefly describe your organisation's role in the national and regional labour market?
2. How would you describe the current labor market conditions in the region?
3. Which industries and job types are currently most prominent, and how has this changed over the past decade?

B. Employment and Skills

4. What major positive and what negative changes have you observed in local employment in recent years? (number of jobs created/lost, skills, tasks)
5. How are the green and digital transitions affecting tasks in your region? ("Green jobs", automation)
6. Are they replacing or changing tasks?
7. How are the green and digital transitions affecting skills in your region? ("Green jobs", automation, new skills etc.)
8. Which new or changing skills are becoming important, and which are becoming obsolete?
9. Do these transitions create mismatches between company needs and workforce skills?
10. How are the green and digital transitions affecting occupations in your region? ("Green jobs", automation, new skills etc.)
11. Are they replacing or changing occupations?
12. How does AI change work, its nature and the tasks of workers?
13. What are the medium-term effects of job creation and destruction at the local level?
14. How do changing consumption patterns (e.g., environmentally aware consumer behavior) influence the labor market?

C. Social Implications

15. Are working conditions in new "green" or digital jobs generally better than before?
16. Which population groups (by age, gender, skill level, or background) are most likely to lose their job and struggle with re-employment?
17. Which groups are likely to benefit most from new opportunities?

D. Local Responses and Policy

18. How do local or regional authorities collect feedback from employers and workers to design skills policies?
19. What mechanisms exist to monitor or forecast job creation and destruction?
20. Are training and retraining programs aligned with the needs of green and digital industries?
21. What are the main labour market policies that the government implements to address job losses and skill mismatches and promote fair employment opportunities and how effective they are?
22. What strategies and local policies does the region implement to address job losses and skill mismatches and promote fair employment opportunities and how effective they are?
23. What barriers exist in adapting to emerging occupations and closing skill gaps?

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24. Is institutional support (e.g., public employment services, partnerships) sufficient and inclusive, particularly for vulnerable groups?

Interview guide trade unions

A. Current Labor Market

1. Could you briefly describe your organisation's role in the national and regional labour market?
2. How would you describe the current labor market conditions in the region?
3. Which industries and job types are currently most prominent, and how has this changed over the past decade?

B. Employment and Skills

4. What major positive and what negative changes have you observed in local employment in recent years? (number of jobs created/lost, skills, tasks)
5. How are the green and digital transitions affecting tasks in your region? ("Green jobs", automation)
6. Are they replacing or changing tasks?
7. How are the green and digital transitions affecting skills in your region? ("Green jobs", automation, new skills etc.)
8. Which new or changing skills are becoming important, and which are becoming obsolete?
9. Do these transitions create mismatches between company needs and workforce skills?
10. How are the green and digital transitions affecting occupations in your region? ("Green jobs", automation, new skills etc.)
11. Are they replacing or changing occupations?
12. How does AI change work, its nature and the tasks of workers?
13. What are the medium-term effects of job creation and destruction at the local level?
14. How do changing consumption patterns (e.g., environmentally aware consumer behavior) influence the labor market?

C. Social Implications

15. Are working conditions in new "green" or digital jobs generally better than before?
16. Which population groups (by age, gender, skill level, or background) are most likely to lose their job and struggle with re-employment?
17. Which groups are likely to benefit most from new opportunities?
18. What are the main challenges faced by vulnerable workers during these transitions?

D. Local Responses and Policy

19. How does your union support workers at risk of job loss or already unemployed due to the transition?
20. How do you engage with employers, government bodies, or training institutions to ensure fair retraining and reskilling opportunities?
21. What mechanisms exist to monitor or forecast job creation and destruction?
22. Are training and retraining programs aligned with the needs of green and digital industries?
23. What are the main labour market policies that the government implements to address job losses and skill mismatches and promote fair employment opportunities and how effective they are?
24. What strategies and local policies does the region implement to address job losses and skill mismatches and promote fair employment opportunities and how effective they are?
25. Are particular social groups (e.g. older workers, migrants, women) underserved in current transition-driven training policies?

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Interview guide with workers

A. Background

1. Could you briefly describe your background — age, education level, gender, and main area of study or qualification, possible migrant or refugee status, place of residence and place of birth?
2. What are the main skills you possess?
3. What is your current employment situation (job title, main tasks, company)?
4. Is it a new job created?
5. What are the working conditions in your current job (type of contract, working hours, salary)?
6. How long have you been in this position, and how has your career path evolved over time? What is your employment history? Did you relocate to find a job? Did you change sectors?
7. What challenges did you face when you were looking for a new job?

B. Job Role and Recent Changes

8. How have your tasks or responsibilities changed in the past few years?
9. How have green or digital transitions (e.g., new environmental regulations, automation, AI tools) affected your work?
10. How does AI change work, its nature and your tasks?
11. Have any parts of your job been automated or replaced by digital systems?
12. How have these changes influenced your daily routine and working conditions?
13. What do you think of the green transition? Do you see it as a threat for your employment? Is the green transition avoidable? Policy-driven?
14. What do you think of the digital transition? Do you see it as a threat for your employment? Is the digital transition avoidable?

C. Skills and Training

15. Have recent environmental/technological changes/regulations/trends (ed. automation, AI, green regulations) created pressure on you to acquire new skills or adapt existing ones? If yes, what skills?
16. Have you received any training or support to develop them? Was it sufficient?
17. Were there any barriers to accessing relevant training (e.g., cost, time, availability)?

D. Work Environment and Job Security

18. Do you feel your job is now more secure or unstable compared to before? Are the working conditions better now than in 2015 or your previous job?
19. Have these green and digital-driven changes affected your satisfaction with work (e.g., salary, workload, skill development, working time)?
20. Have you felt pressure to reskill, relocate, or accept more flexible terms of employment?
21. Who supports you most in adapting to these changes (e.g., employer, trade union, colleagues, public services)? And how?
22. What is your opinion of the municipal/local government in terms of supporting your employment and the locals to find a job?
23. What is your opinion of the national government in terms of supporting your employment and the locals to find a job?
24. What do you see as the main challenges and opportunities for you in the local labour market in the near future?

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