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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 2.2

Report on methods for researching JCD and skills shortages

WP2: Conceptualisation, Co-creation Methodology, and System Architecture

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Abstract

This report examines the methodological approaches used to study job creation and destruction, with a focus on their relationship to workforce skills and the digital and green transitions. It highlights the dominance of quantitative research in the field, alongside a notable scarcity of qualitative studies that capture worker and firm-level perspectives. The review discusses conceptual and data-related challenges, particularly the lack of standardized European datasets and the complexity of defining job flows. It argues for a more integrated methodological framework that combines statistical rigor with discursive insights to better understand labor market transformations in the context of emerging skill demands and structural change.

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Contributors

NAME	ORGANISATION
Diana Gutiérrez Posada	UO
Lukasz Trembaczowski	US
Rafal Muster	US
Grzegorz Gawron	US
Nikos Kapitsinis	UCPH

Peer Reviewers

NAME	ORGANISATION
Maria Tountopoulou	PROG
Kostas Marthoglou	CERTH

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Executive summary

This report presents a comprehensive literature review on the methodological approaches used to study job creation and destruction, with a particular focus on the interplay between employment dynamics, workforce skills, and the Green and Digital Transition that are reshaping labor markets across Europe.

The review includes both quantitative and qualitative research traditions. Quantitative studies dominate the field, offering robust metrics and longitudinal analyses of job flows, generally rooted in firm-level datasets. A key finding is the lack of standardized institutional data on job creation and destruction within Europe, in contrast to more developed datasets available in the United States. While data on skills is comparatively better, measuring emerging skill categories linked to digitalization and sustainability remains complex. However, the report highlights a significant gap in qualitative research, particularly in capturing the lived experiences of workers and the strategic decisions of firms. This imbalance limits our understanding of the social and organizational dimensions of employment change.

The report also discusses conceptual challenges in defining job creation and destruction, with roles evolving rather than disappearing outright. This nuance complicates binary classifications and calls for more refined analytical frameworks.
Geographical factors further add complexity that needs to be accounted for.

By synthesizing existing literature and identifying methodological gaps, the report underscores the need for more integrated approaches that combine quantitative rigor with qualitative depth. It advocates for greater attention to worker and employer perspectives, and for methodological innovation that can better capture the dynamic and multidimensional nature of job change in the context of ongoing economic transformation.

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1. Introduction

Provided the importance of labour market strategies in the policy agenda of all countries, the analysis of Job Creation and Destruction (JCD) becomes a matter of primary interest. Over the decades, many scholars devoted their time to understanding the dynamics behind employment growth: births and deaths, expansion or recession periods, or job reallocations. These events are fundamentally linked to the capacity to create wealth, both at the aggregate and the individual level; hence the need to investigate the processes leading to job gains and losses. Academic literature on this topic has grown substantially, particularly in the realm of quantitative research. Large-scale datasets, firm-level panel studies, and econometric modeling have enabled scholars to measure job flows with increasing precision, uncovering patterns that inform both theory and policy.

Despite this quantitative progress, qualitative research remains notably scarce. The lived experiences of workers, the organizational contexts of firms, and the nuanced social dimensions of employment transitions are often underexplored. This imbalance has left important questions unanswered, especially those concerning how individuals and communities perceive and are affected by job creation and destruction. Bridging this gap is essential for developing a clearer understanding of labor market dynamics.

The need to provide more precise evidence becomes urgent in the context of two transformative forces: the digital and green transition. Automation, artificial intelligence, and sustainability considerations are reshaping industries and occupations. These shifts not only change jobs available but also redefine the skills required to access and retain them. Understanding how job flows interact with skill development, and how these interactions vary across sectors and regions is vital for devising effective education, training, and employment policies.

This deliverable provides a concise overview of the methodologies for studying JCD and skills shortages. It evaluates both quantitative and qualitative research methods, data collection techniques, and analytical tools. The report highlights best practices and innovative approaches, offering recommendations for effectively understanding and addressing JCD dynamics and skills gaps. This foundational resource supports researchers, policymakers, and industry stakeholders in their efforts to promote sustainable and equitable labour market transitions.

To enrich the research process and insights of D2.2, we organized a co-creation workshop on the 10th of July 2025. The exact and detailed procedure, participants and feedback of this first co-creation workshop of ISABEL are described in D2.4. Specificities about the feedback received and how we addressed it can be found in the annex.

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2. Quantitative research methods for JCD and skills

The study of JCD comes from a long tradition in economics that tried to provide empirical evidence to better understand the relationship between firm dynamics and economic prosperity. Although employment growth has been always recognized as an important driver of wealth, it wasn't until 1980s that data availability made it possible to disentangle the components behind net employment figures and measure quantitatively job gains and losses, at least for some developed economies (US and Canada). Although a significant step forward, these first attempts lacked information on occupations or skills, which constrained greatly their explanatory power. As time passed, more countries engaged in detailed firm- and even plant-level data collection and release, enabling international comparisons and deeper analyses encompassing more dimensions. The most important consequence of the academic expansion in field has been the possibility of informing policymaking about fundamental and related processes concerning the functioning of the labour market, the business structure and the industrial composition of the economy. An overview of the topics generally covered, the existing data, and the methodological tools devised and used by scholars to study JCD and their relationship with skills from a quantitative perspective is presented below.

2.1 Dimensions investigated in JCD and skills studies

The release of the Longitudinal Research Database in the late 1980s marked the beginning of a new era in firm and labour research. The works of Dunne et al. (1989), or Blanchard and Diamond (1990) represent some of the first empirical exercises to investigate gross employment flows (labelled Job Creation and Destruction in Blanchard and Diamond (1992)). Building up from these studies, Davis et al. (1996) offered a comprehensive review of the analyses undertaken up to that point, with an emphasis on the relationship between firm size and JCD. At the time, they challenged the notion that small firms accounted for most employment creation in the US, a contention based on the share of net employment (creation minus destruction) they generate. The calculation of gross JCD rates unmasked a more balanced distribution in the contribution to employment creation between small and large firms, and put the focus on the need for additional data to produce a better understanding of the economic environment (i.e., the role of firm survival or job quality), pointing the way forward for future research.

The first international comparisons appeared by the end of the 1990s, being the most salient example the evaluation of JCD in the US and Canada (Baldwin et al, 1998). The study analysed and compared the JCD trends of both countries, as well as net employment and in job reallocation (job creation plus destruction), finding similarly large rates of JCD (contrasting with lower net employment rates), strong industry effect, and little country influence. Another interesting finding was the asymmetry in the behaviour of the indicators: Job Destruction (JD) showed more pro-cyclicality than Job Creation (JC), meaning that JD increases at a higher pace than JC when the economy grows; while job reallocation was counter-cyclical (it decreases when economic activity expands). In a similar fashion, Bilsen and Konings (1998) used the same indicators to compare the performance of Romania, Bulgaria and Hungary, differentiating between new, state-owned and privatized firms. This framework allowed to trace the transition process towards a market economy of each country looking at firm demography and employment, as it implies high initial JD that decreases over time.

Although the measures of JCD remained mostly unchanged, the field continued its growth exploring the linkages of the 'traditional' indicators (gross JC, gross JD, net employment and reallocation) with wider economic aspects such as international trade shocks, looking at the potential aggregated and

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individual costs of JD associated to international competition, and hinting at the benefits of retraining (Klein et al, 2003). The focus on JD brought about considerations of inequality coming from reallocation, with some studies delving into the broad theoretical effect of skill-biased technological change on the labour market (Hornstein et al, 2005). Other researchers leaned towards the existing spatial heterogeneity concerning employment flows. Examples of this academic strand are the studies about the relationship between the snowbelt and the sunbelt in the US, or between UK regions, carried out by Essletzbichler (2004 and 2007, respectively). Geography was also interacted with skills, as in Bleakly and Lin (2012), who found that comparable workers change occupation and industry less, while suffering lower skill depreciation, in more dense areas in the US. Krum and Strotmann (2013) detected that low regional labour costs lower JD while high human capital endowment and innovation increase JC in Germany. Applying further educational level segmentation and proposing a clustering method for the JCD indicators, Kuhn et al (2016) obtained even higher gross employment flows rates in Denmark than those generally found in similar analyses, and also discovered that Danish start-ups concentrated a large share of surplus low-skilled jobs, touching upon issues of labour market segmentation. Linking the gross employment flows indicators with the relatedness and the resilience literature, Eriksson and Hane-Weijman (2017) showed that the industry composition of Swedish regions determined their resistance to shocks and adaptability, advocating for the shift from manufacturing to 'learning' economies.

The layering of different dimensions continued through the years, providing more complex and richer examinations, as in Commander and Kollo (2008), who further dissected gross JCD in transition economies adding the skill content of jobs and the educational background of workers. Another example is the work of Jurajda and Terrell (2008) relying on worker data (instead of firm information) to measure JCD, and comparing two different policy perspectives towards the management of employment trends, especially JD, during transition. Also, in this strand of the literature, Micevska (2008) included the institutional factor in her analysis of the strikingly low JC and reallocation observed in Macedonia, confirming its importance. Analysing a larger geographical scope, Di Cataldo and Rodríguez-Pose (2017) take into account four drivers of regional employment growth in Europe (human capital, innovation, infrastructures and government quality), finding that a greater endowment of highly-skilled workers and a stronger innovative performance is linked to faster growth, which along with an efficient government that implements targeted training programs could moderate JD for low-skilled employment and reduce labour market marginalization.

Apart from the general attention to impacts on the JCD trends, the interest in the effect of Green and Digital transformations on the labour market increased significantly in the 2010s. The main topics explored by this strand of the literature include the relationship between investment, education, skill requirements and the changing labour market context, either in terms of green employment (Consoli et al, 2015; Gagliardi et al, 2016; Cecere and Mazzanti, 2017; Alves Dias et al, 2018; Vona et al, 2018) or the impact of introducing new digital technologies (Peng et al, 2017; Jung et al, 2017; Freddi, 2018; Marques-Santos et al, 2023). Conclusions are mixed as positive and negative effects emerge depending on the focus of the analysis and the geography considered, which leads to additional research venues concerned with, for example, the broader implications of cleaner energy in terms of policy (Blyth et al, 2014), the hidden adjustments related to green activities (Bowen and Kuralbayeva, 2015), or the uncertainty regarding the capacity to compensate the job losses associated with automation (Vivarelli, 1995; Roos and Shroff, 2017).

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2.2 Databases used

The basic element enabling all the empirical research presented in the previous subsection is information. Detailed, coherent and systematically collected databases on firms and workers characteristics are fundamental to generate accurate empirical evidence about JCD that could serve the purpose of timely informing decision-making processes at different levels.

The Longitudinal Research Database compiled by the Center of Economic Studies (Census Bureau - US) allowed scholars to test many hypotheses about labour market dynamics that would have remained as theoretical proposals otherwise. Similarly, the Annual Censuses of Manufacturers fed the analysis of the Canadian labour market flows. The longitudinal character of both statistical operations made it possible for researchers to understand the JCD dynamics behind aggregated employment figures, giving them arguments to challenge established notions that were guiding policy at the time (i.e., the belief that small firms were the employment engine of the economy). Despite the progress, researchers called for richer data that would clarify questions regarding the quality of the jobs created and destroyed, and especially, data that allows to link firm and worker characteristics over time (Picot, 1997).

As information became more readily available in more countries, richer studies appeared. Early European examples of improved data access are the Annual Respondents Dataset in the UK, or the European Bank for Reconstruction and Development Dataset for Transition economies in Eastern Europe. Not only did country-level analyses improve, international comparison also became a new source of empirical knowledge, sometimes already harmonized as in the case of the datasets assembled by the OECD, the International Labour Organization or the World Bank. The next step was the production of matched employer-employee data by National Statistics Offices. The progress in the depth and scope of available data allowed the empirical evolution presented in the previous subsection of this report.

Currently in Europe, consistent labour market information can be found in the EU Labour Force Survey, while firm data can be collected from the Structural and Short-term Business Statistics, although these data sources offer general and aggregated information that makes difficult the study of the aforementioned dimensions. To explore the current trends in JCD and skills, researchers may resort to the following databases:

- European Skills and Jobs Survey (ESJS2) (Cedefop): The survey examines drivers of skill development and the dynamic evolution of skill mismatch of adult employees in relation to changing task complexity and skills requirements of their jobs.

- European Company Survey (ECS 2019) (Cedefop and Eurofond): data in over 20,000 establishments on workplace practices regarding work organisation, human resource management, skills use, skills strategies, digitalisation, and direct employee participation.

- European Working Conditions Survey (EWCS 2024): comprehensive picture of the everyday reality of men and women at work including information related to the job, the workplace, and life quality.

- School-to-work Transition Survey (SWTS) (ILO): in-depth information concerning the labour market situation of young men and women and quantify the relative ease or difficulty of labour market entry of young people.

- Occupational Information Network (O*NET): comprehensive database of worker

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attributes and job characteristics.

- International Green Skills Survey (2023) (Institution of Engineering and Technology): touches upon current priorities and challenges around climate change, what sustainability skills are needed in the near future, and how employers are responding to needing these skills.

One of the main conclusions that comes from the evolution in the dimensions analysed through employment flows is that the implemented policies at the regional, national, and EU levels could be blurred and become ineffective, not relying on sufficient and granular data sets. Indeed, an important caveat for these efforts is the lack of a coherent, comprehensive and detailed database of jobs that have been created and destructed by sector of economic activity and European region, with information about the occupation. Despite some efforts to create a database for JCD (COMPnet, ESCO, O*NET), these have focused on the demand side, without providing detailed figures for regions, sectors and occupations.

Indeed, existing policy efforts to maximize benefits and minimize costs from JCD are significantly hindered by the lack of a comprehensive database of JCD by sector, region and occupation, that incorporates data from both demand and supply side, which also restricts efforts to comprehensively understand the process of JCD and its geographically and socially uneven implications. The comprehensive study of the latter is necessary, to link the net employment change with the working conditions, hours and wages in the new jobs created, seeking to suggest the suitable reallocation of jobs within or across industries and the proper skills set to ensure a fair transition.

A significant gap exists in secondary official data, while studies have relatively overlooked establishing integrated databases detailing the numbers of jobs created and lost by region and sector. Many researchers resort to estimating aggregate employment changes and subsequently forecasting JCD dynamics in both short- and long-term perspectives (Blyth et al., 2014; García-García et al., 2020). Moreover, the existing databases on JCD present some important limitations. The Business Demography Statistics from Eurostat allows to study the process of JCD associated to births and deaths of new companies, although it is not informative about the JCD produced by expansion or reduction of activities in already existing companies. Then, the Competitiveness Research Network provides JCD figures, without however distinguishing the cause of JCD (e.g., new companies arising in particular industries or regions, or the growth of activity in existing companies). Additionally, by using data from the Competitiveness Research Network, it is not possible either to derive detailed indicators of JCD across occupational profiles, educational levels or gender.

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3. Qualitative research methods for JCD and skills

As demonstrated above, research on JCD and skill needs has been dominated by quantitative approaches, which are well suited to identifying broad labour market trends. However, such methods often offer limited insight into how these changes are experienced and interpreted by individuals, firms, and organizations. Qualitative methods — though less frequently used — play an important role in capturing these contextual and subjective dimensions. In some studies, they appear as supplementary tools (e.g. Borms et al., 2023; Vona et al., 2018) or within mixed-methods designs, such as expert panels or Delphi techniques (see Pater & Cherniaiev, 2023). This section reviews the qualitative methodologies applied in JCD and skills research, highlighting their uses, strengths, and practical applications.

3.1 Overview of qualitative methodologies in literature

A diverse range of qualitative research methods has been used to investigate the complexities of JCD and skill transformation under environmental and technological change. The dominant approaches include semi-structured interviews, focus groups, case studies, and, increasingly, participatory and co-creative methods. These methodologies provide a way to uncover the relational, institutional, and lived aspects of labour transformation processes.

- In-depth and semi-structured interviews

These are the most widely used qualitative techniques across the reviewed studies. They allow researchers to capture detailed accounts of work histories, employment conditions, and transitions into or out of specific sectors. For instance, interviews have been used to explore workers' subjective experiences in low-paid, labour-intensive jobs within the circular economy, offering insight into stigma, workplace practices, and occupational identity (Gregson et al., 2016). In other cases, such as in the analysis of transitions into the solar energy sector, interviews formed the basis for constructing full career narratives and identifying both enabling factors and constraints shaping job mobility (Ramsarup & Hepplethwaite, 2025). While utilized as auxiliary method in the research design, Borms et al. (2023) conducted semi-structured interviews with labour market and circular economy experts in Flanders, asking them among other issues, *"What will the future of work and skills look like in a more circular economy?"* The open-ended responses helped identify core skill areas expected to grow in importance, including logistics, IT, R&D, and technical skills.

- Focus Group Interviews (FGIs)

FGIs are frequently used in institutional and forecasting settings to gather group-based assessments of occupational dynamics. The Occupational Barometer, for example, relies on structured expert panels composed of public employment officers, training providers, and employers who jointly evaluate the demand for various professions within local labour markets (Muster, 2019). This group discussion format allows experts to draw on their professional experience and observations, producing classifications such as shortage, surplus, or balanced occupations. Similarly, in Delphi-style studies, experts engage in successive rounds of consultation to reach consensus on regional skill needs (Adamczyk & Szwedor, 2023), offering a hybrid of qualitative judgment and structured evaluation.

- Case studies

Case studies provide a flexible framework for analysing occupational or sectoral transformation, often combining multiple data sources. Although not always purely qualitative, they enable deep contextualisation of skill shifts and job reconfiguration. For example, multi-site case studies in the recycling sector have combined interviews, workplace observations, and policy document analysis to highlight how technological and regulatory transitions reshape job content and hierarchies (Gregson et al., 2016). Similarly, international comparative research on green skills has incorporated

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country-level case studies using a mix of expert interviews, workshops, and surveys to document sector-specific responses to environmental change and green policies (Strietska-Ilina et al., 2011).

- Participatory and co-creation methods

These approaches involve research participants directly in generating knowledge about labour market changes. Participatory methods have been used in green skills diagnostics and transition research to surface perspectives from training providers, policymakers, and affected workers. For example, the ILO's study on green jobs mobilised national experts and stakeholders in workshops to co-identify drivers of skill change (Strietska-Ilina et al., 2011). In another application, Living Lab research has utilised co-creation techniques to involve diverse actors in the design of labour market innovative practices, emphasizing collaboration and mutual learning (Ferguson, van der Heijden, & de Zeeuw, 2020).

- Narrative and biographical approaches

These methods are valuable for understanding how people navigate job transitions and learning pathways in dynamic or uncertain sectors. They emphasise the sequencing of work and education experiences and the personal meaning attributed to them. In studies of solar sector workers, for example, personal stories were analysed in layers to understand motivations, entry points, and the interplay between formal and informal learning — a method that helped expose hidden barriers to labour market entry and career development (Ramsarup & Hepplethwaite, 2025).

- Auxiliary methods: Observations, site visits, and visual tools

These techniques often support core data collection methods and help validate or contrast official accounts with actual practices. In ethnographic studies of the recycling industry, repeated on-site observations and photo documentation were used alongside interviews to capture the sensory and material dimensions of "dirty work," revealing contradictions between formal workplace narratives and daily realities (Gregson et al., 2016). Such methods enrich the qualitative record by bringing attention to embodied experience, physical environments, and informal adaptations.

3.2 Qualitative approach in JCD research

Qualitative research on JCD employs a diverse range of data collection techniques to examine how workers, firms, and organizations experience and manage employment transitions. Among the themes on which qualitative studies focus include workers' transitions in the labour market, how they experience job change and strategic perspectives of employers. The following sub-sections provide a review of such themes by method adopted, based on analysed studies; and examples of questions generally used in this type of investigations.

3.3 Methods

- Worker Experiences of Job Change

In-depth and semi-structured interviews are commonly used to investigate how workers perceive and navigate job transitions. This includes experiences of precarious work, shifting occupational status, or exposure to workplace stigma. For example, ethnographic fieldwork by Gregson et al. (2016) revealed how migrant workers in recycling and shipbreaking sectors internalized the tension between being employed in "green" industries and performing demeaning or hazardous tasks. Such studies help expose the subjective dimensions of job creation, particularly where new roles are socially undervalued or poorly protected.

- Labour Mobility and Occupational Transitions

Biographical and narrative methods are valuable for tracing workers' paths across sectors or employment types. They provide insight into how people enter new roles, the constraints they face, and the role of informal and formal learning. Ramsarup and Hepplethwaite (2025), for example, reconstructed career stories of workers entering South Africa's solar sector, showing how individuals leveraged short training, family networks, or entrepreneurial motivations to shift into newly emerging job niches.

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- Firm-Level Restructuring and Labour Adaptation

Workplace-level qualitative research captures how employers respond to regulatory, market, or technological changes by reorganizing labour processes or redefining tasks. Gregson et al. (2016) demonstrated this through multi-site case studies of textile and ship recycling facilities, combining interviews, field observations, and visual documentation. These studies showed how certain jobs are fragmented, downgraded, or informally reconstituted, revealing the adaptive strategies firms employ and the resulting changes in job content or hierarchies.

- Strategic Perspectives from Employers and Policymakers

Focus group interviews and expert panels are widely used to collect strategic views from employers, public agencies, and policy actors regarding occupational trends and anticipated labour needs. The *Occupational Barometer* is a prominent example of this approach. It uses structured expert panels across all regions of some European countries to assess the near-term demand for over 170 occupations. These experts classify each occupation as being in shortage, surplus, or balance, offering a systematic but locally informed perspective on occupational change (Muster, 2019). While primarily intended to inform skills planning, the Barometer also reflects patterns of job creation and disappearance, especially in fast-evolving or regionally significant sectors.

A complementary approach is seen in the use of Delphi panels, where experts anonymously evaluate future labour needs over successive rounds. As shown in the study by Adamczyk and Szwedor (2023), this method was applied to identify key sectors and occupations at the regional level, with participants refining their assessments based on iterative feedback. Both tools demonstrate how qualitative techniques can support strategic labour forecasting and offer grounded perspectives on where job creation is expected, and where job destruction may be taking shape.

3.3.1 Questions

Drawing from the reviewed qualitative methodologies — including biographical interviews, expert consultations, focus groups, and sectoral case studies — the following questions are proposed as a practical toolkit for stakeholder-driven research in Living Labs exploring JCD by adopting qualitative methods. The following questions are analytically reconstructed based on the structure, themes, and participant types present in existing qualitative studies on job change under environmental and digital transformation. While not directly cited from any one study, they reflect patterns observed in works and are intended to guide multi-stakeholder dialogue in Living Labs' qualitative methods. They focus on how job content, stability, and sectoral profiles are reshaped — not only by macroeconomic forces, but by the policies and institutional frameworks through which transitions unfold.

For workers (individual perspective):

- How has your job been affected by environmentally related policies or digital changes (e.g. new standards, automation)?
- What new tasks, responsibilities, technologies have been introduced?
- Have any of your previous tasks been reduced, eliminated, or taken over by machines or reallocated to others?
- Have you experienced pressure to reskill, relocate, or accept more flexible terms of employment?
- Do you feel supported or neglected in adapting to changes within your job?

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- How do environmentally related policies or technological changes affect your daily work?
- Do you feel that those changes have made your job more secure, or more unstable?
- What challenges have you faced when seeking employment?
- How do others (colleagues, family, society) perceive your current work in the context of these changes?

For employers and organisations (strategic or operational view):

- What external changes (e.g. environmental regulations, market trends, automation, AI tools) have most affected your workforce in recent years?
- How do you decide which positions to eliminate, redesign, or create?
- What kind of training do you provide to your workforce?
- What challenges do you face in aligning your staffing with green or digital transformation goals?
- Have you engaged in cooperation with training organizations, local authorities, or employment services to support workforce transitions?
- Are there any tensions between environmental compliance (e.g. green targets) and maintaining job stability?
- How do you monitor skill needs and anticipate job change internally?

For experts and policymakers:

- Are current vocational or retraining programs aligned with the actual needs of transitioning industries (green or digital)?
- What barriers do you face in forecasting emerging occupations and responding to skills gaps?
- How do you engage with employers to ensure training reflects actual labour market needs?
- Are particular social groups (e.g. older workers, migrants, women) underserved in current transition policies?
- Which sectors or occupations in your region are most affected by transformation-related disruption?
- Which sectors in your region are experiencing the greatest labour disruption due to green or digital changes?
- What mechanisms exist to track, monitor, or forecast job creation and destruction at the local level?
- Are existing institutional supports — such as public employment services or regional partnerships — adequate to help workers adapt?

3.4 Qualitative approach in skills research

Qualitative research plays an important role in capturing how skill needs emerge, evolve, and are interpreted by individuals, firms, and organizations. While large-scale surveys and quantitative forecasting dominate the field, qualitative approaches offer a critical lens into skill development processes, training system alignment, and transitional experiences, especially in sectors undergoing technological or environmental change. In the following sub-sections, the key themes discussed and the questions used in qualitative

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analyses are detailed.

3.4.1 Methods

- Diagnosing Emerging and Latent Skill Needs

Qualitative studies help uncover skill demands that are not yet reflected in formal classifications or statistical models. Interviews, focus groups, and participatory workshops can surface tacit skills, emergent competences, or cross-sectoral capabilities required in new or hybrid occupations. For instance, in Gregson et al. (2016), workers in textile sorting displayed sensory and haptic skills essential to their role, yet these were undervalued or entirely absent from formal qualifications frameworks. Similarly, the ILO global study (Strietska-Ilina et al., 2011) identified hidden green skill demands across sectors by conducting case studies and consulting national experts through qualitative methods.

- Exploring Training and Learning Pathways

Narrative and biographical methods are particularly useful in mapping how individuals acquire skills, especially in non-linear or informal ways. In Ramsarup and Hepplethwaite's (2025) study of solar sector workers, personal career stories revealed varied combinations of formal education, short training courses, on-the-job learning, and self-employment that collectively shaped workers' access to green jobs. These insights show how rigid educational models may fall short of supporting real-world learning trajectories.

- System-Level Analysis of Education and Training Gaps

Some qualitative work takes a system-oriented perspective, examining how institutional structures affect skill formation and transition readiness. For example, Lotz-Sisitka and Ramsarup (2019) emphasize the need for system-level diagnostics to expose gaps in policy alignment, occupational frameworks, and training responsiveness in South Africa's green skills ecosystem. Using a transformative research approach, they highlight how traditional systems fail to capture the fluid and dynamic nature of new green occupations.

- Participatory Skills Foresight and Strategy Building

Participatory qualitative methods such as expert panels, co-creation workshops, and Delphi consultations are commonly used to anticipate future skill needs. In the Occupational Barometer, the same expert discussions used to classify occupational demand also offer qualitative insight into regional training alignment and school-to-work transition readiness. Experts often discuss mismatches between vocational curricula and employer expectations, particularly in rapidly evolving technical sectors. Likewise, the Delphi study by Adamczyk and Szwedor (2023) was used to identify not only future occupational priorities but also gaps in regional training provision.

- Addressing Inequalities and Inclusion in Skills Policy

Qualitative research can uncover how skill acquisition and retraining opportunities are shaped by social identity, institutional bias, or systemic exclusion. Several studies, such as the ILO's global review and the South African green skills project, emphasize the underrepresentation of certain groups (e.g. women, migrants, informal workers) in upskilling efforts (Strietska-Ilina et al., 2011; Lotz-Sisitka and Ramsarup, 2019). These approaches often involve stakeholder interviews, focus groups, or participatory diagnostics to foreground marginalised voices and bring equity concerns into skills strategy discussions.

3.4.2 Questions

The following proposed questions are derived from the thematic patterns and actor roles discussed in the reviewed qualitative studies. While not directly quoted from any single source, they reflect the methodological spirit of transition-oriented, stakeholder-based

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qualitative inquiry. These questions are particularly suited for Living Labs, where the goal is to align training systems, skill development, and institutional responses with the realities of green and digital transformation.

For workers:

- Have recent environmental/technological changes/regulations/trends (ed. automatization, AI, green regulations) created pressure on you to acquire new skills?
- What forms of training or reskilling have been available to you?
- Are your existing qualifications still recognised as relevant in your current/future role?
- Have you encountered any barriers in accessing training (e.g. cost, time, accessibility, relevance)?
- Is your education profile necessary/useful in your current job?

For employers:

- What new skills have become necessary for your workforce due to policy, regulatory or market changes?
- Has it been easy for you to satisfy the emerging skills demand?
- How do you ensure that your workforce keeps pace with changing skills demand?
- Do you collaborate with training organizations or authorities to shape course curricula or learning content?
- What challenges do you face in updating training to reflect emerging occupational requirements?
- What skills do you expect to be necessary for your staff in light of green/digital transition?

For policymakers and experts:

- What mechanisms exist for identifying emerging skill gaps in your sector or region?
- Are the training and vocational programs currently offered aligned with long-term environmental or digital transition goals?
- Which worker groups (e.g. older workers, migrants, women, low-qualified) are most at risk of being excluded from transition-related training?
- How do you ensure feedback from employers and workers is incorporated into skills policy design?
- Which skills do you recognize as being at risk of becoming obsolete in face of digital/green transition?
- Which skills do you recognize as being in shortage in face of digital/green transition?

3.5 Occupational Barometer: a qualitative tool at the intersection of JCD and skills research

The Occupational Barometer is a short-term (one-year) forecasting tool designed to monitor and assess changes in occupational demand at the local and regional level. It was originally developed in Sweden and adapted in other countries, such as Poland in 2009, being conducted annually across all regions in each country. The Barometer offers a structured qualitative approach to tracking JCD while also informing skills development and vocational education and training (VET) policies.

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At its core, the Barometer relies on expert panel methodology, involving focus group interviews with 4–8 participants per region. These panels include representatives from public employment services, private recruitment agencies, employers, training organizations, trade associations, and educational bodies. Drawing on their professional experience and local knowledge — supplemented by relevant labour market data — the experts jointly evaluate the demand for approximately 170 occupations in their local labour market.

The expert panels classify each occupation into one of three categories:

- **Shortage occupations**, where labour demand exceeds supply.
- **Balanced occupations**, where demand and supply are roughly aligned.
- **Surplus occupations**, where available candidates exceed demand.

This classification indirectly reflects both emerging job opportunities and declining roles, making it a valuable resource for understanding localised JCD patterns.

In addition to occupational categorisation, the panel discussions explore two core questions:

- How will the demand for this occupation change in the coming year?
- What will be the relationship between labour supply and demand in this occupation?

These questions encourage participants to consider recent trends (e.g. automation, regulatory shifts, demographic changes) and anticipate their impact on the structure of local employment. As such, the method does not simply record present imbalances — it supports a forward-looking, interpretive diagnosis grounded in expert insight.

Importantly, the Barometer also plays a pivotal role in aligning training supply with labour market demand. Its results are often used by vocational schools, regional training providers, and education authorities to adjust enrolment strategies, plan new curricula, or prioritize retraining investments. For example, repeated identification of a shortage in occupations like electricians, truck drivers, or nurses often triggers targeted education policy responses or labour market interventions at the regional level.

While the Barometer has been praised for its comparability and integration into public planning processes, limitations include potential dominance by stronger personalities in group settings and the partial visibility of informal labour trends. Nevertheless, it remains one of the few institutionalised, large-scale qualitative tools that operates at the intersection of occupational forecasting (JCD) and skills planning (VET) — making it highly relevant to integrated labour market strategies under green and digital transitions.

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4. Conclusion

The landscape of research on JCD and skills reflects a growing recognition of the complex interplay between technological change, labor market dynamics, and policy interventions. Over the decades, literature has shifted from static models of employment adjustment to denser frameworks that account for firm and geographical heterogeneity, skill-biased technological change, and institutional factors shaping workforce resilience. A key insight emerging from this body of work is the centrality of skills, not merely as a shield against displacement, but as a strategy for inclusive growth. The transition from routine to non-routine tasks, the polarization of employment, and the rise of new occupational categories underscore the need for adaptive skill systems and lifelong learning infrastructures.

Methodologically, both quantitative and qualitative approaches reflect the dimensional development in JCD analysis, revealing nuanced insights into employment processes at many levels. While quantitative studies have evolved from firm-level analyses to broader and more complex international comparisons, they are hindered by fragmented datasets. Qualitative research, on the other hand, offers rich context but struggles with limited methodological diversity and underrepresentation of marginalized voices. Both approaches underscore the urgent need for integrated, inclusive, and harmonized data.

In sum, the literature reviewed here not only charts the intellectual trajectory of the field but also highlights the urgent need for evidence-based strategies that align workforce capabilities with the demands of a rapidly transforming economy. While job destruction is an inherent feature of economic dynamism, its social costs can be mitigated through proactive measures: targeted retraining, robust safety nets, and forward-looking education policies. The field continues to pose critical questions about the measurement of skills, the role of institutions, and the long-term effects of automation and AI on labor markets. Questions that should be addressed not only from the perspective of academic research but also from the point of view of the data needed to deal with them.
The outputs of this deliverable will be disseminated to the scientific community through various publications and events. They are already submitted to be presented with dedicated publications to the AECR's Annual Congress, at Pamplona. Spain.

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6. Annex

Annex 1: How the feedback of the first co-creation workshop of ISABEL organized on the 10th of July 2025, online, was taken into consideration in this deliverable D2.2:

Throughout the development of Task and Deliverable 2.2, several methodological limitations have emerged. Those limitations were discussed in the Co-creation workshop. The exchange between the concerned researchers, other consortium members and external academics and stakeholders is summarized next.

1. Geography adds a layer of complexity. When a job moves from one region to another, the company's total employment may remain unchanged, yet the shift registers as destruction in one location and creation in another. Most datasets attribute job changes to company headquarters, which obscures local labor dynamics and makes it harder to assess the real impact on regional employment. This report acknowledges the importance of the spatial dimension when analyzing JCD trends by highlighting several research examples focusing on it and stressing the need for further geographical detail in data sources.

2. Measuring emerging skill categories linked to digital and green transitions remains a methodological issue as well. Understanding their labor market implications requires not only better data but also a more nuanced interpretation of how skills interact with job flows. This is where qualitative research becomes important, but it remains underrepresented in the field. The perspectives of workers and firms are generally absent in existing studies. Without these discursive insights, our understanding of job creation and destruction becomes overly abstract and detached. This problem is discussed at large in the second half of the report, emphasizing possible pathways and methods that could assist in its resolution, and that could be applied in the Living Labs proposed in this project as an attempt to address this gap.

Additionally, the option of using the Spanish Social Security Records to circumvent some of the problems raised was also discussed in the workshop, as they provide rich longitudinal information on individual work histories, making them valuable for tracking job movements. However, they are technically demanding to manage and often lack detailed employer-level data, typically limited to sectoral information.

Taken together, the methodological reflections shared during the Co-creation Workshop and that are present along this report underscore the need for a more integrated approach — one that combines quantitative rigor with qualitative depth, and that remains sensitive to the spatial, institutional, and definitional complexities of labor market change.

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