

Synthesis Report of SkiLMeeT Indicators

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Abstract

This deliverable synthesises the indicators developed in Work Package 3 of the SkilMeeT project. It brings together indicators on skills and tasks, green and digital skills, occupational similarities, labour and skill shortages, skill mismatch, future employment and matching efficiency. The purpose is to provide a concise overview of what each indicator measures, how it is constructed, which data sources it relies on, and how the indicators can be used jointly to quantify labour and skills shortages and mismatch, analyse their potential drivers, and assess pathways to reduce them. The report emphasises that the SkilMeeT indicator framework combines several complementary measurement perspectives: worker-level skill supply and task use, employer demand expressed in online job vacancies, survey-based measures of skill requirements and perceived mismatch, occupational similarity and mobility measures, model-based forecasts of future labour demand, and aggregate matching indicators based on job vacancies and unemployment. Together, these indicators provide a multi-dimensional picture of European labour markets in the context of demographic change, digitalisation and the green transition.

1. Introduction

1.1. Purpose and scope of D3.8

The SkiLMeeT project develops indicators that make it possible to monitor labour-market skill dynamics across European countries, occupations, sectors and groups of workers. These indicators are intended to support the analysis of labour shortages, skill shortages and mismatch in a period in which European labour markets are affected by demographic change, technological transformation and the green transition.

Deliverable D3.8 synthesises the indicators constructed in WP3. The objective is not to reproduce the full methodological documentation of the individual deliverables, but to provide a coherent overview of their conceptual foundations, data sources, methodological choices and potential applications. The synthesis therefore focuses on the relationship between indicators: which aspects of skills and mismatch they capture, how they complement one another, and how they can be combined in subsequent empirical, policy-oriented and stakeholder-facing work.

The task description highlights that the synthesis should provide an overview of the indicators constructed in WP3, stress the contributions of the SkiLMeeT indicators, and show how the indicators can be used to quantify labour and skills shortages and mismatch, analyse possible drivers, and evaluate pathways to reduce shortages and mismatch. This report therefore focuses on the internal SkiLMeeT indicator framework and its contribution to analysing labour-market skill dynamics across Europe.

1.2. Input deliverables and scope of this report

This report draws on five available WP3 deliverables:

- **D3.1 Report skills and tasks:** skill supply and routine task intensity based on OECD PIAAC.
- **D3.3 Indicators for green and digital skills:** greenness of occupations, digital skills, AI exposure, digital skill supply and demand, and multidimensional occupational skill mismatch.
- **D3.4 Variables to measure past, current and forecasted skill shortages and mismatches:** labour shortage ratios, skill mismatch variables, wages, working hours, employment growth and forecast variables.
- **D3.6 Mapping similarities and distances between occupations:** occupational distance measures based on skill similarity, asymmetric human-capital accumulation and observed worker mobility.

- **D3.7 Indicators of matching efficiency:** Beveridge Curve analysis, matching-function-based efficiency indicators and the Şahin et al. mismatch indicator.

1.3. How to read this report

Section 2 provides an overview of the SkilMeeT indicators. Section 3 compares their conceptual focus, distinguishing skill supply, task content, shortages, mismatch, occupational exposure, occupational similarities and matching efficiency. Section 4 synthesises the methodological approaches and data sources. Section 5 discusses how the indicators can be used for quantification, analysis of drivers and assessment of potential pathways. Section 6 summarises the added value of the framework, and Section 7 concludes.

2. Overview of the SkilMeeT indicator framework

2.1. Indicators covered in this synthesis

The WP3 indicators cover different levels of labour-market analysis. Some indicators measure workers' skills and the task content of jobs; others measure employer demand for green and digital skills; others identify labour shortages, skill gaps or mismatches; occupational similarity indicators map potential transitions between occupations; and the matching-efficiency indicators assess whether the labour market transforms available workers and vacancies into matches efficiently. Table 1 summarises the main indicator groups covered in this synthesis.

Table 1. Overview of SkilMeeT indicator groups included in this synthesis.

Indicator group	Concept measured	Data and level	Main contribution
Skill supply	Workers' literacy, numeracy and problem-solving skills	PIAAC; worker level; 16 high-income countries; 2011-2023	Provides a comparable measure of the skills available in the workforce and a baseline for analysing potential gaps
Routine task intensity (RTI)	Routine content of work and task use within occupations	PIAAC; worker level; two cycles; 2011-2023	Captures how digital transformation changes the task content of jobs, including within-occupation adjustments
Greenness of occupations	Occupational exposure to the green transition through green skill requirements	Lightcast online job vacancies; 2018-2023; EU27 plus Norway and Switzerland; ISCO-2	Measures green labour demand based on the skill content of vacancies rather than sectoral labels

Digital skills in job vacancies	Intensity and domains of employer demand for digital skills	Lightcast online job vacancies; occupation-country measures; 4 EU countries; 2018-2023	Captures the demand side of digitalisation as expressed in job advertisements
AI exposure	Exposure of occupations and workers to artificial intelligence technologies	O*NET, PIAAC and predictors for countries without PIAAC	Provides country-specific exposure measures that account for cross-country variation in task content
Digital skill supply	Workers' digital capabilities	PIAAC, problem solving in technology-rich environments	Complements vacancy-based demand indicators by measuring available worker capabilities
Demand for Digital Skills (DDS)	Use of advanced digital tasks at work	CEDEFOP ESJS; worker survey; occupational distribution	Represents an equilibrium measure of digital skill demand that is met in observed jobs
Multidimensional occupational skills mismatch (MOSM)	MOSM	CEDEFOP ESJS; individual worker reports	Identifies workers reporting simultaneous needs to develop numeracy, social and job-specific technical skills
Labour shortage ratio	Imbalance between recruits and inactive workers with prior experience in the occupation	EU-LFS; ISCO-3 and country level	Provides an occupation-based measure of labour shortage or surplus
Skills and mismatch variables	Skills, perceived over- and under-skilling, wages, working hours and employment growth	ESJS, EWCS, EU-SILC and EU-LFS; mostly ISCO-country cells	Links skill measures to labour-market outcomes that may signal mismatch or adjustment pressures
Forecast variables	Projected future employment and labour demand	Theoretical model combining task content, skill prices and allocation across occupations, sectors and regions	Extends the indicator framework from past and current shortages to plausible future demand.

Matching efficiency	Efficiency with which job seekers and vacancies are transformed into matches	Eurostat unemployment, vacancies, hirings; quarterly and annual data	Measures aggregate labour-market mismatch using the Beveridge Curve and matching-function approaches
Şahin et al. mismatch indicator	Sectoral dispersion between vacancy and unemployment shares	Eurostat vacancies and unemployment by sector/country where available	Identifies mismatch when unemployed workers are concentrated in sectors with relatively few vacancies
Occupational similarities	Occupational relatedness based on skill similarity, human-capital distance and observed mobility	O*NET, PIAAC and EU-SILC; occupation-pair matrices	Identifies related occupations and feasible transition/reskilling pathways

2.2. Indicator groups and analytical role

The indicator groups can be organised according to their analytical role. A first group measures the supply of skills and the task content of jobs. This includes direct measures of literacy, numeracy and problem solving, as well as routine task intensity. These indicators describe what workers are able to do and what tasks they perform. They are particularly useful for understanding whether labour-market transformation occurs through occupational reallocation or through changes within occupations.

A second group measures skill demand and occupational exposure. The greenness indicator, the digital skills indicators and the AI exposure indicator capture how demand for specific skills and exposure to technologies varies across occupations and countries. These indicators are especially relevant for analysing the green and digital transitions because they identify changes in the skill content of work that are not visible in standard employment or sector classifications.

A third group measures shortages and mismatch more directly. D3.4 constructs variables for labour shortages, skills, perceived under- or over-skilling, wages, working hours and employment growth. D3.7 adds aggregate matching-efficiency indicators based on vacancies, unemployment and hirings. D3.3 contributes the Multidimensional Occupational Skills Mismatch (MOSM) indicator, which captures individual-level perceived needs for further skill development across several dimensions. These indicators are not substitutes for one another: each measures a

different manifestation of mismatch, ranging from individual perceived gaps to sectoral and aggregate matching frictions.

A fourth group measures occupational similarity and distance. D3.6 constructs indicators that describe how close occupations are to one another based on skill bundles, asymmetric human-capital accumulation requirements and observed worker mobility. These indicators are particularly relevant for identifying feasible transitions between occupations and for assessing where reskilling or mobility support may help reduce shortages and mismatch.

A fifth group introduces a forward-looking dimension. The forecast variables in D3.4 use a theoretical model to project future labour demand and skill requirements. This makes it possible to move from monitoring existing shortages to assessing where future pressures may emerge, and how education, training and labour-market policy might affect future outcomes.

3. Conceptual synthesis

3.1. Skills, tasks and occupational exposure

A central contribution of the SkilMeeT indicators is that they distinguish between skills, tasks and occupational exposure. Skills refer to the capabilities of workers or the competences required by jobs. Tasks refer to the activities actually performed at work. Occupational exposure refers to the extent to which occupations are affected by broader transformations, such as greening, digitalisation or AI. These concepts are related but not identical.

D3.1 starts from the supply side. It measures literacy, numeracy and problem-solving skills using PIAAC and combines these with task-based indicators. Routine task intensity is especially important because it describes the content of work rather than the formal occupation alone. The observed decline in routine work in many countries is interpreted as evidence that technological change reshapes jobs partly through within-occupation task adjustments. This means that the same occupation can become less routine over time, even if the occupational structure of employment changes only moderately.

D3.3 extends this task- and skill-based perspective to the green and digital transitions. The greenness indicator classifies job advertisements as green if they contain validated green skills or explicitly green job titles. It therefore captures the greening of labour demand through the skill content of vacancies. The digital skills indicators follow a similar logic but treat digital competences as a broad and multi-domain set of requirements. Rather than identifying a small

group of “digital jobs”, they measure the intensity and type of digital skills requested by employers.

The AI exposure indicator adds a further layer. It does not simply classify occupations as exposed or unexposed. Instead, it combines occupation-level AI exposure information with task data to generate country-specific worker exposure measures. This is conceptually important because the same occupation may involve different tasks in different countries, and therefore different exposure to AI technologies. In this sense, the SkilMeeT approach avoids interpreting occupational titles as fixed bundles of tasks.

3.2. Labour shortages, skill shortages and mismatch

The deliverables also distinguish several forms of shortage and mismatch. Labour shortage refers to a situation in which demand for labour in an occupation, sector or country is high relative to available labour supply. Skill shortage is more specific: it indicates that workers with the required skills are insufficiently available. Mismatch refers to a broader set of situations in which workers and jobs do not fit well, either because workers lack required skills, possess skills that are not used, or are located in the wrong occupation, sector or region relative to demand.

D3.4 operationalises labour shortage through a ratio based on recruits into an occupation relative to inactive persons with prior experience in that occupation. This approach is designed for EU-LFS data and is calculated at detailed occupational and country levels. In addition, D3.4 uses ESJS, EWCS, EU-SILC and EU-LFS to construct variables related to skills, perceived over- and under-skilling, hourly wages, working hours and employment growth. These variables do not all measure mismatch directly; instead, they provide complementary signals that can be interpreted jointly. For example, wage growth, longer hours and employment growth may indicate demand pressure, while perceived under-skilling can point to worker-level skill gaps.

D3.7 approaches mismatch from the perspective of aggregate matching. The Beveridge Curve relates vacancies to unemployment. Movements along the curve are associated with business-cycle conditions, while outward or inward shifts can be interpreted as changes in matching efficiency. The matching-function indicator estimates the efficiency with which job seekers and job vacancies are transformed into hires, while the Şahin et al. indicator captures sectoral mismatch by comparing the distribution of unemployment with the distribution of job vacancies. This perspective complements the more skill-specific indicators because it captures frictions in the labour-market matching process even when the precise skill content is not observed.

D3.3 contributes the MOSM indicator, which focuses on individual reports of skill-development needs. It identifies workers who simultaneously report needs for further development in numeracy, social and job-specific technical skills. This captures a more multidimensional form of perceived skill gap than single-skill indicators. Conceptually, it helps identify workers at risk of facing broad adjustment barriers, rather than simply measuring whether one particular competence is missing.

3.3. Green and digital transitions

The green and digital transitions are treated as transformations that affect the skill content of work across many occupations, not only as changes confined to a narrow set of sectors. This is reflected in the design of the SkilMeeT indicators. Green skills are identified through a data-driven procedure anchored in the EU Taxonomy for Sustainable Activities. The indicator therefore focuses on whether job advertisements require skills related to environmental sustainability, renewable energy, energy-efficient construction, sustainable mobility, circular-economy processes or related domains.

Digitalisation is captured through several complementary indicators. Vacancy-based digital skill demand measures employer requirements. PIAAC-based digital skill supply measures workers' capabilities. The DDS index measures the use of advanced digital tasks in actual jobs. AI exposure captures how tasks within occupations relate to AI technologies. Taken together, these indicators make it possible to distinguish unmet demand for digital skills from realised digital task use and from broader exposure to technological change.

The indicators also allow for a comparison between demand-side and supply-side evidence. A vacancy-based digital skill indicator may increase because employers request more digital competences. A PIAAC-based supply indicator may remain stable if workers' capabilities do not rise at the same pace. A survey-based DDS measure may capture only digital tasks that are already used in jobs. Differences between these measures are informative: they may indicate emerging labour and skills shortages, training needs or frictions in the diffusion of technologies.

3.4. Occupational similarities

D3.6 adds an explicit occupational-similarity dimension to the indicator framework. It defines occupational relatedness in two complementary ways. First, occupations are treated as bundles of knowledge, skills and abilities, so that occupations with similar skill profiles are considered

close to one another. This skill-based approach uses O*NET, PIAAC and several distance or similarity metrics, including weighted Jaccard similarity, SBERT-based cosine similarity, Euclidean distance and Manhattan distance. Second, D3.6 uses observed worker mobility to construct occupational transition matrices from EU-SILC data. The underlying idea is that frequent movements between occupations reveal practical transferability of skills and human capital.

The occupational-similarity indicators complement the labour and skills shortage and mismatch indicators because they identify potential pathways rather than only diagnosing imbalances. If one occupation faces labour shortage pressures while another occupation has a related skill profile, similarity and mobility matrices can help assess whether transitions or targeted reskilling are plausible. In this way, D3.6 strengthens the framework's ability to evaluate pathways to reduce labour and skills shortages and mismatch.

4. Methodological synthesis

4.1. Data sources and measurement strategies

The SkilMeeT indicators rely on several types of data. This diversity is a strength because each data source captures a different aspect of the labour market. Worker surveys provide information on skills, tasks and perceptions; online job vacancies provide detailed demand-side information; occupational taxonomies and mobility data support the construction of occupational distance and transition measures; public labour-market statistics provide harmonised time series on unemployment, vacancies and employment; and model-based forecasts extend the framework to future labour demand. Table 2 summarises the main measurement strategies.

Table 2. Main measurement strategies in the SkilMeeT indicator framework.

Measurement strategy	Main data sources	Information captured	Strengths	Limitations
Worker skill and task surveys	PIAAC; ESJS; EWCS	Direct skill assessments, task use, perceived skill needs, digital task use	Comparable cross-country evidence on workers and realised jobs; can distinguish supply, task use and perceived gaps	Survey timing and changing questionnaires limit frequency and comparability; some measures are perceived rather than objective
Online job vacancy data	Lightcast OJV	Employer demand for	High granularity and recent	Vacancies are a flow measure and may

		green and digital skills; skill content of vacancies	demand-side information; allows data-driven classification of skill requirements	overrepresent certain occupations, firms, countries or skill levels
Occupation and task taxonomies	O*NET; PIAAC; EU-SILC; ISCO classifications; EU Taxonomy	AI exposure, occupational skill domains, occupational distance and similarity, observed mobility pathways, green skill classification	Provides conceptual anchoring and comparability across countries and occupations; supports transition-oriented analysis	Requires mapping across taxonomies and may not fully capture country-specific job content without additional data; mobility matrices may reflect data issues in some countries or years
Labour-market statistics	EU-LFS; Eurostat vacancies and transitions; EU-SILC	Unemployment, vacancies, hirings, wages, working hours, employment growth	Harmonised and replicable indicators for countries, sectors and occupations; useful for shortage and matching analysis	Some variables are unavailable for all countries or levels; aggregate data may mask skill-specific frictions
Model-based forecasts	Theoretical model calibrated to skill content, prices and allocations	Future labour demand and skill requirements	Adds a forward-looking perspective and allows scenarios to be analysed	Results depend on model assumptions, calibration choices and external scenarios

The use of multiple data sources also reflects the distinction between labour demand and labour supply. Job vacancy data capture employer demand for skills at the hiring margin. Worker surveys capture the capabilities and task use of employed workers. Occupational similarity and mobility indicators capture the distance between jobs and the observed movement of workers across occupations. Unemployment, vacancy and hiring data capture aggregate matching dynamics. Forecasting models link task content and skill prices to future allocations. A key advantage of the SkilMeeT framework is that it does not reduce skill mismatch to one indicator. Instead, it allows researchers to triangulate across demand, supply, task use, perceived gaps, occupational relatedness and aggregate matching outcomes.

4.2. Methodological features by indicator group

Several methodological features are particularly important for interpreting the indicators.

- **Harmonisation across countries:** The indicators are designed to be comparable across European labour markets. This requires common occupational classifications, harmonised surveys or common data sources, and consistent aggregation procedures.
- **Skill-based rather than sector-only measurement:** Green and digital indicators are constructed from skill requirements or task content rather than assuming that whole sectors are uniformly green or digital.
- **Occupational relatedness:** D3.6 maps similarities and distances between occupations using both skill-based measures and observed mobility. This adds a transition-oriented component to the framework.
- **Combination of supply and demand:** The framework includes both workers' capabilities and employer requirements, making it possible to identify potential gaps between the two.
- **Time dimension:** Indicators cover past and current developments, and some extend to forecasts of future employment. The time dimension is essential for distinguishing persistent structural pressures from temporary shocks.
- **Multi-level analysis:** The indicators operate at different levels: worker, occupation, sector, country and, for some outputs, occupation-country cells. This allows both granular and aggregate analysis.

4.3. Strengths and limitations of the approaches

The SkilMeeT indicator framework has several strengths. First, it is multidimensional. It recognises that labour and skills shortages and mismatch can appear as employer recruitment difficulties, worker skill gaps, under-used skills, wage pressure, longer working hours, employment growth, or inefficient matching between job vacancies and job seekers. Second, it uses recent data sources and methods, including online job vacancies, natural language processing and large-language-model-assisted classification. Third, it combines descriptive, diagnostic and forward-looking indicators. This allows researchers and policymakers to move from monitoring to explanation and eventually to policy design.

At the same time, the indicators have limitations that should be made explicit. Online job vacancies do not perfectly represent all labour demand. They are better interpreted as a large-scale demand-side flow of posted vacancies than as a complete census of employment needs.

Worker surveys provide rich information but are limited by periodicity, response design and comparability when questionnaires change. Perceived mismatch measures are useful because they reflect workers' own assessments, but they may also capture expectations, working conditions or training opportunities rather than objective skill gaps alone. Aggregate matching indicators are transparent and replicable but cannot identify the precise skill content of mismatch without being combined with more detailed skill indicators.

These limitations do not reduce the value of the framework. Instead, they indicate how the indicators should be used. No single indicator should be treated as a definitive measure of labour and skills shortage or mismatch. The strongest use of the SkilMeeT framework is joint interpretation: for example, a labour shortage is more credible if vacancy-based demand, wage pressure, employment growth and low matching efficiency point in the same direction. Conversely, divergent signals can reveal the mechanism behind mismatch, such as strong demand but insufficient supply, or adequate supply but weak matching across sectors or regions.

5. Applications of the indicators

5.1. Quantifying labour and skills shortages and mismatch

The indicators can be used to quantify labour and skills shortages and mismatch at several levels. At the occupation-country level, the labour shortage ratio from D3.4 can identify occupations where recruitment is high relative to inactive workers with prior occupational experience. Vacancy-based green and digital skill indicators can show where employers increasingly request specific skills. MOSM can identify groups of workers facing broad perceived development needs. Matching-efficiency indicators can quantify whether aggregate matching deteriorates even when unemployment and vacancies coexist.

The indicators are particularly useful when combined. For instance, if an occupation displays rising digital skill demand in OJV data, low digital skill supply in PIAAC, and increasing perceived under-skilling in ESJS, this would suggest an emerging digital skill shortage. If vacancies are high while unemployment remains concentrated in other sectors, the Şahin et al. indicator would point to sectoral mismatch. If wage growth and working hours rise in the same occupation, this may indicate that firms respond to scarcity by increasing compensation or intensifying labour use.

5.2. Analysing potential drivers

The indicators can also be used to analyse drivers of labour and skills shortages and mismatch. Demographic change can be linked to shrinking labour supply and increasing pressure on matching efficiency. Digitalisation can be analysed through changes in routine task intensity, digital skill demand, digital skill supply and AI exposure. The green transition can be analysed through the greenness of occupations and the diffusion of green skills across traditional and emerging occupations. Structural change can be examined through employment growth, wages and working hours, while model-based forecasts can show where future demand pressures may arise.

A major benefit of the framework is that it can separate several mechanisms that would otherwise be conflated. A shortage may reflect insufficient total labour supply, insufficient specific skills, poor matching across sectors or occupations, regional immobility, or slow adjustment of education and training systems. The SkilMeeT indicators do not solve this identification problem automatically, but they provide the building blocks for diagnosing which mechanisms are most plausible in a given labour-market segment.

5.3. Evaluating pathways to reduce labour and skills shortages and mismatch

The indicators can inform the evaluation of pathways to reduce labour and skills shortages and mismatch. Digital skill supply indicators and MOSM can help identify training needs. Green and digital vacancy indicators can show where future-oriented skill requirements are emerging. Occupational similarity indicators from D3.6 can be used to identify transition pathways between occupations with similar task or skill profiles, while mobility matrices indicate which moves are already observed in the labour market. Matching-efficiency indicators can help assess whether policy should focus on information frictions, mobility, placement services or broader labour-market institutions.

The forecast component in D3.4 is particularly relevant for forward-looking policy. By projecting future labour demand and skill requirements, the model-based indicators can help assess whether current education and training pathways are likely to meet future needs. When combined with occupational similarity measures, the framework can identify feasible reskilling routes. When combined with demand-side indicators from job vacancies, it can help prioritise occupations and skills where labour shortages are likely to be most pressing.

Table 3. Potential applications of the SkilMeeT indicators

Analytical objective	Relevant indicators	Use in the SkilMeeT framework
Quantify labour shortages	Labour shortage ratio; vacancy-based demand; matching efficiency; wages/hours	Identify occupations, sectors or countries where demand exceeds available supply.
Measure skill gaps	PIAAC skill supply; ESJS skills; MOSM; digital supply and DDS	Assess whether workers' skills and tasks match current requirements.
Monitor transitions	Greenness of occupations; digital skills; AI exposure; RTI	Track how green and digital transformations change task and skill requirements.
Diagnose mismatch mechanisms	Şahin mismatch; Beveridge Curve; unemployment/vacancy distributions; skill indicators	Distinguish aggregate matching problems from skill-specific or sectoral imbalances.
Design reskilling pathways	D3.6 occupational similarity indicators; MOSM; digital and green skill measures	Identify workers and occupations where reskilling, mobility support or occupational transitions may be most effective.
Assess future risks	Forecast variables; skill prices; employment projections	Anticipate future shortage pressures and skill needs under alternative scenarios.

6. Added value of the SkilMeeT indicator framework

The SkilMeeT indicators contribute to the measurement of European labour-market transformation in four main ways. First, they create an integrated framework rather than a set of isolated measures. By combining supply, demand, task, exposure, mismatch and matching-efficiency indicators, the framework recognises that labour and skill shortages are multi-dimensional. This is important because a single indicator can easily conflate different mechanisms. For example, high vacancies may indicate labour scarcity, but not whether the problem is insufficient skills, weak geographic mobility, unattractive working conditions or general business-cycle pressure.

Second, the indicators are designed to be policy-relevant. They can identify where shortages occur, which skills are involved, which workers face development needs, and which occupations are exposed to green and digital change. This is directly relevant for education and training policy, active labour-market policy, migration policy, regional policy and employer recruitment

strategies. The framework can support stakeholder feedback loops by translating complex labour-market dynamics into interpretable measures.

Third, the indicators bridge different time horizons. D3.1, D3.3 and D3.4 provide evidence on past and current skills, tasks and shortages; D3.6 adds occupational similarity and mobility pathways; D3.7 examines matching efficiency over time; and D3.4 adds forecasts of future employment and labour demand. This structure makes it possible to distinguish current bottlenecks from future risks and to evaluate whether current policy responses are aligned with likely future needs.

Fourth, the framework is methodologically innovative while remaining transparent. The green and digital indicators exploit detailed online job vacancy data and modern text-based methods, but they are anchored in explicit definitions and validation procedures. Matching-efficiency indicators rely on established labour-market concepts such as the Beveridge Curve and the matching function. Survey-based indicators use recognised European data sources. This combination increases credibility and allows replication or extension in future work.

The main added value of the SkilMeeT framework is therefore not any single indicator, but the possibility of triangulation. By comparing signals across indicators, researchers and policymakers can obtain a more reliable diagnosis of labour and skills shortages and mismatch. The occupational similarity and mobility measures further allow the framework to move from diagnosis to possible transition pathways. This is especially important in periods of rapid transformation, when standard occupational or sectoral classifications may fail to capture how skill requirements change within jobs.

Conclusion

This report synthesises the SkilMeeT indicators developed in WP3. The indicators cover skill supply, routine task intensity, green and digital skill demand, AI exposure, digital skill supply and demand, multidimensional occupational skill mismatch, occupational similarities and mobility pathways, labour shortage ratios, related labour-market variables, forecasted employment and matching efficiency. Together, they provide a broad and complementary framework for analysing labour and skill shortages and mismatch across European labour markets.

The synthesis shows that the indicators differ conceptually and methodologically, but that these differences are a strength. Skills, tasks, labour shortages, skills mismatch and matching efficiency are not identical concepts. They operate at different levels and require different data sources. The SkilMeeT framework therefore avoids a narrow measurement strategy and instead combines

worker-level evidence, vacancy-based demand, survey information, public labour-market statistics and forward-looking modelling.

The synthesis can serve as a concise reference document for internal project work, stakeholder feedback loops and dissemination to the research community. Its contribution lies in showing how the SkilMeeT indicators complement each other: some describe skills and tasks, others measure green and digital demand, others identify labour and skills shortages and mismatch, D3.6 maps occupational transition possibilities, and D3.7 captures aggregate matching efficiency. Used jointly, the indicators provide a richer basis for understanding where labour and skills shortages arise, which mechanisms may drive them, and which pathways may help reduce them.

References and input deliverables

Input deliverables

- SkilMeeT Deliverable D3.1: Report skills and tasks. Piotr Lewandowski and Karol Madoń. Reviewer: Ronald Bachmann.
- SkilMeeT Deliverable D3.3: Indicators for green and digital skills and specialized versus diversified skill sets - Methodology. Federico Fabio Frattini, Christina Gathmann, Mateusz Krzakała, Piotr Lewandowski, Karol Madoń, Ludivine Martin and Francesco Vona. Reviewer: Ulrich Zierahn-Weilage.
- SkilMeeT Deliverable D3.4: Variables to measure past, current and forecasted skill shortages and mismatches. Ludivine Martin and Michal Burzynski.
- SkilMeeT Deliverable D3.6: Mapping Similarities and Distances between Occupations - Methodology. Diane Confurius, Christina Gathmann, Eric Guastalli, Piotr Lewandowski, Roy Peijen, Pascal Kampert and Wojciech Szymczak. Reviewers: Joost van Genabeek and Sadegh Shahmohammadi.
- SkilMeeT Deliverable D3.7: Indicators of Matching Efficiency. Ronald Bachmann. Reviewer: Joost van Genabeek.

Selected methodological references mentioned in the input deliverables

- Commission Delegated Regulation (EU) 2021/2139. Technical screening criteria for the EU Taxonomy for Sustainable Activities. Reference for identifying green skills used in D3.3.
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Skills for labour markets in the digital and green transition

SkiLMeeT is a research project carried out by eight research institutions, exploring how the digital and green transformation of European economies are changing the demand for skills. We analyse the scope of skills shortages and mismatches, identify their drivers and propose innovative ways to reduce skills gaps.

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