CEDEFOP

Next generation skills intelligence for more learning and better matching

Skills anticipation trends, opportunities and challenges in EU Member States

POLICY BRIEF

POLICY BACKGROUND

In this section

Skill trends complexity requires method diversity

Skills anticipation and intelligence can power skills governance

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There is broad consensus that the EU needs a skills revolution to adjust to changing demography, the digital and the green transition and other megatrends reshaping economies and societies. To make that happen, providing relevant, learner-centred, inclusive and efficient vocational education and training (VET) is crucial. Forging strong links between VET and skills policy and other policy areas, such as economic, social, environmental and migration, requires solid data on current and future trends. But data alone, and the statistics and indicators derived from them, are not enough. The dynamics and complexity of today's labour markets and wider megatrends require expert interpretation to turn information into actionable insight that supports countries, regions, sectors and citizens in making transitions.

This is where skills intelligence comes in. Cedefop coined the term long before skills took centre stage in policy debates, defining it as the outcome of an expert-driven process of identifying, analysing, synthesising and presenting quantitative and/or qualitative information on skills and labour market. Skills intelligence helps translate megatrends and aspirations of key stakeholders at national, regional, local and sectoral level into labour market trends

and skill needs. It is essential for shaping feedback loops that effectively transmit labour market signals to education and training systems. The European Commission underlines the importance of timely and relevant skills intelligence for renewing and updating VET curricula and programmes. It is a priority in the 2020 European Skills Agenda and the 2020 Council Recommendation on VET for sustainable competitiveness, social fairness and resilience.

Skills intelligence is the result of skills assessment and anticipation: activities aimed at evaluating current and future skill needs in the labour market in a strategic way by using consistent and systematic methods (Box 1). Trying to understand current and future labour market trends is far from new. Future-oriented labour market and skills analysis has been around in different shapes and forms for decades. Following the US Bureau of Labor Statistics' pioneering 'manpower planning' work carried out over 50 years ago, labour market forecasting based on econometric models became the first mainstream skills anticipation method. Labour market forecasts were used primarily by national statistical offices, labour and finance ministries, and labour authorities.

Economies have come a long way since the first

...**skills intelligence helps translate megatrends** and aspirations of key stakeholders **into labour market trends and skill needs**...

...**no single skills anticipation approach**, method or tool **can sufficiently capture** and comprehensively anticipate **labour market needs** and skill trends...

...for skills anticipation and intelligence **to make a difference**, it must be part of **well-functioning skills ecosystems**...

forecasts, aiming to understand future labour market needs and to plan education and training, emerged after World War II. Over time, it has become increasingly evident that neither employment forecasts nor any other single approach, method or tool can sufficiently capture and comprehensively anticipate labour market needs and skill trends. In the current dynamically evolving and complex socio-economic environment, it is not possible to understand and interpret the current and future state of play in labour markets and skills systems without leveraging different types of skills anticipation. This the essence of skills intelligence.

While combining reliable methods and blending perspectives is integral to sound skills intelligence, this alone is not enough. To be trusted, relevant and usable for policy and in practice, multi-level stakeholder involvement in skills anticipation is crucial. Ministries leading the strategic design and production and use of skills anticipation, and organisations under their responsibility, need to work closely together with VET and skills ecosystem actors and stakeholders. These include national, regional and local authorities, social partners (employer representation organisations and trades unions), education and training providers and teachers and trainers, research institutes, civil society organisations, parents and learners.

Holistic and inclusive skills anticipation approaches permeate sectors, occupations, geographic locations, education and training types and levels; they forge links between policy domains that often operated in silos in the past. Such approaches foster developing skills intelligence that reflects the needs and aspirations of skills ecosystems (see Figure 1) and that provides evidence informing investment in skills and other policy and individual-level decisions. To be effective, skills intelligence needs to consider skills demand and supply. Skills anticipation that considers both sides helps make a case for what Cedefop calls 'permaskilling': leveraging the potential of people by combining investing in skills with investment in quality jobs.

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Box 1. **Skills needs assessment and anticipation explained**

Skills needs assessment is the process of identifying skill gaps and shortages and evaluating the capacity of qualification systems (including education and training provisions and funding schemes) to meet the needs of the economy. It:

- can take place at the national, regional, local, or sectoral level;

- can help provide a comprehensive analysis of current skill needs and the implications of past trends for the future;

- can provide information on emerging skill needs or likely future skill gaps;

- may be provided quantitatively (e.g. with reference to the changing number of people employed in an occupation, or with a certain level of qualification), or qualitatively (e.g. with reference to providing descriptive information about changing skill profiles of jobs).

Skills needs anticipation is the process of identifying skills the economy will require in the short, medium or longer term, to balance skill supply and demand and to promote economic development via skills investment in people, countries, regions, sectors and enterprises.

Skills needs assessment and anticipation tools include:

- skills forecast;
- skills foresight;
- learner tracer or tracking surveys;
- big data analysis;
- skills surveys.

Source: ILO, 2015; Cedefop. Available in Cedefop glossary.

Figure 1. Elements of and actors involved in the permaskilling approach to VET and skills policy implementation

VET/skills systems

Skills intelligence

Incentives & support

national/regional/ local authorities

employer organisations

trade unions

VET teachers/ trainers/schools

PERMASKILLING

learners/workers/ citizens

academia/ researchers

Megatrends

Upgrading jobs

NGOs/ civil society

Source: Cedefop.

Skill trends complexity requires method diversity

Skills anticipation is not a crystal ball and no single anticipation method can provide all the answers. Nevertheless, skills assessment and anticipation tools and methods ([1]) in place in many EU Member States ([2]) help them produce methodologically sound, accurate, and relevant skills anticipation (Table 1). These tools are important because they form the basis of multi-source and multi-perspective skills intelligence. Such intelligence helps shed light on the rapidly changing worlds of work and skills and supports forward-looking, needs-responsive, and inclusive policy-making and implementation.

Skill assessments/surveys (employers/employees/ sectoral bodies) that use labour market indicators and information to offer mapping of the current state of skill demand and supply are the most commonly used type of skills intelligence method. Skills forecasts, typically using an econometric model where skills are proxied by occupations and/or qualifications, are widely used to provide an image of future skill demand and supply. Their key limitation – basing model assumptions on historic trends and past trajectories – is increasingly acknowledged, with change accelerating and the EU policy agenda focus on the digital and green (twin) transition. Several other skills anticipation methods are used to complement the insights skills forecasts provide.

Technological and skill foresight
is a booming skills anticipation method because it captures the ideas that there may be different futures for economies, labour markets, and societies; that policy-makers and civil society more broadly have a say in, and can together shape, a desired future.

Skills and jobs surveys
among employers, workers, VET providers, or learners help collect evidence that can be used to signal skills shortages and mismatches and to

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([1]) Cedefop has published a series of Methodological guides to anticipating and matching skills and jobs, targeting EU policymakers and decision-makers, in collaboration with the ILO and the European Training Foundation. These are complemented by Cedefop practical guides which give insight into how skills anticipation methods can be used to navigate the uncertainty of changing technologies and skill demands (see Cedefop 2021a-c).

([2]) The Cedefop 'Matching skills' online tool showcases a collection of policy instruments from EU Member States that use information on labour market trends and anticipated skill needs to inform and shape upskilling and other skills matching policies for the world of work, current and future.

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identify improvement opportunities in training provision and skills utilisation.

Graduate tracking and tracer studies

help gain insight into the performance of education and training systems with respect to easing the labour market entry of learners and into the links between learning achievements in education and training programmes and skills matching and utilisation in workplaces.

Big data and AI-driven analyses

of online job advertisements, patent data, scientific databases, online course websites and information (Cedefop, 2021c) are gaining traction in skills anticipation. Accelerating digitalisation, 'greennovation', and skill needs linked to the rapidly emerging future of work create demand for faster and more skills-focused intelligence that goes beyond the evidence 'traditional' skills anticipation methods can provide.

Table 1. **Skills assessment and anticipation: seven widely used methods**

01
DESCRIPTIVE STATISTICS/ STOCK-TAKING

Estimates of skill demand and supply and technology use, often based on collating data from different sources (e.g. labour force survey, sector skill studies)

02
GRADUATE TRACER AND TRACKING STUDIES

Using administrative datasets or surveys or a combination of the two to track people through education and the labour market to see how the former influences the latter

03
FORESIGHT

Critical thinking about the future of skills supply and demand and technology trends, using participatory forward-looking methodologies

04
QUANTITATIVE FORECASTING

Forecasting or projecting future demand in sectors, occupations, and/or qualification levels or types using econometric modelling

05
QUALITATIVE RESEARCH

Use of non-quantitative techniques such as company case studies and focus groups to develop expert or practitioner insight into current and future skill demand/supply and technology trends

06
BIG DATA

Use of web sources (e.g. online job ad portals, CV repositories, patent databases), combined with text mining and machine learning approaches, to collect and classify data about skills, jobs, qualifications, vacancies, technologies, etc.

07
SKILLS AND JOBS SURVEYS (QUESTIONNAIRE-BASED)

Mapping of skill demand and supply and technology use, often combined with an assessment of the extent to which skill demand and supply are matched

Source: Cedefop classification in Cedefop, 2022b.

Skills anticipation and intelligence can power skills governance

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For skills anticipation and intelligence to make a difference, it must be part of well-functioning skills ecosystems. While skills intelligence has always had a wide range of potential beneficiaries, the focus is shifting from developing evidence for experts and policy makers towards shaping and disseminating user-centred information that translates trends and policy aims into actionable learning and skills matching opportunities.

Skills governance helps achieve just that. Cedefop defines it as the 'process of involving stakeholders from the public, private and third sector, from different economic sectors and geographic units, in generating, disseminating and using skills intelligence to steer policies aimed at balancing skill supply and demand, and to establish a basis for stimulating economic development via targeted investments in skills development'. Mapping the state of play of skills anticipation in EU Member States helps provide a stylised image of how skills governance is approached across the European Union.

There are no one-size-fits-all skills governance arrangements that work across different contexts. National skills governance arrangements and structures in place reflect economic characteristics, social dialogue arrangements, administrative structures and even culture; to be effective, governance improvement opportunities must be compatible with them. Exploring skills anticipation and skills governance approaches across countries cannot be viewed as a comparative performance assessment or review. Such an exercise can, however, bring to the fore governance arrangements and improvements efforts that work and highlight good practices that can be inspirational for stakeholders and actors in other contexts.

Building on Cedefop's skills intelligence work, this policy brief takes a close look at how effective skills anticipation methods contribute to skills governance and provides a summary of the status of national skills anticipation and matching practices deployed in EU Member States, Norway and Iceland.

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the more the merrier

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more evidence-based policy-making and informing career guidance

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Cedefop's skills governance analytical framework identifies key drivers of well-functioning skill needs anticipation and matching systems and approaches (Figure 2). The framework signals the complexity of skills governance and points towards the need to consider issues, trends, challenges and opportunities at different levels and to interlink different spheres. As skills governance is a collaborative process rather than a combination of structures, resources and measures, it can be a way to overcome fragmented policy-making and weak stakeholder involvement: a skills governance approach can be leveraged to build or strengthen necessary bridges between different policy areas. This is particularly relevant in the current decade, where digital transformation and green transition demand nothing less than a skills revolution; setting it in motion requires shifting from silo-thinking towards collaborative approaches that interlink multiple policy domains.

The skills governance framework can also help identify bottlenecks, potential accelerators and improvement opportunities in national, regional or sectoral skills governance approaches. Barriers in skills governance approaches reported by EU Member States include lack of funds and human resources with relevant expertise, weak coordination among organisations involved and poor statis-

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tical infrastructure (Pouliakas and Ranieri, 2018).

With megatrends accelerating and skills shortages and labour market tensions centre stage in policy debates, countries are stepping up efforts to leverage the full potential of skills anticipation and intelligence. In countries where - until a few years ago - skills anticipation activities were relatively modest, significant steps forward have been taken. New, often ESF-supported, projects reinforce skills anticipation expertise and capacity and enable stakeholders to join forces to contribute to national skills, digitalisation, greening or innovation agendas. Also in 'mature' systems, such as in the Netherlands, there is evidence of progress, for example via adopting more sophisticated anticipation methods or techniques [3].

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[3] The 2019 survey of more than 1100 employers in the Netherlands conducted by the Research Centre for Education and the Labour Market (ROA) included a stated-preferences experiment in which employers were repeatedly asked to choose between two hypothetical job applicants (which were said to be identical except for several characteristics that varied randomly within and across choices) for a hypothetical vacancy in the most common entry-level job. This method enables causal interpretations about the competences influencing the probability that employers will offer graduates a job, the competences seen as most important, and the trade-offs employers make between different competences.

🔍 ...**skills governance** is a **collaborative process** that can help **overcome fragmented policy-making**...

ℹ️ ...Cedefop's **skills governance framework** helps **identify bottlenecks**, potential **accelerators** and improvement **opportunities** in skills governance approaches...

💡 ...with **megatrends accelerating** and **labour market tensions increasing** countries are stepping up **efforts to leverage the full potential of skills anticipation**...

Figure 2. **Cedefop skills governance framework**

culture			history
Organisation	**Resources**	**Stakeholders**	**Use of information**
Legal and institutional frameworkh	Funding and human resources	Cooperation arrangements	Feedback mechanisms
FOUNDATIONS			
Management and control	Data, methods and expertise	Feedback and validation	Customisation and dissemination
PROCESSES			
Vision and strategy	Stability	Integration of stakeholder needs	Reputation
SUSTAINABILITY			
economy			demography

NB: The framework includes 57 skills governance facilitators and 160 descriptors that can be used to map comprehensively a skills governance system or approach.

Source: Cedefop.

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Estonia and Greece are among the countries that have stepped up efforts to disseminate skills intelligence to a wide range of user groups.

In what follows, this policy brief uncovers key trends in skills anticipation in the EU Member States, Norway and Iceland, highlighting examples that can be inspirational for policy makers, skills eco-system stakeholders and practitioners. The findings touch upon all four pillars of Cedefop's skills governance framework: organisation, resources, stakeholders and the use of information.

Organisation: towards more systematic and reflective approaches

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While EU countries move at different speeds when it comes to strengthening their VET and skills formation systems, they increasingly acknowledge the value of skills anticipation as a strategic and transversal policy-decision tool. The uptake of wider and more comprehensive skills governance approaches demonstrates this trend. Smarter governance arrangements leverage information exchange and partnership, improve cooperation and coordination between education and training and employment policy, and help strengthen the links with economic, innovation and related policy agendas.

Many skills anticipation activities continue to be centrally organised in most countries, with one or more ministries taking the lead. Labour and/ or education ministries are usually in charge of coordinating activities and have responsibility for the main skills anticipation tools; these usually include employment or skills forecasts. Linking national forecasts and other skills intelligence tools to activities of regional and local level authorities and stakeholders helps expand the reach of skills intelligence at lower governance levels. The experience of Poland shows that gathering together stakeholders from all administrative levels brings

skills anticipation and intelligence closer to where transitions happen.

Strengthening links horizontally is another trend impacting skills anticipation systems and arrangements. In several countries, ministry departments and agencies that, in the past, had the sole responsibility for coordination are opening up to other ministries/specialised departments and starting to work in partnership with them to grasp better what megatrends mean for the labour market and skills. Systematising skills anticipation approaches and building in reflection opportunities should ideally be integrated in legislation, or national strategy or vision for the road ahead, as is the case in Finland. With this aim in mind, several countries are reforming their national skills bodies (Box 2).

Efforts to understand sectoral employment and skill trends are gaining ground. Likely to be driven by the green and digital transition and the implementation of the European Green Deal, sectoral organisations, such as the sector councils in Czechia, have become more active. They run skills assessments, usually ad-hoc, for example on sectoral qualifications structures. Sectoral councils typically bring together sectoral ministries

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(such as agriculture), sectoral employers' organisations and sectoral trade unions. In Estonia, the sectoral skills anticipation approach, which is a design principle of the national OSKA system, has been fortified via method innovation, improving stakeholder representativeness and expanding the use of information.

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Box 2. **Reform in national skills bodies**

In **Latvia**, in early 2023, the Ministries of Economy, of Welfare, and of Education and Science agreed to convert the Employment Council into the Human Capital Development Council for better coherence and inter-ministerial cooperation in labour market transformation. This collegial body will coordinate planning, design, implementation, and monitoring of labour market adjustments, fostering human resource development in alignment with future demand and economic structural changes for society's benefit.

The National Skills Council in **Ireland** was established 2017; following an OECD review, it is being restructured in 2023. The plan is to reconfigure membership, so that the council can act as a platform for strategic engagement with industry and enterprise and main non-governmental stakeholders with a strong interest in skills and workforce development policy. A High-Level Skills Implementation Committee is expected to deliver a whole-of-government and whole-of-tertiary engagement on national skills policy and delivery, and to provide policy and operational expertise to the council.

In **Malta**, the National Skills Council (NSC) had been established in 2016. Since 2022, it is an executive government body, driving and implementing activities on 'labour market preparation and skills'. It advises government on priority skills needs and the direction of skills development, steers the national skills strategy, and establishes policy and procedures for standards, curriculum and quality assurance. The NSC also oversees research and skills intelligence, creates channels for stakeholder collaboration, and promotes performance benchmarking and reporting, and mechanisms for advancing skills and minimising the skills gap.

Source: Cedefop.

Resources: expanding tools, methods, and expertise

Every EU Member State has at least one skills anticipation method in place and many benefit from multiple methods that complement one another. In most countries, long-standing skills anticipation methods persist. Some countries reshape systems that have been in place for a long time, as in Austria, where the Skills Barometer is being reorganised, and in the Netherlands, where the public employment service has started offering a dashboard presenting tasks and soft skills for occupations at different qualification levels based on big data analysis to provide more skills- and training- oriented information to jobseekers.

Almost all (nine of 10) countries undertake regular skill assessments. Employment and skills forecasts have been and remain the backbone of skills anticipation and intelligence in most countries. In countries that did not have forecast capacity until some years ago, new initiatives have been launched (in Malta, Iceland and – with Cedefop support – in Bulgaria and Slovenia). Most forecasts look around 10 years ahead to give a medium-term perspective on labour market change. There are also short-term (12 months) forecasts relying on an econometric model (e.g. Finland) or other data sources; this is the case in Lithuania, where the national forecast is

based on a survey among employers about current and expected labour demand. Cedefop's EU Skills Forecast continues to serve skills intelligence needs in Member States without a regular forecast (e.g. Luxembourg) or where it has fallen into disuse (e.g. Hungary). Employment forecasts usually cover the national level, but there are also regional forecast models, such as the French regional employment and training observatories (*Observatoires Regionaux de l'Emploi et de la Formation*, OREFs). In Germany, *Länder* governments or industry and trade chambers fund regional forecasts, which are often not directly comparable with national forecasts because they use different methods.

Some Member States use employer surveys to map labour market and skill trends. Examples of employer survey-powered skills anticipation include the Skilled labour radar in Austria and the annual employer survey carried out by the Norwegian Labour and Welfare Administration (NAV). Graduate tracking or tracing surveys have been expanding across Europe because policy makers require better understanding about skills supply and education-to-work transitions. For example, as of 2020 in Slovakia, a website offers data on the employment of secondary school and university

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graduates. In 2018 in Luxembourg, the TEVA Barometer was established by the National Institute for the Development of Continuing Vocational Training (INFPC). The Barometer draws data from the long-standing TEVA study (*Transition école, vie active* – transition from school to working life), which monitors more than 7 000 VET learners in 74 VET trades and occupations.

Shocks and rapidly accelerating transitions have contributed to increased uptake of technology and skill foresight methods, which have become much more used in skills anticipation compared to a decade ago. Several Member States are expanding their foresight capacity to support their understanding of emerging skill needs in different scenarios/futures, mirroring developments at EU level. Most of these foresight exercises are taken up on an ad hoc basis, although there are also countries where they are systematically undertaken, for example by Synthesis Research (Synthesis Forschung) in Austria and as part of the development of the OSKA system in Estonia.

Rapidly emerging technological change affects all economic sectors and has transformative implications for future skill demand. Automated analysis of emerging skills needs and technologies, extracting information from online job advertisements, patent databases and other sources on the web reinforces efforts to provide up-to-date insights on labour market trends, and on the skills impacts of implementing new technology (Cedefop, 2021b). Skills anticipation powered by big data is rapidly expanding, making skills intelligence more sophisticated and usable in practice, also by public employment services. In the Flemish community in Belgium, the public employment service VDAB runs Competrend, an AI-experimental approach looking ahead to see which competences will be much sought after in the future la-

bour market. The use of online job advertisements more generally for developing skills intelligence is gaining ground, with Cedefop's OVATE work and national initiatives in countries such as Finland, Italy, and Slovakia.

Identifying current and future labour market needs and skill trends comprehensively cannot be achieved with a single skills anticipation method. It is the combination of such methods that makes it possible to map evolving trends correctly and to reflect the needs of different stakeholder and learner groups across economic sectors and geographic locations. As starting from scratch will often be neither feasible resource-wise nor desirable, blending different skills intelligence sources developed by other organisations, regions or countries can be a powerful way to make skills intelligence smarter in a sustainable way. Blending approaches are commonly present in sectoral skills anticipation. Examples include the activities of Finland's Skills Anticipation Forum, projecting future skill needs in nine sectors, and the Dutch Advisory Committee on Medical Manpower Planning (ACMMP). The latter combines quantitative forecasts, surveys and Delphi foresight methods to anticipate labour demand for 80 health occupations. This intelligence is reflected in qualifications and feeds proposals about the desired intake of learners in medical education programmes (OECD/ILO, 2022).

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Box 3. **AI and online job advertisements in future skill needs anticipation**

The Competrend project carried out by public employment service VDAB in the Flemish Community of **Belgium** uses online vacancies to understand skill trends better and gain insight into which competences employers want and need in the future. Based on the competence standard Competent 2.0, Competrend uses deep trend analysis of CVs and job vacancies. The project also measures to what extent different competences are interrelated. Its main objective is to understand which competences of jobseekers can be a stepping stone to learning new, future-oriented competences. This makes finding suitable training programmes for retraining and upskilling easier and faster. VDAB plans to expand the tool by combining predictions about the skills jobseekers need with data on sectoral developments, building on collaboration with other government actors and universities.

Technology Industries of **Finland** spearheaded the development of the Competence data playbook – a tool offering insights based on skills anticipation and training development pilot projects. Skills data are analysed using artificial intelligence techniques, to give a better and more up-to-date overview of competence and skill needs based on employee CVs, online job advertisements, training course guides and scientific publications.

Source: Skills anticipation country reports.

Stakeholder partnership: the more the merrier

Stakeholder collaboration is at the core of efficient skills anticipation. Stakeholders most commonly involved in the EU skills anticipation and intelligence landscape include national, regional and local authorities, social partners, sectoral organisations, research institutes, education and training providers, and chambers of trade or commerce.

Partnership approaches are developing across Europe and this trend is probably linked to increasing engagement in tackling the skill challenges stemming from the twin transition, demographic decline and the increasingly fluid geopolitical landscape. Such initiatives can have a regional or local focus. The Belgian Go4Brussels 2030 strategy vision is to integrate various government initiatives. It provides common steering, monitoring, consultation, communication and evaluation tools which promote sustainable transition, employment, and the take-up of training and help to align the training offer with the skills employers need. In Ireland, regional skills fora facilitate cooperation and engagement between employers and education and training providers to make sure that the content of programmes is aligned to labour market needs. The Department of Further and Higher Education, Research, Innovation and Science (DFHERIS) and

the Economic and Social Research Institute (ESRI) established a partnership in 2022 to undertake research on labour market developments and skills shifts to support such efforts.

The role of social partners is expanding, even in countries where a comprehensive approach to skills anticipation is under development. In 2019 Croatian employers were for the first time involved in the development of occupational standards. Employers in Estonia are involved in such tasks via their participation in sectoral expert panels alongside representatives from VET, universities and public authorities. In other countries where stakeholder collaboration is intertwined with policy-making, sectoral bodies, councils and committees are in charge of developing sector-specific skills intelligence. This is the case in the 11 Continuing training and education committees (Efteruddannelsesudvalg for AMU uddannelser) in Denmark, established in 1994, which bring together sectoral employer associations and trade unions.

Policy and stakeholder coordination may be achieved by standing bodies, such as Germany's Standing Conference of the Ministers of Education and Cultural Affairs of the Länder in the Federal

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...**stakeholder collaboration** is at the core of **efficient skills anticipation**...

...**partnership approaches** are developing to **tackle** skill challenges stemming from **twin transition, demographic decline** and the **fluid geopolitical landscape**...

...**skills anticipation capacity** helps regional and local players **gain insight into what greennovation means** for employment and skills...

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Republic of Germany (*Kultusministerkonferenz*, KMK). KMK brings together ministers or senators of the Federal States (*Bundesländer*) responsible for education and schooling, institutes of higher education and research and cultural affairs. It is tasked with interregional cooperation in primary, secondary and tertiary education and coordination of education between the *Länder*.

The European Green Deal and green transition more generally puts local- and regional-level policy approaches and their implementation centre-stage. Skills anticipation capacity at such levels helps regional and local players gain insight into what greennovation means for employment and skills on the ground; this evidence plays a major role in making and shaping a just green transition. Combining anticipation methods and leveraging the expertise of regional and local stakeholders to identify VET and skills policy (implementation) priorities and signal mismatches helps regions and cities become hubs of greening (Cedefop, 2022).

The economic, labour, skills and social impacts of the European Green Deal vary between European countries and regions, and they may be quite different in regions within the same country. The crucial role of partnership in turning skills anticipation into regional- and local-level action is obvious from recent activities of the Czech Confederation of Industry to identify regional skills demand and supply and the collaboration of SOLAS in Ireland with Education and Training Boards, Regional Skills fora and local enterprises to manage further education and training programmes. Skills intelligence helps align VET provision to regional and local realities and provides insight into what VET programme specialties or types are meaningful for a particular region (see Lopes et al., 2023 for a regional approach in Portugal). In Bulgaria, 10 regional competence assessment centres use regional expert surveys to carry out coordination, information exchange and competence assessment tasks in their respective regions.

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Use of information: more evidence-based policy-making and informing career guidance

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The contribution of skills anticipation methods to policy-making and implementation in EU countries has expanded, as is also evident from the policy instruments presented in Cedefop's Matching Skills webtool. Skills anticipation outcomes are used to identify labour market shortages (e.g. in Greece), in career and vocational guidance services (e.g. in Germany), and to allocate continuing training programme subsidies (e.g. Cyprus) and in migration policy (e.g. in Latvia). Public employment services (PES) typically are key customers of skills anticipation and intelligence, channelling skills intelligence into career counsellor training, and often sharing information with the wider public via online career guidance tools or apps. Examples include the interactive Occupations map, produced by the Lithuanian PES, which offers detailed information on supply of, and demand for, 155 occupational groups in 10 regions and 60 municipalities. The VDAB tool for jobseekers is another example, offering detailed information on the skills that occupations require and the alternative occupations experience, skills, and additional training within reach.

Skills anticipation and intelligence tools need to be easily accessible and adapted to the needs and expertise level of users so they can be used by audiences that need them most. Examples of good practices in adjusting skills anticipation findings to the needs of a wide range of users include Promising professions by FOREM (PES in Wallonia in Belgium) the Croatian HKO portal, and the Italian Excelsiorienta platform for lower and upper secondary school learners and their families, offering information and guidance on school-to-work transitions.

According to Cedefop's RefarNet ([4]), almost all countries acknowledge the importance of targeted 'green' skills anticipation. Accelerating digitalisation across functions and occupations has triggered skills anticipation responses in some countries (Box 4). The skills anticipation activities aiming at capturing the implications of the twin transition currently under way reflect the maturity of skills governance approaches, and stakeholder networks and the characteristics of legislative procedures and how they are applied.

([4]) Cedefop RefarNet partners were consulted on green skills anticipation developments in their country.

...**skills anticipation** is used to **identify labour market shortages**, in career and vocational guidance services, to allocate **continuing training programme subsidies** and in **migration policy**...
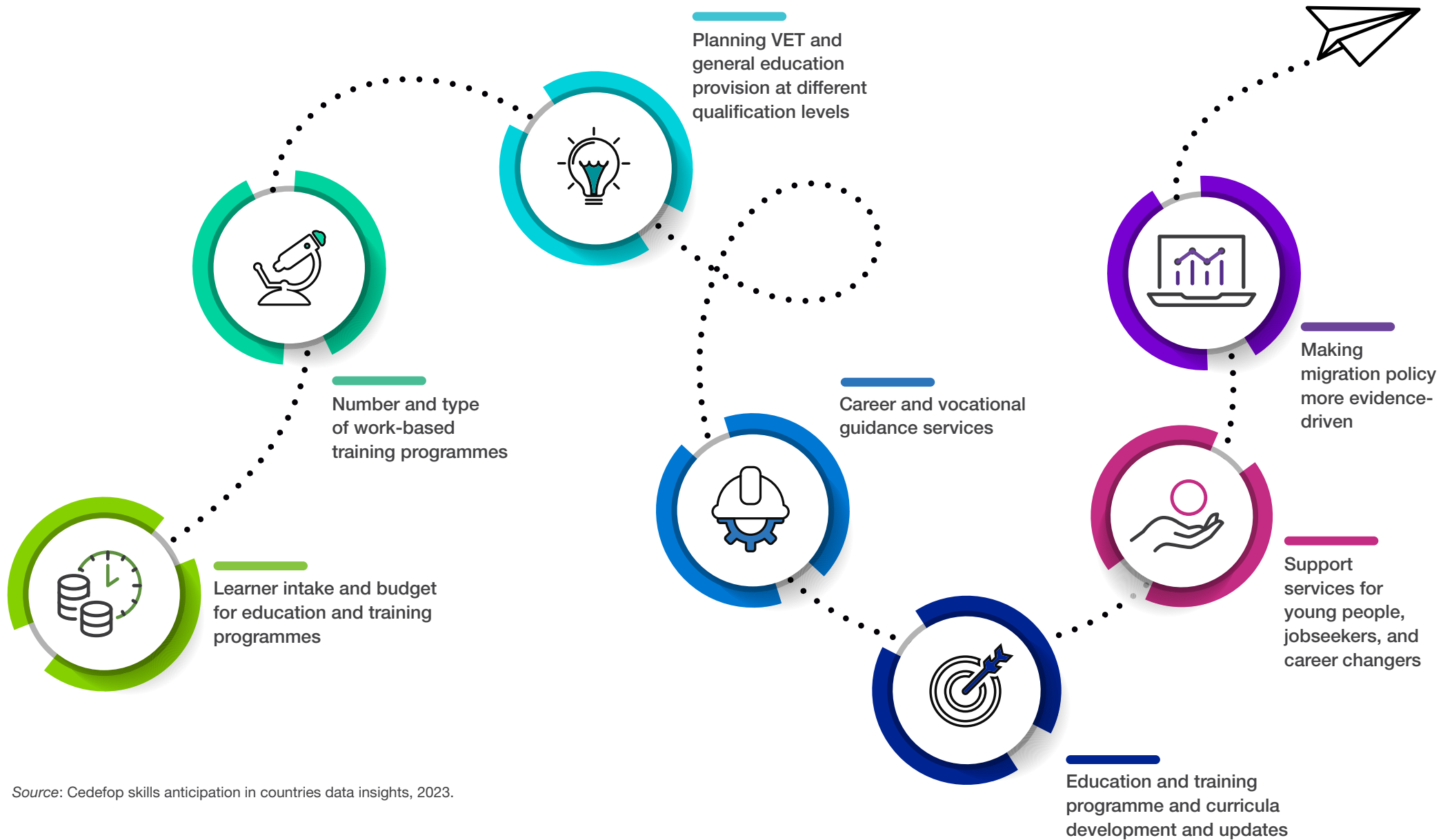
...**skills intelligence tools** need to be **easily accessible** and adapted to the needs and expertise level of users so they can be **used by audiences that need them most**...

...**skills anticipation activities** aiming at capturing the implications of the twin transition **are gaining traction**...

Policy brief | Next generation skills intelligence for more learning and better matching: skills anticipation trends, opportunities and challenges in EU Member States | Evidence | **Use of information: more evidence-based policy-making and informing career guidance**

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Figure 3. **Skills intelligence use applications in EU Member States**

Planning VET and general education provision at different qualification levels

Making migration policy more evidence-driven

Number and type of work-based training programmes

Career and vocational guidance services

Support services for young people, jobseekers, and career changers

Learner intake and budget for education and training programmes

Education and training programme and curricula development and updates

Source: Cedefop skills anticipation in countries data insights, 2023.

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Box 4. **Green and digital skills anticipation in practice**

Bulgaria

The ESF-funded Development of digital skills initiative, aimed to identify digital skills and develop digital skill profiles to anticipate the impact of Industry 4.0 on the labour market. The Ministry of Labour developed methodology to determine the digital state of play and development needs of digital skills of the national workforce. National employer and employee representation organisations launched seven projects to analyse digital skills needs in key professions and occupations in all economic sectors that play an important role in digital transition.

France

The National Observatory for Jobs and Occupations of the Green Economy (*Observatoire national des emplois et métiers de l'économie verte, Oneme*v), was set up by the Ministry of Environment in 2010. It brings together a wide range of stakeholders (national ministries and agencies, public employment services, the main VET association, the national statistical institute, research bodies, and regional employment and training observatories). It analyses employment changes and trends in the green economy, looks at the role of green occupations, and reflects on what the green transition means for VET and skills.

Estonia

In 2020-22, ad hoc studies under the national skills anticipation framework/organisation, OSKA, focused on digital and skills for the green transition. These studies provide evidence to update national VET curricula. It is planned to integrate digital and green skills gradually into vocational training in all areas using support from the EU Just Transition Fund.

Portugal

The INCoDe.2030 initiative under the National Skills Strategy (2017-30) aims at promoting digital skills with a view to meeting major national goals. It sets 2025 and 2030 training, employment, R&D, and inclusion targets and includes activities to forecast the most important digital competences in the Portuguese economy.

Sweden

The 2022 Swedish technology companies competence survey for the green and digital transition, addressing over 1000 CEOs and HR managers, mapped job profiles increasing in demand, their skills requirements, and the megatrends that drive emerging skills needs.

Norway

The national skills forecasts capture the green transition and a 2023 report produced by the Committee on Skill Needs includes a comprehensive analysis of green transition competences, employment trends in renewable energy and the impact of greening on skills shortages.

Source: Cedefop ReferNet network and Cedefop (2023). *Skills anticipation in Bulgaria data insight.*

CONCLUSIONS

With the twin transition accelerating and demographic transformation limiting labour and skills supply volumes Europe needs a skills revolution. Using sound skills anticipation to produce skills intelligence will be central to shaping and managing it. The information about recent trends in skills anticipation and intelligence and experience in the EU presented in this policy brief point towards the following take-aways, which are relevant to all policy-makers with tasks, roles or mandates linking to skills.

01 MAINTAINING ROBUST POLITICAL COMMITMENT

While there is evidence of increasing political commitment towards improving skills anticipation and its uptake, one in four ReferNet national experts still pinpoint lack of political awareness as a key challenge in advancing skills anticipation for the green transition. Such awareness is crucial because introducing new 'green' anticipation activities, expanding existing ones and leveraging the results in policy-making requires investment. Lacking awareness of the importance of skills anticipation may also make it difficult to overcome other structural roadblocks that hinder national/regional skills anticipation efforts. These include weak institutional arrangements, funding mechanisms that respond too slowly to new priorities, and lacking expertise.

02 ACCELERATING INNOVATION IN SKILLS ANTICIPATION

Sound skills anticipation methods and tools are already a major contributor to understanding and projecting how the worlds of work and learning are changing, but that does not mean there is no room for further development, innovation and for doing more to address user needs. There is innovation potential in countries where skills anticipation has recently started developing and in countries with a long-standing skills intelligence tradition. Cedefop's next generation skills intelligence work for the EU can be used as an inspiration for building or adapting systems and approaches at national, regional and sectoral levels. Such intelligence is well-suited for accompanying the EU in the skills transformation the Union will undergo this decade: it fo-

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...**lack of political awareness** is a **key challenge** in advancing **skills anticipation** for the **green transition**...

...not the number of **methods** but the **level of coordination between them** matters...

...giving **stakeholders a seat at the table** in **skills anticipation** supports **skills formation and matching** and promotes **fairness and social inclusion**...

cuses on transitions (green, digital and others), it is more actionable and user-centred, and it provides better insight into the links between learning in all its shapes and forms and skills.

03 LEVERAGING METHOD DIVERSITY REQUIRES COORDINATION

Although method variety is a strength when it comes to informing policies and their implementation, simply having in place a range of methods is not enough. It is not the number of methods but the level of coordination between them that matters. Having a plethora of skills anticipation tools in place without coordinated approaches to aligning methodologies, time horizons, and definitions (e.g. of skills) may do more harm than good. Experience from Italy shows that lack of coordination frustrates efforts to develop meaningful national-level skills intelligence.


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04 CONNECTING STAKEHOLDERS

Realities in labour markets, industrial ecosystems and economies demand stakeholder pluralism. No stakeholder can afford to think and act as an island when information exchange and activity coordination are drivers of success and progress. Stakeholders need to be mobilised to engage with one another horizontally (e.g. by linking government agencies), vertically (e.g. across value chains), and across geographic areas. With such stakeholder connections in place, skills anticipation can go beyond tackling skills and employment bottlenecks and mismatches, also helping signal key societal challenges. Multi-level and -perspective bridge-building is part of European Green Deal plans, such as the European Commission's New European Bauhaus initiative.

05 CHAMPIONING NETWORK THINKING AND ACTING

Simply including stakeholders is not enough. Putting skills anticipation methods to work and ensuring that the skills intelligence is analysed and interpreted so that it can shape policy-making and implementation require synthetic approaches. Moving away from silo-thinking can be a challenge even, in Member States with long-standing skills anticipation initiatives which effectively incorporate stakeholder collaboration arrangements. An expert group in Denmark recently expressed concerns over the ability of Continuing training and education committees to develop education programmes meeting
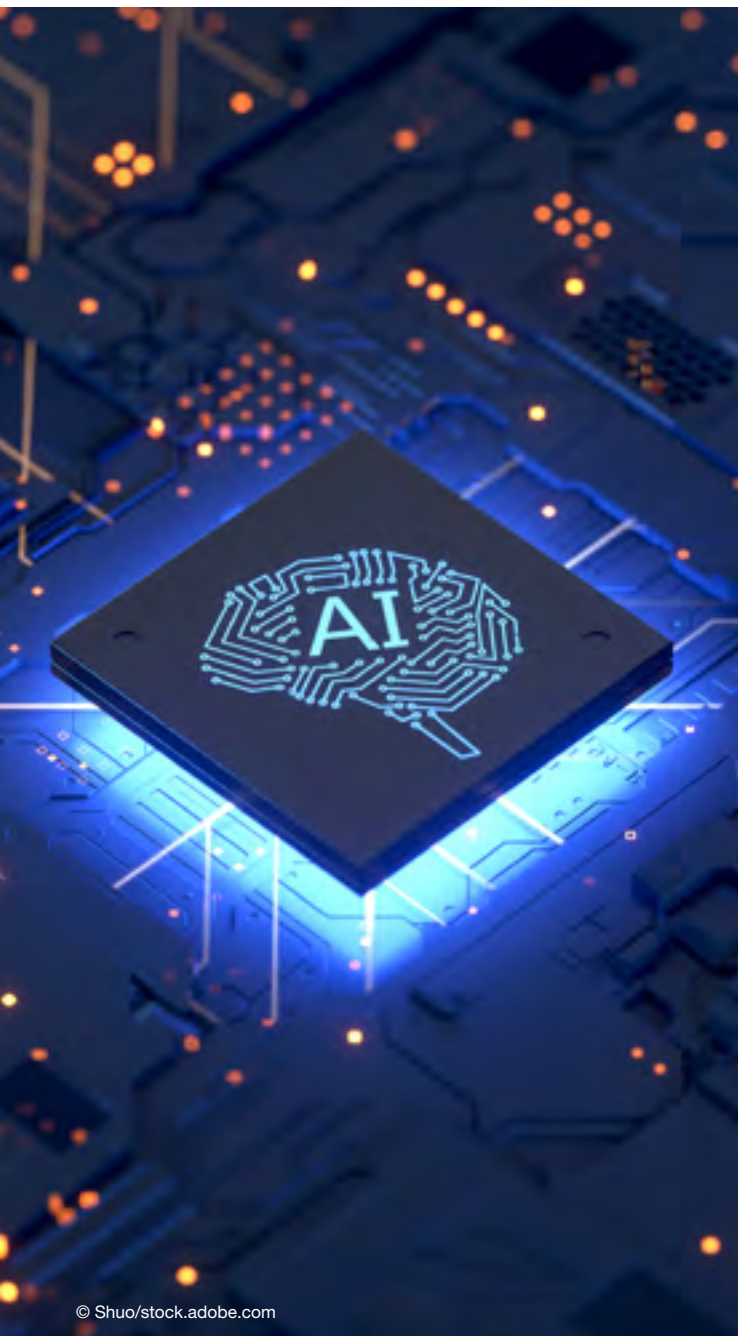
labour market needs. Tripartite negotiations are underway on how to redesign the system (⁵) to move away from its the silo set-up where each committee represents a single business sector.

06 TRAINING SKILLS ANTICIPATION AND SKILLS ECOSYSTEM STAKE-HOLDERS ON BIG DATA AND AI

While not all public servants and private sector employees engaged in skills anticipation at national, regional and local levels need advanced technical big data analysis skills, they all need to be aware of the benefits of using advanced big data and AI-driven skills anticipation methods, as well as their limitations. National strategies, which all EU Member States started developing after Finland introduced its AI strategy in 2017, typically highlight the importance of familiarising people with big data and AI, and how they can contribute to better understanding of trends, phenomena and contexts and underline the need for more targeted actions (Tangi et al., 2022).

07 SUPPORTING DEMOCRATIC VALUES

Multi-method, -level, and -perspective skills anticipation approaches jointly shaped (and – if needed – recalibrated) by all stakeholders strengthen the feedback loops between the labour market and VET and help build bridges between many different policy areas. Blending economic, twin transition, and social inclusion

objectives fortifies democratic values: giving stakeholders a seat at the table and opportunities to contribute and voice concerns leads to skills anticipation that supports skills formation and matching systems in becoming fairer and more inclusive. Next generation skills intelligence helps education and training systems, and training and employment support measures, better reflect the needs and ambitions of vulnerable groups, while supporting the ambitions of companies of all sizes.

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(⁵) More information:
Continuing training and education committees.

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REFERENCES

Cedefop (2022). *Cities in transition: how vocational education and training can help cities become smarter and greener*. Luxembourg: Publications Office. Policy brief.

Cedefop (2021a). *Understanding technological change and skill needs: skills surveys and skills forecasting. Cedefop practical guide 1*. Luxembourg: Publications Office.

Cedefop (2021b). *Understanding technological change and skill needs: big data and artificial methods: Cedefop practical guide 2*. Luxembourg: Publications Office.

Cedefop (2021c). *Understanding technological change and skill needs: big data and artificial methods: Cedefop practical guide 3*. Luxembourg: Publications Office.

Lopes, A. S. et al. (2023). *Supply and demand matching of VET skills – a regional case study*. Cogent Education, 10:1.

OECD/ILO (2022). *Equipping health workers with the right skills: skills anticipation in the health workforce*. Getting Skills Right. Paris: OECD Publishing.

Pouliakas and Ranieri (2018). *Governance of labor market and skills intelligence as driver of VET reform*. In: McGrath, S.; Mulder, M.; Papier, J.; Suart, R. (eds). Handbook of Vocational Education and Training. Springer, Cham.

Tangi, L. et al. (2022). *AI Watch. European landscape on the use of artificial intelligence by the public sector*. Luxembourg: Publications Office.

POLICY BRIEF

Next generation skills intelligence for more learning and better matching

Skills anticipation trends, opportunities and challenges in EU Member States

Collecting data and information on labour market needs and skills trends is not sufficient to design and sustain responsive and efficient vocational education and training (VET) programmes and skills formation systems. Economies and societies need robust skill anticipation methods and trusted skills intelligence to translate data into actionable insights that support the skills revolution. This policy brief reviews trends in skills anticipation in Europe and explains how it contributes to more learning and better matching. It builds on Cedefop's monitoring of national skills anticipation systems and practices in the EU-27, Norway and Iceland and input from Cedefop's **ReferNet** partners.

Project info:
Anticipating and matching skills

Project contacts:
Cedefop expert, Stelina Chatzichristou
Cedefop expert, Jasper van Loo

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