

Employment and labour markets Tackling labour shortages in EU Member States



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Country codes

| AT | Austria | FI | Finland | NL | Netherlands |
|----|----------|----|------------|----|-------------|
| BE | Belgium | FR | France | PL | Poland |
| BG | Bulgaria | HR | Croatia | PT | Portugal |
| CY | Cyprus | HU | Hungary | RO | Romania |
| CZ | Czechia | IE | Ireland | SE | Sweden |
| DE | Germany | IT | Italy | SI | Slovenia |
| DK | Denmark | LU | Luxembourg | SK | Slovakia |
| EE | Estonia | LT | Lithuania | | |
| EL | Greece | LV | Latvia | | |
| ES | Spain | MT | Malta | | |

Abbreviations

| Cedefop | European Centre for the Development of Vocational Training |
|----------|---|
| COVID-19 | coronavirus disease 2019 |
| EMN | European Migration Network |
| ERM | European Restructuring Monitor |
| ESF | European Social Fund |
| ESF+ | European Social Fund Plus |
| ESI | European Skills Index |
| EU-BCS | European business and consumer surveys (European Commission's Directorate General for Economic and Financial Affairs) |
| EURES | European Employment Services |
| FDI | foreign direct investment |
| GDP | gross domestic product |
| ICT | information and communications technology |
| IT | information technology |
| NACE | Nomenclature of Economic Activities |
| NUTS | Nomenclature of Territorial Units for Statistics |
| OVATE | Online Vacancy Analysis Tool for Europe (Cedefop's Skills-Ovate database) |
| PES | public employment service(s) |
| SMEs | small and medium-sized enterprises |
| STEM | science, technology, engineering and mathematics |
| TCN | third-country national |
| | |

Executive summary

Introduction

In the years leading up to the COVID-19 crisis, the issue of labour shortages had been gaining greater prominence on the EU agenda. This issue posed concerns for many Member States in terms of the ability of certain sectors to enhance their productivity and competitiveness and to deliver the level and quality of services required. Although rising unemployment resulting from the impact of the pandemic turned labour shortages into an oversupply of available labour in some sectors, in others long-standing issues have been further aggravated - the healthcare sector being a case in point. Similarly, the decline in overall job vacancy rates as an indication of an easing of the labour shortages phenomenon is no cause for complacency, given that efforts to 'build back better' after the pandemic – in the context of accelerating digitalisation and the transition towards a climate-neutral economy will throw the spotlight on other areas of shortage in many information and communications technology (ICT) and future-oriented technology sectors, professions and skills.

Policy context

The NextGenerationEU recovery plan and the €672.5 billion Recovery and Resilience Facility, together with other existing EU funds, provide the financial framework to support the shift towards a more circular economy, emphasising further investment in 'green' and digital jobs and skills. These funds will support the implementation of the EU's new Industrial Strategy, the European Green Deal and the EU's Digital Strategy, as partially operationalised through the new European Skills Agenda.

However, the labour shortages phenomenon is complex and transversal, cutting across different EU and national policy domains, including many of the principles of the European Pillar of Social Rights and policies linked to supporting labour mobility between EU countries and regulating access for third-country nationals.

Key findings

Quantitative shortages denote an absolute lack of labour and tend to go hand in hand with low unemployment rates and significant difficulties in filling vacancies. Drivers include strong economic growth and high consumer demand, as well as demographic trends leading to a deficit in the working-age population.

Migration patterns and high levels of economic inactivity among often vulnerable groups can be further contributing factors. In the case of qualitative shortages, unfilled vacancies can coexist with relatively high levels of unemployment. Such shortages are driven by changes in demand and the broader economy, including technological change, which generate a mismatch between the supply of and demand for skills. Differences between the preferences of jobseekers and the quality of available jobs constitutes another driver.

The unmet demand for labour increased in the EU overall between 2013 and 2019, with some significant differences between Member States. Measured in terms of vacancy rates, the most significant shortages are in Czechia, followed by Belgium, the Netherlands and Austria, with only limited shortages present in Greece, Portugal, Poland and Slovakia.

The COVID-19 pandemic has led to a decline in different indicators of shortage. In industry, services and construction, the proportion of organisations indicating that a lack of labour constituted a factor limiting production decreased by 9, 13 and 9 percentage points, respectively, compared with the same period of the previous year, while the vacancy rate dropped from 2.3% in the third quarter of 2019 to 1.7% in the third quarter of 2020. Nonetheless, both employer surveys and vacancy rate indicators remain at a higher level in 2020 than in 2013. The pandemic has also aggravated long-standing shortages in sectors such as healthcare and ICT.

- In terms of broad sectors, prior to the onset of the COVID-19 pandemic, the construction sector had witnessed the largest increase in shortages following its recovery from the impact of the economic and financial crisis, followed by manufacturing and services, with important differences between subsectors.
- The COVID-19 pandemic contributed to considerable labour shortages in the health sector. In 2020, nurses and other health professionals were among the occupations with the most critical shortages in most Member States, followed by ICT professionals, skilled trades, technicians and heavy truck and lorry drivers.
- In the context of the post-pandemic recovery, the construction, energy, manufacturing and transport sectors are likely to be affected by the climateneutral transition, requiring additional labour and new skills.

Measures to address shortages can broadly be categorised in the typology set out in Table 1.

Table 1: Typology of measures to address different drivers of labour shortages

| Attracting labour | Activation of underutilised resources and retaining labour | Enhancing the use of existing labour and retaining labour |
|---|--|---|
| 1. Enhancing the attractiveness of certain sectors or professions by improving wages and/or working conditions. | Addressing labour market barriers for different groups currently unemployed or inactive. | 1. Improving matching between supply and demand through better foresight and the adjustment of curricula. |
| 2. Enhancing the attractiveness of living and working conditions in the country/region and the attractiveness of wages and working conditions; creating policies to attract return migration/valuing the skills of return | Increasing working hours for those in involuntary part-time employment. | Addressing skills mismatches through enhancements of different education and training routes. Improving matching services. Enhancing preparations for labour market change for employees. |
| migrants.3. Creating an active migration policy.4. Improving recruitment strategies at company level and enhancing working conditions. | | 5. Preventing (early) exit by protecting work ability. |

Source: Authors' own elaboration

Policy pointers

- Efforts should be made to enhance the knowledge base regarding sectoral and occupational shortages at national and regional levels, including through more reliable forecasting systems.
- In designing policies to address labour shortages, a clear assessment of the main drivers of shortages is critical. To achieve sustainable outcomes, policy measures should tackle the underlying causes of shortages.
- Although some drivers are of greater importance in some countries, sectors and occupations than in others, often a multifaceted approach will be needed to tackle shortages.

- Regional development strategies aimed at achieving greater convergence have an important role to play in addressing regional labour shortages.
- In addition to governments, social partners, individual employers and individuals themselves must work towards effectively addressing the issue of shortages.
- Specific efforts are required to tackle shortages in sectors where the COVID-19 pandemic has worsened already existing gaps in labour supply.
- In the recovery from the pandemic, the emphasis on digital and climate-neutral transitions will give rise to new shortages, as well as exacerbating existing ones. These need to be analysed and prioritised as part of EU and national recovery and resilience strategies.

Introduction

In early 2020, the European Commission's Joint employment report 2020 stated that, 'while receding slightly compared to one year ago, labour shortages [in the EU] are at a high level' (European Commission, 2020a). Between 2013 and 2019, the proportion of businesses indicating that the availability of labour was a factor limiting production increased nearly fivefold in construction, quadrupled in industry and more than doubled in the services sector. The unmet demand for labour, as expressed by the job vacancy rate, rose in the EU over the same period to 2.3% – its highest value since 2006 (European Commission, 2019a). In its Annual review of working life 2018, Eurofound reported that employment-related topics, including shortages, dominated social partner actions in 2018 (Eurofound, 2019a).

Since then, the world has changed as a result of the COVID-19 crisis. The pandemic is having a significant impact on jobs, with EU gross domestic product (GDP) falling by around 7.5% in 2020 (European Commission, 2020b) and around six million jobs lost in the same year. The European Commission's 2020 autumn economic forecast projected an increase in unemployment in the EU: from 3.7% in 2019 to 7.7% in 2020 and 8.6% in 2021 (European Commission, 2020b). While the precise future economic and labour market impact of the pandemic remains unclear, it will be shaped by the timing of the rollout of vaccines, the duration of lockdowns and the extent to which the significant economic, labour market and social policy measures taken at EU and national levels can continue to mitigate the impact of the COVID-19 crisis (Eurofound, 2021a).

Rising unemployment has an impact on the scale of labour shortages (European Commission, 2020c). The link between unemployment and shortages can be captured using the Commission's European business and consumer surveys (EU-BCS) and Eurostat EU vacancy rate data. Compared with the same period of the previous year, in the third quarter of 2020, the proportion of organisations in industry, services and construction indicating that a lack of labour limited production decreased by 9, 13 and 9 percentage points, respectively, while the vacancy rate dropped to 1.7%. However, evidence shows that shortages in some sectors and occupations persist even during periods of higher unemployment. The pandemic has also aggravated shortages in some sectors and occupations where recruitment difficulties have been longstanding (Eurofound, 2020a; European Commission, 2020d).

The underlying context linked to the megatrends of technological, climate and demographic changes, as well as the globalisation of the economy, means that ongoing changes in consumer and economic demands and associated labour and skills requirements will intensify shortages, requiring the attention of policymakers if limitations to productivity, service delivery and overall economic growth and competitiveness are to be avoided (European Commission, 2020c).

This report seeks to supplement the work done by the European Commission, including in its annual report on labour shortages and surpluses (European Commission, 2020d), and the European Centre for the Development of Vocational Training (Cedefop), the latter focusing primarily on skills mismatches and shortages. After briefly charting the definitions and types of labour shortages, as well as evidence regarding the prevalence of the phenomenon at sectoral, occupational and regional levels, this report's main focus is on mapping national policy debates and examining public and social partner measures seeking to address shortages. As part of the latter exercise, it puts forward a typology of measures relevant to addressing different drivers of labour shortage.

As well as looking at the impact of COVID-19 on labour shortages and highlighting some of the measures taken to mitigate shortages aggravated by the pandemic, the report also emphasises the impact of the transition towards a climate-neutral economy. While the impact of digitalisation is considered to be one of the factors shaping the phenomenon of shortages, this issue is not specifically addressed in this report.

Policy context

Labour shortage is a transversal issue linked to a wide range of EU regulations and policies. The development of shortages is affected both by broader policy priorities linked to digitalisation and the EU's climate-neutral future and by overarching demographic developments. Furthermore, EU policies regarding mobility and migration and the labour market, education and training have an impact on the dynamics of labour shortages. This section briefly captures the main European-level policies affecting trends in labour shortages.

Europe's digital and climate-neutral future

The EU's new Industrial Strategy, adopted in March 2020, outlines the pillars of action for Europe's green and digital transitions, with an emphasis on a more circular economy (European Commission, 2020e). As well as boosting innovation and ensuring a regulatory framework fit to address the challenges of this transformation, the strategy emphasises the need for skilling and reskilling to meet the targets set and to capitalise on the employment creation potential within the context of a changing economy. As noted in the Industrial Strategy, 'moving to a low-carbon economy is expected to create more than 1 million jobs by 2030, while there are already currently 1 million vacancies in Europe for digital technology experts' (European Commission, 2020e, p. 11).

The initiatives set out in the Industrial Strategy complement and build on existing actions, such as the Digitising European Industry initiative adopted in 2016 (European Commission, 2016), which saw the establishment of the Digital Skills and Jobs Coalition.

Similarly, the strategy must be considered in the context of the European Green Deal action plan adopted in 2019 (European Commission, 2019b).

This necessitates a move towards renewable energy and cleaner and circular industry and services.

Acknowledging that this climate-neutral transition not only has the potential to create new employment but will also have a significant impact on some existing sectors in terms of jobs and skill requirements, the Just Transition Fund was established by the Commission in 2020 to support EU regions and sectors most affected by the shift towards climate-neutral technologies.

The broader strategic objectives set through the European Green Deal and the Industrial Strategy are operationalised in the new European Skills Agenda, launched by the Commission in July 2020 (European Commission, 2020f). This agenda calls for a 'paradigm shift on skills' and includes a number of key targets and actions, as set out in Box 1.

Box 1: European Skills Agenda

The strategy sets out the following quantitative objectives for upskilling and reskilling to be achieved within the next five years:

- increase in the participation of adults aged 25–64 years in learning during the last 12 months to 50% (from 38% in 2016)
- increase in the participation of low-qualified adults aged 25–64 years in learning during the last 12 months to 30% (from 16% in 2016)
- increase in the proportion of unemployed adults aged 25–64 years with a recent learning experience to 20% (from 11% in 2019)
- increase in the proportion of adults aged 16–74 years having at least basic digital skills to 70% (from 56% in 2019)

Of the 12 actions included in the European Skills Agenda, the following are of particular relevance in helping to address labour shortages:

- strengthening skills intelligence, highlighting the need for online 'real-time' information on skills demand, including at regional and sectoral levels, using big data analysis of job vacancies and making it widely available
- the Pact for Skills, which should lead to the concerted implementation of a one-stop shop to provide
 jobseekers with the best possible guidance, with a strong sectoral approach in areas such as health,
 construction and transport
- developing skills to support the green and digital transitions, including the development of a set of core
 green skills to increase the number of professionals who build and master green technologies and boosting
 digital skills through a digital education action plan
- increasing the number of science, technology, engineering and mathematics (STEM) graduates and fostering entrepreneurial and transversal skills

The European Skills Agenda also includes a proposal for a Council recommendation on vocational education and training, with the key goals of making vocational education and training more flexible and responsive to labour market needs and the digital and green transitions, in particular.

To implement the European Skills Agenda and invest in reskilling and upskilling, Member States can access funding through the European Social Fund Plus (ESF+). In its legislative proposal for ESF+, the Commission argued that the Union is 'confronted with structural challenges ... and growing skills and labour shortages in some sectors and regions, experienced especially by SMEs [small and medium-sized enterprises]' (European Commission, 2018a, p. 16). In addition, in response to the COVID-19 pandemic, the Commission has launched the NextGenerationEU Recovery and Resilience Facility, which provides funding for reforms and investments that target reskilling and upskilling. In line with the European Skills Agenda, the facility prioritises investments that support the acquisition of digital skills and competencies, contribute to progression within education and training, and enable the transition to employment.

European Pillar of Social Rights and European Employment Strategy

Most of the 20 principles of the European Pillar of Social Rights bear a policy relevance to efforts to address the phenomenon of labour shortages. These principles include ensuring rights to good-quality and inclusive education and training and lifelong learning, equal opportunities and equal treatment in access to employment and education, access to good-quality support for labour market integration, fair and good-quality working conditions, and a good work-life balance to support childcare and other care facilities for workers. The principles embody the fundamental requirements for addressing many of the drivers of labour shortage, which will be outlined in more detail in Chapter 1.

Labour shortages have also long featured on the agenda of the European Employment Strategy, which emphasises the need for policies that boost both the demand for and the supply of labour. Most importantly, guideline 6 calls for policies that promote sustainability, productivity, employability and human capital, fostering relevant knowledge, skills and competencies throughout people's lives. This is to be achieved through investment in education and training systems to provide high-quality and inclusive education. The strategy also emphasises the need for transversal competencies and a lifelong learning approach to skills, as well as measures to reduce unemployment levels and increase the labour market participation of women and people with disabilities. Reskilling and upskilling are key priorities for anticipating change in the labour market and for addressing labour market shortages in the context of the challenges posed by ageing societies and

the green and digital transitions. Guideline 6 also underlines the need for better labour market intelligence by asking Member States to improve skills monitoring and forecasting, enhance the comparability of qualifications (including those acquired abroad) and improve the validation of informal learning.

Mobility and migration

When domestic labour supply is not sufficient to cover labour market needs, even in the context of active intraregional mobility within a country, intra-EU mobility and third-country migration can play an important role in addressing labour shortages.

Intra-EU mobility

The principle of free movement of people is enshrined in Article 45 of the Treaty on the Functioning of the European Union. Secondary legislation details the rules that regulate the free movement of citizens and their families within the territory of the Member States. 1

The free movement of workers within the EU provides opportunities to address labour shortages through better cross-national job matching. At European level, the European Employment Services (EURES) network has been developed to support intra-EU mobility by facilitating job matching across the EU.

Third-country migration

In 2020, the European Commission presented the New Pact on Migration and Asylum, which aims to build a comprehensive framework for attracting high-skilled migrants from outside the EU. This document acknowledges that European labour markets face structural pressures generated by demographic ageing and a shrinking population, which can generate 'specific skills shortages in different localities and sectors' (European Commission, 2020g, p. 24). In this context, migrants legally entitled to live and work in an EU country can contribute to reducing skills gaps and increasing the dynamism of the EU labour market. However, despite the potential for migrant workers to contribute to European economies, the document also notes that the EU is losing out in the global race for talent, a situation caused by a combination of factors such as the high level of discretion that Member States enjoy in the implementation of EU directives and the fragmented legal framework that governs labour migration from third countries.

The pact establishes a set of short- and medium-term policy priorities, including a revision of the EU Blue Card Directive and the full implementation of the Directive on Students and Researchers. Recent assessments of the

blue card system underline that it has limited application owing to the high costs it imposes on both migrants and employers and the lack of coordination between the blue card and national schemes for attracting high-skilled migrants (European Commission, 2015). The Commission acknowledges these issues, arguing that the Blue Card Directive needs to be redesigned to include 'more inclusive admission conditions, improved rights, swift and flexible procedures, improved possibilities to move and work in different Member States, and a level playing field between national and EU systems' (European Commission, 2020g, p. 25).

In the medium term, the Commission also plans to facilitate mobility for third-country nationals (TCNs) through three additional sets of measures: revision of the Directive on Long-term Residents, a review of the Single Permit Directive and the creation of an EU talent pool for TCNs. These changes aim to harmonise and simplify the existing legal framework. The talent pool initiative is similar to policies in other countries (such as Australia and New Zealand) and is a migration management policy that seeks to address both qualitative and quantitative labour shortages (OECD, 2019).

Social partner activities

Labour and skills shortages have been at the heart of social partner actions at cross-sectoral and sectoral levels for a number of years. In this section, the focus is on relevant cross-industry activities.

The 2019–2021 cross-industry work programme of the European social partners (ETUC, BusinessEurope, SGIEurope and SMEUnited) emphasises the importance of a skilled workforce as one of the main assets of the European social and economic model. In the document, the social partners recognise the impact of digitalisation and social, demographic and environmental transitions, which require strong joint actions in the following areas:

[E]ducation and training systems in a way that fosters innovation and enhances employees' reskilling and up-skilling. Social dialogue and collective agreements play an important role in the governance of training systems, in creating training opportunities and in improving the relevance and provision of employee training.

(ETUC et al, 2019, p. 5)

As part of their joint work, the social partners followed up on their framework of actions for the lifelong development of competencies and qualifications with a fact-finding seminar on innovation, skills, and the provision of and access to training. Another project will look at the way in which a circular economy contributes to employment growth and/or transformation. This follows on from a 2017 joint declaration on 'tapping the potential from greening the economy for job creation' (ETUC et al, 2017).

The 2020 European social partners framework agreement on digitalisation (ETUC et al, 2020) encourages social partners to devise common strategies to respond to the digital transformation and commits both trade unions and employers to promoting reskilling and upskilling. The cross-industry social partners also recognise the importance of the integration of groups struggling to access the labour market as a way to help overcome shortages. The 2010 Framework agreement on inclusive labour markets was followed in 2013 with a Framework of actions on youth employment and in 2017 by a Framework agreement on active ageing and an intergenerational approach. Also of relevance is the 2016 declaration on a shared vision of apprenticeships.

In addition to joint actions, BusinessEurope and 17 European sectoral employer organisations in 2019 underlined that growing 'skill and labour force shortages in the majority of Member States ... will have a negative impact on innovation and productivity, both in highly innovative industry sectors and other services sectors' (BusinessEurope et al, 2019, p. 1). The statement calls for policy measures that are in line with the European Skills Agenda: reforming the education and training systems to respond to the challenges raised by digitalisation and ageing, bolstered by an updated EU vocational education and training strategy that addresses the need to reskill and upskill the labour force, increased cooperation and social dialogue between social partners and policymakers on education and training policies, and improved policies on labour mobility and third-country legal migration.

1 Types, drivers and measurement of labour shortages

Labour shortage is a complex phenomenon with no agreed definition and thus it has different manifestations in the literature. This also leads to different assessments of the presence or scale of the phenomenon. As the policy approaches implemented tend to depend on the type of shortage being addressed and the drivers underpinning it, it is important to be clear about the definitions used and how these shortages are measured. This chapter sets out the various definitions and outlines the different indicators used to measure labour shortage.

Definitions of labour shortage

Given the significant level of debate regarding the issue of existing and emerging labour shortages and their impact on economic growth potential, it is perhaps surprising that there is no universally accepted definition of the term 'labour shortage' (OECD, 2003).

The European Commission uses the following definition: 'labour shortages occur where the demand for workers in a particular occupation exceeds the supply of workers who are qualified, available, and willing to do that job' (European Commission, 2004).

A definition put forward by Barnow et al (2013), based on the US Department of Labor definition, includes a reference to pay levels but does not specifically refer to qualifications. The definition is as follows:

[A] sustained market disequilibrium between supply and demand in which the quantity of workers demanded exceeds the supply available and willing to work at a particular wage and working conditions at a particular place and point in time.

For the purpose of this report, the following definition is used:

Labour shortages arise when the demand for workers in an occupation exceeds the supply of workers available who possess the required skills and are willing to work at a specific wage rate and in specific working conditions in a particular place and point in time.

This definition acknowledges the importance of quantitative and qualitative shortages and the factors underpinning them, as well as the need to understand these drivers in order to effectively address shortages. It also highlights the role of the skills required and the working conditions – which employers could potentially revise to reduce the shortages experienced.

The most common distinction used in the discussion of labour shortages is between quantitative and qualitative shortages (Adams et al, 2000; Zimmer, 2012; European Parliament, 2015).

Quantitative shortages

A quantitative labour shortage denotes a situation in which there is an absolute lack of workers in the labour market. In this scenario, labour demand is greater than supply, resulting in a large proportion of difficult-to-fill vacancies combined with a low unemployment rate, which can occur at regional or national level. Such quantitative shortages can arise from periods of strong economic growth or from increased consumer demand for specific goods or services, which necessitates an increased supply of labour. Labour shortages arising from such situations tend to be more significant when productivity stagnates.

In addition to economic trends, a number of other factors such as a decline in the working-age population due to ageing, emigration or a decrease in participation rates associated with high rates of early retirement or inactivity among certain groups can also contribute to an insufficient supply of labour.

Demographic change is among the key megatrends affecting labour markets in the EU and beyond, with fewer young people entering the labour market as the baby boom generation retires. While evident in most EU countries, demographic change affects countries to different degrees and at different times; therefore, the role of ageing in the scale of labour shortages varies between Member States (European Parliament, 2020).

The impact of migration trends is a complex phenomenon when considered from a national, European or global perspective. While mobility and migration can aggravate shortages in regions and countries of emigration, it can help to reduce labour market tensions in immigration countries or regions and alleviate unemployment in sending countries. The extent to which emigration results in labour shortages in the sending countries and addresses unmet demand in the receiving countries depends on the profile of the workers in question, the labour market situation in the sending country and the ability of the country of immigration to best utilise the skills and capacities of these workers. Such questions are at the heart of debates regarding 'brain drain' and 'brain waste' (for example, Beine et al, 2008; Gërmenji and Milo, 2011; Albano, 2012; Biondo et al, 2012; Hunter, 2013; Böhme and Glaser, 2014). In the context of intra-EU mobility

and third-country migration, it is also increasingly recognised that return migration ('brain circulation' or 'brain flow') can contribute to skills transfer and innovation in both the receiving and the sending countries, underlining the complexity of the phenomenon of migration flows (European Commission, 2018b).

High levels of economic inactivity among certain groups are another driver of labour shortages. Groups particularly at risk are women with caring responsibilities, single parents, older workers exiting the labour market early, people with disabilities and certain migrant and ethnic minority groups. In addition, the high proportion of individuals not in employment, education or training in some countries (so-called NEETs) is a cause for concern (Eurofound, 2016a).

Despite a narrowing of the gap between male and female employment rates in the EU, male employment rates continued to exceed those of women by close to 12% in 2020. Gender differences in employment, activity and inactivity rates reflect an unbalanced share of care responsibilities for children, the elderly or dependent family members. Data show that, while the percentage difference in the employment rate of men and women without children is 1%, among those with one child younger than six years of age it is 21%, among those with two children it is 25% and among those with three children it rises to 37%. Lower skilled women are more likely to leave the labour market after having children and are also more likely to be unemployed than higher skilled women. Furthermore, women continue to be

overrepresented among part-time workers: only around 27% of part-time workers in the EU are men.

While the employment rate of older workers has increased significantly in the past two decades, it remains below the average rate of employment. The main challenge for older workers is to achieve successful labour market reintegration once unemployed. Despite the increasing employment rate of older workers, long-term unemployment rates for 55- to 64-year-olds have increased and the transition to inactivity remains common. Outdated skills and discriminatory attitudes have been shown to be obstacles to boosting the employment rates of older workers (Eurofound, 2017a).

Discrimination also plays a role in the low employment rates of people with disabilities and some migrant and ethnic minority groups. The employment rate of people with disabilities remains close to 25% below the average (Eurofound, 2021b), with the gap in employment rate being more pronounced for women (Eurostat, 2021). Migrants are also more likely to be unemployed or inactive, with labour market disadvantage sometimes continuing into the second generation. The adverse labour market effects of migration background are not only due to lower education levels but are also closely linked to the region of origin (Eurofound, 2018a, 2019b).

The interplay between perceived labour shortages and labour market slack must also be taken into account and this is discussed in Box 2.

Box 2: Labour market slack

In its report on labour market slack, Eurofound (2017b) defines it as the difference between the volume of work desired by workers and the actual volume of work available. The report points to the fact that, while there were close to 23 million unemployed people of working age in the EU in 2015, there were 50 million people in the broader category of labour market slack: this group encompasses inactive people wishing to work, those who are underemployed and involuntary part-time workers, as well as unemployed people.

According to more recent Eurostat data, in the third quarter of 2020, out of the 336 million individuals aged between 15 and 74 years in the EU, 15.7 million were unemployed and 119.5 million were inactive (with 75.5 million of these aged between 15 and 64 years). Of the 119.5 million, 1.7 million were seeking work but were not available to start immediately (and hence did not fall in the 'unemployed' category) and 8 million were available to work but were not actively seeking work. Among inactive people available for but not seeking work, the main reason given for not seeking work is 'discouragement' – that is, the belief that no work is available.

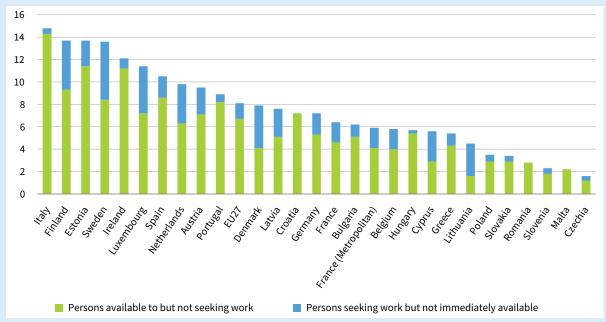
A further 34.5 million individuals work part-time, including 6.5 million who wish to work longer hours and are available to do so (so-called 'underemployed'). According to these data, the labour market slack in the EU amounted to 14.5% of the extended labour force, more than double the number of unemployed people, which accounted for 7.1% of the extended labour force in 2019.

The level and source of potential additional labour vary significantly from country to country. Italy, Finland, Estonia and Sweden have the largest groups of potential additional labour force currently outside the labour market, whereas this population is small in Czechia, Malta, Slovenia and Romania. There were also notable differences within the potential additional labour force outside the labour market in the third quarter of 2020 (Figure 1). For instance, in Czechia, Lithuania and Slovenia, there are few in the population outside the labour

market who are available to work but not seeking a job, whereas their number is relatively high in Italy and Estonia. As regards those seeking work but not immediately available, the proportion was rather high in Sweden, Finland and Luxembourg but very low in Malta, Hungary and Czechia.

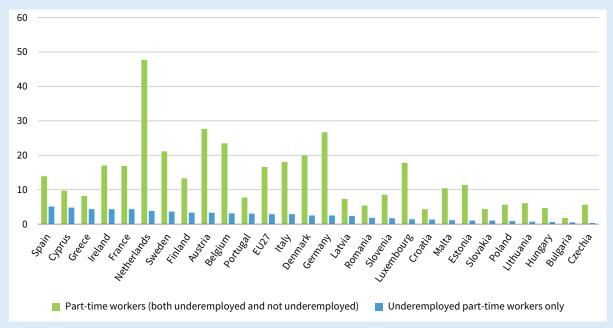
The highest proportion of underemployed part-time workers within the EU27 was in Spain, followed by Cyprus, Greece, Ireland and France. In Czechia, Bulgaria and Hungary, this group of workers is almost non-existent (Figure 2).

Figure 1: Proportion of the inactive population aged 15–74 years representing the potential additional labour force by subgroup and country, seasonally adjusted data, EU27, Q3 2020 (%)



Source: Eurostat, Supplementary indicators to unemployment – quarterly data [lfsi_sup_q]

Figure 2: All part-time workers and underemployed part-time workers as a proportion of total employment, EU27, 2019 (%)



Source: Eurostat, Part-time employment as a percentage of the total employment, by sex, age and country of birth (%) [lfsa_eppgacob] and Supplementary indicators to unemployment by sex and age [lfsa_sup_age]

Quantitative shortages in one region or country can go hand in hand with an oversupply of labour elsewhere as a result of geographical mismatches. This is the result of insufficient geographical mobility, which can be due to several factors, including:

- a lack of attractiveness of the location with a high labour demand, for example owing to high costs and low availability of housing, poor infrastructure (for example, transport, schools and cultural venues) and poor environmental conditions
- a lack of mobility due to factors such as age structure (younger workers are more likely to move than prime age workers) and cultural aspects

Qualitative shortages

In the case of a qualitative labour shortage, labour demand and labour supply are roughly in equilibrium, but a large proportion of unfilled vacancies coexist with a high unemployment rate. This signals an element of qualitative (skills) mismatch between supply and demand and can be due to changing skills requirements that are not being addressed rapidly enough by education and training systems. Such shortages can be the result of technological change, changes in consumer demand and ongoing sectoral and occupational change. In broader terms, the structure of the economy can be biased against complex or skill-intensive productive activities, which can have an impact on the demand for available skills.

Qualitative shortages can also be caused by a mismatch between the preferences of jobseekers and the characteristics of the open vacancies. This occurs when jobseekers do not apply for a vacancy because of the working conditions offered or because the sector or occupation is perceived to be unattractive. Moreover, the lack of sufficient and appropriate labour market information for both employers and jobseekers and

poorly developed matching systems can also contribute to qualitative shortages. Shortages can also be caused by a mismatch between the level of requirements set by employers and the actual skills needs of the job, as well as by an unwillingness to review the job requirements. A Cedefop report on skills shortages in European enterprises points out that the skills shortages announced by enterprises are in many cases not genuine shortages, but are due to employers failing to adapt the profile of jobs on offer and to adjust the salary packages (Cedefop, 2015). According to the findings, just 12% of the declared shortages are genuine skills shortages, while 46% are attributed either to a lack of the right skills combined with a failure to offer a competitive starting salary or a lack of the right skills and human resources management inefficiency. A further 29% of skills shortages are attributed solely to an inability to offer a competitive starting salary.

Skills mismatches or imbalances can be vertical or horizontal. Vertical skills mismatches encompass situations in which the level of skills or education of jobseekers is more or less than the level of skills or education required to perform a job. It is important to note that education and skills mismatches are distinct phenomena. Overeducation is a relatively pervasive phenomenon within European labour markets. An analysis of the scale of the phenomenon in 17 European countries revealed that 30% of those employed were overeducated. In contrast, only 17% of employees were overskilled and 15% were both overeducated and overskilled (Flisi et al. 2014). Horizontal skills mismatches refer to instances when the type of education or skills among jobseekers is not appropriate to meet demand, but their level of education or skills matches the requirements of the job.

The key underlying drivers of quantitative and qualitative labour shortages are summarised in Table 2.

Table 2: Drivers of labour shortage

| Labour supply | Labour demand |
|---|---|
| Lack of/decline in availability of labour | Industrial effect |
| Decline in working-age population resulting from demographic | High overall economic growth. |
| change and emigration (when it exceeds immigration in the working-age population). | High product/service demand (business cycle). |
| Low/decline in the participation rate, resulting, for instance, from work–life balance conflicts. | |
| Early retirement. | |
| Inactivity of marginal groups (and a lack of policy adaptation to address these issues). | |
| Lack of mobility (internal and external) | International division of labour |
| Insufficient attractiveness or infrastructure to encourage cross-border or internal country movement (also linked to issues regarding the recognition of qualifications). | Location decision for production. |

| Labour supply | Labour demand |
|--|---|
| Skills mismatch Resulting from insufficient investment in education/training services | Change in required skills Innovation and technological change requiring new/different |
| by government/employers/individuals and a poor match between education provisions and labour market requirements. | qualifications leading to qualifications mismatch. Regulatory frameworks affecting certain occupations (increasing |
| Insufficient knowledge about future skills requirements (forecasting) and involvement of relevant actors in policy planning. | demand for some when tasks are required by law). Inadequate human resources management planning. |
| Unsuitable education choices/preferences. Perceptions of attractiveness of different sectors/occupations | |
| influencing training/career decisions. Information mismatch | Inability of matching structures to adjust to new/changing demand |
| Suboptimal search channels and information about future labour/skills requirements. | Poor matching infrastructure affecting the utilisation of different channels by employers. |

Source: Authors' own elaboration, adapted from European Parliament (2015)

Different approaches to measuring labour shortages

There is no single optimal measurement that can fully capture the extent of labour shortages based on the definition outlined above. Instead, a range of indicators is usually employed to estimate the extent of labour shortages within a specified geographical unit, sector of activity or occupation. These indicators are generally quantitative representations of the demand or supply of labour and can be based on subjective evaluations of the labour market, as is the case with employer-based indicators, or based on indirect measures that capture labour market dynamics within specific occupations, as is the case with volume- or quality-based indicators. The utility of different indicators depends on the specific issue of interest. For example, employer-based indicators are more sensitive to changes in the business cycle and therefore are better suited to analyses of how labour demand varies with business cycle conditions. In contrast, changes in median wage levels together with job vacancy data can be used to assess the presence of labour shortages that are clearly the result of smaller fluctuations in the economy. Ad hoc surveys can be more suitable for identifying differences in the level of labour shortage for specific jobs across countries. Table 3 categorises the different indicators and sources available at EU level, providing information on their content and advantages and disadvantages.

Employer-based indicators

Employer-based indicators of shortage are derived from surveys that ask employers direct questions about their demand for workers, their ability to recruit and the extent to which this limits their production or service delivery capacity. The indicators draw on subjective assessments of labour shortages, which could inflate their real level or hide other factors that have an impact on an organisation's capacity to hire, such as low wage levels offered by employers, poor working conditions or ineffective recruitment processes. This would therefore

make identifying a genuine lack of suitable candidates in the labour market more difficult.

Volume-based indicators

The growth of employment levels can be used as an indicator of labour shortages. Employment growth within an occupation signals increasing demand for labour and can be interpreted as indicative of potential shortages. However, by itself, this indicator can be insufficient, as employment dynamics can also be affected by entry barriers within occupations, employment protection legislation rules or different hiring standards across countries. Consequently, the extent of any shortages might be underestimated, as organisations might seek to address shortages by investing in additional training or by increasing the use of overtime. Therefore, employment levels are usually used in conjunction with wages or the dynamic of hours worked to detect if a shortage exists.

Price-based indicators

Rising wages within an occupation can also provide an indication of labour shortages. When wages are below the equilibrium level, market pressure should increase wages, increase supply and reduce demand, therefore restoring the equilibrium (Migration Advisory Committee, 2017). Shortages can occur when various factors limit the speed at which the labour market can adjust. For example, wages might be 'sticky' (not adjusting quickly to changes in labour market conditions) or employees might need time to acquire the skills that the market needs (Downs, 2009). However, wage growth is a 'fuzzy' indicator, as it captures both the demand for and the supply of workers (OECD, 2017). Employers might react to a shortage by implementing organisational changes, increasing the intensity of work, adopting changes in working time or investing in labour-saving technologies. Furthermore, wages can rise as a consequence of collective bargaining agreements, minimum wage rules or occupation-specific regulations. Conversely, wage

Table 3: Descriptions and advantages and disadvantages of indicators and sources of labour shortages at EU level

| Indicator | Relevant transnational datasets | Description and advantages/limitations |
|----------------------------|---|--|
| Employer-based indicators | European business and consumer surveys (EU-BCS) | These surveys provides monthly, quarterly and annual data on the business climate for industry, services and the construction sector, which include data on labour shortages as a factor limiting production. |
| | European Investment Bank Survey on Investment and Investment Finance (EIBIS) | This survey was established in 2016 and provides annual data, including on factors limiting production. The survey collects data from a sample of 13,300 non-financial enterprises in the 27 EU Member States and the UK with at least five employees and belonging to one of the Nomenclature of Economic Activities (NACE) categories from C to J. Unlike the EU-BCS data, questions refe to the 'last financial year'. In the majority of EU Member States, survey samples are smaller than samples used in EU-BCS. |
| | Eurofound's European Company Survey (ECS) | The ECS collects nationally representative data from establishments with 10 employees or more every five years and provides information on skills needs and the issues faced in recruitment. Findings are therefore not able to reflect significant year-on-year changes when the economic situation changes dramatically. |
| | | An advantage of the ECS is that it collects a wealth of additional information about establishments, including information on work organisation, human resource management practices, skills, and skills development, as well as employee representation and involvement. This allows for a more complex analysis of perceived shortages that links them to organisational characteristics and practices. In addition, compared with analyses that rely on vacancies published by companies, the ECS data can be used to explore whether establishments recruit on internal markets, which criteria are relevant in the recruitment process and if the newly recruited workers possess the skills that employers need. |
| Price-based indicators | Eurostat's quarterly Labour Cost Index and Labour Cost Survey, and the European Commission's annual macroeconomic (AMECO) database | Eurostat and the EU Labour Force Survey (EU-LFS) are the primary sources of information on real gross wages and salaries of employees. In principle, in the case of a labour shortage, market pressure should increase wages and thus could provide an indication of shortage. The Labour Cost Index shows the short-term development in total hourly labour costs incurred by employers. The index can be broken down by cost items (wages and salaries component, and employers' social contributions) and by economic activity. The Labour Cos Survey is conducted every four years and covers enterprises with 10 employees or more operating in all economic activities in NACE categories B – S (excluding 0). The Labour Cost Survey provides detailed information on labour costs, which can be broken down by region. The AMECO database also provides information on wages and salaries based on Eurostat data, which is complemented, where necessary, by other appropriate national and international sources. |
| Volume-based indicators | EU Labour Force Survey (EU-LFS) | Increases in employment or increases in average hours worked may indicate rising demand and greater utilisation of the existing workforce, which could indicate shortages. Low or falling unemployment among people previously employed in, or seeking work in, an occupation may also indicate shortages (conversely, high unemployment among people seeking work in a particular occupation is an indicator than an occupation is not in shortage). |
| Indicators of imbalance | EU vacancy rate | EU-level data can be disaggregated by economic activity, NACE category and the size of the enterprise. |
| | EURES data on shortage sectors (and sectors where supply outstrips demand) | Data reported by the European network of public employment services (PES). From 2021 onwards, the European Labour Authority will manage the annual report on labour shortages in the EU. |
| | Eurostat's skills mismatch experimental indicators | The indicators are derived from EU-LFS data and can be disaggregated by sector of activity. |
| | Cedefop's European Skills Index (ESI) | The ESI is a composite national-level indicator that assesses how well the skills formation and matching systems of the EU27+4 (Iceland, Norway, Switzerland and the UK) countries are performing in relation to the degree to which they are developing, making use of and matching skills reserves within their economies. The ESI captures both the supply of and demand for skills. |
| | Cedefop's Skills-OVATE database | The Skills-OVATE database provides detailed breakdowns by country, occupation, region, sector, skills in occupations, most requested skills and skill sets in occupations. |

Source: Authors' own elaboration

growth may remain weak even during periods of job growth owing to a low matching efficiency in the labour market, the weak bargaining power of trade unions or the globalisation of production (Frohm, 2020). Finally, changes in wage levels can also reflect compositional effects, such as the increase in female employment or the exit from the labour market of more senior workers, both of which can bias the aggregate wage downwards.

Indicators of imbalance

Imbalances between supply and demand in the labour market are arguably most directly captured by looking at vacancy rates. Vacancy rates are recorded by Eurostat and are defined as the ratio of the number of vacancies relative to the number of filled and unfilled positions.

In addition, the EURES network collects data on job openings across participant countries in a standardised format that allows for a good degree of cross-national comparability. The EURES data capture the country-level intensity and character of labour demand (Kureková et al, 2015). However, the coverage of EURES data varies significantly by country. For example, in 2018, the EURES website covered over 50% of vacancies in 12 countries and under 20% of vacancies in 4 countries. Furthermore, since EURES data rely on submissions from public employment services (PES), they replicate the shortcomings of national PES data. Importantly, these data are not representative at national level owing to variations in legal regulations and recruitment practices by organisations. While in some countries legal requirements make it mandatory for companies to report vacancies to PES offices, in other countries the submission of vacancies is a voluntary practice. In general, PES data tend to capture the unfulfilled demand for labour for jobs that are difficult to fill through internal or informal recruitment and can be skewed towards lower skilled jobs.

In addition, job vacancy rates can increase even if the employment level decreases, as is the case in situations when the number of workers who exit the labour market is larger than the number of new entrants. Therefore, they do not necessarily reflect a situation of shortage.

In a more recent development, the Cedefop Skills Online Vacancy Analysis Tool for Europe (Skills-OVATE database) has collected detailed information on jobs and skills derived from online job advertisements placed by employers. Data are drawn from PES portals, private job portals, recruitment agencies, online newspapers and employer websites. This information therefore overcomes some of the limitations linked to

solely PES-based vacancy data and is available for all Member States.

Furthermore, different international sources are available that measure various aspects of skills mismatches. Although these indicators are largely focused on the skills of those in employment, they are nevertheless relevant to the debate on labour shortages. Among the most commonly used are the following:

- Eurostat's experimental statistics/indicators on skills mismatches,² which provide information on vertical skills mismatches (overqualification rates) and horizontal skills mismatches (job mismatch by field of education)
- Cedefop's European Skills Index (ESI),³ which provides information on overqualification rates (people with a higher education whose job does not require such education), low-waged workers (tertiary graduates with low wages) and qualifications mismatches (the extent to which each employee's educational attainment level matches the modal that is, the most common educational attainment level for each occupation in each industry)
- the Organisation for Economic Co-operation and Development (OECD) Skills for Jobs database,⁴ which provides information on individual skills imbalances.

Even when reliable data are available in relation to different indicators, it remains to be decided if a specific threshold can be set after which an occupation is determined to display a shortage. The United Kingdom (UK) Migration Advisory Committee (2017) argues that there is no convenient economic theory or rule of thumb to determine where to set such a threshold.

The various advantages and limitations of different datasets demonstrate the importance of considering different sources when determining the scale and nature of labour shortages. This approach is used in several Member States.

National-level indicators and data sources

EU Member States use different sets of indicators and methodological approaches to assess the extent of labour shortages (Table 4). These are also used for different purposes, such as migration policy, curriculum planning, the design of active labour market policy instruments and determining the scale of admission to different education and training pathways.

² More information on these experimental indicators is available at https://ec.europa.eu/eurostat/web/experimental-statistics/skills

³ More information on the ESI is available at https://www.cedefop.europa.eu/en/events-and-projects/projects/european-skills-index-esi

⁴ More information on the Skills for Jobs database is available at https://www.oecdskillsforjobsdatabase.org/methodology.php

Table 4: Indicators used in EU Member States to assess labour shortages

| Indicator | Countries |
|---------------------------|---|
| Employer-based indicators | Austria, Belgium, Croatia, Denmark, Estonia, Finland, Germany, Greece, Lithuania, Luxembourg, Malta, Netherlands, Poland, Slovakia, Slovenia, Sweden |
| Indicators of imbalance | Austria, Belgium, Cyprus, Czechia, Finland, Germany, Hungary, Ireland, Italy, Latvia, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Sweden |
| Forecasts | Austria, Belgium, Croatia, Estonia, Finland, France, Germany, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovakia, Sweden |

Source: Authors' own compilation, based on information provided by the Network of Eurofound Correspondents and European Commission (2015)

Such differences can be due to the fact that different definitions are used, although relatively few Member States have an official definition of labour shortage (for example, Austria, Estonia, France, Greece, Hungary, Ireland and Lithuania).

Nonetheless, there are several commonalities between the indicators and tools used by EU countries to assess labour shortages. Typically, PES collect job vacancy statistics, which are a commonly used source of timely data on national labour market dynamics. Information can often be disaggregated by region, sector and occupation, which provides a detailed source of vacancy dynamics. However, as indicated above, such vacancy data are generally not exhaustive and tend to be biased towards reporting shortages in low- and medium-skilled occupations. To help address this, in many countries, PES use vacancy data in conjunction with qualitative data to compile lists of shortage occupations. Qualitative data may include feedback from social partners and inputs compiled from networks of experts on regional or national shortages or from other state or educational institutions.

In 16 countries, vacancy data are supplemented by employer surveys, which are conducted by public employment authorities, research institutes or employer confederations. The methodology, representativeness, frequency and scope of the surveys vary significantly across countries. For example, since 2018, Austria's Federal Economic Chamber (WKO) has run an annual online survey to assess labour shortages. The survey is limited to the private sector and the response rate is relatively low (5.8% in 2018). By comparison, since 2012, the Polish Agency for Enterprise Development has run an annual representative survey to assess employer needs for specific occupations in Poland. The survey response rate varies between 31% and 37% and, since 2016, the survey has been used for in-depth sectoral-level analyses of skills needs. In Estonia, the Occupation Barometer developed by the Estonian Unemployment Insurance Fund (EUIF) is published twice a year and

combines vacancy data registered by the EUIF with qualitative reports from the regional network of EUIF correspondents. In Cyprus, assessments of shortages by social partners are included in the forecast published by the Human Resource Development Authority of Cyprus (HRDA).

In several countries (for example, Austria, Croatia, Estonia, France, Germany, Ireland, Malta, the Netherlands and Spain), demand- and supply-side indicators are combined to compile ratio indicators or to generate lists of shortage occupations (European Commission, 2015). In the Netherlands, the labour market tension metre (*Spanningsmeter arbeidsmarkt*) is based on the ratio of total job vacancies to the number of registered unemployed persons. Similarly, in Austria, the skilled workers radar (*Fachkräfteradar*) is compiled based on vacancy and survey data and provides information on the availability of skilled workers for each vacancy and on how many skilled workers will be available in the future.

To predict future shortages and to help to put measures in place to plan for future labour and skills requirements, at least 18 countries use forecasts to predict the demand for and supply of labour. Forecasts are based on multiple data sources and use modelling techniques. The frequency and time horizon of these forecasts vary across countries. For example, in Slovenia, the employment forecast is compiled twice a year based on data gathered through a survey of employers. By comparison, in Cyprus, annual forecasts are conducted based on both quantitative and qualitative data drawn from social partner assessments of labour market conditions. Some countries use more than one forecasting tool to estimate future labour shortages. In Estonia, both long-term (future skills forecast) and short-term (Occupation Barometer) forecasts are used in policymaking. The future skills forecast employs quantitative and qualitative data to estimate shortages across sectors and occupations over a 10-year horizon. The Occupation Barometer is updated twice a year and uses vacancy data reported

to PES, qualitative input from regional PES offices and employer surveys to estimate short-term labour shortages. Eurofound's European Restructuring Monitor (ERM) database on restructuring support instruments includes further information on forecasting tools used by different Member States.⁵

The next chapter illustrates not only what the different indicators and sources described above can tell us about existing labour shortages but also the challenges that arise from the highlighted shortcomings in the data in terms of comparability and the reliability of the findings.

2 Trend developments in the EU and at national level

This chapter uses both comparative EU-level and national data to provide an overview of the scale of labour shortages, the countries most affected and trend developments. It presents information on the sectors, occupations and regions most affected by shortages and highlights evidence regarding the impact of Europe's digital and climate-neutral transitions and of COVID-19 on the shortages phenomenon.

Trends in shortages at national level

The unmet demand for labour, as expressed by the job vacancy rate in the EU, had been broadly rising since the third quarter of 2013 until the impact of the COVID-19 crisis manifested itself. In the first quarter of 2019, it stood at 2.3% – its highest value since 2006. By the fourth quarter of 2019, this had declined to 2.2%. Following the onset of the COVID-19 pandemic, this fell to 1.6% in the second quarter of 2020, and bounced

back slightly to 1.7% in the third quarter of 2020 as a result of the partial reopening of sectors of the economy affected by the first COVID-19-related lockdown measures.

Czechia is the country that had the highest increase in vacancy rates between 2013 and 2019 – and also currently has the highest job vacancy rate among Member States – followed by Belgium and the Netherlands (Figure 3). The lowest job vacancy rates are recorded in Greece, Portugal and Poland.

Between 2015 and 2019, the Beveridge curve, which plots the unemployment rate against an indicator of unfilled jobs, shifted to the left, indicating that the process of matching jobseekers to vacancies had become more efficient and that the structural unemployment rate had declined (European Commission, 2020h). During the first half of 2020, the COVID-19 pandemic led to a significant decrease in the job vacancy rate, as employers stopped posting vacancies amidst public health measures imposed by

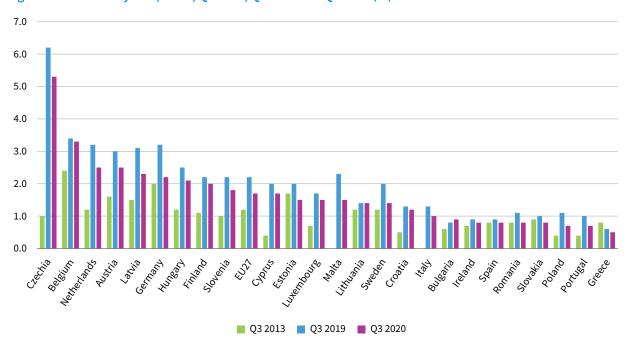


Figure 3: Job vacancy rate, EU27, Q3 2013, Q3 2019 and Q3 2020 (%)

Note: Data for Denmark and France are not available.

Source: Authors' own graph, based on Eurostat, Job vacancy statistics by NACE Rev. 2 activity – quarterly data (from 2001 onwards) [jvs_q_nace2], unadjusted data

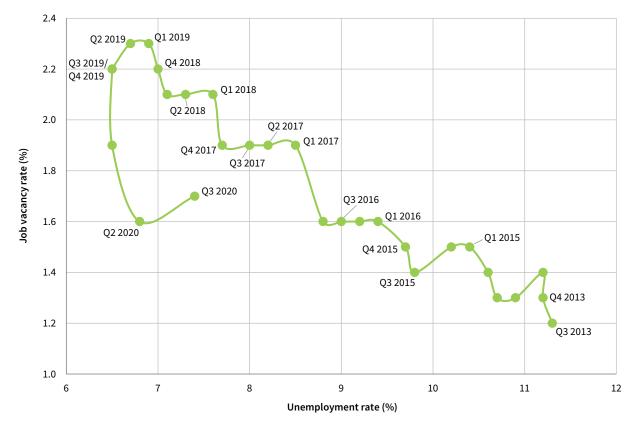


Figure 4: Unemployment versus job vacancy rate – Beveridge curve, EU27, Q3 2013–Q3 2020

Source: Authors' own graph, based on Eurostat, Job vacancy statistics by NACE Rev. 2 activity – quarterly data (from 2001 onwards) [jvs_q_nace2] and Unemployment by sex and age – quarterly data [une_rt_q], seasonally adjusted data

governments. As of the third quarter of 2020, the curve had slightly moved upwards and towards the right (Figure 4). This indicates that, as lockdown measures have been relaxed, employers have resumed posting vacancies. In the medium term, the effects of the crisis on vacancy rates will depend on changes in consumer demand, the use of technology and work organisation, which can affect labour demand and the skills required. For example, a rapid increase in demand for digital skills might increase the mismatch between supply and demand and lead to higher structural unemployment (European Commission, 2020h). As of the third quarter of 2020, the unemployment rate had slightly increased to 7.4%, but trends in the unemployment rate remained buffered by access to short-time working schemes.

Nevertheless, there is a large variation between Member States when it comes to labour market performance.

Figure 5 plots the average job vacancy rate against the average unemployment rate by Member State. It shows that in several Member States (for example, Greece and Spain), there are no quantitative labour shortages, with unemployment levels not having recovered in the aftermath of the global financial crisis. In contrast, in Belgium, the relatively high levels of unemployment are coupled with high vacancy rates, indicating low levels of labour market matching efficiency, which is indicative of qualitative labour shortages. Czechia stands out as an outlier for its very high job vacancy rate and comparatively low unemployment rate, indicating that quantitative labour shortages are a major issue for the economy (high levels of churning could also be responsible for high vacancy rates in this situation).

6 CZ 5 4 Job vacancy rate (%) BE 3 2 SE IT HR EE 1 ES 👛 PL • EL 0 0 2 4 6 10 12 14 8 18 16 Unemployment rate (%)

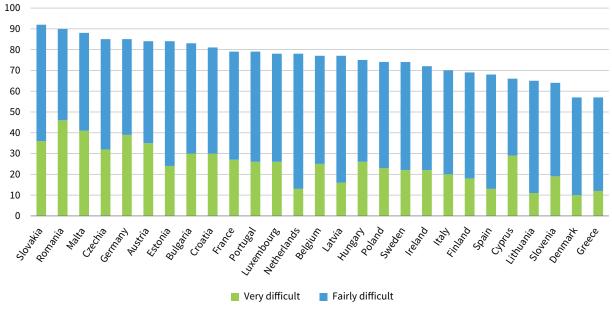
Figure 5: Average job vacancy rate versus average unemployment rate by Member State – Beveridge points, EU27, Q3 2020

Source: Authors' own graph, based on Eurostat, Job vacancy statistics by NACE Rev. 2 activity – quarterly data (from 2001 onwards) [jvs_q_nace2] and Unemployment by sex and age – quarterly data [une_rt_q], seasonally adjusted data

European Company Survey data from 2019 indicate that 26% of European establishments find it very difficult to hire candidates with the right skills, while 51% state

that it is fairly difficult to recruit workers with suitable profiles (Eurofound, 2020b). As Figure 6 demonstrates, there are large variations between European countries,

Figure 6: Proportion of establishments with 10 or more employees having difficulties in recruiting employees with the required skills, EU27, 2019 (%)



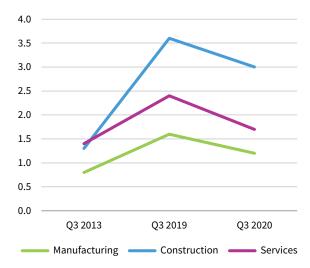
Source: Authors' own graph, based on European Company Survey 2019 data

with the highest proportion of establishments reporting difficulties with finding suitable candidates in Slovakia (92%), Romania (90%), Malta (88%), Czechia and Germany (both 85%). The incidence of establishments reporting difficulties with finding candidates with the right skills is lowest in Slovenia (64%), Denmark and Greece (both 57%). Differences are also evident between small and large companies: while 24% of small companies report that they find it very difficult to find employees with the right skills, only 14% of large companies are faced with similar issues.

Sectors with shortages

Vacancy rate data combined with business sentiment indicators demonstrate that labour shortages have increased significantly between 2013 and 2019 across the broad economic sectors of manufacturing, construction and services. The highest increase was registered in the construction sector, where the vacancy rate increased from 1.3% in the third quarter of 2013 to 3.6% in the third quarter of 2019 (Figure 7). The significant increase in the vacancy rate in the sector reflects both the recovery of economic activity in the aftermath of the global financial crisis and underlying labour market distortions in the demand for and supply of labour linked to skills mismatches (Cedefop, 2015). A recent report shows that these are likely to be amplified in the context of the climate-neutral and digital transformations of the sector (European Commission, 2020c).

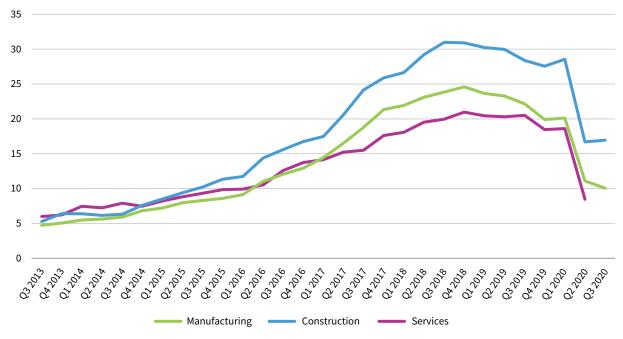
Figure 7: Trends in vacancy rates in the manufacturing, construction and services sectors, EU27, Q3 2013, Q3 2019 and Q3 2020 (%)



Source: Authors' own graph, based on Eurostat, Job vacancy statistics by NACE Rev. 1.1 activity – quarterly data (2001Q1–2009Q4) [jvs_q_nace1]

Both vacancy rate data and business sentiment indicators also show that the COVID-19 pandemic has reduced the perceived shortages across the three sectors (Figure 8). However, the shortages still score above their 2013 levels in all three sectors.

Figure 8: Proportion of companies in the manufacturing, construction and services sectors citing labour shortages as a factor limiting production, EU27, Q3 2013–Q3 2020 (%)



Source: Authors' own graph, based on EU-BCS data

Services Manufacturing Construction 45 45 45 40 40 40 35 35 35 30 30 30 25 25 25 20 20 20 15 15 15 10 10 10 5 5 5 0 0 0 3 600 83 Sept. 30/4 3201 3014 300 300 3007 99 Sept. 1995 Eastern Europe Eastern Europe Eastern Europe Northern Europe Northern Europe Northern Europe Southern Europe Southern Europe Southern Europe Western Europe Western Europe Western Europe

Figure 9: Proportion of companies citing labour shortages as a factor limiting production across European regions, by broad sector, Q3 2013–Q3 2020 (%)

Source: Authors' own graph, based on EU-BCS data

Labour shortages also vary across country groups. The largest perceived shortages in the manufacturing and construction sectors have been reported in eastern Europe, where, in 2019, 39% of companies in manufacturing and 42% of companies in construction pointed to labour shortages as a factor limiting production (Figure 9). In these countries, labour shortages have been driven by the resumption of economic growth in the aftermath of the economic crisis and the corresponding expansion of the productive capacities of companies, high levels of emigration to western Europe and an ageing population. In contrast, in 2019, in northern and western European countries, businesses in the services sector reported the largest labour shortages. In southern Europe, labour shortages have been less severe. Here, the largest proportion of businesses (17%) pointing to labour shortages as a factor limiting production was in the construction sector in 2019, while only 9% of businesses in manufacturing pointed to labour shortages as a major issue.

Comparative vacancy rate data within countries demonstrate that there is an unmet demand for labour across sectors. Table 5 summarises the subsectors in which vacancy rates are above 2% in the Member States with more than two subsectors that are affected by large vacancy rates. The table shows that, in 13 countries, the information and communications sector registers large vacancy rates, with the largest proportions of unfilled vacancies reported in Belgium (5.9%), the Netherlands (4.5%) and Czechia (4.4%). Furthermore, in many countries, significant vacancy rates persist in administrative and support service activities (10 countries), human health and social work activities (nine countries), accommodation and food service activities (nine countries) and professional, scientific and technical activities (nine countries).

Table 5: Sectors with large (greater than 2%) vacancy rates in EU Member States with more than two subsectors affected by large vacancy rates, Q3 2020 (%)

| | Austria | Belgium | Croatia | Cyprus | Czechia | Denmark | Estonia | Finland | Germany | Greece | Hungary | Latvia | Lithuania | Malta | Netherlands | Slovenia | Sweden |
|--|---------|---------|---------|--------|---------|---------|---------|---------|---------|--------|---------|--------|-----------|-------|-------------|----------|--------|
| Accommodation and food service activities | 4.2 | 4.6 | | 2.2 | 8.1 | | | 2.8 | 2.7 | | | 2.3 | | | 2.5 | 3.1 | |
| Administrative and support service activities | 4.9 | 6.5 | | | 27.0 | 2.3 | | 4.1 | 4.1 | | 3.8 | | 2.0 | | | 3.1 | 2.5 |
| Agriculture, forestry and fishing | | | | | 13.3 | | | | 2.6 | | | | | | | | |
| Arts, entertainment and recreation | 2.4 | 2.3 | | | | | | | | 6.7 | | | | 3.8 | | | 2.3 |
| Arts, entertainment and recreation; other service activities | | 2.7 | | | 3.9 | | | 3.2 | 2.1 | 2.0 | | | | 3.3 | 2.0 | | |
| Education | | 3.1 | 2.2 | | | | 2.5 | | 2.0 | | | | | | | | |
| Electricity, gas, steam and air conditioning supply | | 2.3 | | | | | | | | | | | | | 3.4 | | 3.2 |
| Financial and insurance activities | | | | | | | 2.2 | 2.0 | | | | | 2.3 | 2.4 | 3.2 | | |
| Human health and social work activities | 2.1 | 2.0 | 2.0 | | | | 2.2 | 2.2 | 2.7 | | 3.7 | 3.0 | | | 2.6 | | |
| Industry | | 2.8 | | | 4.2 | | | | | | 2.3 | 3.0 | | | 2.2 | | |
| Information and communications | 4.2 | 5.9 | | 3.2 | 4.4 | 2.5 | | | 2.5 | | 2.1 | 2.0 | 2.0 | 2.5 | 4.5 | 2.2 | 2.7 |
| Mining and quarrying | | | | | | | | | | | | | | | | | 4.7 |
| Other service activities | | 2.9 | 3.5 | | 7.0 | | | 5.0 | 2.2 | | | | | | 2.2 | 2.0 | |
| Professional, scientific and technical activities | 2.6 | 5.4 | | | 9.7 | 2.4 | | 2.4 | 2.6 | | | | | 3.4 | 3.2 | | 2.0 |
| Public administration and defence; compulsory social security | | 2.8 | | 2.3 | | | 2.4 | | | | 2.4 | 5.5 | 3.2 | | 2.5 | | |
| Real estate activities | 2.1 | 2.9 | | | 26.4 | | | 2.6 | 2.0 | | | 2.3 | | | 2.0 | | |
| Transport and storage | 2.1 | 2.1 | | | 5.0 | | | | | | | 2.9 | 2.3 | | 2.1 | 2.0 | |
| Water supply; sewerage, waste management and remediation activities | | 2.7 | | | 2.4 | | | | | 3.2 | | | | | 2.7 | | |
| Wholesale and retail trade; repair of motor vehicles and motorcycles | 3.0 | 2.7 | | 2.1 | 4.2 | | | 2.2 | | | | | | | 3.0 | | |

Source: Authors' own compilation, based on Eurostat, Job vacancy statistics by NACE Rev. 2 activity – quarterly data (from 2001 onwards) [jvs_q_nace2]

Occupations with shortages

The Commission's 2020 report on shortage and surplus occupations finds that one in three workers in the EU works in an occupation that is associated with either widespread shortages or surpluses (European Commission, 2020d). A comparison of shortage occupations reported over the past three years demonstrates that the pandemic does not appear to have had an impact on the nature of shortage occupations but instead has amplified the extent and severity of shortages among some job profiles. Nursing professionals occupy the top spot in terms of shortage occupations in 2020, with ICT-based occupations that are particularly linked to software skills also witnessing a worsening of existing shortages (Table 6).

It is perhaps surprising that occupations in some sectors that have been heavily affected by the pandemic (such as hospitality and transport) have continued to witness shortages – for example, cooks and heavy truck and lorry drivers. This could be due to the shift to online sales and deliveries.

Skilled trades also remain high on the list of shortage occupations, despite some COVID-19-related restrictions on construction work. The findings of the report suggest that 'restrictions imposed on cross-border mobility during the pandemic could result in more severe shortages when the European economy moves towards recovery' (European Commission, 2020d, p. 6).

Table 6: Most prevalent shortage occupations, 2020

| Occupation | Number of reporting countries/regions | Occupation | Number of reporting countries/regions |
|---|---------------------------------------|--|---------------------------------------|
| Nursing professionals | 18 | Concrete placers, concrete finishers and related workers | 10 |
| Plumbers and pipe fitters | 14 | Electrical engineers | 10 |
| Cooks | 13 | Software and applications developers/analysts | 10 |
| Heavy truck and lorry drivers | 13 | Systems analysts | 10 |
| Welders and flame cutters | 13 | Accountants | 9 |
| Applications programmers | 12 | Air conditioning and refrigeration mechanics | 9 |
| Generalist medical practitioners | 12 | Cleaners and helpers in offices, hotels, etc. | 9 |
| Software developers | 12 | Electrical and electronic equipment assemblers | 9 |
| Bricklayers and related workers | 11 | Healthcare assistants | 9 |
| Building and related electricians | 11 | Motor vehicle mechanics and repairers | 9 |
| Web and multimedia developers | 11 | Nursing associate professionals | 9 |
| Agricultural and industrial machinery mechanics and repairers | 10 | Sheet metal workers | 9 |
| Carpenters and joiners | 10 | Stationary plant and machine operators | 9 |
| Civil engineers | 10 | Waiters | 9 |

Note: Data cover the EU27 and the UK. For 21 countries/regions, the reference period covered the first and part of the second quarter of 2020, while for the remaining nine countries, the reference period is earlier.

Source: European Commission (2020d), based on analyses of data submitted by EURES national coordination offices

A comparison between the Commission report and Figure 10, which illustrates the occupational shortages reported by the Network of Eurofound Correspondents based on different national data, highlights the impact of differences in the approach to data collection and different levels of granularity in defining occupational shortages. Although there is significant overlap (for example, healthcare professions rank among the

top shortage occupations, and ICT professions and skilled trades are highly represented on both lists), there are also some differences. It is perhaps surprising that sales workers featured most prominently among the top five occupational shortages in the national data provided by the correspondents, but this is at least partly due to the fact that the information relates to pre-pandemic data.

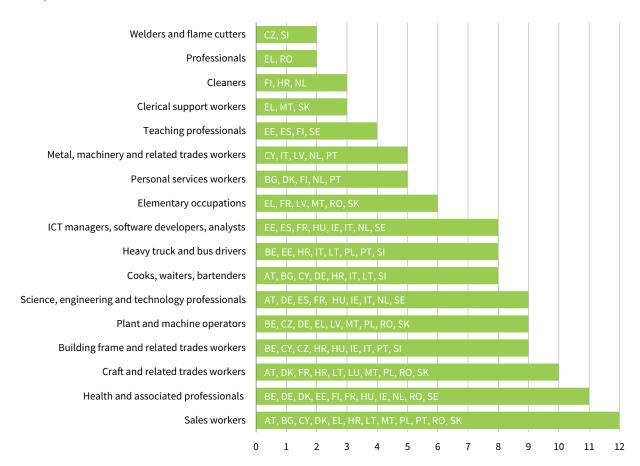


Figure 10: Main shortage occupations – number of countries reporting shortages in different occupations, EU27, 2020

Source: Authors' own compilation, based on information provided by the Network of Eurofound Correspondents

Regions with shortages

Labour shortages are also evident at regional level owing to, for example, differences in the levels of development between regions, varying structural positions in the national economy, the presence of urban areas within regions or divergent regional labour market and living conditions. Certain sectors having particular importance at regional level (for example, tourism or agriculture) can also contribute to the emergence of specific shortages. These factors can lead to regional imbalances between the demand for and supply of labour across regions, generating situations in which mismatches arise between the jobs available in one region and those looking for work in other regions.

Although harmonised vacancy data across regions are unavailable, the dispersion of employment rates across regions can be used to approximate regional imbalances between supply of and demand for labour. A higher coefficient of variation implies larger differences in employment levels across regions; a coefficient of 0 implies that employment levels are equal across regions. However, the dispersion of employment rates between regions should be interpreted with caution. By itself, this indicator is

insufficient for assessing if regional labour shortages exist. This is because employment rates can also be driven by different patterns of economic growth or by compositional differences in the labour force. Therefore, the indicator should be combined with additional labour market information such as vacancy data or employer surveys to determine if regional labour shortages exist.

Figure 11 presents the coefficient of dispersion in employment levels between Nomenclature of Territorial Units for Statistics (NUTS) 2 regions and the percentage change in the coefficient from 2013 to 2019. The figure shows that, in Italy, France, Belgium and Spain, there are large differences between regional employment rates and that these differences have remained relatively stable between 2013 and 2019. The largest labour market imbalances are in Italy, where the employment level in the best performing region of Bolzano is 33 percentage points higher than that in the worst performing region of Sicily. The figure also shows that in several countries labour market disparities between some regions have decreased, with the largest changes being registered in Hungary, Czechia and Slovenia. In contrast, disparities between regions have increased, especially in Ireland, Croatia, Sweden, Romania and Lithuania.

IT • 18 16 Coefficient of variation in 2019 14 FR 12 10 ES BE 8 BG _ RO EL LT FI 🌘 6 HU PL AT DE SE NLSI DΚ -50 -40 -30 -20 -10 0 20 30 40 50

Figure 11: Coefficient of variation in NUTS 2-level employment rates for the 15–64 age group in 2019 and change in the coefficient between 2013 and 2019, EU27 (%)

Percentage change in the coefficient of variation between 2013 and 2019

Note: Cyprus, Estonia, Latvia, Luxembourg and Malta are excluded from the figure as the entire country is a NUTs 2 region and it is therefore not possible to compute the coefficient of variation. Ireland is not included due to the almost seven-fold increase in the coefficient of variation between 2013 and 2020 which would exceed the parameters of the graph.

Source: Authors' own graph, based on Eurostat, Employment rate of the age group 20-64 by NUTS 2 regions [tgs00102]

National data also point to regional shortages, as demonstrated in Figure 12. Although in some countries the picture appears to indicate that shortages are present across the country, differences nonetheless exist. For example, although in Lithuania shortages are present in both of its NUTS 2 regions (Capital region and Central and Western Lithuania region), there are differences across counties and cities. The northern county of Šiauliai is experiencing shortages in the transport and storage sector and the manufacturing sector. In Vilnius county, there are shortages in the transport and storage sector and the human health and social work sector, while in Kaunas county shortages exist in the wholesale and retail trade sector and in the manufacturing sector.

Border regions are also more likely to experience labour shortages, especially if there are large disparities between labour market conditions in neighbouring countries. In central and eastern European countries, cross-border migration contributes to labour shortages in both manufacturing and services sectors. Figure 12 is based on national data provided by the Network of Eurofound Correspondents and should be considered as indicative only.

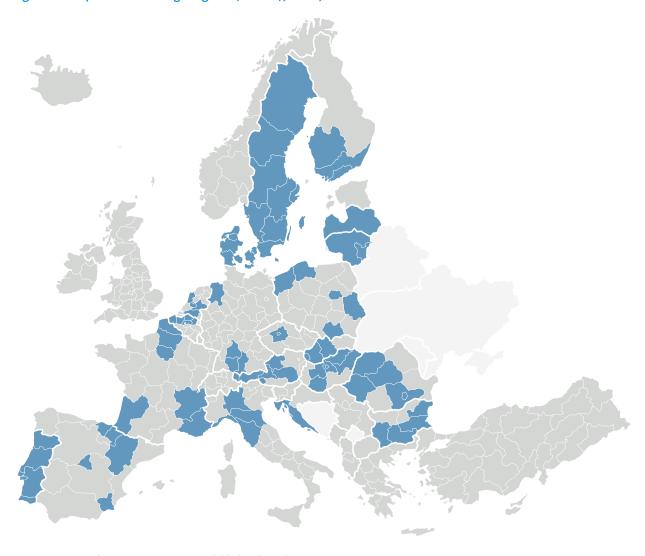


Figure 12: Top labour shortage regions (in blue), EU27, 2020

Note: Data on top shortage regions is not available for all Member States. **Source:** Authors' own graph, based on information from the Network of Eurofound Correspondents

Impact of COVID-19 on labour shortages

The pandemic has had a dramatic impact on European labour markets, leading to sharp falls in labour demand in some sectors and severe labour shortages in others. As indicated above, the COVID-19 crisis has already led to reductions in vacancy rates and a decline in the number of businesses registering labour shortages as a factor limiting production. However, the slight rebound of the EU vacancy rate that occurred as many countries eased lockdown restrictions in the summer and early autumn of 2020 indicates that, as the economy reopens, shortages are likely to reemerge in many sectors. Still, as of March 2021, it remains unclear how the COVID-19 pandemic will affect European labour markets in the longer term. Changes in consumer preferences and business practices and potential bankruptcies could contribute to shifts in the sectoral composition of

employment, which will impact on the dynamics of labour shortages.

However, in the short term, labour shortages developed during or were amplified by the COVID-19 pandemic in several essential sectors, including healthcare and agriculture. In 2020, all European countries reported shortages in the healthcare sector. As indicated above, shortages of nursing professionals ranked first among the most widely reported shortage occupations (European Commission, 2020d). Generalist medical practitioners and healthcare assistants also scored among the top shortage occupations in 2020. In several countries (Hungary, Ireland, Italy and Romania), the considerable shortages of healthcare personnel were also accompanied by large disparities in the supply of medical personnel across regions. The majority of European countries faced an acute shortage of staff, especially during the first phase of the pandemic, when sudden spikes in demand for workers accentuated pre-existent shortages.

Data published by the World Health Organization show that the deficit of labour in the healthcare sector is a structural problem in the EU. In 2013, there was an estimated deficit of 1.6 million workers in the sector, which was predicted to rise to 4.1 million by 2030: 0.6 million physicians, 2.3 million nurses and 1.3 million other healthcare professionals (Michel and Ecarnot, 2020). The long-term care sector was another area where shortages became more pressing. In countries such as Austria, Germany and the Netherlands, home-based long-term care relies heavily on workers from eastern Europe and other countries and was therefore affected by travel restrictions. Eurofound (2020c) provides an overview of the scale of the labour shortages, which affected the long-term care sector even prior to the pandemic, and identifies factors linked to the perceived lack of attractiveness of the sector, coupled with long-term care policies and the nature of the delivery of the service, as key factors explaining the gaps in the long-term care workforce in different countries.

Temporary labour shortages also developed in the agricultural sector. The proportion of seasonal workers in this sector is higher than in other sectors (Natale et al, 2019). For example, in 2016, the agricultural sector in Germany employed 286,000 seasonal workers and had a total workforce of 940,000 people (Schneider and Götte, 2020). The proportion of migrants in non-seasonal positions was 24.2% in Germany, a proportion similar to that in Spain (25% in 2017) and Italy (20% in 2017). As border restrictions coincided with the planting and harvesting seasons, several Member States (Austria, Belgium, France, Germany, Greece, Ireland, Italy, the Netherlands and Spain) have been affected by temporary labour shortages in the sector (ETUC, 2020). As will be discussed in Chapter 5, the Commission sought to address this issue with a guideline on the free movement of workers during the pandemic, which explicitly referred to seasonal workers.

During 2020, labour shortages were also reported in software and craft-related occupations (European Commission, 2020d). Within the framework of the European Semester, the 2020 country-specific recommendations document the persistence of skills shortages in 17 countries. For example, the recommendations for Hungary argue that 'the shortage of highly skilled workers is a key obstacle to innovation' (European Commission, 2020i), while in Croatia the 'labour shortages have continually affected some sectors of the economy, mainly because of skills gaps' (European Commission, 2020j). Data from September 2019 also show that, in Germany, as of September 2019 there was a shortage of 124,000 information technology (IT) specialists, with 65% of the companies surveyed across sectors expecting shortages to increase (ILO, 2020). In a number of countries (for example, Denmark, Estonia, Lithuania and Sweden), the food retail sector also reported labour shortages, in many

cases linked to the increase in demand for home delivery services. The packaging sector was another sector that faced shortages during the pandemic (for example, in Finland).

Shortages linked to a climate-neutral future and the European Green Deal

In 2019, the European Commission set out its strategy for a European Green Deal and its commitment to tackle climate change. It defines the European Green Deal as follows:

[The Union's] new growth strategy that aims to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use.

(European Commission, 2019b, p. 2)

The strategy emphasises a transformational approach, focusing on sustainable and clean energy supplies, mobilising industry to move towards a more circular economy, emphasising energy preservation in construction and renovation of building stock, accelerating the shift to smart and sustainable mobility and encouraging further moves towards environmentally sustainable food supply chains.

The debate on so-called 'green jobs' and 'green skills' is not new. Still, despite a decade-long discussion on the issue, there is no common definition of these concepts (Cedefop, 2019). The European Commission (2013a) distinguishes between an 'eco-industry approach' in which 'jobs are green by nature of activity' (that is, they - or the sectors to which they belong - have an explicit environmental benefit; for example, jobs in the sustainable energy sector) and a 'transformation approach' that emphasises the 'greening' of all jobs as a result of environmental drivers. Acknowledging that the two approaches are not mutually exclusive, the European Commission (2012a) describes green jobs as 'covering all jobs that depend on the environment or are created, substituted or redefined in the transition process towards a greener economy'.

While acknowledging the increasing importance of both 'green jobs' and 'green skills' in a climate-neutral transition, the lack of a common definition and the ongoing development of policies towards climate neutrality at national level nonetheless make it difficult to assess the extent to which labour shortages are likely to arise, which might hamper such transition efforts. Cedefop (2019) finds that monitoring and anticipating green jobs and skills is generally part of overall anticipation mechanisms, rather than being focused on the green economy. An exception to this is the French National Observatory for Jobs and Occupations of the

Green Economy. The observatory has developed two approaches to monitoring employment: an activity-based approach, which highlights changes in 'eco-activities', and a second approach based on jobs and occupations, making it possible to estimate the number of jobs in the so-called 'green' and 'greening' professions. Using this approach, it recognises 9 green occupations and about 70 greening occupations (Cedefop, 2019).

EU-level estimates of existing and potential green jobs and the greening of existing jobs vary substantially depending on whether a narrow or broad definition of green jobs is used. Based on the narrow Eurostat definition of green jobs, the European economy counted 4.5 million green jobs in 2016, up from 3.2 million in 2000. However, using a broader taxonomy that conceptualises 'greenness' as a spectrum of jobs and occupations that are or can be affected by greening shows that the growth in the number of green(able) jobs between 2006 and 2016 exceeded 12 million (European Commission, 2019c). Furthermore, the proportion of potential jobs that would be affected by greening increased from 35% to 40% of all jobs. The potential employment effects of greening are compounded by increased skill requirements and education levels, which could escalate skills shortages and mismatches.

To ensure no one is left behind in the process of working towards a climate-neutral transformation, the Just Transition Fund will support regional, industry and skills transformation to adjust to the new requirements. The implementation of this mechanism acknowledges the need for change at sectoral and occupational levels and the emergence and further development of new skill sets. Furthermore, the COVID-19 support package and European structural funds also emphasise investment in future-oriented skills developments, linking them to the climate-neutral transition.

In its EU-wide assessment of the 27 national energy and climate plans, the Commission notes that, despite setting ambitious plans, which, if fully implemented, 'would lead Europe to overachieve the current 2030 greenhouse gas emissions reduction target' (European Commission, 2020k, p. 1), the strategies and objectives related to employment skills and other distributional aspects of the energy transition lack clarity. In the context of the Just Transition Mechanism and the Just Transition Fund, existing plans are not in sync with other European instruments such as the European Skills Agenda, which prioritises investment in reskilling and upskilling (European Commission, 2020k).

In the context of the national information collection for this report, members of the Network of Eurofound Correspondents were asked if specific labour shortages had been identified in their country in the second quarter of 2020 linked to the policy emphasis on the European Green Deal and the EU's climate-neutral future. Correspondents in nine countries (Austria, Belgium, Czechia, Germany, Greece, Italy, Luxembourg, Slovakia and Slovenia) identified no specific research or debate regarding this issue. There could be different reasons for this, including different levels of advancement of the debate on green jobs and skills, with countries where such discussions are more longstanding not necessarily seeing the need to address this issue with specific reference to the European Green Deal. In the case of Germany, for example, Cedefop (2019) showed that 31 occupations in the German system of occupational classifications had been identified as 'environmental occupations', as they contribute directly to environmental protection, resource conservation, the sustainable use of nature and recycling.

Overall, the Network of Eurofound Correspondents identified close links between national policy debates and strategies relating to environmental policies. For example, although in Luxembourg no specific skills shortages had been identified in 2020, it is emphasised that it will be necessary to reassess the skills profiles required owing to the national action plan concerning energy transition. Similarly, in Slovakia, the closure of coal mining in specific regions is in process and strategic developments towards sectoral transformation are under way but have not been concluded. In Greece, it is also emphasised that the public dialogue on the European Green Deal is at a very early stage, with no specific shortages identified yet.

In countries where some assessment of the skills requirements to make the 'greening' of the economy a reality has taken place, the need for general professional, scientific, digital and technical skills is emphasised, including in Cyprus, Denmark, Estonia and Latvia. In these countries, it is believed that the transition to a climate-neutral economy will face challenges because, in these skills areas, labour shortages are already evident and further measures are therefore needed to address them.

The construction, energy, manufacturing and transport sectors are also identified as being among those where the European Green Deal (as well as relevant national strategies) will require additional labour and new skills. These are sectors where the skilled workforce is already scarce (Table 7). The shift towards renewable energy sources and sustainable and energy-efficient materials, products and modes of transport is particularly emphasised and will require new skills and labour.

Table 7: Shortage sectors linked to the transition to a climate-neutral economy

| Sectors | Countries identifying the shortage sectors |
|---|--|
| Manufacturing | Bulgaria, Finland, Poland, Sweden |
| Construction | Cyprus, Ireland, Poland, Portugal |
| Energy | Croatia, Hungary, Ireland, Malta, Portugal, Romania |
| Transport | Poland, Portugal |
| Professional, scientific and technical activities | Cyprus, Denmark, Latvia, Lithuania |
| Tourism | Bulgaria |
| Agriculture | Latvia |
| Education | Spain |

Source: Authors' own compilation, based on information provided by the Network of Eurofound Correspondents

While such assessments are quite general in most countries, more detailed research on the requirement for green skills has been carried out in a few Member States. In Cyprus, a report by the Human Resource Development Authority of Cyprus (HRDA) focused on identifying green skills in the Cyprus economy in the period 2017–2027 (HRDA, 2018). The report concludes that more than one in three people employed in the green economy will be employed in the sector of professional, scientific and technical activities, a sector already experiencing significant unmet demand, which is likely to persist. The construction sector is the second largest green economy sector, which is also exhibiting an increasing demand for labour. In Denmark, a report by the Ministry of Business and Industry (2019) prepared by the Growth Team for Green Energy and Environmental Technology highlights the importance of access to the right skills for the green sector. The report considers the skills in question to largely be STEM skills. In parallel, the Danish green think tank Concito points to the need to enhance green skills across the board in the Danish labour force to meet future requirements (Concito, 2019).

Similarly, the Irish Institute of Training and Development (2020) argues that there is a need for government and businesses to train and upskill workers for 'new' jobs in the green economy. They identified a particular need for jobs such as eco-construction specialists, energy data analysts and sustainable energy technicians. These demands are linked to a government scheme launched in 2019 to retrofit 500,000 homes for greater energy conservation by 2030. This scheme is also considered to have the potential to create 32,000 jobs. Furthermore, in 2019, the government launched a Just Transition Fund of €20 million targeted at workers in a region involved in the generation of peat-based power, which is set to cease.

In France, all occupations are considered to be part of the climate-neutral transition. The classic distinction between jobs at the heart of the green transition (for example, in biodiversity) and others is considered to be a thing of the past. This approach highlights the need for substantial targeted training for all jobs. Significant skills transformations driven by government policy have also been highlighted by the Ministry for the Environment, Sustainable Development and Climate Change in Malta. Its Low Carbon Development Strategy, launched in 2017, and a subsequent public consultation point to extensive changes being required in a number of sectors owing to these transitions.

In many eastern European countries, the transition from fossil fuels to climate-neutral technology requires reskilling, as a high future demand for workers in the renewable energy sector is projected. In Poland, transport and construction are pinpointed as sectors that are likely to face similar transformations.

Socioeconomic consequences of labour shortages

Labour shortages have an impact on organisations and the economy across all countries, with implications also for individual workers and society as a whole.

Effect on organisations and the whole economy

Reduced production capacity and growth potential

There are productivity effects arising from skills mismatches associated with having to recruit workers whose skills profiles are below – or not fully congruent with – those required by the job, resulting in costs in terms of higher job turnover. Not having access to workers with qualifications that match required profiles can also lead to challenges in meeting regulatory and quality requirements, potentially resulting in reputational damage, a decline in business and loss of market share to competitors.

Furthermore, the negative economic impact of labour shortages on companies leads to a reduced capacity to produce goods and provide services. This can require businesses to turn down work, thus limiting their production/service delivery and growth potential (Bennett and McGuinness, 2009). A report by the European Economic and Social Committee estimates that the EU-wide annual productivity loss associated with skills shortages is 2.14% (EESC, 2018). Research by the German Institute for Economic Research (2018) shows that output could be 0.9% higher (approximately €30 billion) if skilled labour shortages could be addressed effectively. In Romania, a study carried out by PwC (2019) estimates that the losses for Romanian businesses as a result of the shortage of skilled labour amount to €7 billion (around 3.7% of GDP) per year.

In a recruitment survey carried out by the Swedish Confederation of Enterprises, one-third of companies stated that they were forced to turn down orders or projects owing to difficulties in finding suitable workers (SVD, 2018).

The German Association of Small and Medium-sized Businesses considers labour shortages to be the greatest danger facing German Mittelstand businesses due to the inability to acquire new orders and missed deadlines (DMB, n.d.). Uncertainties around the ability to attract suitable labour are also seen as having a knock-on effect on future investment decisions, hampering growth in the medium to long term. Tang and Wang (2005) also highlight the negative impact of skills shortages on the labour productivity of small and medium-sized enterprises (SMEs). Drawing on research among SMEs in Austria, Dornmayr and Rechberger (2019) found that 60% of companies reported a drop in turnover as a result of a lack of skilled workers owing to the refusal or cancellation of orders, restrictions on the range of services offered and reduced advertising efforts to obtain new business. Similar findings are documented in the SME Barometer study by Suomen Yrittäjät, Finnvera and the Finnish Ministry of Economic Affairs and Labour (2019), which showed that 58% of SMEs reported limited growth opportunities due to lack of skilled workers. The report argues that, as well as affecting companies' growth potential, this may also increase the need to outsource or offshore. Research carried out by a cross-industry employer organisation in Czechia indicates that 53% of companies consider labour shortages to be a key obstacle to further growth (SP ČR and ČNB, 2017). This finding is shared by Matějka (2019), who indicates that, as well as leading to companies turning down orders, another impact of shortages is the poaching of workers, resulting in higher rates of turnover, recruitment costs and associated productivity losses. Increased recruitment costs are also cited as an economic impact of labour shortages in Austria (Dornmayr and Rechberger, 2019).

Not only can a lack of own employees have an impact on productivity and competitiveness, but labour shortages among suppliers can also leave companies unable to fulfil orders on time (SP ČR and ČNB, 2017).

Impact on foreign direct investment

The lack of access to skilled labour can also have an impact on a country's or region's attractiveness to foreign direct investment (FDI). In Ireland, this was emphasised as the greatest economic threat arising from a tightening labour market. This is particularly relevant, as around 10% of Ireland's employment is directly linked to FDI, with a similar proportion employed in smaller (SMEs) 'downstream/support' companies, which are reliant on the larger foreign

company (DETE, 2017). It is believed therefore that an inability to access appropriately skilled labour would lead to an increase in unemployment, with detrimental social consequences. The Attractiveness Survey Malta 2019, conducted by Ernst and Young (EY, 2019), suggests that foreign-owned companies are facing rising wage demands owing to widespread skills shortages across all economic sectors. Over 69% of FDI investors stated that such shortages have the largest impact on their next investment decision, while 65% of respondents cited this as the main obstacle to expansion of their business in Malta.

Impact on wages and global competitiveness

Persistent labour shortages can result in an increase in labour costs, as businesses compete to attract the best available workforce. This can lead to negative impacts on competitiveness and reduce profit margins, particularly if wage increases are not matched by an increase in productivity.

Such trends are particularly notable in some eastern European countries, where wages have grown from a low base.

- In Czechia, shortages contributed to an average gross nominal wage increase of 6.8% in 2017 and 7.5% in 2018, an increase that exceeded productivity growth (OECD, 2018; Obserwator Finansowy, 2019; CzechInvest, n.d.).
- Similarly, employer surveys in Lithuania show that the most significant impact of shortages of skilled workers, particularly over the last decade, was on wage growth (Vidūnaitė, 2019). A survey carried out by PwC in 2019 demonstrated that 97% of Lithuanian employers planned to raise wages for their employees (PwC, 2019). Figures show that, between 2012 (when the country's economy started recovering after the 2009 economic crisis) and 2019, gross average monthly wages more than doubled: from €627.80 in the fourth quarter of 2012 to €1,346.70 in the fourth quarter of 2019. Between 2014 and 2019, salaries in Lithuania grew most rapidly in sectors already enjoying among the highest incomes, such as ICT and the finance sector (Povilauskas, 2018).
- Labour shortages are also believed to have contributed significantly to wage increases in Hungary. Between 2014 and 2019, gross wages in the country increased by an average of 8.7%. During this period, wages grew by over 10% annually from 2016. At the same time, the average increase in productivity was only 1.7%, although it accelerated to 3.2% in 2019. The phenomenon of wages rising well in excess of productivity increases is believed to have aggravated the price competitiveness of the economy.

 According to Labour Market Barometer Survey results in Poland (Biernat et al, 2019), in every fourth company surveyed, the employee shortage led to an increase in wage costs. Companies also avail of the services of an employment agency or work-sharing, and in every fifth company surveyed process automation has been introduced.

In this context, it is worth noting that smaller companies often find it harder to match their larger competitors in increasing wages, hence exacerbating the impact of labour shortages on small businesses (Eurofound, 2016b).

Impact on automation and innovation

In some industries, especially in the manufacturing sector, the lack of workers has motivated employers to introduce or expand the automation, robotisation and digitalisation of production (Bogue, 2018; Kubr, 2019; Macháček, 2019; Legun and Burch, 2021). Labour shortages drive automation, particularly in lower skilled sectors, leading to changes in the skills required in the future.

A lack of skilled staff has also contributed to reduced innovation potential and a delay in the development of new products and services (SEV, 2019). Similarly, Nickell and Nicolitsas (2000) found that skills shortages reduced companies' involvement in research and development, although this effect was found to be only temporary.

Impact on individuals

Positive effects of quantitative shortages

Tight labour market conditions characterised by quantitative shortages can provide opportunities for marginal groups, including longer term unemployed or previously inactive individuals, to enter the labour market. While limited work experience, outdated skills and discriminatory attitudes on the part of employers can pose barriers to entry to the labour market for certain categories, such as people with disabilities, those with migrant backgrounds, women returners, older workers and lower skilled individuals, labour shortages provide a greater incentive to expand recruitment beyond normal measures and offer additional support, such as training, upon entry. Furthermore, when the economic and labour market conditions are such that employers find it difficult to recruit the desired number of workers, this can provide opportunities for those already in the labour market seeking to work additional hours to renegotiate their contracts or pick up additional hours with another employer. A tight labour market can therefore lead to a reduction not only in unemployment rates but also in labour market slack.

Negative effects of quantitative and qualitative shortages

In addition to the above-mentioned risks associated with the employment opportunities that might open up for marginal groups in tight labour markets, a particular challenge arises in this labour market environment: that this might encourage people to leave education earlier than they would otherwise have done in order to enter the labour market and start earning an income. In times of economic downturn, such workers are often among the first to be affected by job losses and a lack of completed qualifications can act as a significant barrier to subsequent labour market reintegration.

Furthermore, studies exploring the impact of skills mismatches on job satisfaction show that, by reducing satisfaction, mismatches can increase absenteeism and/or reduce productivity, as mismatched workers are more likely to be absent from work, invest less in training and change jobs, with potentially negative consequences for productivity (Brunello and Wruuk, 2019). In addition, workers who have to take on tasks for which they are not qualified are more likely to experience stress, which again can lead to absence and a loss of self-confidence, potentially affecting their medium- to longer term prospects and jeopardising the quality of outputs in the short term.

The key impacts of labour shortages on those in employment are increased recourse to overtime, rising work intensity and associated increases in stress levels, the risk of burnout and other health and safety issues, and increased work-life balance conflict. The cumulation of such factors could increase absenteeism rates and staff turnover.

Persistent shortages can also lead to efforts to outsource certain tasks, which can negatively affect working conditions for individuals in outsourcing businesses and can contribute to a loss of expertise and joined-up working in the organisation that is outsourcing workers. A survey carried out by the Employment Service in Slovenia shows that 46% of the companies that responded resorted to overtime work for existing employees, 23% used outsourcing and 20% offered reskilling for workers in employment in response to labour shortages (ZRSZ, 2019).

In SMEs, skilled labour shortages affect owner-managers (and their families) and current employees through higher work intensity (85%) and more overtime (Dornmayr and Rechberger, 2019). In Luxembourg, research into skilled workers found that labour shortages impacted significantly on the work-life balance of entrepreneurs, with such workers finding it difficult to avail of family leave due to a lack of skilled professionals (wort.lu, 2019).

Social impact

Impact on living standards

When labour shortages lead to wage increases, this can contribute to an improvement in living standards. However, in cases where shortages are highly regionalised, such dynamics can further contribute to cost-of-living increases in these shortage regions, often in the form of significant rises in housing costs. In some metropolitan areas, an inflation in accommodation costs can quickly eradicate any wage gains made and make it even more difficult to recruit workers in lower paying shortage occupations, including in education, healthcare and other public and essential services.

One of the key sectors experiencing labour shortages is the health and social care sector. When immigration is used to address such shortages, these challenges are often transferred from one country to the other, leading to migration flows from east to west and from the south to the centre and north of Europe (as well as significant third-country migration). However, even these flows are often insufficient to meet rising demand resulting from demographic change (and the impact of COVID-19). The risks posed by such shortages to the viability of high-quality care provision now and in the future were particularly highlighted in Germany and in the Nordic countries, where shortages of skilled staff led to long waiting times for patients and high workloads for professionals in the sector, ultimately contributing to higher turnover rates and reducing the attractiveness of the sector even further.

A number of Member States also point to the impact of labour shortages on the ability to deliver large public and private housing programmes or infrastructure projects, which in themselves are often key to enhancing living conditions or indeed health and public service delivery.

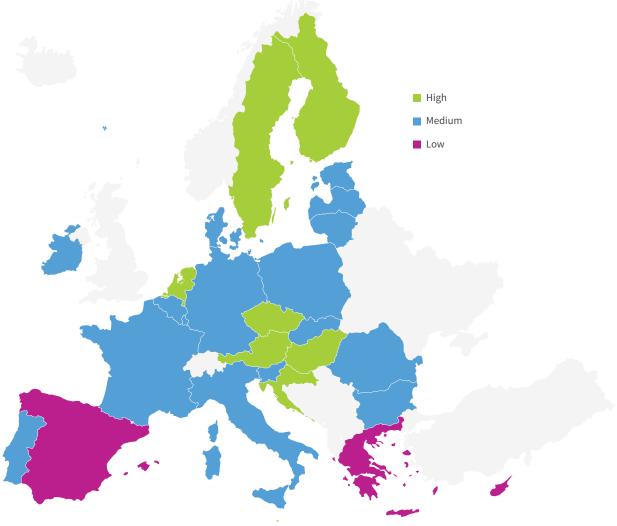
3 Policy debate on labour shortages

A policy debate on labour shortages is present in all EU Member States, although this varies significantly in intensity and is strongly influenced by economic cycles. The intensity of the policy debate in different countries, as assessed by members of the Network of Eurofound Correspondents prior to the COVID-19 pandemic, is depicted in Figure 13. This shows that the level of debate is rated as being of medium intensity in the majority of countries, with only three Member States (Cyprus, Greece and Spain) reporting a low level of debate, largely due to persistent high levels of unemployment resulting from the severe recent recessions in these countries. In Austria, Finland the Netherlands and Sweden, where the policy debate is considered to be very active, the debate tends to be focused on shortages of highly skilled staff in particular

sectors (such as financial services, ICT, care and certain aspects of manufacturing). In Croatia, Czechia, Hungary and Malta, where a significant level of debate is also reported, the debate similarly revolves around quantitative shortages among both high- and lower skilled workers.

Overall, the level of debate is, to a certain extent, congruent with the scale of shortages, although a more active debate might be expected in Belgium and Latvia, while the importance given to the subject in Croatia and Malta appears to exceed the severity of the shortages issue, although in these countries the debate tends to focus on shortages in certain sectors that are key to the national economy (for example, tourism-related sectors prior to the pandemic).

Figure 13: Intensity of policy debate relating to labour shortages, EU27, 2020



Source: Authors' own graph, based on information provided by the Network of Eurofound Correspondents

Despite these differences, several common features can be identified.

- The issue of shortages is mainly raised by employers and employer organisations, primarily in sectors that consider themselves to be particularly affected.
- In emphasising these issues, employer organisations often seek to provide information and help shape the policy debate around access to workers from third countries (for instance, guiding the review of lists of shortage occupations for which visas can be obtained).
- o Trade unions largely do not favour addressing shortages through third-country migration, particularly when such migration contributes to undercutting wage levels and in sectors where enforcement of existing labour standards has been shown to be challenging. Instead, they favour improvements to initial and ongoing training, as well as provisions for upskilling existing employees. They are also more likely to raise issues around the attractiveness of shortage sectors in terms of wages and working conditions as underpinning recruitment difficulties.

The solutions advanced depend to some extent on whether shortages are quantitative or qualitative. Managed migration is likely to be proposed as a solution for quantitative shortages in times of economic growth and as a short-time solution for qualitative labour shortages. Measures to address skills mismatches or seeking to reverse trends towards early retirement are often perceived as requiring a medium- to longer term approach and are favoured by both employer and trade union organisations.

Table 8 lists the most frequently mentioned policy approaches identified in different countries, grouped by thematic cluster, in relation to the types of policy measures described above.

Table 9 provides more detailed information on key areas of shortage and the main policy approaches at the heart of the policy debate in different EU Member States. Chapter 4 of this report highlights some of the policy measures applied over the last five years to address labour shortages.

Table 8: Clusters of key areas of policy debate in the EU Member States, 2020

| Attracting labour | Activation of underutilised resources | Enhancing the use of existing resources and retaining labour |
|---|--|---|
| Enhancing the attractiveness of vocational training routes (including through greater permeability between vocational and tertiary education): Austria, Belgium and Germany. | More effective activation of currently inactive groups: most countries, but specifically highlighted in Belgium and Germany . | Providing greater investment in lifelong learning: most countries, but specifically highlighted in Czechia, Estonia, Ireland, the Netherlands and Sweden. |
| Addressing regional disparities: Bulgaria , Italy and Romania . | Improving the activation of and matching services for unemployed people: most countries, but specifically highlighted in Bulgaria, Denmark, Ireland and Italy. | Preventing early retirement: most countries, but specifically highlighted in Belgium, Hungary, Malta and Slovenia. |
| Easing access to workers from third countries – mainly supported by employers and implemented with the help of governments: Croatia, Cyprus, Czechia, Estonia, Ireland, Lithuania, Malta, Poland, Slovakia and Slovenia. | | Addressing skills mismatches through better alignment of training and labour market needs: most countries, but specifically highlighted in Germany, Greece, Italy, Latvia and Slovakia. |
| Addressing the attractiveness of specific shortage professions by improving wages and working conditions – mainly supported by trade unions in the lower skilled and care sectors: Croatia, Cyprus, Germany, Latvia, Lithuania and the Netherlands. | Enhancing validation of migrants' skills: Sweden. | |
| Addressing high levels of outward migration and encouraging the repatriation of former emigrants: Hungary , Portugal and Romania . | | |

Source: Authors' own elaboration, based on information provided by the Network of Eurofound Correspondents

Table 9: Key focus of policy debate on labour shortages in EU Member States before the onset of the COVID-19 pandemic

| Country | Prominence | Main actors behind the debate | Key focus |
|----------|---------------------|---|---|
| Austria | High | Government, Federal Economic Chamber and social partners at regional level | The skilled labour shortage (Fachkräftemangel) has been prominent in the debate for a number of years and has featured in government programmes between 2013 and 2020. The main focus of the debate is on the attractiveness of apprenticeships and greater permeability between vocational and tertiary education, and training measures for low-skilled unemployed people and qualified migrants. The main sectors considered are the tourism and long-term care sectors. |
| Belgium | Medium | Government and sectoral employer organisations | There has been an initiative from government and employer organisations in the sectors affected to encourage sporadic debate, with a key focus on the care, STEM and ICT sectors. Policies are aimed at increasing the attractiveness of these sectors and vocational routes. Activation of the inactive population has also gained increased attention. |
| Bulgaria | Medium | Government and business organisations | Economic growth has led to shortages in some regions and sectors. The emphasis is on skills mismatches and regional disparities, which are to be addressed through upskilling of unemployed and marginal groups and addressing obstacles to internal mobility. |
| Croatia | High | Employer organisations | Labour shortages have been increasing with the emigration of many skilled young workers from Croatia. Employers favour an easing of access to TCNs, while trade unions call for improvements in wages and working conditions to enhance attractiveness. |
| Cyprus | Low | Sectoral employer organisations | The issue of labour shortages is mainly raised by employer organisations in tourism and the construction sector. While employers tend to stress the need to recruit TCNs in the absence of sufficient supply from local labour, trade unions are keen to address working conditions in these sectors, which are seen to affect their attractiveness. |
| Czechia | High | Government and social partners | Shortages of both professionals and low-skilled labour are emphasised by employers, who advocate the easing of access to TCNs. Trade unions reject the migration approach and both sides agree that this is only a short-term solution. Social partners point to the need for greater investment in lifelong learning and retraining, as well as reform of the education systems to better meet labour market needs. |
| Denmark | Medium | Government and social partners | Employers emphasise the lack of skilled labour, which has impacts for both productivity and growth. Trade unions query employer data and favour better activation policies over seeking labour from third countries. |
| Estonia | Medium | Sectoral employers | The issue of labour shortages is mostly raised by employers in the agriculture, ICT and services sectors, raising concerns about its impact on growth. In the short term, employers favour easing restrictions on TCNs; the longer term emphasis is on the activation of older workers and workers with disabilities and on enhanced lifelong learning. Trade unions take the view that access to third-country labour should be a last resort and that the emphasis should instead be placed on upskilling local labour. |
| Finland | High | Government and social partners | The main thrust of the policy debate is on achieving a better match between education, training and lifelong learning and the skills required by the labour market. There is a specific focus on the health and care sectors, with the government setting the staff-to-patient ratio. While this is aimed at raising the attractiveness of the sector, it will require the recruitment of 4,000–5,000 nurses by 2023. |
| France | Medium | Government and social partners | The key focus of the debate is on the poor match between the skills required by employers and those offered by jobseekers. |
| Germany | Medium ^a | Government and social partners | The skilled labour shortage (Fachkräftemangel) figured prominently in the policy debate, particularly up to 2015. Employers put the emphasis on activating hidden labour reserves and the better matching of supply and demand, including through improved education and vocational training systems and easier access to labour from third countries. Trade unions believe some of the shortage data to be exaggerated and highlight the need to boost the attractiveness of some sectors through better pay and conditions. |
| Greece | Low | Government | Following the country's acute economic crisis, there was little debate on labour shortages, but in more recent years, following concerns expressed by employers about the lack of skilled workers, the government has made efforts to repatriate highly skilled workers who left Greece during the recession. Better matching of supply and demand through education and training is also a key focus. |
| Hungary | High | Government and employer organisations | There is significant concern among employers over labour shortages and associated wage rises outstripping productivity gains. The policy emphasis has been on seeking to ward off the outward migration of skilled young people and retain or reintegrate older workers. |

| Country | Prominence | Main actors behind the debate | Key focus |
|-------------|------------|---|---|
| Ireland | High | Employer organisations and government | The issue of labour shortages has mainly been raised in more recent years (following the post-2008 severe economic recession) by employer organisations, which express concern over the lack of skilled workers, which can also have an impact on FDI. This often focuses on the review of critical lists, which determine access to TCNs. The emphasis is on the upskilling of the existing workforce and integration of unemployed people. |
| Italy | Medium | Government and employer organisations | The main emphasis is on skills mismatches. Employers support better coordination between the education system and labour market requirements. The government also seeks to further move from passive to active labour market policies through upskilling and integrating unemployed people into the labour market. |
| Latvia | Medium | Employer organisations | Employers in the construction and manufacturing sectors emphasise the economic and productivity impacts of shortages, whereas those within the social care sector highlight the social effects in terms of healthcare availability and quality. The focus of the policy debate is on achieving a better match between supply and demand and improving attractiveness (particularly in the care sector). Easier access to TCNs is also requested by employers in some sectors. |
| Lithuania | Medium | Employer organisations | Employers in the logistics and construction sectors particularly emphasise the importance of addressing shortages. They tend to reject trade union demands to address this by increasing wages and improving conditions and instead favour the recruitment of TCNs, arguing that wage increases are not commensurate with increases in productivity. In the care sector, there is particular concern about the outmigration of skilled workers. |
| Luxembourg | Medium | Government and social partners | The solutions proposed are very sector specific, with some differences between the government and sector representatives on the best solutions to address the issue. |
| Malta | High | Government and employers | Both the government and employers point to the critical contribution of foreign workers. Employers also favour government support for retaining older workers and reforming the education system. |
| Netherlands | High | Government and social partners | The government and social partners acknowledge the negative impact of shortages on economic growth and the working conditions of those in shortage sectors. The education and care sectors figure prominently in the debate, even though they do not have the largest shortages. The technical and industry sectors are also highlighted. The main approach taken is to raise awareness of these sectors and enhance training and working conditions. |
| Poland | Medium | Government and social partners | While other issues continue to take precedence, the issue of labour shortages has gained importance in recent years, with a particular focus on the question of economic immigration. While employers favour the easing of restrictions on the recruitment of TCNs, trade unions express concerns about this approach, particularly in areas in which TCNs are employed without respecting national laws. |
| Portugal | Medium | Government and employers | The focus of the policy debate has mainly been on immigration and encouraging the return migration of Portuguese workers who have left the country. |
| Romania | Medium | Government and social partners | The issue is actively discussed by the government and social partners, with an emphasis on addressing regional disparities, obstacles to mobility and measures to halt the outmigration of workers to other parts of the EU. |
| Slovakia | Medium | Government and social partners | In the first instance, the government and social partners sought to address skills shortages by reviewing the matching of education and training systems with labour market requirements. More recently (since 2018), the debate has shifted towards the removal of administrative barriers to the migration of workers from third countries. |
| Slovenia | Medium | Government and social partners | Slovenia has experienced strong fluctuations in labour demand in recent years but, as the economy has expanded and the country is increasingly competing with others for the inflow of migrant workers, the government has sought to address this through a more active strategy on economic migration. The retention and reintegration of older workers is another focus of the policy debate. |
| Spain | Low | Government and employers | In the wake of Spain's severe recession, the focus on labour shortages was limited. More recently, there has been dialogue between the government and employers in the ICT sector on updating education and training programmes in order to address the lack of digital skills. |
| Sweden | High | Government and social partners | The main concern is the shortage of skilled workers, including in the education and healthcare sectors. Better access to lifelong learning and better integration and validation of the qualifications and skills of migrants are deemed to be important approaches. |

Note: ^aThe policy debate in Germany was previously highly prominent, but it has waned somewhat following the arrival of large numbers of migrants in 2015. **Source:** Authors' own compilation, based on information provided by the Network of Eurofound Correspondents

4 Measures to address labour shortages in the EU Member States

A wide range of policy approaches to tackle the issue of labour shortages has been adopted in EU Member States. The approach most suitable for each situation will depend on the underlying drivers and policy context. The focus of the research for this report was on the measures taken at Member State level to address the most prevalent shortages at sectoral, occupational and regional levels. Furthermore, this report focuses on those shortages linked to COVID-19 and the transition to a climate-neutral economy. The impact of digital transitions is not discussed as a separate issue in this report.

This chapter presents the typology of measures developed, discussing the nature of the initiatives, the countries utilising them and their content in more detail.⁸ Its goal is to be descriptive rather than to provide an assessment of the effectiveness of the different measures.⁹

Typology of measures to address labour shortages

Measures to tackle quantitative and qualitative shortages can be grouped into three main types, with each being strongly aligned to specific drivers of shortages (Table 10). The first type focuses on measures that attract labour into countries, regions, sectors and occupations experiencing shortages. The second type of measures seeks to activate underutilised resources, such as unemployed or inactive groups. Finally, a range of policies is aimed at enhancing the use of existing labour and retaining labour that would otherwise be 'lost' in an effort to address existing - or indeed future shortages. Very broadly speaking, the first category of measures primarily seeks to address quantitative shortages while the third is mainly utilised to deal with qualitative shortages. While all measures can, in principle, be used to address both types of shortages and the associated drivers of shortages, polices aimed

at the activation of underutilised resources are arguably most likely to be used and are suited to addressing both types of shortages.

Initiatives to attract labour can have a number of different goals and be divided into different approaches. One of these mainly seeks to address the lack of attractiveness of specific sectors or occupations by improving wages and working conditions. This can take place through collective bargaining or minimum wage policies at national or sectoral level or by employers offering improved terms and conditions to attract workers to a specific company. Enhanced conditions can include improvements in the structure of contracts, better access to training and progression routes, more attractive or flexible working hours to meet individual demands and stricter health and safety protections, as well as the offer of other benefits.

As well as taking measures to unilaterally improve terms and conditions (independent of collective agreements or sectoral policies), individual employers can also improve recruitment strategies through more proactive marketing approaches or innovative measures to target groups that have not previously been considered. On the other hand, employers may also review the requirements to be met by applicants or offer in-house initial training to address the lack of suitably qualified applicants on the market.

Shortages aggravated by a lack of within-country cross-regional mobility can be addressed by adopting more active regional development strategies and enhancing the attractiveness of living and working conditions in particular regions or localities through better housing, infrastructure or cultural and leisure opportunities. Environmental factors such as high levels of pollution may also play a role, and addressing such factors can render particular locations more attractive. However, such approaches tend to require cross-agency collaboration and potentially medium- to longer term investment.

¹ It should be noted that the examples presented in this chapter do not reflect the full gamut of initiatives to tackle shortages at the national level; rather, they represent those that are considered most relevant to addressing the gaps in the areas where shortages are most pressing in each country.

Only a small number of policy initiatives could be presented in this report. A working paper containing more detailed information on policy initiatives at national level will be published to accompany this report, available on the web page at http://eurofound.link/ef21006

⁹ An analysis of the effectiveness of different approaches is the subject of a research project to be carried out in 2021–2022.

Table 10: Typology of measures to address different drivers of labour shortages

| Typology | Attracting labour | Activation of underutilised resources and retaining labour | Enhancing the use of existing labour and retaining labour |
|--------------------|--|---|--|
| Nature of policies | Enhancing the attractiveness of certain sectors or professions by improving wages and/or working conditions (for example, through collective bargaining or minimum wage policies, improving access to training, improving the structure of contracts, increasing working hours and improving health and safety). Enhancing the attractiveness of living and working conditions in the country/region (that is, improving transparency, government, bureaucracy, public services, infrastructure, housing, environment, etc.) and the attractiveness of wages and working conditions; creating policies to attract return migrants and valuing their skills. Creating an active migration policy that combines foresight, systems for the recognition of qualifications and capacities, anti-discrimination policies and attracting return migrants. Improving recruitment strategies at company level and the marketing and attractiveness of the sector/company; enhancing training and prospects; and improving pay and working conditions. | 1. Addressing labour market barriers for different groups currently unemployed or inactive (for example, addressing access to care services, addressing barriers linked to health or other issues, enhancing the recognition of qualifications for migrants, adjusting workplaces for older workers or workers with disabilities, addressing discrimination, etc.). | Improving matching between supply and demand (for example, better skills forecasting, better links between forecasting/business needs and training provisions, the involvement of social partners in curriculum development, the regular updating of curricula, etc.). Addressing skills and competence gaps (for example, work experience, long/short training, recognition of skills, etc.). Improving matching services. Enhancing preparations for labour market change (for example, offering targeted training, employer-focused training, core competence training, support for SMEs in delivering training, improved access to funds and time off for training, improved skills/career advice and matching, etc.). Preventing (early) exit by protecting work ability (for example, through health and safety measures, ongoing training, improving job quality, etc.), as well as through suitable leave policies, flexible working, access to high-quality and affordable local care facilities and access to reintegration services after illness or absence. |
| Drivers | Slow and/or inadequate wage adjustment. Declining population (due to emigration). Low internal migration (regional shortages). Low immigration. Unattractive employment and working conditions. Failure of human resource management practices. | Low participation rates of disadvantaged groups owing to poor integration support and issues of discrimination Low participation owing to work-life balance conflicts. | High economic growth in certain sectors and changes in the structure of the economy, resulting in mismatches between training needs and provision. Low employer investment in training. Poor individual education choices. Failure of matching systems (PES and inadequate foresight). Poor individual search behaviours and own investment in ongoing skills acquisition. Early exit of older workers owing to early retirement and of disabled workers owing to a lack of support. |

Source: Authors' own elaboration

Such approaches can also be relevant for country-level shortages. In addition, shortages existing at national level (either in specific sectors or across the board) can also be addressed through enhanced active migration policies. In some Member States that have experienced a significant outflow of labour to other countries, this can include prevention policies and initiatives to attract return migration. Prevention policies can encompass any of the measures outlined above, as well as some of

those falling under the other typologies, which will described in more detail below (for example, improved active labour market policies). Active migration management can combine shortage measurement and classification systems with foresight to manage migration from third countries, as well as improved systems for the recognition of the qualifications and capacities of migrants (including refugees and asylum seekers). To enhance the attractiveness of a country or

region as a destination, this may also require the implementation of active anti-discrimination and integration policies, particularly when the political and social climate is perceived to be unfavourable to foreign workers.

Shortages can also be linked to low participation rates of certain groups or barriers to remaining in the labour market. Such issues are demonstrated in high levels of labour market slack (as discussed in Box 2 on p. 8). Measures to promote the activation of underutilised resources in Eurofound's typology do not focus directly on skills or work experience - these are addressed in the final cluster of measures focusing on enhancing the use of existing labour (see below). Measures in this group can be specific to the group being targeted: for example, addressing the lack of affordable, accessible high-quality care facilities, which affects the participation of women in the labour market; rehabilitation and employment support measures for workers with disabilities or health conditions; and language training or the recognition of qualifications for refugees and asylum seekers. They can also be intersectional or address employers, for example to tackle stereotypes and discrimination, but also address barriers linked to lower productivity.

The final cluster of measures focuses on enhancing the use of existing labour by ensuring a better match between the supply of and demand for skills and competencies in the labour market and the retention of workers by promoting sustainable work. This can be relevant to active jobseekers, as well as to those who are inactive, meaning that the distinction between the second and third clusters of measures in relation to the inactive target group lies in the fact that the second cluster focuses on removing non-skill-related barriers to labour market access.

As well as overcoming skills and competencies gaps through targeted training, work experience or the recognition of skills, the third cluster of measures also seeks to address shortages arising from economic trends and changes in customer demand by improving the matching of supply and demand through better forecasting of associated skills requirements and by enhancing the link between forecasting and the content of education and training curricula (for example, through the involvement of social partners in the regular updating of curriculum development). The quality of matching services themselves (whether public, private or indeed individual) may also need to be

improved. Finally, measures in this cluster emphasise the importance of regularly updating the skills of individuals in the labour market to enhance employability (by adjusting, for example, to digitalisation and other technological innovations), productivity and innovation capacity. This is also relevant for the retention of older workers, with an emphasis on the importance of sustainable work.

As indicated above, there is clearly a degree of overlap between the types of measures which may be required to successfully address labour shortages. For example, measures to address barriers to labour market entry may need to be combined with training to ensure a match between supply and demand; initiatives to retain certain groups, such as women, may require barriers in the private sphere to be tackled, such as care responsibilities; and measures to encourage third-country migration have to go hand in hand with suitable processes for the recognition of qualifications and the delivery of language skills. However, the typology outlined in Table 10 provides a useful characterisation of the measures required to address some of the key underlying drivers of labour shortage.

As will be shown in the following sections, from a quantitative perspective, ¹⁰ the majority of reported measures adopted by Member States to address shortages focus on enhancing the use of existing labour, with a particular emphasis on overcoming skills barriers and updating skills. The next most commonly reported measures are policies aimed at attracting labour, among which initiatives to enhance the attractiveness of certain sectors are the most commonly reported. Finally, among measures seeking to activate underutilised resources, there were more measures seeking to address labour market barriers for different groups than those aimed at preventing early exit. Table 11 provides an overview of the proportions of measures in the different categories of measures reported by the Network of Eurofound Correspondents. 11 It is important to note that a significant number of measures pursue more than one goal and have therefore been classified in several categories. The priority given to different measures should be viewed with some caution, as the account of measures provided was not exhaustive and the proportions indicated are therefore only indicative of the priority given to different policy approaches to address shortages in the EU countries.

¹⁰ This does not take account of the resources expended on different types of measures.

¹¹ Correspondents were asked about the policy approaches used in their countries to address labour shortages, as of early 2020. They were asked to focus on the policy approaches used to address the most significant shortages (in terms of sectors and occupations) that they had indicated. In principle, each correspondent was asked to report the five most significant measures in this regard, in terms of their scope. However, more than five measures were reported for a few countries, with others reporting fewer than five.

Table 11: Relative importance of different types of measures implemented to address labour shortages, EU27, spring 2020

| Typology | Nature of measure | Proportion of total reported (%) ^a | Number |
|--|--|---|--------|
| Attracting labour | Enhancing the attractiveness of certain sectors | 56 | 58 |
| | Enhancing the attractiveness of living and working conditions in a country/region | 9 | 9 |
| | Creating active migration policies (including foresight) | 32 | 33 |
| | Improving recruitment strategies at company level | 3 | 3 |
| Subtotal | | 50 | 103 |
| Activation of underutilised resources and retaining labour | Addressing labour market barriers for different groups (for example, geographical barriers, work–life balance issues, health issues) | 100 | 18 |
| Subtotal | | 9 | 18 |
| Enhancing the | Overcoming skills mismatches, including through improved matching systems | 69 | 90 |
| use of existing labour and | Improving matching between supply and demand | 5 | 6 |
| retaining labour | Enhancing the preparations for labour market change | 15 | 20 |
| | Other measures (for example, employee sharing) | 2 | 2 |
| | Preventing early exit from the labour market and retaining other groups of workers | 9 | 12 |
| Subtotal | | 63 | 130 |
| Total | | | 208 |

Note: ^aThe subtotal percentages (in bold) indicate the proportion that these measures make up out of all three cluster typologies. As some measures fit into more than one category, the total exceeds 100%.

Source: Authors' own compilation, based on information provided by the Network of Eurofound Correspondents

The next three sections provide more detail about the nature of the policy measures adopted based on the typology outlined above.

Attracting labour

The cluster of measures aimed at attracting labour is of particular relevance in terms of addressing quantitative labour shortages, but it also supports addressing qualitative shortages. As indicated above, measures in this cluster mainly seek to address the following drivers of shortage:

- declining population (due to emigration and demographic deficit)
- low internal migration (regional shortages)
- low immigration
- slow and/or inadequate wage adjustment
- unattractive employment and working conditions
- failure of human resource management practices

There is a strong emphasis in the policy debate on the use of managed migration to improve access to a larger pool of workers from countries outside the EU. However, the measures reported by the Network of Eurofound Correspondents, which are implemented to address shortages in the sectors and occupations experiencing the most significant recruitment

difficulties, place the greatest emphasis on enhancing the use of existing labour by overcoming skills barriers (discussed in the section 'Enhancing the use of existing labour and retaining workers' in this chapter) and enhancing the attractiveness of specific sectors at national, regional and local levels. Such approaches are generally perceived as medium-term strategies in terms of finding sustainable solutions to shortages, with managed migration being used when such approaches are insufficient (particularly in the context of quantitative labour shortages); take some time to bear fruit; prove difficult to negotiate between social partners (for example, the enhancement of pay and working conditions); or are perceived to be more costly for employers.

Table 12 provides an overview of the types of measures adopted to attract labour and the countries that have adopted them specifically to address labour shortages in the key shortage occupations and sectors outlined above. The latter is important to bear in mind because it is clear that many countries regularly review national minimum wages (Eurofound, 2020d) but may not specifically see such measures as a way to address shortages. All Member States implement managed migration systems based on different criteria for identifying the sectors, occupations and companies that can be granted visas and work permits for TCNs

(European Commission, 2015), but again recourse to third-country migration may not be perceived as a critical part of the solution to the shortages identified or may not be considered sufficient to address these shortages. Table 12 should therefore not be considered as an exhaustive account of the presence of such policies in different Member States but as an account of the measures implemented that are considered to be most suited to addressing shortages in the shortage sectors, occupations and regions outlined above.

Among the so-called 'active migration measures', there is a stronger emphasis on regulations and procedures linked to third-country migration than on efforts to encourage return mobility in countries having experienced a strong outflow of labour to other EU countries and beyond. Although such initiatives do exist and the facilitation of this freedom of movement is the purpose of the EURES network, no specific reference was made to efforts to attract workers from other EU countries. This may be because such flows have largely happened organically.

Enhancing the attractiveness of certain sectors

Given the predominance of shortages in the health and social care sectors in particular, it is perhaps not surprising that a significant number of the measures in this category are aimed specifically at enhancing pay and working conditions in this sector (for example, in Finland, Germany, the Netherlands and Slovakia). Other sectors that are targeted by such measures include education (for example, in Lithuania, the Netherlands and Sweden) and other services of public interest for which shortages are reported (for example, in Hungary, Lithuania, Luxembourg and Slovakia). Similar initiatives have also been implemented in the hospitality sector in Croatia and Slovenia.

As well as efforts to entice additional applicants by making pay and working conditions more appealing, initiatives to attract additional workers to specific sectors also focus on raising awareness of the range of occupations and opportunities available and encouraging groups that are currently underrepresented to apply, for example women in STEM sectors and occupations.

Table 12: Overview of measures adopted to address shortages in key shortage sectors, occupations and regions, EU27, spring 2020

| Type of measure | Description | Countries using this approach |
|---|--|---|
| Enhancing the attractiveness of | Enhancing the attractiveness of training for certain (vocational) occupations. | Austria, Germany, Hungary, Luxembourg, Romania |
| certain sectors | Enhancing pay and working conditions in specific sectors (for example, the health and care sectors), including regular reviews of the minimum wage. | Belgium, Bulgaria, Croatia, Estonia, Finland, Germany, Hungary, Lithuania, Luxembourg, the Netherlands, Slovakia, Slovenia, Sweden |
| | Awareness raising of sectors. | Austria, Belgium, Finland, Estonia, Malta, the Netherlands, Portugal, Sweden |
| Enhancing the attractiveness of living and working conditions in a country/region Attracting specific groups of workers, such as high-level professionals, to countries/regions and assisting in their integration and that of their families. | | Austria, Finland, Germany, Latvia |
| Having active migration policies | Setting up specific migration policy projects based on access requirements for high-, medium- and low-skilled staff in specific sectors, including points-based immigration systems, the creation of catalogues of shortage occupations, the easing of salary criteria and quota systems, and the easing of administrative requirements. Setting up agreements with specific countries and prolonging the | Austria, Belgium, Cyprus, Czechia, Estonia, Finland, France, Germany, Hungary, Ireland, Latvia, Lithuania, Malta, the Netherlands, Poland, Portugal, Slovenia, Spain |
| | stays of TCNs. | |
| | Setting up specific schemes to support the rights of seasonal workers. | Croatia |
| | Offering vocational training with integrated language training for migrants. | Sweden |
| | Encouraging the return migration of diaspora. | Lithuania, Portugal, Slovenia |
| Improving recruitment strategies at company level | Providing company-level examples of enhanced recruitment practices. | Austria, Malta, Poland |

Improving pay, working conditions and training opportunities

The health and care sectors have long suffered from significant shortages in many countries. This can be linked to challenging working conditions such as (alternating) shift patterns, high pressure work situations, being subject to harassment and violence by third parties, and comparatively low wages when viewed in relation to the years of training required and the level of associated responsibility. These highly pressurised conditions and shortage situations have been further amplified during the pandemic.

Prior to the arrival of COVID-19, a number of countries had already introduced measures to tackle shortages in the sector. While Finland and the Netherlands have primarily emphasised training and curriculum development, Belgium, Germany and Hungary have adopted multipronged approaches, including actions related to pay and working conditions (Germany), the recruitment of foreign labour and ongoing training (Belgium and Germany) and enhancing the broader image of the sector (Belgium).

In an effort to enhance the attractiveness of certain parts of the health and social care sector, the Finnish government has set a goal to increase the staff–patient ratio from 0.5 to 0.7 in intensive sheltered housing units. The new ratio is due to come into force in April 2023. It is estimated that this will require the recruitment of an additional 4,000–5,000 nurses. At the same time, Finland has implemented a shorter training programme

for care assistants, who would then be able to work in nursing homes and other long-term care settings. The use of care assistants is intended to ease the pressure on medical and nursing staff, to allow them to concentrate on more skilled and demanding tasks. However, it must be stated that this initiative has not been welcomed by the trade unions, which would prefer to see the greater provision of ongoing training for existing staff as a way of rendering the sector more attractive to applicants and to retain more staff.

Emphasis on continuous training is the key approach used in the Netherlands, where the action programme Working in Care (Werken in de Zorg) came into effect in the spring of 2018 with the goal of reducing staff shortages by 2022. A central budget of €320 million has been made available, which is distributed over 28 regional action plans. The intention is for care institutions, training institutes and trade associations to join forces to draw up action plans for their region. Once regional plans have been approved, funding will be provided to train, retrain or provide ongoing skills development to staff in hospitals, nursing homes and home care. The goal of this measure is to enhance the attractiveness of the sector among young people and returners and to assist in retaining existing care staff. A similar approach is being implemented to enhance the attractiveness of the teaching profession in the Netherlands. In Belgium, the so-called Action Plan 4.0 seeks to address the problem of labour shortages in healthcare professions through image campaigns targeted at secondary school pupils and support for

Concerted action in the care sector – Germany

In summer 2018, several federal ministries (the federal ministries for labour, health and families) joined forces with the federal states, employer organisations and unions, as well as church organisations, care institutions and hospitals, to work together on the Concerted Action in Care plan. This would be achieved through the following steps.

To ensure a sufficient supply of labour to meet rising demand, new personnel allocation plans are to be developed and tested in care institutions. Rules for the recruitment of foreign labour to work in German care institutions will be eased. Additionally, working conditions are to be improved in all care institutions to ease the burden on care staff. For example, occupational health programmes at establishment level, shift plans and continuous training for managers are to be improved and additional measures will be taken to improve the work-life balance of employees. New technological tools will also be developed to ease the administrative burdens on care staff, including advances in tele-care.

It is planned to increase pay levels in geriatric care and to have different levels of minimum wages depending on the qualification levels of employees. Finally, employees working in the care sector in eastern or western German federal states are to have access to the same wage levels.

More vocational trainees are to be attracted. To this end, a new campaign was designed to attract more young people to the profession and to increase vocational trainee numbers by 10% by 2023 (Die Bundesregierung, 2019).

Collective agreements providing for wage increases in the tourism and hospitality sectors – Croatia and Slovenia

The Croatian Employers' Association and its sectoral association for catering and tourism collaborated with the Tourism and Services Trade Union of Croatia to sign a sectoral collective agreement, which provided for an increase in the minimum wage of 5% in the hospitality sector. This pay rise came into force on 1 June 2019.

To address a significant labour shortage in the hospitality and tourism sectors (in the summer of 2018, this shortage was estimated to be between 5,000 and 10,000 workers in a sector employing around 41,000 workers), the trade union and employer organisations in Slovenia concluded a sectoral collective agreement on 8 August 2018. It introduced more regulated working conditions in the hospitality and tourism industries, including a regulation for overtime work. Under the agreement, the employer has to balance overtime hours every three months and pay a 30% bonus for overtime every six months. If this is not done, the employer must pay a 45% overtime supplement in the first year and a 50% supplement in subsequent years. The agreement also raised salaries by 4% in 2019 and 10% in 2020.

relevant training for jobseekers and for those considering a second career in care. The plan also includes measures to attract workers from other EU countries and beyond.

In Estonia, in order to tackle the shortage of healthcare workers, a programme was designed for those who have acquired a healthcare education but either never worked in healthcare or exited the field some time ago. A six-month training course offering theoretical and practical knowledge is provided, allowing those who pass a final exam to work as nurses or doctors (depending on their prior experience).

Lithuania and Slovakia have adopted measures that focus on the broader public sector, while in Sweden the main emphasis has been on teachers' pay. Over the past decade, the Slovak government has also sought to enhance the attractiveness of work in the public sector (including in healthcare, social care, education and the police force) by gradually increasing pay levels. A new law in Lithuania dating from 1 January 2020 targets improved wage levels for workers in the municipal sector. It provides for an increase of, on average, 15% in relation to the fixed salary rates of teachers with effect from 1 September 2020. In addition, the variable part of the salary (performance related) has been reduced and the fixed part of the salary has been increased. Sweden agreed a national pay increase for teachers in 2016 in an effort to enhance the attractiveness of the education sector vis-à-vis other sectors and professions requiring similar levels of qualification.

Collective agreements in the tourism and hospitality sectors in Croatia and Slovenia provided for wage increases, with the goal of attracting more workers. In Croatia, this was combined with a measure to stabilise what is largely seasonal employment in the sector. To reduce the challenges associated with seasonal work, the status of so-called 'permanent seasonal work' was introduced in 2001. A fixed-term employment contract

for a permanent seasonal job obliges employers to pay social insurance and pension contributions for their seasonal workers throughout the year and obliges employers to offer their employees new employment contracts for the following season. As a result, around 6,000 persons annually are now insured under an extended pension insurance scheme based on a fixed-term contract for permanent seasonal jobs. In Austria, it is also possible to temporarily suspend an employment contract with a reemployment commitment, which is of particular importance for seasonal sectors.

Awareness raising around the opportunities in specific sectors

Another approach used in some sectors is to raise awareness about the wide range of employment opportunities and career development potential in a sector. Such initiatives are sometimes linked to recruiting certain target groups that are currently underrepresented in the sector. Chief among these are measures to address the underrepresentation of women in STEM occupations (European Commission, 2018c). As demonstrated in the following box, examples of such initiatives can be found in Austria and Belgium. Similarly, in Portugal, the Engineer for the Day project was initiated by the Secretary of State for Citizenship and Equality in the school year 2017-2018 as part of the Agenda for Equality in the Labour Market and in Businesses and the National Strategy for Equality and Non-Discrimination 2018–2030 (Portugal Mais Igual). This project aims to address occupational segregation on gender lines and attract more women into vocational training in engineering and other technology professions. In Finland, the Women Code (Mimmit Koodaa) programme seeks to increase the number of women working in the software industry by providing easily accessible coding workshops free of charge for women who have no prior experience in coding.

Encouraging more women to enter STEM professions – Austria and Belgium

In Austria, the project FiT – Frauen in Technik und Handwerk (women in technology/engineering and skilled trades) – promotes the entry of women into professions where their current share is below 40%. In such occupations, the PES finances more than 200 different education/training courses in engineering, technology and skilled trades, ranging from apprenticeship certificates to a comparable school or university degree. The programme targets registered jobseekers and unemployed women.

The support provided includes:

- vocational orientation courses, giving an overview and outlining the content of the many FiT professions
- internships, providing insight into the technical and manual working worlds
- apprenticeships with a school or college or technical college degree
- advice and support during the training, for example learning assistance and advice on work-life balance
- financial support in the form of, for example, unemployment benefit, training allowances, course attendance allowances and childcare allowances

Initially, a FiT pre-qualification course is provided with a maximum duration of 18 weeks. The programme is accompanied by other supports such as socio-pedagogical care, work placements, try-out days, visits to workshops, company excursions and information events in specific companies.

Results from an evaluation carried out in 2012 show that, three months after completing their training, 54.7% of women who took part in a FiT training programme between July 2011 and December 2012 had found a job (in comparison, among those who left the course early, the rate was just below 36.2%). Over a period of 12 months, the labour market success of FiT graduates improved continuously. Twelve months after completing their training, 80.9% of FIT participants had found a job. Almost two-thirds of the women who had completed FiT training reported having found work in the job they had been qualified for, compared with 33% among those who left the scheme early.

In Belgium, the Flemish government implemented a STEM action plan between 2012 and 2020, which was recently renewed to cover a further decade. Between 2012 and 2020, the plan focused on:

- making STEM education more attractive
- supporting teachers, trainers and supervisors
- improving the process of study and making career choices
- attracting more girls to STEM study programmes and professions
- adapting training provision
- encouraging greater social appreciation of technical professions

This first action plan led to an increase in the percentage of entrants to STEM disciplines between 2011 and 2017, in both higher and secondary education. It also contributed to the fact that, in 2017, generally speaking, at least one-third of pupils and students who opted for a STEM study programme were girls. However, gender imbalances are still significant and some shortages remain. As a result, a follow-on action plan covering 2020–2030 was devised.

In Estonia, the Chose IT programme is aimed at attracting more young people into training and studies relevant to the ICT sector. In Ireland, the Technology Skills 2022 initiative has a similar goal and brings together the relevant ministries, employers and education providers.

Skills shortages in a number of sectors and occupations can be exacerbated by a trend among young people (and their parents) to favour tertiary education over vocational or apprenticeship pathways. Image campaigns and initiatives to increase the permeability between vocational and tertiary pathways have been

introduced in some Member States to address this issue. In Germany, an image campaign initiated by the German Confederation of Chambers of Skilled Trades (Deutscher Handwerkskammertag – DHKT) in 2010 focused on the positive aspects of the skilled trades sector (*Handwerk*), which encompasses many of the important shortage professions in Germany (for example, mechatronics, electricians and skilled construction workers). The DHKT image campaign not only explains the advantages of a career in skilled trades but also offers information on the different trades professions and related vocational training through TV spots, billboard campaigns and events. A web portal

was created to allow young people to search for vacant vocational training positions.

Austria has tackled this issue by introducing the so-called *Berufsmatura* (higher vocational diploma) in 2008. This support programme gives apprentices the opportunity to attend free preparatory courses during their apprenticeship and to take partial examinations for certification (the so-called *Berufsreifeprüfung*), which is equivalent to a higher (post-secondary or tertiary) education entrance examination. Thus, the participants are enrolled in an apprenticeship programme while at the same time receiving an education that opens up access to tertiary education.

Hungary and Romania have recently developed and strengthened their dual vocational training pathway (partly based on examples from Austria and Germany) as a way of enhancing the image of vocational training vis-à-vis tertiary education and attracting more young people into these training pathways to meet existing and developing labour shortages.

Similarly aimed at the sector of skilled trades, the *Pakt Pro Artisanat* (skilled trades pact) initiative in Luxembourg seeks to address the growing shortage of skilled trades workers, not only by marketing relevant training and occupations to young people at the point of deciding their future career paths but also by providing support for the business transfer and succession of established companies to skilled young workers in these trades.

Another sectoral-level response has been developed in Malta, where the European Gaming Institute of Malta (EGIM), a joint venture between the Malta Gaming Authority (MGA) and the Malta College of Art, Science and Technology (MCAST), was launched in response to the ever-increasing demand for talent and the issues of skills mismatches in the online gaming sector. To this end, the EGIM provides a mix of short training courses and programmes at both a diploma level and a postgraduate/master's degree level. The institute aims to ensure that training and development programmes are aligned with the needs of industry by undertaking sustained efforts to understand current skills requirements and by forecasting future skillsets in line with technology and product trends. In 2018, the EGIM partnered up with the iGaming Academy, a private training provider with extensive industry expertise in compliance and skills-based training. Owing to this collaboration, short classroom-based sessions targeting students, as well as workers, are being offered. Moreover, in 2019, the Award in iGaming was launched as a joint collaboration between the EGIM, MCAST and the iGaming Academy.

There are also joint social partner initiatives in this area. In Sweden, employers and trade unions jointly established the Technology College (*Teknikcollege*) in 2004. Its purpose is to increase the attractiveness and

quality of technically oriented education, including by increasing the status and quality of industry-relevant education and matching the education system with the skills needs of Sweden's industrial companies. Teknikcollege is managed as a regional organisation with the collaboration of several municipalities. As of early 2020, there are 150 education organisers and over 3,000 companies collaborating in the initiative. The participating companies inform the content of the programmes, making the content of the courses taken by around 16,000 students annually more relevant to the needs of the labour market. In the Swedish engineering sector, the image bank 'Widen your image' (Bredda bilden) was created by the Association of Swedish Engineering Industries to enhance the image of what engineering is and of who works in the sector, with a focus on showing images of female engineers in particular.

The purpose of such initiatives often lies not only in making these sectors more attractive but also in overcoming skills mismatches. Measures primarily aimed at this goal are discussed in more detail in the final section of this chapter, 'Enhancing the use of existing labour and retaining workers'.

Enhancing the attractiveness of living and working conditions in specific regions

A lack of intraregional mobility at Member State level can contribute to aggravating shortages. An unwillingness on the part of workers and their families to move is particularly striking in countries with significant regional variations in the level of unfilled vacancies. Evidence shows that a reluctance to move for work reasons increases with the age of the jobseeker, particularly following family formation and the integration of children in schools and the establishment of local support networks. The increasing tendency towards completing tertiary education pathways thus has a potential impact on mobility.

These underlying barriers to mobility can be aggravated if living and working conditions in specific countries or regions are perceived as unappealing. The reasons for these can be manifold, such as:

- financial
- practical
- environmental
- political

Financial barriers relate not only to the cost of moving to another area (addressed in the next section, 'Activation of underutilised resources') but also to the cost of living and working in areas with high demands for labour – often capital regions or other large metropolitan areas where the cost of living, and in particular of housing, commuting and service provisions such as childcare, can be substantially higher than in the region of origin (Lux and Sonega, 2012). Particularly

for workers in the healthcare and education sectors, but also those in other lower paid shortage occupations, such costs are either prohibitive or not commensurate with the financial advantage of taking up a job in such an area. Furthermore, practical considerations such as poor infrastructure links or difficulties in accessing high-quality public services can pose an issue. Research has also shown that environmental factors such as high levels of pollution can have an impact on the attractiveness of certain locations (Germani et al, 2018; Mikula and Pytliková, 2020). Particularly in relation to movements between countries, political considerations linked to levels of trust in government and public administration can also influence decision-making (European Commission, 2018b).

A number of the shortage regions highlighted in Chapter 2 have initiated specific programmes to address such issues and to offer practical assistance to workers and their families newly arrived in a region. In Austria, the Welcome Tyrol service assists skilled workers taking up a job in the region to find accommodation and services such as doctors and childcare, and helps their partners in making a new start in their own professional life in the region. Where necessary, workers can be referred to services to help them with language acquisition, as well as with community engagement through leisure, sports and cultural activities. Assistance can also be provided to companies recruiting such workers, such as in dealing with legal and official matters. Similarly, skilled workers who are registered as unemployed in the regional province and city of Vienna are assisted through a collaboration between the PES in Vienna and the PES in Upper Austria and are made aware of concrete employment opportunities in Upper Austria. The goal of the project is for at least every fifth skilled worker who is advised and accompanied to an interview to take up employment in an Upper Austrian company. Such workers can also be provided with assistance to source accommodation, a job for their partner, and school or childcare places for children.

A number of shortage regions in Germany (such as Lower Saxony and Baden Württemberg) have implemented similar strategies aimed at supporting cross-regional mobility. The same is true in Latvia, where a programme assists mobile jobseekers with transport and rent compensation and provides financial support to high-level professionals to allow them to purchase a home in a shortage region if they have insufficient savings for a first deposit on a property; there is also a government programme to construct rental housing in shortage regions.

Policies linked to migration and mobility

Although some countries and companies are actively encouraging the intra-EU movement of labour (with the help of EURES) - since this is based on the free movement principle – such initiatives are not specifically discussed here. In what follows, the focus is therefore placed on efforts made by a number of countries to attract nationals back to their country after a period spent working abroad, as well as on managed third-country migration schemes. As will be shown below, policies aimed at managing the migration of TCNs are significantly better developed than efforts to encourage the return of emigrants. This is at least in part related to the legislative framework in place to manage the migration of TCNs. Finally, this section also briefly looks at initiatives aimed at better integrating refugees and asylum seekers into the labour market.

Encouraging the return of nationals

As the European Commission (2021) has shown, in recent years intra-EU labour mobility has followed an upward trend. In 2019, there were 19.9 million movers in the EU27 and the UK, with 34% of them having a tertiary level of education. The most important EU destination countries of high-skilled movers were Germany, Spain, France, Belgium and Austria, while the major sending countries were Poland, Romania, Italy, Bulgaria and Portugal. Data show that the spells of intra-EU mobility are getting shorter, with 50% of movers staying in the host country for just one to four years. Return mobility has also increased: for every four persons who leave a Member State, three return. Although reliable data are lacking, the information that is available suggests that individuals who have moved once are more likely to move again.

Policy proposals to address the issue of brain drain in the sending countries focus on reducing regional disparities by means of investments financed through the cohesion funds, but also on broader EU-level initiatives such as the proposal to introduce adequate minimum wages, which have a direct effect on living standards and working conditions.

Despite evidence of labour shortages in many sending countries, there is little evidence of concerted policy activity aimed at retaining skilled movers or reattracting them to their home country. Where such policies are in place, they tend to be small-scale, and there is limited evidence of their effectiveness (European Commission, 2018b). However, policies aimed at retaining skilled workers in the home country are difficult to identify, as a general policy mix aimed at economic, education and training development, as well as active labour market policy, can be considered to also serve this purpose, without being specifically targeted at potential movers.

Policy initiatives aimed at attracting EU mobile workers to return to their home country – Lithuania, Portugal and Slovenia

A new Strategy for Demography, Migration and Integration 2018–2030 adopted by the Lithuanian Parliament seeks to address demographic challenges, migration management, diaspora policies and (re)integration. The main objective of the strategy is to ensure a positive population change and balanced age structure. To achieve the main objective, the document establishes three goals related to family, migration and senior citizens, in particular developing a family-friendly environment, ensuring proper management of migration flows according to Lithuania's needs, and enabling senior citizens to integrate into public life. In relation to migration policy, it also emphasises the importance of the return migration of Lithuanian residents to address shortages, as well as attracting a highly qualified labour force from non-EU countries and the creation of a well-functioning integration system for newly arrived migrant workers.

In Portugal, the Return Programme, adopted by the government in 2019, aims to support emigrants, as well as their descendants and other relatives, to give them the best conditions to return to Portugal and make the most of the opportunities that currently exist in the country. It includes specific measures such as tax benefits for those returning, financial assistance for emigrants or relatives of emigrants who come to work in Portugal, and a credit line to support business investment and the creation of new business ventures.

Similarly, the Slovenian government adopted its Strategy in the Area of Migration in 2018, which also includes measures to support the retention of native workers at home and the repatriation of Slovenian emigrants. Beyond this, it focuses on security issues related to illegal migration and the effective management of the migration of skilled workers.

Where measures aimed at attracting return migration are in place, they tend to focus on specific groups of people or required skills. Measures include making return locations (many such initiatives are regional) more attractive, assisting with the matching of workers with job opportunities in the home country, sharing experiences of returners and offering opportunities to establish their own businesses. Another focus is on offering 'one-stop shop' services to help with all job search, administrative and other requirements involved in a return (including sourcing schooling, childcare and so on; European Commission, 2018b). These initiatives rely heavily on proactive collaboration between different agencies and effective networking with diaspora communities.

Managed migration policies

Many Member States consider migration from third countries to be an important source of labour, but there are significant differences in the policy emphasis placed on third-country migration as a way to address labour shortages and the use of measures to activate unemployed individuals or make use of other hidden sources of labour. This depends to some extent on the quantitative and qualitative nature of labour shortages but can also be driven by policy culture or political motivations in a country. Most Member States employ a demand-driven model of managing third-country migration, allowing them to adjust their labour migration policies in the light of labour market shortages (European Commission, 2015). Employers in

shortage sectors can thus benefit from some of the following:

- exemptions from labour market tests (for example, in Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Ireland, Poland and Spain)
- exemptions from quotas (for example, in Croatia and Italy)
- access to a points-based system (such as the one in place in Austria)
- reduced minimum income threshold requirements (in Estonia, Greece, Ireland, Latvia and the Netherlands)
- the easing of access for certain groups already in the country, such as students (for instance, in France, Germany and Lithuania) and asylum seekers (Sweden)
- more favourable conditions for family reunification (for example, in Ireland)

A report prepared for the Commission by the European Migration Network (European Commission, 2015) notes that only a few Member States monitor the impact of labour migration on shortage occupations (just five countries do this on a regular basis).

Member State initiatives aimed at managing third-country migration in shortage sectors are summarised in Table 13. The most recent developments in the applicable legislation and policies point to an easing in the criteria for labour market access for TCNs as labour shortages become more prevalent, particularly for workers in established shortage occupations (prior to the pandemic).

Table 13: Specific managed migration initiatives that aim to address labour shortages in key shortage sectors/occupations, EU27, spring 2020

| Country | Title | Content |
|-----------|--|---|
| Austria | Rot-Weiß-Rot Karte: kriteriengeleitete Zuwanderung nach Österreich (Red-White-Red Card: criteria-based immigration to Austria) | The Red-White-Red Card is a permanent immigration programme for several different groups of TCNs who reach a specific number of points for qualification, work experience, language criteria and age, such as very highly qualified workers, skilled workers in shortage occupations, other key workers, graduates of Austrian universities and colleges of higher education, self-employed key workers and start-up founders. |
| Czechia | Project on economic immigration | In 2012–2018, six migration programmes were introduced to support labour migration from selected third countries (particularly from Ukraine, which was the most important source country over the long term). On 12 March 2020, the government suspended applications for these programmes following the declaration of a state of emergency. |
| Estonia | Changes to the Aliens Act (Välismaalaste seadus) | Changes to the Aliens Act have been gradually introduced since 2016. These changes include: easing the salary criterion set for employers that hire employees from third countries: TCNs previously had to receive at least 1.24 times the national average salary irrespective of the sector or occupation (or 2 times the average in the case of high-level professionals), but, as of 2017, the salary criterion was lowered to the national average salary (except in the case of high-level professionals) and some groups are excluded (seasonal workers and employees of start-ups) excluding from the immigration quota TCNs working in ICT occupations and in start-ups (as of 2017) and high-level professionals in all fields (as of 2018), to mitigate |
| Finland | Changes to labour market tests and amendments to the Aliens Act (<i>Ulkomaalaislaki</i>) (2004/301) | labour shortages. Since 2019, labour market tests (the process of determining the availability of labour) have no longer been used for employers applying for an extension to the residence permit for an employed person who transfers to another sector. The amendment sought to increase the supply of labour in the cleaning sector and the manufacturing, construction and metal industries. |
| Greece | Catalogue of difficult-to-fill occupations | The Labour Ministry publishes a list of those professions in which vacancies are most difficult to fill (monthly and annually). This catalogue allows employers to process work permits for a foreign worker who is qualified for these occupations. This instrument was created in 2011. |
| Ireland | Employment Permits (Amendment) Act (27 July 2014) | The act allows employers to get a work permit for an occupation that is subject to shortages. The Expert Group on Future Skills Needs advises the government on labour market requirements in respect of strategically important skills. The salary levels on offer for the job, qualifications and experience are taken into account when including an occupation in the eligible list of occupations. The Department of Enterprise, Trade and Employment, which administers the act, also operates an ineligible list of occupations, for which no work permit will be issued. |
| Latvia | Attracting highly qualified labour from abroad | To ensure the balanced development of the labour market and the economy in the medium term, in February 2018 the Cabinet of Ministers approved regulations providing for the introduction of incentives for highly qualified labour from third countries in professions where a significant labour shortage was forecast. In 2019, the shortage list included 237 professions. |
| Lithuania | Law on the Legal Status of Aliens No. IX-2206 (29 April 2004) | Procedures relating to the employment of TCNs in Lithuania remained highly constrained up to 2018. With increasing labour shortages, however, the parliament in 2018 adopted amendments to the law aimed at improving the regulation of the legal status of foreigners by reducing administrative burdens and simplifying procedures for the recruitment of TCNs. Furthermore, on 10 April 2019, the government approved the amendments to the law, according to which quotas would be set for foreign workers from third countries based on the list of shortage occupations. TCNs recruited under the quotas will be subject to simplified procedures. |
| Malta | Fast-track work permit scheme for non-EU nationals | In July 2018, the government introduced changes to the work permit process for TCNs. Before this change was implemented, a foreign worker was required to wait for a lengthy period of time upon arrival for a work permit to be issued. Applications are now being vetted before the applicant arrives in Malta, and a temporary work permit is provided to the applicant upon approval if all requirements are met. |
| Poland | Easing recruitment of TCNs | Since 2015, a number of measures have been introduced to ease the recruitment of TCNs. Since 2015, workers from Armenia, Belarus, Georgia, Moldova, Russia and Ukraine have been allowed to be employed for a maximum of 6 months over a 12-month period based on a statement of the employer – without the need for permission or conducting a so-called labour market test. In 2018, a rule was introduced according to which, after a period of work, the work of a TCN would be considered legal while waiting for the work permit application to be considered. In addition, a new type of seasonal work permit was introduced in tourism and agriculture, which is valid for up to nine months during the calendar year. In relation to citizens of the above-mentioned countries, this permit does not require a labour market test. It is possible to obtain a multi-season permit (up to three years) and grant an employee non-seasonal work for up to 30 days. |

| Country | Title | Content |
|----------|---|--|
| Portugal | Tech Visa programme | Established by the government in 2018, the Tech Visa programme is a certification programme targeting companies that wish to attract highly qualified and specialised workers to Portugal, including nationals from countries not included in the Schengen area. This programme aims to ensure that highly qualified staff can access jobs created by Portuguese incorporated companies or start-ups in a simplified way. With the amendment to the Aliens Law in 2020, the temporary residence permit for highly qualified employment in certified companies (the Tech Visa) is now valid for two years (not just one) from the date of issue of the corresponding title and is renewable for successive periods of three years (not just two). |
| | Budget Law for 2020 (Law 2/2020 of 31 March) – amendment to Article 75 of the Aliens Law | This article establishes the conditions for admission into Portugal of employees for the exercise of a highly qualified activity (according to Council Directive 2009/50/CE of 25 May). It provides for the granting of a residency visa for the exercise of a highly qualified activity by a national from a third country. |
| Slovakia | Support for immigration of foreign workers | The growing shortage of domestic labour led to the simplification of provisions for the employment of TCNs in 2018. |
| Slovenia | Act Amending the Employment, Self-employment and Work of Foreigners Act (17 October 2017) | This act eases the hiring of highly skilled foreigners in enterprises that generate high added value. The law allows specific companies to hire highly skilled foreign workers using a shortened procedure. |
| | Strategy on Migration (28 July 2019) | With its migration strategy, the Slovenian government has set three goals: the promotion of foreign labour migration, the retention of native workers at home and the repatriation of Slovenian emigrants. To attract TCNs and ensure their integration in society, the following measures are proposed: eliminating administrative barriers in issuing work permits, setting up information points in third countries for promoting employment opportunities in Slovenia, organising integration programmes prior to arrival, offering free language courses and requiring foreign workers to have a basic knowledge of the Slovenian language within one year. The strategy also explicitly mentions greater protection of the human and labour rights of foreign workers. |
| | Order determining the occupations in which the employment of aliens is not tied to the labour market | Each year, the minister of labour publishes the <i>Order determining the occupations in which the employment of foreigners is not tied to the labour market.</i> The order allows the issuing of work permits without the condition that no Slovenian jobseeker has applied for the job. The rule refers only to specific occupations: welders, heavy truck drivers, toolmakers, metalworking machine tool setters and operators, building and related electricians, bricklayers, carpenters and joiners, cooks, electrical mechanics and fitters, ICT sales professionals, and database and network professionals. A Slovenian employer was allowed to employ no more than 50 workers under this regulation. The order expired on 31 December 2020 (Information relates to order in place up to end December 2020). |
| | Agreement between the Government of the Republic of Slovenia and the Government of the Republic of Serbia (28 May 2019) | Under this agreement, Serbian nationals over the age of 18 years are entitled to search among job vacancies for which Slovenian candidates have not applied. The Slovenian employer and the foreign worker must conclude the employment contract for at least one year. The worker is obliged to stay with the same employer for one year and can then change jobs. After three years, a work permit can be reissued for another three years. |

Integration of refugees and asylum seekers into the labour market

Eurofound (2018a) showed that refugees can face more challenges in the process of labour market integration than labour migrants. Refugees do not have a job arranged prior to their arrival, whereas often labour migrants do. In terms of employment, experience has shown that it can take 20 years for employment rates of refugees to catch up with those of native-born workers (OECD, 2019). To prepare for entering the labour market, refugees often rely on certain public services (for example, housing, health and education) and specific preparatory measures (for example, language training, orientation courses and training for specific skills). Moreover, they have often experienced trauma, lost time in the asylum stage, become demotivated when residing for months in collection/reception facilities without much to do, and faced uncertainties in terms of the prospect of residing legally and permanently, even after asylum is granted. All of these circumstances underline the importance of social

integration other than entering the labour market, involving access to services such as housing, social assistance, health and education. Galgóczi (2021) underlines the impact of differences in asylum and migration policies, as well as active labour market policies, on the success of the integration of different migrant groups into the labour market in the EU Member States.

Improving recruitment strategies at company level

Enhanced wages and benefits are only one way in which individual employers can seek to attract talent in a tight labour market. The results of the European Working Conditions Survey show that there are other aspects of working conditions and working life that are highly valued by employees, including access to ongoing training and career development, flexible working hours and other enhanced work-life balance measures, as well as the feeling of working in a company where workers' collective and individual input is valued

Addressing skills shortages in the construction sector - Austria, Malta and Poland

To address significant labour shortages in the construction sector, the Austrian construction company PORR established an in-house training and further education centre in 2019. At this centre, the full-service provider offers every apprentice an additional three weeks of practical training per year. The curriculum includes practice blocks in the areas of bricklaying, formwork construction, civil engineering and paving. In addition, individual courses to prepare for the final apprenticeship examination are available to apprentices. In early 2020, around 220 apprentices from all over Austria were being trained at the PORR campus. In addition, special training courses are available to assistants, skilled workers, supervisors and polishers in the areas of work safety, handling software and equipment, and construction techniques for personal and professional further training. In addition to sector-specific and high-level digital skills training, the campus offers accommodation and sports and leisure facilities for trainees.

In Malta, a Construction Industry Skill Card (CISC) system has been developed to address the lack of training and certification in the construction sector, which is believed to contribute to labour shortages in the sector.

A further example from the construction sector comes from Poland, where Erbud, one of the largest domestic employers in the construction sector, is running sponsored classes in several vocational schools in various regions of the country. Under the cooperation model, the school is responsible for organising workshops, trips and apprenticeships, and provides workshop and teaching rooms where classes take place. As a sponsor, Erbud provides students with the opportunity to become familiar with practical work on a construction site, substantive support for teaching vocational subjects and modernisation/renovation of the classrooms. Students of the sponsored classes have the opportunity to pursue apprenticeships at the construction sites run by the company, where they have a good chance of obtaining employment with the company after completing their apprenticeship.

(Eurofound, 2017c). In many countries, awards systems are in place which rate the top employers based on employee assessments of being a 'good place to work'. Having a positive rating in relation to such awards, as well as word of mouth, can assist companies in being attractive to jobseekers in a labour market where they can choose between employers. An important role can also be played by the recruitment practices adopted and the extent to which such systems are able to target the calibre of workers being sought.

Activation of underutilised resources

As indicated in Chapter 1, almost a third of individuals in the EU aged between 15 and 64 years are either unemployed or inactive (26.6% of the population in this age group were inactive in 2019). While a high proportion (36%) of this group were not in employment because they were in education or training, around 15% of the inactive population cited illness or disability as the main reason for not seeking work, with a further 17% citing family/caring responsibilities. Around 4% considered that no work was available to them, discouraging them from seeking employment.

Among the long-term unemployed, low or outdated skills pose an issue (addressed in the next section, 'Enhancing the use of existing labour and retaining workers'), but many of the labour market groups and individuals who find themselves long-term unemployed or inactive face barriers to integration that extend

beyond low or outdated skills. Among the key drivers of shortages linked to the lower representation of these groups in the labour market are:

- poor integration support (for example, for those with health issues) and issues around discrimination
- work-life balance conflict

Given the availability of a 'reserve army of labour', it may initially appear surprising that measures supporting the activation of underutilised resources constituted the lowest number of policy initiatives reported by members of the Network of Eurofound Correspondents as being directly aimed at addressing the key sectoral and occupational shortages reported. This is to some extent because, according to the typology used in the report, this cluster of measures is limited to addressing labour market barriers for disadvantaged or discouraged groups, excluding measures addressing skills barriers. In addition, the relatively low number of measures in this area could also be associated with the fact that initiatives aimed at overcoming underlying barriers to labour market entry are challenging, often require a multifaceted and multi-agency approach, and can take longer to bear fruit - not least because they are often just a first step on a longer integration journey. They are therefore less likely to immediately satisfy target-driven labour market integration policies. Table 14 summarises the measures taken at Member State level to address these types of barriers in cases where they were considered to

Table 14: Measures taken at Member State level to activate underutilised resources and retain labour, EU27, spring 2020

| Type of measure | Description | Countries using this approach |
|--|---|---|
| Addressing geographical barriers | Support for mobility. | Austria, Croatia, Latvia, Lithuania, Sweden |
| Addressing work-life balance | Providing support for childcare. | Malta |
| issues | Enhancing work-life balance policies, including the encouragement of a better balance in caring responsibilities between men and women. | Estonia, Slovenia, Spain |
| Active labour market policies and other measures to support the integration of specific groups | Overcoming non-skills-related barriers to integration for vulnerable groups in the labour market, including those who are long-term unemployed, workers with disabilities, and migrants and refugees. | Belgium, Bulgaria, Czechia, Denmark, Germany |
| | Improving rehabilitation services to allow workers to return from long-term sick leave, unemployment or inactivity. | Austria, Estonia, Romania |

be particularly important for attracting additional workers to sectors and occupations experiencing particular shortages in the country.

The issue of discrimination as a barrier to integration is not raised in these measures. However, a study by Eurofound (2020e) demonstrates the important challenges remaining in tackling discrimination in recruitment and at the workplace and the important role played by social partner initiatives in this area to complement, implement and enhance existing legislation and government policy.

Addressing geographical barriers

The section on attracting labour has already discussed some aspects linked to geographical mobility, including enhancing the attractiveness of specific regions and encouraging greater interregional and intra-EU mobility. In terms of approaches to overcome barriers to labour market entry for unemployed or inactive individuals, financial support can play an important role when vacancies are not available in close proximity to their place of residence. As well as ensuring that candidates are able to physically attend interviews, measures to compensate for high commuting costs can be the difference between successful and unsuccessful matching between jobseekers and a workplace. To address such issues, a number of Member States, including Austria, Latvia and Lithuania, offer travel allowances. Austria provides jobseekers with access to a long-distance travel allowance (Enfernungsbeihilfe) as a partial reimbursement of the cost of additional financing burdens arising from the distance between the place of work and the place of residence, which can include travel and accommodation costs. Croatia offers such mobility support for students and trainees.

Addressing work-life balance issues

The continued underrepresentation and underutilisation of women in the labour market, as mentioned in Chapter 1, strongly underscores the need to improve work-life balance measures. Such initiatives can take different forms, including amending family leave schemes by placing greater emphasis on more equal sharing of caring responsibilities and leave take-up, as well as improving access to flexible working and greater investment in childcare and long-term care facilities.

Enhancing work-life balance and encouraging a more equal sharing of caring responsibilities

One of the key goals of the EU Work–life Balance Directive is to support the take-up of leave by fathers and to encourage the greater sharing of caring responsibilities. The emphasis has been on extending paternity leave and reducing the transferability of parental leave while (in some cases) enhancing compensation during paternity and parental leave to make this more attractive to fathers.

In the transposition period for the directive, several Member States have taken action to amend their systems of family leave. Greater equality in taking up leave is being encouraged to allow women to return to the labour market sooner, thereby addressing a variety of goals, including addressing labour shortages.

For example, in Spain, under Royal Decree-Law 6/2019, parental leave will progressively become more equal to maternity leave until it reaches 16 weeks for both mothers and fathers in 2021 and will be non-transferable. In Slovenia, the Parental Protection and Family Benefits Act (2018) extended paid paternity leave by five days (from 25 to 30 days). In 2017, Estonia introduced a 30-day-long paternity leave, which will be covered by a non-transferable parental benefit and compensated at 100% of previous salary.

Within individual companies, there are examples that go further to equalise leave entitlements for men and women. In May 2019, global beverage company Diageo announced that it will offer 26 weeks of paid paternity leave to match 26 weeks of paid maternity leave to its workforce in Ireland, where it employs around 1,500 workers. Ireland offers 26 weeks' statutory maternity benefit of €245 a week and two weeks of paternity benefit at the same level. To encourage fathers to take the full benefit, the extended paternity leave offered by Diageo is non-transferable.

An assessment of the costs and benefits of enhanced leave systems also suggests that greater access to flexible working and enhanced childcare provision would significantly contribute to the more rapid reintegration of women into the labour market. Even limited aspects of flexibility (such as the ability to take an occasional hour off work to take care of family responsibilities or flexible start and end times) can have a significant impact on the perception of improved work–life balance (Eurofound, 2018b).

The European Parliament (2021) found that employer measures ensuring regular contact with women while on parental leave, maternity return coaching, breastfeeding facilities, supporting the higher take-up of men of parental leave and offering childcare support have a positive impact on encouraging the (earlier) return to work of women following leave. Active labour market policies specifically supporting single parents are also encouraged.

Enhancing access to childcare and adult care services

Acknowledging the importance of the availability of high-quality, accessible and affordable childcare, the European Council set the following so-called 'Barcelona targets' in 2002 (restated in the European Pact for Gender Equality (2011–2020), to be reached by 2010, of providing childcare to:

- at least 90% of children between three years of age and the mandatory school age
- at least 33% of children under three years of age

Nearly 10 years on from the target date, while most Member States meet or exceed the first target, a significant number fall short of the target of childcare availability for younger children. In addition, there are significant differences in the hours of enrolment in childcare between Member States. In 2018, 35.1% of children in the EU27 and the UK under three years of age received early childhood education and care (ECEC) for an average of at least one hour per week. Between 2010 and 2018, the average number of hours in ECEC rose from 7 to 10 hours (Eurofound, 2020f).

An analysis of the main reasons for not using professional ECEC shows that these reasons vary by parents' age group, with younger parents who wish to access such services being the most likely to indicate that costs are prohibitive. As well as being affected by income brackets, the differences in the reasons provided by age groups are also associated with the nature and costs of provisions of ECEC in different EU countries. Most EU countries (25 of the Member States) offer free ECEC to children in the last year before school starts (that is, at four, five or six years of age, depending on the country). Free-of-charge ECEC is available to three-year-old children in 15 Member States. Only Latvia, Lithuania, Luxembourg and Romania offer this for children under the age of two (European Commission/EACEA/Eurydice, 2019, quoted in Eurofound, 2020f). With the explicit goal of addressing the low participation rate of women in the labour market, Malta introduced free childcare for children under the age of three in 2014.

In relation to long-term care, basic availability and affordability vary immensely between Member States (SPC and European Commission, 2014; Eurofound, 2017d, 2019c), with few data being available on the quality of such services (Eurofound, 2019d). As the population ages, access to such care services is likely to play an ever-increasing role in maintaining the labour force participation of carers.

Overcoming non-skills-related barriers to labour market entry

Some unemployed and inactive individuals face barriers to labour market entry that go beyond the need to acquire labour market-relevant skills. Such barriers often have to be addressed before skills needs can be met or need to be tackled in tandem to achieve successful and sustained labour market integration. In addition to challenges around childcare or other care obligations, the barriers may include one or other of the following:

- health conditions
- addiction problems
- debt problems
- lack of language skills
- lack of accreditation of skills and qualifications
- lack of 'soft employability skills'

Measures to tackle language skills and the accreditation of skills and qualifications gained abroad have increasingly been the focus of measures to support and tap into the full potential of migrants, refugees and asylum seekers in different countries (Eurofound, 2019b), but they did not feature prominently among key policies or measures aimed at tackling labour shortages reported for this research (apart from in examples from Cyprus, Czechia and Sweden).

Supporting the rehabilitation of workers on long-term sick leave - Austria

Fit2work is a prevention and early intervention programme in Austria offering a low-threshold, free-of-charge consulting service (including case management) for employees whose jobs are endangered owing to health problems or for persons who have difficulties finding employment because of their health condition. Since 2013, the programme has been available in all nine federal provinces of Austria. Fit2work is open to all employees facing health problems and to all age groups. The programme is open to both individual workers and unemployed people, as well as to companies. Repeated evaluations have shown that the service has a positive impact on the integration of supported unemployed individuals, as well as on the reduction of the length of sick leave among those in employment.

Initiatives to tackle some of the other barriers mentioned above tend to focus on individual action planning and the agreement of personalised integration pathways, which can involve a multi-agency approach. Although individual action planning in general has become more commonplace in PES in recent years, such multi-agency efforts remain more exceptional and are often supported by European Social Fund (ESF) social inclusion funding programmes. In Bulgaria, for example, an ESF-supported programme provides iobseekers with disabilities with financial means to employ a 'personal assistant' to support them in employment. In Czechia, the ESF also supports specific integration programmes for individuals with disabilities, ethnic minorities and migrant workers facing language issues and other disadvantaged groups with the express goal of helping to tackle labour shortages. While the primary goal of such measures is labour market integration, they are also intended to contribute to addressing shortages. Multifaceted support for the labour market integration of such groups is also provided for in Belgium, Denmark and Germany and delivered in combination with training measures.

One specific aspect of such initiatives that is increasing in importance as the population ages relates to rehabilitation services.

Improving rehabilitation services

The importance of prevention and workplace accommodation is emphasised by the fact that 13% of the EU working population report having a limiting longstanding illness. Data from Eurofound's European Working Conditions Survey demonstrate that 9% of workers say that they are severely limited by their condition, with a further 45% indicating that their performance is somewhat limited by their condition. This is more prevalent among older workers.

A strong emphasis on the prevention of ill health in the context of sustainable employment (Eurofound, 2015a) is at the heart of Estonia's so-called 'workability reform'. It aims to integrate as many people with a reduced ability to work into the open labour market as possible, including those who had been inactive for years, by encouraging them through support measures and an allowance system. The mitigation of labour shortages

was one of the explicit goals of this reform. Among the approaches used was the transformation of a system of passive support into an activation allowance, requiring individuals with health conditions to seek work and providing rehabilitation, training and placement support, as well as support for employers to make workplace accommodations, where required.

Romania's 2015 National Strategy for Active Ageing also sets out rehabilitation support measures aimed at preventing early labour market exit and supporting the reintegration of workers leaving the labour market because of health conditions.

Enhancing the use of existing labour and retaining workers

Measures to enhance the use of existing labour aim to obtain a better match between the skills demanded in the labour market - both currently and in the future and those existing in the labour supply, including among jobseekers and those in employment. Skills mismatches are driven by a wide range of factors, including the megatrends of demographic and climate change and digitalisation, changing patterns of consumer demand and associated structural changes in the economy. However, they are also the result of a failure to effectively adjust education and training curricula to such developments; a lack of investment in education and training by governments, individuals and employers; poor education and training choices of individuals; and a lack of information on current and future skills requirements, for example through forecasting. In addition, skills mismatches can also result from poorly developed labour market matching systems and inadequate individual search behaviour.

The fact that the highest number of measures reported to address shortages focus on addressing skills mismatches is a testament to the relevance of the above drivers of qualitative shortages to an inadequate match between the supply of and the demand for labour. Table 15 provides a summary of the measures taken at Member State level to address these issues, including improved matching between supply and demand through better forecasting; aligning current and future

skills requirements with education and training curricula; improved matching systems, including competency assessments and action planning by employment agencies; the provision of relevant training and work experience to jobseekers to meet the requirements of bottleneck occupations; encouraging individuals to make education and vocational training choices to meet the needs of the labour market; and ensuring better preparation among existing employees for labour market change resulting from digitalisation and developments in consumer demand.

A number of initiatives also focus on reducing labour market slack by enabling part-time workers to increase the number of hours worked through job sharing, while at the same time enabling employers to meet skills shortages.

Finally, this section also addresses measures to prevent the exit of older workers from the labour market, as this is related to the issue of enhancing the use of existing labour.

Table 15: Measures taken at Member State level to enhance the use of existing labour to assist in addressing shortages, EU27, spring 2020

| Type of measure | Description | Countries using this approach |
|---|---|--|
| Improved matching between supply and | Using skills forecasting to adapt vocational and ongoing training systems to identify future shortages. | Croatia, Estonia, Greece, Latvia, Lithuania, Malta |
| demand | Integrating broader government development strategies with training and job creation (taking account of digital transformation and artificial intelligence). | Ireland |
| | Improving the match between the education system at all levels and labour market needs through regular updating, including with the involvement of social partners. | Bulgaria, Germany, Latvia, Lithuania, Netherlands (technology sector), Poland, Spain |
| Addressing skills | Introducing and developing dual education pathways. | Slovakia |
| mismatches | Enhancing the relevance of transferable skills in vocational training systems, including digital and soft skills. | Finland, Ireland |
| Improved matching | Improving career guidance and counselling. | Greece |
| systems | Better validation and certification of existing skills and non-formal and informal education. | Croatia, Cyprus, Sweden |
| | Implementing active labour market policies (training) to provide a better match between bottleneck occupations and jobseekers (sometimes intensive/accelerated). | Austria, Belgium, Bulgaria, Croatia, Cyprus, Estonia, Finland, Germany, Latvia, Romania |
| | Delivering workplace-tailored training (for example, by PES). | Austria, Belgium, Cyprus |
| | Greater emphasis in active labour market policies on in-work training. | Bulgaria, Cyprus (both at home and abroad for qualifications that cannot be obtained in the country), Czechia, Denmark, Estonia, Greece, Ireland, Italy, Latvia, Slovenia |
| Enhancing the preparation of employees for labour | Providing support for the delivery of lifelong learning, including digital skills. | Austria, Belgium, Latvia, Luxembourg, Sweden |
| market change | Ongoing assessments of vocational requirements (including mid-career assessments). | Croatia, Germany |
| Enhancing the use of existing labour through employee sharing | Addressing labour shortages through employee sharing. | Czechia, Netherlands |
| Preventing early exit from the labour market | Providing support for active age management strategies and promoting the retention of the work ability of older workers. | Lithuania, Romania, Slovenia |
| | Pension reform and other (non-skills-focused) measures to retain older workers. | Croatia, Estonia, Slovakia, Slovenia |

Improved matching of supply and demand and better matching services

Most EU countries prepare national forecasts of anticipated future labour demand and supply. In addition, at EU level, Cedefop delivers forecasts, with projections also available at national level; the latest forecasts cover the period up to 2030. ¹² A criticism sometimes levelled against national forecasts is the relative absence of reliable forecasting elements on more detailed skills needs. The development of more detailed assessments is a relatively recent development (ILO and OECD, 2018).

Many approaches and methods have been developed to identify and analyse current and future skills needs (ILO and OECD, 2018; Table 16). Each of these methods has specific data and technical expertise requirements, and their use largely depends on the study objectives (qualitative or quantitative), the level of analysis (national, sectoral or local) and the availability of data and operational capacities of responsible agencies.

Larger scale, economy-wide forecasts usually employ quantitative macroeconomic modelling techniques. Such quantitative projects are then sometimes strengthened with expert advice and qualitative inputs and/or institutional collaboration between different

Table 16: Skills anticipation methods, data requirements, and advantages and disadvantages

| Instrument | Data requirements | Advantages | Disadvantages |
|---|--|---|---|
| Focus groups, round tables, expert workshops, expert opinion surveys and Delphi-style methods ^a | No specific data requirements. | Direct user involvement. May be able to address problems in greater depth. Useful mechanisms for exchanging views. | May be non-systematic. May be inconsistent. May be subjective. May be non-representative and provide a partial view. May be anecdotal, not grounded in reality. |
| Sector studies | Sector-based data from statistical surveys, employer– employee surveys, etc. | Strong on sectoral specificities, including detailed information on capabilities, competencies and skills. | Potentially partially biased. May introduce inconsistency across sectors. |
| Employer-employee skills surveys and enterprise/establishment skills surveys | A company registry from which the sample frame will be formed. | Direct user involvement. If the survey is factual, it focuses on how people behave, not on what they perceive. In the case of opinion surveys, they allows direct skills measurement. | Response rates are often low. Large samples are needed to get robust data; therefore, they may be expensive. May be subjective and inconsistent. |
| Quantitative forecasting methods | Reliable and consistent time series on labour markets (sector, occupation, qualification) and population (age, gender, labour market participation) are necessary. | Comprehensive. Consistent. Transparent and explicit. Measurable. | Require large datasets. Costly. May give false impression of precision. |
| Foresight and scenario development | May use a number of input data and reports, such as results of quantitative forecasts, labour market information and sector studies, but this is not compulsory. | Direct user involvement. May be able to address problems in greater depth. Useful mechanisms for exchanging views. Takes into account uncertainties for the future. | May be non-systematic. May be inconsistent. May be subjective. |

¹² More information about Cedefop's forecasts is available at https://www.cedefop.europa.eu/en/eyents-and-projects/projects/skills-forecast/data-visualisations

| Instrument | Data requirements | Advantages | Disadvantages |
|---------------------------------|--|---|---|
| Graduate surveys/tracer studies | Primary data collection. Tracer studies require the contact details of recent graduates. Additional administrative data from educational institutions can be used to enrich data. | May provide useful information for improving the quality of training programmes. Relatively low cost. Easy execution. | Difficult to establish detailed information and contacts for forming a sample/population for the survey. Confined to workers' early market experience and findings may be biased and subjective. |
| Vacancy surveys | Primary data collection. Vacancy surveys can either use existing administrative data or processes of PES or be conducted as employer surveys. Using administrative data requires adequate processes for ensuring the consistency and representativeness of data. | Direct user involvement. Targets jobs actually available – demand proxy. Objective. | Partial coverage, non-representative for all demands. Short-term demand only. Data processing takes time while some vacancies may be already taken. |

Note: ^aDeveloped by the Rand Corporation in the US in the 1950s, the Delphi method aims to obtain feedback from a broad spectrum of stakeholders on a specific topic.

Source: Adapted from ILO and OECD (2018)

institutions (for example, in Czechia, Estonia and Germany). National forecasts often offer detailed breakdowns of future skills requirements at occupational and sectoral levels (often also broken down by educational level in relation to supply projections). Some countries' forecasts also offer subnational breakdowns of information (for instance, in Croatia, Czechia, Germany, Poland and Slovakia).

The time span and frequency of forecasting varies. While long-term forecasts are obviously useful for medium- to longer term planning, they require a more sophisticated statistical infrastructure because they require longer time series data and microdata sources, which may not be easy to implement in all countries or regions. Furthermore, they are limited by the challenges of longer term forecasting, which might be disrupted by random shocks (for example, unpredictable technological or economic changes, which reduce the reliability of such exercises). Shorter term forecasts may provide more accurate scenarios, but their policy usefulness may be restricted to short-term skills policies (for example, temporary migration and active labour market policies). In view of the limitations associated with each type of exercise, countries often have multiple types of exercises in place, with varying time spans. For example, Germany complements its long-term forecasts (BIBB-IAB qualification and occupational fields) with short-term forecast exercises that feed specifically into the planning of vacancies in apprenticeships. A similar approach was also put in place in Estonia (see box below).

Typically, the time period covered in the forecasts available in EU Member States is between 5 and 10 years, although several Member States have forecasts that extend into the very long-term future (for example, to 2050 in Poland). In contrast, some countries undertake projections for the very short term, namely the next 12 months or 2–3 years. This is the case in Estonia, Latvia and Sweden.

Another key methodological development has been for the forecasts to include reflections on the core challenges facing the national labour markets. Thus, the forecasts in Cyprus and Romania have been made specifically for green jobs, whereas in Germany the forecasts include a specific digitalisation scenario.

Forecasting and foresight systems should, by definition, take into account anticipated further trend developments, insofar as they link to the megatrends of demographic and climate change and digitalisation. They should in principle also take account of key governmental economic development strategies (or regional/local development strategies if forecasting is done at this level). This link is explicitly made in Ireland's Technology Skills 2022 plan - the third plan of its kind. In line with the government's emphasis on attracting FDI and domestic growth in the technology sector, the Technology Skills 2022 plan aims to deliver an additional 5,000 graduates with ICT qualifications by 2022, representing a 65% increase from 2019. This goal is to be delivered in a partnership approach between the government, industry and the education sector.

Predicting future labour demand through skills forecasting systems – Croatia, Estonia, Greece and Lithuania

The Croatian Strategy for Education, Science and Technology includes the development of a forecasting system that will link education, labour market and social welfare data in order to model future labour and skills needs for specific occupations and qualifications. These quantitative data will be combined with employer surveys on labour market needs. To ensure a link between these data and training provision, tripartite involvement in the procedures will be ensured for the preparation of occupational and qualifications standards and curricula.

In Estonia, the System of Labour Market Monitoring and Future Skills Forecasting (OSKuste Arendamise koordinatsioonisüsteem – OSKA) was established in 2015 to better coordinate skills anticipation activities. The main goal of OSKA is to involve stakeholders more in the process of skills anticipation. Between 2016 and 2020, all Estonian economic sectors will be analysed, forecasting the labour force and skills needs for the next 10 years. The round of analysis of all economic sectors will be repeated, meaning each sector is analysed every six years on average. The forecasts rely on quantitative data as well as qualitative input (individual interviews and group discussions with sector representatives). The Occupational Barometer from the Estonian Unemployment Insurance Fund (EUIF) is another measure used to forecast labour demand on a short-term basis, focusing on a 12-month perspective and based on employer assessments at regional level. It aims to evaluate the balance between labour supply and demand after the next 12 months, that is, the ratio between the existing labour force on the labour market and employers' demands.

In Greece, the so-called Foresight Lab for monitoring drivers of change in industries and professions has been implemented. It focuses on 20 occupations in the following sectors, which are considered to be particularly affected by future skills shortages: agri-food/food, energy/environment, construction/materials, cultural and creative industries, technological/scientific, and professional services.

In Lithuania, the National Human Resource Monitoring (NHRM) framework, adopted in 2016, sets out the purpose, development, principles and coordination of the NHRM in Lithuania. Its aim is to collect and analyse national-level data on education and skills levels in the population and the labour market situation. The aim is for the analysis to help forecast future trends and make evidence-based decisions. The system was developed through collaboration between various ministries and statistical entities.

In addition to introducing or enhancing foresight systems, methodologies and partnerships, the better integration of high-quality foresight studies with the development of education and training curricula, as well as decisions around the availability of suitable (higher) education and vocational training places, is critical to ensure supply is better matched with

demand. In this context, the strong involvement of social partners, with their knowledge of current and future skills requirements, is key. The link between foresight systems and curricula development is part of policy developments in Bulgaria, Denmark, Germany, Latvia, Lithuania, the Netherlands, Poland and Spain.

Using forecasts to tailor education and training efforts – Denmark

In Denmark, the so-called Positive List is a list of professions experiencing a shortage of qualified professionals. The Positive List is updated twice a year on 1 January and 1 July. Job titles are listed according to professional fields. For each profession, the educational requirements are mentioned along with the associated code within the official classification of professions. The purpose of the Positive List is to allow the regional councils to promote focused education efforts in specific areas where job openings are expected within the next six months.

Addressing skills mismatches

Measures to address skills mismatches represent the next step on from measures to anticipate skills needs and the adaption of training curricula to meet labour market needs. Although they are closely linked, they are categorised separately, as they refer to the way in which the delivery of these relevant skills comes to be operationalised in the higher education, vocational education and training systems (whereas the next subcategory of measures, 'improving matching systems', focuses on the delivery of such skills to jobseekers).

The main focus of such measures for the shortage sectors and occupations discussed in this report has been on strengthening vocational education pathways, enhancing the attractiveness of vocational qualifications and (dual) apprenticeships, increasing the porosity between vocational and tertiary education systems and enhancing the delivery of transferable skills throughout the education and training systems (including digital skills). This emphasis perhaps reflects that, while tertiary education is key to delivering the specialist knowledge to drive innovation, the expansion of the take-up of academic pathways has been at the expense of the acquisition of skills in vocational training, posing an issue, including in countries with strong dual apprenticeships and other vocational routes.

As part of its research into the future of manufacturing (Future of Manufacturing in Europe project 2015–2018), Eurofound reviewed how national apprenticeship systems were adapted to advanced manufacturing and

implemented at company level, providing a useful insight into how such systems can be made both attractive and future ready (Eurofound, 2018c).

Improving matching systems

For jobseekers and employers facing difficulties in filling vacancies, the presence of a good matching system is an important factor in ensuring a better fit between the demand for and supply of skills in the labour market. Both public and private employment services can play an important role in this regard, but in terms of public policy measures the focus has largely been on enhancing the capacity of PES (or public-private partnerships) to support skills matching. In recent years, many PES have placed greater importance on advanced profiling tools and individual action planning (for example, in Belgium and Denmark; see also European Commission, 2012b, 2014), improved career guidance and career counselling systems (in Greece; see also Cedefop, 2009) and the better validation and certification of existing skills (for example, in Croatia and Cyprus; see also Cedefop and European Commission, 2017). Sweden is one of the countries where the validation and certification of existing skills has particularly focused on refugees and asylum seekers to ensure the better utilisation of their human capital.

A number of Member States including Austria, Belgium, Bulgaria, Cyprus, Estonia, Finland, France and Latvia have developed measures to ensure that active labour market policies focusing on training provision provide a better match between bottleneck occupations and jobseekers (Table 17).

Table 17: Active labour market policies focusing on training for shortage occupations, EU27, spring 2020

| Country | Title and summary of content |
|----------|---|
| Austria | Fachkräftestipendium (skilled employees' fellowship) The fellowship supports training courses for jobseekers in occupations meeting the requirements of shortage (health and social care and STEM occupations). It also supports those who have already started training in these fields to obtain supplementary qualifications. |
| Belgium | Versnellingsplan (acceleration plan) This plan initiated by the Flemish government in 2017 seeks to provide a better match between bottleneck vacancies and jobseekers, including through individual skills assessment, action planning, the delivery of relevant training and matching functions. |
| Bulgaria | National Employment Action Plan 2020 Emphasis is placed on better matching between supply and demand through enhanced guidance and training provision for shortage occupations. |
| Cyprus | Intensive programme of initial training in technical occupations for unemployed people The Cyprus Productivity Centre offers intensive training programmes aimed primarily at unemployed young people in shortage occupations, such as air conditioning and refrigeration technicians, technicians of photovoltaic systems, plumbers, telecommunications engineers and lift mechanics. Training programme for unemployed people The Human Resource Development Authority of Cyprus (HRDA) works in collaboration with vocational training centres to provide training to jobseekers in shortage occupations. Employers also participate by offering practical work experience. |
| Estonia | Tööhõiveprogramm 2017–2020 (Employment Programme 2017–2020) As of May 2017, the Estonian Unemployment Insurance Fund (EUIF) offers services aiming to prevent skills mismatches and labour shortages. Support includes degree study allowances and labour market training for shortage occupations. This is available to unemployed people as well as employees with low levels of qualifications. |

| Country | Title and summary of content | | |
|---------|--|--|--|
| Finland | Joint acquisition of education | | |
| | The system has been in place since 2008 and has three pillars: | | |
| | 1. education for unemployed people in occupations and skills experiencing shortages | | |
| | 2. education for employees in companies facing restructuring | | |
| | 3. support for employers having to dismiss employees to provide employees with early retraining. | | |
| France | Digital training programme for 10,000 | | |
| | As part of the country's Skills Investment Plan, the digital training programme for 10,000 was set up to give young people and low-skilled jobseekers the opportunity to train in digital technology. This programme will prioritise people who do not have a secondary school diploma, with these people making up 80% of those targeted. | | |
| | The plan provides financial support for digital training for the target group in an effort to fill around 80,000 vacancies in the area, while at the same time offers opportunities to young people and low-skilled jobseekers. | | |
| Latvia | Operational programme for growth and employment | | |
| | The operational programme includes a specific objective to increase the qualifications and skills of unemployed people in accordance with the demands of the labour market. PES support includes guidance, counselling, training and work experience measures focused on skills/occupations required by the labour market. | | |

Source: Authors' own compilation, based on information provided by the Network of Eurofound Correspondents

Work carried out within the framework of the European network of PES has also emphasised the important role of enhanced or dedicated employer services offered by PES to ensure better matching between the skills and work experience provided to jobseekers and to increase the value of structured collaboration with private providers in meeting labour and skills demands (European Commission, 2012c, 2013b). Among the

initiatives arising from closer collaboration between PES and employers to address shortages are the delivery of employer-focused training to meet the specific needs of individual employers, on the one hand, and the better sourcing of targeted work experience to allow more jobseekers to gain the skills required to meet requirements in the broader economy, on the other hand.

Delivering training via partnerships between PES and employers – Austria, Belgium and Cyprus

In Austria, the *Arbeitsplatznahe Qualifizierung* (AQUA) initiative (a workplace qualification) gives jobseekers the opportunity to receive training that meets the requirements of specific companies. This includes practical and theoretical training, ending in a qualification and, in most cases, subsequent employment with the specific company.

In Belgium, cybersecurity training is organised through a collaboration between the Brussels employment services (Actiris), Fujitsu, Evoliris and Bruxelles Formation. As ICT has become increasingly essential in companies, cybersecurity is becoming a real bottleneck profession. Currently, the cybersecurity specialist profession is one of the most sought-after profiles in companies in the Brussels region. Fujitsu, as an expert in cybersecurity, took over the reins by offering training in collaboration with Evoliris, Actiris and Bruxelles Formation. The training received 140 applications, with 12 candidates selected. Following their training, the majority of the participants were hired by either Fujitsu or one of the other partners.

The Cypriot Human Resource Development Authority offers training targeted at a single employer, including for employers in the hotel and restaurant sector, through its single and multi-employer training initiatives. Employers can also utilise the low-season period to implement their training programmes in order to preserve jobs. Apart from training on the basic occupations in the sector, the initiative covers courses such as language skills, health and safety, food hygiene, first aid, and the introduction and implementation of quality standards.

Evaluations of active labour market policies have shown that training and other integration measures for jobseekers tend to be more effective and provide better matching outcomes when they are combined with periods of work experience at the workplace. This is because this approach not only supports the development of workplace-related soft and occupation-specific skills generally but also exposes workers to employers, thus providing a greater opportunity for subsequent employment within the company. A number of countries place emphasis on including elements of work experience within active labour market policy measures for the shortage occupations and sectors identified.

Better preparation for labour market change

Investing in lifelong learning to re- and upskill and to prevent skills obsolescence has been at the heart of the EU education and training agenda for many years and was also emphasised by the EU-level social partners with the adoption of a Framework of Actions on Lifelong Learning in 2002. Progress in this area is regularly monitored as part of the European Semester process. Lifelong guidance measures are part of the successful delivery of lifelong learning, whether they be delivered by public or private agencies or are part of ongoing assessments of training requirements at company level (including through mid-career reviews) (Eurofound, 2016c).

Ongoing training and skills development at the workplace can take a variety of forms involving formal and informal learning, with formal training often – but not exclusively – delivered in short courses providing skills updates. Examples are also available of

company-funded or publicly supported additional qualifications and retraining measures, including those delivered in situations of restructuring to prevent unemployment and to assist workers in finding new jobs. 13 One of the initiatives being considered at EU level (based on the experience of a number of Member States) is the introduction of individual learning accounts, which could support workers who may wish to improve their skills but do not have the means to do so. An important balance needs to be struck in this area between job-related training to be provided by the employer and employment-related training (not directly linked to the current job), which individual workers may wish to invest in to enhance their employability. In several countries, governments provide financial support for employer-level training. For example, since March 2017, the Lithuanian Ministry of the Economy and Innovation has provided companies with opportunities to invest quickly and easily in employee training, thus supporting employees in adapting faster to the changing needs of the labour market. Part-funded by the ESF, 'competence vouchers' allow employers to offer their workers specialised certified training programmes or other training courses to acquire relevant skills. The competence voucher is implemented through a global grant. The company is granted €4,500, which must be used within 12 months, to purchase training services for the company's employees. The amount financed under the measure must not exceed 70% of the total amount allocated to training.

Linked to this is the question of entitlement to training during working hours and time off work to pursue training.

Offering the right to paid time off for training – Belgium

Since September 2018, in Flanders, Belgium, every employee has been allowed to receive 125 hours of government-funded education leave. This is available for a list of courses curated by the Flemish employment services. The list is linked to shortage skills and occupations, as well as core employability skills. There is also the possibility for longer leave for education purposes. In such cases, a period of leave can be paid for by the federal unemployment services. In general, this period can last up to 36 months; however, for training that is on the list of bottleneck jobs by the public employment service (Vlaamse Dienst voor Arbeidsbemiddeling en Beroepsopleiding – VDAB), this period can be up to 48 months. The payment by the federal unemployment services during this educational leave is lower than the wage of the person in question. However, to compensate for this, there are encouragement cheques available to make up for some of the income lost (available regardless of whether the person is in a bottleneck job or not). In addition, there are training cheques available for people who pay for their own tuition. For people who pursue training for a bottleneck job, the value of these training cheques is higher.

¹³ Eurofound's ERM database provides an overview of legislative and policy measures to deal with restructuring; for more information, see https://www.eurofound.europa.eu/observatories/emcc/european-restructuring-monitor

Enhancing the use of existing labour through employee sharing

Employee sharing is an approach that can assist in generating employment and can also address labour shortages by ensuring that the working hours being offered suit both the employer (in a situation where there may not be a requirement for a full-time post) and the employee (in cases where part-time or seasonal hours are insufficient to support the individual or household (Eurofound, 2020g). Strategic employee sharing refers to a model of employment whereby a group of employers forms a network with a separate legal entity that recruits one or several workers to perform work for the different partners. The employer group combines the fragmented, but recurring, staffing requirements of individual employers into a permanent and full-time position for the worker (Eurofound, 2015b, 2016d). The highest incidence of strategic employee sharing is found in France, with some examples also existing in Austria, Belgium and Germany (Eurofound, 2020h). A similar approach has also been developed in Czechia to help deal with shortages, where the demand may not extend to full-time positions.

Preventing early exit from the labour market

One of the key features of labour market trends over the last decade or so, including during and after the 2008–2010 financial and economic crisis, has been the increase in the labour market participation rate of older workers (Eurofound, 2020g). This has so far largely been driven by measures that have tightened up access to early retirement schemes, unemployment and disability benefit systems. Most Member States have also increased retirement ages for both men and women and introduced incentives for longer working lives, largely in an effort to shore up pension systems and help address labour shortages. As well as such measures, initiatives to support active ageing have come more to the fore, with an increasing emphasis on sustainable employment and a lifecycle approach.

Factors that can motivate older workers to continue working include greater autonomy, physical security, fewer quantitative demands and shorter working hours. The sixth European Working Conditions Survey shows that the ability to adjust working hours can have a significant effect on the likelihood of a worker being able to or wishing to remain in employment (Eurofound, 2017c). Access to lifelong learning also plays a critical role with regard to sustainable work.

Research by the European Agency for Safety and Health at Work (EU-OSHA) and Eurofound has highlighted the different approaches available to encourage retention, including measures to adjust the physical working environment, task adjustments and workload changes, health promotion and the ongoing delivery of skills. This work points to the importance of holistic lifecycle approaches that are strongly embedded within organisational management (EU-OSHA, 2016; Eurofound, 2018d).

Providing support for comprehensive active age management - Slovenia

Support for comprehensive age management strategies is provided by the Public Scholarship, Development, Disability and Maintenance Fund of the Republic of Slovenia under its programme, Comprehensive Support to Companies for Active Ageing of Employees. The programme was launched in 2017 to raise awareness about demographic trends, provide support to employers for developing age management strategies and boost the competencies of older employees. It involved creating a catalogue of measures targeting the problem of ageing workers. It is envisaged that, by 2022, about 1,000 companies (out of around 180,000 businesses in the country) will participate in the project. Companies are invited to prepare age management strategies, equip workers over 40 years of age ('future older workers') with career plans and offer these workers training and education following their career plans. In the end, about 12,500 employees are expected to have participated in the programme. Another strand coordinates public tenders for pilot projects developing innovative practices to increase productivity, reduce absenteeism and so on. The programme also organises workshops for company owners and managers about age management. Other activities undertaken as part of this strategy include awards for companies displaying good practices, international conferences and a national campaign.

Addressing labour shortages arising from COVID-19

Measures to address the labour shortages exacerbated by or arising from COVID-19 have been taken at both EU and Member State levels. The EU measures largely focused on safeguarding cross-border labour mobility for workers employed in sectors that were deemed essential. Two communications published by the Commission in March 2020 established the categories of workers employed in critical occupations. The occupations that were deemed critical included health professionals and personal care workers, workers involved in the supply of goods, workers in food manufacturing and related trades, information and communication professionals, and workers working in essential infrastructures. The Commission also asked Member States to facilitate the entry of seasonal workers into sectors such as agriculture in order to respond to labour shortages (European Commission, 2020l). It also issued specific guidelines on the free movement of health professionals during the COVID-19 emergency, which established common rules regarding the recognition of qualifications and permission to work in cross-border situations, as well as the recognition of qualifications from third countries (European Commission, 2020m).

Member States have also undertaken swift measures with regard to migrant labour in response to the labour shortages generated by the COVID-19 pandemic, which included facilitating the access of migrants to the labour market and changing their status to allow work, extending the residence status of migrants and applying exemptions to entry requirements for essential workers (EMN and OECD, 2020). This was in addition to initiatives in some countries to recruit unemployed workers from within the country to assist with seasonal harvests.

Noting that seasonal workers tend to be more vulnerable to precarious working and living conditions, the Commission also published a set of guidelines for the protection of their rights in the context of the COVID-19 pandemic (European Commission, 2020n). The guidelines outline the rights of seasonal workers and call for suitable working and living conditions, including the implementation of relevant organisational health and safety requirements, monitoring and enforcement of applicable rules under the Framework Directive on Safety and Health at Work and adequate standards of accommodation.

In response to outbreaks of clusters of COVID-19 in sectors dominated by migrant or immigrant workers (for example, in the meat industry), countries such as Germany and Ireland introduced new health and safety protocols for the sector. In Germany, this also included new provisions regarding the possibility of subcontracting. The agreement limited the

performance of the butchering and processing of meat to direct employees of the company and significantly increased fines for breaches of health and safety and working time regulations.

In addition, national governments have taken a variety of measures to deal with the sudden expansion in demand for frontline workers and to reinforce the public healthcare system (Eurofound, 2020a). While some of these measures sought to remove barriers to participation and returning to work in the healthcare sector, others were more restrictive. Austria extended the duration of its mandatory 'alternative civilian service', deploying young people not wishing to enter military services for longer periods in the health and care sector, as well as other essential services. Cyprus introduced a mandatory draft of registered doctors and nurses, and Finland introduced an obligation on healthcare professionals to work (limiting access to leave). The Slovak government adopted measures enabling the temporary transfer of employees and resources between hospitals to ensure that they could be used where they were most needed. Slovenia moved to limit certain rights of healthcare workers on a temporary basis to ensure sufficient staffing.

In a number of countries, including Ireland, retired healthcare workers and those who had left the service some time ago were encouraged to return to the service. Portugal authorised the hiring of additional healthcare staff on fixed-term contracts. Ireland, as well as Cyprus, Finland and Sweden, turned to the pool of medical and nursing graduates, allowing them to enter frontline service prior to the completion of their final examinations. A number of Member States including Austria, France, Italy and Lithuania offered pay enhancements or one-off bonuses to healthcare staff. Luxembourg supported the voluntary interruption of parental leave among frontline workers.

Sweden looked beyond the shortages in the healthcare sector and also sought to address increased demand in the IT sector, with a particular focus on attracting more women and immigrants with relevant qualifications from their home countries.

To ensure that essential workers could perform their tasks on the frontline while schools and childcare facilities were closed, a number of countries offered specific childcare support for such workers or ensured that schools maintained services for their children.

A number of initiatives specifically sought to bring in unused or underutilised workers from other sectors to supplement the workforce in essential services. Malta, for example, recruited unemployed workers from the tourism sector to support its 'track and trace' system. At company level, an agreement between McDonald's and Aldi in Germany enabled workers to move from the restaurant chain to temporarily work at the supermarket. In addition, in the retail sector in a

number of countries, supermarkets drew on the decline in demand for taxi services by recruiting drivers to meet the exploding demand for grocery home delivery services.

Addressing labour shortages linked to a climate-neutral economy

An explicit link between the identification of current and future labour shortages and a climate-neutral economy (see Chapter 2) has been identified in only a limited number of Member States. This is partly due to the paucity of explicit assessments of the nature and scale of skills shortages linked to the climate-neutral transformation, but it also relates to the specific nature of skills forecasting and its link to the development of education and training curricula in different countries, as well as the evolution of overarching government initiatives related to the climate-neutral transition. Arguably, in countries where there are strong links between forecasting, ongoing curriculum development and the involvement of such partners in shaping training programmes, as well as a strong emphasis on future-oriented skills delivery in active labour market policies, such considerations will be taken into account as a matter of course and may not necessarily be emphasised as specific policy approaches linked to the development of climate-neutral strategies. Chief among these countries, which also feature strong social partner involvement in the ongoing development of apprenticeship curricula, are Austria and Germany. In Austria, the 2020 government programme explicitly set out the modernisation of curricula and the introduction of new apprenticeship professions in areas linked to digitalisation, the environment and climate change.

In a few countries, the policy debate on the skills requirements of a climate-neutral economy has been linked to a specific assessment of the employment creation potential of a green economy. This is the case in Denmark and Ireland, for example, where the focus on green transition is evaluated in terms of its potential contribution to employment growth in the context of an active government and social partner strategies to boost and deliver relevant skills.

In Belgium, a policy note for the Department of Work and Social Economy mentions the importance of a future-proof labour market. The main challenges to be addressed are increased digitalisation, an ageing population, migration and the effects of climate change. These megatrends are seen to lead to some jobs being replaced, others being changed and new job types being created. The employment services and associated training providers are mentioned as playing a key role in facilitating such transition trajectories, particularly for those affected by sectoral transformation. In the Netherlands, the National Climate Agreement contains a section on the labour market and education, which presents measures to be taken by the government and social partners to facilitate such change (for instance, through the development of new training courses and

In a few countries, social partner organisations are emphasising the need for governments to take a more proactive approach to ensuring that the skills needs of a climate-neutral economy are effectively assessed and addressed (for example, in Bulgaria and Greece). In contrast, in Spain, the Ministry of Ecological Transition highlights the importance of the private sector adopting a stronger role in the delivery of such skills.

5 Conclusions and policy pointers

Labour shortage is a complex phenomenon and the definition proposed in this report seeks to emphasise the importance of both the quantitative and qualitative aspects of shortage and the need to understand the various drivers underpinning the phenomenon.

Although the issue of labour shortages may have somewhat receded into the background in the face of the impact of the COVID-19 pandemic on employment and labour demand, the evidence presented in this report demonstrates that, despite the ongoing recession, labour shortages persist and indeed have been aggravated in some sectors and occupations. The increase in vacancy rates during the period of the easing of lockdown measures in many EU countries in the late summer and autumn of 2020 also demonstrates the persistence of structural shortages as economies begin to reopen. In planning for the economic recovery, the emphasis being placed on climate-neutral and digital transitions, combined with ongoing demographic changes, means that new shortages are likely to emerge and existing ones could be exacerbated unless sustainable, holistic policies are introduced to address the underlying drivers.

The multifaceted nature of the shortages phenomenon requires data from a variety of sources to illuminate its different aspects, as all of the tools used to measure the available indicators can be shown to suffer from some shortcomings. Improved and new methodologies and data sources should therefore be developed further and integrated into the decision-making process (such as a 'big data' approach to gathering vacancy information, as utilised in Cedefop's Skills-OVATE database), as currently the often different conclusions that are drawn from the use of existing data sources can complicate the policymaking process. This includes the development and enhancement of high-quality labour market anticipation tools as an early warning system for forthcoming shortages. Good forecasting information is all the more important, as evidence shows that measures to tackle the underlying drivers of shortage often need a longer time horizon to become effective. Although short-term measures can provide immediate solutions, they often fail to address underlying weaknesses in the policy structures underpinning the functioning of the labour market.

The balance between the significance of the quantitative and qualitative aspects of labour shortage (and therefore different underlying drivers) varies between EU countries and the policy response required will therefore be different in the short, medium and longer term – although it is likely that some elements of all approaches will be required in all countries. Regional development strategies aiming for greater convergence also have a role to play in addressing regional labour shortages.

As this report has shown, measures to tackle shortages are varied, and therefore policy measures should not be developed in silos, while both demand- and supply-side factors should be taken into account. Social partners have a key role to play in informing the design and implementation of such measures, as they are engaged at the core in terms of emerging trends and labour demands. As well as shaping wage developments and the evolution of working conditions, their involvement in curriculum design and the shaping of active labour market policy and the framework conditions that ensure non-discriminatory access to the labour market for more vulnerable groups is therefore vital.

In addition, individual employers also play a critical role, as their involvement in the creation of profiles of the workforce and skills required, as well as in the working conditions and levels of pay offered, can have a direct bearing on the extent to which recruitment difficulties emerge. Collaboration with other stakeholders including employment services and training providers can also play an important role in preventing the emergence of shortages or in the effectiveness of tackling these shortages where they arise.

Similarly, responsibility also lies with pupils and students (and in some cases their parents), for example as regards decisions on education, training and career paths, as the experience from many countries demonstrates that the importance of well-established vocational pathways appears to be diminishing.

Finally, from a first review of the available evaluations of measures to address labour shortages, where the impact of less than a quarter of the measures has been assessed to date, it is clear that the policy evaluation culture in many Member States is underdeveloped.

References

All Eurofound publications are available at www.eurofound.europa.eu

Adams, J., Greig, M. and McQuaid, R. W. (2000), 'Mismatch unemployment and local labour-market efficiency: The role of employer and vacancy characteristics', *Environment and Planning A*, Vol. 32, No. 10, pp. 1841–1856.

Albano, A. (2012), 'The brain drain: Winners and losers. Socio-economic effects of highly skilled migrations on both sending and host countries', *Sfera Politicii*, Vol. 20, No. 4, pp. 83–90.

Barnow, B. S., Trutko, J. and Schede Piatak, J. (2013), 'Conceptual basis for identifying and measuring occupational labor shortages', in *Occupational labor shortages: Concepts, causes, consequences, and cures*, W. E. Upjohn Institute for Employment Research, Kalamazoo, Michigan, pp. 1–34.

Beine, M., Docquier, F. and Rapoport, H. (2008), 'Brain drain and human capital formation in developing countries: Winners and losers', *The Economic Journal*, Vol. 118, No. 528, pp. 631–652.

Bennett, J. and McGuinness, S. (2009), 'Assessing the impact of skill shortages on the productivity performance of high-tech firms in Northern Ireland', *Applied Economics*, Vol. 41, No. 6, pp. 727–737.

Biernat A., Mosurek, O., Panecka-Niepsuj, M., Sas, P. and Ścisłowicz, T. (2019), *Barometr Zawodów 2020. Raport podsumowujący badanie w Polsce*, Wojewódzki Urząd Pracy w Krakowie, Kraków.

Biondo, A. E., Monteleone, S., Skonieczny, G. and Torrisi, B. (2012), 'The propensity to return: Theory and evidence for the Italian brain drain', *Economics Letters*, Vol. 115, No. 3, pp. 359–362.

Bogue, R. (2018), 'What are the prospects for robots in the construction industry?', *Industrial Robot*, Vol. 45, No. 1, pp. 1–6.

Böhme, M. H. and Glaser, T. (2014), *Migration experience, aspirations and the brain drain: Theory and empirical evidence,* working papers in economics and management, Vol. 14, Bielefeld University, Department of Business Administration and Economics, Bielefeld, Germany.

Brunello, G. and Wruuk, P. (2019), *Skill shortages and skill mismatch in Europe: A review of the literature*, IZA Discussion Paper No. 12346, IZA Institute of Labor Economics, Bonn, Germany.

BusinessEurope, CEEMET, CEPI, Co ESS, EBF, ECEG et al (2019), Reducing labour shortages by improving skills matching: Employers statement, Brussels, 12 September.

Cedefop (European Centre for the Development of Vocational Training) (2009), *Professionalising career guidance: Practitioner competences and qualification routes in Europe*, Office for Official Publications of the European Communities, Luxembourg.

Cedefop (2015), Skill shortages and gaps in European enterprises: Striking a balance between vocational education and training and the labour market,
Publications Office of the European Union, Luxembourg.

Cedefop (2019), *Skills for green jobs: 2018 update*, Publications Office of the European Union, Luxembourg.

Cedefop and European Commission (2017), *European inventory on validation of non-formal and informal learning – 2016 update*, Publications Office of the European Union, Luxembourg.

Concito (2019), *Den danske grønne beskæftigelse*, Copenhagen.

CzechInvest (n.d.), *Wages*, web page, available at https://www.czechinvest.org/en/For-Investors/Reas ons-to-invest/Wages, accessed 18 May 2021.

DETE (Department of Enterprise, Trade and Employment) (2017), Department News, *FDI employment hits new level of almost 200,000*, Government of Ireland, 3 January.

Die Bundesregierung (2019), Konzertierte Aktion Pflege, web page, available at

https://www.bundesgesundheitsministerium.de/filead min/Dateien/3_Downloads/K/Konzertierte_Aktion_Pfle ge/0619_KAP_Vereinbarungstexte_AG_1-5.pdf, accessed 18 May 2021.

DMB (Deutschen Mittelstands-Bund) (n.d.), Themenschwerpunkt: Fachkräftemangel im Mittelstand, web page, available at

https://www.mittelstandsbund.de/themen/arbeit-bildung/themenschwerpunkt-fachkraeftemangel/ursac hen-folgen, accessed 2 June 2021.

Dornmayr, H. and Rechberger, M. (2019), *Unternehmensbefragung zum Fachkräftebedarf/-mangel in Österreich: Fachkräfteradar 2019 – Teil II*, ibw-Forschungsbericht No. 198, Institut für Bildungsforschung der Wirtschaft (ibw), Vienna.

Downs, A. (2009), 'Identifying shortage occupations in the UK', *Economic & Labour Market Review*, Vol. 3, No. 5, pp. 23–29.

EESC (European Economic and Social Committee) (2018), *Skills mismatches –An impediment to the competitiveness of EU businesses*, Brussels.

EMN (European Migration Network) and OECD (Organisation for Economic Co-operation and Development) (2020), *Maintaining labour migration in essential sectors in times of pandemic– EMN-OECD Inform*, Brussels.

ETUC (European Trade Union Confederation) (2020), National measures targeting seasonal workers to address labour shortages (particularly in the agricultural sector), Brussels, 29 May.

ETUC, BusinessEurope, CEEP and SMEUnited (2017), European social partners statement on tapping the potential from greening the economy for jobs creation, Brussels, 30 May.

ETUC, BusinessEurope, CEEP and SMEUnited (2019), European social dialogue work programme 2019–2021, Brussels.

ETUC, BusinessEurope, CEEP and SMEUnited (2020), European social partners framework agreement on digitalisation, Brussels, 22 June.

EU-OSHA (European Agency for Safety and Health at Work) (2016), *The ageing workforce: Implications for occupational safety and health – A research review – Executive summary*, Publications Office of the European Union, Luxembourg.

Eurofound (2015a), *Sustainable work over the life course: Concept paper*, Publications Office of the European Union, Luxembourg.

Eurofound (2015b), *New forms of employment*, Publications Office of the European Union, Luxembourg.

Eurofound (2016a), *Exploring the diversity of NEETs*, Publications Office of the European Union, Luxembourg.

Eurofound (2016b), *ERM annual report 2015: Job creation in SMEs*, Publications Office of the European Union, Luxembourg.

Eurofound (2016c), *Changing places: Mid-career review and internal mobility*, Publications Office of the European Union, Luxembourg.

Eurofound (2016d), New forms of employment: Developing the potential of strategic employee sharing, Publications Office of the European Union, Luxembourg.

Eurofound (2017a), *Working conditions of workers of different ages: European Working Conditions Survey 2015*, Publications Office of the European Union, Luxembourg.

Eurofound (2017b), *Estimating labour market slack in the European Union*, Publications Office of the European Union, Luxembourg.

Eurofound (2017c), *Sixth European Working Conditions Survey – Overview report (2017 update)*, Publications Office of the European Union, Luxembourg.

Eurofound (2017d), European Quality of Life Survey 2016: Quality of life, quality of public services, and quality of society, Publications Office of the European Union, Luxembourg.

Eurofound (2018a), *Labour market integration of migrants and their descendants*, Dublin.

Eurofound (2018b), *Striking a balance: Reconciling work and life in the EU*, Publications Office of the European Union, Luxembourg.

Eurofound (2018c), Adaptation of national apprenticeship systems to advanced manufacturing, Publications Office of the European Union, Luxembourg.

Eurofound (2018d), *State initiatives supporting the labour market integration of older workers*, Eurofound working paper, Dublin.

Eurofound (2019a), *Annual review of working life 2018*, Publications Office of the European Union, Luxembourg.

Eurofound (2019b), *How your birthplace affects your workplace*, Publications Office of the European Union, Luxembourg.

Eurofound (2019c), *Quality of health and care services in the EU*, Publications Office of the European Union, Luxembourg.

Eurofound (2019d), *Challenges and prospects in the EU: Quality of life and public services*, Publications Office of the European Union, Luxembourg.

Eurofound (2020a), *COVID-19: Policy responses across Europe*, Publications Office of the European Union, Luxembourg.

Eurofound (2020b), European Company Survey 2019: Workplace practices unlocking employee potential, Publications Office of the European Union, Luxembourg.

Eurofound (2020c), *Long-term care workforce: Employment and working conditions*, Publications Office of the European Union, Luxembourg.

Eurofound (2020d), *Minimum wages in 2020: Annual review*, Minimum wages in the EU series, Publications Office of the European Union, Luxembourg.

Eurofound (2020e), *Role of social partners in tackling discrimination at work*, Publications Office of the European Union, Luxembourg.

Eurofound (2020f), *Access to care services: Early childhood education and care, healthcare and long-term care*, Publications Office of the European Union, Luxembourg.

Eurofound (2020g), *Labour market change: Trends and policy approaches towards flexibilisation*, Challenges and prospects in the EU series, Publications Office of the European Union, Luxembourg.

Eurofound (2020h), *New forms of employment: 2020 update*, New forms of employment series, Publications Office of the European Union, Luxembourg.

Eurofound (2021a), *COVID-19: Implications for employment and working life*, Publications Office of the European Union, Luxembourg.

Eurofound (2021b), *Disability and labour market integration*, Publications Office of the European Union, Luxembourg.

European Commission (2004), Forecasting labour and skills shortages: How can projections better inform labour migration policies?, Publications Office of the European Union, Luxembourg.

European Commission (2012a), *Exploiting the employment potential of green growth*, SWD/2012/92, Brussels.

European Commission (2012b), *Monitoring and follow-up of IAPs and their outcomes in selected EU countries*, Brussels.

European Commission (2012c), *How to best structure services for employers?* Brussels.

European Commission (2013a), *Pathways to green jobs:* strategies and policy options for a sustainable job-rich recovery, Brussels.

European Commission (2013b), PARES Strategic Dialogue 2013: Evaluation of partnerships Recommendations to employment services, Brussels.

European Commission (2014), *Skills-based profiling and matching in PES. Analytical paper*, Publications Office of the European Union, Luxembourg.

European Commission (2015), Determining labour shortages and the need for labour migration from third countries in the EU: Synthesis report for the EMN focussed study 2015, Brussels.

European Commission (2016), Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Digitising European industry: Reaping the full benefits of a digital single market, COM(2016)180 final, Brussels.

European Commission (2018a), Proposal for a Regulation of the European Parliament and of the Council on the European Social Fund Plus (ESF+), COM(2018)382 final, Brussels.

European Commission (2018b), *Study on the movement of skilled labour: Final report*, Publications Office of the European Union, Luxembourg.

European Commission (2018c), *SheFigures 2018*, Publications Office of the European Union, Luxembourg.

European Commission (2019a), Employment and social developments in Europe: Quarterly review March 2019, Publications Office of the European Union, Luxembourg.

European Commission (2019b), Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: The European Green Deal, COM(2019)640 final, Brussels.

European Commission (2019c), *Employment and social developments in Europe 2020. Sustainable growth for all: Choices for the future of social Europe*, Publications Office of the European Union, Luxembourg.

European Commission (2020a), *Joint employment report* 2020, Brussels.

European Commission (2020b), *European economic forecast: Autumn 2020*, Publications Office of the European Union, Luxembourg.

European Commission (2020c), *Employment and social developments in Europe 2020*, Publications Office of the European Union, Luxembourg.

European Commission (2020d), *Analysis of shortage and surplus occupations 2020*, Publications Office of the European Union, Luxembourg.

European Commission (2020e), Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: A new industrial strategy for Europe, COM(2020)102 final, Brussels.

European Commission (2020f), Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: European skills agenda for sustainable competitiveness, social fairness and resilience, COM(2020)274 final, Brussels.

European Commission (2020g), Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on a new pact on migration and asylum, COM(2020)609 final, Brussels.

European Commission (2020h), *Labour market and* wage developments in Europe, annual review 2020, Publications Office of the European Union, Luxembourg.

European Commission (2020i), 'Council Recommendation of 20 July 2020 on the 2020 National Reform Programme of Hungary and delivering a Council opinion on the 2020 Convergence Programme of Hungary 2020/C 282/17', Official Journal of the European Union, C 282, 26 August, Brussels.

European Commission (2020j), Recommendation for a Council Recommendation on the 2020 National Reform Programme of Croatia and delivering a Council opinion on the 2020 Convergence Programme of Croatia, COM(2020)511 final, Brussels.

European Commission (2020k), Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. An EU-wide assessment of National Energy and Climate Plans. Driving forward the green transition and promoting economic recovery through integrated energy and climate planning, COM(2020)564 final, Brussels.

European Commission (2020l), 'Communication from the Commission Guidelines concerning the exercise of the free movement of workers during COVID-19 outbreak, *Official Journal of the European Union*, C 102l, 30 March, Brussels.

European Commission (2020m), 'Communication from the Commission Guidance on free movement of health professionals and minimum harmonisation of training in relation to COVID-19 emergency measures – recommendations regarding Directive 2005/36/EC 2020/C 156/01, Official Journal of the European Union, C 156, 8 May, Brussels.

European Commission (2020n), 'Communication from the Commission Guidelines on seasonal workers in the EU in the context of the COVID-19 outbreak 2020/C 235 I/01, Official Journal of the European Union, C 235I, 17 July, Brussels.

European Commission (2021), *Annual report on intra-EU labour mobility*, Publications Office of the European Union, Luxembourg.

European Commission/EACEA/Eurydice (2019), *Key data on early childhood education and care in Europe – 2019 edition*, Eurydice report, Publications Office of the European Union, Luxembourg.

European Parliament (2015), *Labour market shortages in the European Union*, Brussels.

European Parliament (2020), *Demographic outlook for the European Union 2020*, European Parliamentary Research Service, Brussels.

European Parliament (2021), After parental leave: Incentives for parents with young children to return to the labour market, Luxembourg.

Eurostat (2021), Employment rate of people by type of disability, sex and age [hlth_dlm010], web page, accessed 15 June 2021.

EY (2019), *Attractiveness survey – Malta 2019*, Ernst & Young Malta, Msida.

Flisi, S., Goglio, V., Meroni, E., Rodrigues, M. and Vera-Toscano, E. (2014), *Occupational mismatch in Europe: Understanding overeducation and overskilling for policy making*, JRC Science and Policy Report, Publications Office of the European Union, Luxembourg.

Frohm, E. (2020), *Labour shortages and wage growth*, Sveriges Riksbank Working Paper Series No. 394, Sveriges Riksbank, Stockholm.

Galgóczi, B. (ed.) (2021), *Betwixt and between: Integrating refugees into the EU labour market*,
European Trade Union Institute (ETUI), Brussels.

Germani, A., Talamo, G. and Scaramozzino, P. (2018), 'Air pollution and migration in Italy: An empirical investigation at provincial level', *Energia, ambiente e innovazione*, No. 1/2018, pp. 26–31.

German Institute for Economic Research (2018), *Wachstumsbremse Fachkräfteengpässe*, IW-Kurzbericht No. 27/2018, Berlin.

Gërmenji, E. and Milo, L. (2011), 'Migration of the skilled from Albania: Brain drain or brain gain?', *Journal of Balkan and Near Eastern Studies*, Vol. 13, No. 3, pp. 339–356.

HRDA (2018), Εντοπισμός Αναγκών σε Πράσινες Δεξιότητες στην Κυπριακή Οικονομία 2017-2027 [Identification of green skill needs in the Cyprus economy 2017-2027], Nicosia.

Hunter, P. (2013), 'Brain drain, brain gain or brain sharing? New studies of the migration routes of scientists show that international mobility benefits all parties including countries that are net exporters of researchers', *EMBO Reports*, Vol. 14, No. 4, pp. 315–318.

ILO (International Labour Organization) (2020), *Skills* shortages and labour migration in the field of information and communication technology in Canada, China, *Germany and Singapore*, International Labour Office, Geneva.

ILO and OECD (Organisation for Economic Co-operation and Development) (2018), *Approaches to anticipating skills for the future of work: Report prepared by the ILO and OECD for the G20 Employment Working Group*, International Labour Office, Geneva.

Irish Institute of Training and Development (2020), 'Skills for green jobs in Ireland', *news article*, Naas, Co Kildare.

Kubr, J. (2019), Robotizace: Nevyhnutelné řešení nedostatku pracovníků v průmyslu – Svět průmyslu, web page.

Kureková, L. M., Beblavý, M. and Thum-Thysen, A. (2015), 'Using online vacancies and web surveys to analyse the labour market: A methodological inquiry', *IZA Journal of Labor Economics*, Vol. 4, No. 1, pp. 1–20.

Legun, K. and Burch, K. (2021), 'Robot-ready: How apple producers are assembling in anticipation of new Al robotics', *Journal of Rural Studies*, Vol. 82, pp. 380–390.

Lux, M. and Sonega, P. (2012), 'Labour mobility and housing: The impact of housing tenure and housing affordability on labour migration in the Czech Republic', *Urban Studies*, Vol. 49, No. 3, 489–504.

Macháček, J. (2019), *Lék na nedostatek pracovní síly? Migrace*, web page accessed 13 June 2021.

Matějka, J. (2019), 'Zákon džungle: nedostatek lidí nutí firmy k predátorským praktikám', euro.cz, 8 February.

Michel, J. P. and Ecarnot, F. (2020), 'The shortage of skilled workers in Europe: Its impact on geriatric medicine', *European Geriatric Medicine*, Vol. 11, No. 3, pp. 345–347.

Migration Advisory Committee (2017), Assessing labour market shortages: A methodology update, London.

Mikula, S. and Pytliková, M. (2020), *Air pollution & migration: Exploiting a natural experiment from the Czech Republic*, EconPol Working Paper No. 43, European Network for Economic and Fiscal Policy Research, Munich.

Ministry of Business and Industry (2019), *Danmark som* frontløber i den grønne omstilling, Copenhagen.

Natale, F., Kalantaryan, S., Scipioni, M., Alessandrini, A. and Pasa, A. (2019), *Migration in EU rural areas*, Publications Office of the European Union, Luxembourg.

Nickell, S. and Nicolitsas, D. (2000), 'Human capital investment and innovation: What are the connections?', in Barrell, R., Mason, G. and O'Mahoney, M. (eds.), *Productivity, innovation and economic performance*, Cambridge University Press, Cambridge.

Obserwator Finansowy (2019), 'Average salary in the Czech Republic reaches historical record', blog post, 16 October.

OECD (Organisation for Economic Co-operation and Development) (2003), *Labour shortages and the need for immigrants: A review of recent studies*, OECD Publishing, Paris.

OECD (2017), *Getting skills right: Skills for Jobs indicators*, OECD Publishing, Paris.

OECD (2018), OECD economic surveys: Czech Republic 2018, OECD Publishing, Paris.

OECD (2019), Building an EU talent pool: A new approach to migration management for Europe, OECD Publishing, Paris.

Povilauskas, T. (2018), *Darbo užmokesčio augimas – sparčiausias nuo 2008 metų*, web page accessed 13 June 2021.

PwC (2019), European Private Business Survey 2019, Time to act: moving from good to great in times of uncertainty and digital transformation, Germany.

Schneider, J. and Götte, M. (2020), 'Germany', in Palumbo, L. and Corrado, A (eds.), *Are agri-food workers only exploited in southern Europe? Case studies on migrant labour in Germany, the Netherlands, and Sweden*, Open Society European Policy Institute, Open Society Foundations Brussels.

SEV (Hellenic Federation of Enterprises) (2019), *The pulse of the operation*, web page, available at https://www.sev.org.gr/Uploads/Documents/52496/2SR _Business%20Pulse%202019_v13.pdf, accessed 13 June 2021.

SPC (Social Protection Committee) and European Commission (2014), *Adequate social protection for long term care needs in an ageing society*, Publications Office of the European Union, Luxembourg.

SP ČR and ČNB (2017), *Výsledky šetření SP ČR a ČNB v nefinančních podnicích a vývoj ekonomiky: Q2/2017*, SP (Confederation of Industry of the Czech Republic), Prague.

Suomen Yrittäjät, Finnvera and Ministry of Economic Affairs and Labour (2019), *PK-yritysbarometri – kevät 2019*, Helsinki.

SVD (Svenska Dagbladet) (2018), *Brist på "rätt"* arbetskraft slår mot tillväxten, 3 July.

Tang, J. and Wang, W. (2005), 'Product market competition, skill shortages and productivity: Evidence from Canadian manufacturing firms', *Journal of Productivity Analysis*, Vol. 23, No. 3, pp. 317–339.

Vidūnaitė, I. (2019), *Neregėtas dosnumas: Lietuvoje 97 proc. darbdavių planuoja kelti algas*, web page, accessed 13 June 2021.

wort-lu (2019), 'L'artisanat en manque de 9.400 salariés', Luxemburger Wort, 19 November.

Zimmer, H. (2012), 'Labour market mismatches', *Economic Review*, National Bank of Belgium, Brussels, No. ii, pp. 55–68.

ZRSZ (Zavod republike Slovenije za zaposlovanje) (2019), *Napovednik zaposlovanja 2019/II*, Employment Service of Slovenia, Ljubljana.

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While unemployment is still a huge challenge in Europe, some countries, sectors and occupations are experiencing labour shortages. This report explores various approaches to identifying labour shortages and maps national policy debates around the issue. It documents public and social partner interventions to tackle labour shortages, such as measures fostering geographical or occupational mobility, addressing skills shortages and underinvestment in skills, improving working and employment conditions, and providing better matching procedures.

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