



# 2023 skills forecast Germany





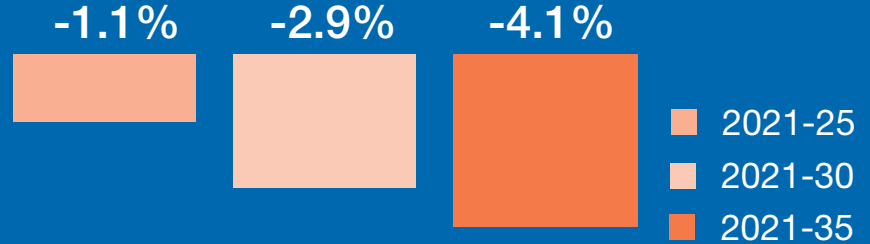
Employment in 2035

% Employment growth 2021-35

43 068 000

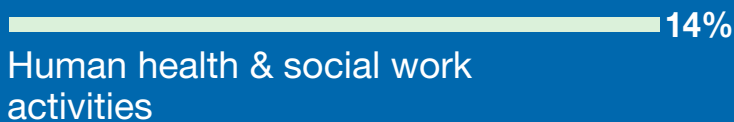
-4,12%

increase 2021-35



### Fastest-growing sectors

2021-35% growth



### Highest-demand occupations

Largest creation of new jobs, 2021-35



increase in high-skilled labour demand 2021-35

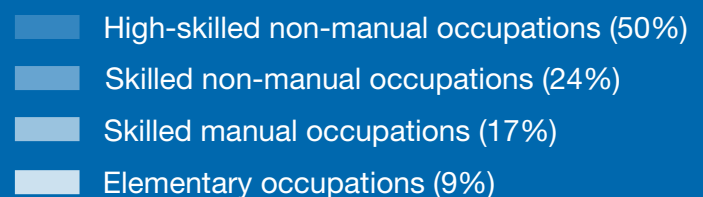
6%

### Total job openings, 2021-35

25 022 000



### Total job openings by skill level 2021-35



3.4%

employment increase in 2021-35



Fastest growing occupation

Legal, social and cultural professionals



Fastest growing sector

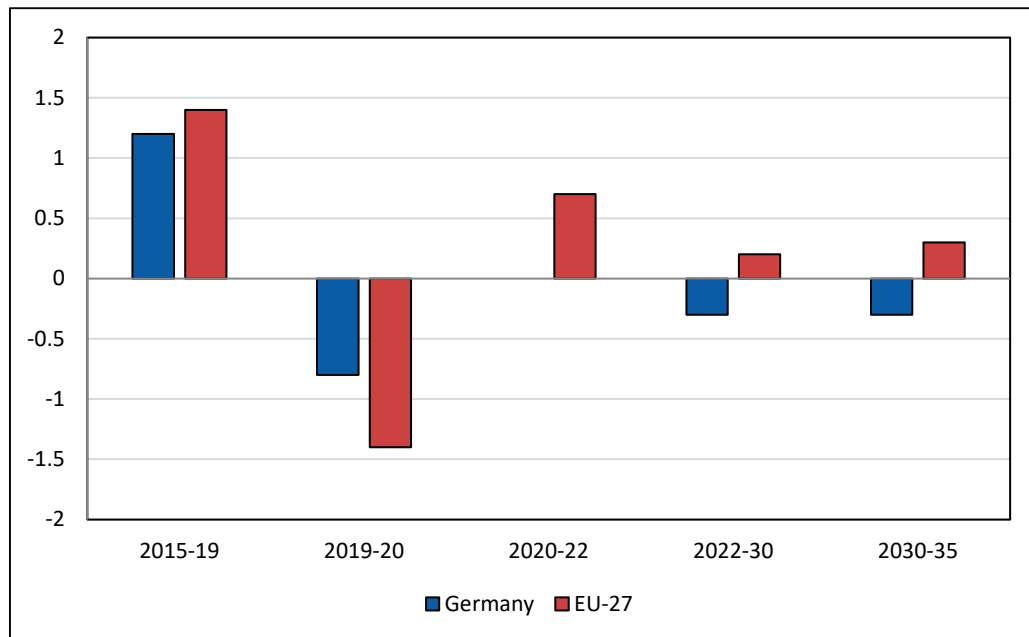
Information and communication

# Cedefop skills forecast: Germany

## 1. Employment outlook

Employment in Germany is forecast to fall over 2022-35, compared with an increase, albeit relatively small, forecast for the EU-27 as a whole. Figure 1 shows that employment in Germany grew by just over 1% pa over 2015-19, slightly slower than the EU-27 average, but fell slightly less sharply than the EU-27 in 2020 as the Covid-19 pandemic hit. Employment in Germany is estimated to have remained static over 2020-22, whereas there was generally something of a bounceback seen in the EU-27 as a whole. Across the forecast period, employment in Germany is forecast to decline by around 0.3% pa compared with growth of around 0.2-0.3% pa for the EU-27 as a whole.

Figure 1. Annual percentage employment growth in Germany and the EU-27, 2015-35



Source: Cedefop (2022 Skills Forecast).

## 2. Labour force overview

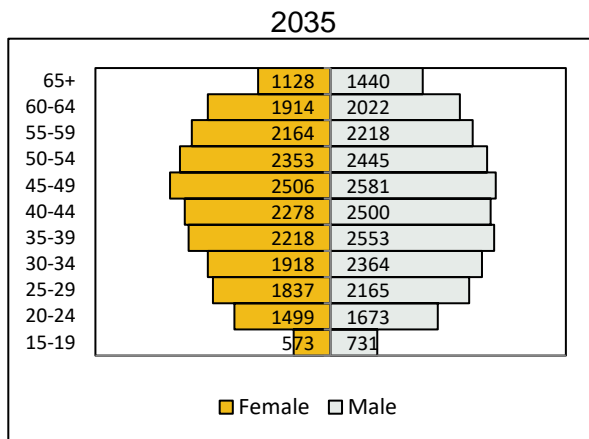
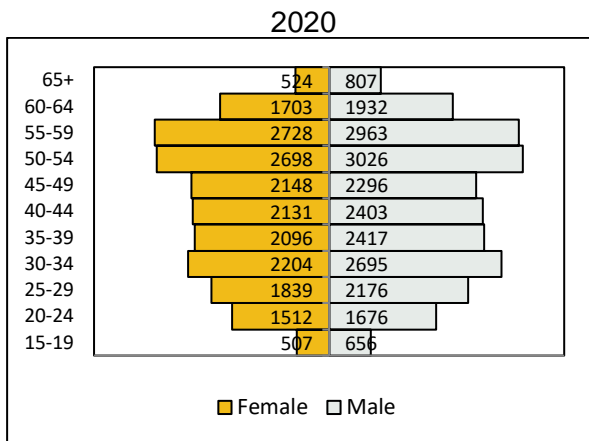
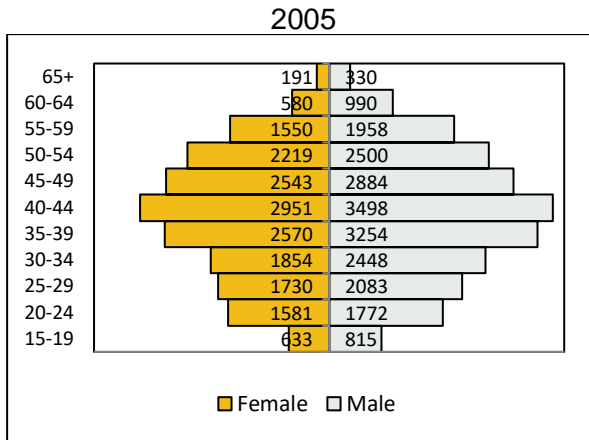
Figure 2 shows the labour force by age group in Germany in 2005, 2020 and 2035. Changes in the labour force in Germany over the forecast period will continue to be driven by the ageing population and increasing participation rates in almost all age groups. The total labour force in Germany is projected to fall very slightly over 2020-35, compared with an increase of around 5.5% seen over the previous 15 years. This compares with an expected increase in the labour force of just under 3% over 2020-35 for the EU-27 as a whole. Due to a slight fall in the total population, and particularly due to falling population in those age groups that are projected to see the largest increases in participation rates, the total participation rate in Germany is forecast to remain the same in 2035 as in 2020. The participation rate for the EU-27 as a whole is projected to increase by 1 pp over this period.

Although the overall population in Germany is forecast to fall slightly over 2020-35, the population aged 15-19, 40-49 and 65+ is forecast to grow quite strongly, while all other age groups are projected to decline, reflecting trends in the relevant younger cohorts in preceding periods.

The participation rates of almost all age groups in Germany are forecast to grow quite strongly over 2020-35, with the strongest increases projected for the 25-29 (10 pp), 35-39 (9 pp), 45-59 (6-8 pp) and 60-64 (14 pp) age groups.

As in EU-27 as a whole, female participation rates by age group in Germany are generally projected to increase more than male rates and, overall, the total participation rate for females is forecast to increase by 1 pp over 2020-35 while the total rate for males is forecast to fall by 1 pp.

Figure 2. Distribution of the labour force (thousands), 2005-35

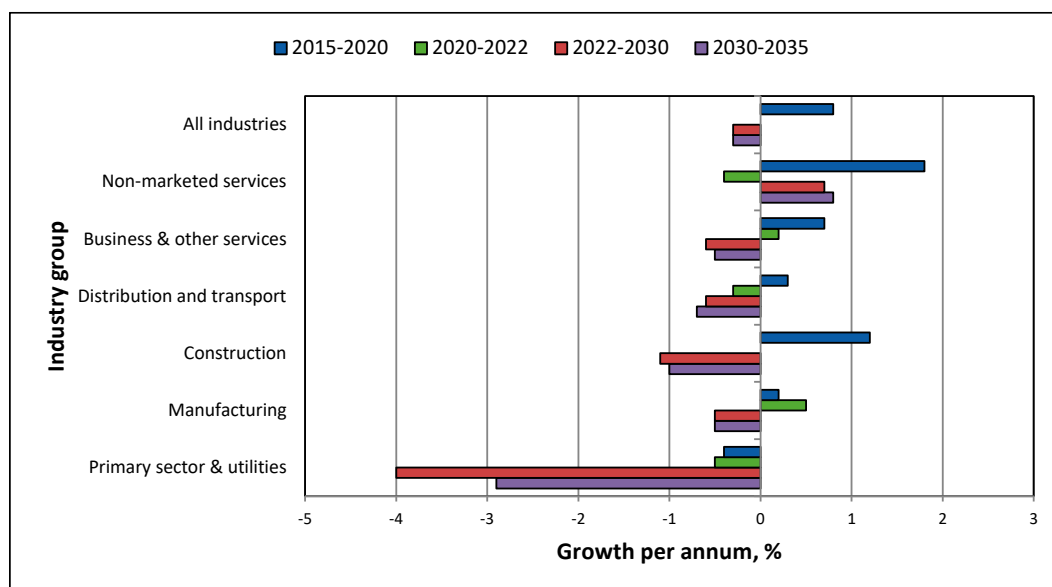


Source: Cedefop (2022 Skills Forecast).

### 3. Sectoral employment trends

Figure 3 shows annual average employment growth by broad sector in Germany between 2015 and 2035. The only broad sector that is forecast to see positive employment growth over 2022-30 is *Non-marketed services*, with growth of 0.7-0.8% pa. Even *Business & other services*, the driving force of employment growth in many EU countries, is forecast to see a decline in employment, of around 0.5% pa. The *Primary sector & utilities*, as for the EU-27 as a whole, is forecast to see a sharp (and in fact slightly sharper than the EU-27 average) decline in employment, of 3-4% pa, while *Construction* is forecast to see a decline of 1% pa over the same period.

Figure 3. **Employment growth by broad sector of economic activity, 2015-35**



Source: Cedefop (2022 Skills Forecast).

In terms of sub-sectors (i.e. below the level of the six broad sectors discussed above), the pattern of growth is much more mixed. Within *Business & other services*, relatively strong growth in employment is expected in *research & development, architectural & engineering* and *real estate activities*. Within *Non-marketed services*, employment growth is forecast to be mainly driven by *education* and *health*. In *Manufacturing*, the *pharmaceuticals, optical & electronic equipment* and *electrical equipment* sub-sectors are forecast to see positive growth, but all other sub-sectors are forecast to see a fall in employment. Within *Primary sector & utilities*, only *electricity* is forecast to see positive growth in

employment over the whole of the forecast period, and *agriculture, mining & quarrying* and *gas, steam & air conditioning* are all forecast to see strong declines. The degree to which these structural changes will manifest themselves and the exact speed of these changes will also depend on the political measure taken.

## 4. Job openings by occupational group

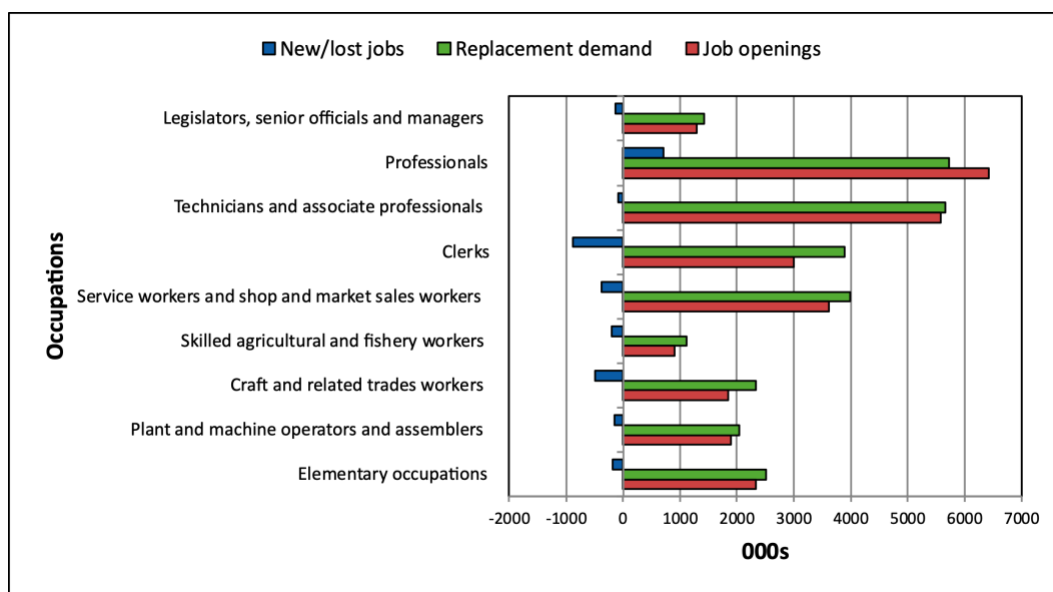
Cedefop skills forecasts estimate the total job openings by occupational group as the sum of net employment change and replacement needs. Net employment change refers to new jobs created or jobs lost due to the expansion or contraction of employment in that sector or occupation. Replacement needs arise as the workforce leaves the occupation due to retirement or career changes. Replacement needs, generally, provide more job opportunities than new jobs, meaning that significant job opportunities arise even in occupations declining in size (i.e. agricultural workers are a typical example, as ageing workers employed in the sector will need to be replaced).

Figure 4 shows the total job openings by broad occupational group over 2020-35. The number of job openings indicates the number of jobs that are required to be filled due to lost/newly created jobs and those that are in need of replacement workers. All broad occupations except for *Professionals* are expected to experience a decrease in the number of jobs over this period, reflecting the forecast by sector. However, there will still be a large number of job openings due to replacement demand. *Professionals* and *Technicians & associate professionals* are the two broad occupations that are expected to generate the largest number of job openings over the forecast period, accounting for 24% and 21% of total job openings respectively.

At the more detailed level, the most job openings (taking both new/lost jobs and replacement needs together) are expected to be in high skilled non-manual occupations, such as *business & administration associate professionals*, *health associate professionals*, *teaching professionals*, *science & engineering professionals*, *science & engineering associate professionals*, *legal, social & cultural professionals* and *business & administration professionals*. Of these, only *business & administration associate professionals* and *science & engineering associate professionals* are expected to see a decline in the number of jobs, and job openings in all of them is expected to account for 4% or more of total job openings in the economy. The skilled non-manual occupations general & keyboard clerks, personal service workers, and sales workers are also all expected to provide a large number of job openings, driven entirely by replacement demand as

the total number of jobs is expected to contract for these occupations. Similarly, the skilled manual occupations of *metal, machinery & related trades workers* and *drivers & mobile plant operators* are expected to see substantial job openings, due entirely to replacement demand. Even among elementary occupations, *cleaners & helpers* and *labourers in mining, construction, manufacturing & transport* are projected to see a large number of job openings, due to replacement demand.

Figure 4. Job openings by broad occupational group, 2020-35



Source: Cedefop (2022 Skills Forecast).

## 5. Drivers of occupational change

Within the Cedefop skills forecast, future employment growth (or decline) of occupations is further broken down by separating national economic components from regional industrial and economic effects, helping to interpret what is driving the change. From this perspective employment growth can be explained by three possible drivers: (a) overall trends of the economy (i.e. growth or decline), (b) shifts of employment between sectors and (c) changes in the occupational structure within sectors (i.e. factors making some occupations more important than others).

An increasing specialisation in many sectors influences the occupational composition of employment in Germany. This is reflected in stronger occupation-specific effects, leading, overall, to increasing shares of *professionals* and *technicians and associate professionals* in the economy. These changes reflect changes in job organisation in many sectors, and in many cases an increasing



specialisation. Along with these specialisations there is also a move towards managing these new work forms. High-skilled occupations that can benefit from this trend are, for example, *legal and business professionals, managers*, as well as *business and other associate professionals. Health professionals* as well as *associate health professionals* both benefit from the increase in the underlying health sector, yet not all of the increases in employment translate into higher employment in these important health occupations. An increasing specialisation will lead also to a larger share of other occupations in that sector.

The overall effect of occupational change therefore depends on a number of factors that need to be considered together. Increasing digitalisation and the move towards a more service-oriented economy, including within manufacturing, will lead to a greater use of higher-level occupations. At the other end of the spectrum, lower-level occupations supporting production, as well as in the service sector, seem to be increasing at the cost of intermediate occupations.

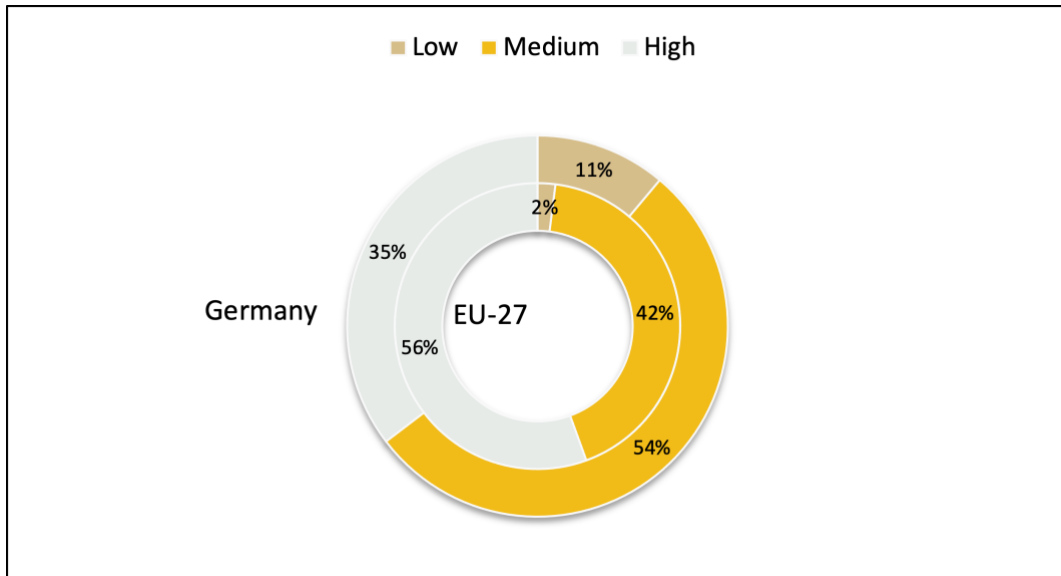
The strength of intermediate occupations, with a strong intermediate qualification level in Germany, limits the overall effect on the medium qualified occupations. Whereas building and related trade workers remain somewhat stronger, the industry-based metal, machinery and related trade workers are decreasing in number, most likely through increases in automation within the sectors. Clerical work is expected to see a decrease in its employment share in all but customer service clerks.

## 6. Demand for and supply of skills

Within the Cedefop skills forecast, skills are proxied by the highest level of qualification held by individuals in the labour force and in employment. Three levels are distinguished, high, medium, and low, which correspond to the official ISCED classification. The occupational group also offers an indication of the skill level required, as some occupations (e.g. professionals) typically require high-level skills, while some others (e.g. elementary) typically require only basic ones. Therefore, occupational groups are also linked to a skill level.

Well over half (54%) of the total job openings that are expected to be created in Germany over the period up to 2030 will require medium level qualifications, about 12 pp more than the EU-27 average (see Figure 5). This reflects the strong standing of Germany's dual system of education. Slightly more than one-third (35%) of total job openings will require high level qualifications and one in ten will require low level qualifications.

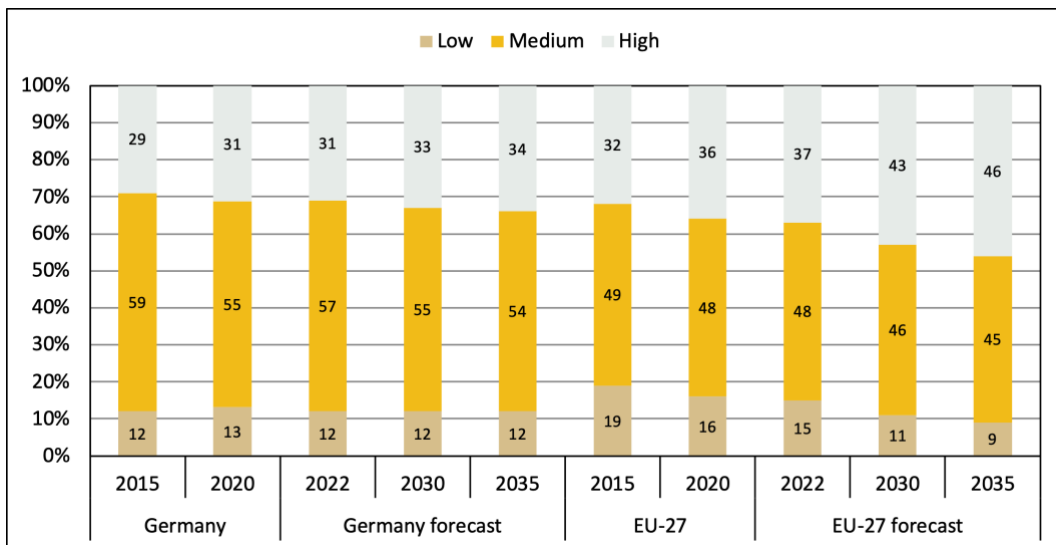
Figure 5. Shares of total job openings by level of qualification, 2022-35



Source: Cedefop (2022 Skills Forecast).

Future labour supply trends depend on the size of the working age population (defined as aged 15 or older), labour market participation rates, and the extent to which people acquire formal qualifications.

Figure 6. Labour force share by level of qualification, 2015-35



Source: Cedefop (2022 Skills Forecast).

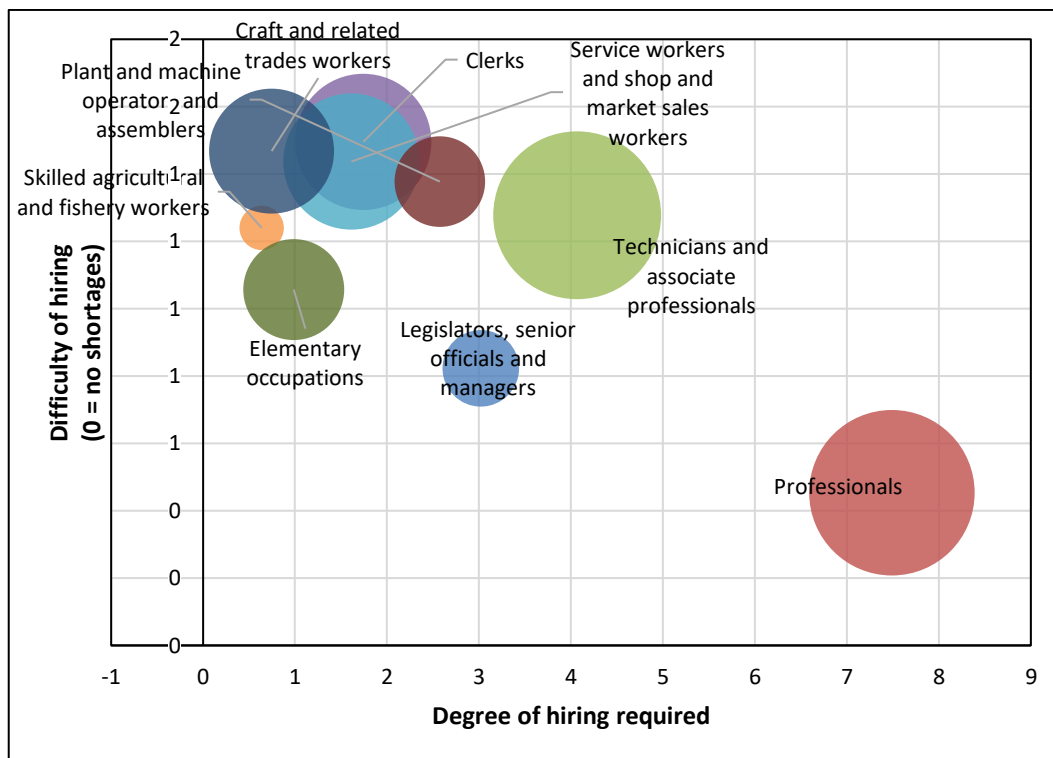
Germany is expected to experience little changes over 2022-35 in shares of qualifications in the labour force, as seen in Figure 6. The share of people with high level qualifications in Germany is expected to increase to 34% in 2035. The share of medium qualified labour force is expected to remain stable the largest qualification group in Germany (54%, in 2035). Those with low levels of qualification are expected to remain stable at 12%. In Germany, the proportion of the labour force with medium level qualifications remains significantly higher than the EU-27 average.

In Germany, the supply of low and medium qualifications is expected to be below what is required by demand by 2030, while the supply of high skill workers is expected to meet the demand for those qualifications broadly.

Figure 7 shows an indicator, *difficulty of hiring*, whose aim is to approximate shortages of supply by qualifications and its impact on occupations. This measure, shown along the vertical axis, indicates increasing difficulties to fulfil demand given the available supply of qualifications used in the occupation. Along the horizontal axis, the *degree of hiring required* in the occupation is depicted. Higher values indicate that to reach the forecast result that occupation will need to adjust more (in terms of workers with particular qualifications) relative to the base year (2018) levels. These changes (degree of hiring required) can be due to a change in the qualifications required or increases in the number employed. The size of the bubble indicates the *overall employment level*; bigger bubbles indicate more employment while smaller bubbles less employment.

Occupations with both a high *degree of hiring required* and a high *difficulty of hiring* (i.e. towards the top right of the figure) are likely to have the most difficulties in achieving a suitable workforce.

Figure 7. Indicators of future hiring difficulties, 2022-35



Source: Cedefop (2022 Skills Forecast)

Note: Indicators were calculated at the level of the underlying 2-digit occupation groups. Aggregation was based on the employment weights within each 1-digit occupation group.

Germany faces extreme labour market tightness. This lack of labour supply has led to the forecast's lower overall employment growth projections. This explains the relatively low projected hiring difficulties for Germany up to 2035 for a lower level of overall growth. Yet, labour market tightness is expected to remain

throughout the forecast period. Hiring difficulties arise mainly among medium qualified.

Figure 7 shows that occupations within *Professionals* are forecast to experience a lot of changes, which will require hiring new workers, mainly highly qualified workers. It is expected that there will be few hiring difficulties for this group as it requires predominantly high qualified job-seekers who are not projected to be in shortage. However, within (i.e. for 2-digit occupations) professionals, the degree of hiring required will differ, with *information and communications technology professionals* and *health professionals* (5) being above average within this group.

*Crafts and related trades workers* are expected to experience higher levels of hiring difficulties while having relative low degrees of hiring. *Technicians and associate professionals* show intermediate level of hiring while being somewhat more affected in their hiring difficulties (relative to the low country level).

## Cedefop methodology

The Cedefop Skills Forecast offers quantitative projections of future trends in employment, by sector of economic activity and occupational group. Future trends in the level of education of the population and the labour force are also estimated. Cedefop's forecast uses harmonised international data and a common methodological approach allowing cross-country comparisons between employment trends in sectors, occupations and qualifications. The forecast and methodology is validated by a group of national experts. The forecast does not substitute national forecasts, which often use more detailed methodologies and data, while they also incorporate in-depth knowledge of a country's labour market.

The latest round of the forecast covers the period up to 2035. The forecast takes account of global economic developments up to May 2022. The European Economy experienced a sharp downturn in 2020 due to the global pandemic, and partially bounced back in 2021. However, the strength of the recovery in the short term is threatened by global factors such as supply chain disruptions, the consequences of the war in Ukraine and high inflation.

The key assumptions of the baseline scenario incorporate the Eurostat population forecast available in May 2022 (Europop 2019) <sup>(1)</sup>, and the short-term macroeconomic forecast produced by DG ECFIN in May 2022 <sup>(2)</sup>. Several revisions to the data affect the Cedefop Skills forecast 2022, when compared to the 2019 update. For example, the population projections used in the 2022 update are generally more pessimistic than those used in the 2019 update (i.e. Europop 2015), with a corresponding impact on labour force figures. The source of historical labour force data is the European Labour Force Survey, which in 2021 underwent important methodological changes causing a break in the time series for several variables, including labour force. As a consequence, in many Member States the participation rates in 2021 are noticeably above/below historical trends, which causes the Cedefop Skills forecast 2022 to be revised in the same direction, compared to the 2019 update. Moreover, some Member States experienced significant revisions in the historical data series for sectoral employment from the National Accounts.

The Cedefop Skills forecast 2022 is made consistent with the objectives set by the European Green Deal by incorporating suitable assumptions in terms of additional investment, power sector technologies, energy balances and carbon pricing.

Energy and commodity price forecasts from the World Bank and the IEA are used as inputs to the Cedefop Skills forecast, which therefore incorporate the recent surge in prices.

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(1) <https://ec.europa.eu/eurostat/web/population-demography/population-projections/database>

(2) [https://ec.europa.eu/info/business-economy-euro/economic-performance-and-forecasts/economic-forecasts/spring-2022-economic-forecast\\_en](https://ec.europa.eu/info/business-economy-euro/economic-performance-and-forecasts/economic-forecasts/spring-2022-economic-forecast_en)

For the latest update and access to more detailed Cedefop skills forecast data visit our [Skills forecast project page](#).



The country fiche for Germany has been developed in collaboration with Tobias Maier, researcher at the Federal Institute for Vocational Training and Education (BIBB), Germany.

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