Skills England

Skills Needs Assessments technical annex

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1. Introduction

This technical annex outlines the methodology used to produce the analysis for the 10 Sectoral Skills Needs Assessments (SNAs) reports and Chapter 6: Skills England's Skills Needs Assessments in the Skills England Annual Skills Report.

The Sectoral SNA reports focus on skills demand and supply for specific sectors, whereas Chapter 6 in the Annual Skills Report includes analysis across all 10 of the priority sectors.

The same data and methodology have been used for Chapter 6 in the Annual Skills Report and the 10 Sectoral SNA reports. Skills England have also published a set of accompanying tables, which presents the data used across our Skills Needs Assessments publications.

1.1 Handling Notes

The SNAs use occupations, as defined by Standard Occupation Classification (SOC) codes, to provide an indication of the skills needs for the sectors. These allow for a consistent approach and cross-sector comparison. However, they are an approximation and do not work for all types of employment, particularly in highly specialised and emerging roles, such as in the retrofit sector. To supplement information on jobs by SOC, we have expanded our methods to use the newly developed UK Standard Skills Classification to identify the skill areas relevant for priority occupations.

This is the first step for assessing the future demand for skills across key sectors in terms of both occupations and specific skills areas. All estimates of future employment and skills are highly uncertain and their inclusion here is not for making precise forecasts of employment levels. Rather, the aim is to provide information about the general nature of changing employment patterns and their implications for skill requirements. The projections should be regarded as indicative of general trends and orders of magnitude, given the assumptions made by sponsoring departments, as set out in section 2 below.

2. Priority occupations and demand figures

Methods used to select priority occupations, project future demand, and create alternative demand scenarios were selected by sponsoring departments, with support from Skills England analysts where required. Therefore, the methods differ by sector and as such projections are not directly comparable across sectors. The methods are summarised below.

For all priority sectors, where the workforce of a priority occupation was projected to decrease from 2025 to 2035 by the sponsoring department, Skills England have held the demand for flat instead, meaning that growth for this occupation over 2025 to 2035 would appear as zero.

2.1 Advanced Manufacturing

Priority occupations were selected by the Department for Business and Trade (DBT) based on workforce size and proportion in the Advanced Manufacturing sector, using 2024 Annual Population Survey (APS) data. Expert judgement was applied to determine whether occupations were conceptually manufacturing in nature rather than general, and considerations were made in terms of the skill level, qualification level requirement, levels of skills shortage vacancy and the demand levels of occupations from Skills England's (DfE) Occupations in Demand in 2024 publication. Additional consultation was made with sector teams and the Migration Advisory Committee's temporary shortage list was considered when finalising the priority occupation list.

Workforce size projections and actual figures are based on The Skills Imperative economy-wide projections 'technological opportunities' scenario occupation level data for the UK weighted by the proportion of each occupation appearing in the sector, based on 2024 APS data. This assumes that the growth seen in each occupation at an economy wide level will also apply to growth in the occupation in the Advanced Manufacturing sector.

Sector-wide workforce size projections assume that growth will remain flat, based on historical employment trends.

Alternative demand scenario growth figures are based on The Skills Imperative economy-wide projections 'baseline' scenario occupation level data for the UK weighted by the proportion of each occupation appearing in the sector, based on 2024 APS data.

Further information on the scenarios can be found here: The Skills Imperative 2035: Occupational Outlook – Long-run employment prospects for the UK, Alternative Scenarios Working Paper 2b (p12).

2.2 Clean Energy

The Department for Energy Security and Net Zero (DESNZ) used their 2025 Clean Energy Jobs Plan to identify the priority occupations which require the largest increase in workforce and are experiencing workforce supply challenges. Qualitative and quantitative

assessment of demand and supply for each occupation was carried out including considering the absolute and proportional increase in workforce required by 2030 from DESNZ analysis applied to Low Carbon and Renewable Energy Economy (LCREE) employment data, and the skills shortage vacancy density and size of existing workforce meeting full skills requirements from ONS and employer skills survey data.

Occupations were shortlisted based on demand and supply indicators and then sense-checked with DESNZ sector teams and industry bodies. Full details of the methodology used can be found in the Clean Energy Jobs Plan Technical Annex.

Limitations to this approach include reliance on economy-wide datasets and a focus on demand to 2030, rather than to 2035 or later.

Workforce size estimates are derived from DESNZ's sector level analysis of direct clean energy jobs in 2023 and 2030 associated with clean energy activities. To translate sector-level demand into occupational demand, an experimental approach was developed to apportion clean energy jobs by occupation, at the 4 digit SOC level. This approach identified the relative importance of occupations based on economy-wide SOC by Standard Industrial Classification (SIC) employment breakdowns sourced from the ONS Annual Population Survey. For a more detailed explanation please see the Clean Energy Jobs Plan Technical Annex.

Projections were provided to Skills England up to 2030. Estimates for intervening years were estimated by Skills England (SE) using simplifying assumptions (for example, a straight-line increase). To enable comparison across other priority sectors which have demand projections to 2035, Skills England have held projected demand growth flat for the period from 2030 to 2035.

An alternative demand scenario was developed, to allow wider sensitivity analysis of priority occupations, based on LCREE estimates for a subset of "clean energy" sectors, where the annual growth rate of direct employment in these sectors between 2020 and 2023 were applied to baseline figures and extrapolated to 2030. This resulted in a slower growth rate.

Historical LCREE growth rates are likely to be conservative relative to expected clean energy sector demand. Using this approach some LCREE sectors encompass a broad range of technologies, and some are not captured, for example electricity networks. There is not perfect equivalence between LCREE sectors and clean energy – making direct comparisons more difficult.

Top-down approaches assume uniform growth across all priority occupations, whereas the relative importance and growth of different roles may change over time.

2.3 Creative Industries

Priority occupations were primarily selected by the Department for Culture, Media, and Sport (DCMS) based on workforce size and proportion in the Creative Industries, using analysis of APS, together with the DfE Occupations in Demand in 2024 demand index and the number of Creative Industries sub-sectors where the occupation appears in the top 25. Additional factors considered included share of employment at subsectors level, and

whether creative and computing training pathways offer a clear route into these occupations. The results of the Creative Industries Skills Audits were also used to identify occupations where staff numbers are expected to grow over the next 3 to 5 years.

Workforce size to 2035 are estimated based on the past relationship between investment and GVA together with a conservative assumption that half the Creative Industries Sector Plan's target to increase investment to 2035 is realised. Using this, GVA per worker in 2024 is calculated supported by DCMS economic estimates for Jan to Dec 2024 and summed monthly GVA for the same period.GVA per worker in 2024 is calculated supported by DCMS employment estimates for Jan to Dec 2024 and GVA estimates for the same period.

OBR estimates are then used to forecast how GVA per worker will grow, based on the published high productivity scenario, as it can be expected that some of the capital investment will support productivity increases. These estimates are published to 2030 so annual productivity growth is assumed to be the same across 2031 to 2035 as in 2030 (1.5%).

Predicted GVA and predicted GVA per worker is then used to estimate employment to 2035, with a compound annual growth rate (CAGR) of 1.62% for the sector between 2024 and 2035. Priority occupations are assumed to follow the growth rate observed between 2021 to 2023 (2.41%), providing a scenario where priority occupations become more prevalent in the overall workforce from 2025 to 2035.

Faster growth was projected in an alternative scenario based on the methodology above with the assumption that the full amount of the Creative Industries Sector Plan's target to increase investment to 2035 is realised. GVA per worker is also assumed to increase annually by a baseline of 1% and in addition to this the OBR impact of AI on productivity "J-shaped scenario" is applied. Through this approach a CAGR of 4.19% is applied uniformly to each priority occupation.

2.4 Construction

Skills England has worked with the Department for Business and Trade (DBT) and Ministry of Housing, Communities & Local Government (MHCLG) to identify occupations of importance to the Construction sector. DBT initially identified priority occupations using their modelling calculations – where occupations within the sector had estimated workforce shortages in 2030 of 5,000 or above, these occupations were selected as priority occupations. DBT's modelling calculations are based on their wider workforce modelling for the Construction sector, which is included in the technical annex of the Construction Sectoral SNA report.

Following discussions with DBT and MHCLG, 3 additional occupations were included specifically to target the housebuilding-subsector. These were conservation professionals, environmental professionals, and inspectors of standards and regulations (SOC 2151, 2152, and 3581).

To note that this definition of priority occupations for the Construction sector differs to the definition used for priority occupations in Housebuilding that was used in the Assessment of Priority Skills to 2030. This means that the analysis for Construction in the SNAs is not

comparable to the analysis for Housebuilding in the Assessment of Priority Skills to 2030 publication.

For the Assessment of Priority Skills to 2030 publication, the criteria applied in order to identify priority occupations for the Housebuilding sector were:

- Whether there are barriers to entry to the occupation (for example, a qualification or training requirement to start the job)
- If a job in the occupation could not be hired from other industries - because either the skillset is specific to construction or shortages in other industries are already known to exist

Whereas for the SNAs, priority occupations for the Construction sector were selected because of their importance and their considerable expected growth. As a result, some occupations are not included in the analysis due to their limited expected growth, but have been identified by MHCLG as important in supporting housebuilding. This particularly applies to occupations in the planning phase of development, which have an outsized impact on housebuilding because one person can contribute to a large number of homes per year. These occupations are as follows:

SOC Description
Estate agents and auctioneers
Skilled metal, electrical and electronic trades supervisors
Stonemasons and related trades
Crane drivers
Steel erectors
Pipe fitters
Building and civil engineering technicians

Workforce sizes were projected from 2025 through a combination of business as usual (BAU) forecasts and demand relating to government commitments. This reflects Scenario 3 in DBT's wider construction modelling (outlined in the annex of the Construction Sectoral SNA report). Business as usual demand was based on CITB construction workforce outlook forecasts extrapolated to future years, with BAU housebuilding kept constant. To factor in the impact of government commitments on demand in this sector, the number of additional workers needed to complete the government ambition to build 1.5m homes in England were estimated and included in projections.

A faster growth alternative scenario was estimated based on the use of the Experian forecast for construction workforce for the BAU forecast, while also adjusting for the additional workforce required to meet the Governments housebuilding commitments. This reflects Scenario 4 in DBT's wider construction modelling.

Overall sector workforce size was estimated based on SIC definitions with an additional 1.3067 uplift to account for architectural and engineering activities SIC (71.1) inclusion. This was then applied to published ONS employment figures by SIC, BAU and government commitment scenarios were then applied as part of future projections.

To note that no figures are currently included for jobs in the Construction sector supported by Department for Energy Security and Net Zero (DESNZ) energy efficiency and clean heating policies. These jobs are captured in the Clean Energy Skills Needs Assessment. However, there is likely to be crossover between roles in the Clean Energy and Construction sectors. Further details of projected employment in the repairs, maintenance and improvements sector can be found in the Warm Homes Plan.

2.5 Defence

Skills England worked with the Ministry of Defence (MOD) to identify occupations of importance to the Defence sector. The priority occupations for Defence have been selected as they contain important skills for defence capabilities now and in the future. In some cases, their inclusion responds to specific sub-sector demand or where the MOD has identified evidence of workforce shortages.

Demand was projected using demand estimates from the Assessment of Priority Skills and extrapolating these forward for the period 2030-2035 using compound annual growth rates. The projections included in this publication are provisional as they do not reflect the effect of the forthcoming Defence Investment Plan which will likely change the current pattern of defence spending. We note that the projections may change with the publication of the Defence Investment Plan.

Official estimates for jobs supported in the sector are not available. Occupational and workforce size projections are based on data from a sample of companies which have had the 2023 ADS defence sector figures applied to estimate the overall size of the UK sector. ADS is a trade association which represents the UK aerospace, defence, security and space sectors. This methodology assumes that the industry returns are representative of the whole sector. However, individual adjustments have been made to specific occupations' workforce size projections based on departmental knowledge.

Data has also been adjusted to account for the expected increase in defence spending to 2.6% of GDP by 2027, with compound annual growth rates applied to extrapolate to 2035.

ADS figures for total employment in the defence sector were used as a baseline and these were projected using the same methodology, adjusting for expected increases in defence spending and extrapolated to 2035 with compound annual growth rates.

An alternative scenario was created based on projecting 2024 estimates of workforce sizes for priority occupations using the baseline scenario projections from The Skills Imperative economy-wide projections. These economy-wide projections do not capture the planned increase in defence spending, and as such the alternative scenario for defence could be significantly underestimating the future demand for workers.

2.6 Digital and Technologies

Priority occupations were identified by the Department for Science, Innovation and Technology (DSIT) based on a combination of online job advert analysis and sector qualitative analysis. Firstly, occupations with a large proportion of digital or technical skills were identified from job adverts. Secondly, job adverts from sector specific companies

were assessed to determine the occupations most recruited by the Digital and Technologies sector. This combined list then went through an expert manual review to remove generic or unrelated occupations and sub-sector specific policy reviews were carried out to determine additional sub-sector specific priority occupations.

Priority occupation workforce figures were calculated based on the Annual Survey of Hours and Earnings (ASHE) total UK employment in priority occupations. These were then adjusted based on the proportion of the UK workforce in these occupations that are in Digital and Technologies related SIC codes according to Annual Population Survey data.

Projected employment demand has been estimated by weighting ASHE occupation-level employment data to the Digital and Technologies sector using SIC/SOC mappings, then projecting all occupations forward using a long-run digital sector growth rate derived from historic employment trends. An assumption is made that employment for Digital and Technologies priority occupations is projected to grow at the same average rate between 2025 and 2035 as that observed in the closely related Digital sector between 2011 and 2024. Projections carry a substantial degree of uncertainty and should be considered as illustrative only.

Sector specific analysis suggests this may be a significant under-estimation for some parts of the Digital and Technologies sector. This should be considered when using this analysis and figures should not be used to inform detailed policy making decisions.

Digital and Technologies whole sector growth was projected according to the same compound annual growth rate of the Digital sector, applied to the 2025 sector workforce as defined by SIC (summarised in Table 1).

An alternative scenario for employment growth has been calculated by applying baseline growth rates from economy-wide projections to ASHE data, apportioning results to the sector using SIC/SOC mappings.

To note that the SIC system does not fully capture the detail and fast-changing nature of Digital and Technologies, and the estimate uses a set of SIC codes to proxy for the sector. Analysis included in the SNAs publication for the Digital and Technologies sector uses the SIC definition as previously published in the Digital and Technologies Sector Plan (published in June 2025). DSIT is developing an updated SIC proxy definition for the Digital and Technologies sector as part of a statistical release (due to be published in June 2026). Therefore, the analysis within the SNAs publication should be treated as indicative rather than the latest representation of the sector.

2.7 Financial Services

HM Treasury (HMT) identified priority occupations based on considering employment within the sector, the demand level, and whether the role is technology-based. Specifically, the following factors were considered:

- Occupations were categorised into bands based on the level of employment within the sector.

- Occupations in Demand in 2024 analysis was used to assess which occupations are broadly in demand across sectors. Those occupations with 'Critical Demand' were prioritised, with those with 'Elevated Demand' were also in scope.

- Occupations from technology SOC codes were prioritised. This is because, as a result of the digitalisation of the sector, roles in technology have become increasingly important, with demand for these occupations likely to see a continued strengthening over time.

Where occupations hit a combination of these factors, they are considered to be a priority to the financial services sector. An additional expert review in the form of a qualitative assessment was applied to these occupations to remove occupations where digitalisation is likely to reduce their importance or where relatively small volumes or proportions are seen in the Financial Servies sector.

2024 employment volumes were based on Occupations in Demand in 2024 analysis of workers in the "Finance and Insurance" named grouped SIC industry. For demand projections, different approaches were taken based on whether occupations were Technology-related or not.

For non-technology roles, demand projections were estimated based on the average of two projections from economy-wide projections from the Skills Imperative programme:

- SOC 4 annual projections for future employment growth (Table 2: Employment by occupation (SOC2020 unit group), baseline scenario, 2021 to 2035, United Kingdom. These can be found in the United Kingdom Additional Tables, which can be downloaded from the 'Nations projections'.

- Financial Services SOC 2 Projections for 2020-2035 employment growth (Industry and Occupation Table 1 Occupation composition (SOC2020) by gender, 2015-2035, United Kingdom). These can be found in the United Kingdom Main Tables, which can be downloaded from the 'Nations projections'.

For technology-related roles, defined as those within the 3-digit SOC 213, demand projections were estimated based on applying a compound annual growth rate of 6.4%. This growth rate is to account for the dramatic increase in technology roles over the past four years and the expectation that the sector becomes increasingly digitalised. The growth rate has been calculated based on Annual Population Survey (annual population survey - regional - occupation (SOC2020) by sex by employment type) data between 2021 and 2024.

Skills England agreed with HMT on an alternative scenario, estimating projections based on the human-centric scenario in the economy-wide projections from the Skills Imperative programme.

2.8 Health and Adult Social Care

2.8.1 Health

Priority occupations in Health were selected by the Department for Health and Social Care (DHSC) based on the 2023 NHS Long Term Workforce Plan. However, as SOC does not always match clearly with NHS occupation groups, approximations have been made where necessary.

Workforce size data for health in 2024 was sourced from APS data for England, assuming the full workforce within the occupations was in the health sub-sector. This includes people working in NHS trusts, primary care, local authorities, schools and private providers. These will differ from NHS England published data on the number of people employed by NHS Trusts and related organisations, as these only capture those working for NHS providers and are self-declared.

At the time of preparing the Skills Needs Assessments, due to ongoing workforce modelling for the upcoming 10 Year Health Workforce Plan, the Department of Health and Social Care (DHSC) were not able to provide projected demand estimates for health priority occupations. As such, the Skills Needs Assessments do not include any future demand estimates for health.

2.8.1 Adult Social Care

Priority occupations in Adult Social Care were selected because of their volume, compatibility with SOC code system and distinctiveness within adult social care – aiming to reduce overlap with the forthcoming NHS 10 Year Workforce plan or other industrial strategy sectors.

While these classifications provide the closest match to adult social care job roles, DHSC colleagues and Skills England engagement with the sector has indicated that SOC codes do not fully represent the diversity of roles within Adult Social Care. For instance, the Social Worker SOC includes Adult and Children Social Workers. In this instance, the demand growth estimate is based solely on projected demand for Adult Social Workers on top of SOC numbers for all Social Workers in general.

Current worker numbers were calculated based on Annual Population Survey analysis of full time and part time employees in England that belong to relevant SOC codes. While these classifications provide the closest match to adult social care job roles, APS estimates are generally considered less accurate than other preferred sources, such as Skills for Care's Adult Social Care dataset. However, APS data has been used here to maintain consistency across sectors.

There is not a definitive metric for actual workforce demand. Therefore, DHSC have assumed that demand will grow in line with projected increases in care users, using current supply as a baseline. Projections were calculated based on care user growth projection rates from the Care Policy and Evaluation Centre (CPEC) published projections (2025), with 2023 to 2024 as a base year, and 2024 to 2025 onwards using published CPEC projections. DHSC assume that current supply meets demand and that the workforce will grow proportionally with projected care user growth. Projections are for demand growth in England only.

As the Social Worker SOC includes Adult and Children Social Workers, the demand growth estimate for this occupation is based solely on projected demand for Adult Social Workers on top of SOC numbers for all Social Workers in general.

Whole sector workforce sizes were estimated for 2024 based on Skills for Care's Adult Social Care data and projected based on the Care Policy and Evaluation Centre growth rates, these estimates apply to England only.

To create an alternative scenario, Skills for Care's Adult Social Care growth estimates were applied (as opposed to growth estimates from CPEC) to produce projections up to 2035.

Other specific caveats to note are:

- The figures reported are SOC-based figures rather than actual. SOCs are self-reported in the Annual Population Survey and may be subject to misclassification. This can lead to discrepancies when compared with Skills for Care data.
- The figures represent a current snapshot and assume demand aligns with existing supply.
- The analysis does not account for potential policy changes or labour market shifts, such as international recruitment. It also does not address the challenge on focusing on workforce productivity over increased supply of workers.
- SOC's 1232 and 1172 represent the best match that will cover registered Social Care managers, but will also likely include overlap with other professions, explaining the large discrepancy with Skills for Care.

2.9 Life Sciences

Priority occupations were selected by the Office for Life Sciences (OLS) based on ONS census employment, Bioscience and Health Technology Sector Statistics (BaHTSS), and industry expertise. The approach used involved taking the SOC breakdown within each SIC code from ONS census data and applying this to a 3-digit SIC cut of OLS BaHTSS data, to estimate total employment for each occupation in the Life Sciences sector. Occupations were ranked by employment and filtered for where the BaHTSS SIC employment is at least 10% of the census SIC employment and the SOC represents more than 0.01% of total estimated life sciences employment. This gave added certainty that the roles are specific to the sector. Then, qualitative analysis was undertaken to remove some remaining occupations which were deemed not relevant to the sector, based on industry engagement. The OLS then worked together with industry stakeholders to select the top occupations from this ranking which are relevant to the Life Sciences sector.

Life Sciences sector total projections to 2035 were calculated by applying a 5-year recent employment growth rate from BaHTSS to 2025 estimates. Occupation-level estimates were projected for each year by applying the technological scenario growth rates from economy-wide projections from the Skills Imperative programme to each occupation. Occupation-level projections were then scaled up proportionally so that their sum is equal to the total Life Sciences total employment value in each year of projections.

Projections for the alternative scenario were calculated by applying economy-wide labour market projections from Skills Imperative, under the technological scenario, to the 2025 employment estimates. For occupational-level estimates, the Skills Imperative growth rates were applied to each occupation's 2025 estimate. Then, as in the central scenario, these occupation-level estimates were scaled up so that for each year of projections, the sum of employment for all occupations equals the sector total.

2.10 Professional and Business services

Priority occupations were identified by the Department for Business and Trade (DBT). Annual population survey data was analysed to identify the occupations most related to the sector's relevant SIC codes (as shown in Table 1), and Occupations in Demand 2024 analysis was also used to shortlist these occupations by identifying occupations in elevated and critical demand.

Workforce figures for 2022 to 2025 were estimated based on historical Annual Population Survey data. Demand projections up to 2035 were then estimated using the 'baseline' scenario from the Skills Imperative economy-wide projections. The growth rates were applied to historic and current actual figures estimated from the 2024 Annual Population Survey. There is a simplifying assumption made that occupation growth is even across all the sectors it appears in. In practice, some subsectors will display variable growth rates depending on their sensitivity to trends like AI or offshoring (Common considerations for outsourcing and offshoring | ICAEW).

ONS data on employee jobs by industry were used together with relevant sector SIC codes to determine whole sector workforce size, this was then projected to 2035 using the Skills Imperative economy-wide projections 'baseline' scenario growth rates.

There are 2 alternative scenarios for the demand projections. These scenarios have been calculated by using forecasted annual growth rates from the 'human-centric' and 'technological opportunities' scenarios, respectively, from the Skills Imperative economy-wide projections. Further information on these scenarios can be found here: the Skills Imperative 2035: Occupational Outlook – Long-run employment prospects for the UK, Alternative Scenarios Working Paper 2b. The growth rates were applied to historic and current actual figures estimated from the 2024 Annual Population Survey. This approach differs to the main scenario for the demand projections, which used the 'baseline' scenario from the Skills Imperative economy-wide projections.

2.11 Occupation demand aggregation

To account for counting workers multiple times when summing occupational demand across sectors, the total priority occupation workforce in 2025 was used to calculate a proportion of the UK workforce accounted for in sector returns, using the total workforce in each occupation who were 16 or older and in employment in January to December 2025 in the APS.

In cases where the total 2025 workforce across sectors exceeded 100% of the workforce in the APS data, and where the occupation is a priority for more than one sector, a scaling factor was applied to cap the 2025 workforce figure to the APS occupational workforce

figure. In these cases where a scaling factor was applied to the 2025 workforce figure, the same scaling factor was then applied to all years from 2026 to 2035. The scaled workforce figures were then used to calculate demand between 2025 and 2035.

The scaling is only applied to the aggregated totals. Therefore, summing individual sector totals will not match the estimates for growth across all sectors.

3. Occupations in demand analysis

Occupations in Demand in 2025 was used to determine the proportion of priority occupations in each sector, and across all sectors, which were in critical (substantially higher demand than usual) or elevated demand (above average). Further information on the methodology behind the Occupations in Demand statistics can be found here: Occupations in demand 2025 methodology.

Only occupations where a demand value was available were included in this analysis. This excludes all occupations that were “not elsewhere classified”.

4. Qualification level demand figures

Skills England have developed an expected education level to 4-digit SOC lookup, showing the education level that we expect learners to have when working in each occupation. Education levels have been split into level 2, level 3, level 4/5, and level 6 and above. The full lookup can be found in the accompanying tables, with 1 indicating that the level is expected for those working in a given occupation, and 0 indicating that it is not. For many occupations, a range of education levels are expected. For example, we expect production managers and directors in manufacturing (SOC code 1121) to have a qualification of at least level 3.

This lookup was developed by considering:

- Skills England occupational maps
- ONS skill levels as outlined in table 1 of the SOC 2020 Volume 1
- graduate roles as defined by the Warwick Institute for Employment Research

These were combined with data analysis of the census, the APS, and ASHE linked to LEO. The various sources were used alongside judgement of Skills England analysts to develop the final lookup.

The Migration Advisory Committee use a different methodology for defining skilled occupations for SOC codes. The methodology for assigning skill levels to occupations in the immigration system is set out in:

- paragraph 2.32 of Analysis of the Points Based System
- paragraphs 2.4 to 2.18 of Review of the Shortage Occupation List: 2020

5. Demographics

The Sectoral SNA reports include a section on demographics, which presents data on a sector's workforce distribution in terms of age, sex, and place. This provides an indication of the current characteristics of the workforce.

Note: Where demographic information has been derived from Annual Population Survey data, it should be noted that data at the 4-digit SOC level has large confidence intervals, where some estimates will be considered unreliable. This imprecision is increased when disaggregating by age, sex, and location.

5.1 Age and sex

2025 APS data was used to calculate age and sex demographic distributions for sectors which can be defined by Standard Industrial Classification (SIC) codes. These sectors are: Professional and Business Services, Construction, Advanced Manufacturing, Digital and Technologies, Financial Services, and Health.

It should be noted that SIC definitions do not fully capture the detail and fast-changing nature of some of the sectors, and these are proxies for sector specific estimations.

Creative Industries can be defined by SIC, however as the Department for Culture, Media and Sports produces their own sector specific estimates, these were used instead. SIC definitions for sectors can be found in Table 1.

Where sectors are not easily defined, or where there is a better alternative to APS data, demographic information from sector specific sources have been used:

- **Adult social care** – Skills for Care, Adult social care statistical appendix, 2025
- **Life sciences** – Futures Group – Life Sciences 2035: Developing the Skills for Future Growth, Aggregate data covering 3 years from Q1 2021 to Q4 2023, using a SIC definition for the sector. This uses a SIC-based definition, which differs from the Office for Life Sciences' chosen definition for the sector.
- **Creative Industries** – Economic Estimates: Employment January 2024 to December 2024 for DCMS Sectors
- **Defence** – The joint economic hub 2025 annual economic report for age and sex, and ADS defence sector outlooks for regional demographics. Data is for the year 2023.
- **Clean energy** - demographics were not produced due to data availability.

Table 1: SIC defined sector definitions

Sector	SIC definition
Advanced Manufacturing	20, 26, 27, 28, 29, 30
Creative Industries	3212, 5811, 5812, 5813, 5814, 5819, 5821, 5829, 5911, 5912, 5913, 5914, 5920,

	6010, 6020, 6201, 6202, 7021, 7111, 7311, 7312, 7410, 7420, 7430, 8552, 9001, 9002, 9003, 9004, 9101, 9102
Construction	41, 42, 43
Digital and Technologies	2611, 2612, 2620, 2630, 2640, 26511, 26512, 26513, 26701, 2680, 2731, 2732, 2790, 4651, 4652, 5811, 5812, 5813, 5814, 5819, 5821, 5829, 5911, 5912, 5913, 5914, 5920, 6010, 6020, 6110, 6120, 6130, 6190, 6201, 6202, 6203, 6209, 6311, 6312, 6391, 6399, 7112, 712, 721, 9511, 9512
Financial Services	64, 65, 66
Health	86
Professional and Business Services	69, 70, 71, 72, 73, 74, 77, 78, 82

Note: 711 is also included in Construction's SIC definition however, due to overlap with Professional and Business Services, Skills England agreed with DBT to exclude this for the sector when analysing demographics.

For all sectors, in addition to the sector demographics data, we have produced a UK-wide comparison, based on all occupations in the economy. For SIC-defined sectors, this has been produced using APS 2025 data. For Adult Social Care, Life Sciences, Defence, and the Creative Industries, we have used APS data for the year which is most comparable to the sector data. For example, if the sector data is based on the year 2023, we have used APS 2023 data to estimate the UK-wide comparison.

5.2 Employment status

For Construction employment status was considered alongside age and sex demographics. An employment status distribution was produced using APS 2025 data, to show the proportion of the workforce who are an employee compared to the proportion who are self-employed.

5.3 Place based analysis

The Sectoral SNA reports include analysis showing a sector's workforce by region and by Local Skills Improvement Plan (LSIP) areas.

A range of approaches were used for the place analysis. The data presented for a sector depends on whether the sector can be defined by SIC and on the data sources available. The approaches cover:

- Distributions of the workforce by English region, based on APS 2025 data. This is only applicable to sectors which can be defined by SIC.

- Distributions of the workforce by English region, and/or Local Authority areas, based on sector-specific data.
- Distributions of the workforce by English region, and for LSIP areas, based on Business Register and Employment Survey (BRES) 2024 employment estimates.

5.3.1 BRES Analysis

Priority sectors were defined using Standard Industrial Classification (SIC) codes in line with the sector definitions outlined in Table 1. Sector employment is calculated by aggregating BRES employee jobs across relevant SIC codes.

Outputs were produced for England, LSIP areas, and regions. LSIP geographies were constructed using 2023 Local Authority District mappings, with regional totals aggregated to ONS boundaries. Minor differences may occur due to rounding in published data. Also, BRES primarily captures VAT- and PAYE-registered businesses and may therefore underrepresent sectors with high numbers of freelancers or micro-businesses. As a result, apparent regional concentrations may reflect the location of larger employers rather than the full distribution of sectoral employment.

For some sectors not fully captured by SIC, the BRES analysis used groupings of relevant codes in order to approximate activity:

- **Health and adult social care:** This sector is only partially defined by SIC and captures a subset of wider activity. The definition combines healthcare and social care codes, providing a proxy that does not fully isolate adult social care from broader health services.
- **Construction:** This sector is only partially defined by SIC and reflects core construction activities. Related activities such as design and supply chains are not fully captured.

5.3.2 Sector-specific place data

For sectors which are not easily defined by SIC, an alternative, sector-specific data source was used to present place analysis. These sources are referenced in the Sectoral SNA reports where applicable, and include:

- **Life Sciences:** Employment estimates are taken from the Bioscience and Health Technology Sector Statistics (BaHTSS) 2023 to 2024, which cover the biopharmaceutical and medical technology subsectors. The main metric used is employment from Table 32 (Local Authority District).
- **Defence:** Estimates are taken from Ministry of Defence (MOD) supported employment statistics 2023/24, which estimates the number of direct and indirect full-time equivalent (FTE) jobs supported by MOD expenditure. Figures are based on the 2023/24 publication, with methodology set out in the accompanying background report. To note that these figures reflect jobs supported as a result of MOD spending, rather than employment within the Defence sector itself. Some roles included in these estimates would not be classified as ‘defence’ jobs, and this distinction should be considered when interpreting the figures.

6. Replacement demand

In addition to expansion demand, where we consider the additional workers needed due to expected future sector growth, there is also demand for workers required to replace existing workers in the labour market. This is known as replacement demand.

Skills imperative labour market and skills projections to 2035 were used to estimate the volume of replacement demand in each sector.

The United Kingdom baseline scenario was used to calculate the rate of replacement demand, as a proportion of total employment for each SOC2020 sub-major group over years. These replacement demand rates were then applied to sector estimates of total workforce in SOC2020 unit group priority occupations and summed to estimate the volume of replacement demand for each sector and year.

Whilst we have attempted to indicatively estimate replacement demand, our Skills Needs Assessments analysis focusses on expansion demand and assumes current supply is sufficient to maintain the existing size of the workforce. In practice, this will not be the case for some occupations.

7. UK Standard Skills Classification

The UK Standard Skills Classification (SSC) is a set of standardised lists of the skills, knowledge and tasks required for UK occupations. Using the prototype version of the SSC (published in November 2025), experimental analysis was conducted to identify the skill areas which are relevant to priority occupations and the UK economy as a whole. Skills England analysts devised a method in conjunction with the SSC research team from the Warwick Institute for Employment Research (IER), the University of Sheffield, and Omnifolio, who developed the classification on behalf of Skills England.

The data is available through the UK Skills Explorer (published April 2026).

7.1 Overview of outputs and weighting approach

The analysis produced four sets of outputs, covering two types of skills (occupational skill areas and core skills) and two levels (UK-wide and sector-specific priority occupations):

- **Occupational skill areas (UK level):** the relative prominence of each occupational skill area across the UK workforce.
- **Occupational skill areas (sector level):** the relative prominence of each occupational skill area across priority occupations within each sector.
- **Core skills (UK level):** the weighted average proficiency level required for each core skill across the UK workforce.
- **Core skills (sector level):** the weighted average proficiency level required for each core skill across priority occupations within each sector.

All outputs were weighted to reflect differences in the size and structure of occupations.

To produce these outputs, weights were calculated for each 4-digit SOC occupation:

- **UK weights** were based on each occupation's share of total UK employment in 2025, using APS data.
- **Sector weights** were based on each occupation's share of the total priority occupation workforce within each sector.

Data for 2025 was used for all sectors except Health, where the most recent available data (2024) was used.

7.3 Occupational skill areas

Occupational skill estimates were derived using version 0.9.1 of the SOC-to-skills mapping. Skills with a 6-digit SOC importance score below 50 were excluded. Due to limitations in the importance scores in this version of the data (since improved in version 1), all remaining importance scores were standardised to 1.

These values were then multiplied by the 4-digit SOC coverage values, excluding not elsewhere classified (n.e.c.) categories, based on ONS Census data. The resulting coverage values were reweighted using the UK and sector occupation weights and then recalculated as a proportion of all skills. They were then summed across each skill area and ranked based on the overall prominence of the skill area in the sector or across the UK.

7.3.1 Life Sciences

For Life Sciences, the occupational skills were identified based on a subset of their priority occupations, where the occupations have a direct relevance to the sector rather than a supporting role. This was done on request of the Office for Life Sciences, to identify skill areas most relevant for the Life Sciences sector. This subset of occupations is shown in Table 2 below.

Table 2: Life sciences priority occupations with direct relevance to the sector

SOC2020 unit group	Occupation name
1121	Production managers and directors in manufacturing
2134	Programmers and software development professionals
3111	Laboratory technicians
2161	Research and development (R&D) managers
2119	Natural and social science professionals n.e.c.
2129	Engineering professionals n.e.c.
2482	Quality assurance and regulatory professionals
2132	IT managers
2113	Biochemists and biomedical scientists
8113	Chemical and related process operatives
3119	Science, engineering and production technicians n.e.c.
2481	Quality control and planning engineers
3544	Data analysts
2433	Actuaries, economists and statisticians
3115	Quality assurance technicians
2111	Chemical scientists
2112	Biological scientists
3131	IT operations technicians

7.4 Core skills

Core skill estimates were based on version 0.9.0 of the SSC core skills dataset. To map this data from 6-digit to 4-digit SOC, a weighted mean of the proficiency score for each core skill was calculated for each 4-digit SOC based on the coverage value of each provided in the version 0.9.1 SOC-to-skills mapping.

These 4-digit SOC-level proficiency scores were then combined with the UK and sector occupation weights to produce UK-wide weighted average proficiency levels for each core

skill and sector-specific weighted average proficiency levels for each core skill across priority occupations.

For cross sector analysis, the workforce size of all priority occupations was used to create the required weighting.

8. Influence of AI

For the Sectoral SNA reports, research collated as part of a British Academy funded AI fellowship with Royal Holloway, University of London (RHUL), in collaboration with Skills England, was used to consider the influence of AI on the sector. Skills England supported Dr Nisreen Ameen from RHUL to develop an AI Skills tools package. Insights from sector-lead workshops and Skills England's AI Skills for the UK Workforce report highlight key skill demands most affected by AI.

Sector-specific external sources were also considered and referenced where appropriate.

8.1 Exposure of occupations to AI

The methodology for the exposure of occupations to AI can be found in Chapter 1 of the Impact of AI on UK Jobs and Training publication. This release introduces a number of refinements to the AI exposure methodology to improve consistency with newer classification standards, incorporate updated data sources, and expand comparative analysis.

The most significant structural change is the transition from SOC2010 to SOC2020. All underlying datasets and mappings have been updated accordingly to align with the latest occupational classification framework. In line with this, the analysis also draws on the most recent available data releases to ensure outputs reflect current labour market conditions.

The treatment of International Labour Organization (ILO) AI exposure ratings has also been updated. Previously, occupations were classified into binary categories of high automation or high augmentation. The revised ILO framework now uses a four-point gradient scale, which is adopted in this release. As ILO data are defined at the ISCO level, a mapping to SOC2020 is required. Where multiple ISCO codes map to a single SOC2020 occupation, the highest associated AI exposure gradient is assigned to that SOC2020 code.

A new comparative analysis has been introduced using the task-based AI exposure framework developed by Eloundou et al. This approach assesses exposure at the task level using O*NET data, with tasks classified into exposure categories: E0 not exposed; E1 tasks where access to an Large Language Model (LLM) alone or with simple interface would lead to 50% time savings; or E2 tasks where additional software is needed on top of an LLM to realise 50% time savings. Exposure scores are constructed using both a human-assessed "beta" measure (E1 + 0.5 × E2) and a GPT-based automation rating (scaled 1–4). Task importance is incorporated through weighting, with core tasks receiving double weight relative to supplementary tasks. Results from this method are presented alongside the existing exposure measures to provide additional context.

Finally, when calculating exposure by training route, this release uses full-person-equivalent counts rather than simple row counts, providing a more accurate representation of workforce composition.

9. Education supply

9.1 Historic supply

To estimate historic supply figures into priority occupations, we have used results from an internal model named the Education Leavers Model of Occupations (ELMO). This model was built using the Longitudinal Education Outcomes Study (LEO) linked with the Annual Survey of Hours of Earnings (ASHE) which includes information on the occupation of employment after training for a 1% sample of the population. We have used the ASHE-LEO data covering the period from 2015 to 2024 and taken the latest year where an employee is present in ASHE.

The ASHE-LEO sample was used to estimate the distribution of SOC occupations that learners have historically entered based on their education pathway (consisting of level, subject, and pathway of their highest qualification), industry sector of employment and gender. The output of this model is a dataset that, for each education pathway, SIC, and gender assigns a probability to each occupation at the 4-digit SOC code level.

The probabilities were applied to a cohort of education leavershttps://explore-education-statistics.service.gov.uk/find-statistics/leo-graduate-and-postgraduate-outcomes/2021-22 who were in sustained employment in the year after education, to estimate their occupations at 4-digit SOC. For higher education the cohort comes from LEO Graduate and Postgraduate Outcomes We include graduates and post-graduates employed in the 2022 to 2023 tax year and who graduated in 2020 to 2021 academic year.

For further education the cohort comes from Further education outcomes. Further education figures only include Full level 2, Full level 3 and Level 4 and above achievements employed in the 2022 to 2023 tax year and who achieved their qualification in the 2021 to 2022 academic year. The impacts of including other Level 3 achievements and Skills Bootcamps are estimated in the main report.

Education leavers which entered into priority occupations were summed to create overall volumes and proportions of pathway, level, and subject as conversion rates into priority occupations.

9.2 Important national training routes

In Chapter 6: Skills England's Skills Needs Assessments of the Skills England Annual Skills Report, we include training routes which are important across the priority occupations for all 10 priority sectors.

For higher education and further education pathways with a high conversion rate into priority occupations were selected as important training routes. This information was sourced from ELMO using the criteria below:

- Level 2 and 3 further education – all subject areas with a conversion rate at or above 40% with the addition of the Construction, Planning and the Built Environment subject area due to a conversion rate of 38% and high relevance to the Construction industrial strategy sector. T levels are included within these subject areas.

- Level 4 and above – all subject areas where the conversion rate is at or above 60% for level 6 higher education. The level 6 subject areas are selected across level 4 and above ensure alignment in subject areas across all levels.

For apprenticeships, whilst relevant apprenticeships can be identified using Skills England occupational maps, subject areas are used as a proxy. This allow more consistent tracking of achievements over time while standards were introduced and frameworks were phased out. Apprenticeship subject areas are selected by identifying all subject areas that include a standard mapped to a priority occupation and looking at recent achievement numbers using the criteria below:

- All apprenticeships – subject areas are retained where at least 60% of achievements in 2024/25 in that subject area were on a standard mapped to that priority occupation subject. Archaeology and archaeological sciences apprenticeships due to mapping to a single standard which did not appear related to the priority sectors.

All skills bootcamps which mapped to priority occupations, through expert judgement-based analysis by DfE's Skills Bootcamps team, were selected as important training routes.

Table 3: Important training routes into priority occupations across all priority sectors

Pathway	Level	Subject area
Apprenticeship	All levels	Accounting and finance
Apprenticeship	All levels	Administration
Apprenticeship	All levels	Architecture
Apprenticeship	All levels	Building and construction
Apprenticeship	All levels	Digital technology (practitioners)
Apprenticeship	All levels	Economics
Apprenticeship	All levels	Engineering
Apprenticeship	All levels	Health and social care
Apprenticeship	All levels	Manufacturing technologies
Apprenticeship	All levels	Marketing and sales
Apprenticeship	All levels	Mathematics and statistics
Apprenticeship	All levels	Media and communication
Apprenticeship	All levels	Medicine and dentistry
Apprenticeship	All levels	Nursing, and subjects and vocations allied to medicine
Apprenticeship	All levels	Science
Apprenticeship	All levels	Urban, rural and regional planning
Further education	Level 2/3	Accounting and finance
Further education	Level 2/3	Building and construction
Further education	Level 2/3	Engineering
Further education	Level 2/3	Transportation operations and maintenance
Skills Bootcamp	All levels	Arts, Media and Publishing (bootcamp)
Skills Bootcamp	All levels	Care Services (bootcamp)
Skills Bootcamp	All levels	Construction (bootcamp)

Skills Bootcamp	All levels	Creative and Design (bootcamp)
Skills Bootcamp	All levels	Digital (bootcamp)
Skills Bootcamp	All levels	Engineering and Manufacturing (bootcamp)
Skills Bootcamp	All levels	Green (bootcamp)
Skills Bootcamp	All levels	Health and Science (bootcamp)
Skills Bootcamp	All levels	Health, Public Services and Care (bootcamp)
Higher education	Level 4+	Allied health
Higher education	Level 4+	Architecture, building and planning
Higher education	Level 4+	Chemistry
Higher education	Level 4+	Computing
Higher education	Level 4+	Economics
Higher education	Level 4+	Engineering
Higher education	Level 4+	Mathematical sciences
Higher education	Level 4+	Medical sciences
Higher education	Level 4+	Medicine and dentistry
Higher education	Level 4+	Nursing and midwifery
Higher education	Level 4+	Pharmacology, toxicology and pharmacy
Higher education	Level 4+	Physics and astronomy

Note that higher education here includes all training at level 4 and above, including training delivered in both higher education and further education providers.

9.3 Important sectoral training routes

In the Sectoral SNA report for each of the 10 priority sectors, we identified the training routes important for each individual sector, based on the sector's priority occupations.

The criteria for each sector were consistent, but relative, to the sector. The training routes identified were based on information from ELMO analysis.

For each sector, only priority occupations identified for that sector were considered. This means that the conversion rate figures may be lower for a training route for a specific sector than nationally. Additionally, this means that the same training route can have different figures for different sectors as a different list of occupations is considered for each sector (based on a sector's list of priority occupations).

Due to differing overall trends in average conversion rates across sectors and the scale of sectors differing, the criteria used was relative to the sector:

- **Conversion rate** – the rate of employed education leavers entering priority occupations for that sector need to be in the top decile. This means that the top 10% of training routes by conversion rate were shortlisted.
  Volume – the number of education leavers entering priority occupations for that sector had to constitute a notable contribution. Training routes that supplied at least 2% of education leavers into priority occupations were shortlisted.

A training route had to meet both criteria to be included. Following this, expert judgement was applied to add additional training routes where they were very close to meeting the

criteria and subject matter experts considered them to be important. Further training routes were considered where the metrics were strong for an individual occupation rather than the sector as a whole. These training routes are highlighted in the sector report where applicable.

9.4 Trends in national and sectoral important training routes

For the Sectoral SNA reports and Chapter 6 in the Annual Skills Report, published analysis on historical achievements were used to calculate the recent growth in important training routes.

The data for each pathway was sourced as follows:

- Skills bootcamps – Skills bootcamps starts, completions and outcomes
- Level 4+ higher education and further education – Higher level learners in England
    - Unpublished figures for all domiciles outside of England are used in creating this analysis so figures will not directly match published data.
- Level 2/3 further education – Further education and skills
- Apprenticeships – Apprenticeships starts, achievements and participation
- T-Levels – T level results

The period of 2021 to 2022 to 2023 to 2024 was used to determine recent growth in important routes. This was to allow consistency between pathways, as published data on Skills Bootcamps and Higher education was not available at the time of analysis.

Skills bootcamps do not have achievements data, and therefore outcomes have been provided instead. Outcomes include a valid start, and milestone 2 and milestone 3 payment made, which is evidence of a successful outcome.

Potentially due to their recent introduction, outcomes in skills bootcamps show fast growth. Also to note that some skills bootcamp sector subject outcomes are not available for all years, which causes difficulties in consistent analysis.

For the analysis presented in Chapter 6 of the Annual Skills Report, growth in supply relative to specific priority sectors was considered. Routes related to digital technology (practitioners), computing, and digital bootcamps were grouped and compared with demand growth in the Digital and Technologies sector. Routes related to architecture, building and planning, building and construction, and construction bootcamps were grouped and compared with demand growth in the Construction sector.