

Skills  
Development  
Scotland

# Sectoral Skills Assessment

## Life and Chemical Sciences

October 2023



## Sectoral Skills Assessments

First launched in 2017, the purpose of the Sectoral Skills Assessments (SSAs) is to provide a robust evidence base to support partners in strategic skills investment planning. Skills Development Scotland (SDS) has worked with key partners and stakeholders in the production of SSAs to ensure an inclusive approach to their development, dissemination and utilisation.

SSAs include published data sets. Inevitably, when using published data there is a time lag, but the data contained is the most up-to-date available at the time of writing.

SSAs also include forecast data that has been commissioned through Oxford Economics. The Technical Note<sup>1</sup> provides full detail on the caveats that must be applied when using forecast data, but broadly, it should be noted that:

- Forecasts are based on what we know now and include past and present trends projected into the future.
- The more disaggregated they become, especially at smaller geographical units, the less reliable they are likely to be.
- Their value is in identifying likely directions of travel rather than predicting exact figures.
- The forecasts do not account for national or sectoral activities, initiatives or investments that are planned.

Industries and occupations used in the SSAs are defined by standard industrial classifications (SIC) and standard occupational classifications (SOC). The Office for National Statistics have SIC<sup>2</sup> and SOC<sup>3</sup> hierarchy tools that can be used to understand the classifications in more detail.

**This SSA infographic is for the Life and Chemical Sciences Key Sector.** The sector encompasses: Life Sciences includes the Manufacture or Research Associated with Medtech, Digital Health, Pharma Services and Contact Research Organisations, Therapeutics, Agritech, and Stem Cell and Regenerative Medicine. Chemical Sciences includes the Manufacture of Commodity, Speciality and Consumer Chemicals plus Materials and Industrial Biotechnology. Please see Appendix 1 for the SIC definition used in this report.

Key Sectors are central to our Skills Investment Planning approach. Each Key Sector has a tailored Skills Investment Plan (SIP) which outlines trends in skills and qualification supply and employers' perspectives on the skills issues affecting the sector. Regional SIPs have also been developed and are available alongside SIPs on the SDS website.<sup>4</sup>

The SSAs are part of a suite of Labour Market Insight publications by SDS. Other products in the suite include:



**Economy, People and Skills** provides succinct and up-to-date evidence on Scotland's economy, business and people. It is updated monthly.



**Regional Skills Assessments** provide a coherent evidence base to inform future investment in skills, built up from existing datasets and forecasts for Regional Outcome Agreement areas, Rural Scotland and all City and Growth Deals regions. It is updated annually.



The **Data Matrix** is an interactive tool offering data from a variety of sources in a visually engaging format. It is updated frequently.

Alongside the suite of Labour Market Insight publications, SDS also produces a wide range of reports such as statistics on the Apprenticeship Family and the Annual Participation measure for 16-19 year olds. Further information can be found on the [Publications and Statistics](#) section of the SDS corporate website.

For any further information or queries on the SSAs or any of our other products, please contact: [RSA@sds.co.uk](mailto:RSA@sds.co.uk)

***We value user feedback on the Sectoral Skills Assessments.***



*If you would like to provide feedback on the SSAs please do so [here](#).*



**Join us to get the latest insight and find out more about Sectoral Skills Assessments**

**Sign up to attend the Life and Chemical Sciences SSA Webinar [here](#)**

**11 am - 12 pm on Wednesday 6<sup>th</sup> December**

You can also sign up for our webinars covering other key [sectors](#) and [regions](#) in Scotland.

# The Context for Scotland's Labour Market and Sectoral Insight

Within the last 10 years, the economy has faced disruption due to events such as the pandemic, Brexit, the war in Ukraine, and the cost of living crisis. In addition to these events, megatrends around demography, technology, and the environment have continued to shape Scotland's economy and labour market.

This section provides an overview of five key drivers of the Scottish labour market, highlighting that an agile and responsive skills system is vital to respond to the challenges and opportunities that exist in the economy, to support and attract inward investment, to increase productivity and to tackle inequality and deprivation.



## The Economy

Scotland and the UK have been hard hit by rising inflation, tight monetary policy, and subdued economic performance. The impact of the war on Ukraine, increased energy prices, and a tight labour market have resulted in inflation reaching a 40-year high in 2022. At the time of writing, inflation has started to fall, but at a slower pace than previously anticipated. By the end of 2023, the Bank of England expect inflation to be 4.9%, falling to within the 2% target by Q2 of 2025.<sup>1</sup>

Interest rates have increased to combat rising inflation, and rates are likely to remain higher for longer than expected as inflation proves challenging to address. This has weighed on economic growth and the outlook for Scotland and the UK remains uncertain, with downside risks.

Forecasts predict Scotland<sup>2</sup> and the UK<sup>3</sup> will see weak economic growth between 2023 and 2026.<sup>3</sup> International growth is also expected to be weak by historical standards, with global growth of 3% forecast for both 2023 and 2024.<sup>4</sup> However, the success of Scotland's economy is not solely based on GDP. There has been growing commentary on the need to evaluate the economy on measures other than GDP growth, such as how the economy serves society and sustains the environment. The Scottish Government's National Strategy for Economic Transformation (NSET) noted a commitment to a 'Wellbeing Economy' – '*a society that is thriving across economic, social and environmental dimensions*'.<sup>5</sup>

## Skills Shortages and Skills Gaps



The [Employer Skills Survey 2022 \(ESS\)](#) provides insight on skills supply, skills gaps and training across Scotland and the UK. The published findings are timely; however, they do not capture the very recent cooling of the labour market that has taken place during 2023. The ESS shows:

- **Supply challenges have worsened** across Scotland and the UK, and vacancies have become harder to fill.
- **There has been a sizeable rise in skills shortages**, 10% of establishments in Scotland reported a Skills Shortage Vacancy (up from 6% in 2017).
- **Skills gaps have decreased slightly in Scotland**, 15% of establishments reported a skills gap (-1 pp) while 4.8% of employees in Scotland were not fully proficient, which was the lowest level recorded.
- **Training activity has decreased across Scotland**, access to training offered by employers was at the lowest recorded level since the survey began in 2011.



## Technology and Automation

Technology and automation have been major disruptors and drivers of the Scottish labour market and economy over the past few decades. Ongoing advances and technological change are expected to continue to have a great impact on the global economy, particularly with the prominence of Artificial Intelligence.<sup>6</sup> This will shape consumer behaviour, modify commercial models, and drive innovations in ways of living, working and learning.

While Artificial Intelligence is expected to result in changes to the world of work, many jobs are expected to evolve rather than disappear.<sup>7</sup> However, around a third of jobs may see a large share of their tasks being automated and changed. The technological revolution has highlighted the importance of uniquely human meta-skills around self-management, social intelligence and innovation.<sup>8</sup>

As well as risks to certain jobs, technology may also create new jobs and enhance existing roles to support smarter and more agile ways of working. However, employers are already reporting digital skills gaps in the workforce.<sup>9</sup> The [Digital Economy Skills Action Plan](#) aims to address the digital economy skills challenge through upskilling and reskilling, to help realise the potential of Scotland's digital economy.<sup>10</sup>

SDS is exploring the potential labour market impact of Automation and Artificial Intelligence through new research. The findings from the research will be published at the beginning of 2024 and will include breakdowns of the risk of automation by gender, income and occupation.



## Climate Change

The Climate Emergency has been recognised by governments across the world, with the Scottish Government being one of the first to do so in 2019. Recognising the gravity of the situation, the Scottish Government has set a target to achieve a net zero carbon economy by 2045.<sup>1</sup>

Growing recognition of the importance of protecting the environment will have a significant impact on the labour market. Changes in legislation and consumer behaviour will mean growing demand in some areas and a fall in others. Demand for green jobs (and green skills) is expected to increase rapidly as a result of policy and legislative drivers, and consumer choice.<sup>2</sup>

Scotland's skills requirements for the Climate Emergency are set out in the [Climate Emergency Skills Action Plan](#). It outlined the need for action to ensure that current and future skills investment in support of net zero is strongly evidence based.<sup>3</sup>

The CESAP Pathfinder is a direct response to this, led by Skills Development Scotland (SDS) in collaboration with the Scottish Funding Council (SFC) and forms part of the [Shared Outcomes Framework](#). The CESAP Pathfinder advances the evidence base used to identify current and future skills demand, establishes a baseline of green skills provision and identifies nine opportunities for action needed across the skills system. A suite of reports to share insights, intelligence and lessons learned is due to be published in Autumn 2023.



## Demographic Change

Scotland's population is ageing. By 2045, the number of people of pensionable age in Scotland is expected to increase, while the working-age population is projected to decline, and migration is expected to be the only source of population gain in Scotland.<sup>4</sup> Demographic change could contribute to a tighter labour market in the future, and increase pressure on the demand for public services and the funds available from tax and National Insurance to provide them.

Whilst it was initially thought that Brexit would lead to falling levels of migration, the Office for National Statistics estimated that net migration to the UK hit a record high in 2022.<sup>5</sup> Migration has been driven by non-EU citizens, while more EU citizens left than arrived in the UK. Migration from outside of the EU has been driven by a number of factors, including humanitarian schemes such as those available to Ukrainians; higher levels of migration for study; and people coming to the UK for work. Changes to migration policy and the UK's points-based migration system could further impact migration flows.

With populations ageing, the global economy is likely to see more people working for longer due to increases in the state pension age.<sup>6</sup> Advances in medicine and technological innovations are expected to enhance the health of the older population, which in turn will likely change working habits and preferences. As a result, some targeted upskilling and reskilling may be required to enhance older workers' experience and knowledge to enable the transition into new and growing careers.<sup>7</sup>



## Scotland's Census 2022<sup>8</sup>

**Scotland's population was estimated to be 5,436,600 in March 2022**, which marks the highest population ever recorded by Scotland's Census. The Scottish population has **grown by 2.7% since the previous census**, however, this growth rate was slower than the period between 2001 and 2011, when the population grew by 4.6%.

Although Scotland's population increased over the past ten years, this growth was largely driven by migration, as the number of deaths exceeded the number of births. **Without migration, Scotland's population would have declined by around 49,800.**

The proportion of females (51.4%) and males (48.6%) in Scotland has remained relatively unchanged compared to the previous census in 2011 (51.5% and 48.5% respectively). However, **there are now more older people in Scotland than ever before**. The number of people aged 65 and over increased by 22.5% between 2011 and 2021, while the population aged 0-14 and 15-64 decreased by 2.5% and 1.1% respectively.



## Inclusive Growth and Equality

Across Scotland, significant economic inequalities exist, especially for disadvantaged groups. For example, more women than men earned less than the Real Living Wage in 2022<sup>1</sup>, the disability employment gap<sup>2</sup> remained high (29.6 percentage points) in 2023, meaning people with a disability are less likely to be employed, and in the same year, the employment rate gap for the ethnic minority population compared with the white population was 9.2 percentage points.<sup>3</sup>

The Scottish Government's commitment to fairness and greater equality is reiterated in the National Strategy for Economic Transformation (NSET). One of the strategy's key ambitions is creating a fairer society – '*Ensuring that work pays for everyone through better wages and fair work, reducing poverty and improving life chances*'.<sup>4</sup>

A 'Fairer and More Equal Society' is also one of the five programmes of action outlined in the NSET. This programme of action looks to '*reorient our economy towards wellbeing and fair work*' with key aims including higher rates of employment and wage growth, and reducing poverty.<sup>5</sup>

The Scottish Government's targets are set against the challenging backdrop of the cost of living crisis and the pandemic, affecting groups already impacted by inequality the most: low-income households, young people, disabled people, and people from ethnic minority backgrounds.<sup>6</sup> Research from the Joseph Rowntree Foundation found that eight in ten single parents, large families and low-income households in Scotland had to go without one or more essentials (such as food or heating) in spring 2023.<sup>7</sup>



## Sectoral Insight<sup>8</sup>

At a national level, Life and Chemical Sciences continues to be a sector of key importance for the growth of the Scottish economy, acknowledged within the National Strategy for Economic Transformation, National Innovation Strategy 2023-2033, and Export Plan: A Trading Nation.

Scotland has particular strengths within Pharmaceutical Services, Industrial Biotechnology, Digital Health, Medical Devices, Precision Medicine, Animal Health, Aquaculture, and Agritech.

The sector benefits from a globally recognised and highly skilled workforce, with current demand for individuals with skills and experience within:

- Quality control, quality assurance, regulatory;
- Laboratory technician;
- Process manufacturing (upstream and downstream);
- Commercial, project management and business development;
- Digital skills, data scientists, AI, prediction, and data modelling.

Advancements within Industrial Biotechnology are also supporting the Scottish Government's ambition of achieving a net zero economy by 2045. This is leading to a demand for fermentation scientists and downstream processing engineers.

Entry routes into the sector continue to widen with the industry recruiting candidates from a range of pathways including the apprenticeship family, college, and university graduates.

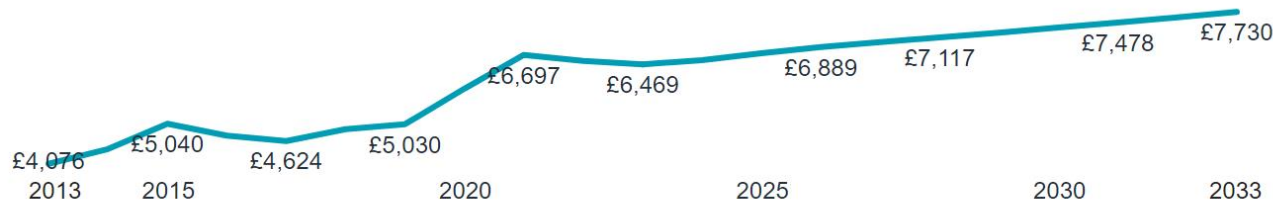
At a regional level investment is supporting innovation, technological advancements, and company growth/university spin-outs. Within the Highlands and Islands, the [Life Sciences and Innovation Centre](#) opened in April 2023. The £9.5m investment provides dedicated space including access to high-tech research equipment and laboratory conditions for industry and academia to work in collaboration on innovative life science projects.

It is important to note that the forecasts used in this Sectoral Skills Assessment are policy and investment neutral. This means the figures present a baseline outlook that takes into account historical trends and external economic conditions, but the figures do not reflect investment or policy that is unconfirmed or at planning/development stage. Therefore, the forecasts should be used in conjunction with other sources, and readers are encouraged to overlay the forecasts with their own local and sectoral knowledge.



# The Economy<sup>1</sup>

## Gross Value Added (GVA, £m) (2013-2033)<sup>2</sup>



In 2023, GVA in the Life and Chemical Sciences sector was forecast to be £6,469m, generating 4.4% of Scotland's total economic output. Between 2013 and 2023, GVA in the sector grew by 5.0% on average each year, compared to growth of 1.0% across Scotland over the same period.

Economic output in the Life and Chemical Sciences sector contracted by 2.2% in 2022, in contrast to the growth seen in the Scottish economy overall (4.3%). A further contraction of 1.3% is estimated in 2023, reflecting the challenging economic conditions.

Growth in the Life and Chemical Sciences sector is forecast to recover with average annual growth of 1.8% between 2023 and 2033, slightly higher than that forecast for Scotland overall (1.3%). In 2033, the Life and Chemical Sciences sector is forecast to account for 4.6% of Scotland's total economic output.



**Life and Chemical Sciences**  
forecast GVA in 2026: **£6,889m**

↑ up 6.5% from 2023

**Scotland** forecast GVA in 2026:  
**£155,521m**

↑ up 5.1% from 2023

**Life and Chemical Sciences**  
forecast GVA in 2033: **£7,730m**

↑ up 12.2% from 2026

**Scotland** forecast GVA in 2033:  
**£168,475m**

↑ up 8.3% from 2026

## Productivity (GVA per job)<sup>3</sup>

In this report, we have used Oxford Economics measure of productivity, which is calculated by dividing total sectoral GVA by total sectoral employment (measured by jobs). Please note, there are different ways of calculating productivity, and the pandemic has created new challenges in how productivity is accurately measured. Caution is needed when interpreting productivity data presented in this report, and it must be considered in the context of other data and insight.

In 2023, productivity in the **Life and Chemical Sciences** sector was forecast to be **£217,200**. In comparison, the Scottish average was £52,600.



**Life and Chemical Sciences**  
forecast productivity in 2026:  
**£236,900**

↑ up 9.1% from 2023

**Scotland** forecast  
productivity in 2026:  
**£54,100**

↑ up 2.9% from 2023



**Life and Chemical Sciences**  
forecast productivity in 2033:  
**£286,100**

↑ up 20.8% from 2026

**Scotland** forecast  
productivity in 2033:  
**£58,200**

↑ up 7.6% from 2026

1. Forecasts by Oxford Economics (unless otherwise stated). See Page 11 for full list of source references

2. GVA is the measure of the value of goods and services produced within the economy and is an indicator of the sector's health. GVA in constant 2019 prices.

3. Productivity is the measure of goods and services produced per unit of labour input. The Oxford Economics forecasts of productivity shown here have been calculated by dividing total sector GVA by total sector employment (measured by jobs).

## Current Demand<sup>1</sup>



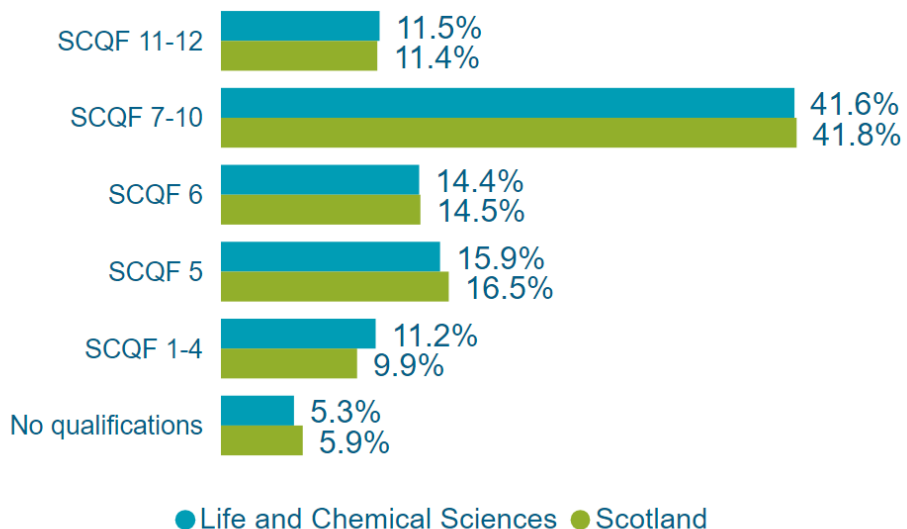
Workforce size 2023: **27,400** people

The workforce **increased** by **4.5%** or **1,200** people between 2013 and 2023. During this 10 year period, the pandemic had a notable effect on the workforce, as it **declined** by **-7.3%** or **-2,100** people between 2019 and 2021.

This compares to a Scotland wide increase of **4.0%** or **99,400** people between 2013 and 2023. Between 2019 and 2021, the workforce declined by **-2.2%** or **-56,900** people across Scotland.

## Workforce Qualifications, 2023

Workers in the **Life and Chemical Sciences** sector typically have similar levels of qualifications as the Scottish average. In 2023, an estimated 53% of workers in the sector were qualified to SCQF Level 7 and above.<sup>2</sup>



## The proportion of workforce in the Local Authorities employed in Life and Chemical Sciences, 2023<sup>3</sup>

In 2023, **Life and Chemical Sciences** sector accounted for 1.1% of Scottish employment.

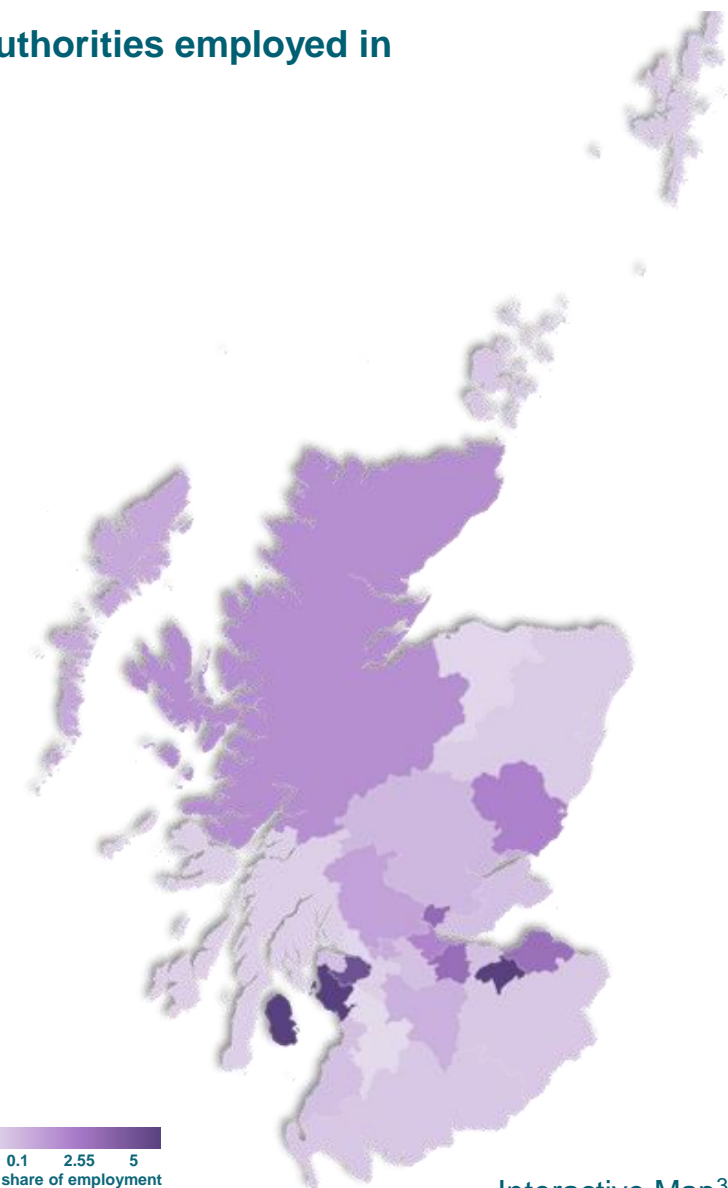
Scottish local authorities have sectoral strengths that make them unique. This means that despite its relatively small workforce size, the **Life and Chemical Sciences** sector may be more important to some local economies, as a higher proportion of the local workforce is employed in the sector.

The sector was most prominent in the Midlothian (5.0%), North Ayrshire (5.0%), Renfrewshire (4.3%), and Clackmannanshire (3.2%) local authorities.

## Employment by Region (people), 2023

The greatest number of people employed in **Life and Chemical Sciences** were in:

Edinburgh, East and Midlothian	5,100
West Region	3,100
Forth Valley	2,800
Highlands and Islands	2,700
Tayside	2,700



[Interactive Map<sup>3</sup>](#)

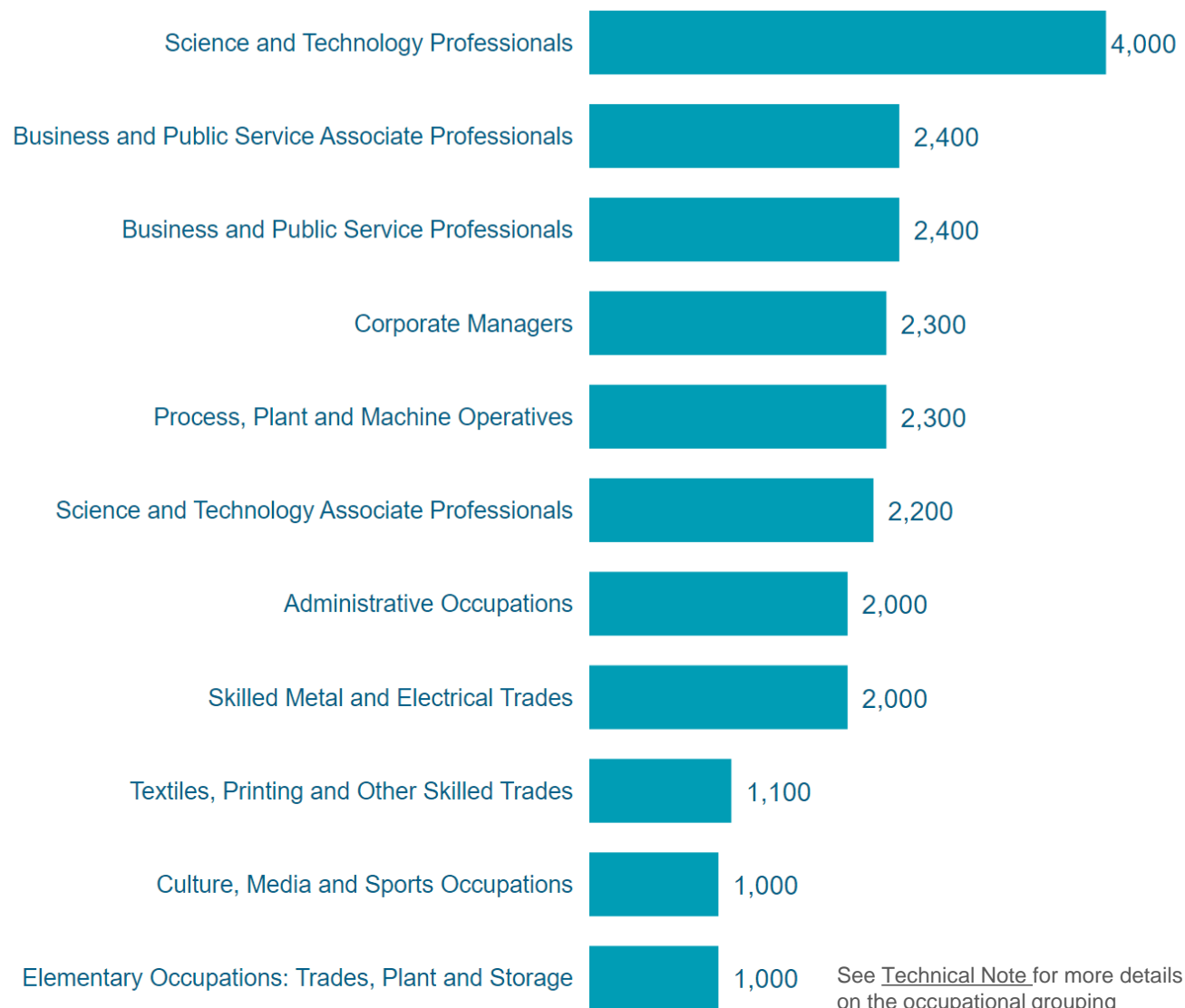
1. Forecasts by Oxford Economics (unless otherwise stated).

2. See [SCQF Framework](#) for further information on SCQF qualification levels

3. The proportion of the workforce in the Local Authority employed in sector is calculated by dividing the sectoral employment in the area by total employment in the area.

## Current Demand<sup>1</sup>

### Top Employing Occupations (people), 2023



1. All Forecasts by Oxford Economics (unless otherwise stated)

2. Due to data availability, a 'best fit SIC code approach' has been used, so the sectoral definitions and totals in this section may vary from those we have used elsewhere.

3. 2022 data is provisional.

4. The real living wage rates have been independently calculated by the Resolution Foundation according to the cost of living based on household goods and services and are overseen by the Living Wage Commission.

## Real Living Wage and Gender Pay Gap<sup>2,3</sup>

### Individuals earning Real Living Wage or more:<sup>4</sup>

In April 2022, the real living wage rate for employees who did not work in London was £9.90.



#### Professional, Scientific & Technical Activities

2021: **92.1%**      2022: **94.6%**

#### Manufacturing

2021: **87.2%**      2022: **91.1%**

#### All sectors

2021: **85.5%**      2022: **91.0%**

### Gender Pay Gap for median full-time hourly earnings:<sup>5,6</sup>



#### Professional, Scientific & Technical Activities

2021: **21.6%**      2022: **24.6%**

#### Manufacturing

2021: **12.0%**      2022: **17.2%**

#### Scotland

2021: **3.0%**      2022: **3.7%**

*Due to data availability, a 'best fit SIC code approach' has been used, so the sectors definitions may not fully match key sector definitions.*

## Modern Apprenticeships<sup>7</sup>



### MA starts for Chemical & Biotechnology Related\*:

Q4 2021/22: **47**

Q4 2022/23: **29**

Q1 2023/24: **0**



### MA in training for Chemical & Biotechnology Related\*:

Q4 2021/22: **76**

Q4 2022/23: **72**

Q1 2023/24: **65**

\* Based on [SDS Occupational Groupings](#).

For data on FAs and GAs please see the Publications section of our [website](#). For data on colleges and universities please see [Scottish Funding Council](#) and [Higher Education Statistics Agency](#).

5. A 4% gender pay gap denotes that women earn 4% less, on average than men. Conversely, a -4% gender pay gap denotes that women earn 4% more, on average, than men.





## Spotlight on... Laboratory Technicians

Between January 2023 and June 2023, there were **330 job postings**

### Top Locations:

-  **Glasgow City**  
90 job postings
-  **Edinburgh City**  
70 job postings
-  **Aberdeen City**  
30 job postings

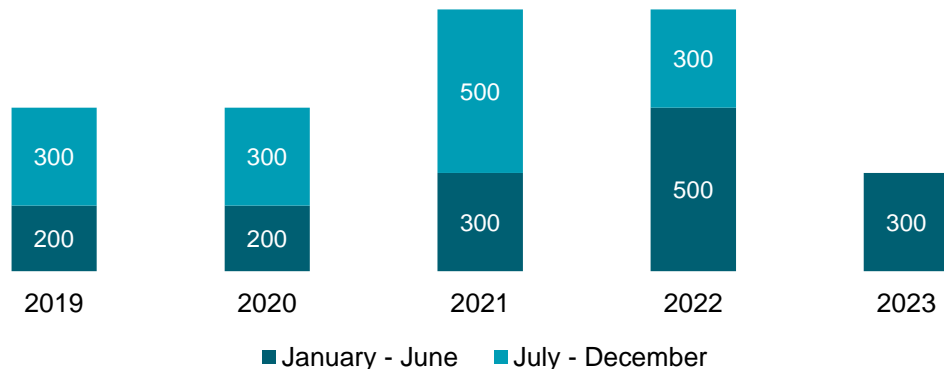
### Specialised skills and knowledge:

- **Good Laboratory Practiced**
- **Quality Management Systems**
- **Laboratory Research**
- **Clinical Research and Trials**
- **Data Analysis**



Median real-time advertised salary: **£25,800\***

### Job Postings 2019 – 2023, Laboratory Technicians



## Spotlight on... Biological Scientists and Biochemists

Between January 2023 and June 2023, there were **1,100 job postings**

### Top Locations:

-  **Edinburgh City**  
410 job postings
-  **Glasgow City**  
380 job postings
-  **Aberdeen City**  
70 job postings

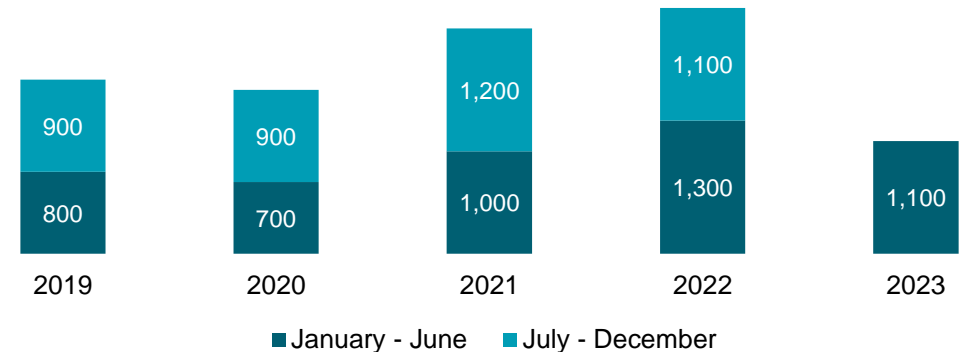
### Specialised skills and knowledge:

- **Ecology, Biology and Microbiology**
- **Biomedical Sciences**
- **Project Management**
- **Data Analysis**
- **Python - Programming Language**



Median real-time advertised salary: **£39,900\***

### Job Postings 2019 – 2023, Biological Scientists and Biochemists



1. Lightcast 2023. Online job postings data provides a useful barometer for the health of the jobs market. It is important to note that the data does not capture all activity, so it should be considered as an estimate of activity only.

2. Job postings are rounded to the nearest 10 or 100.

3. Data for Laboratory Technicians is based on SOC 3111 for the whole of Scotland. Data for Biological Scientists and Biochemists is based on SOC 2112 for the whole of Scotland.

\* Median salary based on the following proportion of job postings that contain salary information: Laboratory Technicians– 31%, Biological Scientists and Biochemists– 44%

## Future Demand: Mid-term (2023-2026)<sup>1</sup>

Continued automation and improvements in productivity in the Life and Chemical Sciences sector are forecast to result in **employment contraction, with a decline of 2.3% (-600 people)** in the mid-term (2023-2026).<sup>1</sup> This contrasts with growth that is forecast overall across Scotland where employment is predicted to rise by 2.2% (57,000 people).

In 2026, the top employing regions in the sector are forecast to be **Edinburgh, East and Midlothian** and **West Region**, the same as in 2023. Similar to 2023, **the largest proportion of the workforce employed** in the sector is forecast to be educated to **SCQF 7-10**, and the top employing occupation is forecast to be **Science and Technology Professionals**.

The forecasts for the mid-term (2023-2026) suggest there could be demand for **600 people in the sector**, as a result of the need to replace workers leaving the labour market. Whilst positive, caution is needed as a wide range of factors may impact the future labour market.

### Workforce (people), 2026



Workforce size 2026: **26,800** people



The workforce is expected to **decline** by **-2.3%** or **-600** people between 2023 and 2026



Compared to a Scotland wide increase of **2.2%** or **57,000** people

### Total Requirement\*



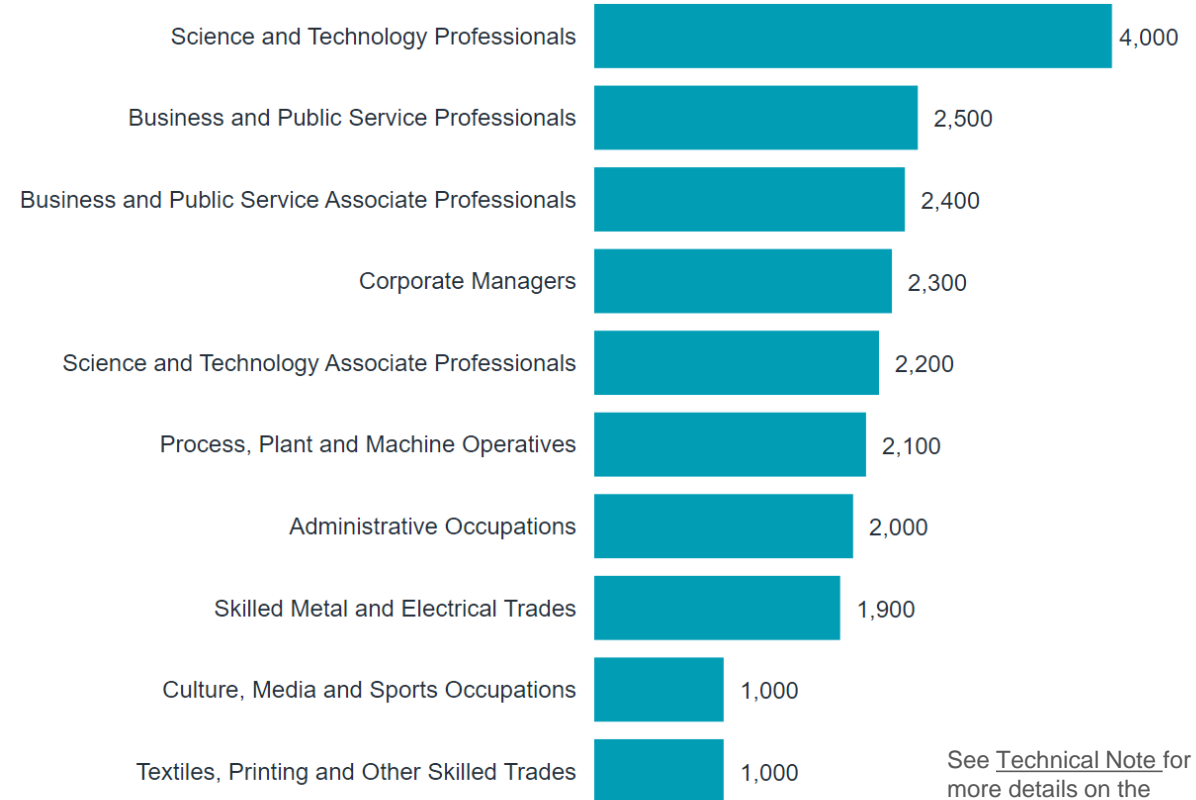
**Expansion demand:**  
**-600** people

**Replacement demand:**  
**1,200** people

**Total requirement:**  
**600** people

**Life and Chemical Sciences** is forecast to account for **0.2%** of Scotland's total requirement for people in the mid-term (2023-2026)

### Top 10 Employing Occupations (people), 2026<sup>2</sup>



See [Technical Note](#) for more details on the occupational grouping

<sup>1</sup>. Forecasts by Oxford Economics (unless otherwise stated).

\* Total requirement for people is made up of expansion and replacement demand.

The expansion demand is the number of people required as a result of economic growth or contraction;

The replacement demand is the number of people required to replace workers leaving the labour market (i.e. those who retire, move away or change jobs). Please note, figures are rounded to the nearest 100 and as a result totals may not equal the sum of the constituent parts

## Future Demand: Long-term (2026-2033)<sup>1</sup>

Continued automation and improvements in productivity in the Life and Chemical Sciences sector are forecast to result in **employment contraction, with a decline of 7.1% (-1,900 people)** in the long-term (2026-2033).<sup>1</sup> This contrasts with the growth that is forecast overall across Scotland where employment is predicted to rise by 0.9% (22,700 people).

In 2033, **Edinburgh, East and Midlothian** and **West Region** are forecast to remain the top employing regions in the sector. The largest proportion of the workforce employed in the sector is **forecast to be educated to SCQF 7-10**, and **Science and Technology Professionals** is forecast to remain the most in-demand occupation within the sector.

Forecasts for the long-term (2026-2033) estimate that **900 people** could be required in the sector. This will be **driven by the need to replace workers leaving the labour market**.

### Workforce (people), 2033



Workforce size 2033: **24,900** people



The workforce is expected to **decline** by **-7.1%** or **-1,900** people between 2026 and 2033



Compared to a Scotland wide increase of **0.9%** or **22,700** people

### Total Requirement\*



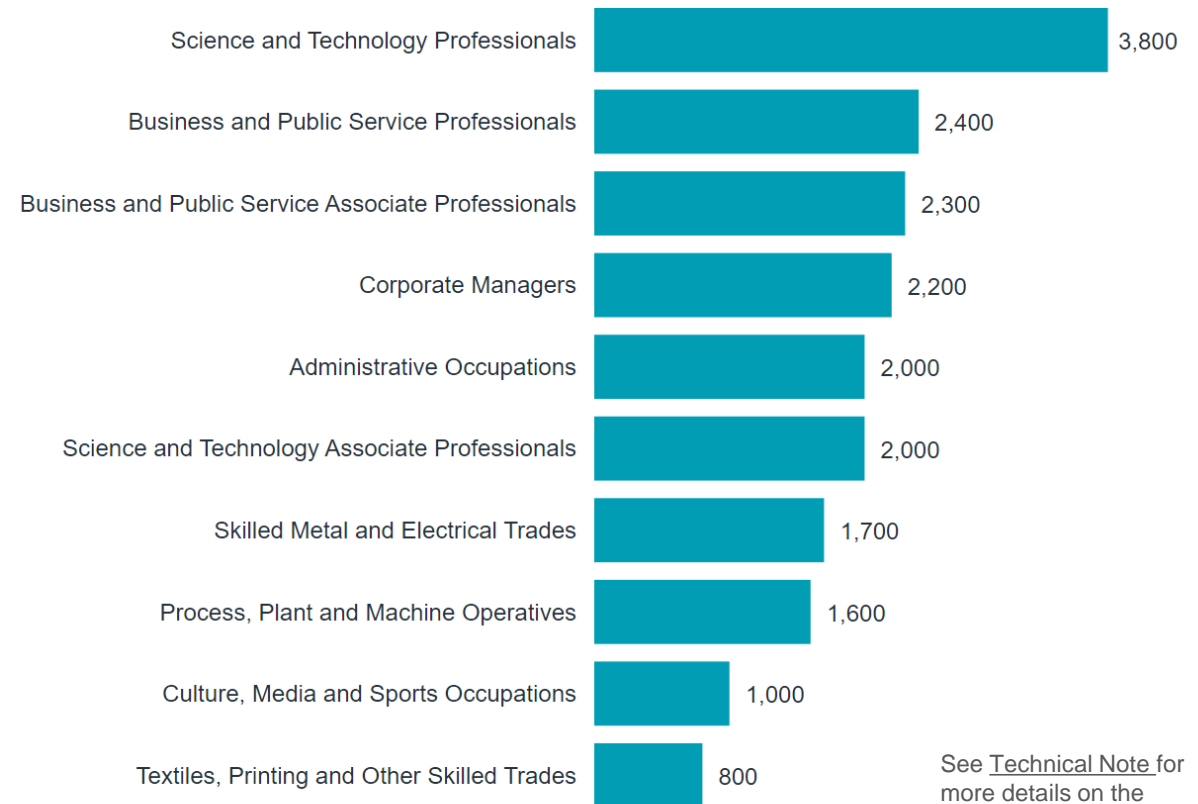
**Expansion demand:**  
**-1,900** people

**Replacement demand:**  
**2,800** people

**Total requirement:**  
**900** people

**Life and Chemical Sciences** is forecast to account for **0.1%** of Scotland's total requirement for people in the long-term (2026-2033)

### Top 10 Employing Occupations (people), 2033<sup>2</sup>



See [Technical Note](#) for more details on the occupational grouping

1. Forecasts by Oxford Economics (unless otherwise stated).

\* Total requirement for people is made up of expansion and replacement demand.

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## Appendix 1: Life and Chemical Sciences Sector Definitions (SIC 2007)

SIC	Name
20.11	Manufacture of industrial gases
20.12	Manufacture of dyes and pigments
20.13	Manufacture of other inorganic basic chemicals
20.14	Manufacture of other organic basic chemicals
20.15	Manufacture of fertilisers and nitrogen compounds
20.16	Manufacture of plastics in primary forms
20.17	Manufacture of synthetic rubber in primary forms
20.20	Manufacture of pesticides and other agrochemical products
20.30/1	Manufacture of paints, varnishes and similar coatings, mastics and sealants
20.30/2	Manufacture of printing ink
20.41/1	Manufacture of soap and detergents
20.41/2	Manufacture of cleaning and polishing preparations
20.51	Manufacture of explosives
20.52	Manufacture of glues
20.53	Manufacture of essential oils
20.59	Manufacture of other chemical products n.e.c.
20.60	Manufacture of man-made fibres
21.1	Manufacture of basic pharmaceutical products
21.2	Manufacture of pharmaceutical preparations
21	Manufacture of basic pharmaceutical products and pharmaceutical preparations
26.6	Manufacture of irradiation, electromedical and electrotherapeutic equipment
32.5	Manufacture of medical and dental instruments and supplies
72.11	Research and experimental development on biotechnology
72.19	Other research and experimental development on natural sciences and engineering



## References

Page 2	<ol style="list-style-type: none"><li>1. SSA Technical Note (2023)</li><li>2. Office for National Statistics UK Standard Industrial Classification (SIC) Hierarchy. Available online at: <a href="https://bit.ly/3eMy1V9">https://bit.ly/3eMy1V9</a></li><li>3. Office for National Statistics UK Standard Occupational Classification (SOC) Hierarchy. Available online at: <a href="https://bit.ly/3F3xQQ0">https://bit.ly/3F3xQQ0</a></li><li>4. Skills Development Scotland Skills Investment Plans. Available online at: <a href="https://bit.ly/3gOntFi">https://bit.ly/3gOntFi</a></li></ol>
Page 3	<ol style="list-style-type: none"><li>1. Bank of England (2023). Monetary Policy Report – August 2023. Available online at: <a href="https://www.bankofengland.co.uk/monetary-policy-report/2023/august-2023">https://www.bankofengland.co.uk/monetary-policy-report/2023/august-2023</a></li><li>2. Fraser of Allander Institute (2023). FAI Economic Commentary 2023 Q2. Available online at: <a href="https://fraserofallander.org/publications/fai-economic-commentary-2023-q2/">https://fraserofallander.org/publications/fai-economic-commentary-2023-q2/</a></li><li>3. Bank of England (2023). Monetary Policy Report – August 2023. Available online at: <a href="https://www.bankofengland.co.uk/monetary-policy-report/2023/august-2023">https://www.bankofengland.co.uk/monetary-policy-report/2023/august-2023</a></li><li>4. International Monetary Fund (2023). World Economic Outlook Update. Available online at: <a href="https://www.imf.org/en/Publications/WEO/Issues/2023/07/10/world-economic-outlook-update-july-2023">https://www.imf.org/en/Publications/WEO/Issues/2023/07/10/world-economic-outlook-update-july-2023</a></li><li>5. Scottish Government (2022). Scotland's National Strategy for Economic Transformation. Available online at: <a href="https://www.gov.scot/publications/scotlands-national-strategy-economic-transformation/">https://www.gov.scot/publications/scotlands-national-strategy-economic-transformation/</a></li><li>6. Maniyaka et al (2017) Jobs Lost. Jobs Gained. What the future of work will mean for jobs, skills and wages. McKinsey Global Institute. Available online at: <a href="https://bitly.ws/Tuyh">https://bitly.ws/Tuyh</a></li><li>7. IPPR (2018). Preparing for Automation and Ageing. Available online at: <a href="https://www.ippr.org/research/publications/preparing-for-automation-and-ageing">https://www.ippr.org/research/publications/preparing-for-automation-and-ageing</a></li><li>8. SDS. Meta Skills Progression Framework. Available online at: <a href="https://www.skillsdevelopmentscotland.co.uk/media/48745/meta-skills-progression-framework-final.pdf">https://www.skillsdevelopmentscotland.co.uk/media/48745/meta-skills-progression-framework-final.pdf</a></li><li>9. Scottish Government (2021). Digital Economy Business Survey 2021. Available online at: <a href="https://www.gov.scot/publications/digital-economy-business-survey-2021/">https://www.gov.scot/publications/digital-economy-business-survey-2021/</a></li><li>10. SDS (2023). Digital Economy Skills Action Plan 2023-2028. Available online at: <a href="https://www.skillsdevelopmentscotland.co.uk/media/50035/digital-economy-skills-action-plan.pdf">https://www.skillsdevelopmentscotland.co.uk/media/50035/digital-economy-skills-action-plan.pdf</a></li></ol>
Page 4	<ol style="list-style-type: none"><li>1. Scottish Government (2021) Energy strategy: position statement available online at: <a href="https://www.gov.scot/publications/scotlands-energy-strategy-position-statement/">https://www.gov.scot/publications/scotlands-energy-strategy-position-statement/</a></li><li>2. International Labour Office (2019). Skills for a Greener Future: a global view. Available online at: <a href="https://www.ilo.org/skills/pubs/WCMS_732214/lang--en/index.html">https://www.ilo.org/skills/pubs/WCMS_732214/lang--en/index.html</a></li><li>3. SDS (December 2020). Climate Emergency Skills Action Plan. Available online: <a href="https://www.skillsdevelopmentscotland.co.uk/media/47336/climate-emergency-skills-action-plan-2020-2025.pdf">https://www.skillsdevelopmentscotland.co.uk/media/47336/climate-emergency-skills-action-plan-2020-2025.pdf</a></li><li>4. National Records of Scotland (2023). Population Projections of Scotland (2020-based). Available online at: <a href="https://bit.ly/3KmLvUF">https://bit.ly/3KmLvUF</a></li><li>5. Office for National Statistics (2023). Long-term international migration, provisional: year ending December 2022. Available online at: <a href="https://bitly.ws/Tq9m">https://bitly.ws/Tq9m</a></li><li>6. OECD (2019). OECD Employment Outlook, The Future of Work. Available online at: <a href="https://www.oecd-ilibrary.org/employment/oecd-employment-outlook-2019_9ee00155-en">https://www.oecd-ilibrary.org/employment/oecd-employment-outlook-2019_9ee00155-en</a></li><li>7. PwC (2018). Workforce of the Future – the competing forces shaping 2030. Available online at: <a href="https://www.pwc.com/gx/en/services/people-organisation/publications/workforce-of-the-future.html">https://www.pwc.com/gx/en/services/people-organisation/publications/workforce-of-the-future.html</a></li><li>8. Scottish Government (2023). Scotland's Census 2022 - Rounded population estimates. Available online at: <a href="https://www.scotlandscensus.gov.uk/2022-results/scotland-s-census-2022-rounded-population-estimates/">https://www.scotlandscensus.gov.uk/2022-results/scotland-s-census-2022-rounded-population-estimates/</a></li></ol>
Page 5	<ol style="list-style-type: none"><li>1. Scottish Government (2022). Annual Survey of Hours and Earnings: 2022. Available online at: <a href="http://bitly.ws/PEn7">http://bitly.ws/PEn7</a></li><li>2. The difference between the employment rates of Equality Act disabled and not Equality Act disabled people. Annual Population Survey, accessed via NOMIS September 2023.</li><li>3. Annual Population Survey, accessed via NOMIS September 2023.</li><li>4. Scottish Government (2022). Scotland's National Strategy for Economic Transformation. Available online at: <a href="https://bitly.ws/TuMb">https://bitly.ws/TuMb</a></li><li>5. Scottish Government (2022). Scotland's National Strategy for Economic Transformation. Available online at: <a href="https://bitly.ws/TuMb">https://bitly.ws/TuMb</a></li><li>6. Scottish Government (2020) Impacts of Covid 19 on Equality in Scotland. Available online here: <a href="https://www.gov.scot/publications/the-impacts-of-covid-19-on-equality-in-scotland/">https://www.gov.scot/publications/the-impacts-of-covid-19-on-equality-in-scotland/</a></li><li>7. Joseph Rowntree Foundation (May 2023). 10 cold, hard facts. Available online: <a href="https://bitly.ws/Tuys">https://bitly.ws/Tuys</a></li><li>8. Skills Development Scotland, Skills Planning and Sector Development Directorate. Insight from Sector Managers</li></ol>
Page 6	<ol style="list-style-type: none"><li>1. SDS (2023). Oxford Economics Forecasts</li></ol>
Page 7	<ol style="list-style-type: none"><li>1. SDS (2023). Oxford Economics Forecasts</li><li>3. Flourish Studio (2023): Available online at: <a href="https://flourish.studio">https://flourish.studio</a></li></ol>
Page 8	<ol style="list-style-type: none"><li>1. SDS (2023). Oxford Economics Forecasts</li><li>4. Scottish Government (2022). Annual Survey of Hours and Earnings: 2022. Available online at: <a href="http://bitly.ws/PEn7">http://bitly.ws/PEn7</a></li><li>5. Scottish Government (2022). Annual Survey of Hours and Earnings: 2022. Available online at: <a href="http://bitly.ws/PEn7">http://bitly.ws/PEn7</a></li><li>7. SDS (2023). Modern Apprenticeship Statistics, Quarter 1, 2023-24. Available online at: <a href="https://bitly.ws/Tuyx">https://bitly.ws/Tuyx</a></li></ol>
Page 9	<ol style="list-style-type: none"><li>1. Lightcast, (August, 2023)</li></ol>
Page 10	<ol style="list-style-type: none"><li>1. SDS (2023). Oxford Economics Forecasts</li></ol>
Page 11	<ol style="list-style-type: none"><li>1. SDS (2023). Oxford Economics Forecasts</li></ol>

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