

Development of evidence based demand analysis in CESAP sectors

CESAP Pathfinder Work package 1: Action 1.4

November 2023



Introduction

This research was undertaken by Skills Development Scotland to improve the understanding of likely demand for skills and labour to support sectors of importance to the transition to net zero, as outlined in the Climate Emergency Skills Action Plan (CESAP)¹.

These sectors are:

- Agriculture (including Forestry and Fishing);
- Construction;
- Energy and Waste Treatment;
- Manufacturing (including Engineering); and
- Transport.

These sectors were defined in consultation with industry as part of the [Green Jobs in Scotland](#) research. The definitions, which are bespoke, underpin all the analyses undertaken to support the CESAP Pathfinder².

These sectors include a range of activities that are likely to bear the biggest implications of carbon reduction targets, either through adjusting primary inputs, materials, processes, or operations, or through the development or adoption of new low carbon product and service solutions in the market.

The research forms part of the CESAP Pathfinder Work Package 1. This report summarises the findings from the main report, which includes a more detailed look at demand across each CESAP sector.

Employment demand data

This research uses Oxford Economics forecasts to review employment demand data. This includes trends and forecasts in the CESAP sectors. The forecasts provide a baseline that is policy and investment neutral; however, the scale of known investment to support the transition to net zero could change the outlook and create additional job growth. More information on known investment is available in the Pathfinder report, and the supporting Investment Precipitous and Mapping of Green Investments Report. All data used was the most recent data available at the time of analysis.

In addition to the employment forecasts, the research considers employer demand for labour in CESAP sectors through analysis of web-based vacancy data³. The industry definition used for this comes from the *Green Jobs in Scotland Report*⁴. This real-time data includes total job postings, top occupations, and job postings by region.

Finally, a comprehensive literature review supplemented with industry consultations also provided valuable insight into demand. The consultations were conducted by Cambridge Policy Consultants in early 2023, and included a number of employers, key stakeholders and industry experts.

Findings

The main findings across CESAP sectors were as follows:

Scotland's labour market

- In 2022, **Scotland's CESAP sectors were estimated to account for over a quarter of total employment in Scotland (690,900, 26.5%)**. The largest CESAP sectors were Construction (214,400 people), Manufacturing (181,600 people) and Energy and Waste Treatment (157,800 people). See Table 1.1 below.

Table 1.1 Total employment in CESAP sectors, 2022

Sector	Total employment 2022	% Scotland's employment
Construction	214,400	8.2%
Manufacturing (including Engineering)	181,600	7.0%
Energy and Waste Treatment	157,800	6.1%
Transport	98,000	3.8%
Agriculture (including Forestry and Fishing)	39,100	1.5%
CESAP Total	690,900	26.5%

Source: Oxford Economics Forecasts⁵

¹ Skills Development Scotland (2020). [Climate Emergency Skills Action Plan](#).

² A full list of the Standard Industrial Classifications (SICs) used is available in the following link: [SIC Categories - GJS research Definition.pdf](#) A full list of the Standard Occupation Classifications (SOCs) used is available [here](#).

³ Burning Glass (2022)

⁴ Cardenas Rubio, J., et al. (2022). [Green Jobs in Scotland: An inclusive approach to definition, measurement and analysis](#).

⁵ The Oxford Economics employment estimates draw from multiple reliable and recognised sources. More information on the sources and the Oxford Economics economic model used is available in the supporting Technical Note. [Oxford Economics Technical Note](#).

- Employment in CESAP sectors is **greatest in volume in and around Scotland's cities**. However, **CESAP sectors accounted for a greater proportion of employment in rural areas** (32.7%, compared with 26.5% across Scotland as a whole).⁶
- **Most people (seven in ten) employed in CESAP sectors were working in green occupations in 2022**. This ranged from 51.7% in the Transport sector to 82.7% in Construction and 82.8% in Agriculture.
- **More than one-half (54%) of workers employed in green occupations were in occupations requiring enhanced skills and knowledge because of the transition to net zero**. A further 31% were in increased demand occupations and the remaining 15% were in new and emerging roles.
- The Oxford Economics forecasts, which are both policy and investment neutral, estimate that without intervention, employment in the CESAP sectors will stay broadly flat in the mid-term (rising slightly from 690,900 in 2022 to 691,700 in 2025 – 0.1% increase). This highlights the importance of policy and investment in driving jobs growth in these sectors. Of all the CESAP sectors, Construction is expected to have the most substantial growth, increasing by 3,200 people from 2022 to 2025⁷.
- The expansion demand described above combined with replacement demand for workers leaving the labour market means there is a forecast **total requirement in CESAP sectors for 77,000 people in the medium-term (2022-2025)**. This is around one quarter (23%) of Scotland's overall total requirement and is particularly concentrated in **Transport and Construction**.
- Demand for labour is also predicted to grow in the long-term (2025-2032), with a **total requirement of 151,600 people expected**.

Scotland's vacancies

Online job postings data⁸ is an important measure of labour market demand as it provides real time data and allows the types of job roles and demand to be examined within CESAP sectors. This research undertook analysis of vacancies over the period January to December 2022.

- **Manufacturing accounted for the largest number of vacancies within CESAP sectors, at 15,000** – accounting for over a quarter all job postings in CESAP sectors at 29.2%.
- Across all the CESAP sectors, **green occupations accounted for the majority of jobs postings in 2022**. This ranged from 54.6% for the Manufacturing sector to 74.2% for Transport.
- In 2022, the **green occupation** with the highest number of job postings in CESAP sectors was **Large goods vehicle drivers (3,080 postings)**. This was followed by **Plumbers and heating and ventilating engineers (1,630 postings)**.
- **Regions in and around Scotland's cities tended to account for the largest number of jobs postings in CESAP sectors**. Agriculture was a slight outlier as Highlands and Islands featured in the top three regions for jobs postings in the sector.

Future green skills demand

In relation to green skills needs in the CESAP sectors, the evidence points to the need for more workers in key occupations and for a substantial volume of upskilling for those already employed in these occupations. This reflects the anticipated higher levels of employment growth in the CESAP sectors – growth which will be essential if net zero is to be achieved.

Significant demand for new skills is expected within the **Energy and Waste Treatment** sector over the short to medium term. This is driven primarily by:

- Replacement demand as existing skilled workers retire from the workforce.

⁶ Rural Scotland is based on the Scottish Government's Rural and Environment Science and Analytical Services (RESAS) [classification of rural areas](#).

⁷ Some sectors will decline while others will grow, therefore total figures may not sum.

⁸ Burning Glass (2022)

- A significant reskilling requirement to support the transition of workers from high carbon intensive to low carbon intensive forms of energy production.
- Growth in the demand for new skills as new and emerging technologies such as Hydrogen production and Carbon Capture and Storage come to fruition.
- A significant requirement to upgrade grid and transmission infrastructure to accommodate new technologies.

The **Construction** sector in Scotland plays a key role in heat decarbonisation, and as work ramps up to support this process, the sector is expected to face significant demand for new workers and new skills. The main factors driving the demand are:

- A requirement for substantial upskilling and reskilling to support the current workforce to acquire suitable skills for retrofitting and installing net zero heating systems.
- An ageing workforce and reduced availability of migrant labour which is expected to contribute to high replacement demand and labour shortages.
- Shortages in key trades required for the decarbonisation of heat, including plumbers, electricians and retrofit coordinators.

The evidence highlights there are challenges around upskilling and reskilling, particularly due to financial barriers, availability of training and labour shortages.

It is expected that the **Transport** sector will be subject to significant demand for changing and new skills as the sector adapts to the transition to net zero. The primary factors driving this are:

- Demand for skills to support the expansion of ULEV infrastructure.
- A significant requirement for training (for new starts and re-skilling existing workers) on the maintenance and repair of ULEVs.
- Wider training requirements (for both new starts and re-skilling) around ULEVs
- Replacement demand as the ageing workforce retires.

With the **Manufacturing** sector, there is currently a heavily reliance on fossil fuels, and there will be major changes required in the sector to reduce emissions and meet Scotland's net zero targets. This will result in significant demand for skills and

labour, which will be driven by:

- An ageing workforce and reduction of migrant labour.
- Shortages of workers trained in key trades required to support decarbonisation in the Manufacturing sector, including welders, fabricators, and engineers.
- Significant upskilling and reskilling required to allow workers in the sector to adapt to new ways of working to support the decarbonisation of Manufacturing.

The **Agriculture** sector is of key importance to the transition to net zero. It is expected to face significant demand for new skills as it adapts to agricultural practice in a low carbon environment.

The primary factors driving this are:

- A considerable replacement demand as the ageing workforce retires.
- Adoption of new digital technologies to support more efficient and sustainable agriculture.
- Growing skills demand from peatland restoration. This is a new and growing sector, which is already leading to unmet skills demand.

Evidence gaps and lessons learned

An important aim of the Pathfinder was to assess the quality of the existing evidence base and identify ways in which it could be strengthened.

Key findings in this area include a lack of consistency in evidence on demand across CESAP sectors, reflecting uncertainties around investment and also a fragmented approach to forecasting skills requirements, meaning that there are often competing and overlapping definitions of potential requirements. There is also a need for more granular data, at Standard Occupational Code (SOC) 5 or 6 (as opposed to the current use of SOC 4 due to data availability) to help sharpen the green occupations definition.

Nevertheless, a consistent message across the review of demand evidence has been the impact of replacement demand (or more pointedly expected retirements) from the workforce in many of the CESAP sectors. Allied with the persistence of skills shortages – and competition for key skillsets across sectors, suggests a strong likelihood of the people and skills availability acting as barrier to achieving Scotland's net zero ambitions.

Looking ahead, pilots are currently underway by the Institute of Employment Research at the University of Warwick to explore SOC 5 and 6 data availability.

The work of the Pathfinder has also underlined the need for a blended approach in identifying demand, incorporating both numerical modelling from standard data methods and direct input from employers and industry on specific skills requirements and challenges. This will be further explored in CESAP Pathfinder Work Package 2 (decarbonisation of domestic and commercial heat).

The Pathfinder identifies the following opportunities in relation to demand:

- *Further develop specific demand analysis across CESAP sectors, focusing on known opportunities and including direct insight from employers and industry. This analysis should also look to identify skills in demand across sectors and inform skills planning plan on a national and regional basis.*
- *Undertake further engagement with relevant stakeholders and partners to assess and validate findings from this pathfinder work and explore ways to address data gaps collectively and strengthen the evidence base.*

About the study

This study was undertaken by Skills Development Scotland in Autumn 2022 with support from the Scottish Funding Council (SFC) to support the CESAP Pathfinder Work Package 1: An Evidence Based Approach to Supporting the Transition to Net Zero. This research supports Action 1 which looks to map jobs and skills demand in the sectors of importance to the net zero transition. The analysis was undertaken by SDS with support from Cambridge Policy Consultants who undertook consultations.

The study used a combination of employment and vacancy data sources, along with existing literature and industry insight, to understand the volume and extent of demand in CESAP sectors across Scotland. It uses employment forecast data from Oxford Economics, alongside web-scraped vacancy data from Burning Glass Technologies (renamed Lightcast).

Analysis was conducted to understand how many people were employed in industries relevant to the

net zero transition. These industries were defined in earlier stages of the Work package 1 research, by the Universities of Warwick and Strathclyde as part of the *Green Jobs in Scotland* research.

Linked research

The CESAP Work Package 1 Pathfinder has a suite of reports to share the insights, intelligence and lessons learned. These can be found [here](#).

This precis is supplemented by:

- *Pathfinder Report* - a comprehensive overview of the full range of activity that constituted the Pathfinder and the opportunities identified for further action.
- *Executive Summary* – a short summation of the CESAP Pathfinder report and the opportunities identified for further action.
- *Precis Reports* (Investment, Demand and Provision) – succinct, accessible documents which provide the background to the work, summarise the main findings and identify key lessons learnt.
- *Mapping of Green Investments* – further detail on identified investments in Scotland to support the transition to net zero.
- *Supplementary Demand Evidence* – additional technical data from activity to estimate demand.
- *Supplementary Provision Evidence* – additional technical data from activity to quantify provision.