FUTERRA SOLUTIONS UNION







Green Advantage

Employment in an AI-Enabled Economy

Energy&Climate INTELLIGENCE UNIT

POWERED BY CBI Economics

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Contents

Foreword: Futerra Solutions Union 4

Foreword: Energy and Climate Intelligence Unit 5

Executive Summary 7

Introduction 10

How we assess AI exposure 12

AI and green apprenticeship routes for young people 19

AI and the current green workforce 31

AI and future clean energy workforce demand 43

AI in renewable energy and low-carbon transport 50

Conclusion 58

Foreword: Futerra Solutions Union

I was talking to my daughter last night about what she wanted to do with her life. She likes the idea of being a lawyer. But she wonders what that job will look like, by the time she leaves school.

She is not alone. Artificial intelligence is making millions of people nervous about their livelihoods. But advancements in AI are happening at the same time as the energy transition. This report looks at the intersection of these two mega-trends.

Futerra Solutions Union exists to help inform the public narrative around climate. Green jobs should be an extremely compelling proposition. Jobs are done by people, and people make the best messengers. Green skills are in high demand from employers.[1] But understanding how green jobs intersect with AI advancement, a key concern for the public, is difficult. This is why we commissioned this report.

As the mother of two school-age children, this research has made me think completely differently about what constitutes a good job for them. I now counsel my kids to think about trades, technical, or installation occupations, while keeping an eye on how AI can complement other paths. Doing and building things, while exercising human judgement.

It also looks pretty fun. Have a read of the case studies in this report: Pearl, Anand, Alex, Matty, Grace, Carl, Jessica, Steve and Mary are a handful of the hundreds of thousands of people employed in the green economy. They work in Scotland's offshore wind industry, solar installations in Durham, electric vehicles in Norfolk, heat pump installation in Coventry, nature restoration in Cornwall, and river restoration in Sheffield. We were blown away by their sense of community, belonging, camaraderie and sheer hope.

My hope is that this gives a fresh perspective on a familiar topic. The green transition is often framed as something we must do to avoid catastrophe. This analysis gives a different story: one of opportunity, prosperity, resilience and belonging.



Lucy Shea

CEO, Futerra

[1] Workers with green skills are getting hired at 1.5x the rate of the wider workforce. **LinkedIn Global Green Skills Report 2026**.

Foreword: Energy and Climate Intelligence Unit

The rise of clean technology and AI are reshaping the global economy. Seismic shifts are underway with myriad implications for industry and society. Both offer the hope of growth to a UK economy that has underperformed its potential. But what does that growth look like and who stands to benefit? Any transition like these will involve change, just as attempts to stand still are a choice that comes with repercussions for the country and communities. It seems important and timely to ask the question ‘what does this mean for jobs?’.

The analysis laid out in this report provides answers, pointing to AI as an aid to some green jobs, but also green jobs as a route to long-term job security, less challenged by, and less at risk from substitution as AI adoption accelerates.

We know that the net zero economy supports a disproportionate amount of economic activity outside of London and this goes for jobs too. At a time when some more office-based sectors may see dramatic change from AI, the skills of tradespeople and engineers that underpin clean industries are not only increasingly in demand, but also irreplaceable.



Those skills are often developed through green apprenticeships which, even when compared to apprenticeships as a whole, are much more futureproof in leading to jobs less likely to be disrupted by AI. This in turn could offer a hopeful path forwards to the increasing number of young people struggling to get a foothold on the career ladder.

There are understandable concerns about the footprint of AI and contrasting views of the road ahead. Those skilled young people are needed to enable the UK's switch to renewable energy, powering the electrified businesses, heat pumps and electric vehicles that can bolster the country's energy security against the volatility of oil and gas markets that have driven the cost-of-living crisis. But the quid pro quo for those efforts now seems to be job security, benefitting families and communities.

The Prime Minister himself has stated that the green transition is "the best chance we will ever have to reindustrialise Britain". But this vision can only materialise when policy stability enables the investment in new clean industries, and the jobs, training and skills that support them. Government in partnership with industry have important decisions to make that could lead to more secure jobs right across the country, but the wrong decisions will lead to the opposite. Nothing can be taken for granted. This is a pivotal moment.



Peter Chalkley

Director, Energy and Climate Intelligence Unit (ECIU)

Executive Summary

Across all measures examined, green jobs have less potential for AI substitution than jobs in the UK economy as a whole. This pattern reflects two groups of occupations. In the first, exposure to AI is low because its capabilities overlap with relatively few of the abilities required, leaving limited scope for current AI systems to perform the core work. In the second, AI capabilities align more closely with the work, but requirements such as responsibility, judgement and interpersonal interaction make AI more likely to complement workers' expertise than replace it.

96%

Around 96% of young people on green apprenticeships in England are training for occupations with lower potential for AI substitution.

2x



Clean energy employment is expected to almost double by 2030, from around 440,000 to 860,000, with additional workers needed in every UK region.

94%

Of the additional priority clean energy workers needed by 2030, 94% are in occupations with lower potential for AI substitution.

4 in 5



More than 4 in 5 jobs in the current green workforce are in occupations with lower potential for AI substitution, against around 3 in 4 across the UK.

AI and green apprenticeship routes for young people

- **Around 96% of young people on green apprenticeships in England are training for occupations with lower potential for AI substitution**, compared with around three quarters (73%) across apprenticeships as a whole. This reflects the concentration of green apprenticeships in trades and technical roles, where AI overlaps with relatively few of the abilities the work requires.
- This profile is driven by trades**.** Green apprenticeships cover two broad groups: roles that directly deliver environmental outcomes, such as horticulture and environmental practice, and established trades whose skills are changing with the transition, such as electricians and plumbers. **All ten of the largest apprenticeships in the second group lead into occupations with low AI exposure,** led by installation and maintenance electricians, motor vehicle service and maintenance technicians, and plumbing and domestic heating technicians. **Nine of the ten largest in the first group also lead into occupations with lower substitution potential. Overall, around 86% of young people on green apprenticeships are training for low-exposure occupations.**
- **Green apprenticeships already operate at scale, accounting for around 32% of all apprenticeship participation among 16- to 24-year-olds in England.** Around two thirds of this is at Level 3, broadly equivalent to A levels. Green standards make up only around one in five (19%) apprenticeships at Level 2, broadly equivalent to GCSEs, which is an important entry point for young people with few or no qualifications.

AI and the current green workforce

- **More than four in five green jobs are in occupations with lower substitution potential.** The figure is around 82% and 84% respectively on the ONS-defined Low Carbon and Renewable Energy Economy (LCREE) and Environmental Goods and Services Sector (EGSS) measures, compared with around 74% across the UK workforce.
- **The share of green jobs in the occupations with the highest substitution potential** is around a third lower than across the UK on the LCREE measure (18% against 26%) and nearly two fifths lower on the EGSS measure (16%).
- **The difference is driven by low-exposure work, which accounts for half of LCREE employment and 58% of EGSS employment, against 41% across the UK.** The largest green occupations are practical trades and operative roles, including construction trades, carpenters and joiners, plumbers, electricians and water and sewerage plant operatives.

AI and future clean energy workforce demand

- Clean energy employment is expected to almost double, **from around 440,000 in 2023 to 860,000 by 2030**, according to the government's Clean Energy Jobs Plan. Every UK region will need additional workers, with the largest requirements in Scotland and the East of England, at around 55,000 to 60,000 each.
- The large majority of additional workers needed in priority occupations by 2030, **around 94%**, are in occupations with lower substitution potential. Two thirds (**66%**) are in low-exposure occupations, and a further **28%** are in occupations where AI is more likely to support the worker.
- **Demand is concentrated in established trades. Plumbers and heating and ventilating installers have the largest projected increase**, at 8,500 to 10,000 additional workers. Electricians and carpenters and joiners each need a further 7,000 to 8,499.
- **Many of these roles are accessible without a degree. Skills England estimates that 59% of projected additional employment in key priority occupations will require qualifications at Level 2 or 3**, making clean energy one of only three sectors, alongside adult social care and construction, where most expected demand sits at these levels.

AI in renewable energy and low-carbon transport

- **These are among the fastest-growing parts of the green economy**. Between 2014 and 2024, renewable energy employment grew by around 64% to 70,600 full-time equivalents. Low-carbon transport employment grew by around 260% to 33,400.
- **Around four in five jobs in each sector are in occupations with lower substitution potential.** The share in the category with the highest substitution potential is 19% in renewable energy and 20% in low-carbon transport, against 26% across the UK, which is around a quarter lower.
- **Both sectors are close to the UK average for occupations where AI is more likely to support workers, at 34% and 33% against 34% nationally,** standing to gain from AI-driven productivity improvements to a similar degree as the wider economy.
- Most of the largest occupations in **both sectors combine lower substitution potential with an established apprenticeship pathway**. This applies to **eight of the ten largest occupations in renewable energy** and **six of the ten largest in low-carbon transport**.

Introduction

The UK labour market is being reshaped by two transitions at once. Artificial intelligence is changing the tasks people perform, the skills employers need and how work is organised. Meanwhile, the transition to net zero is redirecting investment and creating new demands for labour and skills. Although often considered separately, these transitions are reshaping the same occupations and affecting the same workforce.

This report examines the intersection between them. It asks whether the occupations supporting green activity today and those expected to grow as the transition progresses have lower or higher potential for AI substitution. Understanding this interaction matters; if net zero increases demand for occupations with lower substitution potential, the transition could provide an important and growing source of employment as AI adoption accelerates.

Produced by CBI Economics for Futerra Solutions Union and the Energy and Climate Intelligence Unit (ECIU), this report examines the question through several complementary strands. It considers apprenticeship routes into green occupations and estimates the occupational composition of current green employment through the Low Carbon and Renewable Energy Economy (LCREE) and Environmental Goods and Services Sector (EGSS). It then looks ahead to projected clean energy workforce demand before examining renewable energy and low-carbon transport in greater detail. There is no single definition of green employment, so these strands capture different parts of the green labour market. Together, they allow the evidence to be triangulated rather than combined into a single measure.

The analysis applies a common framework across these strands. It draws on the AI exposure framework developed by Felten et al. (2021)[2] and the complementarity metric developed by Pizzinelli et al. (2023).[3] Together, these assess how far occupations are exposed to current AI capabilities and whether characteristics of the work make AI more likely to complement or substitute for workers.

Occupations described as having lower potential for AI substitution are those where AI overlaps with relatively few of the abilities the work requires, or is more likely to complement the worker's expertise. This is a relative measure based on current AI capabilities and is not a forecast of employment outcomes. AI may still change demand in occupations identified here as having lower substitution potential, depending on how the technology develops and how it is adopted.

[2] Felten et al. (2021) **Occupational, industry, and geographic exposure to artificial intelligence: A novel dataset and its potential uses**

[3] Pizzinelli et al. (2023) **Labor Market Exposure to AI: Cross-country Differences and Distributional Implications**

The report is structured as follows:

- **Chapter 1** introduces the AI exposure framework used throughout and sets the wider context for AI and UK employment.
- **Chapter 2** examines green apprenticeship routes and what they mean for the skills pipeline and for young people entering work.
- **Chapter 3** examines the types of jobs within the low-carbon and renewable energy economy and the environmental goods and services economy, comparing their AI exposure and complementarity with that of the UK economy.
- **Chapter 4** looks ahead to future clean energy workforce demand and examines the AI exposure and complementarity of the occupations expected to grow, and the skills routes needed to meet that demand.
- **Chapter 5** turns to two sectors of the green economy, renewable energy and low-carbon transport, and examines the opportunities their lower potential for AI substitution presents.
- A concluding chapter draws together the main findings and their implications for policy.

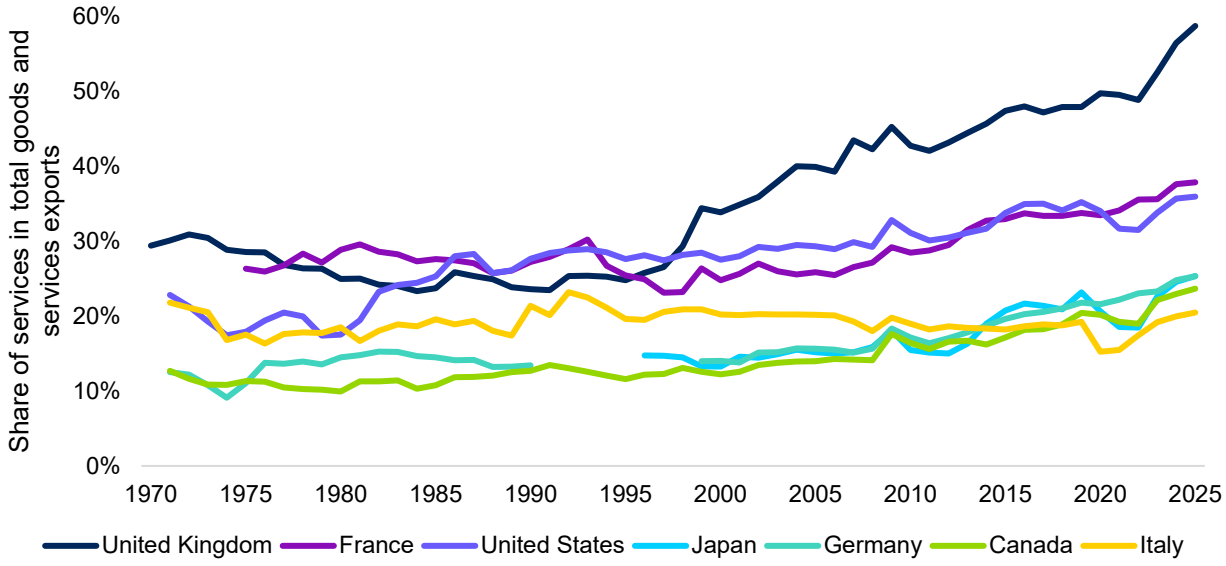


How we assess AI exposure

The rapid diffusion of artificial intelligence, and of generative AI in particular, has moved labour market disruption from a speculative concern to an active policy priority. What distinguishes the current epoch is the pace at which AI capabilities are advancing and being adopted across the economy. Governments and international institutions increasingly treat AI as a general-purpose technology capable of reshaping how work is performed in most sectors, with consequences for productivity and for the distribution of income.

The consistent finding across the literature is that exposure is greatest in office-based professional and administrative work, such as finance, law, data analysis and clerical roles.[4] This marks a departure from earlier waves of automation, whose effects fell most heavily on routine manual tasks. This pattern carries particular weight for the United Kingdom, which is more reliant on services trade than any other G7 economy. Services account for more than half of total UK exports, a share that has risen steadily since the mid-1990s and now sits more than 20 percentage points above the United States (**Figure 1**). The capabilities advancing most quickly therefore underpin the UK's international competitiveness.

Figure 1: Share of services in total goods and services exports, G7



Source: United Nations Population Division, national statistical offices, and Eurostat, via WorldBank (2026)

[4] Department for Education (2023) **The impact of AI on UK jobs and training - GOV.UK**

Exposure alone, however, does not indicate whether AI represents a challenge or an opportunity for UK occupations. A technology that substitutes for a task in one occupation may complement a worker performing a similar task in another. The outcome depends not only on the technical content of the task, but also on the skills required, the level of human responsibility involved and the social context in which the work is performed.

In this report, an occupation's potential for AI substitution depends on both its exposure to AI and the extent to which the role's characteristics make AI more likely to support human work. Distinguishing between exposure and complementarity is therefore central to assessing how different occupations may be affected.

Measuring AI exposure and complementarity

The analytical framework used in this report separates two related b ut distinct dimensions: the degree to which an occupation is exposed to AI, and the extent to which AI is likely to complement the worker.

Exposure measures which of an occupation's abilities AI can perform

AI exposure is measured using the AI Occupational Exposure (AIOE) Index developed by Felten et al. (2021).[5] The index assesses the overlap between a set of AI applications and the abilities required within each occupation. A higher AIOE score indicates that AI has the potential to affect a larger proportion of an occupation's core abilities. Importantly, the index does not determine whether that effect will be positive or negative. A highly exposed occupation may see some of its tasks automated, but it may also benefit substantially from AI-enabled productivity improvements.

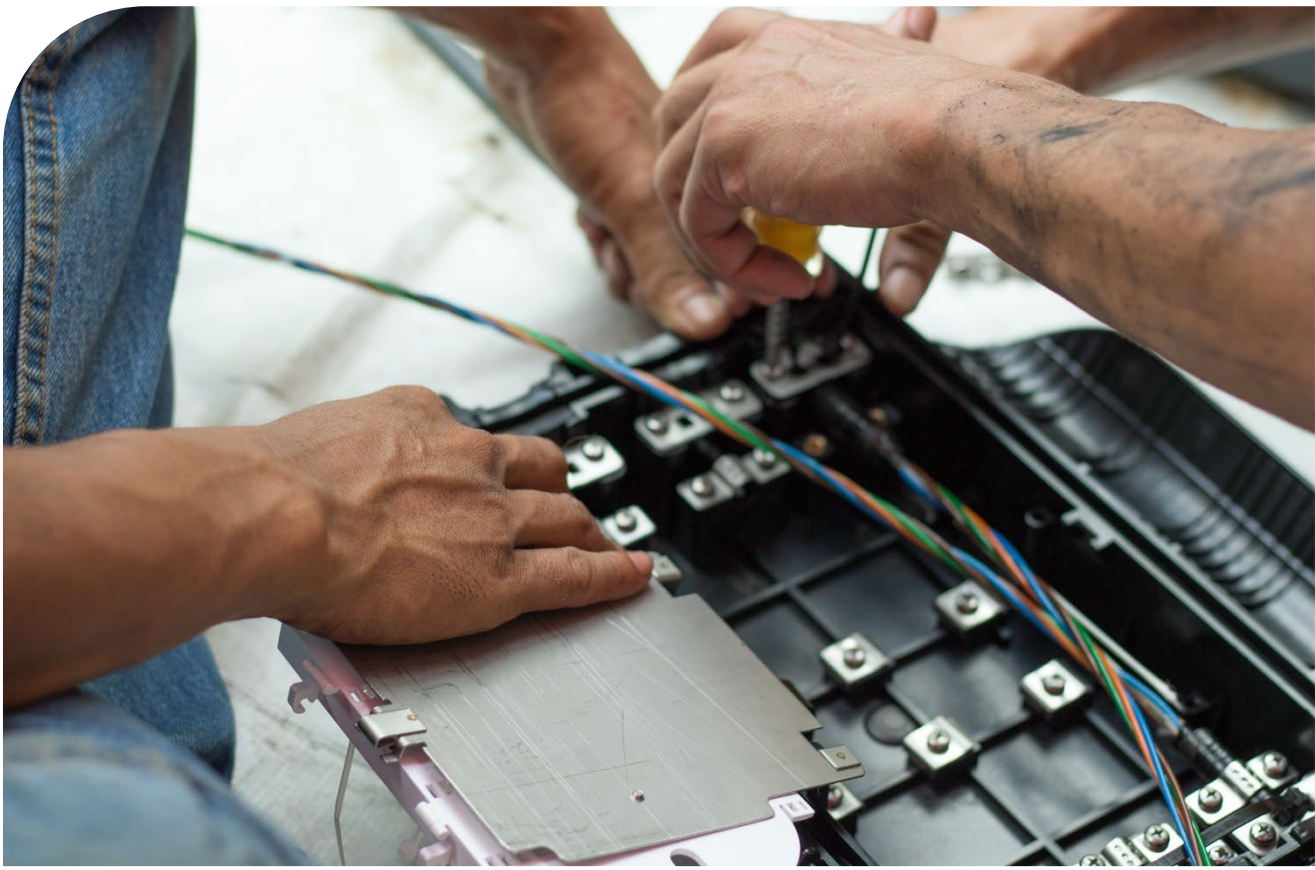
[5] Felten et al. (2021) **Occupational, industry, and geographic exposure to artificial intelligence: A novel dataset and its potential uses**

Complementarity measures whether AI supports or substitutes the worker

To assess the likely direction of this effect, the AIOE measure is combined with an indicator of potential complementarity, following the approach developed by Pizzinelli et al. (2023)[6]. This measure draws on information from O*NET about the physical, organisational and social context in which work is undertaken. Relevant factors include:

- the level of responsibility associated with the role;
- the consequences of error;
- the importance of interpersonal interaction and human judgement; and
- the training and expertise required to perform the work.

Occupations tend to receive higher complementarity scores where errors could have serious consequences, where human accountability or interpersonal interaction is central, or where substantial training enables workers to incorporate AI tools into their existing expertise. In such roles, AI is more likely to support decision-making and improve productivity than to remove the need for human involvement.



[6] Pizzinelli et al. (2023) **Labor Market Exposure to AI: Cross-country Differences and Distributional Implications**

Figure 2 plots each unit standard occupation classification (SOC) according to its AI exposure, shown on the horizontal axis, and its potential complementarity, shown on the vertical axis. The lines represent the median score on each axis and divide occupations into four quadrants.[7]

Figure 2: AI Exposure and Complementarity by UK 2020 Unit SOC



Source: CBI Economics (2026) adapted from Felten et al. (2021)[8], Pizzinelli et al. (2023)[9]

[7] For more information on how the exposure and complementarity scores are derived please refer to **Section 1** in the accompanying technical annex.

[8] Felten et al. (2021) **Occupational, industry, and geographic exposure to artificial intelligence: A novel dataset and its potential uses**

[9] Pizzinelli et al. (2023) **Labor Market Exposure to AI: Cross-country Differences and Distributional Implications**

The location of individual occupations illustrates why exposure and complementarity must be considered together. Engineers, for example, sit towards the top right, indicating relatively high exposure alongside high complementarity, which reflects the substantial human judgement, responsibility and interpersonal interaction involved in their work. AI may affect some of the tasks they perform, but the high degree of complementarity suggests that it is more likely to support than replace the worker. By contrast, occupations such as electricians, carpenters and plasterers sit towards the left, indicating relatively low exposure to the AI capabilities captured by the index. Occupations such as telephone salespersons occupy the lower-right area of **Figure 2**. Their tasks are comparatively open to automation and less strongly anchored by human judgement, responsibility or sustained interpersonal relationships. This does not mean that AI will cause widespread job losses in these occupations. It does suggest, however, that the tasks these roles currently involve are likely to change more as a result of AI's capabilities than those in other occupations across the economy.

For the analysis that follows, the four quadrants are consolidated into three categories, shown by the colours in **Figure 2**:

1. **Low exposure:** occupations in which AI currently overlaps with a relatively small proportion of the abilities required.
2. **High exposure and high complementarity:** occupations in which AI is likely to affect a share of tasks but is more likely to augment workers in their roles. These roles have comparatively strong potential to absorb AI as a productivity-enhancing tool.
3. **High exposure and low complementarity:** occupations in which a share of tasks could be performed or transformed by AI, but where there are fewer contextual factors anchoring the human role.

Throughout this report, occupations in the first two categories are described as having lower potential for AI substitution. In these roles, AI either overlaps with relatively few of the abilities the work requires, so workers may interact with it relatively little, or is more likely to support workers than replace them. Occupations in the third category are described as having the highest potential for AI substitution. This reflects greater scope for AI to change or take on some of the tasks these roles currently involve. It is not an expectation that the jobs will be lost, and it says nothing about the value or quality of the work. These occupations are needed across the economy today. Whether and how AI changes them depends on factors the framework does not capture, including the cost of adopting the technology, regulation, how employers choose to redesign roles and how quickly workers adapt. The findings suggest that the priority is therefore helping businesses adopt AI in ways that raise productivity, while supporting workers into new and changing roles through reskilling and upskilling.

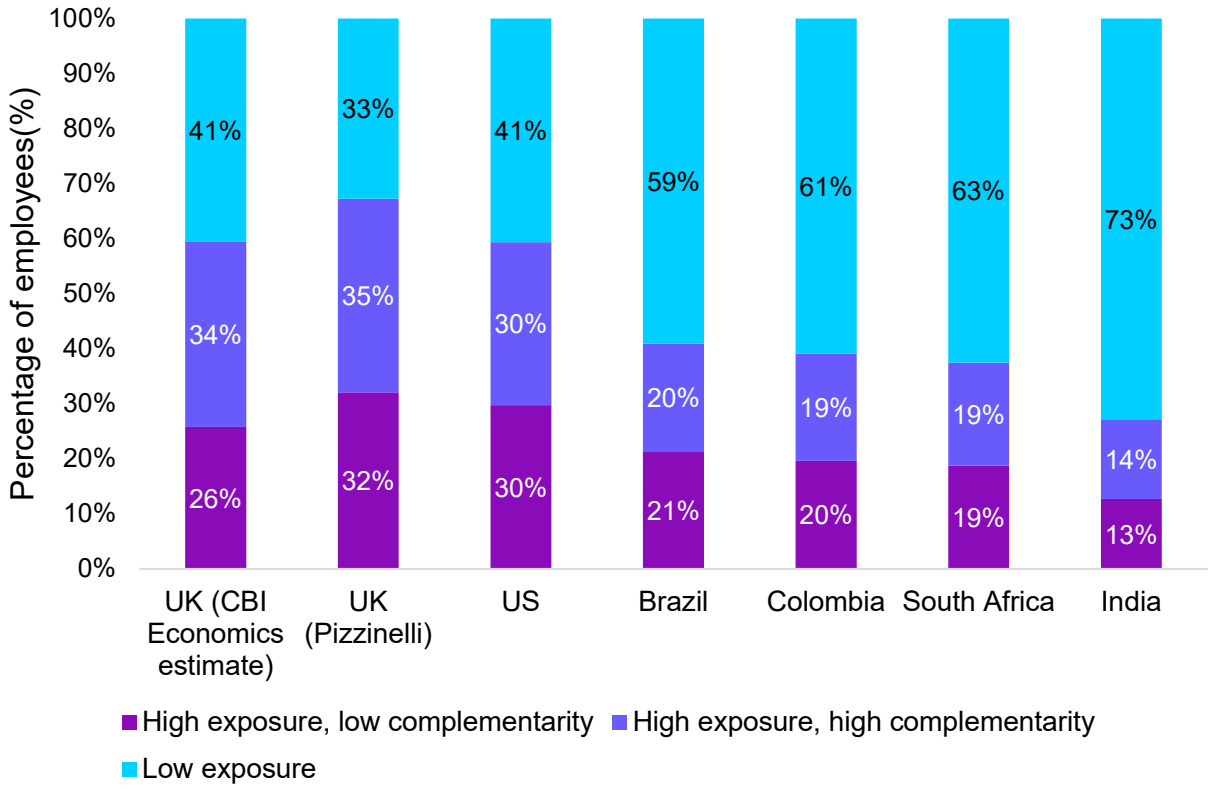
AI exposure across the UK workforce

The UK is the most AI-exposed economy among its comparators

Figure 3 presents Pizzinelli et al.'s (2023)[10] application of this framework to labour force data across six countries. Their analysis identifies the UK as the most AI-exposed economy in the group, with around 67% of employment concentrated in occupations where AI capabilities overlap with tasks.

Looking only at exposure, however, risks overstating the potential for substitution. Many highly exposed workers are employed in occupations where AI is more likely to complement their expertise. When exposure and complementarity are assessed together, approximately 32% of UK workers fall within the high-exposure, low-complementarity category. This is still, however, the largest share among the countries examined and represents the segment of the workforce with the highest substitution potential.

Figure 3: Employment share by AI exposure and complementarity by country



Source: Pizzinelli et al. (2023), CBI Economics (2026)

[10] Pizzinelli et al. (2023) **Labor Market Exposure to AI: Cross-country Differences and Distributional Implications**

Updating the estimates for SOC 2020 and recent employment data

Figure 3 shows both the original Pizzinelli et al. estimate for the UK and other countries and an updated CBI Economics estimate for the UK. The two differ because this report uses more recent Annual Population Survey data and the SOC 2020 occupational classification, with the exposure and complementarity measures crosswalked to the corresponding UK occupational codes. The underlying analytical framework is unchanged.

The updated estimate places around 26% of UK employment in the high-exposure, low-complementarity category, compared with 32% in the original study. The high-exposure, high-complementarity group changes relatively little, while the low-exposure group rises by approximately eight percentage points. As the update covers the UK only, it does not indicate how the UK now compares with the other countries in the original study, whose estimates have not been re-estimated on the same basis.

These whole-economy estimates provide the benchmark against which the AI exposure and complementarity of green employment are assessed. A separate England benchmark is also produced for the apprenticeship analysis, ensuring consistency with the geographic coverage of the Skills England apprenticeship data.



AI and green apprenticeship routes for young people

Before turning to green jobs more widely, we first examine the routes into them. The recent Milburn review found that, between January and March 2026, the number of 16- to 24-year-olds in the UK who were not in education, employment or training (NEET) exceeded one million for the first time since 2013.

Apprenticeships are one of the main routes into work, and the expanding green economy is a growing source of the openings young people might fill. We therefore combine the Skills England green apprenticeship categorisation with the latest participation data for 16- to 24-year-olds to test whether current green apprenticeships lead into occupations with lower or higher potential for AI substitution.

Key findings:

- **Around 96% of green apprenticeship participation among 16- to 24-year-olds** is in occupations with lower potential for AI substitution.
- **Green apprenticeships compare favourably with apprenticeships as a whole,** where around 73% of participation is in occupations with lower potential for AI substitution.
- **This pattern is driven by trades and technical occupations.** All ten of the largest mid-green apprenticeship standards lead into low-AI-exposure occupations, including electricians, vehicle technicians and plumbers.
- **Green apprenticeship provision is weighted towards Level 3, which accounts for around two thirds of green participation.** At Level 2, green standards account for 19% of participation among 16- to 24-year-olds

Defining green apprenticeships

This section identifies green apprenticeships using the green classifications attached to Skills England's occupational maps. These maps link occupations to apprenticeship standards and technical qualifications, which makes them well suited to identifying the training routes associated with green skills. A job is treated as green here on the basis of its occupational content and the standard it trains towards. Skills England's current public framework classifies green occupations and their associated standards in two categories:

- **'Dark-green' occupations** are embedded within the green economy and directly deliver sustainable outcomes. These occupations are closely connected to activities such as renewable-energy generation, environmental protection, sustainable land use and the transition to low-carbon infrastructure.
- **'Mid-green' occupations** retain their overall purpose but require new knowledge, skills and behaviours to accommodate greener technologies and working practices. Electricians, vehicle technicians and heating engineers are examples of occupations whose core function remains recognisable, but whose skills are changing in response to electrification, energy efficiency and other elements of the transition.

The classifications build on the work of the Green Jobs Taskforce and group occupations under themes including energy and networks, heat and buildings, manufacturing, sustainable land use and forestry, transport, and the circular economy. This report therefore combines dark-green and mid-green apprenticeship standards.

The apprenticeship participation data cover England only, so the analysis compares them with a separate England employment benchmark produced using the same AI exposure and complementarity framework. The findings in this chapter relate to apprenticeship participation in England and should not be assumed to represent provision elsewhere in the UK.

The focus on 16- to 24-year-olds

The number of 16- to 24-year-olds in the UK not in education, employment or training (NEET) passed one million in early 2026[11], the first time it had done so since 2013. The Young People and Work review led by Alan Milburn warns that on current trends the figure could reach 1.25 million within five years, taking the rate from around one in eight young people to one in six.[12]

At the same time, the routes into work have narrowed. Entry-level roles have been in long-run decline, and apprenticeships, designed as a direct route into employment, have drifted away from young people. Starts among 16- to 24-year-olds in England have fallen by 35% since the Apprenticeship Levy was introduced in 2017, and starts at Level 2, the entry point for a young person with no qualifications and no work history, have fallen by 68%.[13]

Restricting the analysis to 16- to 24-year-olds puts green apprenticeships in that context. Apprenticeships are open to workers of any age and are increasingly used to train people already established in their careers, to the point where under-25s accounted for only 48.7% of starts in England in 2024/25[14]. Isolating that group therefore isolates the provision which serves young people, both as a way into work for those outside it and as paid employment with structured training for those in the early stages of a career.

With fewer entry-level opportunities available, it matters whether apprenticeship standards are associated with occupations with lower substitution potential. Green apprenticeships can form one part of the response to rising youth inactivity by offering routes into trades and technical work for which demand is expected to grow, provided that suitable opportunities are available at accessible entry levels and reach young people currently furthest from employment. Not every apprentice will go on to work in the occupation their standard is linked to, so the results describe the routes on offer rather than individual outcomes.

[11] **Young people not in education, employment or training (NEET), UK - Office for National Statistics**
[12] **Young people and work: interim report - GOV.UK**
[13] **Young people and work: interim report - GOV.UK**
[14] **Release home - Apprenticeships - Explore education statistics - GOV.UK**

Data and method

The analysis combines Skills England's green occupational classifications with Department for Education apprenticeship data for the 2024/25 academic year. The DfE data cover the period from August 2024 to July 2025 and are drawn from the finalised Individualised Learner Record submitted by apprenticeship and further-education providers in England.

The analysis uses apprenticeship participation, rather than starts or achievements. Participation measures the number of learners recorded as taking part in an apprenticeship at some point during the academic year. It therefore provides a measure of the current training pipeline, including both new starters and apprentices continuing programmes begun in an earlier year. It should not be interpreted as a measure of annual entry into apprenticeships, completions or subsequent employment outcomes.

The following steps are applied:

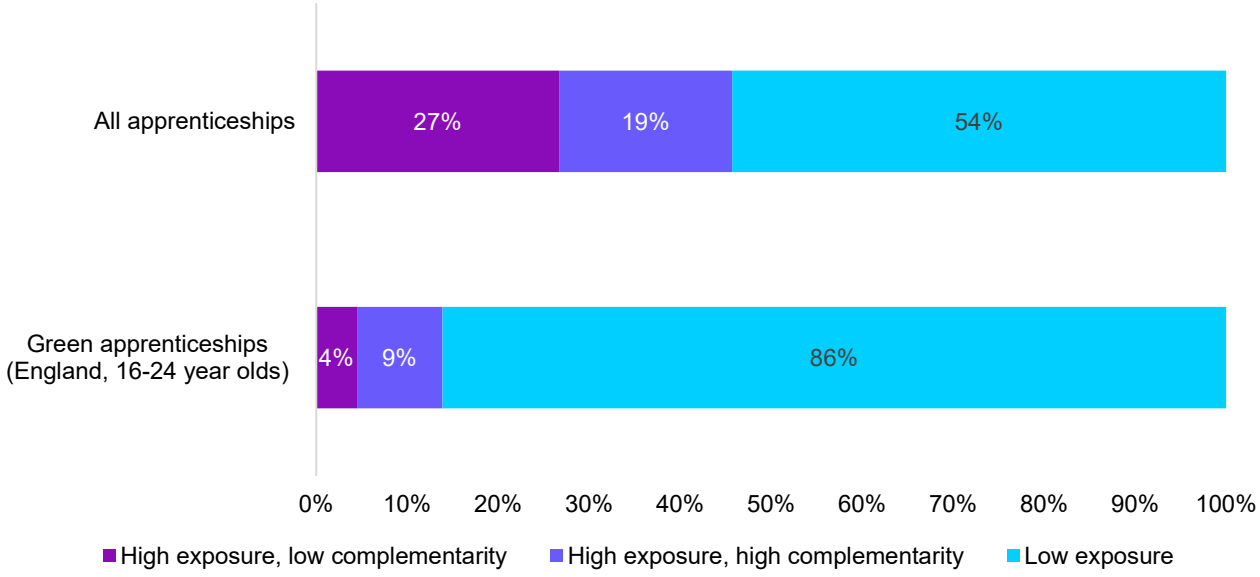
1. Apprenticeship standards attached to dark-green and mid-green occupations are identified using the Skills England occupational maps.
2. Each standard is matched to the number of participating learners aged 16 to 24 in the 2024/25 DfE data.
3. The standard is linked to its associated SOC 2020 occupation or occupations.
4. The AI exposure and complementarity classification developed in the previous is applied to the matched occupation.
5. Participation is aggregated across the three AI categories: low exposure; high exposure and high complementarity; and high exposure and low complementarity.

Where an apprenticeship standard maps to more than one SOC occupation, the relevant classifications are retained, and the standard is recorded as having a mixed AI profile where those classifications differ. The full apprenticeship-to-occupation crosswalk and the treatment of standards linked to multiple occupations are set out in **Section 2** of the technical annex.

AI exposure across green apprenticeships

Applying the exposure and complementarity framework to all dark-green and mid-green apprenticeship participation shows that green apprenticeships are far more concentrated in occupations with lower substitution potential than apprenticeships as a whole. Comparing with all apprenticeship participation provides a like-for-like benchmark, using the same data, age group and geography.

Figure 4: Share of apprenticeship participation among 16- to 24-year-olds by AI exposure and potential complementarity, green and all apprenticeships, England, 2024/25



Source: CBI Economics (2026)

Around 96% of green apprenticeship participation is in occupations with lower potential for AI substitution, compared with around 73% across all apprenticeships

Approximately 86% of green apprenticeship participation is associated with low-exposure occupations. These are roles in which the abilities required have relatively limited overlap with the AI applications captured by the exposure index.

A further 9.5% is associated with occupations that have high AI exposure and high potential complementarity. Apprentices entering these occupations are likely to interact more extensively with AI, but human expertise, accountability, regulation or interpersonal judgement make AI more likely to support their work.

Across apprenticeships more broadly, AI has the potential to change the tasks and skills involved in many roles, and the priority is ensuring young people can develop the skills to work alongside it.

Dark-green apprenticeships

Nine of the ten largest dark-green standards map to occupations with lower substitution potential, whether because AI overlaps with relatively few of the abilities the work requires or because the role carries characteristics that make AI more likely to support the worker.

Dark-green apprenticeships are associated with occupations that directly deliver environmental or sustainable outcomes, such as managing green spaces, monitoring environmental conditions and operating low-carbon energy plant. Although participation is lower than across the mid-green group, the standards cover a diverse range of land-based, environmental, energy and regulatory occupations. The largest dark-green standards among 16- to 24-year-olds include horticulture and landscape construction, arboriculture, environmental practice, crop production and countryside management.

Table 1: Largest dark-green apprenticeship standards by participation among 16- to 24-year-olds, England, 2024/25

Rank	Apprenticeship code and name	Matched standard occupational code	AI category
1	ST0225: Horticulture or landscape construction operative	5113 Gardeners and landscape gardeners	Low exposure
2	ST0223: Arborist	5113 Gardeners and landscape gardeners	Low exposure
3	ST0778: Environmental practitioner (Degree)	2152 Environment professionals	High exposure, high complementarity
4	ST0934: Corporate responsibility and sustainability practitioner	3549 Business associate professionals n.e.c.	High exposure, low complementarity
5	ST0018: Crop technician - Soil Based Systems Crop Technician	5112 Horticultural trades	Low exposure
6	ST0158: Dual fuel smart meter installer	5241 Electricians and electrical fitters	Low exposure
7	ST0290: Nuclear health physics monitor	3111 Laboratory technicians	Low exposure
8	ST0291: Nuclear operative	8133 Energy plant operatives	Low exposure
9	ST0714: Environmental health practitioner (integrated degree)	2483 Environmental health professionals	High exposure, high complementarity
10	ST0408: Countryside worker	5119 Agricultural and fishing trades n.e.c.	Low exposure

Source: Skills England (2026), CBI Economics ranking (2026)
Note: Both the horticulture or landscape construction operative and arborist standards are matched to SOC 2020 unit group 5113 (Gardeners and landscape gardeners), which is assigned to the low-exposure category. Although the specific tasks of each apprenticeship will differ from those of the wider occupation, both centre on practical outdoor work, so the AI category is likely to be a reasonable guide to the exposure of each role.

Seven of the ten largest dark-green standards are associated with occupations assigned low AI exposure. These are principally roles involving physical work, direct interaction with natural or built environments, the use of specialist equipment and adaptation to conditions that vary between sites.

The two largest standards, horticulture or landscape construction operative and arborist, illustrate this clearly. Skills England describes horticulture and landscape construction operatives as creating and maintaining parks, green spaces and gardens, working with both plants and soil and the surfaces and structures around them. They work outdoors year-round, often at height or with machinery, with training in biosecurity and biodiversity.[15] It describes arborists as managing trees for their environmental value, including alongside highways, railways and watercourses, through chainsaw and aerial tree work.[16] Both roles are likely to be needed in greater numbers on the path to net zero, with the Climate Change Committee's recommended pathway relying on large-scale woodland creation and other nature-based measures to increase carbon sequestration. Both roles are also carried out by hand, on site and in changing conditions, which the current framework suggests AI cannot substitute for.

Corporate responsibility and sustainability practitioner is the only one of the ten largest dark-green standards to fall into the high-exposure, low-complementarity category. The occupation contains a larger proportion of research, reporting, communications and information-processing tasks that generative AI is increasingly able to support or perform. Within the framework used in this report, it has a higher potential for AI substitution than the median across other occupations in the economy.



[15] **Horticulture or landscape construction operative / Skills England**

[16] **Arborist / Skills England**

Case study:

Mary Joyce
Water Environment Worker Apprentice at Riverlution, Sheffield.



> **I think there's some things AI can help with but there always needs to be a person**

Apprenticeships can offer an accessible route into green work for young people who do not follow an academic path. Mary Joyce's apprenticeship shows how that route can lead into hands-on environmental work.

Mary didn't go to university and wasn't sure what career was right for her but knew she wanted to work outdoors. After volunteering with the National Trust, she found an apprenticeship with Riverlution on the government website, and now works on the rivers in and around Sheffield, tackling invasive species, coppicing and supporting natural processes**. "I'm usually in a river in my waders, pretty much every day."**

She sees the physical setting of the work as a clear limit on what automation can do: **"I think there's some things AI can help with but there always needs to be a person. We have a robot mower that's pretty good, but as soon as anything is on a slope the robots are pretty useless, and most of the work we do is on a slope."**

Her role also involves working closely with volunteers, reflecting the interpersonal side of the work that the analysis identifies as one of the characteristics anchoring the human role.

Mid-green apprenticeships

Mid-green apprenticeships account for substantially more participation than dark-green standards, and all ten of the largest are associated with occupations that have low AI exposure. They are concentrated in established trades and technical occupations whose core purpose remains broadly unchanged, but whose skills are evolving in response to the green transition. The tasks are often non-routine and require workers to respond to the condition of a particular vehicle, building, machine or site, which limits the potential for direct substitution by the AI capabilities represented in the exposure index. This concentration in trades explains much of the green apprenticeship pipeline's lower substitution potential.

The shift towards electric vehicles, heat pumps, smart-energy systems, building retrofit and more efficient industrial processes does not remove the need for electricians, vehicle technicians, plumbers or engineering workers. Instead, it changes the technologies with which those workers must be competent. Mid-green apprenticeships provide a route through which these new skills can be embedded within existing occupations.

Installation and maintenance electrician is the largest mid-green apprenticeship standard for learners aged 16 to 24 in 2024/25. It is followed by motor vehicle service and maintenance technician, autocare technician, heavy vehicle service and maintenance technician, and plumbing and domestic heating technician.



Table 2: Largest mid-green apprenticeship standards by participation among 16- to 24-year-olds, England, 2024/25

Rank	Apprenticeship code and name	Matched standard occupational code	AI category
1	ST0152: Installation and maintenance electrician	5241 Electricians and electrical fitters	Low exposure
2	ST0033: Motor vehicle service and maintenance technician - light vehicle[17]	5231 Vehicle technicians, mechanics and electricians	Low exposure
3	ST0499: Autocare technician	5231 Vehicle technicians, mechanics and electricians	Low exposure
4	ST0068: Heavy vehicle service and maintenance technician	5231 Vehicle technicians, mechanics and electricians	Low exposure
5	ST0303: Plumbing and domestic heating technician	5315 Plumbers and heating and ventilating installers and repairers	Low exposure
6	ST0432: Engineering fitter	5241 Electricians and electrical fitters	Low exposure
7	ST0607: Metal fabricator	5211 Sheet metal workers	Low exposure
8	ST0417: Civil engineer	3114 Building and civil engineering technicians	Low exposure
9	ST0457: Engineering technician[18]	3113 Engineering technicians 3512 Ship and hovercraft officers 5222 Tool makers, tool fitters and markers-out	Low exposure
10	ST0155: Gas engineering operative	5315 Plumbers and heating and ventilating installers and repairers	Low exposure

Source: Skills England (2026), CBI Economics ranking (2026)

[17] Estimated based on apportioned enrolment data. For more information see **Section 2** of the technical annex.

[18] Engineering technician apprenticeships have different specialties such as within aerospace manufacturing, maritime pipework and toolmakers and therefore map to different standard occupational codes.

Case study:

Matty Beckworth
Apprentice solar panel installer, Future EV, Durham



> **More people will go for solar as a lot of people are seeing the benefits... It's growing quickly**

Installation and maintenance electrician is the largest mid-green apprenticeship standard among 16- to 24-year-olds, and all ten of the largest mid-green standards are associated with low-exposure occupations. Matty Beckworth's apprenticeship shows how electrical trades are being applied in fast-growing parts of the green economy.

Matty set out to become an electrician but found his way into solar and is now a year into his solar panel installer apprenticeship. He sees demand rising as households look to cut their energy bills: **"More people will go for solar as a lot of people are seeing the benefits... It's growing quickly."** He also expects the technology itself to develop: **"The systems are going to get more advanced."**

He enjoys the variety of the work, travelling to different sites and meeting customers, and sees its hands-on nature as central to his long-term prospects**: "AI can't install systems like we do."**

Implications for the skills pipeline

Standards classified by Skills England as dark-green or mid-green account for around 32% of all apprenticeship participation among 16- to 24-year-olds in England. This shows the scale of provision linked to occupations relevant to the transition, although not all these apprentices currently work in explicitly green activities. Provision is weighted towards Level 3, broadly equivalent to A levels, which accounts for around two thirds of green participation. At Level 2, broadly equivalent to GCSEs, green standards make up only around one in five (19%) apprenticeships among under-25s.

This matters because the young people who could benefit most from an accessible route into employment with structured training are not necessarily those the apprenticeship system currently reaches. The interim findings of the Milburn review found that a small proportion of apprentices were previously NEET. Expanding accessible routes in, particularly at entry level, could help apprenticeships play a greater role for this group. Level 2 provision, an important entry point for young people with few or no prior qualifications, has declined substantially, with Level 2 apprenticeship starts falling by 68% since the introduction of the Apprenticeship Levy in 2017.

The constraint is therefore one of access as well as provision. Green apprenticeships offer an established route into occupations with skills relevant to the transition, but their contribution to youth employment will depend on whether sufficient opportunities are available at accessible entry levels and whether those opportunities reach young people currently outside education and work.

These results describe the occupations that green apprenticeship standards lead into, not the future employment of individual apprentices. Training towards an occupation with lower substitution potential does not guarantee a job in it, and AI has the potential to change the tasks and skills involved in most roles, including these. Whether that happens will depend on the pace of adoption, employer investment, regulation and how apprenticeship standards and working practices evolve.

AI and the current green workforce

The previous chapter examined the routes into green work, using Skills England's occupational classification to identify green apprenticeships and test how AI is likely to alter their role. This chapter turns from the routes to the workforce already in place. It assesses the AI exposure and complementarity of the occupations that make up the green economy, measured through the ONS-defined Low Carbon and Renewable Energy Economy (LCREE) and the Environmental Goods and Services Sector (EGSS). Where the apprenticeship analysis defined green work by occupation, this chapter defines it by activity, capturing employment attributable to defined environmental and low-carbon sectors.

Key findings:

- **Over four in five jobs in the current green workforce are in occupations with lower potential for AI substitution,** compared with around three in four across the UK workforce.
- **Green jobs are around a third less likely** than jobs across the UK workforce to be in occupations with the highest potential for AI substitution (EGSS: nearly two fifths).
- **This reflects the occupational make-up of green employment**, particularly its concentration in practical, technical, operative and installation roles where current AI has less scope to substitute directly for workers
- **Nature-related green work reinforces this pattern**, with activities such as forestry, conservation and landscape management relying heavily on physical skills, local judgement and work in changing environments.

Defining green employment

The Office for National Statistics (ONS) defines a green job as 'employment in an activity that contributes to protecting or restoring the environment, including activities that mitigate or support adaptation to climate change'. It produces estimates on three bases, using industry, firm and occupation approaches, and notes that these overlap and should not be added together.

The ONS headline measure uses the industry approach. It estimates the employment associated with defined environmental and low-carbon activities. On this basis the ONS estimated 652,100 full-time-equivalent green jobs in the UK in 2024, 27.8% above the 2015 figure of 510,100[19]. Two statistical sources sit at the centre of that measure, Low Carbon and Renewable Energy Economy (LCREE) and Environmental Goods and Services Sector (EGSS), supplemented by the Business Register and Employment Survey (BRES).

This chapter approaches green employment from a different angle to the previous apprenticeship analysis, adopting the industry approach to consider the broader set of occupational roles that make up the green economy. For example, an accountant is not a green occupation in itself, but an accountant employed by a wind farm operator is counted within the green workforce because their employment is attributable to a green activity.

The measure used in this report

LCREE asks businesses to report the employment and economic activity attributable to 17 predefined low-carbon and renewable-energy sectors, among them renewable electricity, low-carbon heat, energy-efficient products, low-emission vehicles, energy storage and low-carbon services. A business need not operate principally within the low-carbon economy to be included, but only the share of its activity directly attributable to a defined LCREE sector is counted. LCREE employment in the UK was an estimated 304,000 full-time equivalents in 2024, having risen from just over 200,000 in 2015.

EGSS measures a different part of the green economy rather than a wider version of the same one. It follows the UN System of Environmental-Economic Accounting and covers 17 activities producing goods and services for environmental protection and resource management. Some of these overlap with LCREE, notably the production of renewable energy and energy saving and sustainable energy systems. Others fall outside it entirely, including waste, wastewater, recycling, water quantity management, environmental charities and the management of forest ecosystems. EGSS employment in the UK was an estimated 506,200 full-time equivalents in 2023, having risen from 381,300 in 2015.

[19] These figures are not directly comparable with CBI Economics' separate estimate that the UK net zero economy supports more than one million jobs. That analysis identifies net zero businesses from their activity rather than through ONS survey data, and it is calculated on a different basis that includes employment supported through supply chains.

Neither measure captures green employment in its entirety, and the definition of a green job remains under development. References to the green workforce in this chapter denote the employment these two measures cover, and the shares reported should be understood as applying to those populations rather than to green employment as a whole. Figures in this chapter refer to LCREE unless stated, with EGSS figures shown in brackets.

Estimating occupational composition

Neither measure reports employment by occupation, so the occupational profile of the green workforce must be estimated. The same approach is applied to both, following the method used in the Clean Energy Jobs Plan.[20]

For each sector within each measure, the distribution of employment across Standard Industrial Classification (SIC) codes is compiled over a multi-year period to reduce the influence of year-on-year variation. This covers 2018 to 2024 for LCREE and 2018 to 2023 for EGSS, the latest full year for which EGSS data are available as of writing.

These industry-level estimates are then linked to the Annual Population Survey, which records the number of people employed in each Standard Occupational Classification (SOC) group within each industry. The occupational distribution observed within each SIC code is applied to the corresponding employment estimate, and aggregating across industries and sectors produces the occupational profiles used throughout this chapter.

The analysis adds one step to that method through an occupational filter based on O*NET's classification of green occupations mapped to UK SOC codes. This is designed to avoid assigning green employment to occupations that happen to be present within an industry but are unlikely to contribute directly to its green activity. For example, an unfiltered industry distribution could assign a small share of offshore wind employment to coffee shop workers simply because they are present within the same industry classification. The filter removes such occupations from the estimated distribution and reweights the remaining occupational shares.

The resulting figures are modelled distributions rather than counts of workers in each occupation. The industry-to-occupation mapping, the O*NET filter and the assumptions applied are set out in more detail in Section 3 of the technical annex.

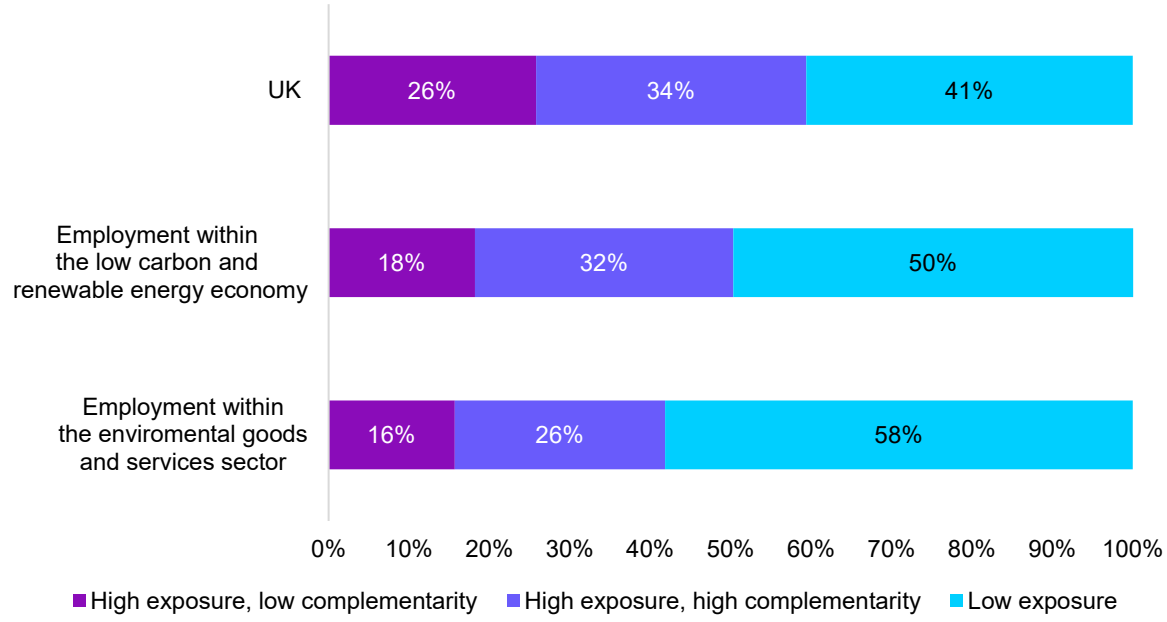
[20] **Clean energy jobs plan: technical annex - GOV.UK**

AI exposure across the green workforce

Applying the exposure and complementarity framework to the estimated occupational composition of green employment produces a similar broad pattern across both measures, as shown in **Figure 5.** Green employment is more concentrated in low-exposure occupations, and less concentrated in the high-exposure, low-complementarity category associated with the highest potential for AI substitution, than employment across the UK economy.

More than four in five green jobs, around 82% (EGSS: 84%), are in occupations with lower potential for AI substitution, compared with around three in four jobs across the UK workforce.

Figure 5: Employment share by AI exposure and potential complementarity, LCREE, EGSS and the UK economy



Source: CBI Economics (2026)

Green employment has lower potential for AI substitution than the wider workforce

The clearest difference between green employment and the wider workforce is in the occupations with the highest substitution potential, which combine high AI exposure with low potential complementarity. This category accounts for around 18% of green jobs (EGSS: 16%), compared with 26% across the UK workforce. The share is therefore around a third (31%) lower than across the UK (EGSS: 38%, or nearly two fifths).

Most of this difference comes from occupations with low exposure to AI. Half of green jobs (EGSS: 58%) are in low-exposure occupations, compared with 41% across the UK workforce. These are occupations in which current AI capabilities overlap with a relatively limited proportion of the abilities required to perform the work.

The share of employment in occupations that combine high AI exposure with high potential complementarity is 32%, close to the UK figure of 34% (EGSS: 26%, reflecting its larger share of low-exposure work). Workers in these occupations may interact more extensively with AI, but characteristics such as human judgement, responsibility and expertise make the technology more likely to support their work than substitute for them.

On both measures, the difference between green employment and the wider workforce is driven principally by a greater concentration of low-exposure occupations and a correspondingly smaller concentration of occupations where high AI exposure is combined with limited potential for complementarity.



Case study:

Anand Sajeevan
Renewable Energy Advice Officer, Community Energy, Scotland



> **There is an element of trust I build with (communities) that AI can't replace**

Around a third of renewable energy jobs are in occupations with high AI exposure but high potential complementarity, where AI is closely connected to the work but characteristics such as judgement and interpersonal interaction make it more likely to support workers. Anand Sajeevan's role illustrates the kind of work in this group.

After seeing the effects of climate change first-hand in his home village in Kerala, India, where floods submerged his house in 2018, Anand moved to Edinburgh in 2023 to study for a master's in renewable energy. He now works at Community Energy Scotland, helping community organisations lower their energy bills and develop practical plans to decarbonise.

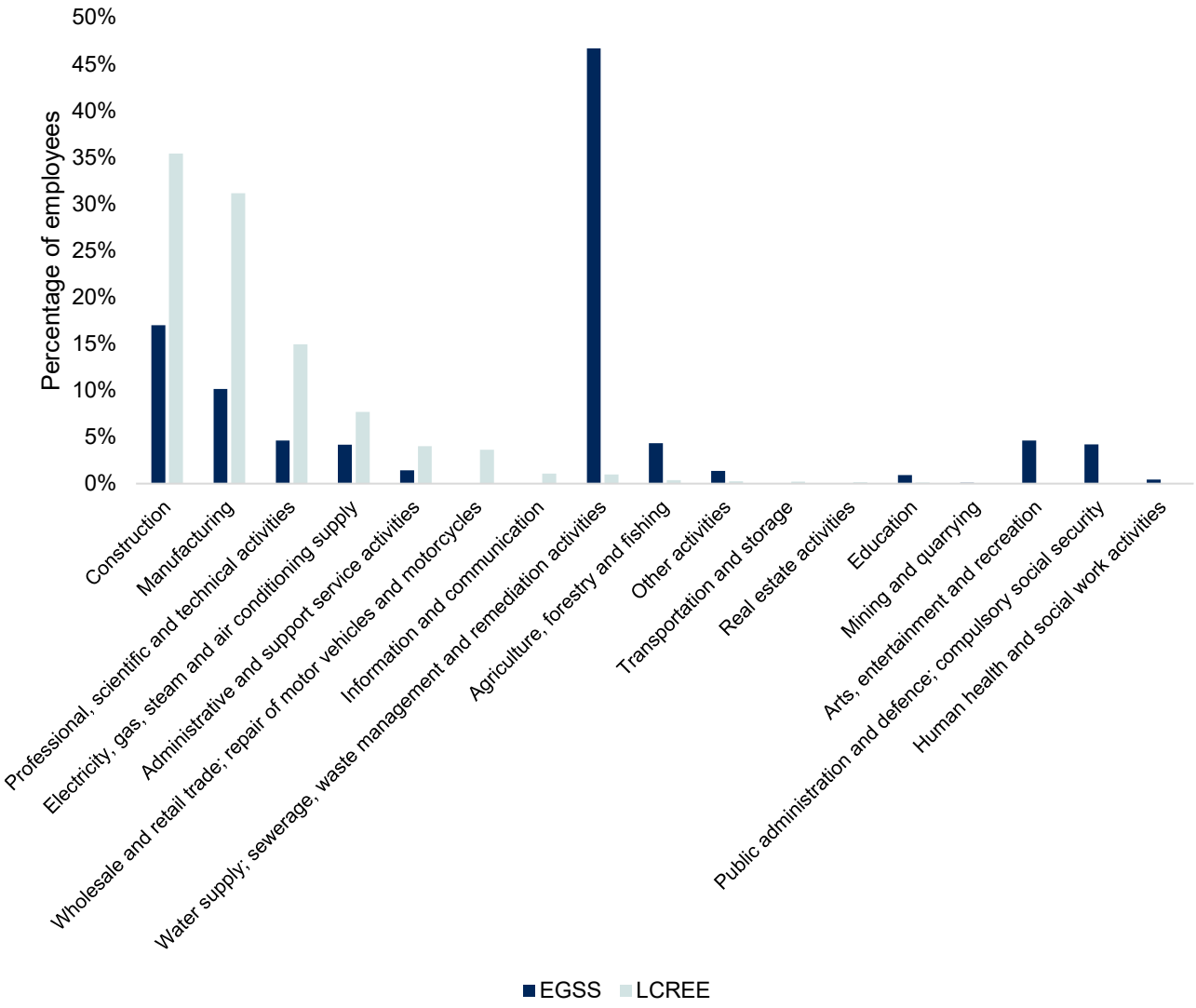
Much of his work is technical: **"I like finding a design that fits their energy demands and gives them the best value for money."** But he sees the relationships he builds as central to the role: **"I work with community groups so going into these communities there is an element of trust I build with them that AI can't replace."**

He's confident about the sector's future, and not only because bills are rising. **"The main thing is renewable energy will grow as we reduce our reliance on fossil fuels as it gives us an alternative solution"**.

Why the two measures differ

Overall, the results suggest that the current green workforce has comparatively low potential for AI substitution. This is not because green activity is inherently protected from technological change, but because of the types of industries and subsequent occupations in which green employment is concentrated. **Figure 6** shows how employment is distributed across industry sections under each measure.

Figure 6: Employment share by industry, EGSS and LCREE



Source: ONS EGSS and LCREE estimates (2026)

Under LCREE, employment is concentrated in construction and manufacturing, which together account for two thirds of the total, with professional, scientific and technical activities making up a further 15%. EGSS distributes that weight differently. Water supply, sewerage and waste management alone accounts for 47% of employment on the EGSS basis, against 1% under LCREE, while the share in professional, scientific and technical activities falls to under 5%. Because the occupational profiles are built from these industry distributions, the difference in industry coverage carries directly through to the occupations each measure identifies.

Which occupations explain the difference

The lower substitution potential across green jobs is largely explained by a concentration in trade, technical, operative and installation occupations. Many of these roles involve physical activity, site-specific work, non-routine problem-solving and direct interaction with equipment or the built environment. These characteristics limit the extent to which current AI systems can substitute directly for the worker.

Table 3 shows the ten largest estimated occupations under each measure. The LCREE list is led by construction and building trades not elsewhere classified, carpenters and joiners, and plumbers, heating and ventilating installers, reflecting its weight in construction. The EGSS list is led by large goods vehicle drivers, refuse and salvage occupations, and water and sewerage plant operatives, reflecting the dominance of waste, water and remediation activity.

Despite drawing on different industries, all three of the largest occupations under each measure are classified as having low AI exposure, and eight of the ten largest occupations (EGSS: nine) fall outside the high-exposure, low-complementarity category. Four occupations appear on both lists, namely electricians and electrical fitters, metalworking production and maintenance fitters, construction and building trades, and production managers and directors in manufacturing.

Table 3: Ten largest estimated occupations in LCREE and EGSS employment

Rank	LCREE	AI category	EGSS	AI category
1	Construction and building trades n.e.c.	Low exposure	Large goods vehicle drivers	Low exposure
2	Carpenters and joiners	Low exposure	Refuse and salvage occupations	Low exposure
3	Plumbers, heating and ventilating installers	Low exposure	Water and sewerage plant operatives	Low exposure
4	Production managers and directors, manufacturing	High exp., high compl.	Electricians and electrical fitters	Low exposure
5	Electricians and electrical fitters	Low exposure	Production managers and directors in manufacturing	High exp., high compl.
6	Production managers and directors in construction	High exp., high compl.	Waste disposal and environmental services managers	Low exposure
7	Programmers and software development professionals	High exp., high compl.	Customer service occupations n.e.c.	High exp., low compl.
8	Marketing, sales and advertising directors	High exp., low compl.	Metal working production and maintenance fitters	Low exposure
9	Metal working production and maintenance fitters	Low exposure	Construction and building trades n.e.c.	Low exposure
10	Management consultants and business analysts	High exp., low compl.	Farmers	Low exposure

Source: CBI Economics (2026)

Case study:

Jessica Rose
Heating Engineer, Worcestershire



“It can support me in my day to day but it still can’t do the job. It can’t fix the problem without me using my hands to do it.”

Plumbers and heating and ventilating installers are among the largest occupations in the low-carbon workforce, and the occupation has low AI exposure. Jessica Rose’s move into the sector shows how practical trades can draw in people from very different careers.

After six years as a paralegal, Jessica wanted work that was different every day. She began helping a plumber friend on Saturdays, signed up for an evening course in plumbing and was later offered a gas apprenticeship, during which she was named Rising Star at the Heating Installer Awards. She now specialises in servicing and repairing air source heat pumps and solar systems. “I’m constantly learning. It’s constantly changing and challenging me, and I love the feeling of getting something up and running again.”

She sees AI as a tool in her work rather than a substitute for it: **“It can support me in my day to day but it still can’t do the job. It can’t fix the problem without me using my hands to do it.”**

Nature-based activity in the green workforce

Using both measures gives a fuller picture of green employment. EGSS brings into view parts of the green economy that are largely absent from LCREE, including a much greater share of nature-related activity. Agriculture, forestry and fishing, for example, accounts for 4.3% of employment on the EGSS basis, compared with 0.4% under LCREE.

This brings into the analysis work associated with the management, restoration and protection of the natural environment, although the statistical categories do not separately identify every form of nature-based activity. This part of the green economy is particularly relevant to the question of AI exposure because of the nature of the work involved. Activities such as habitat management, forestry, conservation, horticulture and landscape management frequently require workers to operate in physical environments, respond to changing local conditions and apply practical skills and judgement on site.

There is a clear connection with the apprenticeship analysis earlier in the report. The two largest dark-green apprenticeship standards among 16- to 24-year-olds are horticulture and landscape construction operative and arborist, both of which map to low-AI-exposure occupations. This illustrates how nature-related activity can combine environmental value with forms of work that remain dependent on physical skills and human judgement.

Case study:

Grace Finnie
National Trust Ranger, Cornwall





Forestry and land management are among the nature-based activities brought into the analysis by the EGSS measure, and the work depends heavily on practical skills and judgement on site. Grace Finnie's career shows how an apprenticeship can open a route into this part of the green economy.

Grace moved to Cornwall to study photography but started an apprenticeship with Working Woodlands Cornwall, where she trained in regenerative forestry and woodland management. **"I dropped the camera and picked up a chainsaw,"** she says. She had her chainsaw licence within six months and, three years later, was working as a forester and woodland consultant. After a period in commercial forestry, she became a ranger for the National Trust at Lizard Point.

Her work is physical and varies from day to day, from managing riverbanks to working in woodland, reflecting the changing site conditions that characterise much nature-based work. She also sees growing opportunity in the sector: "**You can see good things happening in the industry: more funding available, more emphasis on nature recovery, habitat improvement and rewilding."**

AI and future clean energy workforce demand

The previous chapter showed that today's green workforce is more concentrated in occupations with lower potential for AI substitution than the UK workforce as a whole. This chapter asks whether the same holds for the jobs the transition will need in future. No detailed employment forecast exists for green employment as a whole, so the Clean Energy Jobs Plan is used as a proxy for the likely scale and direction of growth. The analysis identifies where additional workers are expected to be needed, the occupations central to meeting that demand, and how those occupations are positioned in relation to AI

Key findings:

- **Clean energy workforce requirements are expected to almost double by 2030,** rising from around **440,000 jobs in 2023 to 860,000 in 2030,** an increase of approximately 420,000 jobs, or 95%.
- **Future demand is concentrated in practical and technical occupations,** including plumbers and heating installers, electricians, carpenters, engineers and manufacturing roles.
- **Around 94% of the additional priority workers required are in occupations with lower potential for AI substitution,** including 66% in low-exposure occupations.
- **Accessible skills routes will be critical to meeting demand,** with **59% of projected additional employment in key priority occupations requiring Level 2 or 3 qualifications,**
  creating significant opportunities for workers without a degree.

The scale and direction of future demand

The LCREE estimates provide a picture of employment as it stands today rather than a forecast of future workforce requirements. Assessing how demand may develop therefore requires a different source. The Clean Energy Jobs Plan, published by DESNZ in October 2025, sets out estimated workforce requirements to 2030 and is used here as a directional proxy.[21]

Several of the Plan's sector baselines draw directly on LCREE estimates, while others are mapped to related LCREE categories. Its coverage is broader, however, extending to areas including nuclear, electricity networks, fusion and energy efficiency. The figures should therefore be interpreted as an indication of the scale and direction of future clean energy workforce demand rather than as a like-for-like forecast of LCREE employment and green employment more generally.



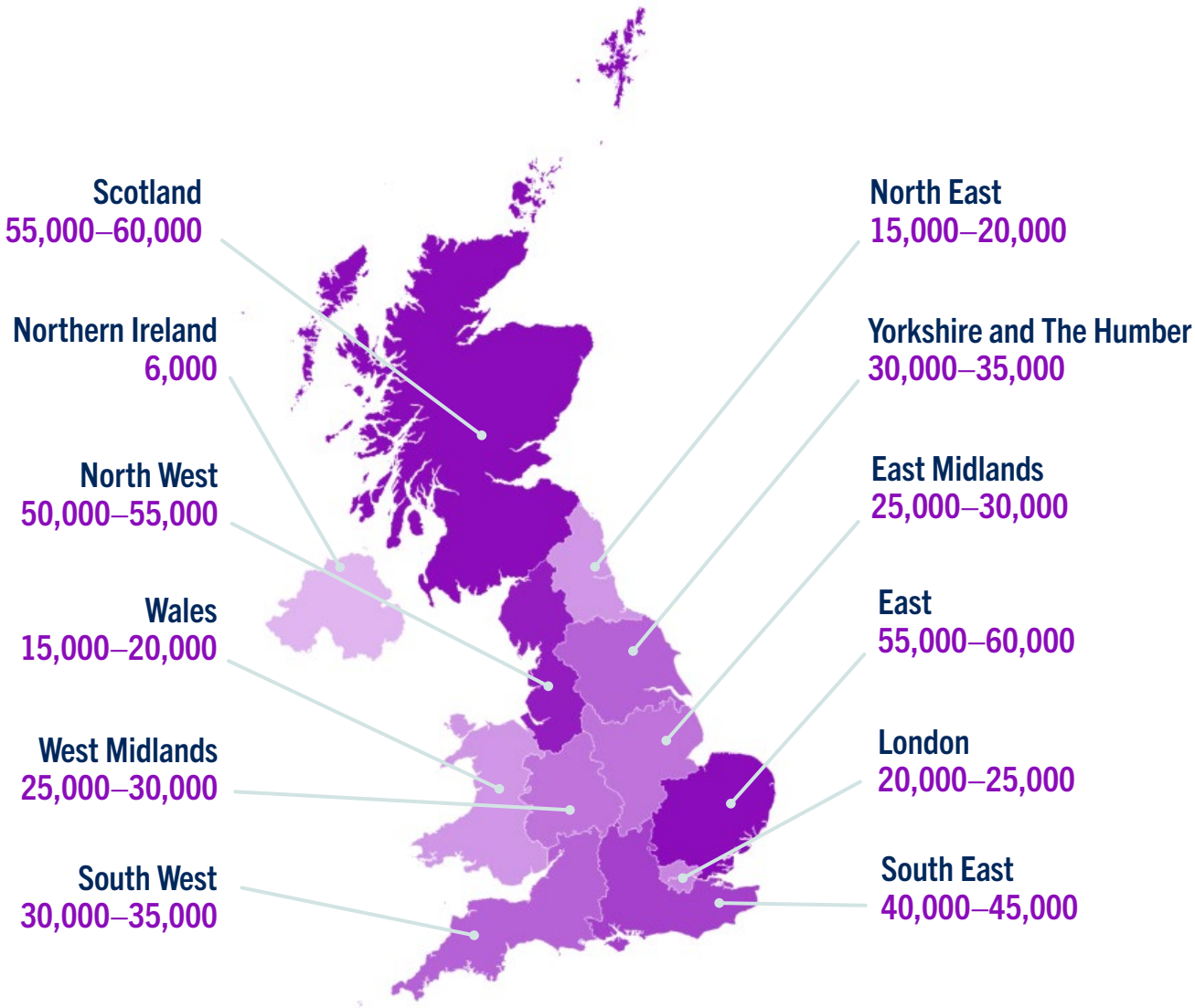
[21] Clean energy jobs plan (HTML) - GOV.UK

Clean energy employment is expected to almost double by 2030

On the Plan's estimates, clean energy employment rises from around 440,000 in 2023 to 860,000 by 2030, an increase of approximately 420,000 jobs or 95% in the space of seven years, covering both direct and indirect roles. Meeting this requirement would entail a substantial expansion of the workforce over a relatively short period.

Figure 7 shows that every UK region is expected to require additional clean energy workers by 2030, although the scale varies considerably. The largest requirements are projected in Scotland and the East of England, at around 55,000 to 60,000 workers each, followed by the North West and South East of England.

Figure 7: Regional requirement for clean energy jobs in 2030

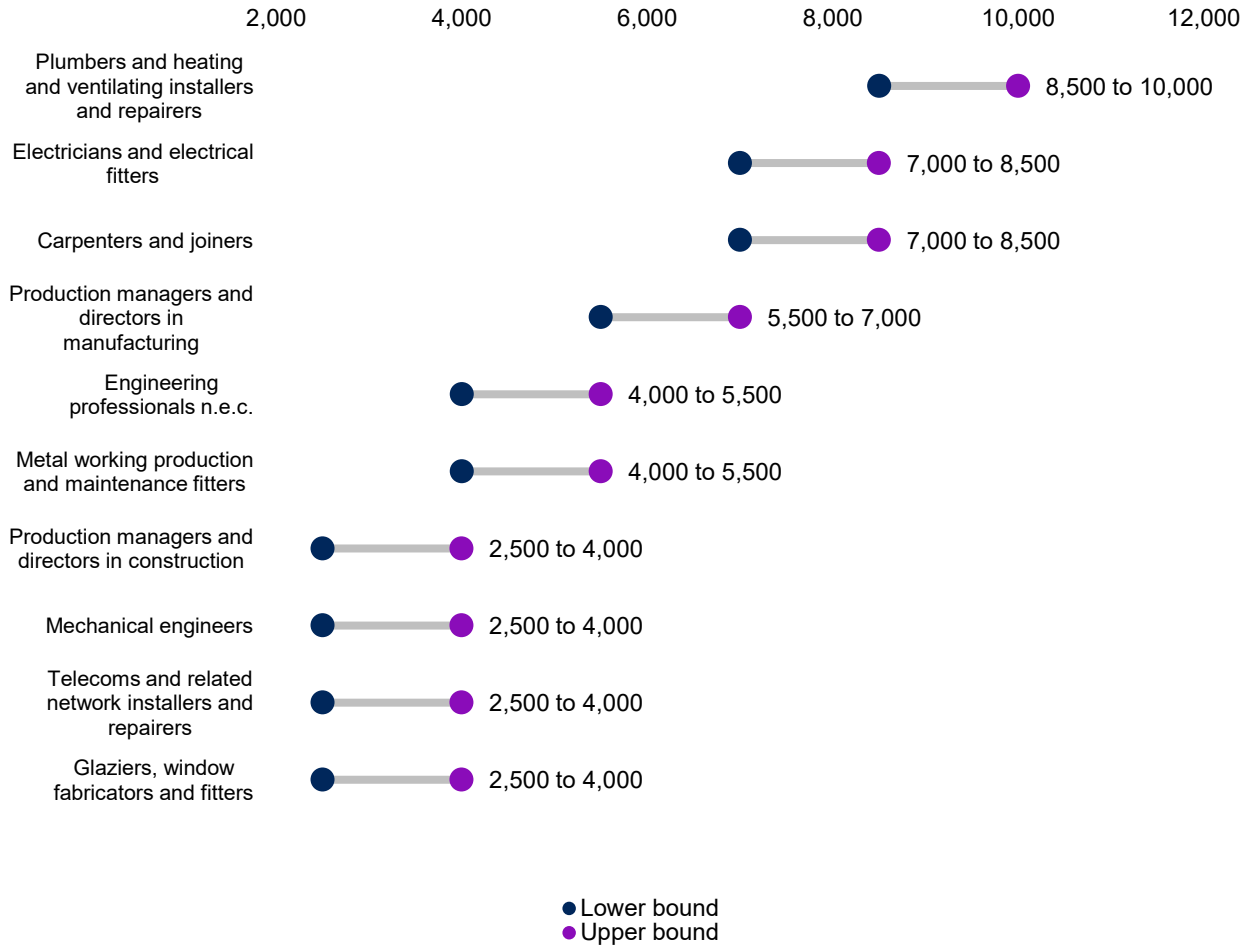


Source: DESNZ Clean Energy Jobs Plan (2025)

Demand is concentrated in priority occupations requiring practical and technical skills

The Clean Energy Jobs Plan identifies a set of priority occupations that are expected to be particularly important to meeting future clean energy workforce requirements. Demand across these priority occupations is concentrated particularly in practical and technical work. Plumbers and heating and ventilating installers and repairers have the largest projected increase among the ten occupations with the greatest additional requirement, at between 8,500 and 10,000 additional workers by 2030. Electricians and electrical fitters, and carpenters and joiners, each require an estimated further 7,000 to 8,499 workers. There is also substantial additional demand for production managers in manufacturing, engineering professionals, and metalworking production and maintenance fitters.

Figure 8: Required increase in priority occupations to 2030, top 10 occupations, lower and upper bounds



Source: DESNZ Clean Energy Jobs Plan (2025)

Case study:

Carl Ladd
Heat Pump Installer, Coventry



> **If the job is done well, it improves efficiency and cost**

Plumbers and heating and ventilating installers have the largest projected increase in demand of any clean energy priority occupation, at 8,500 to 10,000 additional workers by 2030. Carl Ladd's route into the role shows how trades skills can be built on through an apprenticeship later in a career.

Carl was working as a carpenter when a serious hand injury forced him to rethink his career. At 35, he took a job as a plumber's labourer, went on to complete an apprenticeship, and won the Rising Star prize at the 2021 Heating Installer Awards.

He now installs heat pumps, work that involves assessing the whole house, from room sizes and water supply to pipework and radiators, so each job presents a different problem to solve. Installers also play a central role in advising customers and building trust, and in making sure systems are fitted to perform well: **"If the job is done well, it improves efficiency and cost"**

How this demand will be met

The level at which these workers are needed matters as much as the occupations themselves. Skills England finds that 59% of projected additional employment in the key priority occupations will require qualifications at Level 2 or 3, with the remaining 41% at Level 4 or above.[22] Clean energy, therefore, is one of only three sectors where the majority of expected demand sits at these levels, alongside adult social care and construction.

Applying the AI exposure and complementarity framework to the required increase in these occupations estimates that 94% of the additional workers needed are in occupations with lower substitution potential. Two thirds of the increase (66%) is in occupations with low AI exposure, and a further 28% is in occupations with high exposure but high potential complementarity, where AI is more likely to change how the work is done than to remove the need for the worker. The remaining 6% is in the high-exposure, low-complementarity category.

The occupations where the clean energy transition needs the most additional workers are, with few exceptions, the same occupations this analysis identifies as having lower substitution potential. Demand across these priority occupations is also weighted towards Level 2 and 3, the qualification levels most accessible to young people without a degree.

New entrants alone will not close the gap. Skills England highlights the transition of workers from declining carbon-intensive industries, alongside upskilling of the existing workforce, as crucial to meeting demand. Many of the required skills already exist elsewhere in the economy, with 28 of the 31 priority occupations shared with at least one other priority sector.

[22] **Sector Skills Needs Assessment – Clean energy - GOV.UK**

Case study:

Pearl Stephen
Wind turbine operator, Scotland



Scotland has one of the largest projected requirements for additional clean energy workers by 2030, at around 55,000 to 60,000. Meeting that demand will depend partly on experienced workers moving in from other sectors, and Pearl Stephen's move from oil and gas shows how existing skills can transfer.

After 15 years working offshore in oil and gas, Pearl faced redundancy. With support from the Oil and Gas Transition Training Fund, she completed the Global Wind Organisation (GWO) training required to work in the sector, and soon afterwards secured a permanent role as a site coordinator on an offshore wind project.

She describes the move as one to a more predictable working environment, with a strong pipeline of future work. **"I've gone from working in traditional oil and gas to helping support Scotland's growing offshore wind industry. The technology might be different, but so many of the skills are transferable."**

AI in renewable energy and low-carbon transport

This section examines employment within two clearly defined green sectors, renewable energy and low-carbon transport, which are among the largest components of the low carbon and renewable energy employment statistics. The analysis examines them together, comparing their occupational make-up, their exposure to AI and the geography of recruitment.

Key findings:

- **Renewable energy and low-carbon transport supported around 104,000 FTE jobs in 2024,** with employment growing by **64% and 260% respectively since 2014.**
- **Around four in five jobs in both sectors are in occupations with lower potential for AI substitution.** The share in the category with the highest potential for AI substitution is around a quarter lower than across the UK workforce (27% lower in renewable energy and 23% lower in low-carbon transport).
- **Both retain substantial potential to benefit from AI**, with around a third of employment in highly exposed but highly complementary occupations, broadly in line with the UK.
- Recruitment has distinct regional strengths, concentrated around the **South West and Thames Valley, alongside West Central Scotland for renewable energy** and the **West Midlands for electric vehicles.**

Renewable energy, as defined in the ONS green jobs estimates, brings together seven activities within the Low Carbon and Renewable Energy Economy. These are offshore and onshore wind, solar, hydropower, renewable heat, renewable combined heat and power, and other renewable energy. Low-carbon transport combines two LCREE activities, low-emission vehicles and infrastructure, and fuel cells and energy-storage systems. Between them these activities cover the manufacture and deployment of low-emission vehicles, the supporting charging and refuelling infrastructure, and the technologies required to store and manage energy.

In 2024, renewable energy accounted for an estimated 70,600 full-time-equivalent jobs and low-carbon transport for 33,400, together around a third of total LCREE employment. Both have expanded considerably over the past decade. Renewable energy employment grew by around 64% between 2014 and 2024, while low-carbon transport grew by around 260%, making it the fastest-growing part of the green economy in the data used here, with much of the increase coming after 2020 as vehicle electrification accelerated.



Case study:

Steve Gibson
Head technician at Cleevely EV Mobile, Norfolk



> **There's an opportunity for people that are coming into the industry - it is growing.**

Low-carbon transport employment grew by around 260% between 2014 and 2024, and around four in five jobs in the sector are in occupations with lower potential for AI substitution. Steve Gibson's career shows how established vehicle maintenance skills are carrying across as the fleet electrifies.

Steve joined his local independent garage straight from school, where he learned to diagnose and fix a wide range of faults. He then worked at a dealership before spending 15 years repairing vehicles at the roadside for the RAC. Four years ago, he joined Cleevely EV Mobile, which services electric vehicles at customers' homes and workplaces, and he is now head technician.

Over that time, he has seen demand move from early adopters to the mainstream: **"People are realising they work really well. Our customer base has changed a lot in that time."** His experience reflects a wider point in the analysis: electrification changes the technology technicians work with, rather than removing the need for them. As Steve puts it, **"EV is the new technology and it is at the forefront - it's quite an exciting time. And there's an opportunity for people that are coming into the industry - it is growing."**

Occupational composition of the two sectors

Renewable energy is dominated by construction and installation trades. Its five largest green occupations are construction and building trades, plumbers and heating and ventilating installers, carpenters and joiners, electricians and electrical fitters, and production managers and directors in construction. Four of those five sit in the low exposure category, and eight of the ten largest occupations in the sector combine lower potential for AI substitution with established apprenticeship pathways.

Low-carbon transport has a more varied occupational structure, reflecting its stronger manufacturing and logistics base. Its largest estimated occupations include production managers and directors in manufacturing, metalworking production and maintenance fitters, warehouse operatives, engineering professionals, carpenters and joiners, and electricians and electrical fitters. Eight of its ten largest occupations fall outside the high-exposure, low-complementarity category, and six combine lower substitution potential with an established apprenticeship pathway. This is a lower count than in renewable energy, reflecting the greater presence of managerial, analytical and professional functions within vehicle and battery manufacturing.

Table 4: Ten largest estimated occupations in renewable energy and low-carbon transport

Rank	Renewable energy occupation	Low-carbon transport occupation
1	Construction and building trades n.e.c.	Production managers and directors in manufacturing
2	Plumbers, heating and ventilating installers	Metal working production and maintenance fitters
3	Carpenters and joiners	Warehouse operatives
4	Electricians and electrical fitters	Marketing, sales and advertising directors
5	Production managers and directors, construction	Engineering professionals n.e.c.
6	Production managers and directors in manufacturing	Carpenters and joiners
7	Management consultants and business analysts	Electricians and electrical fitters
8	Painters and decorators	Chartered and certified accountants
9	Marketing, sales and advertising directors	Management consultants and business analysts
10	Construction project managers and related professionals	Mechanical engineers

Source: CBI Economics (2026)

Some of these occupations are not obviously green in themselves, and their presence follows from how LCREE measures employment. Because the survey captures the share of a business's activity attributable to a low-carbon sector, every role supporting that activity is counted, not only those with visibly green technical content. An offshore wind developer requires accountants, marketing and sales staff and business analysts in the same way as any other capital-intensive business, and those roles are part of the workforce the sector depends on.

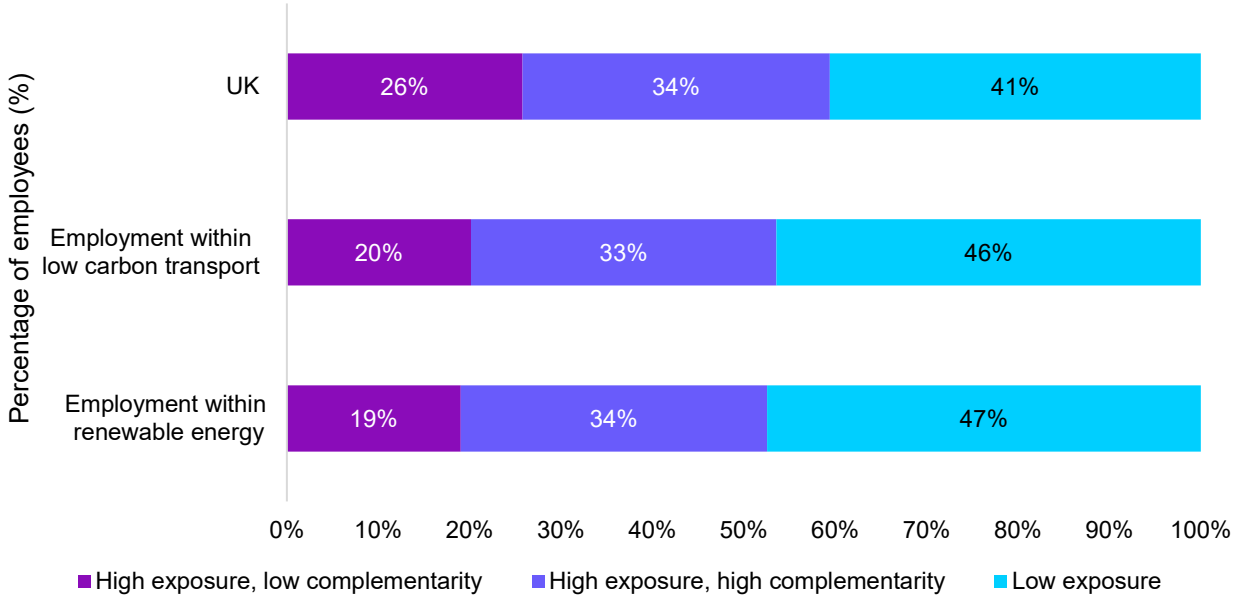
AI exposure across the two sectors

Applying the exposure and complementarity framework to the estimated occupational profiles produces a similar aggregate pattern in both sectors, with around four in five jobs in each in occupations with lower substitution potential. The clearest difference from the wider economy is in the category with the highest potential for AI substitution, which makes up 19% of renewable energy employment and 20% of low-carbon transport employment, against 26% across the UK. In both sectors this share is around a quarter lower than across the UK workforce. This is consistent with the pattern found across LCREE as a whole.

Both sectors are correspondingly more concentrated in low exposure occupations, where AI overlaps with a relatively small proportion of the abilities the work requires. Renewable energy is around 15% more concentrated in this category than the UK workforce, at 47% against 41%, and low-carbon transport around 12% more concentrated, at 46%.

The share of employment that is highly exposed but highly complementary is close to the UK-wide figure in both sectors, at 34% in renewable energy and 33% in low-carbon transport against 34% across the UK. Workers in this group are likely to interact extensively with AI, and the technology is expected to support their expertise rather than remove the need for their role. That both sectors sit at around the national average here means they stand to gain from AI-driven productivity improvements to a similar degree as the rest of the economy, while having materially lower substitution potential.

Figure 9: AI exposure and potential complementarity of renewable-energy and low-carbon transport employment compared with the UK labour market



Source: CBI Economics (2026)

Case study:

Alex Muir
Wind turbine technician, Coast Renewables, Dundee





> **I don't feel like any AI would be able to replicate the human problem solving and fixing involved on the job.**

Around four in five jobs in the renewable energy sector are in occupations with lower potential for AI substitution, and most of the largest renewable occupations have established vocational routes in. Alex Muir's experience shows how an entry-level qualification can open the door to this work.

Alex spent six years as a parts advisor in the motor trade before a move into fibre telecoms ended in redundancy. After six months out of work, he enrolled on an SVQ Level 2 in Performing Engineering Operations, focused on renewables, and was offered a job at the end of the course. **"It's hard to actually get that first step into it, but once your foot is in the door the opportunities are endless."**

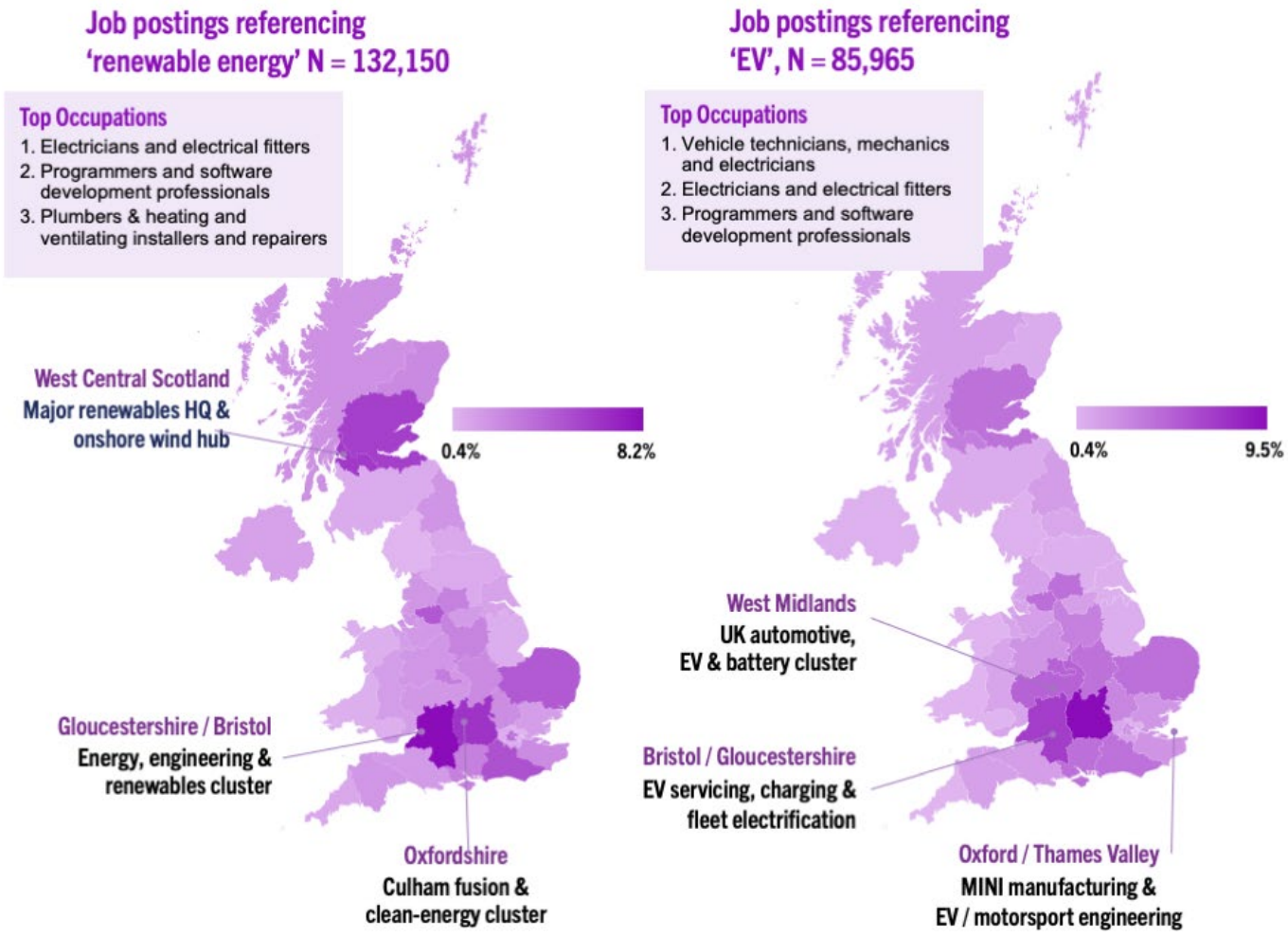
Six months into his role at Coast Renewables, Alex travels the country maintaining wind turbines, including exchanging the heavy hydraulic cylinders that adjust the position of the blades. **"It's very hands-on, lots of heavy lifting," he says.**

That practical, problem-solving side of the work shapes how he sees the future of the role: **"There is plenty of work out there. I don't feel like any AI would be able to replicate the human problem solving and fixing involved on the job."**

Where employers are recruiting

Figure 10 overleaf uses Adzuna Intelligence data to provide a complementary indication of where employers have been advertising roles in each sector. Between 2018 and 2024, approximately 132,000 job postings referenced renewable energy and 86,000 referenced electric vehicles.

Figure 10: Share of local job postings referencing 'renewable energy' and 'EV' by ITL2 area, 2018 to 2024



Source: Adzuna Intelligence, CBI Economics (2026)

Renewable-energy recruitment was most concentrated, relative to local activity, in Gloucestershire, Wiltshire and the Bath and Bristol area, in Berkshire, Buckinghamshire and Oxfordshire, and in West Central Scotland. Electric-vehicle recruitment was most concentrated in Berkshire, Buckinghamshire and Oxfordshire, in Gloucestershire, Wiltshire and the Bath and Bristol area, and in the West Midlands, the last of which reflects the concentration of vehicle manufacturing in the region.

Renewable-energy postings most often sought electrical trades, software-development professionals and several types of engineers, reflecting a workforce that depends on physical construction and maintenance as well as digital, analytical and engineering capability. Electric-vehicle postings most often sought electricians and electrical fitters, and vehicle technicians, mechanics and electricians. In both sectors these figures should be read as indicators of recruitment activity rather than estimates of employment. Job postings measure the flow of vacancies advertised over a period, not the stock of people employed at a point in time, and they may include repeated advertisements that do not align exactly with the ONS definitions.

Postings are also recorded at the location given in the advert, which is often a head office or regional base rather than the site where the work is carried out. The map is therefore likely to understate recruitment linked to activity in some areas, which may explain why parts of the country with significant offshore wind activity, such as the North East, do not appear as hotspots for renewable energy.



Conclusion

The UK labour market is being reshaped by two transitions whose implications have largely been considered separately. This report brings them together by asking whether the occupations supported by the net zero transition, and those it is expected to need more of, also have lower potential for AI substitution. Across every strand of the analysis, the evidence suggests that they do.

The pattern holds across very different measures of green employment. Around 96% of green apprenticeship participation among 16- to 24-year-olds is in occupations with lower substitution potential. The same is true of more than four in five jobs in the current green workforce, on both the LCREE and EGSS measures, and of 94% of the additional clean energy workers needed by 2030.

The explanation lies in the nature of green work. Electricians, plumbers, vehicle technicians, carpenters and landscape operatives make up a large share of green employment, and their work is largely physical and site-based, making it less likely to be substituted by AI. Importantly, this is a comparative finding rather than a prediction. AI has the potential to change the tasks and skills involved in most roles, green jobs included, and the analysis does not forecast employment gains or losses. What it shows, however, is that the occupations supporting green activity are better positioned than the wider economy for the impact of AI.

This means the AI and net zero transitions can reinforce each other rather than pull in opposite directions. Clean energy employment alone is projected to almost double by 2030, and much of that demand falls in occupations where AI is more likely to change how the work is done than to remove the need for workers. As AI adoption accelerates, green employment could become an increasingly important source of work, provided that the expected demand materialises.

The more immediate challenge therefore is ensuring enough people can take up these opportunities. Many of the training routes the transition needs already exist, and green apprenticeships account for around a third of all apprenticeship participation among young people. Access at the entry level is narrower. Green standards make up only around one in five Level 2 apprenticeships, the main starting point for young people with few qualifications, at a time when more than one million 16- to 24-year-olds are not in education, employment or training.

Realising the potential identified in this report will therefore depend on widening access to these routes, helping existing workers update their skills as both AI and green technologies develop, and ensuring that training keeps pace with changing employer needs. The intersection of the two transitions is ultimately less a question of which jobs AI will affect than of whether the UK has the workforce and skills systems to meet growing demand. That is where skills and industrial policy are likely to matter most.

POWERED BY

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