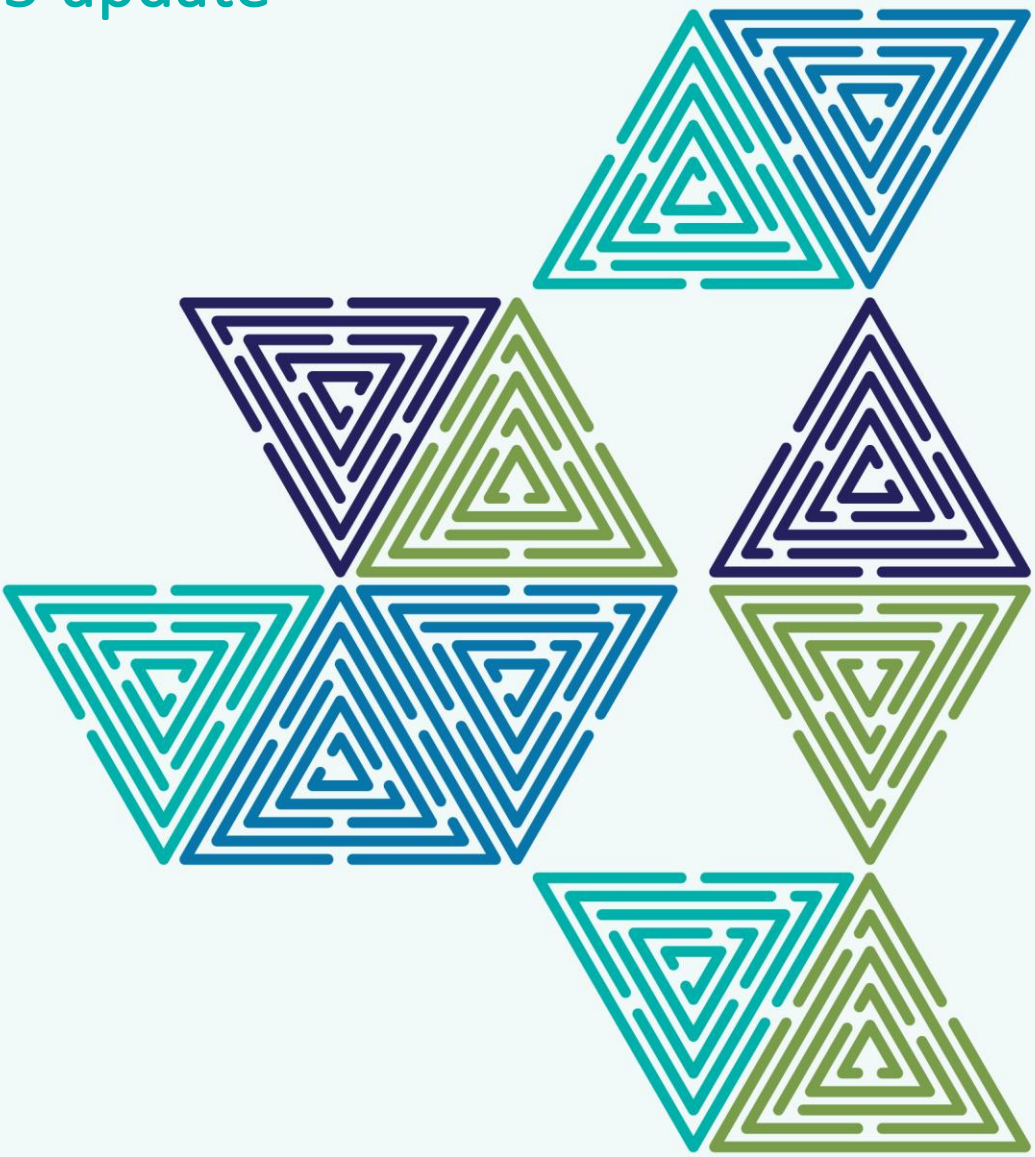
NET ZERO WORKFORCE

An analysis of existing research

April 2025 update



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Content

Executive summary

Introduction

Much of the decarbonisation required across the UK economy to achieve 'Net Zero' emissions, including in electricity generation, transportation and industry, will depend on new, innovative engineering and technology solutions as well as the expansion of existing low-carbon solutions. This will, in turn, require a workforce with the necessary skills – principally engineers, technicians and scientists – to deliver these solutions. Whilst much of the workforce that will deliver this transformation are already in employment, many are now coming through the education system.

The Government's recent 'Clean Power 2030 Action Plan' (Dec 2024) included rapid scaling up of renewable electricity infrastructure; this has yet to be reflected in the jobs forecasts presented here.

Purpose

The report attempts to summarise recent (2019 to 2025) published research on the jobs and skills that will be required in the UK to meet the challenge of Net Zero emissions and presents recommendations for addressing some of the issues found when reviewing and comparing the existing research.

Whilst this report does not attempt to sum the jobs forecasts across all sectors (owing to inconsistencies in the source data), the Climate Change Committee has attempted to do this. It estimated that "Between 135,000 and 725,000 net new jobs could be created by 2030 in low-carbon sectors, such as buildings retrofit, renewable energy generation and the manufacture of electric vehicles" (May 2023).

Findings

The research covered 20 reports, most of which were published between 2022 and 2024. All reports represent original research and analysis for a specific economic sector.

Reports tended to take different approaches to developing their jobs forecasts and there is a need for a consistent, standardised approach. It is therefore difficult to provide an overall picture of the jobs needed due to the disparities in the way figures were derived, and figures may not be comparable from sector to sector nor accumulative. Some of these inconsistencies are discussed below.

When reviewing the reports, the following issues were identified.

- New vs Replacement jobs: Jobs forecasts sometimes neglected to state the proportion of future jobs that represented new jobs (that is, due to expansion of the market) and how many represented jobs that needed to be filled due to anticipated retirements.
- Technical jobs: Jobs forecasts did not always distinguish between those requiring engineering and technical skills (meaning those that would be classified as engineering occupations) and those that would arise within the engineering industry but did not require such skills, such as procurement or HR.
- Back-casting: To make sure that future engineering and technology jobs can be filled, it is important to 'back-cast' to estimate the implications for engineering and technology apprenticeships and graduates, as well as A level and T Level students. However, only one

report mentioned STEM uptake in schools.

- SICs and SOCs: The ONS uses Standard Industrial Classification (SIC) and Standard Occupational Classification (SOC) codes to classify jobs. One key limitation is that these are created by coding jobs and industries retrospectively, which means that they may not reflect the latest job types or industry types, or those expected in the future.
- Timescales: All reports used different timescales to forecast jobs.

Some reports identified opportunities for re-training within their sector to balance areas of declining and increasing jobs demands, such as domestic gas boiler installation to heat pump installation, internal combustion engine manufacture to electric motor manufacture, oil and gas to offshore wind or CCS and coal power to nuclear power. However, opportunities for movement between different sectors were rarely highlighted.

It is clear from the review that there is a strong demand for engineering skills. For some industries, this comes on top of expected disruptions due to an ageing workforce retiring from the sector. Other sectors face steep re-skilling and recruitment forecasts due in large part to the UK decarbonisation target, for example the energy sector and buildings retrofit.

Failure to meet the skills demands associated with decarbonising the UK risks increased costs, as competing projects chase the same in-demand skills, or delay to delivery.

Recommendations

To address the issues identified above, and to enable government to deliver on its carbon reduction targets, we recommend that government:

- review the SIC and SOC codes more frequently so as to develop up to date and future-looking skills taxonomies
- ensure that Skills England, working with the devolved administrations and the Migration Advisory Committee, Department for Work and Pensions, the Industrial Strategy Council, the Department for Energy Security and Net Zero and the Office of Clean Energy Jobs, becomes the hub guiding government on Net Zero workforce issues. This body should provide:
    - annual statistics on:
        - numbers currently employed in the UK, including each sector that is critical to achieving Net Zero
        - workforce demand forecasts in each sector, distinguishing between 'new/expansion' and 'retirement/replacement' jobs
        - the occupations associated with these jobs, so that skills specialisms can be clearly identified.

      ensuring it applies a holistic 'systems approach' that recognises the interdependencies between different industries
    - forecast data in a format that allows industries wishing to undertake more granular sector-level analysis to do so
    - annual 'back-casting' to identify the number of students required to enter an engineering and technology pathway including STEM subject A levels, T Levels, apprenticeships or BTECs
    - insights into the needs for reskilling and upskilling across different sectors of the UK

economy
    - early warnings to government on anticipated skills shortages, together with policy recommendations as to how such shortages might be addressed.
- use this information to develop a STEM education and skills strategy that will ensure the UK has the pipeline of skilled young people to meet future workforce needs.

Introduction

In July 2019, the UK parliament passed legislation committing the country to become a 'Net Zero' economy by 2050. This pledge built upon an earlier commitment to reduce the UK's greenhouse gas emissions by at least 80% in 2050, compared to 1990 levels. Scotland has a Net Zero emissions target year of 2045.

In December 2024, the new government published its 'Clean Power 2030 Action Plan' in which it sets out[1] its ambition for:

- x3 increase in offshore wind
- x2 increase in onshore wind
- x3 increase in solar
- a slight reduction in civil nuclear
- x5 increase in batteries

However, this action plan has yet to be fully reflected in the jobs forecasts presented here. Electricity supply will need to expand beyond 2030 as the economy – particularly road transport and the heating of buildings – continues to move away from fossil fuels to renewable energy.

In February 2025, the UK's Climate Change Committee published its advice to Government on the seventh carbon budget[2], which covers the five-year period 2038/2042. The emissions for this period average 107 $MtCO_2e$ p.a. which compares with ~390 $MtCO_2e$ p.a. in the current budgetary period (2023/27), ie emissions will need to fall by a staggering ~72% over the next 15 years.

Much of the decarbonisation required across the economy, including energy and power, transportation and industry, will depend on new, innovative engineering solutions (such as hydrogen networks and low-carbon air travel) as well as the expansion and optimisation of existing low-carbon engineering solutions (such as wind power). This will, in turn, require a workforce with the necessary knowledge and skills to deliver these solutions, which will be predominantly in engineering, technology and science.

Whilst much of the workforce that will deliver this transformation during 2025 to 2050 are already in employment, many will require retraining or are now coming through the education system. Those 11-year-olds in the education system today will be 36 years old in 2050.

A short glossary can be found in Appendix A.

Purpose of this report

The purpose of this report is to provide the reader with a better understanding of the future demand for engineering and technical jobs in the UK as it responds to the 'climate emergency' (as declared by numerous developed jurisdictions and local authorities). The report attempts to summarise recent (2019/2025) published research on the 'green jobs' and engineering skills that will be required in the UK to meet this challenge and presents recommendations for addressing some of the issues found when reviewing and comparing the existing research.

[1] 'Clean Power 2030 Action Plan: A new era of clean electricity' (UK Government, Dec 2024) Table 1

[2] 'The Seventh Carbon Budget: Advice for the UK Government' (Climate Change Committee, Feb 2025)

The forecast jobs are broken down by the sectors defined by the UK Climate Change Committee, an independent, statutory body established under the Climate Change Act 2008 which advises the UK and devolved governments on emissions targets and to report to Parliament on progress made in reducing greenhouse gas emissions). These sectors are shown in Table *1*.

Table 1: Mapping of Net Zero sectors

Climate Change Committee sector	This report category (see Table 2)
Surface transport (road & rail)	Transportation
Aviation	Transportation
Shipping	Transportation
Electricity supply	Energy & power
Fuel supply	Energy & power
Buildings	Buildings
Industry	Industry
Agriculture	Other
Waste	Other
Land use	Other
F-gases	Not covered

Whilst this report does not attempt to sum the jobs forecasts across all sectors (owing to inconsistencies in the source data), the Climate Change Committee has attempted to do this[3]. It estimated that "**Between 135,000 and 725,000 net new jobs could be created by 2030 in low-carbon sectors, such as buildings retrofit, renewable energy generation and the manufacture of electric vehicles**" (p9).

Note that this Climate Change Committee estimate is of new jobs and **does not appear to include the need to replace people** as they retire from the workforce.

[3] 'A New Zero workforce' (Climate Change Committee, May 2023)

Findings

The research for this paper covered 20 reports, most of which were published between 2022 and 2024. All reports represent original research and analysis for a specific economic sector.

Table *2* summarises the job numbers found for each major sector of the economy which has a significant part to play in the Net Zero challenge; each main section of Table 2 represents a sector of the UK economy that align approximately with those used by the Climate Change Committee. Note that not all jobs are necessarily engineering and technical jobs, an issue discussed in section 3.3. Source documents (including their reference numbers) are listed in Appendix B, Table 3, together with a more in-depth summary of their findings.

Table 2: Main findings

			Source document	
			Ref.	Date
TRANSPORTATION				
Electric vehicles and batteries[4]		**Number**: 90,000 new jobs by 2040 (from 180,000 today to 270,000); growth all in 'gigafactory' and 'battery supply chain' jobs **Location**: Midlands, northwest and northeast England **Skills**: Batteries: 50% Production Staff (Qualification Level L2), 30% Maintenance & Engineering (Qual Levels L3, L6 and L7)	1	Sep 2024
Rail		**Number**: nearly 12,000 people needed by 2028 **Location**: Midlands, Yorks & Humber, nationwide **Skills**: Electrification, Signalling & Telecoms	2	2023
Public transport & active travel		No jobs forecasts found. ('The Ten Point Plan for a Green Industrial Revolution', HM Government, Nov 2020, did include "up to 3,000 jobs by 2025" under 'Green Public Transport, Cycling and Walking')		
Aviation		**Number**: 10,350 jobs in sustainable aviation fuel in 2030 (800 of which direct, 600 construction, 8,950 upstream); ~37,000 jobs in 2040; 60,000 in 2050 **Location**: No data; "upstream jobs" include, for example, agricultural or waste management jobs **Skills**: No data	3	Apr 2023
Shipping		No jobs forecasts found. ('Maritime 2050' (HM Government, 2019) foresees 'new, highly skilled jobs' but does not quantify this forecast)		
ENERGY & POWER				
Energy (all)		**Number**: 260,000 new jobs and 140,000 replacement = 400,000 new people by 2050 159,800 new jobs + 62,400 retirees = 222,200 new people by 2030	4 5	Jan 2020 Sep 2024

[4] N.B. This does not include jobs associated with the EV charging infrastructure

			Source document	
			Ref.	Date
		Location: Across the UK, though 25% in north of England **Skills**: Skilled scientists and engineers in designing: data, new tech (CCUS, H_2), renewables, grid infrastructure. Skilled technicians in installation and maintenance of clean energy. More than half will initially be working at RQF level 3 or below		
EV charging points		**Number**: 1,500 – 4,900 jobs through to 2030 **Location**: Nationwide **Skills**: Fully qualified electricians	6	Sep 2022
Wind power		Scope: Offshore **Number**: 104,400 jobs by 2030 (56,000 direct, 48,000 indirect), an increase from today's 32,250 **Location**: 30% Scotland and 27% north east coast of England **Skills**: Over 60% of roles in the sector require STEM skills Scope: Onshore **Number**: 27,000 jobs by 2030; 31,000 jobs by 2035 **Location**: 60% in Scotland	7 8	Jun 2023 Oct 2021
Solar PV		**Number**: 26,250 new jobs by 2035 (in addition to ~6,750 currently employed) **Location**: '…spread across the whole UK…' **Skills**: Various	9	Mar 2022
Wave & tidal		No forecasts found (However, the 'British energy security strategy' HM Government, 2022, commits to '…aggressively explore… opportunities afforded by… tidal…')		
Hydropower		**Number**: No new jobs, 400 replacement jobs **Location**: Scotland and Wales **Skills**: No data	10	Sep 2024
Civil nuclear		No current forecasts found (Published jobs forecasts are based on the previous government's ambition of "24GW of nuclear power by 2050" from around 6GW today. However, the current government's 'Clean Power 2030 Action Plan' anticipates a reduction in civil nuclear capacity to around 4GW.)	11	2023
Hydrogen	H_2	**Number**: 28,000 new direct jobs plus 63,000 new indirect jobs by 2030; (from less than 1,600 currently). **Location**: No data **Skills**: No data	12	Feb 2025
Biomass & bioenergy		**Number**: 15,000 domestic market, 11,000 export market (2050) **Location**: No data **Skills**: Mainly 'O&M services' and 'New energy feedstocks'	13	Oct 2019

			Source document	
			Ref.	Date
BUILDINGS				
Retrofit		**Number**: 250,000 new workers 2029-45 (350,000 peak in 2028) **Location**: Nationwide **Skills**: • **Plumbers & HVAC**: 59,000 primarily in heat pump installation by 2028 • **Projects managers**: 86,000 including Retrofit Coordinators • **Building envelope specialists**: 27,000 in 2028, including insulation installers	14	Mar 2021
INDUSTRY				
Industrial decarbonisation		Scope: Chemical, cement, iron & steel, food & drink, minerals, oil & gas, paper & printing, major & minor power producers **Number:** 353,000 new jobs by 2050 **Location**: 60% nationwide and 40% in 7 industrial clusters (esp. Humber, Grangemouth, N. West and Teesside) **Skills**: 87% Construction; 72% technical 28% professional	15	Nov 2022
CCUS (Carbon Capture, Usage & Storage)		**Number**: 70,000 new jobs between now and 2035 **Location**: Mainly coastal clusters **Skills**: pre-construction, construction, operation: professionals & technical	16	Jul 2023
Energy-efficient products		**Number**: No significant increase **Location**: No data **Skills**: Highly skilled NVQ level 4+ in software engineering	17	Jun 2020
OTHER				
Agriculture		No forecasts found (Reductions in emissions from the agriculture sector are largely associated with changes to feedstock in order to suppress methane production in livestock, so jobs growth may be limited.)		
Waste and recycling		Scope: waste treatment and disposal, incl. energy from waste and landfills **Number**: 14,800 new people by 2030 (5,500 new jobs + 9,300 retirements). 54,400 employed in 2024. **Location**: Closely aligned with centres of population **Skills**: Machine drivers & operatives; admin and service occupations	18	Sep 2024
Land use / nature-based		**Number**: (approx. 23,000 employed in 2022) • Tree planting: 7,000 to 37,000 new jobs by 2030 • Peatland restoration and hedgerow planting: "a small number" **Location**: Nationwide **Skills**: See above	19 20	Feb 2025 Mar 2024

A further finding was that 'nature-based' jobs were estimated to represent less than 3.6% of all 'green jobs' in the UK in 2022 (see Source Report 20), and around 5% of projected NetZero jobs in 2030[5].

NB the jobs forecasts for the wind and solar sectors have not been updated since the publication of the government's 'Clean Power 2030 Action Plan' in December 2024.

As the findings below indicate, the reviewed reports tended to take different approaches to developing their jobs forecasts and there is a need for a consistent, standardised approach. It is therefore difficult to provide an overall picture of the jobs needs due to the disparities in the way figures were derived, and figures may not be comparable from sector to sector nor accumulative. Some of these inconsistencies are discussed below.

New jobs vs Replacement jobs

Reports did not always distinguish between jobs created due to expansion demand and those due to people leaving the labour market (for example, due to retirement). Reports that did this well include those from Energy & Utility Skills. Their reports adopted the definition of:

New people required = New jobs + Forecast retirements

This approach works well when all forecast retirements need to be replaced with new people; this may not always be the case (such as in sunset industries).

Some reports identified opportunities for re-training within their sector to balance areas of declining and increasing jobs demands, such as domestic gas boiler installation to heat pump installation, internal combustion engine manufacture to electric motor manufacture, oil and gas to offshore wind or CCS and coal power to nuclear power[6]. However, opportunities for movement between different sectors were rarely highlighted.

Engineering jobs vs All jobs

Many reports refer to jobs in the round, perhaps distinguishing between 'unskilled', 'skilled' and 'professional' but did not always identify the number of jobs that require engineering and technical skills.

There appears to be no UK-level estimate of the number of engineers and technicians required to support the UK's Net Zero transition, and therefore no breakdown of the engineering specialisms needed, for example the number of electrical, chemical or mechanical engineering graduates and higher-level apprentices.

Back-casting from forecasts

Extrapolating backwards from jobs forecasts, there is no UK-level assessment of the required number of A level and T Level students and apprentices in STEM subjects each year that are needed to satisfy

[5] midpoint of tree planting jobs (7,000 to 37,000) is 22,000; midpoint of all Net Zero jobs (235,000 to 725,000) is 430,000; 22,000/430,000 = 5%

[6] In particular, 'North Sea Transition Deal' (DBEIS/OGUK, March 2021) and 'UK Offshore Energy Workforce Transferability Review' (Robert Gordon University, May 2021) provide analysis within the energy sector.

the future engineering and technical jobs needs. Only one report considered the number of students currently taking STEM-related A levels.

SICs and SOCs

One key limitation to using existing data frameworks such as Standard Industrial Classification (SIC) and Standard Occupational Classification (SOC) codes is that these are created by coding jobs and industries retrospectively, which means that they may not reflect the latest (or future) jobs.

Although SOC codes have typically been revised every 10 years (SOC90, SOC2000, SOC2010, 2020) and SIC codes have been revised 7 times since they were first introduced in 1948, it is highly likely that these will need to be updated more frequently than once a decade if we are to capture emerging industry segments and new occupations in a rapidly evolving economy, such as 'EV charging point installer'.

Other issues

It should be noted that the job forecasts often utilise different time periods and methodologies. Consequently, it is difficult to obtain an overarching picture of the demand of green jobs. Moreover, because these forecasts have been estimated in isolation from each other, there is a risk that they do not take into account the considerable interdependencies between sectors to achieve Net Zero. Many of these sectors are inextricably linked. As we increase investment in renewable energy technologies, for example, we need to also consider the investment (and skills) required to enable the nation's grid infrastructure to distribute this energy.

Early warnings

It is clear from the review that there is a strong demand for engineering skills. For some industries, this comes on top of expected disruptions due to an ageing workforce retiring from the sector. Other sectors face steep re-skilling and recruitment forecasts due in large part to the UK decarbonisation target, for example:

- the energy sector will need to fill 400,000 roles by 2050, 260,000 of which will be new roles (equating to 65% and 10,000 each year)[7]
- in the buildings sector, retrofitting will require the training of 45,000 technicians each year at its peak in 5 to 10 years' time (30,000 each year in fabric improvement and 15,000 each year in heat pump installation)[8]

Failure to meet the skills demands associated with decarbonising the UK risks increased costs, as competing projects chase the same in-demand skills, or delay to delivery.

[7] 'Building the Net Zero Energy Workforce' (National Grid, 2020)
[8] 'Building Skills for Net Zero' (CITB, 2021

Recommendations

To address the issues identified above, and to enable government to deliver on its carbon reduction targets, we recommend that government:

- review the SIC and SOC codes more frequently so as to develop up to date and future-looking skills taxonomies
- ensure that Skills England, working with the devolved administrations and the Migration Advisory Committee, Department for Work and Pensions, the Industrial Strategy Council, the Department for Energy Security and Net Zero and the Office of Clean Energy Jobs, becomes the hub guiding government on Net Zero workforce issues. This body should provide:
    - annual statistics on:
        - numbers currently employed in the UK, including each sector that is critical to achieving Net Zero
        - workforce demand forecasts in each sector, distinguishing between 'new/expansion' and 'retirement/replacement' jobs
        - the occupations associated with these jobs, so that skills specialisms can be clearly identified.

      ensuring it applies a holistic 'systems approach' that recognises the interdependencies between different industries
    - forecast data in a format that allows industries wishing to undertake more granular sector-level analysis to do so
    - annual 'back-casting' to identify the number of students required to enter an engineering and technology pathway including STEM subject A levels, T Levels, apprenticeships or BTECs
    - insights into the needs for reskilling and upskilling across different sectors of the UK economy
    - early warnings to government on anticipated skills shortages, together with policy recommendations as to how such shortages might be addressed.
- use this information to develop a STEM education and skills strategy that will ensure the UK has the pipeline of skilled young people to meet future workforce needs.

Appendix A – Glossary

CCC	Climate Change Committee
CCS	Carbon Capture & Storage
CCUS	Carbon Capture Usage & Storage
LCREE	Low Carbon and Renewable Energy Economy
NUTS	Nomenclature of Territorial Units for Statistics
O&M	Operations & Maintenance
ONS	Office of National Statistics
PEI	Professional Engineering Institutes
RQF	Regulated Qualifications Framework
SIC	Standard Industrial Classification
SOC	Standard Occupational Classification

Appendix B – Source documents and research

This appendix summarises the key findings from each of the source reports. It has avoided more general assessments of the engineering skills shortage (such as 'The Farmer Review of the UK Construction Labour Model: Modernise or Die' (2016)) or those focussing on a particular geographical area (for example 'Climate Emergency: Skills Action Plan 2020-2025' which deals with Scotland only). The reports considered are listed in Table *3*.

Table 3: Reports referenced

Ref. No.	Title	Publisher	Date of publication
1.	UK electric vehicle and battery production potential to 2040	The Faraday Institution	Sep 2024
2.	Navigating the Skills Shortage: Annual Rail Workforce Survey 2023	NSAR (National Skills Academy for Rail)	2023
3.	Roadmap for the development of the UK SAF industry	UK Sustainable Aviation	Apr 2023
4.	Building the net zero energy workforce	National Grid	Jan 2020
5.	Workforce demand estimates – 2024 to 2030: The energy and utilities sector	Energy & Utility Skills	Sep 2024
6.	Electric Vehicle Charging: Labour Market Information Study	TESP (The Electrotechnical Skills Partnership)	Sep 2022
7.	Offshore wind skills intelligence report	Offshore Wind Industry Council	Jun 2023
8.	The onshore wind industry prospectus	RenewableUK	Oct 2021
9.	Solar's role in addressing the energy crisis	Solar Energy UK	Mar 2022
10.	Workforce demand estimates – 2024 to 2030: The Power industry	Energy & Utility Skills	Sep 2024
11.	A scenario-based approach to nuclear workforce planning	NSSG (Nuclear Skills Strategy Group)	2023
12.	EMPOWERING THE FUTURE: A Strategic Skills Plan for the UK Hydrogen Economy	Hydrogen Skills Alliance	Feb 2025
13.	Energy Innovation Needs Assessment: Biomass & bioenergy	Dept. for Business, Energy & Industrial Strategy	Oct 2019

14.	Building Skills for Net Zero	CITB (Construction Industry Training Board)	Mar 2021
15.	Enabling Skills for the Industrial Decarbonisation Supply Chain	IDRIC (UK Industrial Decarbonisation Research and Innovation Centre)	Nov 2022
16.	CCSA Workforce & Skills Position Paper	CCSA (Carbon Capture and Storage Association)	Jul 2023
17.	Local green jobs – accelerating a sustainable economic recovery	LGA (Local Government Association)	Jun 2020
18.	Workforce demand estimates – 2024 to 2030: The Waste & Recycling industry	Energy & Utility Skills	Sep 2024
19.	The Seventh Carbon Budget: Advice for the Government	Climate Change Committee	Feb 2025
20.	Experimental estimates of green jobs, UK: 2024	Office for National Statistics	Mar 2024

1. Automotive: 'UK electric vehicle and battery production potential to 2040' (The Faraday Institution, September 2024)

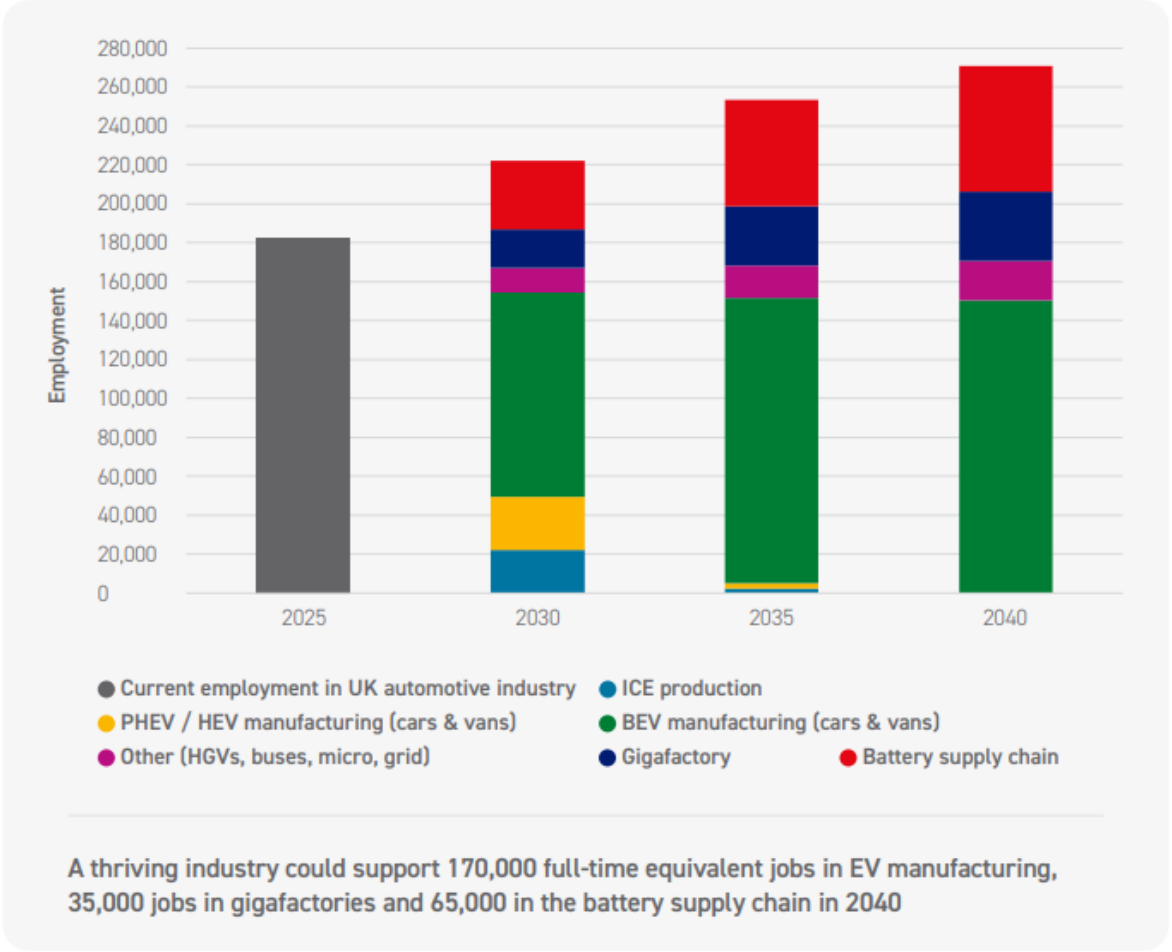
This report predicts that "Implementation of the [re-skilling / up-skilling] strategy will require coordinated support from central government, local government, training providers and industry alongside a well-sequenced STEM curriculum in schools to feed the demand for a future workforce. A skilled workforce will be a significant advantage over European competitors …" (p2).

It forecast that "Employment supported in this new EV and battery industry would increase to 270,000 jobs by 2040…" which represents a 50% (90,000) increase from the current 180,000 jobs. The 2040 figure is broken down as:

- Car and light commercial vehicle EV production: 145,000 jobs
- HGVs, buses etc. manufacture: 25,000 jobs
- Battery manufacturing (new jobs): 35,000 jobs
- Battery supply chain: 65,000 jobs

The following figures shows that all growth is anticipated in 'gigafactory' and 'battery supply chain' jobs:

Figure 6: Potential employment in the UK automotive and battery industry to 2040



The following skills levels are anticipated (in gigafactories, ie battery manufacture):

Table 1: Job types and skills required for a typical gigafactory

Division	Job Type	Examples of job activities	Qualification level
Production Staff (50%)	Material Handling	Mixing electrochemically active materials, additives and binders to produce electrode material	L2
	Machine Loading	Slitting electrode into smaller pieces for welding	L2
	Machine Unloading	Drying and stacking	L2
	Module Assembly	Tab and laminate	L2
	Pack Assembly	Injections of electrolyte	L2
	Logistics	Formation and charging, modular and pack assembly, inspection	L2/3
Maintenance and Engineering (30%)	Technicians	Service, maintenance and repair of process equipment	L3
	Senior Engineers	Lead engineers and department heads	L7
	Pro-cess/Production Engineers	Problem solving, tool and die, new product introduction, process improvement	L6
	Facility Engineers	Facility management, utilities, building, fire etc	L6
Quality (10%)	Engineers	Process controls, confirmation of part/supply specification, per-formance evaluation, defect analysis	L6
	Practitioners	Process controls, confirmation of part/supply specification. Per-formance evaluation, defect analysis	L4
Other (9%)	IT	Process controls, confirmation of part/supply specification. Per-formance evaluation, defect analysis	L6
	Data Management	Process controls, confirmation of part/supply specification. Per-formance evaluation, defect analysis	L6
Management (1%)	Process Leadership	Achievement of KPIs, conformance to legislation etc	L4
	Engineering Man-agement	Senior management of engineering processes across the organi-sation, innovation, compliance, budget etc	L7

How were the figures developed?

No methodology is offered.

2. 'Navigating the Skills Shortage: Annual Rail Workforce Survey 2023' (NSAR)

The focus of this report is on the aging workforce, with "…a third of our workforce aged 50 years old or over" (p4). Pinch points are expected in:

- Electrification & Plant: Engineers, Operatives, Technicians (in 2026/30)
- Signalling & Telecoms: Engineers, Technicians, Operatives, Technicians (in 2024/30)

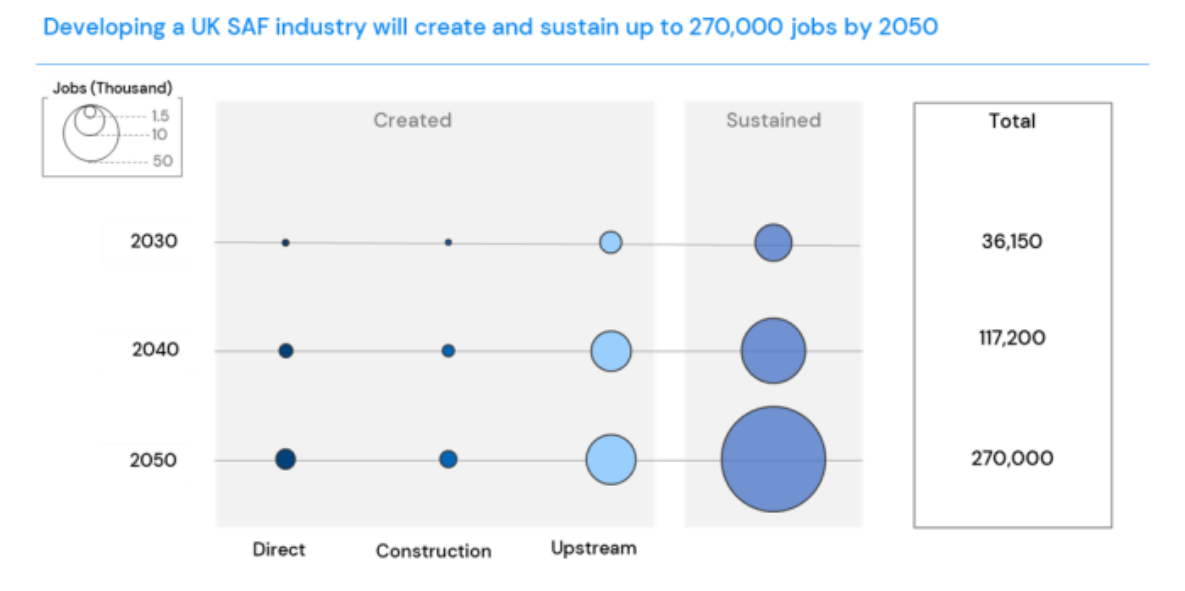
"As the number of expected retirees and the levels of additional demand increase, nearly 12,000 people will be needed by 2028" (p10). The report also highlights that 16% of the workforce are women (p15), and reflects the Government's cancellation of HS2 Phase 2.

How were the figures developed?

Each year railway organisations across the industry contribute by submitting their workforce data to NSAR, which is completely anonymised and GDPR compliant to enable NSAR to analyse over 240,000 employee records.

3. ‘Roadmap for the development of the UK SAF industry’ (UK Sustainable Aviation, April 2023)

The report states that “Building a SAF industry has significant potential to create jobs and economic growth. Production of 0.6 MT SAF in 2030 could create 10,350 jobs, including operators, construction, and upstream. By 2050, this could increase to 60,000 jobs in the UK. By decarbonising aviation, a SAF industry could sustain a further 210,000 aviation jobs in a carbon-constrained economy” (p2). It also claims additional jobs would be “…sustained/safeguarded across the aviation industry (calculated as the percentage of the industry employment decarbonised by SAF in that year)…” but these are not included in our summary. The following figure is presented (p63):



“The feedstocks assessed include agricultural, woody, and municipal wastes, advanced feedstocks such as algae, and renewable electricity” (p2).

How were the figures developed?

“Job creation from UK SAF production has been estimated through to 2050. As an initial top-down analysis of job creation from a UK SAF industry, a number of facilities which have publicly announced values for job creation were assessed. The published values were scaled to 1 MT equivalent as facilities are often small… A bottom-up analysis was also done by calculating the number of jobs that could be created per facility, based on facility size and production pathway” (p70).

4. ‘Building the net zero energy workforce’ (National Grid, 2020)

This report states that “…the UK’s energy sector needs… to fill 400,000 roles in the net zero energy workforce. Of this, 260,000 will be in new roles, while 140,000 will be replacing those who have left the workforce. The 400,000 breaks down as:

- 117,000 between 2020 to 2030
- 152,000 between 2031 to 2040

- 131,000 between 2041 to 2050”

“…One fifth [20%] of people currently working in the energy sector are set to retire by 2030 as the ‘baby boomer’ generation reaches pensionable age.”

“…UK adults cited lack of relevant qualifications as the biggest barrier to getting a job tackling climate change.”

“Although more young people are choosing to study STEM subjects, building a net zero energy workforce will require a significant increase.”

“STEM uptake in schools: Britain still needs to increase the number of students studying STEM A levels over the next decade. In 2019, 37,000 students took physics A level and 91,000 completed maths A level. Research… found that we need to increase the number of A level candidates for physics by 24% and maths by 19% to maintain the pipeline of qualified talent Britain needs.” Also, “…only 22% of 37,000 A level physics students…” were girls.

“Apprenticeships: Between 2016 and 2017 England’s apprenticeship starts in engineering and manufacturing technologies fell … from 75,000…” to 59,000 (a 21% decrease).” Also, ‘…only 8% of all STEM apprentices…’ were women.

“Degree qualifications: In 2017/18, around 42,000 undergraduates took engineering and technology courses... research estimates this number must grow by over 30% over the next 30 years, to 56,000 annual enrolments.” Also, only ‘…15% of engineering and technology undergraduates…’ were women.

A quarter of the 400,000 jobs are expected to be created in the north of England: 60,000 in the north west and 40,000 in the north east, due partly to the development of offshore wind.

The skills required are expected to be:

- Digital and data, including AI (artificial intelligence) and ‘big data’ which, for example, might be required to forecast power generation from renewables
- Designing and implementing new technologies, highly skilled scientists, engineers and designers will be needed to design and test new technologies such as effective carbon capture and hydrogen gas
- Scientists and engineers skilled in renewable energy, will be needed to install new wind farms and to build solar capacity
- Skilled technicians to install and maintain clean energy solutions, such as heat pumps in homes and a nationwide EV charging network.

How were the figures developed?

The study started by estimating the likely clean energy mix required to reach Net Zero, using the Climate Change Committee’s net zero 2050 report and National Grid Electricity Systems Operator’s Future Energy Scenarios report. By understanding the contribution of each form of energy each year over the period 2020 to 50, “…Development Economics then sought to ascertain the levels of employment required to build, operate, manage, maintain and decommission the network of increasingly clean energy generation, transmission and distribution infrastructure…” using ONS data as well as other sources.

5. 'Workforce demand estimates – 2024 to 2030' (Energy & Utility Skills, Sept 2024)

This report states that "The Net Zero imperative, rapid technological developments, environmental pressures and instability in international markets all point to changing demands on workforces and their skills" (p.1). The following table is presented:

	2024	2030	New jobs		New people
Gas Networks	23,500	39,300	15,800		19,600
Gas Utilisation	195,400	207,700	12,300		45,700
Power	158,600	290,300	131,700		156,900
Waste & Recycling	181,400	197,100	15,700		46,400
Water	83,200	113,200	30,000		43,700
	644,124	**849,630**	**205,500**		**312,300**

From which we can sum the following, for the energy sectors (gas and power):

	2024	2030	New jobs		New people
All energy	**377,500**	**537,300**	**159,800**		**222,200**
Proportion of E&U sector	59%	63%	78%		71%

E&U Skills use the following equation for calculating 'New people':

> New people = New jobs + Forecast retirements (p.1)

Which holds true if all forecast retirements need to be replaced with new people (which may not be the case in, for example, energy transition sectors such as oil and gas). This allows us to derive the number of forecast retirements in the energy sector as 62,400 (222,200 – 159,800).

Note that the majority of E&U new jobs (78%) and new people (71%) will be in the energy sector.

For the utilities sector as a whole, "…more than half… will initially be working at RQF level 3 [including A-level, T-level] or below…" (p2).

How were the figures developed?

No methodology is offered.

6. ‘Electric Vehicle Charging: Labour Market Information Study’ (The Electrotechnical Skills Partnership, Sept 202w)

This report is based on a government pledge “… to increase the number of EV public chargers to 300,000 by 2030” and covers both domestic and commercial charging points. However, is considers that “…the 300,000 public charge point aim should be treated as a minimum and potentially up to double this number may be required” (p20).

The report concludes that:

- “The total number of fully qualified electricians required for the domestic and commercial markets is a minimum of 1,495 working full time on EV installations every day of the year”
- “Working to current top end projections, …, the number of fully qualified electricians required for the domestic and commercial market is 5,484.”

How were the figures developed?

“The work involved a two-stage approach consisting of desk research, which formed the backbone of the report, supplemented with in-depth interviews which provided greater detail on the numbers of people working in a team of installers and how long each installation takes” (p20).

7. ‘Offshore Wind Skills Intelligence Report’ (Offshore Wind Industry Council, June 2023)

This report estimates that the offshore wind sector currently employed some 32,257 (of which 17,394 are ‘directly employed’). This is forecast to grow to 104,401 jobs (of which 56,296 will be ‘direct’) by 2030.

The current workforce is made up of around 21% women. Most jobs are located in Scotland (30%) with Humber employing 16%.

Jobs are spread across manly skills and specialities, with growth anticipated to be linear across these groups. The largest area of job roles is O&M (Operational & Maintenance) at 26%.

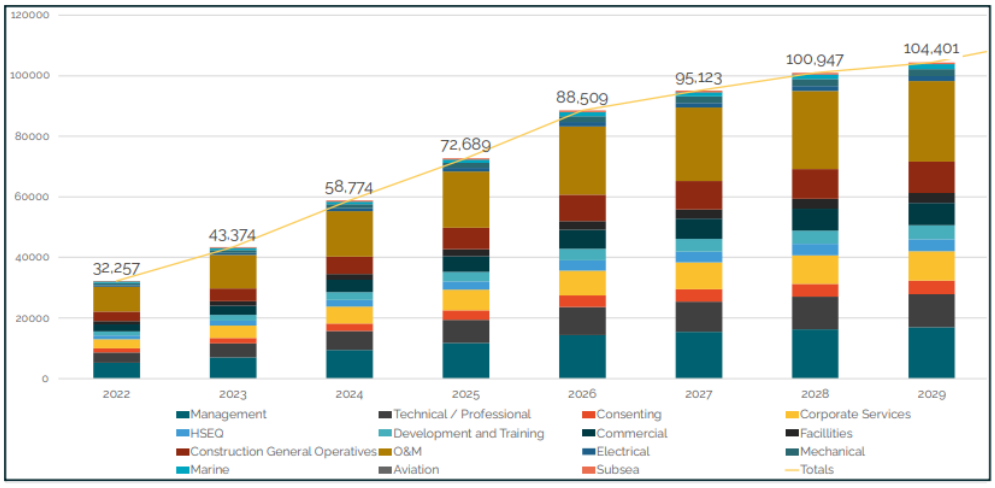


Figure 2 - Breakdown of number of UK offshore wind jobs by Job Role

"Of particular note is that over 60% of roles in the sector require STEM skills. This does not include management and leadership roles (including Project management), many of which will also need a STEM background. This demonstrates that the sector is very exposed to any reduction in the number of young people pursuing STEM area education in the future" (p38).

How were the figures developed?

A survey was used to capture current workforce data; this was then extrapolated in order to develop a model representing the total current workforce. RenewableUK's Project Intelligence Database, as well estimated future investment, were then used to estimate the future workforce requirements.

8. 'The onshore wind industry prospectus' (2021)

This report states that "To meet the challenge of net zero, we must scale-up the growth of renewables and the industry has set an ambition for 30GW of onshore wind by 2030". This will have the added benefit of creating "27,000 high quality jobs" in the UK, 17,000 of which (63%) would be in Scotland. These jobs would be "…across development, supply chain and operations activity… peaking at 36,000 in the 2020s".

Most (64%) of the skills needed from 2021 to 2030 would be in 'Wind farm OMS' (which we assume stands for operations management systems).

How were the figures developed?

No methodology is offered. Modelling was undertaken by BVGA Associates.

9. 'Solar's role in addressing the energy crisis' (Solar Energy UK, March 2022)

From a current installed capacity 16.6 GW of solar in the UK, the government is aiming for 47 GW by 2030 ('Clean Power Action Plan' p32), an increase of 30 GW.

The Solar Energy report estimated that "There are currently around 6,500 people employed in the UK solar industry, across a wide range of jobs…" (p6) associated with 14.6 GW of PV deployment.

Solar Energy estimated that "Deploying 40GW of solar could create 35,000 new jobs by 2030" (p6). Presumably then, deploying 30GW of solar could create 26,250 new jobs.

"The solar industry recruits for roles ranging from business development experts, data analysts, distribution and logistics specialists, electrical engineers, energy finance professionals, environmental planners and natural capital experts, maintenance advisors, product researchers and developers, scientific and technical staff, solar cleaning specialists, and system designers, planners, and installers" (p6).

"Because of the distributed nature of the industry, these jobs will be spread across the whole UK and not solely concentrated in any one region…" (p7).

How were the figures developed?

No methodology is offered, though the jobs forecast is "Based on analysis carried out for Solar Energy Scotland's forthcoming briefing, Solar Skills Scotland." (p6)

10.'Workforce demand estimates – 2024 to 2030: The Power Industry' (Energy & Utility Skills, Sept 2024)

This report forecasts no new jobs in the hydropower sector, though 400 new people will be required to replace retirements (Fig.2, p5).

11.'A scenario-based approach to nuclear workforce planning' (NSSG, 2023)

This report covers civil, defence, decommissioning and waste management. It is based on the previous government's ambition of 24GW of civil nuclear power, an increase from the existing capacity of around 6GW ('Civil Nuclear: Roadmap to 2050' Department for Energy Security and Net Zero, Jan. 2024, p6): "…plans continue for the development of up to 24 gigawatts of new power generation". The current government's 'Clean Power 2030 Action Plan' (Dec. 2024) reduces the anticipated civil nuclear capacity to 4GW (p32), which must undermine many of the projections for civil nuclear presented in the NSSG report.

Whilst the report highlights that ~9,000 of the STEM workforce are expected to reach retirement age during 2025-40 (Fig.15), this figure appears to cover both the civil and defence sectors. Fig.5 shows a 'Replacement' of ~10,000 FTE p.a. across the two sectors. However, if civil nuclear capacity is to fall (from ~6GW to ~4GW), presumably the replacement needs of the workforce will decline too.

How were the figures developed?

Figures were derived based on three scenarios for civil nuclear and three scenarios for nuclear defence, giving nine possibilities in total. From this, three scenarios were chosen to explore in more depth.

12.'EMPOWERING THE FUTURE: A Strategic Skills Plan for the UK Hydrogen Economy' (Hydrogen Skills Alliance, February 2025)

This report, endorsed by the government, estimates "…the current workforce of just 1,600 in the 'alternative fuels' marketplace (including hydrogen and other fuels)…"; thus the hydrogen workforce must currently be less than 1,600.

Whilst the present government's 'Clean Power 2030 Action Plan' envisages a role for 'hydrogen to power' (Dec 2024), it does not quantify the capacity that may be needed. The previous government's 'British energy security strategy' (Apr 2022) committed to "…10GW of low carbon hydrogen production capacity by 2030…". The HAS report adopts the 10GW target (p6) and presents the following estimate of workforce demand:

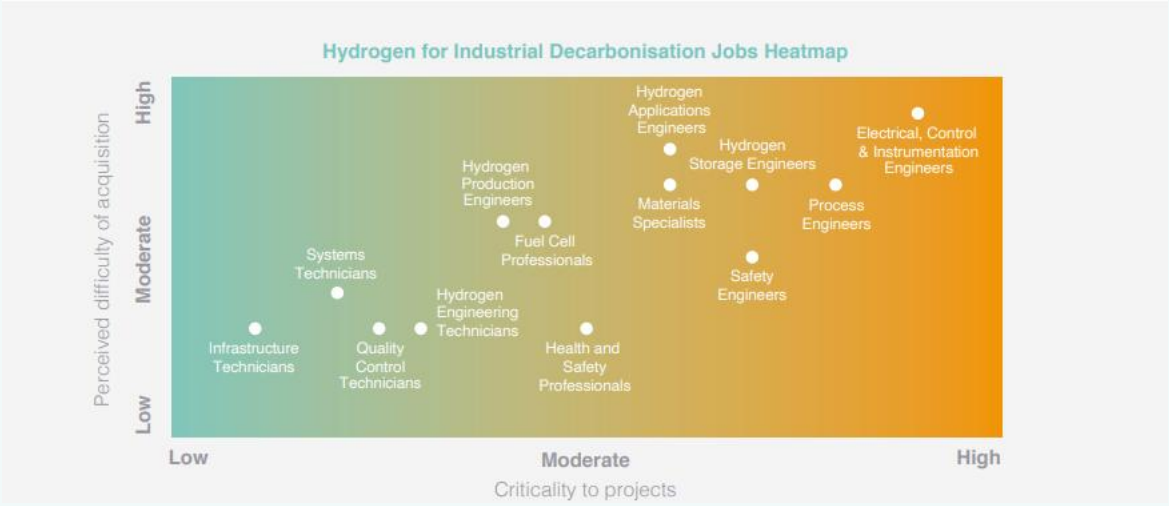
Estimated workforce demand across the hydrogen value chain by 2030

	Production	Transmission (e.g. project union)	Transportation & distribution	Storage	Transport (usage)	Industrial processes	Heat	Power	Total
Direct	8,500	6,000	1,500	3,000	3,500	2,500	175	3,500	28,675
Indirect	24,000	13,500	3,000	6,000	7,500	3,500	300	6,000	63,800

(HUK - Hydrogen UK, Hii - Hydrogen Innovation Initiative, Cogent Skills/HSA - Hydrogen Skills Alliance)

The report does not define the terms 'direct' or 'indirect'.

For many functions (production, HSQE, engineering, pipe distribution, etc.) 'jobs heatmaps' are presented. In all but one of the nine heatmaps, engineers and/or technicians are in the top-right quadrant for 'Perceived difficulty of acquisition' and 'Criticality to projects'. An example is provided below:



How were the figures developed?

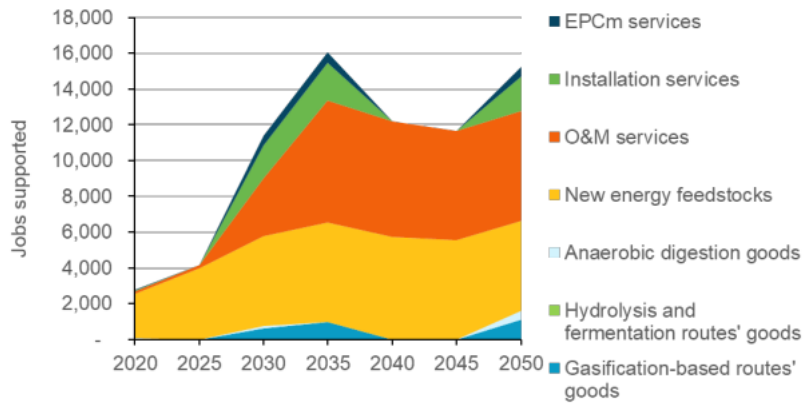
No methodology is offered.

13. 'Energy Innovation Needs Assessment: Biomass & bioenergy' (DBE&IS, Oct 2019)

This report covers gasification (to produce bio-SNG, bio-H2 etc.), energy crops (such as woody biomass), hydrolysis and fermentation (to produce liquid fuels such as ethanol) and Anaerobic Digestion (AD) to produce biogas.

The report states that "…exports could directly support up to 11,000 jobs … by 2050" and "Domestic business opportunities are similar in scale to export opportunities, supporting … 15,000 jobs per annum by 2050" (p7). The following graph provides a breakdown of the domestic market, showing that most jobs will be associated with 'O&M services' and 'New energy feedstocks':

Figure 8 **Jobs supported per annum from domestic markets by component – biomass and bioenergy**



Source: Vivid Economics

How were the figures developed?

Appendix 4 of the report describes the methodology used to derive business opportunities (and associated jobs). Ultimately, the "…GVA [Gross Value Added] figure is divided by productivity figures for that sector to obtain jobs created…"

14.'Building Skills for Net Zero' (CITB, Mar 2021)

Buildings represent one of the largest sources of carbon emissions in the UK, largely due to the mains gas used to heat the UK's 27 million domestic dwellings.

This report states that "…the industry needs to increase by 350,000 FTE workers over the next decade to deliver the volume of work needed to reach Net Zero by 2050…" (p8), with this peak being in 2028, followed by a workforce of 250,000 over the period 2029-45. To skills of greatest demand are predicted to be:

- Plumbing and HVAC trades
- Construction project managers.

"We estimate that an additional 59,000 plumbers and HVAC workers will be required, primarily in the installation of heat pumps by 2028. The research also highlights that we require just over 86,000 project managers by the same date, this includes specific roles like Retrofit Coordinator. The requirement for building envelope specialists, including insulation installers, will be 27,000 in 2028" (p6).

How were the figures developed?

No methodology is offered beyond the following: "Using data from the Climate Change Committee (CCC)'s balanced scenario, our modelling suggests that an additional 350,000 FTE workers will be needed by 2028…"

15. 'Enabling Skills for the Industrial Decarbonisation Supply Chain' (IDRIC, Nov 2022)

This report focuses on seven key industrial clusters across the UK (North West, Humber, Teeside etc.) which are responsible for 40% of the UK's industrial carbon emissions. However, it also covers "Dispersed industrial areas outside of the industrial clusters" (p6) encompassing industries such as: chemical, cement, iron & steel and food & drink, as well as major and minor power producers (ie electricity generation).

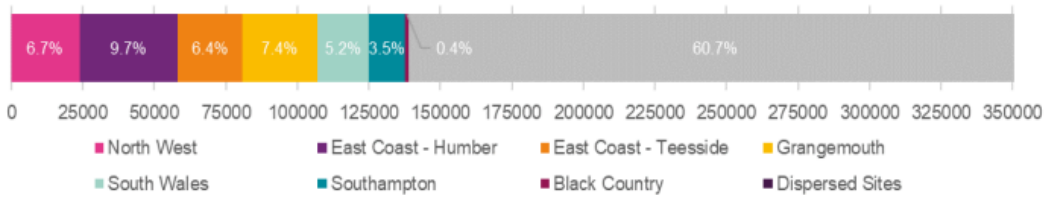
One of the main conclusions is that "Across the three stages of preconstruction, construction, and operation a workforce of circa 350,000 will be needed to deliver the estimated £515 bn of development to 2050" (p59); this workforce figure is derived from the following table.

Table 18: Number of estimated jobs required per stage

		Professional	Technical
Pre-construction	Specialist Advisory	1159	
	Strategic Client	3035	
	Pre-construction	20021	
Construction	Construction Professionals	61506	
	Construction Trades People		241372
	Administrative Support Professionals	4551	
	Cleaning & Security		1766
Operation	Operation Professionals	3531	
	Operation Technical		9215
Skills Development	Education & Training	3500	3500
	Sub Total	97302	255853
	Total	**353155**	

Figure 35: Estimated proportion of professional to technical jobs needed

Figure 36: Percentage of estimated jobs by industrial cluster



The above table and figures also show that:

- 87% of jobs (309,195) will be in "Construction"
- 28% of jobs will be "Professional" while 72% of jobs will be "Technical"

- Over 60% of jobs will be dispersed across the country, with the remaining 40% being located in the seven clusters of the report's focus.

Note that these figures include **direct and indirect** impacts (for example, jobs created) but not induced impacts (p53).

How were the figures developed?

"In this analysis, the GVA [Gross Value Added] and jobs demand modelling starts with CAPEX estimates…" (p54). In summary, GVA is derived from CAPEX, and job numbers are derived from GVA, as illustrated in the following table excerpt:

Table 13: GVA and jobs required to fully decarbonise industrial clusters, whole economy

	CAPEX	GVA demand	'Job years' demand	Jobs demand (2025-40)
North West	31.8	18.0	320,671	21,378
East Coast - Humber	46	26.1	463,864	30,924
East Coast - Teesside	30	17.0	302,520	20,168
Grangemouth	35	19.8	352,940	23,529

16.'CCSA Workforce & Skills Position Paper' (CCSA, July 2023)

CCUS (Carbon Capture Utilisation & Storage) sites will mainly be collocated with centres of heavy industry.

The CCSA reports states that "The CCSA estimate CCUS will create a peak of over 70,000 new jobs between now and 2035 as Opex and Capex is spent in cluster regions and their supply chains… This predicted growth… will rely on both those already in the workplace, as well as those currently coming up through the UK education system" (p11).

Job locations are expected to be in 13 mainly coastal clusters, according to the report's Figure 1, while a very high-level view of job categories is provided in its Table 1.

Figure 1: Map of Track-1 and further planned cluster projects in the UK (correct as of June 2023)

Project Phase	Job categories
Preconstruction	Specialist Advisory
	Strategic Client
	Pre-construction
Construction	Construction professionals
	Construction trades people
	Administrative support professionals
	Cleaning and security
Operation	Operational professionals
	Operation technical professionals
Skills development	Education and training specialists

Table 1: Simplified job categories required per project phase (edited from: Enabling Skills for the industrial Decarbonisation Supply Chain report 2022)

How were the figures developed?

No methodology is offered. It states that "The CCSA undertook modelling to provide national figures on jobs created and jobs protected…" (p8).

17.'Local green jobs – accelerating a sustainable economic recovery' (Local Government Association, June 2020)

This report takes as its starting point the UK government's/ONS's definition of the "…low-carbon and renewable energy economy…" (LCREE) which is made up of 6 groups:

1. Low-carbon electricity
2. Low-carbon heat
3. Alternative fuels
4. Energy-efficient products
5. Low-carbon services
6. Low-emission vehicles & infrastructure

The ONS estimates (2018, see graph below) that the majority (71%) of the 185,000 full-time workers in the LCREE sector are employed in the energy efficient products sub-sector, which covers: insulation, lighting, monitoring and control systems.

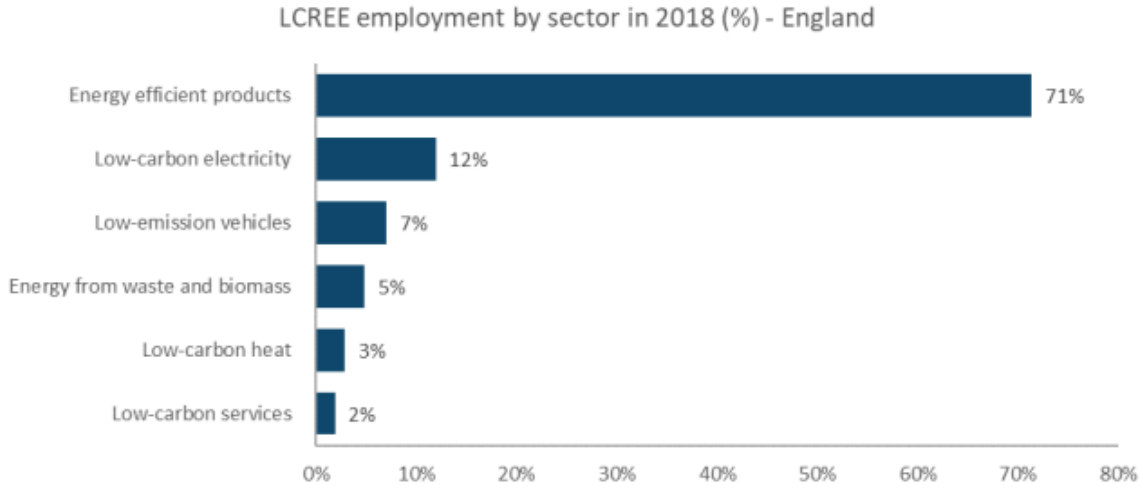


Figure 1 - current employment by LCREE sector (source: ONS)

The paper then estimates the number employed in each group in 2030 and 2050. The numbers employed in the 'energy efficiency products' sector is forecast to remain little changed from 2018 to 2030 and 2050, as the figure below illustrates.

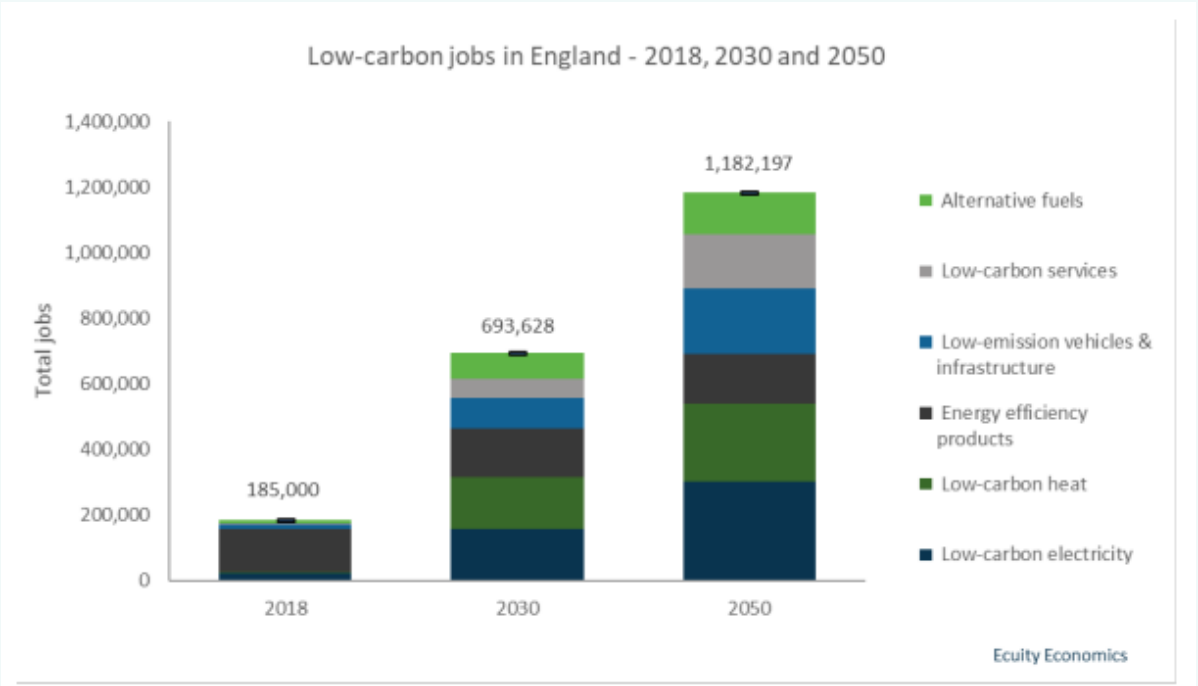


Figure 3 – low-carbon jobs in 2018, 2030 and 2050 (sources: ONS and Ecuity estimate)

The number of low-carbon jobs in 2050 is projected to be split fairly evenly across the 9 regions of England, ranging from 7% (north east) to 14% (north west, Yorkshire and the Humber), but no breakdown is provided by LCREE sub-sector.

The report assesses the anticipated skill level gaps for some of the sub-sectors, as summarised below.

Sub-sector		Comment on skill gap areas	Time horizon
Energy efficient products	Smart controls	Highly skilled **NVQ level 4+** in software engineering is considered as a key skill to enable future innovations within the sub-sector; good stock of manufacturing technicians expected to be available (NVQ 1 to 3) for manufacturing demands	

Key	Sub-sectors that are considered to have key near-term (2020 to 2025) skills gaps	
	Sub-sectors considered to have a skills gap emerging in the longer-term (2025 to 2035)	

How were the figures developed?

"To inform the pathway over the next 30 years, Ecuity developed a time series for the uptake of each low-carbon technology. For example, the annual installed capacity of offshore wind was estimated between 2020 and 2050 based on the trajectory projected by the CCC or National Grid. This method

would enable estimation of the annual workforce demand between 2020 and 2050 dependent on the projected installed capacity of each technology."

The insights on skill gap areas were developed from "…interviews have… undertaken with experts from individual sub-sectors to provide critical perspectives on the future requirements for green jobs, skills and training…"

18. 'Workforce demand estimates – 2024 to 2030: The Waste & Recycling industry' (E&U skills, Sept 2024)

Emissions from the waste sector are largely associated with methane (as waste decomposes in landfill sites) and energy from waste (EfW) emissions, when waste is burnt. The E&U Skills report categorises waste and recycling industry jobs as:

- Waste collection
- Waste treatment and disposal (incl. operation of landfill, EfW, treatment of organic waste)
- Materials recovery (incl. separating and sorting)
- Remediation activities and other waste mgt activities (incl. cleanup of contamination).

The majority (52%) of the 46,400 new people needed by 2030 are associated with 'waste collection'. However, the waste industry's contribution to Net Zero will be associated with the 'waste treatment and disposal' sector. Here, the report anticipates 14,800 new people required by 2030, of which 5,500 are expected to be new jobs (hence 9,300 retirements).

Figure 2: Estimated number of new jobs created and new people required by sub-industry

Industry	Total employment		New jobs created		New people required	
	2024	2030	Number	% Growth	Total	Average per year
Waste Collection	93,600	102,000	8,400	9%	24,200	3,500
Waste Treatment and Disposal	54,400	59,900	5,500	10%	14,800	2,100
Materials Recovery	18,300	17,300	-1,000	-5%	2,200	300
Remediation activities and other waste management services	15,100	17,900	2,800	19%	5,200	700
Waste & recycling	181,400	197,100	15,700	9%	46,400	6,600

How were the figures developed?

The report provides the following information on its methodology:

- "The estimates contained in this report have been produced by Energy & Utility Skills by applying the above assumptions to data provided by Lightcast"
- "…, these estimates have been tested and adjusted through direct engagement with our members and employer network groups."

19. 'The Seventh Carbon Budget: Advice for the Government' (Climate Change Committee, Feb 2025)

Figures for the nature-based workforce are not easy to find, though additional sources of data are provided below. However, the Climate Change Committee estimates that "Demand for forestry workers could create 7,000 to 37,000 new jobs by 2030 to meet tree planting ambitions, while

peatland restoration and hedgerow planting could create a small number of additional jobs by 2030" (p335).

How were the figures developed?

The report states that "These estimates are based on the analysis in our report A Net Zero Workforce, updated with the Balanced Pathway from this advice." (p335 footnote).

Additional sources of jobs data and information in this sector include **'Green Jobs Taskforce: Report to Government, Industry and the Skills Sector' (Jul 2021)**

The Green Jobs Taskforce report categorises "nature-based solutions" as a climate adaptation measure (p16) rather than a way of reducing / removing carbon emissions.

It noted that "Three types of environmental development – improving woodland, peatlands, and urban parks – could potentially create over 16,000 jobs in UK constituencies severely impacted by employment challenges" (p28).

The Climate Change Committee[9] sees woodland creation and peatland restoration as part of the UK's journey to Net Zero.

'"Nature jobs" using environmental goods and services sector data: 2019' (Office for National Statistics, March 2022)

This report defines 'nature-based' jobs as those working in:

- Management of forest ecosystems
- Organic agriculture
- In-house environmental activities and managerial activities of government bodies.

It estimates that there were around 22,000 FTE employees in these roles in 2019.

20. 'Experimental estimates of green jobs, UK: 2024' (Office for National Statistics, March 2024)

This analysis includes a link to the following data table for the entire 'green jobs' UK workforce in 2022; the nature-based activities are highlighted in green.

Green Activity	United Kingdom
Alternative fuels, including hydrogen supply	1,600
Bioenergy	7,500
Carbon capture and storage	800
Energy efficient products	116,100
Energy-efficient and low carbon heating	*
Energy-efficient lighting	34,300

[9] Progress in reducing emissions 2024 Report to Parliament (Climate Change Committee, July 2024)

Green Activity	United Kingdom
Energy-efficient windows and doors	*
Insulation	*
Other energy efficient products n.e.c	*
Energy saving and monitoring	18,800
Energy storage	5,600
Environmental charities	40,400
Environmental consultancy not elsewhere classified	16,300
Environmental related education	2,400
Grid infrastructure	*
In-house environmental activities	2,500
Low carbon transport	34,800
Zero and low emission vehicles	34,800
Low-carbon rail	*
Low-carbon water transport	*
Low-carbon road transport	*
Low-carbon air travel	*
Other low-carbon travel	*
Management of forests	14,300
Managerial activities of government bodies	17,100
Nature protection and restoration (excluding forests)	8,700
Protection and remediation of soil, groundwater and waste	*
Protection of biodiversity and landscapes	*
Nuclear power	23,100
Recycling	17,600
Renewable energy	47,900
Renewable electricity	28,600
Offshore wind	11,300
Onshore wind	6,600
Solar	9,000
Hydropower	1,100
Other renewable energy	600
Renewable heat	15,100
Renewable combined heat and power	4,200
Repairs	54,200
Waste	138,900
Wastewater	25,600
Water quantity	45,200
Total	**639,400**

* symbol indicates no data is available

From this table, we see that nature-based jobs make up 23,000 of the UK's 'green jobs'. Whilst this represents 3.6% of the total jobs (639,400) listed in the table, it should be noted that one significant top-line category ('Grid infrastructure') has not been estimated, so 3.6% should be seen as an upper bound.

How were the figures developed?

This statistical bulletin states that: "We provide estimates using three approaches: industry-based, occupation-based, and firm-based. They are described in our accompanying Developing estimates of green jobs in the UK methodology."