

Green and hydrogen skills

Mapping green and hydrogen skills in the Midlands Engine

The UK Government has committed to a Net Zero Strategy by 2050. The Midlands Engine partnership have translated these national goals into regional objectives with the 2021 Ten Point Plan for Green Growth and the 2022 Midlands Engine Hydrogen Technologies Strategy. In order to assess progress of these plans, measurement of green jobs is needed, with a focus on hydrogen-related jobs.

The recent report “Green and Hydrogen Jobs in the Midlands” by the Warwick Institute for Employment Research (IER), co-funded by the Midlands Engine, HyDEX and Warwick University presents this analysis.

Hydrogen at a glance

- Hydrogen is manufactured in several ways, including the reaction of methane from natural gas with steam, cracking of crude oil fractions (hydrogen is a by-product of this process), and the electrolysis of water.
- Green hydrogen is not dependent on fossil fuel feedstock energy and can be generated from renewable sources.
- To date, hydrogen demand is primarily concentrated in the industrial sector, namely chemical processing and ammonia manufacture.
- Hydrogen is becoming a globally recognised energy vector to decarbonise hard-to-electrify sectors.



What are green and hydrogen jobs

Until recently, the measurement of the extent and demand of green jobs was a challenge due to a lack of agreed definition. To address this issue, the report defines green jobs utilising IER's GreenSOC methodology, developed in tandem with the University of Strathclyde. The framework classifies each occupation into its respective green category, via a rigorous multi-stage screening process. This method recognises that green activities and technologies have different effects on different occupations. Under this framework, green jobs can be categorised into three types:

- 1. New and emerging:** occupations that have come into existence as a direct result of the growth and development of the green economy and can be thought of as 'pure' green jobs;
- 2. Enhanced skills and knowledge:** occupations subject to significant changes in work and worker requirements, and;
- 3. Increasing demand:** occupations with an increase in employment demand levels without significant changes in the job requirements.

Combining the GreenSOC with the green sectors classification, four categories of jobs are recognised in estimating green jobs.

These jobs are shown below:



1.

**Green jobs
in green
industries**

2.

**Greening jobs
in non-green
industries**

3.

**Non-green
jobs in green
industries**

4.

**Non-green
jobs in
non-green
industries**

Due to the nascent nature of the hydrogen industry, there is no established sector classification or comprehensive information available on its occupations and required skills. Thus, in order to evaluate employment within the hydrogen industry this report utilises a three-step approach: Artificial Intelligence, job vacancy descriptions, and engagement with stakeholders.

Key facts and figures

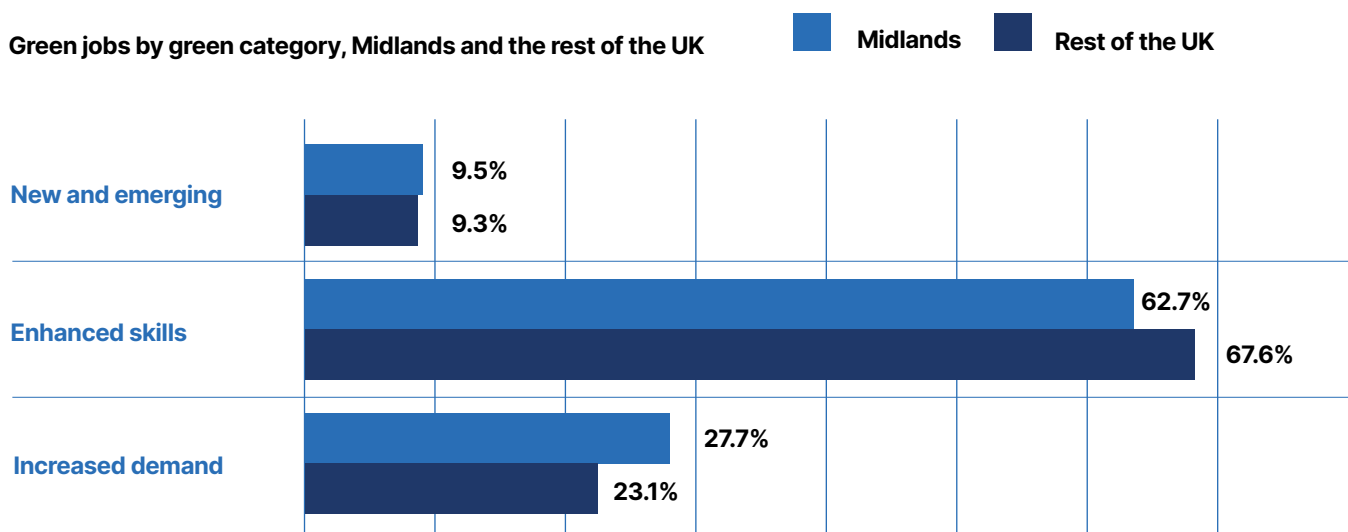
2% of both employment and job vacancies were in occupations classified as new and emerging hydrogen jobs, whilst over the period 2014-2022 0.08% of job vacancies mentioned hydrogen, up to 9.5% of employment could be considered as occupations that could contribute to a green hydrogen economy.

Here, we summarise the findings of the report and the implications for our region's growth and green transition:

- Up to 41% of employment in the Midlands region were in occupations classified as green (that is, either contributing to green activities, and those that are considerably influenced by the green economy), while up to 44% of online job vacancies can be categorised as green.
- Of all vacancies that mentioned hydrogen in the UK since end-2020, on average, 17% of these were in the Midlands. However, compared to total number of job vacancies in the Midlands, the share that explicitly mentioned hydrogen was low and only accounts for 0.08%.
- Green employment in occupations either related to the production, utilisation, or advancement of hydrogen, or in another green occupation which supports the hydrogen industry (collectively termed green Hydrogen occupations) accounted for up to about 10% of employment in the Midlands, with this share slowly increasing over time.
- Hydrogen employment is mainly revolved around skilled and technical occupational roles, with about 50% of hydrogen jobs concentrated in manufacturing (21.7%), construction (15.6%), and professional, scientific, and technical sectors (10.7%).
- Based on vacancy data, median advertised wages are higher in green jobs than in non-green jobs in the Midlands (£30,600 vs £26,500). The same is true for the rest of the UK (£33,000 vs £27,750). Median wages are highest for Enhanced Skills and Knowledge jobs (£35,000 in the Midlands vs £37,000 in the rest of the UK), likely driven by the fact that this type includes more senior occupations.
- Green jobs are more likely to be demographically held by men (73.7% male vs 26.3% female) similarly to hydrogen jobs (82% male vs 18% female) in the Midlands, showing lower than the rest of the UK average for female hydrogen employment (21%).
- The distribution of green jobs by age is largely similar in the Midlands as in the rest of the UK, with 25–49-year-olds holding the largest share of green jobs (57.9% vs 59.6% in the UK), followed by 50–64-year-olds (28.8% vs 27.9%). Many of these jobs (over 70%) also require some previous experience.

Mapping green jobs

Green jobs by green category, Midlands and the rest of the UK



In the 2014-22 period, New and Emerging green jobs accounted for an average 9.5% of all green jobs – marginally higher than the UK average (9.3%). The Midlands had a lower share of Enhanced Skills green jobs than the rest of the UK (62.7% vs 67.6%) but a higher share of Increased Demand green jobs (27.7% vs 23.1%) changing little since 2014.

Green jobs by SOC2010 major occupational group, Midlands and the rest of the UK (%)

Occupational group	Midlands	UK	Difference
Managers, directors and senior officials	11.8	12.4	-0.6
Professional occupations	27.5	33.1	-5.7
Associate professional and technical	12.4	13.5	-1.1
Administrative and secretarial	2.7	2.9	-0.2
Skilled trades occupations	19.5	18.3	1.3
Caring, leisure and other service	0.1	0.1	0.0
Sales and customer service	4.6	4.4	0.2
Process, plant and machine operatives	14.5	10.8	3.6
Elementary occupations	7.2	4.6	2.5
	100	100	

The largest share of green jobs exists in professional occupations (27.5% in Midlands and 33.1% in the UK), followed by skilled trades occupations (19.5% in Midlands and 18.3% in the rest of the UK). Caring, leisure and other service occupations have the lowest proportion of green jobs (0.1% for both the Midlands and rest of the UK).

Top twenty skills demanded in vacancy data by type of green job

New & Emerging	Enhanced Skills	Increased Demand
Communication	Communication	Communication
Attention to detail	Customer service*	Customer service*
Customer service*	Work as a team	Logistics
Work as a team	Attention to detail	Attention to detail
Energy management/energy solutions	SQL*	Work as a team
Electronics	Accounting	Quality standards
Control systems	JavaScript*	Work independently+
Mechanical engineering*	Logistics	Contact customers*
Project management*	Energy management/energy solutions	Lead a team
Civil engineering	Lead a team	Manage a team
Personal development	Project management*	Meet deadlines
Quality standards	SQL Server*	Use IT tools
Lead a team	Manage a team	Follow written instructions
Maintenance and repair	Quality standards	Manage time+
Logistics	Computer science	Adapt to change+
Electrical engineering	Cyber security*	Assist customers*
Chemistry	Risk management	Provide information
Hydraulics	Financial management	Use hand tools
Pneumatics	Work independently+	Communicate with customers
Physics		Work in teams+

*denotes a sector-specific skill + denotes a transversal skill. Transversal skills can help employees to adapt to change.

Policy recommendations to boost green and hydrogen jobs

The report concludes by offering recommendations to ensure that the benefits of this type of research is fully maximised to meaningfully contribute to the Midlands Engine strategic objective of green growth:

INSIGHTS

1. Encourage the greening of jobs in non-green sectors.

Most, if not all, jobs should contribute to the transition of a net zero economy. Already in the Midlands, there is a significant proportion of green jobs in non-green industries (41%) showing it's possible for non-green jobs to change. One way of encouraging the transition is training that delivers up-skilling and re-skilling via micro-credentials. Additionally, active dialogue with traditionally non-green sectors to steer such companies toward greener working practices where possible.

2. Working towards more inclusive green employment.

Women and younger workers are under-represented in green and hydrogen jobs - improvement in their presence is possible and necessary to deliver a just transition as part of the Green Industrial revolution. Improving job quality

is one way to attract under-represented workers and is associated with innovative companies – providing dual benefits of an inclusive and innovative workforce. Similarly, apprenticeships are a great way to foster on-the-job training experience.

3. Routine monitoring of the green economy and green employment.

There should be periodic updates of the analysis used within this methodology (GreenSOC) to monitor trends and developments over time in the extent and demand for green and hydrogen jobs in the Midlands. Continuous monitoring of skills could usefully inform education and training systems to meet those needs – as well as changing skills needs.

4. Unblocking constrains in employment in green and hydrogen industries.

Continuous monitoring of vacancy data can identify changes in skills demanded by employers. Beyond this, further research is needed to identify any constrains to expanding green employment and activities on the demand side to feed into green policy and practice in the Midlands hydrogen industry and beyond.



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