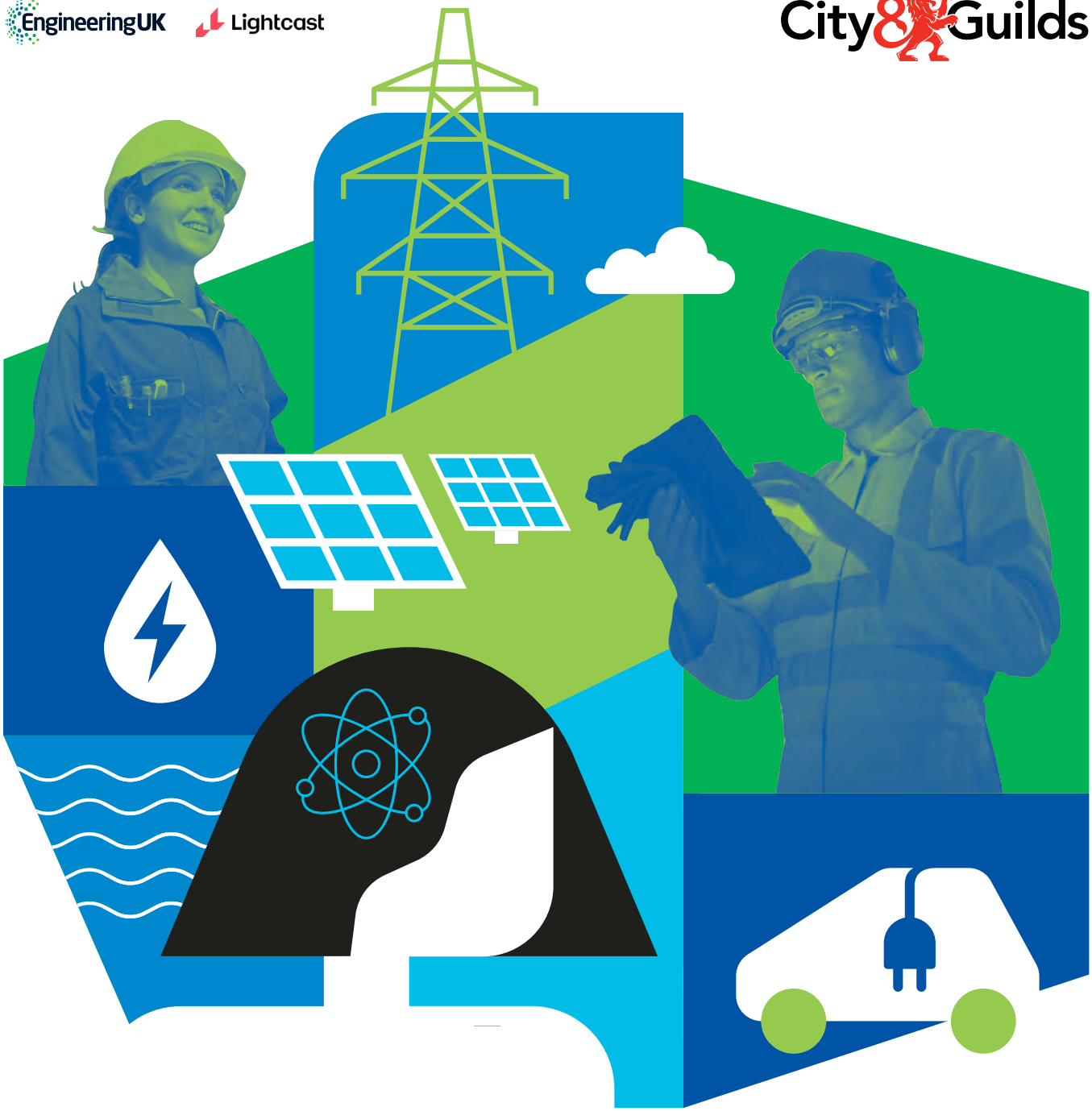
EngineeringUK Lightcast

City & Guilds



BRIGHT FUTURES

Decarbonising the UK's energy workforce

A spotlight on the UK's nuclear industry

An overview of the UK nuclear energy sectors skills requirements

The energy jobs market and skills needs: past, present and future

Labour market forecasts for the UK energy market

Employees and the energy market – how are they feeling?

Findings from our poll of 1,000 energy sector workers

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Andy Moss
Chief Customer Officer
City & Guilds

Tackling climate change is the defining challenge of our generation. Yet as economies around the world work to transition to a carbon-neutral future, demand for energy continues to rise. The imperative to address these diverging trends has never been stronger, and it's driving major structural shifts across energy production

These shifts are now being reflected in government policy. In April 2022, the UK Government released the British Energy Security Strategy, which aims for 95% of electricity to be low carbon by 2030, and for total decarbonisation of the electricity system by 2035, subject to security of supply. Phasing out high carbon energy sources, such as oil and gas, and dramatically scaling up low / zero carbon energy sources such as nuclear and hydrogen is fundamental to achieving this aim.

Worryingly, what's less widely recognised or understood right now is the dramatic shift in skills and labour markets needed to underpin the move to a low carbon future. To rise to this challenge, it's clear we need a skills system that's capable of supporting a broad and diverse range of new entrants into the sector, whilst also helping those already in the sector to transition to high-demand roles; roles where their existing skills – supported by supplementary training and certification – will be essential if we're going to meet the needs of the sector.

Yet, at the moment, there is a mismatch between the ambitions for change, and the support needed if our skills system is to get us there.

In this report, we have worked with a broad coalition of partners, notably Engineering UK, the National College for Nuclear and economists at Lightcast, to examine the state of play when it comes to jobs and skills in the energy sector, and to identify the barriers that risk holding back our transition to low carbon energy production.

This report presents a compelling argument for why we must take action now to upskill the current

"IT'S IMPORTANT TO RECOGNISE THAT THIS TRANSITION WILL TAKE TIME – FOR POLICY TO TRANSLATE INTO PLANNING PERMISSION, TO CONSTRUCT NEW ENERGY INFRASTRUCTURE, AND TO TRAIN A NEW WORKFORCE."

energy workforce with the green skills required for the future; if we don't act now, we'll almost certainly lose the race to that more sustainable future. And we all have a part to play, governments, employers, those working in the education sector and the workforce at large.

It is only then that we will see policy translate into practice and facilitate a new energy infrastructure with a workforce equipped to deliver the cleaner, greener energy sources that future generations deserve.

I hope you enjoy reading this report and that ultimately the recommendations we have made are enacted to support the UK's transition to a greener future for all.

Hilary Leevers
CEO Engineering UK

Much of the decarbonisation required across the UK economy to achieve net zero emissions will depend on new, innovative engineering solutions, as well as the expansion of existing ones

This requires a diverse workforce with the necessary numbers of engineers, technicians, and scientists, with the right skills and the creativity to develop and deliver these solutions.

The UK has an ongoing shortage of engineers, with demand increasing faster than average across the economy*. Demand for both green skills and green jobs is growing, and this is only likely to intensify as necessary investment is made to hit the UK's net zero requirements by 2050, and 2045 in Scotland.

To meet these workforce demands, the sector must work together with government to achieve joint aims and ensure its prosperity into the future. Engineering and technology apprenticeships have declined over the last 10 years, with the modest increase in numbers studying at universities insufficient to meet demand. It is essential, therefore, that there is sustained and growing investment in training and education, including apprenticeships, T levels, and academic routes, as well as reskilling, retraining and retaining those already in work.

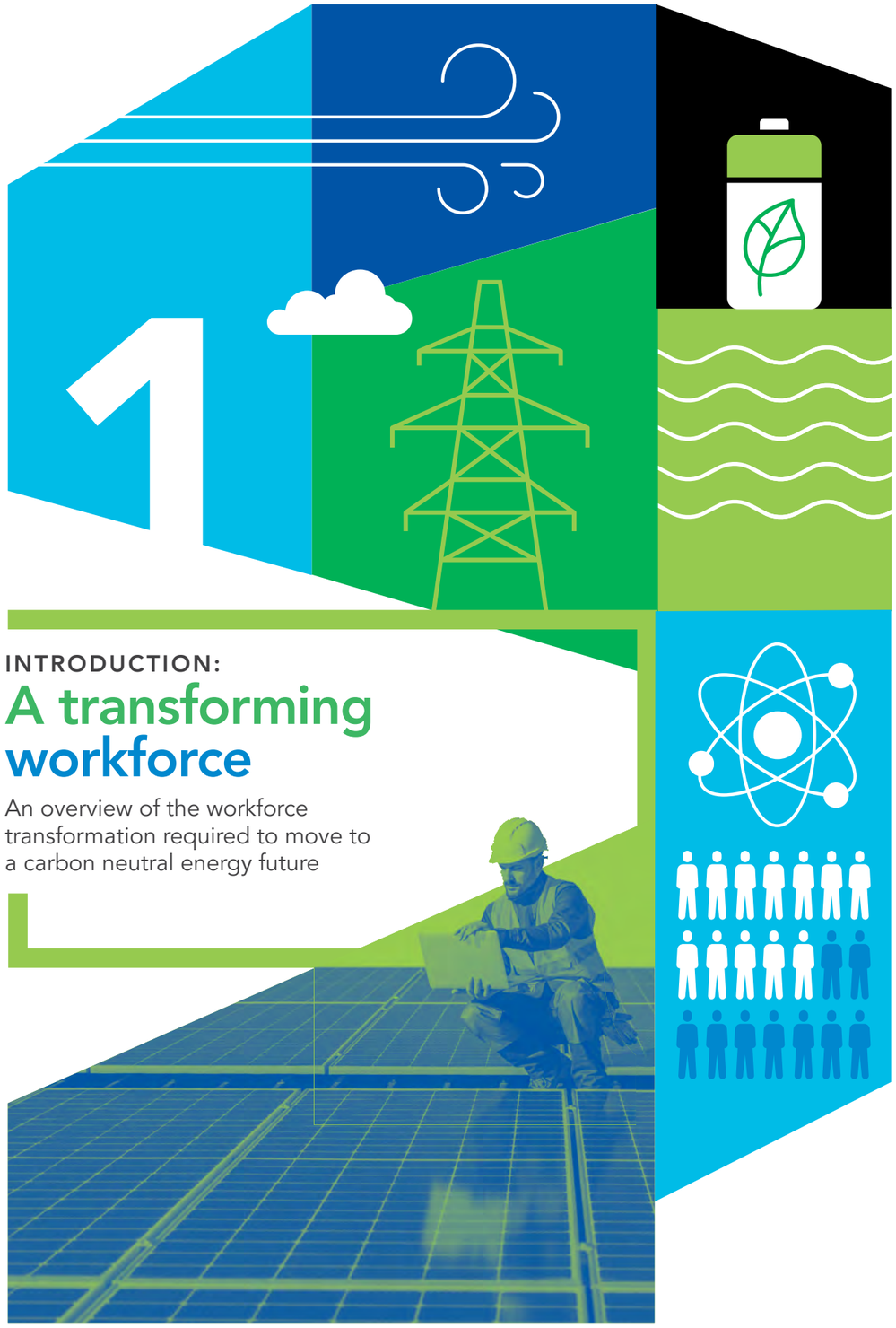
Given the pace of technological advances, it is difficult to be certain how and whether more jobs will be affected by skills needs changes in the future. Employers, employees, training providers, and government will need to maintain flexibility and a willingness to fund continuous upskilling of the workforce through training schemes, including apprenticeships and shorter-term courses.

In addition, it is vital to invest in bringing a more diverse range of new entrants into engineering and technology, giving more young people from a wider range of backgrounds the chance to pursue rewarding careers and bring their different perspectives to the fore. Only by improving workforce diversity and enjoying the breadth of talent available can the sector fill its skills and labour gaps and maximise its innovation.

Despite much work going on to identify skills gaps across the economy, data can still be complicated, hard to come by, and sporadic. We support calls to improve data availability through clearer, standard definitions, by reviewing regularly, and by increased monitoring and reporting of needs and the extent to which they are being met.

EngineeringUK is pleased to support this report, which adds to the evidence of a dire and urgent need for action on labour market and skills in order to meet the UK's net zero targets.

***engineeringuk.com/futureskills**



INTRODUCTION:

A transforming workforce

An overview of the workforce transformation required to move to a carbon neutral energy future

The transition to net zero is already triggering one of the most dominant labour market trends of the next 30 years. According to research carried out by the Place-based Climate Action Network (PCAN), approximately 6.3 million jobs in the UK[1] – roughly one in five – are expected to be affected by the transition, with millions of workers experiencing either an increase or decrease in demand for their current skills.

The Government's target to decarbonise the UK's power supply by 2035 will be a crucial part of the path to net zero. And this will require a significant transformation of the energy industry workforce. Jobs and skills related to high carbon energy production are set to see a rapid decrease in demand, while demand for jobs and skills related to low carbon energy production will soar.

To get the workforce in place, it won't be a question of just recruiting new talent or graduates. Indeed, 2019 research from the Industrial Strategy Council found that 80% of the overall 2030 workforce are already working[2]. Therefore, the biggest challenge for the energy industry will be to reskill and retain employees to ensure the sector has the people it needs to accomplish this transition.

As part of this, we also must ensure that it is a just transition. This means that any change should be inclusive and holistic; and it's by investing in reskilling and retraining that we can ensure workers and communities see a positive societal impact as we strive towards our goals.

The Government has already begun to make headway in tackling this, outlining plans to support a green workforce in the 2021 'Net Zero Strategy: Build back Greener'[3]. This includes commitments to reform the skills system, deliver on a Lifetime Skills Guarantee and introduce a broader climate change and sustainability strategy for the education system.

But are these changes sufficient? And will they happen quickly enough?

In this report, we explore the changes in the energy labour market and the challenges that could hold this sector back from helping the UK to meet its net zero ambitions. And we will also take an in-depth look at the nuclear industry, to understand the specific workforce needs and challenges in that area.

Workforce changes

- There is already an uplift in new roles being created by the move to low carbon energy, and job postings data reveals that many of the skills required are transferable between high and low carbon roles.
- As high carbon industries wind down in some regions, and low carbon ones spring up in others, there will almost certainly be a regional shift in energy sector jobs. This could help levelling up goals but will require local and national collaboration to ensure this transformation truly helps communities and local economies, rather than simply shifting high skill workers around the country.
- The workforce is largely optimistic about the future of the industry; however, many employees don't think they have the skills or training they need to keep up with the pace of change. And workers in high carbon energy are also concerned about losing out from the transition, such as through loss of job or salary.
- In the nuclear sector, there is a lot of potential for job creation in the future. But uncertainty about the timing of projects is leaving employers and their staff in limbo.
- There needs to be much more clarity, commitment, and collaboration between Government, industry and education bodies to ensure we have the workforce we need to deliver on energy security and net zero goals.

"THE WORKFORCE IS LARGELY OPTIMISTIC ABOUT THE FUTURE OF THE INDUSTRY; HOWEVER, MANY EMPLOYEES DON'T THINK THEY HAVE THE SKILLS OR TRAINING THEY NEED TO KEEP UP WITH THE PACE OF CHANGE."

The energy jobs market and skills needs: past, present and future

Labour market forecasts for the UK Energy sector

National Grid research from 2020 estimated that 400,000 roles will need to be filled by 2050 to build the workforce required for the UK to meet increased demand for renewable energy production and our net zero targets[4].

If the UK is to deliver on long term energy security and meet its energy transition targets by 2050, an estimated 200,000 new workers will be required[5].

A powerful new labour market trend

The drive to decarbonise energy production is a powerful force of change in the energy sector labour market.

Whist it's difficult to provide an accurate prediction of the total number of people that will be required in such a rapidly changing market, what is clear is that policy and projects are fast evolving. Looking at jobs listings data, Lightcast's analysis demonstrates that employer demand for low carbon energy industry jobs and skills has only really started to take off in the last four years, and we are likely to see an even faster acceleration in the years ahead.

Looking at the fastest growing job titles requiring low carbon skills from 2019 to 2022, we can see, for instance, that the number of unique job postings for Renewable Energy Managers has shot up from only 16 postings in 2019, to 199 in 2022 – a massive 1144% growth.

The energy skills shift

At the same time, as part of the transition towards a low carbon energy sector, jobs in high carbon sub-sectors are already seeing a decline.

Looking at the fastest declining job titles requiring high carbon skills from 2019 to 2022, we can see that demand for oil and gas analysts dropped by 43.4% from 2019 to 2022. Meanwhile, demand for oil and gas engineers has decreased by 34.2%. As the energy sector progresses with decarbonisation,

"RECENT PWC ANALYSIS REVEALED THAT ONCE WE CONSIDER THE EXISTING ENERGY SECTOR WORKFORCE AND PEOPLE LEAVING ROLES DUE TO RETIREMENT, A SIGNIFICANT GREEN ENERGY SKILLS GAP IS EMERGING."

those working in high carbon energy will need to pivot and reskill to move into the new jobs opening up within low carbon energy production.

The good news is that whilst there is high demand for some specialist low carbon energy knowledge and skills – such as nuclear power, or renewable energy – which would require workers to upskill or reskill, many employees won't need to completely retrain as they already have the core skillsets that will be required, whether those are hard or soft skills.

Lightcast analysis of the most in demand skills in low carbon job listings in 2022 shows that many of the skills required are more generic business skills, such as communications, management, leadership, and operations, which will be very transferable.

We can also see, thanks to Lightcast's analysis, how demand for skills in low carbon related job postings has changed over the past few years – from 2019 to 2022. Here, many of the technical skills that have seen the greatest uplift in demand are also transferable between high and low carbon sectors

"THE NUMBER OF UNIQUE JOB POSTINGS FOR RENEWABLE ENERGY MANAGERS HAS SHOT UP FROM ONLY 16 POSTINGS IN 2019, TO 199 IN 2022 – A MASSIVE 1144% GROWTH."

– such as engineering management, resource management and grid connections.

This demonstrates again that there will be a lot of potential for workers in high carbon industries to transfer across to low carbon sector jobs, without needing to completely reskill. However, to do this effectively, employers across industries will need to operate using consistent terminology – so when people are applying for jobs in a different energy sector, it is clear which skills are transferable, which need to be topped up, and which need to be learnt from scratch.

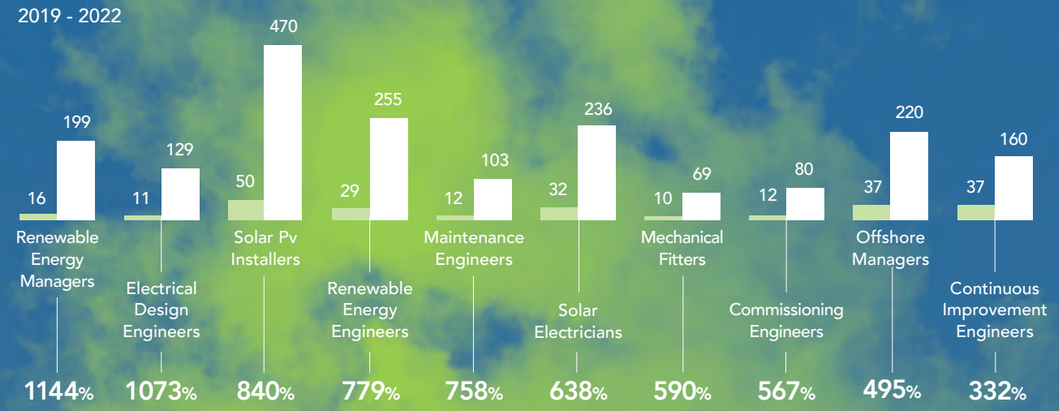
Most in demand skills in low carbon job postings

2022

SKILL	NUMBER OF POSTINGS	FREQUENCY IN POSTINGS
Communications	6568	34.28
Management	6490	33.87
Nuclear Power	5063	26.42
Planning	3643	19.01
Nuclear Safety	3348	17.47
Operations	3344	17.45
Nuclear Engineering	2780	14.51
Leadership	2524	13.17
Renewable Energy	2086	10.89
Mechanical Engineering	2061	10.76
Procurement	1880	9.81
Project Management	1795	9.37
Electrical Engineering	1684	8.79
Sales	1683	8.78
Innovation	1649	8.61
Security Clearance	1635	8.53
Research	1603	8.37
Problem Solving	1601	8.36
Coordinating	1587	8.28
Construction	1553	8.11

Fastest growing job titles requiring low carbon skills

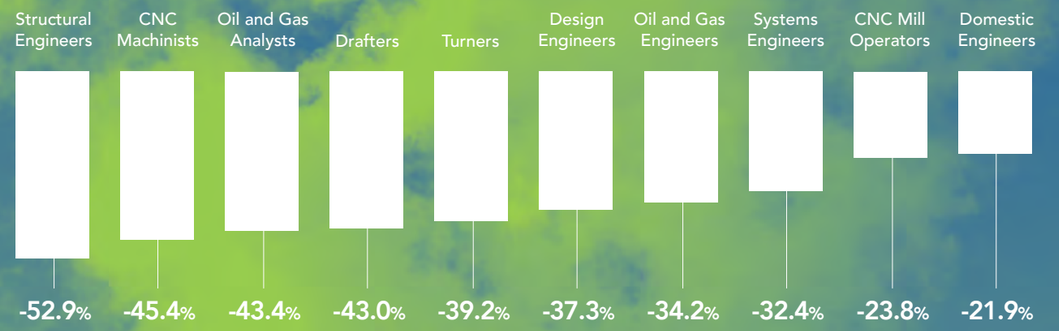
2019 - 2022



Percentage growth over period

Fastest declining job titles requiring high carbon skills

2019 - 2022



Percentage decline over period

Demand for skills in low carbon related job postings

2019 vs 2022

SKILL	CHANGE IN FREQUENCY	SKILLS TYPE
Agile Methodology	212%	Specialised Skill
Ethical Standards And Conduct	180%	Common Skill
Aerospace Engineering	171%	Common Skill
Strong Work Ethic	169%	Common Skill
Engineering Management	144%	Specialised Skill
Marketing	144%	Specialised Skill
PVsyst	134%	Specialised Skill
Water Treatment	123%	Specialised Skill
Resource Management	123%	Specialised Skill
Plant Design	122%	Specialised Skill
Solar Energy Systems Installation	110%	Specialised Skill
Built Environment	101%	Specialised Skill
Grid Connections	100%	Specialised Skill
Business Process	91%	Specialised Skill
Nuclear Engineering	91%	Specialised Skill
Resilience	88%	Common Skill
Root Cause Analysis	85%	Specialised Skill
Relationship Building	83%	Common Skill
Manufacturing Processes	82%	Specialised Skill
Biomass	81%	Specialised Skill

The top five most common job titles for the low carbon energy skills categories include:

CLEAN ENERGY
- Renewable Energy Engineers
- Renewable Energy Managers
- MaintenanceEngineers
- Field Service Engineers
- Electrical Design Engineers

NUCLEAR ENERGY
- Nuclear Safety Engineers
- Mechanical Engineers
- Safety Engineers
- Nuclear Engineers
- Principal Engineers

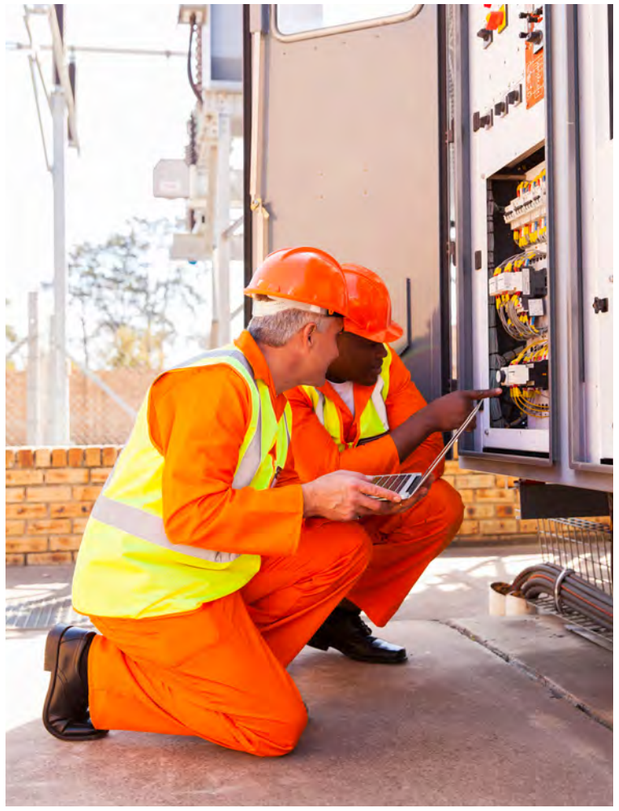
WIND ENERGY
- Wind Turbine Technicians
- Offshore Managers
- Offshore Structural Engineers
- Principal Consultants
- Service Technicians

WATER ENERGY
- Mechanical Engineers
- Maintenance Electricians
- Lead Electrical Design Engineers
- Power Engineers
- Hydro Operators

SOLAR ENERGY
- Solar Pv Installers
- Solar Electricians
- Solar Project Managers
- Renewable Energy Engineers
- Solar Design Engineers

Low carbon skills analysis

Elena Magrini
Head of Global Research at Lightcast



The public policy drive to move the UK to a low carbon energy supply will have a number of profound effects on the labour market. Although these effects will be felt primarily in the energy sector, the changes are likely to impact most, if not all industries, which means that the nature of many job roles, and the skills needed to perform them, will also change.

The key to all this really is to think less in terms of changes to industries and jobs, and much more in terms of skills. Skills are the building blocks of the labour market, and by seeking to understand the sorts of skills that are needed for a successful energy transition, we'll be in a far better position to understand the training needed for new workers, and the upskilling that can be given to existing workers – particularly in the energy sector – to transfer to new energy sectors.

The upskilling dimension is particularly crucial. As an example, the top five in-demand specialised skills for the job of Renewable Energy Engineer are plumbing; heating systems; electrical engineering; boilers; and project management. As it happens, three of these skills are also in the top five specialised skills for Boiler Engineer, which indicates that rather than training up Renewable Energy Engineers from scratch, a programme of retraining and upskilling Boiler Engineers in the skills they may currently lack – electrical engineering and project management – would be a far quicker, more efficient and cost-effective way of achieving the same goal.

For the Government to achieve its aims, it will need to set about understanding the skills that are needed, and work with education providers, economic developers and employer groups to ensure the right education training programmes are in place to deliver.

Lightcast

Standardising a common approach to base technical competence

Technical competence varies across sectors. The Engineering Construction Industry Training Board (ECITB) suggest a standardised approach

The evidence of technical competence recognised and required by companies in the oil and gas sector varies. Employers would often start competence profiles from scratch when workers transferred to different contracting organisations.

This created significant duplication of training at a huge cost. It also meant workers had to re-do assessments with a knock-on delay in onboarding.

And with an increased demand for skilled workers, particularly during busy periods such as maintenance shutdowns, employers needed a programme that harmonised assessments and made records accessible online so that workers could transfer easily between companies and sectors.

So, Connected Competence was born.

Connected Competence reduces the duplication of assessments and costs, speeds up the deployment of personnel between sites, but most importantly, increases safety through the assurance of base technical competence.

Industry-led and enabled by the ECITB, it was initially developed by a collaboration of supply chain organisations principally in the oil & gas sector. But these common, transferable skills are now being recognised through the Connected Competence initiative across other energy sectors such as nuclear, wind, onshore refining, and chemical industries to support workforce resilience and diversification.

Workers are always required to undertake basic safety training before being deployed to safety-critical sites - but they do not necessarily demonstrate their 'current' technical competence.

Connected Competence aims to standardise a common approach to base technical competence, benchmarked against National Occupational Standards, by requiring workers to demonstrate their ongoing technical competence every 3-4 years.

This is aligned with the HSE's good practice definition of 'performing activities to a recognised standard on a regular basis'.

Organisations that recognise and promote Connected Competence as the industry base standard for technical competence for craft and technician trades include Shell, bp, Harbour Energy, INEOS Energy, Bilfinger, Worley, TotalEnergies, Aker Solutions, Stork, Wood and Petrofac, to name a few.

When the base standard has been achieved (either at site, as part of an employer's competence management system, or at a testing centre) the candidate will receive a digital badge. This gives them ownership of their skills which is verifiable online and transferable across energy industry employers.

It assures a common approach to base technical competence required of site-based craft and technician trades in the same way as sector-specific safety training is widely acknowledged.

The regional story

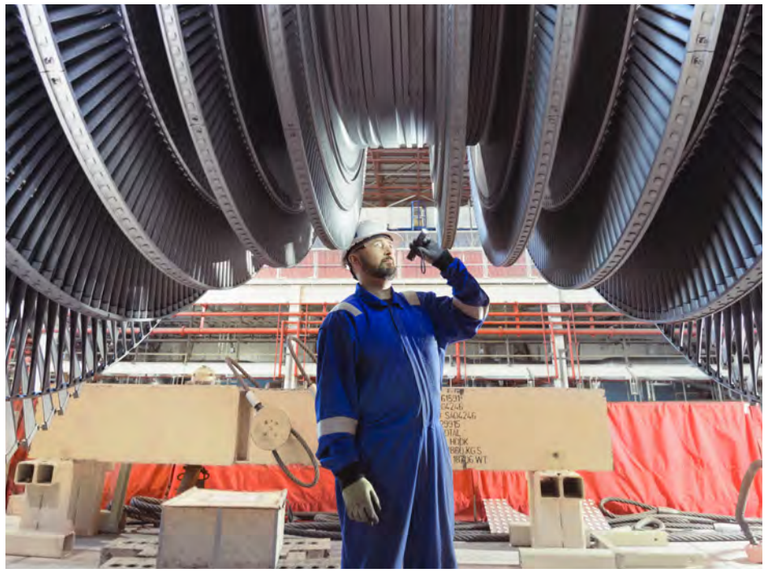
Sub-industries within the energy sector have clear footholds in certain UK regions, meaning there is already a distinct regional difference in the spread of low and high carbon jobs.

Today, jobs in high carbon industries are still dominant. However, as power production transitions, and investment is poured into low carbon energy, the skills required around the UK are likely to see a shake-up.

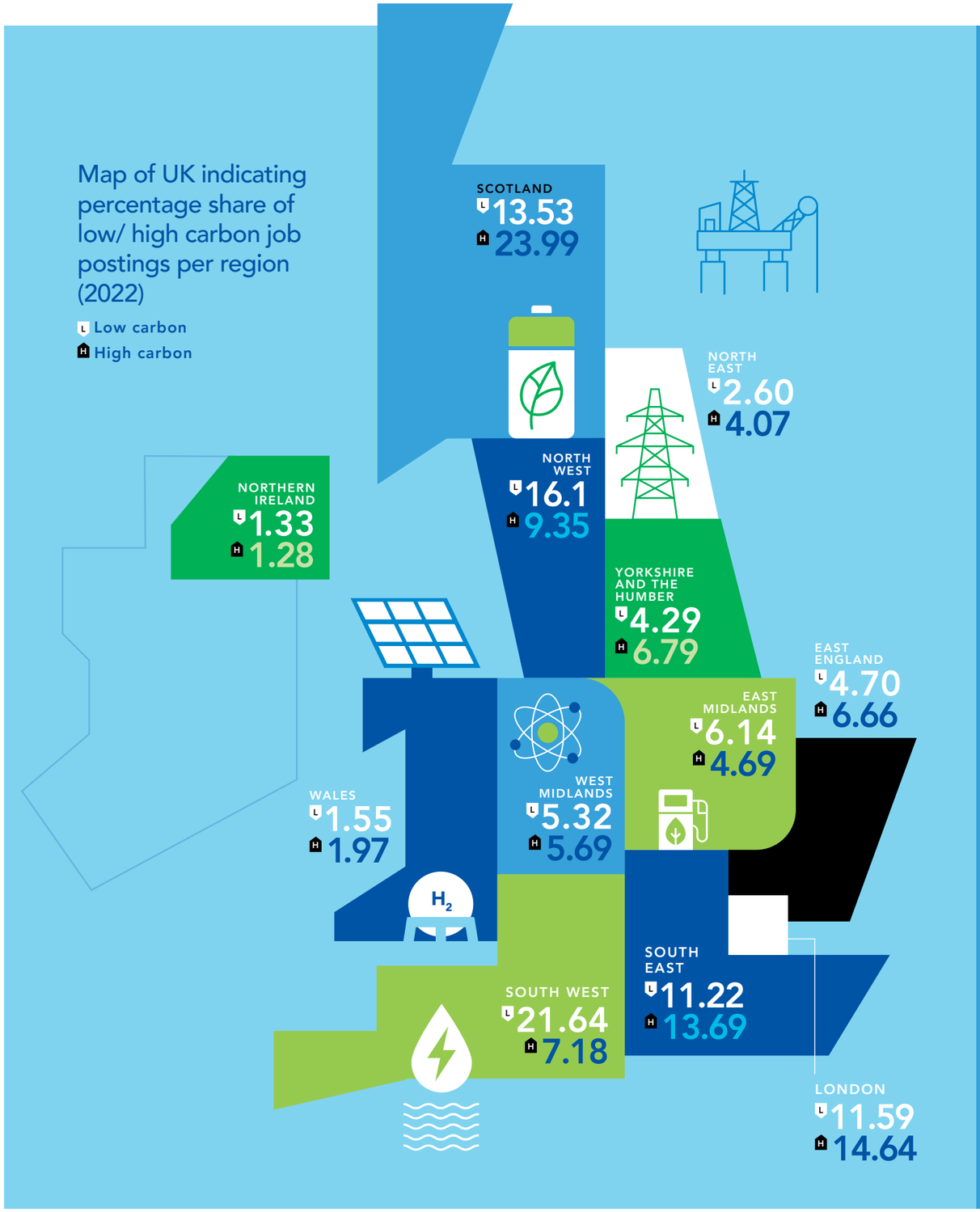
This could present an opportunity for local areas to develop new industries and create new local job opportunities. This has potential to support levelling up in UK regions. However, it's not necessarily straightforward. Areas creating low energy jobs will need to ensure they have the skilled workers they need to fill these roles, meanwhile there's a risk that jobs might decline in other areas, and people will need to reskill, transition, or even consider relocating for work. This transition will only support levelling up ambitions if it supports regional economic growth in a sustained way across the board.

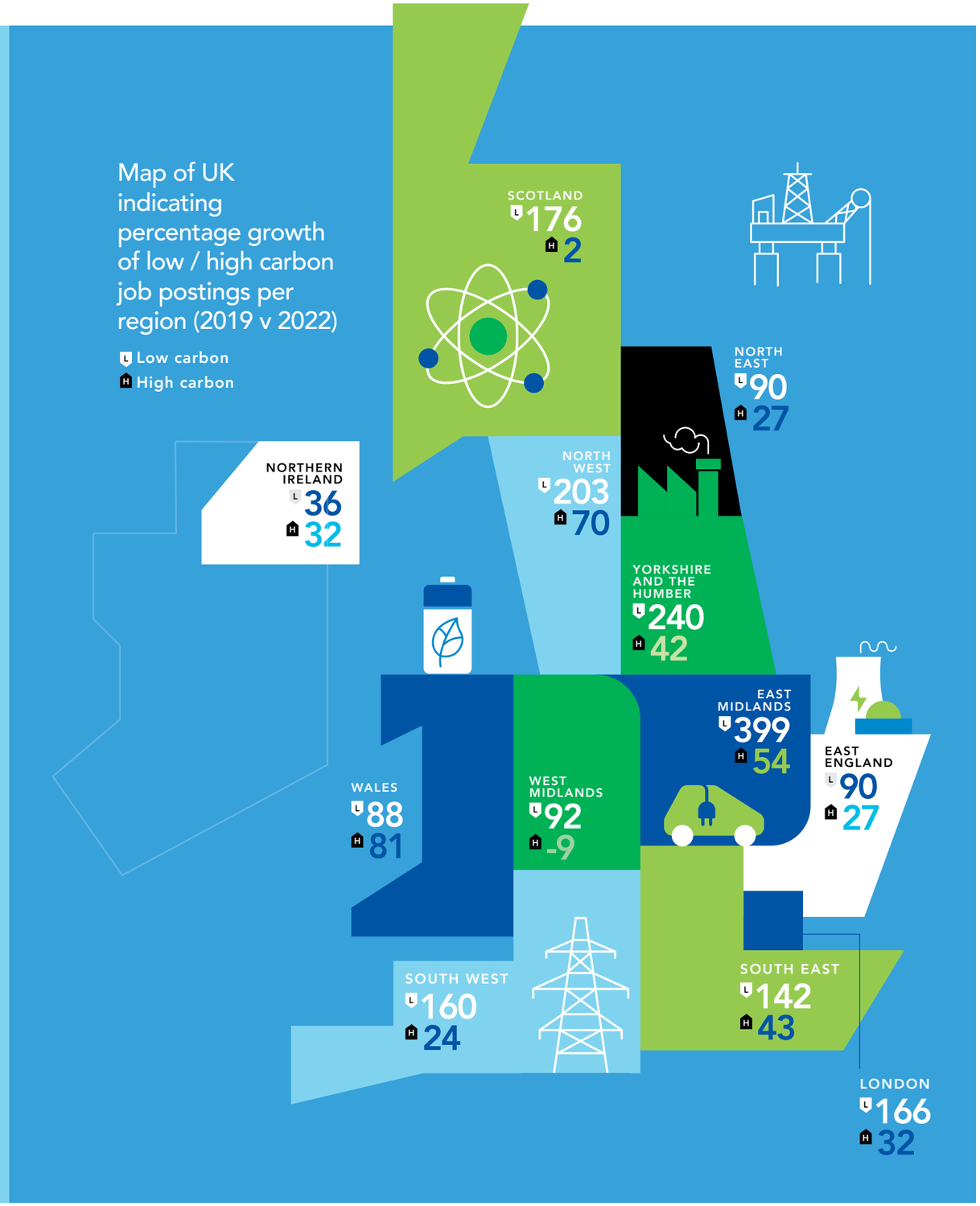
When we look at where energy jobs are today, an interesting picture emerges. The largest share of low carbon job postings in 2022 was in the South West of England (22%) and the North West (16%), primarily due to the nuclear industry. Whilst Scotland has the third largest share (13.5%) of low carbon jobs, it is also the most dominant region for high carbon jobs, due to the prominence of its oil and gas industry.

However, when comparing low and high carbon industry job postings in 2019 and 2022, the data shows that growth was much stronger for low carbon jobs across the board. Certain regions saw greater uplift than others – for example, The Humber saw considerable growth in the number of low carbon job postings, and this is where one of the first major UK sites for decarbonised industry is expected to be built, exploiting hydrogen and carbon capture[6].



As power production transitions, and investment are poured into low carbon energy, the skills required around the UK is likely to see a shake-up


Map of UK indicating percentage share of low/ high carbon job postings per region (2022)
L Low carbon
H High carbon
SCOTLAND
L 13.53
H 23.99
NORTH EAST
L 2.60
H 4.07
NORTHERN IRELAND
L 1.33
H 1.28
NORTH WEST
L 16.1
H 9.35
YORKSHIRE AND THE HUMBER
L 4.29
H 6.79
EAST ENGLAND
L 4.70
H 6.66
EAST MIDLANDS
L 6.14
H 4.69
WALES
L 1.55
H 1.97
WEST MIDLANDS
L 5.32
H 5.69
H2
SOUTH EAST
L 11.22
H 13.69
SOUTH WEST
L 21.64
H 7.18
LONDON
L 11.59
H 14.64


Map of UK indicating percentage growth of low / high carbon job postings per region (2019 v 2022)
L Low carbon
H High carbon
SCOTLAND
L 176
H 2
NORTH EAST
L 90
H 27
NORTHERN IRELAND
L 36
H 32
NORTH WEST
L 203
H 70
YORKSHIRE AND THE HUMBER
L 240
H 42
EAST MIDLANDS
L 399
H 54
EAST ENGLAND
L 90
H 27
WALES
L 88
H 81
WEST MIDLANDS
L 92
H -9
SOUTH WEST
L 160
H 24
SOUTH EAST
L 142
H 43
LONDON
L 166
H 32

3

Employees and the energy market – how are they feeling?

Change is coming, and employees are largely getting on board

It's no secret that jobs in low carbon industries in the UK are set to skyrocket. We spoke to 1,000 people working in the UK energy sector and it's clear that they sense the opportunity this brings. 60% of those we surveyed believe that many new jobs will be created in low carbon energy sectors such as wind, solar, hydro, nuclear, carbon capture and storage, over the next five years.

And the change and opportunities on the horizon are translating into optimism – with over half (54%) of those working in the energy industry feeling hopeful about the Government's ambition to decarbonise the UK energy system by 2035, and a third feeling excited (34%).

But not everyone is feeling confident and on board with the trajectory of the energy market. Our research found a huge disparity between those working in high carbon and low carbon industries. Despite 63% of those working in low carbon energy production feeling hopeful about the Government's plans, this stands in stark contrast to less than half (45%) of those working in high carbon energy sectors.

Pulling the plug on high carbon jobs

The findings highlight a much greater sense of security and optimism amongst those already

"OVER HALF (54%) OF THOSE WORKING IN THE ENERGY INDUSTRY FEELING HOPEFUL ABOUT THE GOVERNMENT'S AMBITION TO DECARBONISE THE UK ENERGY SYSTEM BY 2035."

working in the low carbon energy industries that we're set to be reliant on – which is welcome news.

But employees in high carbon sectors, aware of the anticipated decline in their industries, are more likely to see the drive to low carbon as a threat to the existence and stability of their job roles. And understandably, this is causing fear and confusion about what the future holds and how to prepare for it.

In fact, our research found that 60% of those surveyed working in high carbon jobs agree that the move to decarbonise the power system will put their job at risk by 2025, compared to just 30% of people working in low carbon jobs.

There are clear barriers to 'decarbonising the workforce'

But the transition of workers from high carbon to low carbon doesn't look set to be that simple. Our research found that there are still a myriad of barriers inhibiting, or even preventing, people from moving from high carbon jobs to low carbon ones. And this threatens to halt the energy transition in its tracks.

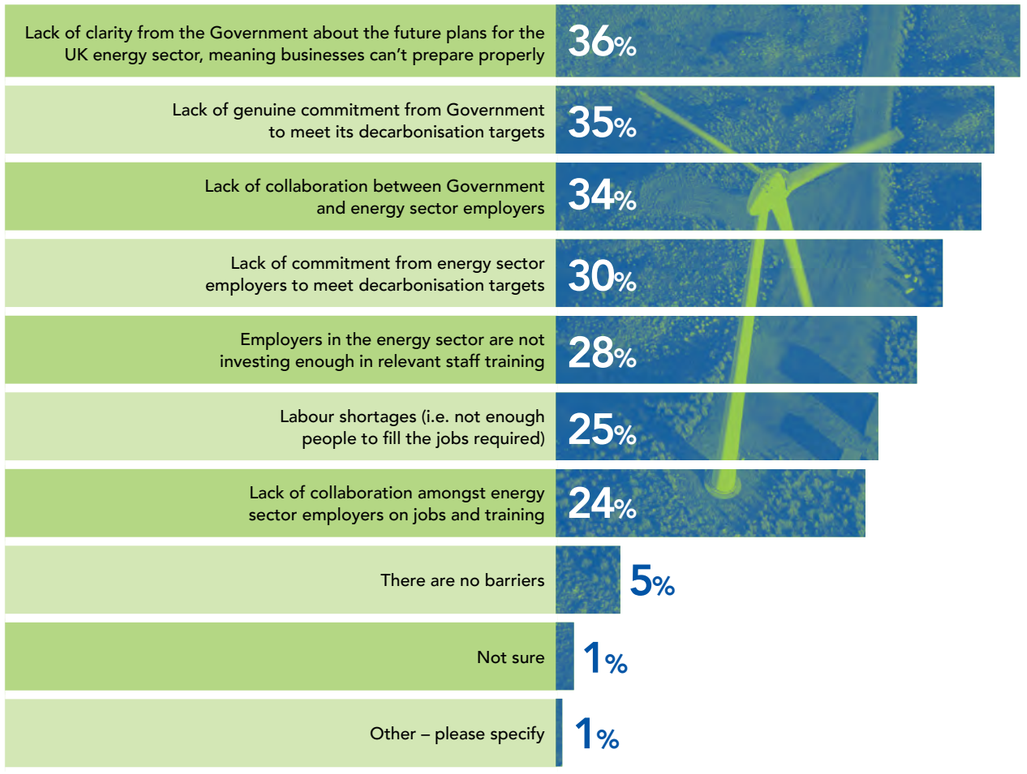
The barriers

Lack of understanding around what decarbonisation really means

Worryingly, one quarter (25%) of those surveyed working in the energy sector don't have a clear understanding of what decarbonising the power system will involve. This rises to 30% amongst high carbon energy sector workers.

There's clearly a large cohort of energy workers still unfamiliar with what decarbonisation really means. This suggests that a lack of understanding might be holding people back from engaging with the energy transition – and as a result could be holding people back from upskilling and transitioning into low carbon energy roles.

What are the biggest barriers to the energy sector meeting the Government`s target to decarbonise the UK power system by 2035?



Financial fears are front of mind

With the cost of living and rising energy costs still front of mind for workers across the UK, fears around finances have never been higher. And this is a key consideration that could prevent people from switching careers.

Our research found that nearly half of high carbon energy sector workers (49%) surveyed are worried that if they moved to work in another sector, they'd be paid less than they are now.

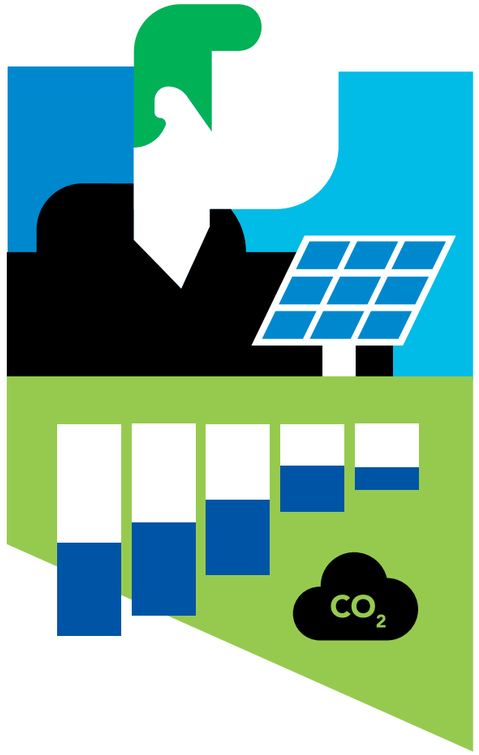
Insufficient training provision holding people back

Only a third (33%) of energy workers think they have the skills they need to succeed in meeting the future demands of the energy sector, meaning two thirds (67%) do not or are unsure if they do. Meanwhile, almost a third (29%) of energy sector employees agree that their employers are not investing enough in the future skills required to decarbonise the energy sector. This rises to 33% of those working in high carbon jobs.

On top of this, only a quarter (26%) of energy sector workers have received job specific training, such as technical, digital skills or health and safety training to help with day-to-day work within the last year. And this drops down to 19% of those in the high carbon sectors, who are the ones most at risk of displacement in the future.

And, when it comes to the training needed to transition to low carbon, employees aren't feeling supported. In fact, just 22% of workers stated that they had received training to support the switch to low carbon jobs in the last year and this dropped to 16% of those working in high carbon energy jobs. More than 10% state that they have never received training in this area.

"JUST 22% OF WORKERS STATED THAT THEY HAD RECEIVED TRAINING TO SUPPORT THE SWITCH TO LOW CARBON JOBS IN THE LAST YEAR AND THIS DROPPED TO 16% OF THOSE WORKING IN HIGH CARBON ENERGY JOBS."



Training is deemed inaccessible

In addition, energy sector workers don't always know how to access training. A quarter of energy sector employees (26%) reported that they don't know how to access training that will allow them to adapt to future changes in the industry.

A lack of time is a key challenge, with almost a quarter (24%) saying they do not have the time to access training that will allow them to adapt to future changes in the industry.

And where training isn't subsidised by employers, many energy sector employees perceive that there are financial barriers, with nearly a third (31%) saying they can't afford to pay for training.

Lack of support from Government and industry hindering progression

Crucially, our data points to the fact that Government and industry will need to work together to deliver on commitments to drive the

energy transition and create more low carbon energy job opportunities. But many employees feel that there is a lack of clarity, commitment and collaboration – which in turn could prevent people and employers from investing in all important training and upskilling.

Our research found that only 42% of energy industry employees surveyed believe that the Government is sufficiently supporting the sector to meet its net-zero targets, meaning well over half (58%) do not or are unsure.

And, when asked to name the top three barriers to meeting the 2035 deadline to decarbonise the UK energy system, the biggest barrier was thought to be a lack of clarity from the Government regarding future plans for the UK energy sector (36%). The second biggest barrier was thought to be a lack of genuine commitment from the Government to decarbonise the sector (35%).

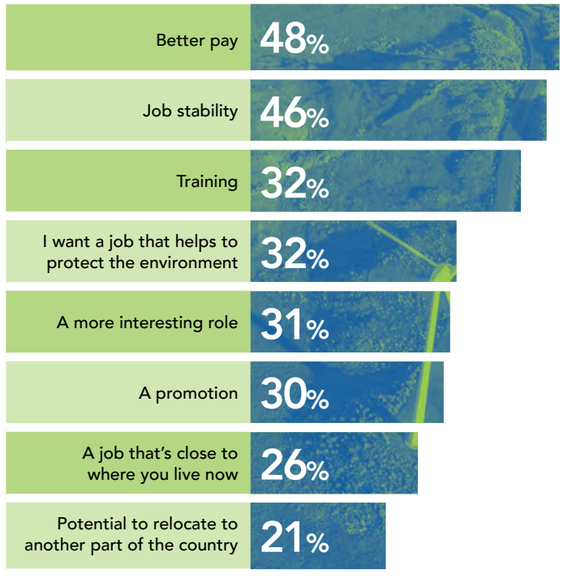
Employees expect more of their employers as well, citing a lack of commitment from energy sector employers when it comes to decarbonisation (30%). On top of this, 34% think that a lack of collaboration between Government and the energy industry is hindering progression. And only just over half (52%) think that their own business is on track to meet the 2035 decarbonisation target, meaning almost half (48%) do not or are unsure.

"ONLY A QUARTER (26%) OF ENERGY SECTOR WORKERS HAVE RECEIVED JOB SPECIFIC TRAINING, SUCH AS TECHNICAL, DIGITAL SKILLS OR HEALTH AND SAFETY TRAINING TO HELP WITH DAY-TO-DAY WORK WITHIN THE LAST YEAR."

What would help you to consider a role in the low carbon energy sector?

Our research found that there are several pull factors that would motivate current energy sector employees to consider a role in low carbon energy. The data shows that better pay and job stability opportunities could be the most powerful factors for employers to lean on when advertising roles in the sector. However, training and the positive environmental impact of the role are also very important for candidates.

When it comes to location, it's clear that people are drawn either way. A quarter of workers are keen to stay in their local area where they have laid down roots, whereas a fifth would be tempted to relocate for work.



A change of perspective

Nick Worpole
Associate Director EMEA at Spencer Ogden, a global energy and infrastructure recruitment firm

There is a huge opportunity for workers in oil and gas industries to transfer their skills and experience to low carbon energy industries. But not all employers recognise this potential. And this is not only holding back candidates from moving across to roles in low carbon energy, but it's also preventing employers from recruiting the skilled people they need.

If we look at the hydrogen industry for instance, there is a clear link between the skills and experience required to manage industrial gas and those required for managing hydrogen. But many employers in hydrogen are still not taking advantage of these transferrable skills, instead looking for people who have specific hydrogen experience on their CV. But, given green hydrogen is a new and growing industry, it's hard to find people with that direct experience.

As well as the requirement for relevant industry experience, the need to have the right training and qualifications can present a huge financial barrier to candidates looking to transfer from high to low carbon energy industries. For example, in offshore wind, many employers expect candidates to already have specific qualifications under their belt. But these can cost several thousands of pounds, and candidates have to pay their own way.

There is talent to be snapped up by employers. Brexit has made it harder for UK nationals to work abroad, so there are many candidates with UK oil and gas experience who are here in the UK, ready for work.

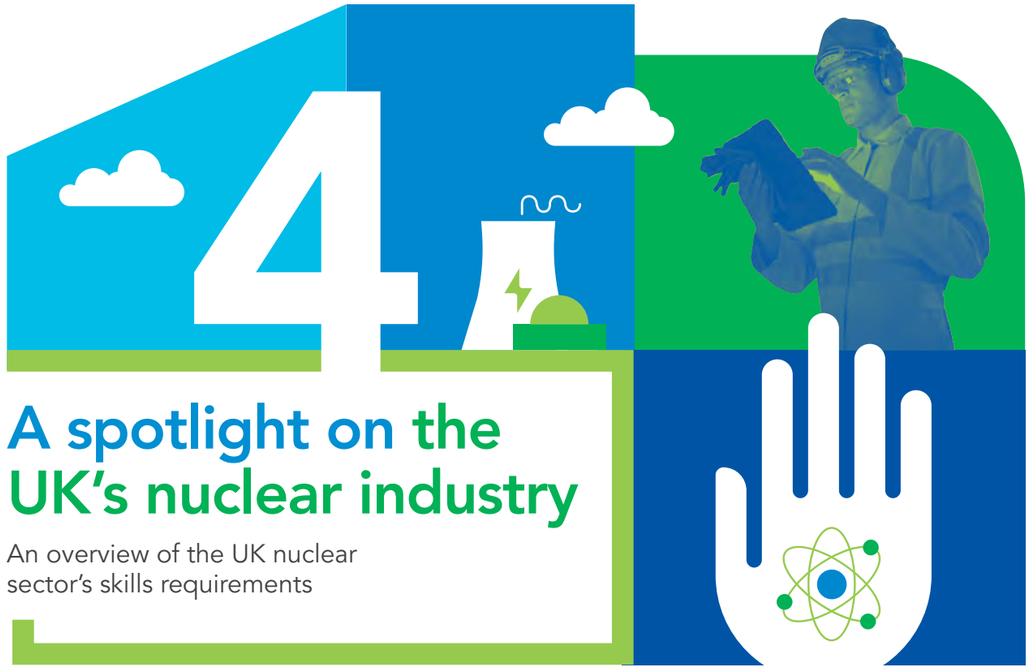
Many of the skills and qualifications employees already possess from working in high carbon sectors are transferrable

But, as the need for talent in low carbon energy grows, recruiting for the future energy workforce can't be a box ticking exercise.

Employers in low carbon industries need to change their perspective and recognise that many of the skills and qualifications employees already possess from working in high carbon sectors are transferrable and provide the basis for a successful career in low carbon – of course with the appropriate top-up training and support.

If they're to solve immediate and longer-term skills shortages, employers will need to take advantage of the huge wealth of knowledge, skills and experience that workers can transfer across from high carbon energy sectors. And they should offer opportunities for candidates to upskill and get key qualifications as part of their onboarding.

SPENCER OGDEN



4 A spotlight on the UK's nuclear industry

An overview of the UK nuclear sector's skills requirements

There is already a demand for skills in the nuclear industry, with a range of job opportunities on offer. According to the National College for Nuclear the most in demand jobs for this sector by subcategory are as follows:

Nuclear Power and Networks

- Tunnelers
- Civil and Structural Engineers
- Welder
- HS – Rad Protection
- Generation

Nuclear - Infrastructure

- Tunnelers
- Civil and Structural Engineers
- Welder
- HS – Rad Protection
- Generation
- Project planning and control
- Quality Assurance
- Safety Case Preparation
- Commissioning Engineers
- Mechanical, electrical and heating and ventilation works
- Nuclear engineers
- Mechanical engineers
- IT and telecoms
- MEH (Mechanical, electrical and heating and ventilation works)

More commitment needed

Digging into our research findings for nuclear industry employees* specifically, it's positive to see that most think their business is on track to meet the target to decarbonise energy by 2035 (63%). However, they are not confident that the Government is doing enough – over one third (38%) don't believe the Government is sufficiently supporting the energy sector to meet this target.

While there is huge potential, there is still a lot of uncertainty over the timings of nuclear projects, as well as concern that the industry is lacking the workforce it needs both for the short and longer term.

Only 38% of nuclear workers say they personally have the skills they need to adapt to any future changes in the energy industry, and the same number (38%) feel that their business lacks the skilled people needed to keep up with industry changes over the next 12 years. It's no surprise then that 78% of nuclear workers say more needs to be done to attract people to work in nuclear energy sector jobs, more than any other energy subsector.

Data from this section is based on a small pool of respondents (only 32 respondents surveyed were working within the nuclear power sector, with 50 minimum being optimal for a representative sample) which is therefore not considered statistically significant. These findings have been included as an interest point only and must not be taken as representative for this group at large.

A need for growth

Donna Connor
Strategic Partnership Director at the National College for Nuclear:

According to data compiled by the World Nuclear Association[i], the UK generates about 15% of its electricity from about 6.5 gigawatts (GW) of nuclear capacity, but this is set to increase. Indeed, nuclear is a key part of the UK's energy security strategy, and Government plans call for up to 24GW of new nuclear capacity by 2050 to provide about 25% of the UK's electricity. This points to an imminent need to substantially grow our nuclear provision – and the workforce – in order to meet the demand forecast for the coming decades.

Whilst most existing nuclear plants are set to be decommissioned by the end of this decade, the first of a new generation of nuclear plants is already under construction. In the short term, this means that there will be increased demand for workers to support decommissioning. By 2028, all seven of the UK's Advanced Gas-cool Reactors (a type of nuclear reactor) are expected to have ended power generation and be at various stages of decommissioning. However, as new plants are commissioned, there will be an increased requirement for workers to construct and operate these plants.

There are several challenges to recruiting and attracting talent to the nuclear sector. First, geographical siting of nuclear plants makes it more difficult to attract the skilled workers that are needed to safely operate our sites. That includes competing for the same scarce nuclear specialisms across the sector, as well as the invaluable logistic and generic support roles that are critical to keep the industry going, from catering and hospitality to earthwork operatives, steel fixers, crane and lifting operatives, concrete operatives, carpenters and even bus drivers.

In terms of attracting Science Technology Engineering and Maths (STEM) talent to nuclear industry roles, another challenge is that there is strong competition from other major infrastructure projects that are also looking for skilled engineers, project management and control, and Health and Safety resources, which are all short in supply now.

Attracting a more diverse workforce is key to meeting our skills shortages. To do this, we need to educate our future skills pipeline – from school age – about nuclear, the vast number of roles available, and what an exciting and rewarding career it offers. As part of this, we need to bust the myth that you must have nuclear knowledge and experience to enter our sector. In fact, only very niche roles require an in-depth insight, and many roles are transferable from one industry to another.

Importantly, as a result of the anticipated increase in demand for skilled individuals to support the growth in the nuclear sector, there are now concerns around the resilience of the educational sectors' capability and capacity to meet this demand. It's expected that the recruitment of staff to teach nuclear-specific content will be especially challenging.

NATIONAL COLLEGE FOR NUCLEAR

Collaboration in Cumbria

As the home of Sellafield – one of Europe's largest industrial complexes – the nuclear industry in Cumbria is facing a problem: there are more jobs than there are skilled people to fill them. And it's not the only energy sector or region facing shortages, meaning they are competing for talent on a national scale. This persists even as decommissioning at Sellafield begins ramping down, since there are other new projects on the horizon, with sites in the region lined up for potential industrial development for Small Modular Reactors and Nuclear Fusion Reactors.

Here, training providers play a key role in building the skilled talent pipeline the industry requires. But there is a huge amount of competition in the local skills system as well, with colleges competing for the same young talent, and the same small pool of tutors.

To effectively help solve these skills shortages, local education providers and industry have realised that they need to break the mould. They need to collaborate, rather than compete, and work together to deliver an end-to-end learning journey.

Cumbria Chambers of Commerce:

Suzanne Caldwell
Managing Director at Cumbria Chambers of Commerce:

The work of Cumbrian stakeholders on our Local Skills Improvement Plan makes the benefits of partnership working abundantly clear. Within the stakeholders there's a range of competitors, not least among employer bodies and between providers. But the task is huge and there's more than enough pie for us all.

Actions being implemented, for example the Skills Hub and Apprenticeship Hubs and shared curriculum development, are already having an impact, as is the great work being done by and coordinated through the Careers Hub. Cooperation through the Work Based Learning Providers Forum is gaining new momentum.

Training providers already find it challenging to recruit and retain trainers with the right skills and experience, with salary differentials a key part of the challenge. Finding enough with the skills for low carbon is likely only to add to the difficulty.

Among the solutions providers are exploring is sharing staff where they don't need someone full-time, and the potential for employers making staff available part-time. There are also opportunities to agree who will focus on what where there's smaller volume demand. And for shared provision, potentially incorporating digital access from various provider premises. Other interesting opportunities for sharing include models where trainees can gain experience in more than one business.

Cumbria
Chamber of Commerce

Energy Coast University Technical College (UTC)

Simon Richardson
Acting Vice Principal:

Post-16 options for students are vast. In the west of Cumbria, students can choose from sixth form, college, apprenticeships and various step-into courses. Many students struggle with the decision and most choose the one which pays the most at the time, as opposed to what will be more beneficial in the future.

Among training providers, there is a rush to gain the most students into post-16 options as opposed to developing an understanding of which pathway is right for which student. This is mainly based on funding. In education, the number of students on seats is the main driver of the funding formula, so providers are competing against each other for the same students, with many courses which are incredibly similar.

With industry backing we could make the providers hubs of certain skills needed. To enable this, post-16 training providers would need security of funding, as well as security from employers that students would not be poached onto an apprenticeship programme until the end of year two.

This type of hub also creates an opportunity to reassess staffing. In the local area, post-16 providers are struggling to recruit the right calibre and quantity of staff to fill vacancies. A more combined approach by those providers – led by employers – would create a structure where the sharing of staff and resources would be more acceptable and, in the long run, better for all involved.

UTC®

Energy Coast UTC is a secondary school with sixth form in Cumbria serving students from the age of 14-19. Situated in Lillyhall, Workington, Energy Coast UTC is a specialist Engineering college and prides itself on its ability to transform the life chances of students through a technically focused education.

Recommendations

City & Guilds recommendations to ensure a brighter future for the energy sector

From speaking to employers, recruiters and industry experts, and thanks to the findings presented in this report, we have identified four core barriers to the effective transition to decarbonisation and net zero.

Here we have set out some clear solutions to these issues that could be taken on board by Government, employers and other education bodies to ensure that employers and employees are receiving the clarity, support, training and encouragement they need to make the road to net zero a success.

So, what can we do?

1 We need stronger policy frameworks that provide commitment and certainty to the market, enabling industry to invest in skills with confidence

Problem:
The issues and solutions we propose in this section cannot be solved until employers, local authorities, local commissioners of services and the skills providers are given confidence and certainty about the future trajectory of the energy sector. Without detailed knowledge about the projects that are planned, where they will be located and exactly when they will happen, employers and regional areas are not able to invest in local growth by training the skilled workforce required. This also has an impact on workers themselves, many of whom are uncertain about what decarbonisation means for their careers.

If not addressed, this lack of clarity risks stalling the decarbonisation of the energy industry and may prevent the UK from meeting net zero targets.

Solution:
We need stronger policy frameworks that provide commitment and certainty to the market, enabling industry to invest in skills with confidence.

Government can lead the charge by providing more certainty about the long-term future direction of the UK's energy industry, working in partnership with business to unlock the skills required to achieve this. We are calling for a green skills roadmap running to 2035 as part of a national strategy for inclusive growth.

To support this, we propose that there should be a joint minister for green skills development across the Department for Education, Department for Business and Trade and Department for Energy Security & Net Zero and HM Treasury to ensure that the right focus and investment is placed upon this agenda and that plans are not created in isolation.

2 Work locally and collaboratively to support levelling up and a just transition

Problem:
There will almost certainly be a regional shift in energy sector jobs. This has huge potential to help levelling up goals, whilst ensuring that the transition is just by creating opportunities for communities. But if the regional impact on jobs and skills is not properly considered, this transformation risks shifting high skill workers around the country whilst leaving some communities behind.

Solutions:

a. We would like to see clear and transparent monitoring of low carbon skills requirements and developments in line with the move to net zero through a government backed annual state of the nation report. This should be aligned with national infrastructure plans and reporting from the National Infrastructure Commission. It should include data on investment and skills gaps across sectors and regions, as well as employer progression towards shifting to green jobs, all set in the context of the wider transition.

This would enable employers to benchmark improvement and give employers and the education sector a better understanding of where investment in larger projects might displace workforces or create competition for specific skills that could further delay progress. This should link into groups already in existence such as the Green Jobs Taskforce.

b. Government should invest in skills hubs and development in the areas that are or will be hotspots for low carbon projects,

such as Yorkshire, Scotland, East Midlands, North East/Humber, Sussex and the North West. This should build on the work already being done as part of Local Skills Improvement Plans (LSIPs) to map local skills, which have a mandate to consider climate and environmental targets.

c. The education sector needs to work effectively with regional bodies and those responsible for LSIPs to identify and develop the skills needed in those geographical areas. For example, in the South East, educational organisations can talk to the Great South East Net Zero Hub to look at things from a regional perspective and see what skills are needed and how that maps against the training that is currently available in the region. There are some pockets of excellence in this regard, but in other geographical areas there is still work to do to ensure the skills demand is identified and met.

There is also an opportunity for the large prime employers to work directly with the education sector to create skills hubs to upskill the local workforce to meet their skills needs in areas with significant civils projects.

3 Invest in skills and lifelong learning

Problem

It's highly possible that the labour market demand for reskilling and retraining in the energy sector could outstrip the current educational infrastructure (i.e. colleges / training providers / in-work training available), creating significant skills shortages in the coming years.

Much more investment in skills and training at the beginning and throughout people's careers will be required to ensure employers can source the home-grown talent that they need. This is especially important as research suggests that the half-life of skills currently sits at 5 years, falling to 2.5 years for more technical skills[i], meanwhile the UK has one of the lowest levels of employer investment into training in Europe.

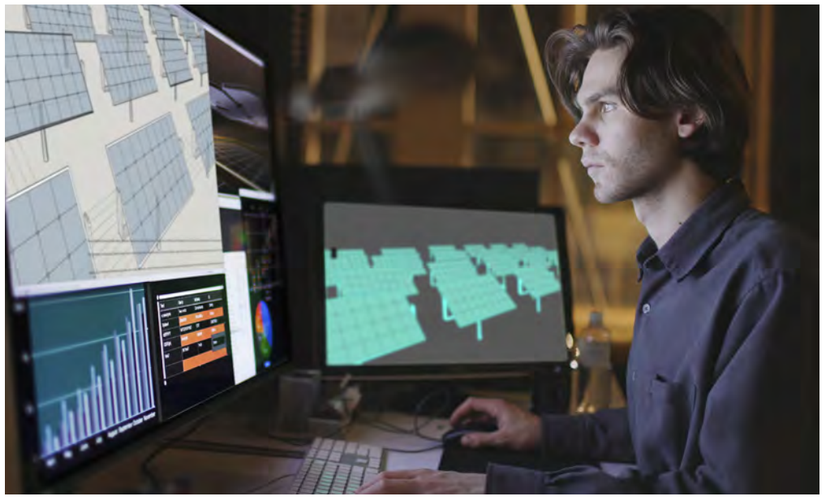
"GOVERNMENT SHOULD INVEST IN SKILLS HUBS AND DEVELOPMENT IN THE AREAS THAT ARE OR WILL BE HOTSPOTS FOR LOW CARBON PROJECTS."

Solutions:

a. Businesses must recognise their role in providing lifelong training pathways to upskill and reskill new or existing employees, and opening their doors to a wider pool of diverse candidates who can be trained up on the job. To support employers, the Government should revisit tax incentives for investing in training and enable more funded flexible learning opportunities to ensure the opportunity to reskill and retrain is available to our existing and emergent talent pools to transition to greener jobs.

b. Government should expand the Lifelong Learning Entitlement (LLE). At the moment, this is only available to qualifications at Level 4 and above, but we need to broaden the availability across more skill levels and offer maintenance support for adult learners at all levels. We would also like to see greater flexibility in the types of courses that can be funded through the LLE to include more bitesize and digital training that allows people to update their skills more easily in high demand areas throughout their careers.

c. Education organisations will need to work with Government and employers to identify and map the brand-new skill sets that are required (for example in hydrogen) and build qualifications / short courses that allow businesses to train their people to do this. And training providers (i.e. FE Colleges / Private Training Providers / University Technical Colleges, Higher Education providers) in regional areas will need to better collaborate with each other more effectively to deliver the skills required to a high standard; this includes exploring concepts such as sharing staff, as exemplified through the work being done by providers and businesses in Cumbria (see page 26).



Businesses should take a more collegiate approach across the sector to developing a stable pipeline of employees

4 Collaborate on skills, training and qualifications to support a robust skills pipeline

Problem:

The system is not set up to enable the efficient transfer of skills and talent from high to low carbon energy industries. It's somewhat of a patchwork situation for skills development in the sector; there is a lack of consistent terminology or standards across qualifications and job profiles that allows people and employers to identify where skills already exist and can be easily transferred.

This means employers and workers often need to spend time and money duplicating training, which is inefficient, expensive, and slows down talent pipelines, exacerbating skills shortages.

Solutions:

a. We need to create a single language for skills across the energy sector that makes it easier for employers and individuals to understand what transferrable skills employees have. This will allow them to more freely move between jobs across the different parts of the energy sector, topping up skills rather than retraining, where necessary. And it will enable businesses to better understand where gaps lie to improve future training and recruitment. This skills taxonomy framework should sit outside of job role titles but be mapped to them.

b. Employers need to take a more collegiate approach across the sector to developing a stable pipeline of employees. Businesses and industry bodies should work together to develop pan-sector training and qualification standards, considering the workforce in the sector as a shared resource to be invested as a pool of talent for the whole of the energy sector. Together, they can not only work to agree sector wide skills terminology, they can also share best practice and learn from one another's transition to net-zero, in order to create a robust skills pipeline for the whole industry.

c. Government and Employers should also work with awarding bodies to create the qualifications, training and standards required to train up workers and give confidence to markets that the transition to greener jobs is enabled through high quality skills transfer approaches.

Getting this right could enable huge efficiencies, help get people into jobs more quickly and support employers to plug critical skills shortages. ECITB's Connected Competence (see page 14) initiative, which looks at base technical competencies in the engineering and construction industries, is a good example of this collaboration already in action in another industry.

We are a member of a number of policy-making forums that help to influence net zero policy, such as the Net Zero APPG

Our Commitments

At City & Guilds we are aware of our responsibility in enabling and supporting the transition to low carbon energy. We are engaged and ready to collaborate with industry and government to ensure individuals, communities and businesses are equipped with the skills they need to succeed in the future, and support the whole energy industry to meet the UK's net zero targets.

- We have developed new qualifications in EV Charging and retrofitting to meet the future skills need in these areas. We have also developed a suite of sustainability qualifications aimed at developing awareness amongst senior managers with an nvironmental, Social and Governance (ESG) responsibility in their organisations.

- We are embarking on a programme to map and roadmap low carbon skills development that address both the current skills needs of the burgeoning green economy and the anticipated needs arising from new technologies and sectors

- We have been working with various organisations and businesses in the energy sector to develop and run clean energy skills pilots in regions across the country.

- We are a member of a number of policy-making forums that help to influence net zero policy, such as the Net Zero APPG.

- Our research led campaigning work to encourage a diverse range of workers to consider careers in industries such as the energy sector. Recent examples include;
  - Great Jobs, which explored why so many groups of people were reluctant to do the jobs that are essential to keeping the UK running and made recommendations for how industries could address this.
  - Youth Misspent which explored the barriers that young people face to the jobs market and made recommendations to industries to make their workplaces more accessible.

- We have provided bursaries for people who faced barriers to the workplace to receive training to allow them to work as EV charging installers.

- We have made a series of investments in businesses that will play a key role in support the decarbonisation of the energy sector and the road to net zero, more broadly:
  - We acquired Gen2 in 2017, which is the largest training provider to the UK civil nuclear industry, working with over 250 employers – including the likes of Sellafield Ltd, Iggesund, and British Steel – across its six sites in Cumbria.
  - We acquired Trade Skills 4U (TS4U) in 2022, which is one of the leading training providers in the field of electrical engineering.

City & Guilds

About City & Guilds

City & Guilds is the global skills partner, empowering people, organisations and economies to develop the skills they need for growth. With almost 150 years of trusted expertise, we support people into work, help them develop on the job and move into the next job.

We work with Governments, employers, training providers, colleges and industry stakeholders to design and deliver high-quality training, qualifications, assessments and credentials that lead to meaningful career progression. We understand the life changing link between skills development, social mobility and success. Our solutions span critical sectors including construction, engineering, transport, energy and electrical, serving over 1 million learners annually.

Through our comprehensive portfolio of brands and trusted global network, we set industry-wide standards for technical, behavioural and commercial skills to improve performance and productivity. We believe you can achieve your potential - and we're here to help make it happen.

Our City & Guilds Foundation activities amplify our purpose by helping to remove barriers to getting into a job, celebrating best practice on the job, and advocating for jobs of the future.

The City & Guilds community of brands includes Gen2, ILM, Intertrain, Kineo and The Oxford Group.

EngineeringUK

About EngineeringUK

EngineeringUK is a not-for-profit with the ambition to enable more young people from all backgrounds to be informed, inspired and progress into engineering and technology.

Working in partnership to inspire more young people from a greater range of backgrounds to pursue the exciting career opportunities in modern engineering and technology is at the heart of EngineeringUK's purpose. Collaboration is essential to reach our long-term vision: that the UK has the workforce needed for engineering and technology to thrive, to improve sustainability and to achieve net zero. We base everything we do on evidence and share our insight widely.

EngineeringUK leads engagement programmes including The Big Bang, creates careers resources and helps schools bring STEM to life through real-world engineering via Neon. We manage The Tomorrow's Engineers Code, which drives change at scale to increase the number and diversity of young people choosing academic and vocational pathways into engineering.

Lightcast

About Lightcast

Lightcast is the world's leading authority on job skills, workforce talent, and labour market dynamics, providing expertise that empowers businesses, education providers, and Governments to find the skills and talent they need and enables workers to unlock new career opportunities.

Lightcast market research, analytical software, and data expertise is used by companies across the globe to better understand their own workforce and identify skilled and diverse talent for future growth. The company also guides colleges and universities in connecting their programmes to the needs of the local labour market and advises Government entities in creating more effective programmes for economic prosperity.

Headquartered in Boston, Massachusetts, and Moscow, Idaho, Lightcast is active in more than 30 countries and has offices in the United Kingdom, Italy, New Zealand, Canada, and India. The company is backed by global private equity leader KKR.

Methodology

Market research was conducted by Censuswide, on behalf of City & Guilds. Fieldwork was undertaken between 28th April and 4th May 2023 amongst 1,003 Renewable and Fossil Fuel workers in the energy sector (Aged 18+). Respondents must not work in admin / support departments and must have a technical role in either high carbon or low carbon energy production (501 low carbon and 502 high carbon).

Energy subsectors defined as high carbon: Coal, Oil, Natural gas, Electricity (non-renewable), other high carbon. Energy subsectors defined as low carbon: Offshore wind, Onshore wind, Solar, Hydropower, Other renewable electricity, Carbon capture and storage, Nuclear power, Electricity (renewable), other low carbon.

Lightcast CoreLMI data was used to estimate the number of jobs within the energy sector (defined by using SIC codes). The job postings and skills analysis was conducted using Lightcast job postings data. Lightcast Skills Taxonomy was used to identify high carbon and low carbon jobs. Any job postings requiring a high carbon skill - either related to 'Oil and Gas' or to 'Natural Gas' was classified as 'high-carbon'. Any job postings requiring a 'low carbon' skill - defined as a skills related to 'Wind energy', 'Water energy, 'Clean energy', 'Nuclear energy' or 'Solar energy' - was classified as a low carbon job.

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[1] Place-based Climate Action Network (PCAN), Just Transition Jobs Tracker (2021)
[2] Industrial Strategy Council, UK Skills Mismatch in 2030 (published October 2019)
[3] Department for Energy Security and Net Zero and Department for Business, Energy & Industrial Strategy, Net Zero Strategy: Build Back Greener (published October 2021)
[4] National Grid, Building the Net Zero Energy Workforce (published January 2020)
[5] PWC, Energy transition will be constrained by green skills gap of c.200,000 workers - PwC Green Jobs Barometer (published August 2022)
[6] Climate Change Committee, Net Zero offers real 'levelling up', but Government must get behind green jobs

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