nationalgrid

Building the skills for our energy future:

Delivering opportunities for all

August 2025

Executive summary

People and skills are at the heart of a successful, growing economy. Industry and government must collectively redouble efforts to strengthen the UK's skills capacity in the face of an increasingly competitive global market. Ultimately, this will provide secure job opportunities and a pipeline of homegrown talent across the economy, including electricity networks and the wider energy industry.

Access to secure, affordable and clean energy is foundational to unlocking UK growth, productivity and competitiveness. Electricity networks underpin these ambitions, with delivery of unprecedented levels of investment planned by the end of the decade. Collectively, however, we face a shortage of experienced people with the critical skills needed to deliver this new infrastructure.

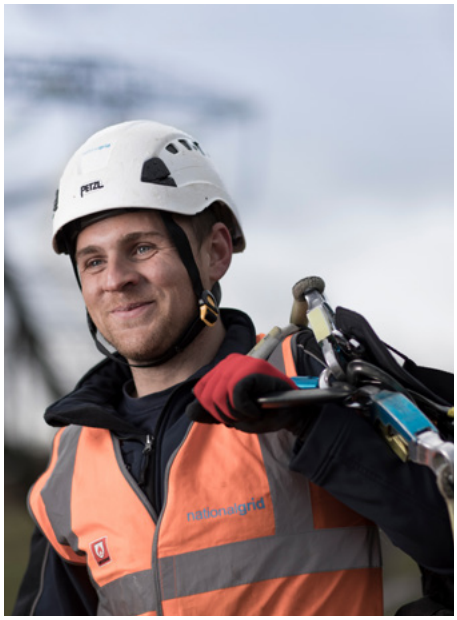
At National Grid, we have already made significant strides, working closely with our supply chain partners and wider business community, the education and skills sector, and trade unions, to start to build the workforce needed to deliver the largest overhaul of the grid in generations. And we have ambitious plans to do more.

But this should not be an individual sector endeavour. Government and Ofgem are uniquely positioned to complement action taken by industry at every step of the workforce lifecycle.

Delivering a cohesive and strategic approach to the skills needed for the energy system of the future will be crucial for reaching both the UK's growth and clean power goals. When thinking about what implementation of such a strategy should look like, the focus should be on:

1. **Getting the basics right.** Understanding the scale and scope of the skills gap, whilst also ensuring that there are clear roles and accountabilities for skills delivery across government bodies.
2. **Targeted interventions that aim to maximise investment in people and training facilities,** supporting industry's ongoing efforts to recruit, retain and retrain talent.
3. **Unlocking opportunities for future generations through an ambitious curriculum** which focuses on applied STEM learning in schools.

Everyone, everywhere, should have the opportunity to access a career in clean energy, and our industry should reflect the diverse communities that we seek to serve. **Taking collective action now will provide the foundations for skilled, well-paid and secure jobs across every nation and region of the UK, for decades to come.**



Summary of actions and recommendations

A cohesive and strategic approach will unlock the workforce and skills needed to deliver the UK's ambition for secure, affordable and clean energy, while driving economic growth. Building a pipeline of homegrown talent – across electricity networks, the supply chain, and the wider energy sector – requires decisive action from industry, government and Ofgem. This approach should complement the cross-sectoral skills initiatives in the Industrial Strategy, and connect the dots between Government missions and departments, local government, and the various arms-length independent bodies with responsibilities for skills and jobs. This document sets out targeted steps to deliver on such an ambition, focusing on three strategic 'pillars' where action is required.

1. Identify and prioritise roles, competencies and skills for the future energy system

What National Grid is doing:
- Developing long-term Strategic Workforce Plans.

Priority actions for Government:
- Publish updated analysis by the end of the year that identifies the energy roles and skills required to deliver the UK's growth and clean power ambitions, along with current and forecast workforce shortages.
- Clarify roles, accountabilities, and governance structures for the various bodies involved with the delivery of the UK's future energy workforce.

2. Recruit, retain and retrain a homegrown skills pipeline

What National Grid is doing:
- Recruiting over 2,300 graduates and apprentices across our UK business over the next five years.
- Exploring new training approaches to adopt emerging skills and safely reduce accreditation times.
- Working with industry partners to build standard occupational competency maps for critical roles.
- Enhancing end-to-end career pathways to support professionals to return to work after a career break.

Priority actions for Government:
- Ensure the Growth and Skills Levy enables an increase in the take-up of apprenticeships by making qualification routes more accessible.
- Introduce more flexibility into apprenticeship standards, and prioritise funding for high-quality, short training courses in the energy sector.
- Expand the National Wealth Fund's remit to co-invest, alongside industry and educational institutions, in high-quality, and innovative, technical training facilities.

Priority action for Ofgem:
- Ensure the regulatory framework supports the required growth in the electricity network workforce.

3. Unlock opportunities for future generations

What National Grid is doing:
- Partnering with STEM education outreach initiatives that serve primary and secondary schools in our service area.
- Opening up new career pathways for individuals who don't meet the traditional GCSE requirements for apprenticeships.
- Providing supported work placements for students with additional educational needs and disabilities.

Priority actions for Government:
- Establish a comprehensive strategy for STEM skills across Key Stages 1 – 4, to expose children to engineering and technology learning opportunities from a young age.
- Work with industry to drive public awareness and accessibility of careers in the energy sector.

Case for action

Networks are at the heart of the UK's growth and security ambitions. Not only is our energy use as a country rising dramatically – with demand for electricity expected to more than double by 2050[1] – our methods of generating power are changing and increasing significantly in volume. Networks are also critical for connecting the demand that drives economic growth and enabling the industries of the future, such as AI and data centres. To make these ambitions a reality, National Grid is embarking on the largest transformation of the electricity network in generations, investing over £30 billion in England and Wales over the five years to 2029.

At the same time, a loss of existing talent through retirement, competition with other sectors, a lack of diversity and sector accessibility, and a diminishing pipeline of people taking up engineering and related subjects are contributing to a growing skills 'capacity crunch'.

Over the five years to 2029 **National Grid** will be **investing over £30 billion** to upgrade our electricity networks across England and Wales.

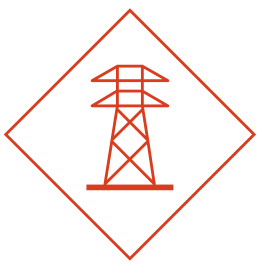
Urgent business, policy and regulatory interventions are required to produce a pipeline of homegrown talent – across electricity networks and their supply chain, the broader clean energy industry, and the wider UK economy. This includes specialist roles such as Overhead Lineworkers, commissioning engineers, and cable jointers, along with a swathe of generalist roles, from project managers to cyber professionals [see Table 1].

Table 1

Critical workforce shortages*

Electricity network specific roles:	General infrastructure roles:
• Overhead Lineworkers • Substation fitters • Cable jointers • HVDC engineers • Flexibility engineers • Protection and control engineers • Transmission engineers • Commissioning engineers • Infrastructure designers (mechanical and electrical, power systems and civil engineers)	• Project management professionals (project managers, planners, site managers, quantity surveyors, project controls, risk, estimating) • Offshore engineering specialists • Civil labour • Cyber professionals • Wayleaves specialists

*list not exhaustive



National Grid's investment is expected to support **55,000 more UK jobs** by the end of the decade[2].

Although this represents a significant challenge, if we work collaboratively to overcome it and achieve the UK's growth and security goals, there is a significant prize to be won. National Grid's investment is expected to support 55,000 more UK jobs by the end of the decade[2]. Decarbonisation of the economy more broadly presents a huge opportunity to unlock hundreds of thousands[3] of new secure, well-paid and purpose-led jobs across the country.

Next steps towards securing the energy workforce of the future

At National Grid, we have already made significant strides, working closely with our supply chain partners, the education and skills sector, third sector organisations, and trade unions, to start building the workforce needed to deliver the largest overhaul of the grid in generations. And we have ambitious plans to do more. Government and Ofgem are also uniquely placed to complement action taken by industry at every step of the workforce lifecycle, and recent interventions are already resulting in positive outcomes.

Providing confidence to invest, through long term policy certainty and strategic planning

Long term certainty, visibility, and strategic planning enables electricity networks and our supply chains to plan effectively and have the confidence to invest in the workforce. For example, the development of the Accelerated Strategic Transmission Investment (ASTI) framework by Ofgem enabled National Grid to create a strategic enterprise with our supply chain – the Great Grid Partnership. This will support supply chain capacity and drive investment in skills, ultimately delivering benefits for consumers and the wider UK economy [see Table 2].

Looking ahead, the development of a Centralised Strategic Network Plan (CSNP) and a Strategic Spatial Energy Plan (SSEP) will provide further long term policy certainty.

Driving better outcomes and opportunities through industry collaboration

In order to secure supply chain capacity for the next decade, National Grid is working jointly with supply chain partners and asset owners with the aim of furthering sector collaboration to speed up the attraction, development and retention of talent into critical roles, particularly those with a protracted time to competence. This 'Electricity Transmission Industry Skills & Workforce Planning programme' seeks to align industry on defining and standardising competencies, career paths, and accelerated training for key disciplines. The intention is to expand the initiative to include electricity distribution networks in due course.

Table 2

The commitment and foresight of future work that the Great Grid Partnership has given to the supply chain has provided partners with the confidence to invest, or increase investment, in their training facilities.

- £30m investment by Murphy to create a new Overhead Line (OHL), High Voltage (HV) cable installation and HV substation training facility in Ollerton, Nottinghamshire which will be operational early 2027.
- Omexom Taylor Woodrow have invested in a new institute in Castleford, West Yorkshire covering a range of skills and offering an indoor substation, training towers, Extra High Voltage (EHV) cable containment, and a state-of-the-art Virtual Reality (VR) suite.
- In 2024, the Morgan Sindall Infrastructure Energy business unit launched an OHL training centre in Swynnerton, Staffordshire. Since opening, the training centre has provided more than 20,000 training hours to over 200 people, including supply chain partners.

Collaborating to deliver a skills strategy for the energy system of the future

The following sections set out targeted steps to deliver an energy skills strategy, focusing on three strategic 'pillars':

- Identify and prioritise roles, competencies and skills for the future energy system;
- Recruit, retain and retrain a homegrown skills pipeline;
- Unlock opportunities for future generations.

Contained within these pillars are eight policy and regulatory measures that could have a significant impact in addressing critical workforce challenges, supporting and accelerating the work already being undertaken by National Grid in collaboration with industry and other delivery partners.

Pillar 1

Identify and prioritise roles, competencies and skills for the future energy system

Understanding the true scale and detail of the skills challenge is the essential foundation for UK skills policy making. While the Clean Power 2030 Action Plan[4] provided a helpful step forward in providing a static view of clean energy sector skills demand and supply over the next decade, this needs to be a dynamic process of evidence gathering, with stronger alignment to strategic outcomes. Ultimately, better quality data across key UK industrial sectors, including clean energy, transport, defence, manufacturing and construction – which require similar skillsets for delivery – will drive a holistic, and strategic, approach to skills policy. Institutional accountability for driving forward a skills strategy, with prioritisation of well-paid jobs in high-growth sectors, including those in clean energy, will also be vital for success.

Action taken by National Grid

Developing long-term strategic workforce plans

Given the expected step change in network build in the coming years, National Grid has embraced the latest workforce forecasting methodologies, adopting a dynamic approach to develop a 'Strategic Workforce Plan' (SWP), which has provided us with a clearer understanding of both the growth and critical role challenges we will face in the future. Long term policy certainty, project visibility, and strategic planning will also enable electricity networks and our supply chains to plan effectively and have the confidence to invest in the future energy workforce.

Key action needed from Government

1. Publish updated analysis by the end of the year that identifies the energy roles and skills required to deliver the UK's growth and clean power ambitions, along with current and forecast workforce shortages

DESNZ is well placed to bring together the wider UK energy industry and its supply chain, supported by the proposed Labour Market Evidence Group (LMEG), to develop a holistic view of workforce needs, and current supply, out to 2030 and beyond. To provide enduring benefit, this data collection exercise needs to be dynamic, and based on up-to-date policy assumptions. A detailed gap analysis should aim to take a view of evolving specialist and generalist industry needs, and, crucially, it should be updated over time to reflect both the forthcoming SSEP and the CSNP. New analysis would require a coordinated approach with combined authorities and devolved administrations, as well as consultation with trade unions. This will ensure both national and local growth plans are accounted for when mapping geographic-based skills supply and demand.

Ultimately, robust workforce data would provide a baseline with which to track successful outputs from an energy skills strategy, helping to inform timely and effective policy and regulatory interventions [see Table 3].

2. Clarify roles, accountabilities, and governance structures for the various bodies involved with the delivery of the UK's future energy workforce

There are multiple government bodies and groups, including Skills England, the DESNZ Clean Power Unit and Office for Clean Energy Jobs, the Industrial Strategy Advisory Council, and the Migration Advisory Committee, alongside devolved administrations and combined authorities, who have responsibility in some form for skills policy and delivery. Getting the institutional architecture right will be crucial for the development and implementation of a coherent energy skills strategy, and the skills initiatives set out more broadly in the Industrial Strategy. In particular, Skills England needs to set out, at pace, a roadmap for how it intends to support the delivery of the future energy workforce.

Building on the newly announced partnership between Skills England and local and combined authorities, the UK Government should also work with the devolved administrations to establish a joint 'four nations skills framework'. This would remove unnecessary duplication or silos and ensure an aligned approach to skills that are critical to national economic growth, while respecting devolved accountabilities and powers.

Table 3

A 'live' view of key skills constraints could, where relevant, inform the Migration Advisory Committee's work in relation to occupational visas (including for engineering roles). While industry continues to invest in the domestic workforce, overseas talent will continue to play an important role in the energy industry and its supply chain in the short-medium term. Temporary flexibility in the UK's visa policy would help to address specific gaps in experienced talent; supporting both project delivery and on-the-job mentoring for apprentices and graduates starting out in their career in safety-critical environments.

Pillar 2

Recruit, retain and retrain a homegrown skills pipeline

New approaches to recruitment, retention and retraining are needed to tackle the twin challenges of growth and attrition in the energy sector.

Over the last five years, apprenticeships in Engineering and Manufacturing Technologies have fallen by around 12%[5]. More must be done to maximise appeal and take up of apprenticeships, which will play a crucial role in creating a resilient and cleaner energy system.

At the same time, we have an ageing workforce, with long lead times for training to backfill roles. Throughout the 2020s, it is estimated that, in total, one fifth of people working in the UK energy sector will retire by 2030 as the 'Baby Boomer' generation reaches pensionable age[6]. Many of the critical roles identified in this report take several years of professional experience and further study to reach full competency, or the level of 'Senior Authorised Person' (SAP), with responsibility for ensuring the safe operation of high voltage (HV) equipment and systems on site.

Ensuring that we have a pipeline of talent to deliver the clean energy transition is only one side of the coin; more also needs to be done to counter chronic underinvestment in both people and capital resources across the Further Education and technical training landscape.

Action taken by National Grid

Supporting talent through our Early Careers development programmes

At National Grid, we have more than doubled our new entry programme in the last five years. Over the next five years, we will recruit more than 2,300 graduates and apprentices across our UK business. Our world-class residential training centre in Eakring, Nottinghamshire achieved the status of being the first UK apprenticeship provider to be rated 'Outstanding' on three consecutive inspections by Ofsted. This one-of-a-kind facility is a central part of our training proposition, along with dedicated operational and technical training centres in Taunton in Somerset and Tipton in the West Midlands.

Exploring new training approaches to address emerging skills and create future leaders

To ensure our training addresses crucial skills shortages at pace, National Grid has led accelerated development of new national apprenticeship frameworks to augment traditional engineering skills with High-Voltage Direct Current (HVDC), digital and cyber skills. We are also rethinking training and accreditation processes to reduce the time to competence, while maintaining the highest safety standards. These new approaches are supporting a pilot project which aims to halve the time to accreditation for Senior Authorised Person roles (the person responsible for safety for all those working on our sites) to one year.

Working with industry partners to pilot new ways to maximise transferable skills

National Grid is playing a leading role in bringing together the UK power sector, our collective large supply chain contractors, and industry organisation Energy & Utility Skills, to build standard occupational competency maps aligned to an independently managed 'skills passport' framework for Overhead Lineworkers. This will enable greater transparency of both skills and experience, mitigating the need for unnecessary retraining as individuals move between companies. This process will also serve to enable the safe transition of individuals from other sectors with similar skills and competencies. The aim is to expand the pilot scheme to other technical roles in the future.

Enhancing end-to-end career pathways

National Grid has partnered with STEM Returners, an organisation which, among other initiatives, aims to help professionals return to work after a career break, through training and employment opportunities in the energy sector. National Grid's Returner programme provides practical routes to re-skill or upskill on the job, allowing individuals to be reintegrated into an inclusive environment on their return to STEM (science, technology, engineering and mathematics) roles. The structured placement programme provides additional support which includes access to coaching, mentoring, and a wider support network. 43% of the individuals who joined National Grid's programme were female, which compares to 25.2% of the total UK workforce of core-STEM employees. Since it was piloted, 12 returners have joined National Grid's programme, with 10 of those individuals being made permanent after its completion.

Key actions needed from Government

3. Ensure the Growth and Skills Levy enables an increase in the take-up of apprenticeships by making qualification routes more accessible

Industry and Government need to work hand-in-hand to increase entry level (Level 2 and 3) apprenticeships, working in partnership with training providers to maximise appeal and take-up. Alongside the full establishment of Skills England, reforms to apprenticeship funding need to be progressed at pace, to allow immediate flexibility for Levy spend on indirect costs, such as travel and accommodation for apprentices who have to stay away from home for off-the-job learning. Linked qualifications, such as pre-apprenticeship training courses which allow individuals to take the first step on the pathway to an apprenticeship, should also be eligible for Levy funding.

4. Introduce more flexibility into apprenticeship standards, and prioritise funding for high-quality, short training courses in the energy sector

The current approach to apprenticeships, where standards are created as fixed programmes and individuals follow a rigid 'one size fits all' learning model, doesn't provide the flexibility needed by employers and learners alike. Embedding 'modularity' into apprenticeship standards – by breaking down learning into smaller units, tailored to specific knowledge, behaviours and skills – would allow for apprenticeships to be 'personalised'.

Increased flexibility in the skills system would enable companies to respond dynamically to new technologies or needs, without entire apprenticeship standards having to be rewritten. It would also provide adults with greater recourse to upskilling opportunities at any age, enabling apprentices to build a tailored training path.

As part of the prioritisation of clean energy as one of the Industrial Strategy growth sectors (the 'IS-8'), high-quality short training courses, aimed at supporting safety critical competencies and upskilling in the energy sector, should be eligible for funding through the Growth and Skills Levy. This would enable, for example, the expansion of industry-backed 'skills passports' – tools used to recognise a common competency taxonomy – leading to greater efficiency and coordination across the UK energy industry and its supply chains.

5. Expand the National Wealth Fund's remit to co-invest, alongside industry and educational institutions, in high-quality, and innovative, technical training facilities

Historically, the UK's collective training estate has lacked investment and is not currently equipped to train the volumes of people needed to deliver the future energy system and unlock growth. The National Wealth Fund should work with industry, independent training providers (which deliver approximately two-thirds of apprenticeship training), and combined authorities to identify opportunities for co-investment in high-quality technical training facilities, responding to local and regional demand. This could include upfront capital investment to establish specialist joint facilities, run by businesses and supply chain partners, together with Further Education colleges, or facilities dedicated to upskilling for work with new and emerging technology and innovations.

Key action needed from Ofgem

6. Ensure the regulatory framework supports the required growth in the electricity network workforce

Transmission and distribution companies need to scale their workforces to be able to deliver at the pace required and respond to evolving network needs. To support this, the regulatory framework needs to give confidence to networks that funding will be available from the start and throughout regulatory periods. Ofgem can give this confidence through ensuring the upcoming transmission and distribution regulatory periods provide sufficient allowances up front for major workforce expansion investments, and mechanisms that automatically increases funding as the level of investment need increases.

For example, in the upcoming 'RIIO-T3' regulatory framework for electricity transmission network operators, providing baseline funding to support our training programmes and an 'indirect costs escalator mechanism'. This would enable the scaling up of training projects currently in pilot phase, investments in rapidly emerging future technologies and skills, and the future-proofing of experienced talent capacity.

Pillar 3

Unlock opportunities for future generations

Equitable access to education and learning opportunities, and exposure to a wide variety of career possibilities from a young age through to adulthood, should be the cornerstone of the UK's approach to developing genuine long term skills policy. While Mathematics and Science subjects are steadily increasing in popularity, Engineering is not a core subject on the curriculum and is not universally offered by schools. Similarly, take up of Design & Technology (D&T) has declined – research shows that take up of D&T GCSEs has fallen by about 50% over the past decade, following its removal as a mandatory subject in 2000[7].

Women and girls are the most underrepresented group in terms of take up of engineering qualifications and roles – only 15.7% of the engineering and technology workforce is made up of women, compared to 56% of other occupations[8].
If people from underrepresented and disadvantaged groups were more proportionately represented in engineering and technology roles, as they are in the wider workforce, such a wealth of diversity would enable the sector to flourish while providing purpose-led, well-paid careers to a broad range of individuals, and opportunities for talent to thrive.

Action taken by National Grid

Inspiring the next generation of talent and connecting with the communities we serve

In collaboration with educational charity STEM Learning, National Grid has been supporting partnerships with 11 primary and infant schools and 10 secondary and sixth form colleges in Solihull and Preston since 2023. The partnerships' aim is to advance STEM education and increase awareness of STEM career opportunities through curriculum development.

Breaking down barriers to careers in the energy industry

In 2022, National Grid Electricity Distribution launched a pioneering new training scheme specifically designed for people who have left school either without or with minimal qualifications but have the skills and ability to thrive in our industry. The Power Network Craft Assistant ('PNCA') scheme, which we partner with Catch22 and Young Enterprise to deliver, provides a 12-18 month salaried training programme. It is targeted specifically at individuals who don't meet the traditional GCSE requirements for apprenticeships, providing the first step on the path towards accredited qualifications and a career in the industry.

Driving social inclusion through supported work placements

National Grid's EmployAbility 'Let's Work Together' supported internship programme supports students with additional educational needs and disabilities by providing the opportunity to gain real work-based skills and experience. The internship is a structured study programme for students aged 16-24 years old with autism and/or learning disabilities who have an Education and Health Care Plan. Our interns spend an academic year at our Warwick office fully immersed in job placements and supported by a qualified job coach. The programme has been running since 2013 and on average, 50-60% of our interns move into paid employment. This is in the context of a national average of just 4.8% of adults with learning disabilities being in paid employment.

Key actions needed from Government

7. Establish a comprehensive strategy for STEM skills across Key Stages 1 – 4, to expose children to engineering and technology learning opportunities from a young age

This should complement the Government's post-16 education and skills strategy, and embed practical, applied STEM learning opportunities into primary and secondary education, and more broadly into the national curriculum. This ambition must be matched, however, with adequate bursaries and Continuing Professional Development (CPD) funding for teachers, along with equitable access to a central bank of quality-assured STEM school resources. Schools should also be supported to deliver a more integrated approach to climate education, and promotion of 'energy literacy' – teaching pupils about the entire energy journey, from generation to suppliers and energy bills.

8. Work with industry to drive public awareness and accessibility of careers in the energy sector

A sector-specific initiative should drive greater awareness, to a diverse audience, of the job opportunities within the energy industry and its supply chain. In parallel, the Government needs to enable access to these opportunities, by working with stakeholders to signpost existing hubs and platforms that promote vacancies, training pathways, and talent pooling mechanisms. This would complement the Government's proposed new, holistic approach to careers advice services for all ages – which should aim to enable children and young people to make better informed learning and career choices, while removing the stigma associated with adults accessing Jobcentre Plus services.

About National Grid in the UK

National Grid Group's operations in the UK include National Grid Electricity Transmission (NGET), which owns the high voltage transmission system in England and Wales; National Grid Electricity Distribution (NGED), which owns and operates electricity distribution networks in the Midlands, the South West and South Wales; National Grid Ventures (NGV), which owns and operates energy businesses in competitive markets, including sub-sea electricity interconnectors.

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