

ESNZ Committee – Workforce planning to deliver clean energy call for evidence

The Institution of Mechanical Engineers (IMechE) represents around 110,000 engineering professionals and students in the UK and worldwide. The Institution plays a significant role in promoting education and skills in mechanical engineering, including inspiring young people into engineering careers.

Within the Institution, the Engineering Policy Unit informs and responds to UK policy developments by drawing on the expertise of our members and partners, and the Education and Skills Strategy Board works to influence government and other stakeholders across the field to recognise the contributions and potential of engineering to society. By engaging widely with key actors in the field, the Institution campaigns to shape education and skills policy and raise the profile of engineering and engineering careers.

As an institution, we are also interested in growth and the progression of technologies for the good of society, and therefore bring expertise on the skills required to meet industry needs. With the evolution of technology and the needs of the planet, the engineer skillset is evolving, and so must the environment

This response was collated by the Education and Skills Policy Team.

- **Does the Government have an appropriate understanding of the skill needs to deliver the Clean Energy Mission by 2030 as well as decarbonise homes and businesses?**

The Clean Power 2030 Action Plan showcases the government's growing understanding of the skills required for the Clean Energy Mission and decarbonisation efforts.

Focussing on the electricity system, which will need to grow significantly in the next two decades as heating and transport are increasingly electrified, the Action Plan identifies a high demand for engineering professionals across various disciplines, including civil, mechanical, electrical, design, chemical, and environmental engineering. These skills are crucial across offshore wind, nuclear, and engineering construction sectors. Additionally, there is significant demand for skilled trades, particularly electricians and electrical fitters, which are essential for meeting decarbonisation targets¹. This also includes the skills required for instrumentation and control. However, industry reports indicate difficulties in recruiting for these roles. This challenge is compounded by existing shortages across the wider economy, which may exacerbate skills, gaps in the clean energy sector.

¹ <https://assets.publishing.service.gov.uk/media/675b3171348e10a16975a422/clean-power-2030-clean-energy-skills-assessment-annex.pdf>

The government has made relevant strides in addressing these challenges, nevertheless, there are areas for improvement. The evolving nature of the clean energy sector requires ongoing evaluation and adjustment of skills strategies and stronger integration within the education system². Furthermore, increased international cooperation on skills development could be beneficial, as well as involving knowledge exchange programmes, international standards for skills recognition, and collaborative research initiatives.

In response to the identified needs, the government has also established Skills England, a new body tasked with addressing skills gaps across various sectors, including green industries. Skills England aims to form a coherent national picture of skills shortages and unify the skills landscape by bringing together key stakeholders such as local authorities, businesses, and educational institutions.

A crucial component of this initiative is the introduction of the Growth and Skills Levy, which is set to replace the existing Apprenticeship Levy. This new approach offers businesses greater flexibility in their training budgets, allowing them to allocate up to 50% of their levy contributions towards specified non-apprenticeship training³. This change should enable more targeted skills development in areas critical to the Clean Energy Mission and decarbonisation efforts.

Furthermore, the government's plan to devolve skills funding to regional authorities, with Skills England working closely with local partners, demonstrates an understanding that skills needs may vary across different parts of the country (e.g. housing type, methods of home heating, and renewable resources will vary). This approach should allow for better alignment of skills development with local economic needs and labour markets, which is particularly important given the diverse nature of clean energy projects and home retrofitting requirements across the UK.

² <https://assets.publishing.service.gov.uk/media/675b3171348e10a16975a422/clean-power-2030-clean-energy-skills-assessment-annex.pdf>

³ <https://learningandwork.org.uk/wp-content/uploads/2024/06/Flex-and-match-a-new-Skills-Levy-for-growth-and-opportunity.pdf>

- **To what extent can the Clean Energy Mission and the retrofitting of homes and businesses be carried out by the existing workforce and to what extent will it require new entrants to the workforce?**

The Clean Energy Mission and retrofitting efforts will require a significant expansion of the existing workforce, alongside substantial recruitment of new entrants across the whole country, particularly in less privileged areas. This expansion is due to the scale of the challenge and the specific skills required.

Concerning engineering specifically, the Plan identifies a high demand for professionals at level 6 and above across various disciplines related to engineering and its role in enabling the Clean Energy Mission⁴.

Engineering professionals are particularly in high demand, with around 24% of all clean energy job adverts being for engineering professionals, compared to less than 5% of all job adverts across other sectors.

Looking at the broader energy system, mechanical engineers play a pivotal role in developing and implementing cutting-edge technologies that are essential for the transition to a low-carbon future. Their expertise is vital in addressing challenges related to energy storage and distribution, which are critical for the widespread adoption of renewable energy sources. Mechanical engineers are also instrumental in integrating new technologies into the broader energy infrastructure, working on improving energy efficiency across various sectors and developing advanced materials for clean energy applications⁵.

In the context of the power system, there is a critical need for electrical engineers to support grid infrastructure upgrades and expansion. Power systems engineers and technicians are essential for integrating renewable energy sources like wind and solar into the electricity grid, whilst control systems engineers are required to manage the increasing complexity of a decarbonised power network. This expertise is particularly crucial as renewables provided 47.7% of electricity generation by Major Power Producers in the UK in 2024, highlighting the rapid transformation of the power sector⁶.

Regarding apprenticeships, the current numbers fall short of meeting the demands of the clean energy transition. The UK will need 60,000 people installing solar panels and related industries simultaneously by the mid-2030s and 50,000 heat pump engineers⁷.

⁴ <https://www.gov.uk/government/publications/clean-power-2030-action-plan>

⁵ <https://www.scirp.org/journal/paperinformation?paperid=90227>

⁶ <https://www.gov.uk/government/statistics/energy-trends-and-prices-statistical-release-29-august-2024>

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https://www.solarpowerportal.co.uk/there_has_never_been_a_better_time_to_join_the_solar_industry_says_solar_en/

However, the current rate of apprenticeship uptake is insufficient to meet these targets, and more tailored awareness of the role of apprenticeships is required nationwide.

In this regard, the MCS foundation emphasises the need to move beyond a system where the university is seen as the only path for aspirational school leavers and to demonstrate that apprenticeships can provide job and learning opportunities that are enjoyable, well-paid, and align with environmental values⁸. The challenge is exacerbated by the fact that the engineering construction sector, which is crucial for clean energy projects, faces an ageing workforce. About 38% of the workforce in this sector is aged 50 and over, with only 14% aged under 29⁹.

Recruitment and investment into young people is vital to address long term capacity. The energy sector faces a pressing challenge in maintaining long-term capacity due to an ageing workforce, particularly as it transitions towards clean energy. In this context, the ECITB's Workforce Census reveals that the renewables sector has a disproportionate number of workers over 60 and fewer in the 30-59 age range compared to the broader engineering construction industry¹⁰.

This significant imbalance highlights the critical importance of investing in young talent and developing diverse educational pathways to address impending skills shortages particularly in marginalised areas across the country. To meet these targets, the industry must proactively attract professionals from other sectors while simultaneously enhancing its efforts to recruit and nurture younger generations of engineers and technicians. These initiatives are essential to meet the projected growth in the renewables sector and ensure a robust, skilled workforce for the future.

Within this context, the transition to net zero will require rapid reskilling, with estimates suggesting that 1 in 5 jobs will experience a shift in demand for skills, and around 3 million workers will need some form of reskilling¹¹. For example, clean energy jobs tend to advertise salaries higher than the UK average, making them attractive prospects for both new entrants and those transitioning from other sectors. This aligns well with the synergies between the declining oil and gas sector and emerging industries such as offshore wind and carbon capture and storage (CCS). Many skills from the oil and gas industry are highly transferable, with over 90% of the UK's oil and gas workforce

⁸ <https://blog.greenjobs.co.uk/2023/12/08/green-apprenticeships-a-necessity-to-harness-the-potential-of-the-next-gen/>

⁹ <https://www.ecitb.org.uk/research/census/>

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<https://www.ecitb.org.uk/news/workforce-census-shows-ageing-workforce-challenge-for-renewables-sector/>

¹¹ <https://www.gov.uk/government/publications/clean-power-2030-action-plan-assessment-of-the-clean-energy-skills-challenge/assessment-of-the-clean-energy-skills-challenge>

possessing skills that have medium to high transferability to the offshore renewables sector¹².

Upskilling the current workforce through alternative educational pathways and methodologies is crucial to supporting the transition to a clean energy future and meeting decarbonisation goals. In this regard, the Clean Power 2030 Action Plan recognises the need for targeted interventions to reskill and upskill workers across the economy.

This approach can help bridge the skills gap more quickly than relying solely on new entrants or apprenticeships to the workforce. It's not just about expanding technical knowledge but also about preparing the workforce for the evolving demands of the green economy.

Continued collaboration between key stakeholders is key to bringing the right solutions to addressing the questions on demand.

As a leading institution in mechanical engineering, the IMechE is uniquely positioned to foster vital collaboration between industry, academia, government and other relevant stakeholders. By leveraging its extensive network and expertise, the IMechE can serve as a catalyst for progress in the clean energy sector.

The institution also provides an essential platform for knowledge exchange through its conferences, seminars, and lectures on renewable power and clean energy topics. Furthermore, through its Policy team and specialised committees, the IMechE contributes valuable insights to government bodies, helping shape policies that address the critical skills gap in the clean energy sector.

The IMechE also plays a crucial role in promoting interdisciplinary collaboration, recognising that the clean energy sector demands expertise from various engineering disciplines. By facilitating collaboration between different branches and fields of engineering, the institution ensures a holistic approach to solving complex energy challenges.

- **How might the Government ensure that the job market in clean energy roles is sustainable enough to incentivise private sector investment in training for 2030 and beyond?**

In collaboration with diverse sector stakeholders, the government could establish a dynamic, skills forecasting system (possibly AI driven) for the clean energy sector to revolutionise and make workforce planning more efficient. This innovative system would continuously research and analyse industry trends, technological advancements, and

¹² <https://www.ecitb.org.uk/news/transferring-skills-for-the-energy-transition-case-study/>

market demands to provide real-time insights into future skill requirements¹³. The government could enable more targeted and responsive training programmes by making this valuable data available to businesses and educational institutions to shape trends and keep abreast with technological progress in the field.

Such a dynamic and innovative system could prove invaluable in the rapidly evolving clean energy sector. It could, for example, predict the skills needed for emerging technologies as well as identifying potential skills gaps in critical areas, allowing for proactive measures to address these gaps before they become critical.

Complementing this forecasting system, a flexible micro-credentialing approach could effectively address the rapidly evolving nature of clean energy technologies. This system would allow workers to continuously upskill and reskill through short, targeted courses recognised industry-wide.

The result would be a more agile workforce capable of swiftly adapting to technological changes and meeting the sector's evolving needs. To drive the adoption of this approach, the government could offer additional tax incentives to businesses investing in employee micro-credentials. This aligns with the Green Jobs Taskforce's recommendation that the government use net zero policy and funding to promote good green jobs and skills.

Such incentives can encourage businesses to take a proactive role in upskilling their workforce, ensuring they remain competitive in the rapidly evolving clean energy landscape. By implementing these innovative strategies alongside other initiatives like establishing Great British Energy and the Clean Power 2030 plan, the UK government could create a dynamic and sustainable job market in clean energy roles. This comprehensive approach could provide the certainty and opportunity needed to incentivise significant private sector investment in training beyond 2030, ultimately supporting the UK's ambition to become a global leader in clean energy.

¹³ <https://www.hp.com/gb-en/shop/tech-takes/ai-uk-workforce-skills-gaps>

- **How can the new Office for Clean Energy jobs contribute to workforce planning in the energy sector?**

The Office for Clean Energy must work in concert with the broader economic goals and initiatives outlined in the UK's industrial strategy to ensure a cohesive and effective approach to developing the clean energy workforce; it cannot be done in isolation.

The Office's role in workforce planning should be deeply intertwined with the overarching objectives of the industrial strategy. Through strategic partnerships with Skills England and other key stakeholders, the Office can develop a comprehensive understanding of the structural skills needs across the UK economy, with a particular focus on the energy sector. This approach is crucial for creating a holistic view of the skills landscape, identifying gaps, and forecasting future needs specific to the clean energy transition.

Furthermore, the Office's partnership with the Industrial Strategy Advisory Council is vital for ensuring that workforce planning in the clean energy sector aligns with broader economic goals. This alignment is essential for creating a coherent strategy that not only addresses the immediate needs of the clean energy sector but also contributes to the overall economic growth and competitiveness of the UK. The Advisory Council's insights into long-term economic trends and priorities can inform the Office's strategies for workforce development, ensuring that they are future-proofed and adaptable to changing economic landscapes.

The Office's support in implementing the Growth and Skills Levy represents a tangible way to bridge industrial strategy with workforce development. By offering businesses more flexibility in their training budgets, this levy can serve as a powerful tool to incentivise private sector investment in training for clean energy roles. This aligns perfectly with the broader industrial strategy's goals of upskilling the workforce to meet future economic needs. The Office can play a crucial role in ensuring that the levy is implemented effectively within the clean energy sector, potentially by providing guidance on how businesses can best utilise this flexibility to address specific skills gaps in clean energy technologies.

From the IMechE's perspective, this integrated approach is crucial for addressing the engineering skills shortage in the UK. We see the Office for Clean Energy Jobs as a critical mechanism for bridging existing skills gaps, particularly in regions with historical industrial heritage. Creating clear pathways for reskilling and upskilling is a significant for the Office to transform potential workforce challenges into opportunities for economic regeneration and technological innovation.

We believe that this alignment is paramount to ensure the UK's clean energy aspirations are underpinned by a highly skilled and adaptable workforce. To achieve this, it is

imperative that the Office forges strong collaborative relationships with the Department for Education, Skills England, the devolved administrations and other key stakeholders. Through these partnerships, a comprehensive understanding of the structural skills requirements across the UK economy can be developed, with a particular emphasis on the energy sector's unique needs. By fulfilling this role, the Office for Clean Energy Jobs has the potential to be a cornerstone in the UK's journey towards becoming a Clean Energy Superpower.

- **What more can the Department for Energy Security and Net Zero do to ensure the workforce is in place to deliver the Clean Energy Mission and accelerate the retrofitting of homes and businesses?**

The Department for Energy Security and Net Zero (DESNZ) should focus on enhancing collaboration with educational institutions and industry partners nationwide to develop tailored training programmes addressing the skills gaps in the clean energy and retrofitting sectors. This action could involve working closely with universities, colleges, training and vocational training providers to create courses and apprenticeships that align with the evolving needs of the industry. In this context, the Clean Power 2030 Action Plan highlights the importance of such collaboration, emphasising the need for a comprehensive understanding of structural skills needs across the UK economy, with a particular focus on the energy sector. It is important that these collaborations are continued and built upon.

Additionally, the Department should consider implementing a comprehensive public awareness campaign to highlight career opportunities in the clean energy and retrofitting sectors along with funding opportunities. This campaign could target both young people entering the workforce and those looking to transition from other industries, emphasising the long-term prospects and the importance of these roles in achieving the UK's net zero goals.

Furthermore, DESNZ could expand its efforts to support reskilling and upskilling programmes for workers in related industries, such as oil and gas or traditional construction. The Department can tap into existing expertise while addressing potential job losses in carbon-intensive sectors by providing targeted support and incentives for these workers to transition into clean energy and retrofitting roles.

DESNZ could also work towards improving the diversity and inclusivity of the clean energy workforce. Implementing targeted initiatives to attract underrepresented groups, including women and ethnic minorities, is essential to helping address skills shortages while also creating a more representative workforce.