



# Net zero skills: insights and evidence from emissions sectors in Wales

## Introduction

The transition to net zero presents opportunities and challenges for workers, employers and government. Among these is a shift in the skills needed across the economy, as new industries develop, some close down, and other job roles change.

The Welsh Government has published [Stronger, Fairer, Greener Wales: Net Zero Skill Action Plan](#) to set out key actions to support businesses and learners to develop a skilled workforce ready for the transition, working in collaboration with stakeholders and partner organisations.

The Wales Centre for Public Policy were asked to support this by providing a rapid overview of the evidence on future skills needs across emissions sectors and cross-cutting themes in Wales. We conducted interviews with sector representatives and undertook a desk-based review of evidence. Our findings are a contribution to an ongoing conversation in an area where evidence is rapidly evolving.

## Findings across emissions sectors

We sought evidence across the eight emissions sectors as outlined in *Net Zero Wales*, corresponding to the emissions sectors used by the Climate Change Committee. This policy briefing outlines our key findings and recommendations across each of the emissions sectors, and a selection of recommendations relating to cross-cutting themes.

## Electricity and heat generation

Decarbonising the electricity and heat generation sector is a crucial part of the net zero transition and Wales has ambitious targets in place to increase renewable energy generation, as well as supporting the development of new nuclear power and hydrogen production. Our findings suggest that skills exist within the supply chain, but not currently in sufficient numbers. Workers in the oil and gas sector might possess transferable skills which can be used for cleaner energy, if they are supported to transfer. To ensure an adequate supply of skills, further and higher education courses could focus on renewable energy, and flexible funding models for apprenticeships could be developed to allow earlier hiring for infrastructure projects in the planning stage. Putting in place energy skills partnerships to promote collaboration between skills providers and industry could also help to increase numbers with relevant skills.

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## Surface transport

In the UK, surface transport is currently the sector with the highest emissions, and it has seen no net reduction in emissions since 1990.

Reaching net zero will therefore require significant changes to the transport system, including technical solutions (such as increasing the use of electric vehicles) and policies to encourage modal shift (shifting from private transport to public transport or active travel).

There is likely to be increased demand for workers in battery manufacturing (for road and rail) and for electricians capable of installing charging points. Maintenance and repair jobs will also require reskilling and retraining as they change. To support the development of these skills, larger industries paying an apprenticeship levy could be encouraged to transfer funds to SMEs in their supply chain. To achieve modal shift, transport planning education and policymaking will need to change from being focused on cars to prioritising lower-emissions forms of transport.

### **Residential buildings**

There are two main challenges to decarbonising housing. Firstly, ‘retrofitting’ existing stock to be more energy-efficient with lower emissions. Secondly, ensuring that new construction is designed to be energy efficient and minimising construction-related emissions.

For retrofit, there is an acknowledged need to provide more skills in roles such as home insulation and heat pump installation. However, limited consumer demand means there is limited incentive to develop these skills. This means that there are fewer trained installers, and that high quality installation is not always possible, further constraining demand. Alongside measures to increase demand such as Welsh Government incentives to decarbonise homes, robust evaluation and certification could ensure quality and, in turn, drive up skills across the sector. Train-the-trainer schemes, mentoring arrangements, and reviews of National Occupational Standards could also promote skills development.

In construction, a major skills change will come with the adoption of modern methods of construction which tends towards off-site,

modular construction. The different skills needed to support this could allow for new entrants from manufacturing, which has a similar skillset.

Existing workers will need to be incentivised to retrain, whether through increased consumer demand or certification requiring the acquisition of new skills.



### **Industry and business**

Many key Welsh economic sectors fall within the industry and business emissions sector and as such there is a range of skills within the emissions sector. In our research we focus on heavy industry including steel, and small and medium enterprises (SMEs).

Wales has a higher proportion of jobs in heavy industry than elsewhere in the UK and, consequently, more exposure to job losses resulting from the transition. Jobs and skills will evolve as industrial processes are decarbonised, but there is reluctance to retrain until pathways for decarbonisation become clearer – for instance, whether hydrogen or electrification will be used. There will be a need to balance the pressures arising from decarbonisation and other factors such as automation, with ensuring a just transition in which workers are protected.

Alongside retraining, it will be important to ensure a supply of basic technical skills and transversal skills such as project management and digital skills. Dialogue between government, trades unions and the private sector through

social partnership can help to ensure that these skills needs are managed effectively.

For SMEs, which make up over 90% of businesses in Wales, a key challenge is ensuring net zero remains a priority in a difficult operating environment. Cost and capacity pressures may make retraining more difficult, although these may also provide an incentive to adopt energy efficiency measures. Transversal skills including carbon literacy will be very important to ensure SMEs focus on net zero. Signposting from government and bodies such as Business Wales could effectively communicate where support is available to help businesses reach net zero.

**Pathways to net zero are clearer in some sectors than in others; and those with clearer pathways have greater preparedness and awareness of the skills needed for the transition**

### **Agriculture**

Emissions associated with agriculture include those related to machinery use, soil and fertiliser, and livestock. Achieving emissions reductions will require changes in skills, including those associated with new agronomic practices such as more effective fertiliser use as well as innovations in genetics or animal health. Carbon accounting and business management skills will also be required in the future. These skills could be incorporated into farmer education including agricultural courses as well as being more prominent in programmes such as Farming Connect.

Changes to subsidy regimes are likely to mean that the skills required for agriculture interacts with those required for land use, land use change and forestry as both sectors will see an increased need for land management and biodiversity promotion.

### **Land use, land use change and forestry**

The land use, land use change and forestry sector includes emissions associated with forest land, grassland, settlements, crops and harvesting of wood, and also includes negative emissions from land uses which act as carbon sinks.

Policy initiatives to increase afforestation and restore biodiversity mean that employment in this sector will grow as the net zero transition advances. In forestry, this will not involve a wholesale change in the skills needed, but a limited pipeline of trained workers and competition between the public and private sectors means that there could be a shortage of skilled workers. Accredited on the job training could address some of these issues.

For nature-based jobs, there is a good supply of graduates with the required skills, but limited specific accreditation schemes, particularly for nature restoration and peatlands.

Apprenticeships and training courses could help to increase numbers of skilled workers although businesses may be reluctant to invest in training if they think workers might change jobs on completing the programme.



### **Waste management**

Waste management emissions are associated with landfill, waste-water treatment and incineration of waste. The clear target of 'zero waste' by 2050 means that the need to decarbonise is well understood by this sector and will incentivise action.

Most of the skills required are present in the workforce already although minor reskilling will be needed for changes in materials being handled and electrified vehicle fleets. Managers will also need training to ensure they have the people management and carbon literacy skills required to facilitate the transition. Correcting perceptions that training is either unnecessary or something which can be handled on the job will be needed.

The circular economy will form a larger part of the waste management sector in the future, with the current focus on recycling being accompanied by a greater focus on repair and re-use. There will need to be a growing focus on ensuring that skills in these areas are provided to achieve the zero waste goal.

### **Public sector**

Public sector emissions are mainly associated with buildings and operations across the Welsh public service. However, the public sector also has a strong leadership role in promoting decarbonisation. In addition to the skills required for the decarbonisation of buildings, there will need to be a focus on skills for climate leadership (including building capacity in areas such as emissions reporting or carbon literacy), and in related areas such as building net zero targets into procurement. There will also need to be fora for information sharing and ensuring that best practice can be adopted across Wales.

### **Cross-cutting themes**

Through this research we also identified cross-cutting themes and areas for development across emissions sectors and in the wider skills system. The themes, and our recommendations related to them, are:

- Placing a just transition framework at the centre of skills development, to address the need to reskill and redeploy workers in industries at risk of job changes, and to maximise the diversity of new entrants;

- The need to reform aspects of the education and skills system, with long-term planning that brings together education providers, businesses, government, trades unions and other actors to ensure adequate provision of qualifications underpinned by labour market intelligence;
- The need to support businesses to incorporate the circular economy into their business models and day-to-day operations, and encourage the integration of circular economy principles into qualifications at all levels;
- The importance of recognising the role digitalisation can play in cutting emissions, and the related need to prepare the workforce by focusing on digital skills development and corresponding support for business leaders;
- The need for sensitivity to the ways in which changes brought about by decarbonisation have the potential to influence Welsh language use; and
- Improved labour market intelligence to better understand current skills needs and to inform future needs.

### **Conclusion**

Pathways to net zero are clearer in some sectors than in others; and those with clearer pathways have greater preparedness and awareness of the skills needed for the transition.

Our findings and recommendations point to a number of specific interventions which could be implemented to support the skills system across different sectors.

More generally, while the knowledge of the exact skills needed for the future workforce differs, transversal skills will be needed across industries and sectors, and most jobs will see some element of reskilling or retraining as the transition advances. Ensuring the correct skill profiles in the labour force and a diverse pool of new entrants will need a responsive education and skills system.

Clear policy direction and intervention from government is necessary to ensure that sectors can confidently plan for the future. Long-term collaboration between government, employers, workers, trades unions and the education and

skills system will be needed for integrated planning and for implementation.

## Find out more

For the full report see Notman, G., Coles-Riley, J., Tilley, H., Price, J. [Net zero skills: insights and evidence from emissions sectors in Wales](#). Wales Centre for Public Policy.



## About the Wales Centre for Public Policy

Here at the Centre, we collaborate with leading policy experts to provide ministers, the civil service and Welsh public services with high quality evidence and independent advice that helps them to improve policy decisions and outcomes.

Funded by the Economic and Social Research Council and Welsh Government, the Centre is

based at Cardiff University and a member of the UK's What Works Network.

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