



What could education, jobs and work look like across Wales by 2035?

Introduction

Education and work form the backbone of people's lives, as well as being of crucial importance to the economic and social development of Wales. To reach net zero, we need to think about how the skills we acquire will need to change and how work and jobs will need to be organised differently in the future. This note is a high-level summary of some of the key issues in this area, drawing on previous WCPP papers:

- [Supporting the Welsh Lifelong Learning System](#) (Pember et al., 2021);
- [Developing skills for a just transition](#) (Silva et al., 2022); and
- [Net zero skills: Insights and evidence from emissions sectors in Wales](#) (Notman et al., 2023).

It forms part of WCPP's [work to support the Wales Net Zero 2035 Challenge Group](#), which was established as part of the Welsh Labour / Plaid Cymru Co-operation agreement to examine potential pathways to net zero by 2035. Specifically, it is a contribution to challenge area 5: *What could education, jobs and work look like across Wales by 2035?*

Key net zero skills

The transition to net zero calls for the development of new industries, the phasing out of others and the creation and change of job roles. This shift creates the need for the development of general skills, the green skilling of all jobs as well as specific green skills, and

industry skills within Wales to ensure a just transition.

In our research, we have not attempted to rigorously define 'green skills' in order to represent the self-understanding of experts and organisations within individual economic and emissions sectors. While definitions vary, there is a general understanding that 'green skills' skills which, as a result of changes due to the net zero transition, are either new or increase in importance for a particular job role or industry.

Skills context

Opportunities and challenges for both workers and communities are likely to emerge as Wales transitions to a decarbonised economy. Whilst there is evidence that this will create more jobs and increase the demand for technical skills (Valero et al., 2021), Wales has a number of low-skilled workers, as well as a decreasing rate of participation in further education, suggesting workers and communities are not prepared for the transition to a climate-neutral economy.

Productivity is lower in Wales than elsewhere in the UK. In Wales it has consistently been between 80-85% of the UK level since 1998, and Powys has some of the lowest productivity rates in the UK (Henley, 2021). The development of skills is considered a 'critical productivity driver' (Henley, 2021). However, in Wales, a high proportion of the population has low qualifications, with 66% of adults being under-skilled for their employment to some extent and 13.6% lacking a level 1 qualification and having poor essential skills (Pember et al., 2021).

Furthermore, the proportion of adults (19+) participating in further education has been falling. It reduced considerably from 7.6% in 2012/13, to 4.4% in 2019/20 (RCU, 2021).

The Welsh Government have already begun to invest in the training and upskilling of the workforce to meet the demand of net zero. The Personal Learning Account (PLA) programme provides eligible individuals access to free FE courses if they earn below £30,596 per year or wish to gain skills in sectors with skills shortages (Digital or Net Zero and Green technologies) and encourage lifelong learning by providing free access to specific courses and training programmes (Welsh Government, n.d.a). In the 2020/21 academic year, the PLA programme had 7,603 enrolments (Welsh Government, 2023a). The Welsh Government has also adapted their older schemes, such as the Flexible Skills Programme (FSP). The FSP was first introduced in 2015, providing 50% funding support to employers to upskill their staff in various areas. In 2023, the Welsh Government introduced a net zero element to FSP with a range of pre-approved net zero training topics for employers to receive 50% funding on (Welsh Government, n.d.b)

To ensure workers whose jobs are impacted by decarbonation are able to adopt new roles, (re)training and upskilling will have to be prioritised by all those involved.

Industry skills

The Welsh economy has been shaped by its industrial history. Fossil-fuel and aeroplane manufacturing, the Newport and Port Talbot steel works and the oil refineries and liquid natural gas terminals in Pembrokeshire are carbon-intensive industries that are responsible for a proportionally larger part of the Welsh economy in comparison to the rest of the UK (Henley, 2021).

As industrial processes are decarbonised, these sectors which provide a high number of jobs for the Welsh people, are likely to be exposed to job losses (Silva et al., 2022). One example of this is the electrification of the blast furnaces in Port Talbot to support decarbonisation of the town,

which is expected to result in the loss of 3,000 jobs (Thomas, 2023).

As the pathways for decarbonisation of industry become clearer, so will the identification of new and evolving jobs and the associated skills that are necessary. However, balancing decarbonisation with a just transition to ensure that workers are protected is essential.

**‘Existing workers will need to be incentivised to retrain, whether through the increased consumer demand or certification requiring the acquisition of new skills.’
(Notman et al., 2023)**

Green skills

The decarbonisation of the aforementioned industries and other sectors will create a demand for new jobs and skills relevant to net zero. Some sectors will need to adjust to the impact of decarbonisation at a faster rate, especially those in which environmentally preferable alternatives are available, such as the growing demand for electric vehicles in the car industry. These green jobs require the adoption of green skills which are more technical, requiring education and training (Valero et al., 2021). Currently, there is a disconnect between the skills and training available and the requirements of green industry (CBI, 2021). In addition to the specific technical green skills, it is recognised that all jobs are likely to need to adjust to include an understanding of climate-related issues, such as carbon accounting.

Below, we outline key findings from WCPP’s overview of the evidence regarding the skills needs of the eight key emissions sectors, written to support the development of the Welsh Government’s [*Stronger, Fairer, Greener Wales: Net Zero Action Plan*](#). It is important to note that these findings are based on interviews and available literature, and therefore reflects the differing progress and priorities across

emissions sectors. It is likely that some themes which were brought out in relation to specific sectors will generalise across some or all other sectors.

[The WCPP paper](#) (Notman et al., 2023) contains specific recommendations which are not detailed here.

Electricity and heat

- Many of the necessary skills already exist within the electricity and heat generation workforce, but are not yet sufficient in numbers to meet net zero targets;
- Those employed in the oil and gas sector may possess transferable skills for green jobs, but they must be supported in the transfer;
- To support the necessary skills supply, a focus on renewables in further and higher education courses is recommended as well as funding availability to enable apprentices to be hired at the planning stage of infrastructure projects; and
- Establishing partnerships to improve collaboration between skills and industry providers are also suggested to ensure the required supply of skills.

Surface transport

- The sector with the highest emissions in the UK is surface transport;
- Demand for workers in battery manufacturing and electricians able to install charging stations is likely to increase;
- The redirection of apprenticeship levy funds paid by larger industries to SMEs in their supply chain would support skills development in the transport sector; and
- Policymaking and transport planning focusing on behaviour change along with modal shift will help to achieve a balance between the supply and demand of skills in the sector.

Residential buildings

- The challenge of decarbonising housing is two-fold: the need to retrofit the existing housing stock; and ensuring new and future buildings will be energy efficient;
- More skills are required for retrofitting, particularly in the areas of home insulation and heat pump installation. However, incentives to develop these skills are limited as there is minimal consumer demand; and
- A shift in skills for construction will be part of the adoption of modern building methods. Workers in manufacturing are likely to be able to support this due to their similar skillset.

Industry and business

- The high proportion of jobs in heavy industry in Wales means increased exposure to job losses in the transition to net zero; and
- Providing (re)training opportunities for workers and ensuring there is a supply of technical, digital and project management skills is vital.

Agriculture

- Agricultural emissions are associated with machinery usage, fertiliser and soil, and livestock; and
- Adoption of new agronomic practices, carbon accounting and business management skills will be required in the future and a qualified workforce will be needed to deliver these.

Land use, land change and forestry

- This sector includes the emissions connected to forest land, grassland, settlements, crops and harvesting of wood, as well as negative emissions from land uses which act as carbon sinks;
- Initiatives focusing on the restoration of biodiversity will increase employment opportunities, within the sector, but

competition between the private and public sector may create a shortage of skilled workers;

- The supply of graduates with the necessary skills are not limited, but accreditation schemes specific to the sector are, especially for nature restoration and peatlands; and
- Training programmes and apprenticeships may increase the number of skilled workers in the sector.

Waste management

- Minor reskilling will be required for changes in material handling and electrified vehicle fleets, but most of the necessary skills are already present within the workforce; and
- Training for managers in people management and carbon literacy skills will be needed to support the facilitation of the transition.

Public Sector

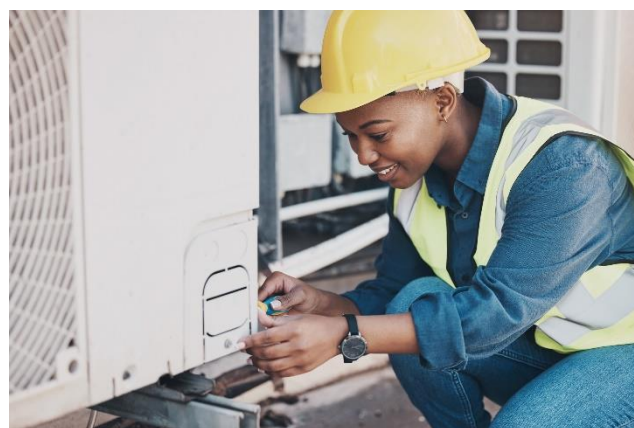
- Emissions from the public sector are associated predominantly with buildings and operations across public services in Wales; and
- A focus on climate leadership and integrating building net zero targets into procurement will be necessary.

Our review also looked at cross-cutting issues, which recommended;

- A just transition framework should be placed at the centre of skills development, addressing the need to reskill and redeploy workers in at-risk industries;
- Reforming aspects of the education and skills system, bringing together various actors to ensure the provision of necessary qualifications supported by labour market intelligence;
- Supporting businesses in the incorporation of the circular economy into their operations and business models, as well as the development of

digital skills which support emission reduction.

- Ensuring sensitivity and understanding of the potential impact of decarbonisation on Welsh language use, specifically in relation to the agricultural sector where the Welsh language is of cultural and community importance; and
- The improvement of labour market intelligence to understand the current and future skills needs.



Education and net zero

The educational landscape in Wales is already going through a period of change with the implementation of the Curriculum for Wales and, at post-16 level, the introduction of the new Commission for Tertiary Education and Research (CTER).

The Curriculum for Wales, in place for students aged 3-16, replaces a mandatory list of subjects and material with broader guidance arranged around six areas of learning and organised with four purposes in mind. The four purposes are that learners should become:

- ambitious, capable learners, ready to learn throughout their lives;
- enterprising, creative contributors, ready to play a full part in life and work;
- ethical, informed citizens of Wales and the world; and
- healthy, confident individuals, ready to lead fulfilling lives as valued members of society (Welsh Government, n.d.c)

The six areas, intended to draw connections across and between traditional subject areas, are: expressive arts; health and well-being; humanities; language, literature and communication; mathematics and numeracy; and science and technology.

Through the Curriculum for Wales, schools will have significant latitude to design their own programme of study and are not confined to traditional subject areas, although some topics, including climate change and sustainability, remain mandatory. There is flexibility to cover these topics across disciplines and select content accordingly. This means that, in accordance with the four purposes, there is the ability to integrate the teaching of green skills and climate literacy into local curricula. There would also be the opportunity to tailor teaching to local economic contexts, for instance through engaging with local employers or green skills opportunities.

For post-16 education, the Tertiary Education and Research (Wales) Act 2022 (TER Act) establishes a new body, CTER, which will oversee, fund and regulate all post-16 provision. CTER has a number of statutory strategic duties, including a duty to contribute to a 'sustainable and innovative economy' in Wales (TER Act, 2022). There is therefore significant scope for CTER to act to promote the development of green skills in tertiary education. Moreover, CTER could harmonise progression pathways and encourage co-operation between institutions to ensure that skills needs are met and that learners can develop their skills in the most appropriate and effective way for them. This could dovetail with existing Welsh Government efforts such as the personal learning account for green skills which offers funded FE courses in a number of areas across Wales.

Vocational courses will be particularly important to this end and the Welsh Government has recently completed a review of the sector (Lusher, 2023). Following this review, Qualifications Wales have announced a new 'VCSE' qualification at 14-16 focused on

vocational skills (Qualifications Wales, 2024). It will be important to focus efforts on post-16 vocational qualifications, however, to ensure that sector- and role-specific skills can be taught.

Welsh Government net zero skills consultation

In February 2023, the Welsh Government launched [*Stronger, Fairer, Greener Wales: Net Zero Action Plan*](#) which outlines the Government's seven priority areas and 36 actions to support the current and future workforce in a just transition to net zero (Welsh Government, 2023b).

Since the publication of the Action Plan, the Welsh Government have also held a consultation to gain a more detailed understanding of the skills landscape across the eight emissions sectors and to agree a definition of 'net zero skills'. It also hopes to gain an insight into the new and emerging skills demands of net zero; in terms of impacts, challenges, potential solutions, and cross cutting challenges of the Circular Economy, Artificial Intelligence, technology and supply chains.

The findings of the consultation will be released in 2024 in the Welsh Government's 'Roadmaps' publication. This is expected to:

- Outline key milestones for the decarbonisation of industry and address the factors associated with the skills required for this shift;
- Present a summary of key investments and projects coming into Wales relevant to skills;
- Include the necessary key actions identified from the consultation related to skills development; and
- Indicate any new or updated legislation and policy developments.

(Welsh Government, 2023c)

These consultations could provide a more up-to-date and detailed picture of skills needs across Wales and inform planning and actions by the

Welsh Government and other actors in the skills system.

The future of work in Wales

Universal basic income

Universal basic income (UBI) refers to payments from government given to everyone irrespective of factors such as age, income or profession on a regular basis (e.g. weekly or monthly). This non-means-tested payment is argued to give every person a guaranteed income and to support the alleviation of poverty (Reed et al., 2023).

Globally, there have been various UBI trials to ascertain whether it is an effective policy. In Finland, participants of the pilot were given UBI payments monthly, and after two years of the pilot running there was no statistically significant impacts regarding employment although there were notably improved signs of wellbeing (Charlton, 2019). In Canada, a trial of UBI was planned for three years, although payments were stopped within two years due to a change of provincial government. However, research was conducted in 2020, investigating the self-reported outcomes of the pilot and found that just over 25% of respondents started an educational or training programme after receiving UBI, and over one-third found higher paying jobs during the trial (Ferdosi et al., 2020).

The Welsh Government introduced a three-year basic income (BI) trial in 2022 for young people leaving care, providing them with £1,600 (pre-tax) on a monthly basis, to support the transition from care to adulthood.¹ More recently, support for BI has been raised in relation to the decarbonisation of the economy and achieving a just transition. There is a desire for the trial to be extended to industry workers in Wales, who are at risk of their carbon-intensive jobs being phased out. Extending a basic income to these workers would, according to the previous future generations commissioner for Wales, provide

workers with financial security whilst enabling them to retrain (Breese, 2022).

There is a lack of conclusive evidence regarding the impact of UBI on increasing the uptake of educational, employment and (re)training opportunities. However, there is an evident need for the Welsh Government to support those whose jobs are to be phased out or who are required to reskill during the transition to net zero. A basic income could provide this support although this will need to be balanced alongside other factors, including the cost of provision.

Four-day working week

Adopting a four-day work week in Wales has the potential to support the acquisition of new skills and the (re)training necessary in the decarbonisation of the economy in Wales. The majority of literature exploring a reduced working week considers the impacts on wellbeing and the emissions savings resulting from a reduction in commuting and the running of buildings, with an estimated potential reduction of annual carbon emissions of 127 tonnes in the UK (Mompelat et al, 2021). This estimate does not, however, consider the emissions created either at home or through activities carried out during the additional day off.

With regards to employment, [one report](#) suggests that implementing a four-day week in Wales would create 37,859 full and part time jobs, supporting the under and unemployed populations (Autonomy, 2022).

Research from the UK-wide four-day working week trial shows a reduction in absenteeism and a greater satisfaction amongst staff regarding the use of their time (Lewis et al., 2023). Those in the study used their additional day off for leisure, but potentially this additional day could be used for educational courses, (re)training or skilling.

¹ The pilot is of a 'basic income' rather than UBI because it is being offered conditionally to a small group, rather than unconditionally to all. See Notman,

Coles-Riley and Hill-Dixon (2023) for more information.

Conclusion

The transition to net zero creates a demand for the development of general skills, as well as industry and green skills in Wales. Whilst there is a concern regarding the potential loss of jobs as sectors are decarbonised, a unique opportunity is presented to encourage workers to upskill and (re)train.

There is work ongoing across the education and skills system with reforms aiming to bring together post-16 provision as well as a shift towards a less prescriptive, purpose-driven curriculum during compulsory education. Some of this work bears directly on decarbonisation and net zero and there are opportunities to integrate green skills provision and climate literacy across both compulsory and post-compulsory education and training.

There are also opportunities to think about the future shape of work and its place in our lives, with initiatives such as UBI and four-day working weeks offering more chances to reskill alongside increasing leisure time and potentially reducing emissions. However, these initiatives may be prohibitively costly to implement, and their broader impact will need to be carefully considered.

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<https://www.wcpp.org.uk/project/net-zero-35/>

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