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Welsh Parliament
Economy, Trade, and Rural Affairs Committee
Green Economy
GE20
Evidence from: Universities Wales



Economy, Trade and Rural Affairs Committee Consultation: Green Economy

Universities Wales response

March 2024

About Universities Wales

Universities Wales represents the interests of universities in Wales and is a National Council of Universities UK. Universities Wales' membership encompasses the Vice Chancellors of all the universities in Wales, and the Director of the Open University in Wales.

Our mission is to support a university education system which transforms lives through the work Welsh universities do with the people and places of Wales and the wider world.

Universities Wales welcomes the opportunity to respond to the Committee's consultation.

Key messages

- Universities are well-placed to work with businesses and Welsh Government to develop green economy opportunities through research and innovation activity and upskilling the nation.
- Due to the technological and workplace change associated with the green economy, participation in higher education will be increasingly important. The gap in participation in education between Wales and the rest of the UK presents a clear risk for our ability to move into and capitalise on the green economy. The factors affecting participation in Wales will need to be considered.
- Investment in research and innovation is a vital for building our green economy, and universities have a fundamental role to play in basic research, innovation activity and commercialisation of new and emerging technologies.
- Universities are also key drivers of higher-level skills development across the workforce, equipping the nation with the skills needed to progress the green economy, through traditional degree programmes, professional development courses, and by partnering with businesses to upskill the workforce.

- Increasing investment in university R&I, including through core funding and exploring financing mechanisms, would boost economic growth and expansion of emerging technologies and sustainable manufacturing, encouraging private investment to support public expenditure.
- Universities are involved in a wide range of existing partnerships and research projects which are developing the technologies and skills needed to drive forward the green economy.

Consultation questions

- 1. Within its devolved powers, what should be the Welsh Government's key priorities to maximise the potential economic opportunities from green economy sectors? To what extent does its current approach reflect these?**

Universities Wales would suggest that a focus on investment in research and innovation and development of key skills should both be priorities for Welsh Government to maximise potential economic opportunities from green economy sectors.

Universities in Wales are key partners in delivering opportunities for maximising the nation's potential for growth in the green economy. Through research and innovation activity, and providing vital skills in emerging technologies, universities are at the forefront of this developing sector.

Research and innovation

Investment in research and innovation is fundamental to developing Wales' green economy. This will include research and innovation activity in advanced manufacturing and decarbonisation, as well as wider R&I across social sciences and AI.

Universities are key deliverers of research and innovation activity, making up 28% of Wales' total R&D activity in 2021/22, a higher proportion than elsewhere in the UK. Given Wales' business mix, with a high proportion of SMEs, universities play an important role in enabling smaller businesses to participate in R&I activity.

Current funding levels for university research and innovation lag behind other parts of the UK. When adjusted for population, 2023/24 funding allocations for research and innovation (£105m) were £44m lower than in England (£149m equivalent) and £68m lower than in Scotland (£173m equivalent).

This underpinning funding supports universities to capture further funding from external sources such as UKRI and Horizon Europe. The loss of EU Structural and Investment Funds has had a huge impact on the sector, with the UK Shared Prosperity Fund an inadequate replacement for lost funding, as Universities Wales set out in our response to this committee's inquiry into post-EU regional funding arrangements. ¹

¹ [ETRA Committee consultation on post-EU regional development funding - Universities Wales response.pdf \(uniswales.ac.uk\)](#)

Projects that were formerly funded via ESIF include:

- [Swansea University researched the risk and suitability of an insect pathogenic fungus](#), *Metarhizium brunneum* and its volatile organic compounds (VOCs) as an alternative to conventional chemical pesticides. The research team licensed the intellectual property to Certis Europe BV for them to develop *M. brunneum* VOCs as new pesticides. Based on the research, Certis Europe BV created three new pesticides and a new programme for managing soil pests. The research has allowed companies to update and renew products as well as opening up new markets.
- The University of South Wales has worked with ITM Power Plc, a UK-based company specialising in hydrogen technologies, to [develop a technique to produce hydrogen without carbon emissions](#). They've also worked with Tata Steel HyET (Netherlands) and Skyre (USA) to explore recovery of hydrogen from steel making. The team has developed a way to produce, store and use low-carbon hydrogen that is now used in refuelling stations and power-to-gas plants in 21 countries.
- **ASTUTE**: The ASTUTE 2020 (Advanced Sustainable Manufacturing Technologies) operation supports collaboration in industrial Research, Development and Innovation (RD&I) between world-class academics based in five Welsh universities and a team of technical experts and project managers and industry. Successful projects have included a collaboration with Brother Industries (BIUK) to develop printer cartridges made using recycled plastics. BIUK can now transition products currently made from virgin resins to recycled resins, creating a direct environmental impact, reducing the use of raw materials, saving energy and reducing CO2 emissions from manufacturing and landfill.
- **FLEXIS**: Led by Cardiff University, Swansea University and the University of South Wales, brings together expertise from across these universities to facilitate an affordable, sustainable, and socially acceptable transition to a low carbon future. The five-year EU-backed project will look to solve a diverse, complex and inter-dependent set of challenges, ranging from energy storage, to decarbonisation and fuel poverty.
- **BEACON** is a partnership led by Aberystwyth University, working with Bangor and Swansea Universities and the University of South Wales. The BEACON team works on converting biomass and bio-industry wastes into biobased products with commercial applications, via biorefining and bio processing.

Skills

As well as research and innovation capacity, we need to ensure the nation develops the appropriate higher-level skills required to maximise the green economy. Universities are key deliverers of skills to the workforce, particularly in cutting-edge technologies and emerging sectors. This includes through professional development and short courses, and students undertaking degree programmes.

Universities in Wales provide around 250,000 days of Career Professional Development every year, and recent research demonstrates that we will need more graduates than ever before. More than 400,000 extra graduates will be needed in Wales by 2035 in order to respond to skills gaps and workforce challenges of the future, according to the findings of

a new report by UUK. By 2035, 95% of *new jobs* in Wales will be at graduate level, with 88% of UK jobs set to be at graduate level. As Welsh universities currently provide around 40,000 graduates each year, and account for nearly three quarters of the UK graduate workforce in Wales, this means increasing the number of graduates from Welsh universities very significantly.²

2. What are the key barriers to Wales making the most of opportunities in the green economy, and what steps should be taken to overcome these?

Funding

Further to the response to question 1, a key barrier to Wales making the most of opportunities in the green economy comes down to the funding required to maximise our research and innovation capacity.

Quality-related Research funding (QR), via HEFCW, provides a vital underpinning of the research base, allowing universities to develop bids for external funding, while also maintaining capacity for basic research. Evidence suggests that there is a strong correlation between the amount of QR funding and the amount of external funding an institution is able to capture. In his 2018 review of government-funded research and innovation in Wales, Professor Graeme Reid argued that historic underfunding via QR is the main reason why Wales fails to secure its population share of competitive, external funding sources.³

Transition to a green economy will require the translation of basic research and innovation activity into commercialised products and services. Universities act as facilitators to bridge the gap between academia and industry, through knowledge exchange and partnerships. We have a high proportion of SMEs in Wales (ONS estimates 99.9% of businesses in Wales are SMEs, with a higher than UK average % of business turnover and employees⁴) and universities can act as crucial vehicles in supporting their research and innovation activity.

Skills

Furthermore, there are current limits on our capacity for developing the skills required to build the green economy through mechanisms such as degree apprenticeships. Via degree apprenticeships, learners gain knowledge and expertise at degree-level, informed by university-led research and innovation, which enhances industry skills.

However, Wales currently only offers a few degree apprenticeship frameworks at level 6, compared to over 100 standards available in England at levels 6 and 7 (Master's level). Construction and rail have recently been added to advanced manufacturing and digital pathways. Expansion of the degree apprenticeship programme would be an effective way to enhance the skills offer and create clarity of progression routes for learners to access the skills they need for the future economy. We welcome the work of the Welsh Government's Degree Apprenticeship Framework Advisory Panel in exploring this area,

² [Jobs of the future \(universitiesuk.ac.uk\)](https://www.universitiesuk.ac.uk/jobs-of-the-future)

³ [Reid Review \(gov.wales\)](https://gov.wales/reid-review)

⁴ [Business population estimates for the UK and regions 2022: statistical release \(HTML\) - GOV.UK \(www.gov.uk\)](https://www.gov.uk/business-population-estimates-for-the-uk-and-regions-2022-statistical-release-html)

and the recent [policy statement](#) given by the Minister for Economy on apprenticeships, including the expansion of degree apprenticeships.

3. What actions should the Welsh Government take to support development of Wales-based supply chains in green economy sectors?

An integrated approach would be required to support development of Wales-based supply chains in emerging products and services. For example, the manufacture and installation of heat pumps would require a joined-up strategy to ensure manufacturing capability is met as well as the skills base having capacity to install the products.

There is considerable scope for the development of clusters around our universities to enable smaller companies to access expertise and innovation capabilities. This would support SMEs to develop products and services they can sell to larger Welsh-based green businesses.

4. What skills challenges exist in relation to transitioning to a green economy? What actions should be taken, and by whom, to ensure the skills are there to meet the growing demands of a green economy?

As outlined in response to question 2, expansion of the degree apprenticeship programme in Wales would go some way to addressing the skills challenge we face.

At the same time, Wales has the lowest level of participation in higher education (whether traditional degree programmes or degree apprenticeships) of all the UK nations. The percentage of Welsh domiciled 18-year-olds entering higher education in 2023/24 was 29.9%.⁵ For the sake of comparison, the entry rate across the UK as a whole is 35.8%, and for London is 49%. The gap between Wales and the UK has been steadily increasing for over a decade. Together with a lower level of graduates, and an ageing population, this puts Wales at a serious disadvantage in terms of skills capacity to deliver a green economy.

Welsh Government should urgently address the participation rate, or we face a future where successive cohorts are less well qualified than their immediate predecessors, and we do not have the capacity within our population to develop the green economy.

Universities Wales has written to the Children, Young People and Education Committee to urge them to investigate this issue.

5. What will workers and employers need for a just transition to a Net Zero economy to be achieved, and what actions should the Welsh Government take to deliver the elements of this that lie within its devolved powers?

Welsh universities are significant drivers of local and regional economies, with their economic impact – totalling £5bn annually – rippling throughout the nation.⁶ Universities provide direct employment to academic and professional services staff, as well as generating jobs across their regions from supply chains to retail and hospitality services meeting the demands of student populations and their visitors. Universities also work

⁵ [UCAS Undergraduate end of cycle data resources 2023 | Undergraduate | UCAS](#)

⁶ [The economic impact of higher education in Wales.pdf \(uniswales.ac.uk\)](#)

directly with businesses of all sizes, supporting innovation activity to develop new products and services.

Stability and growth of the funding environment for Welsh universities, will in turn allow universities to continue to develop Wales' future prosperity. Investment decisions to involve Welsh universities in expanding and developing industries and technologies serve as a key driver of our nation's economic prosperity and transition to a green economy.

Further to this, workers and employers will need to develop green skills. As set out above, universities deliver training across a broad spectrum of expertise and work directly with industry in doing so, and expansion of degree apprenticeships and an increase in participation in higher education will be crucial to upskilling the nation.

6. How will the Welsh Government need to work in partnership with others to realise the potential of the green economy and deliver a just transition? To what extent is the partnership working that is needed being undertaken?

There are a number of existing partnerships seeking to realise the potential of the green economy and deliver a just transition. For example the [Circular Economy Innovation Communities \(CEIC\) programme](#) was developed by Swansea and Cardiff Metropolitan Universities to bring organisations from all sectors across Wales together to create collaborative innovation networks that work towards a more sustainable future. The programme provides organisations with all the tools they need to implement crucial Circular Economy principles that enable them to work towards net-zero, enhance service levels, lower operational costs, implement sustainable change, encourage innovative thinking and foster valuable collaborative relationships.

At a sector level, the [Wales Innovation Network](#) encourages collaboration between Welsh universities, making it easier for institutions to form partnerships and share infrastructure and expertise. This in turn is designed to support Welsh universities in securing competitive grant funding from external funding sources by setting up joint bids, capitalising on each institutions' diverse strengths.

A [small grants fund](#) set up in 2022/23 has already generated over £9m in external funding bids, including a project led by Bangor University, the Place-based Climate Change project. It was awarded just under £5,000, which enabled them to bid for funding worth £2 million. The project builds on extensive previous and ongoing research across Wales and beyond. It aims to enable local communities to identify and implement place-based solutions for creating and saving energy through a sophisticated expert-informed and place-based online tool.

More broadly, the Commission on Tertiary Education and Research will have a vital role to play in continuing the development of the research and innovation funding landscape by supporting higher education institutions across Wales. It will also bring together further education and higher education partners to work together on enhancing the skills offer to bring about the changes needed in the system such as clarity of progression routes and clear learner pathways, to ensure increasing numbers of learners are able to reach the higher-level of skills that will be required in the future economy. Partnerships such as the

Partnership for Innovation in Education (PIE) in South East Wales encourage collaboration between higher education, further education and industry.⁷

7. The Welsh Government says it will face considerable budgetary constraints in the short term. How should it prioritise investment to support development of the green economy over the shorter and longer-term? What innovative approaches to financing could be considered to maximise potential investment and benefits?

In the short term, the Welsh Government's first order issue is to ensure stability and investment in core higher education infrastructure, given the vital underpinning role of universities in both developing skills for the future workforce and providing research and innovation capacity.

The role of universities in working with businesses in knowledge exchange to translate ideas into new products and services is crucial in finding shorter- and longer-term opportunities to grow the green economy. Tuition fees and grant funding do not cover the costs of domestic undergraduate teaching or research and innovation. In green economy terms, there could be further challenges given that relevant subject areas are likely to be high-cost for universities to deliver.

The Minister for Education and Welsh Language's [Statement of Priorities](#) for the Commission on Tertiary Education and Research (CTER) prioritises the development of a culture of innovation and driving excellence in research, which will be important to realising the economic benefits and tackling the challenges of the green economy.

It is important that Welsh Government and CTER recognise the role of university R&I capacity and prioritise actions that will help to grow our researcher base and better place Wales to manage the risks and opportunities of the future green economy.

Universities Wales would like to see future UK Shared Prosperity Fund allocations returned to Wales and directed towards research on a scale in keeping with previous funding under EU Structural and Investment Funds. Party commitments on the future shape and structure of the shared prosperity fund, going into the next general election, will be vital.

In the longer-term, growth in the research and innovation budget would increase a return on investment. As the Welsh research base has expertise in renewable energy and advanced manufacturing, and the Welsh Government would do well to explore funding opportunities within its scope to enhance investment in these areas.

⁷ [Innovative project sparks new collaborations between education providers and industry | University of South Wales](#)