

Universities Wales response to Invest 2035: the UK's modern industrial strategy

About Universities Wales

Universities Wales represents the interests of universities in Wales. Our membership encompasses the Vice Chancellors of all the universities in Wales and 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.

Executive Summary

Overview

- Welsh universities are critical research and innovation assets, making up 36% of Welsh research and development expenditure, and are well positioned to support growth in key priority areas.
- In their own right, Welsh universities make a substantial economic contribution generating £10.97bn of economic impact through teaching, research, exports and institutional expenditure.
- Welsh research and innovation activity delivers tangible benefits to people and places in Wales, leads the UK for research that is considered world-leading or internationally excellent for impact, and is rooted in an interdisciplinary and collaborative environment.
- The Wales Innovation Network (WIN) is a collaborative initiative set up to strengthen research and innovation in Wales. WIN raises the profile of Welsh universities' research and innovation, facilitates interdisciplinary collaboration, and makes it easier for Welsh universities to form partnerships and share infrastructure and expertise.

Strengths

- Welsh universities have a diversity of strengths across the proposed priority areas, including in the subsectors set out below:
 - **Advanced manufacturing:** compound semiconductors, steel, aerospace
 - **Clean energy:** energy technologies including on energy storage and generation, nuclear, hydrogen, biofuels
 - **Creative industries:** a substantial creative cluster including one of the largest media production centres outside of London
 - **Digital and technologies:** robotics, cyber security, data science
 - **Professional and business services:** expertise in supporting industry with innovation including product development

- **Life sciences:** population data, agriculture and food, neuroscience
- Welsh universities also have significant strengths in supporting entrepreneurship with the highest rate of graduate start-ups in the UK.

Barriers

- **Funding:** Welsh universities are operating within a highly challenging financial environment which presents barriers to realising growth in priority areas. This includes a relative underfunding of core research and innovation in Wales which limits the ability of universities to capitalise on wider funding opportunities.
- The loss of EU Structural Funds has also had a highly detrimental impact on the universities' research, innovation and skills activity.
- **Skills and talent:** the workforce in Wales is, on the whole, older and less well qualified than elsewhere in the UK. This position will likely be compounded by the higher education participation gap between Wales and the rest of the UK, and the cross border flow of students and graduates which reduces the available talent pool within Wales.
- **Policy uncertainty:** Past uncertainty surrounding the graduate route and migration policy more broadly has presented barriers to attracting international students and staff.
- Uncertainty over four nation approaches and join up in the research and innovation environment also pose barriers to delivering the aims of the industrial strategy.

Recommendations

- Reflect the distinct context of the four UK nations within the Industrial Strategy, including the subsectors that present the greatest growth potential for devolved nations and the different enablers and barriers that exist across the four UK nations.
- Ensure the delivery of the Industrial Strategy includes mechanisms for engaging across the breadth of the UK, taking into account the distinct demographic, business and innovation contexts.
- Ensure that UK funding opportunities reflect the different business and research environments across the UK
- Review the UK Shared Prosperity Fund to provide long-term funding that supports collaboration on a Wales-basis
- Provide stability and certainty on migration policy to help improve the UK's attractiveness to international talent and bolster the UK's ability to force international partnerships.
- Ensure international trade agreements serve as catalysts for cross-border education and research and reflect the strengths of different parts of the UK and areas of devolved responsibility.
- Be cautious in utilising England-specific structures and mechanisms, such as Skills England, for delivering UK-wide industrial strategy aims, or when that approach is unavoidable, ensure mitigations are in place.

- The Industrial Strategy Council should engage with devolved administrations, devolved funding agencies (ie Medr) along with key research and innovation organisations in the devolved nations such as universities.
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Responses

1. How should the UK government identify the most important subsectors for delivering our objectives?

Welsh universities are well-placed to deliver upon the objectives of the industrial strategy, with a diverse set of strengths across the identified priority areas, widespread experience in industrial collaboration, and an ability to leverage interdisciplinary collaboration across Wales to maximise impact.

The role of Welsh universities in the Welsh economy is substantial and wide-ranging. Recent analysis by London Economics identified £10.97bn of economic impact arising from Welsh university activities in 2021-22 including £5.27bn from teaching and learning activities, £1.979bn from research and knowledge exchange and £1.259bn from educational exports¹.

In identifying the most important subsectors, the UK Government should consider the breadth of evidence, ensuring that the evidence reflects the different regional ecosystems for research and innovation. Although there are many data sources that can be useful in determining subsectors – the Research Excellence Framework outputs, measures of Foreign Direct Investment, turnover, concentration of research organisations in a particular area – we would note two key issues that should be considered: data lag and the challenge in extrapolating future performance from historic performance. To mitigate the impact of this, data sources should be accompanied by direct, qualitative engagement including on a four-nation basis.

Identifying subsectors should also consider the different regional environments across the UK. For example, Wales has a comparatively higher proportion of its workforce employed in micro or small businesses while Wales' large businesses have a comparatively higher proportion of turnover. Similarly, 31.6% of Wales' workforce is employed in the public sector compared to 24% of the UK workforce². As such, delivering the plan's objectives around growth will require an understanding of the different approaches required to develop research and innovation activity in areas where there is a higher proportion of SME employment but with comparatively lower turnover in those enterprises.

¹ <https://uniswales.ac.uk/sites/default/files/2024-10/LE%20-%20Universities%20Wales%20-%20Impact%20of%20Welsh%20universities%20-%20Final%20report.pdf>

² <https://statswales.gov.wales/Catalogue/Business-Economy-and-Labour-Market/People-and-Work/Employment/Persons-Employed/publicprivatesectoremployment-by-welshlocalauthority-status>

2. How should the UK government account for emerging sectors and technologies for which conventional data sources are less appropriate?

As set out above, qualitative engagement with assets and organisations across the UK will help ensure that decisions reflect, as far as possible, future trajectory as well as prior performance.

4. What are the most important subsectors and technologies that the UK government should focus on and why?

Please note response to Question 5.

5. What are the UK's strengths and capabilities in these subsectors?

Wales has a range of strengths and capabilities within subsectors that have high growth potential. Importantly, many of the areas below reflect interdisciplinary work which makes use of different strengths and assets across the Welsh university sector.

Advanced Manufacturing

There are a number of areas of pre-existing strength in Wales in advanced manufacturing that present opportunities for the UK in terms of growth. In particular:

Compound semiconductors

Wales has established and significant experience and capabilities in compound semiconductors³, evident through the compound semiconductor cluster in South Wales, a world-leading hub for the development and manufacturing of compound semiconductor technologies.

Steel

Wales hosts the UK's first regional centre of excellence for steel innovation⁴, creating a high-tech research cluster that links the supply chain to research projects, commercial opportunities and training.

Aerospace

There are a broad range of academic and industry strengths and assets in aerospace across Wales spanning computational aerodynamics⁵, propulsion system design⁶, optics research on high altitude imaging and communication technologies⁷, research

³ <https://csconnected.com>

⁴ <https://www.samiswansea.co.uk>

⁵ <https://results2021.ref.ac.uk/impact/71241144-14ba-43f0-873c-8db00195c17a?page=1>

⁶ <https://www.ukspacefacilities.stfc.ac.uk/Pages/Swansea-University---Swansea-Research-Centres-and-Facilities.aspx>

⁷ <https://results2021.ref.ac.uk/impact/6ff5f56b-4b8b-45a4-aba3-668fb4b1037e?page=1>

on mitigating lightning strikes on aircraft structures⁸, and sensor technologies. Industry partners include Airbus and Rolls Royce. Universities with expertise in this area include Swansea University, Cardiff University, Wrexham University and the University of South Wales.

Clean Energy Industries

Welsh universities have broad expertise in a range of clean energy subsectors including in supporting business transition to sustainable processes.

Energy technologies

Wales has experience in delivering a broad range of energy technology research. For example, SPECIFIC is a UK Innovation and Knowledge Centre that leads in energy technology research⁹. In particular, the centre develops active buildings which can generate, store and release their own heat and electricity. The Centre researches, proves and promotes early commercialisation of these technologies. This area overlaps with Wales' wider strengths in material science.

Nuclear

The [Nuclear Futures Institute](#) (NFI) has been created at Bangor University with the support of the Welsh Government through the Sêr Cymru programme, delivering a world leading nuclear research capability for Wales and the United Kingdom. NFI combines state-of-the-art nuclear materials manufacturing and modelling capabilities, nuclear and reactor physics expertise as well as thermal-hydraulics, sensor development and nuclear regulation for current and future nuclear systems, including fusion and advanced modular reactors. NFI is building a capability devoted to nuclear medicine to support industry efforts in this area. The close links with industry and world-leading experimental facilities are vital to economic growth and the creation of high value jobs in the area.

Hydrogen

Research by University of South Wales, based at the university's Hydrogen Centre and its Sustainable Environment Research Centre laboratories¹⁰, is developing cost-effective low carbon methods of producing and recovering hydrogen. The team has worked with academic and industrial partners to find ways to produce and store hydrogen, use it efficiently, recover it from steel making and use it for transport. Methods developed by the team to produce, store and use hydrogen are now used across 21 countries.

Biofuel

⁸ <https://www.cardiff.ac.uk/research/explore/research-facilities/lightning-laboratory>

⁹ <https://specific-ikc.uk>

¹⁰ <https://serc.research.southwales.ac.uk>

Wales hosts cutting edge research in biomass production, based at IBERS in Aberystwyth University, which is exploring how to speed up the breeding of the perennial energy grass miscanthus¹¹.

Creative industries

Wales is home to a successful and growing creative industries cluster, with 8,000 active enterprises in Wales' creative industries¹². An independent review of the creative industries, commissioned by the UK Government, suggested that Cardiff had become one of the UK's largest media production centres outside London. The report notes Wales' strong independent TV production industry with over 600 active firms¹³.

Media Innovation

Media Cymru is collaboration to accelerate growth in the Cardiff Capital Region, making it a hub for global innovation. Media Cymru is funded through £22m from UK Research and Innovation's (UKRI) flagship Strength in Places Fund, £3m from Cardiff Capital Region, £1m from Welsh Government, through Creative Wales, and £23m match funding from industry and university partners. A Consortium of 22 partner organisations all with one aim.

Digital and Technologies

Robotics

Aberystwyth University's Intelligent Robotics research group (IRG) has substantial expertise in producing integrated hardware and software systems for real-world applications with significant impact, including in the space industry. Members of IRG are responsible for developing several key systems of the ExoMars programme and providing data for industry partners. Furthermore, they have been actively engaging with the general public. Through varied activities appealing to a diverse range of audiences along with the award-winning robotics club, they have interacted with thousands of people inspiring youngsters and changing perspectives on the future and potential of robotics¹⁴.

Data science

Wales has distinct strengths in data science including in population data as set out under the Life Sciences heading.

¹¹ <https://www.aber.ac.uk/en/news/archive/2022/08/title-256381-en.html>

¹² https://clwstwr.org.uk/sites/default/files/2020-05/Creative%20Industries%20Report%20No%201_Final_compressed.pdf

¹³ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/649980/Independent_Review_of_the_Creative_Industries.pdf

¹⁴ <https://www.aber.ac.uk/en/cs/research/ir/>

Cyber Security

With the increasing sophistication and prevalence of threats to digital and network infrastructure, cyber security is an area of crucial ongoing importance to the UK's national interest. Wales has a diverse range of strengths in this area, including capacity reflected through:

- Cardiff University's Centre for Cyber Security Research¹⁵, an Academic Centre of Excellence in Cyber Security research, and;
- The National Digital Exploitation Centre¹⁶, a collaborative project by Thales and the University of South Wales in partnership with Welsh Government. NDEC is Thales' global hub for the delivery of Operational Technology security transformation.

Professional and business services

Wales has widespread expertise in delivering innovative professional and business services.

Product development

There are extensive examples of Welsh universities working with industry in product development. This includes PDR at Cardiff Metropolitan University which is focused on the use of design as a tool for innovation in the private and public sectors, [CEMET Wales](#) at USW which supports businesses with the creation and adoption of emerging technology, and [CBM Wales](#) at UWTSD which is an industry focused product development and batch manufacturing facility.

There are also examples of where product development overlaps with improving health outcomes including through the development of products for use in health and care settings such as:

- the [Cerebra Innovation Centre](#) at UWTSD which builds innovative, bespoke products to help disabled children discover and engage with the world around them
- [HUG](#), an innovative new product by design researchers at Cardiff Metropolitan University that has been proven to enhance the quality of life for people living with advanced dementia. The success of the product has led to HUG™ being prescribed on the NHS, and the launch of a spin-out company, HUG by LAUGH, to manufacture and sell HUG™.

The Welsh university sector also developed capacity in collaborative work with industry through EU funded activity such as:

¹⁵ [https://www.cardiff.ac.uk/centre-for-cyber-security-research#:~:text=cyber%20security%20analytics,-.Cardiff%20University's%20Centre%20for%20Cyber%20Security%20Research%20\(CCSR\)%20is%20a,att ack%20detection%20and%20situational%20awareness.](https://www.cardiff.ac.uk/centre-for-cyber-security-research#:~:text=cyber%20security%20analytics,-.Cardiff%20University's%20Centre%20for%20Cyber%20Security%20Research%20(CCSR)%20is%20a,att ack%20detection%20and%20situational%20awareness.)

¹⁶ <https://tradeandinvest.wales/regional-strengths/national-data-exploitation-centre-ndec>

- KESS II which operated on a Wales wide basis, led by Bangor University, and paired master's and PhD students with external partners including SMEs
- ASTUTE 2020, a collaborative project involving Swansea University, Cardiff University, Aberystwyth University and UWTSD. It focused on leveraging university research to enhance processes and foster innovation with the manufacturing industry.

Life Sciences

Population Data

Wales has expertise in harnessing large scale population data for healthcare research and innovation. The SAIL Databank at Swansea University is one of the best characterised population databanks in the world. SAIL has supported fast-response policy intelligence during the pandemic, performed as the national data linkage and access system for all public data in Wales, and worked with thousands of researchers and hundreds of research projects.

Agriculture and Food

Across Wales there are a range of strengths in relation to agriculture and food. This includes the work of the [Institute of Biological, Environmental, and Rural Sciences](#) at Aberystwyth University which makes a significant contribution to addressing global challenges such as food security and sustainability bioenergy. It has been pivotal in developing resilient crop varieties that improve agricultural efficiency and sustainability.

The [ZERO2FIVE Food Industry Centre](#) at Cardiff Metropolitan University is focused on advancing Welsh food and drink sector through innovation, research and collaboration. ZERO2FIVE supports SMEs in food manufacturing.

Neuroscience

Wales has significant strengths in neuroscience. Cardiff University hosts specialised centres including the MRC Centre for Neuropsychiatric Genetics and Genomics, the Dementia Research Institute, and the National Centre for Mental Health.

Research and innovation in this area is supported through the interdisciplinary strengths in Wales including in data science.

6. What are the key enablers and barriers to growth in these subsectors and how could the UK government address them?

Many of the barriers faced by Welsh universities in enabling growth in these subsectors relate to the funding environment or the effectiveness and limitations of current place-based approaches to policy.

Universities in the UK operate under the dual-support system. With core funding for research and innovation (quality-related research funding and unencumbered innovation funding) provided by devolved funding bodies while UK-wide competitive funding is delivered through UKRI and its constituent councils. Core funding is crucial in enabling universities to secure UKRI funds. Within Wales, a relative level of underfunding over recent years makes it more difficult for Welsh universities to compete for UK-wide funds. For AY 2024/25, when compared on a per capita basis, the funding allocations for research and innovation in Wales (£98m) were £57m lower than in England (£155m equivalent) and £86m lower than in Scotland (£184m equivalent).

The wider financial challenges facing the university sector in Wales, and the UK more broadly, present a key risk and limitation in the ability of the research, development and innovation infrastructure to develop these subsectors. For example, fees and grant funding no longer cover the cost of teaching UK undergraduates or delivering research and innovation activity. With the volatility in international recruitment placing additional financial pressure on institutions, universities will have to make difficult decisions to secure their long-term sustainability. These decisions could limit or inhibit the ability of the sector to capitalise on opportunities for research, development and innovation. Given the relative importance of universities in the Welsh research and innovation ecosystem – higher education research and development accounts for 37% of Wales' research and development expenditure – this presents even greater risks to Wales than other parts of the UK.

Skills and talent pipeline is essential to support growth in the priority areas outlined in the green paper. This presents a key challenge from a Wales-perspective given the demographics of our workforce, which is on the whole older and less well qualified, and the education participation challenge we face. This is further outlined in our responses to question 7 and 8.

Another key barrier for growth in these subsectors is the extent to which there is sufficient join up between the four nations of the UK. For example, engagement between the devolved administrations and relevant parts of UK Government and UKRI can be highly variable depending on individual relationships or historic engagement. This can lead to the development of UK-level priorities or funding competitions that do not reflect the breadth of the UK. Ensuring a joined-up approach will help address barriers to securing growth in the priority areas identified in the green paper. This applies across the skills and talent environment as well as research and innovation. For example, the apprenticeship levy is currently applied to employers across the UK. Skills England's review of the levy must engage with partners across the four nations to ensure that it does not exacerbate existing challenges within the skills and challenge space.

A central enabler for research and innovation in Wales are the opportunities presented by collaboration, including our ability to leverage the diverse strengths of universities. This collaborative environment was well-demonstrated through the benefits Welsh

universities delivered through European Structural and Investment Funds. National schemes such as KESS2 enabled Welsh universities to link companies and organisations with academic expertise to undertake collaborative research projects, working towards a PhD or Research Masters qualification.

However, the loss of ESIF funds, and their subsequent inadequate replacement through the UK Shared Prosperity Fund, has had a damaging impact on the capacity of Welsh research and innovation. In March 2023, Universities Wales identified 60 projects and 1000 staff at risk as a result of the loss of EU Structural Funds¹⁷, the vast majority of these projects were in the research, innovation or skills environment. The UK Government's commitment to review the arrangements for providing structural funds replacements should consider how best to ensure that this capacity within Wales can be strengthened. Replacement funds should support long-term planning and large scale regional and national collaboration within Wales.

Welsh universities have jointly created the Wales Innovation Network to improve collaboration, build upon our strengths and increase our share of UK research and innovation activity. This Network provides a clear engagement point for UK Government and partner agencies, and opportunities to identify and develop research and innovation opportunities in Wales.

The international reputation of our universities is, similarly, another key enabler for us securing growth in the priority areas outlined in the green paper. However, there have been a series of challenges to this reputation in recent years. Our withdrawal from the EU and the long-running (now resolved) uncertainty over our relationship to Horizon Europe led to a slow down in research partnerships with EU-based institutions. The recent policy uncertainty over the graduate route and changes to migration policy, including in relation to dependents and salary thresholds, established barriers to our ability to secure the skills and talent needed for growth. As part of its Industrial Strategy, UK Government should work to eliminate uncertainty where possible and provide confidence to international organisations and researchers on the viability of the UK as a trusted and reliable partner and study and work destination.

7. What are the most significant barriers to investment? Do they vary across the growth-driving sectors? What evidence can you share to illustrate this?

Skills and talent are a key driver of investment. Wales' faces particular challenges in this area with a relatively low proportion of the workforce with higher level qualifications and a higher proportion of people with no qualifications¹⁸. These differences are likely

¹⁷ <https://www.theguardian.com/education/2023/feb/07/welsh-universities-face-jobs-being-lost-eu-research-funding-ends>

¹⁸

<https://www.ons.gov.uk/peoplepopulationandcommunity/educationandchildcare/bulletins/educationenglandandwales/census2021#:~:text=Level%201%3A%20one%20to%20four,A%20Levels%20or%20equivalent%20qualifications>

to become more pronounced given the education participation gap between Wales and the UK, and the cross-border flow of students and graduates.

In 2024, 33.8% of the 18 year old population in Wales applied to go to university, the lowest proportion of the four UK nations and compared to an application rate of 41.9% in the UK more broadly¹⁹. This gap is likely to be, in part, the result of differences in participation in routes such as A level qualifications. Recent analysis by the Wales Centre for Public Policy found that only 32% of Welsh Key Stage 4 learners undertake A-levels, compared to 47% of young people in England who study A-levels²⁰.

Of those Welsh young people who apply to go to university, around a third will study in a university in England. Those that study in England are less likely to return to Wales to work, 88% of Welsh-domiciled young people who graduate from a Welsh university are working in Wales 18 months after graduation while only 47% of those who graduate from an English university are working in Wales at the same point.

These factors suggest a fundamental and structural challenge in developing and retaining a highly skilled pool of human capital within Wales.

As set out in our response to question 6, the financial environment that universities are operating remains a significant barrier to investment, limiting the ability of universities to secure opportunities and best leverage their strengths.

8. Where you identified barriers in response to Question 7 which relate to people and skills (including issues such as delivery of employment support, careers, and skills provision), what UK government policy solutions could best address these?

As set out in our responses to question 7, there are a range of barriers in relation to people and skills that include the relatively low levels of higher level skills within the Welsh workforce, the ongoing participation challenges in Wales with the lowest application rate to university in the UK, and the impact of cross-border flow for study on retaining skills and talent within Wales.

Wales, on the whole, has an older and less well-qualified workforce than the rest of the UK.

Significant efforts have been made to address this. There has been a focus on increasing demand for provision of part-time higher education, which has led to a substantial increase in the number of part-time students in Wales with the Open University in Wales reporting a particular increase in delivering higher level skills to hard to reach groups. Wales has also hosted regional and national projects aimed at addressing skills needs. For example, the KESS2 project that was supported by EU Structural Funds sought to link companies with academic expertise through the

¹⁹ <https://www.ucas.com/undergraduate-statistics-and-reports/ucas-undergraduate-releases/applicant-releases-2024-cycle/2024-cycle-applicant-figures-30-june-deadline>

²⁰ <https://wcpp.org.uk/wp-content/uploads/2024/10/Expert-reflections-on-the-challenges.pdf>

provision of scholarships for Master's and PhD students. However, the loss of EU Structural Funds has led to a reduction in the availability of programmes of this type.

There are a range of solutions that UK Government could implement to address these areas:

1. The replacement UK Shared Prosperity funding has not been targeted at areas of need or provided universities with the same opportunities to deliver transformational benefits. The way it is distributed makes it difficult to collaborate on a regional or national basis for local gain. The short-term nature of the funds has also meant that the long-term planning previously enabled through Structural Funds has not been possible. There is an opportunity for UK Government to address these shortcomings and put in place replacement funding that enables ambitious, collaborative research, innovation and skills delivery. Wales has developed an excellent foundation upon which to build commercialisation activity and develop new possibilities in pan-Wales collaboration.
2. The apprenticeship levy is applied to employers on a UK-wide basis although the levy funding system is only operated within England (with other UK nations receiving additional block grant funding to reflect the levy income). UK Government has committed to Skills England reviewing the levy. It is crucial that Skills England engages with partners across the devolved nations to ensure that reforms to the levy work for the whole of the UK.
3. Providing confidence and stability on migration policy will help strengthen universities' ability to attract the right skills and talent whether for study or work. Previous uncertainty, including on the future of the graduate route, has had a detrimental effect on the ability of universities to attract appropriate skills and talent.

10. Where you identified barriers in response to Question 7 which relate to RDI and technology adoption and diffusion, what UK government policy solutions could best address these?

As set out elsewhere in this response, the financial environment universities operate in is a significant barrier for research and innovation. For example, the loss of EU Structural Funds led to a significant loss of RDI capacity and resource within Welsh universities. EU Structural Funds enabled Welsh universities to deliver cutting-edge innovation projects that developed buildings that generate more energy than they use, created more sustainable practices in manufacturing, supported small businesses to collaborate with academics, and drove innovation in agricultural practices. Many of these projects worked regionally or nationally across Wales, drawing on strengths and expertise from multiple universities. Universities were the second largest recipients of EU Structural Funds in Wales in the most recent programme, being awarded over £350m as lead partners since 2014, around £60m a year.

The adequate replacement of these funds, in line with UK Government policy to reform the UK Shared Prosperity Fund, is essential in enabling Welsh universities to strengthen research and innovation capacity and, in doing so, drive further growth in key sectors within Wales.

Another area where the UK Government could support RDI and technology adoption and diffusion is by ensuring an appropriate place-based lens is applied on policy development relating to research and innovation funding. For example, ensuring that the development of competitions considers the different regional strengths, assets, needs and institutions (as described in our response to question 1).

11. What are the barriers to R&D commercialisation that the UK government should be considering?

The industrial plan should recognise the role that universities are able to play both as regional anchors and as vehicles for smaller businesses which have less research and innovation capacity.

When developing support for commercialisation, UK Government should consider the most appropriate vehicles for that support, including how that support can drive commercialisation across the UK. For example, what may seem like an arbitrary decision on whether commercialisation support is considered innovation funding (via Innovate UK) or university knowledge exchange support (via Research England) has considerable implications for the operation of research and innovation within the devolved nations.

Welsh universities also play a critical role in start-ups and scale ups, with the highest per capita rate of active graduate start-ups in the UK²¹. There are opportunities to further leverage the ability of universities to generate start-ups, particularly when it comes to supporting growth and sustainability of those enterprises.

In delivering the aims of the Industrial Strategy, it will be crucial that UK Government, UKRI and other key funders and policy makers engage with the breadth of the UK to understand the distinct contexts of the four UK nations.

24. How can international partnerships (government-to-government or government-to-business) support the Industrial Strategy?

Universities, in Wales and across the UK, are international in focus with international research partnerships, staff and students. In 2022/23 there were 28,000 students from outside the UK studying at Welsh universities and 2,370 staff from outside the UK working in Welsh universities. Of the research impact case studies submitted by Welsh universities to the 2021 Research Excellence Framework, 22% included an international partner.

²¹ <https://www.hesa.ac.uk/data-and-analysis/business-community/ip-and-startups>.

International collaboration has been a key priority for Welsh higher education over a number of years. Through the Global Wales partnership we have facilitated inward delegations, memorandums of understanding, and partnerships with a range of international partners. This included securing the UK's first partnership with T-Hub in Hyderabad, the world's largest innovation campus for start-up.

As such, universities are well-placed to facilitate, strengthen and expand the UK's international partnerships.

The international work that universities undertake makes a significant contribution to growth and GVA in its own right. Recent analysis of Welsh universities contribution to the economy found that the export activity of our universities in 2021-22 had a total economic impact of £1.26bn.

The international activity of universities provides longer-term benefits including in supporting the position of the UK as a credible investment partner and generating soft power through international students who graduate from UK universities. It is crucial that the Industrial Strategy does not just consider how to position the UK for international partnerships, but also how to support different parts of the UK, which may have different strengths, to forge international partnerships that are best suited to their own needs.

For example, this should include ensuring international trade agreements serve as catalysts for cross-border education and research and reflect the strengths of different parts of the UK.

There are also opportunities for UK Government, working with its agencies and devolved governments, to put in greater support for research organisations to take advantage of collaboration opportunities in support of key industries. There has been high growth potential engagement between the compound semiconductor cluster in Wales and partners in the US, support being made available to match 'CHIPS and Science Act' funding opportunities in the US could transform collaboration between the UK and US.

25. Which international markets do you see as the greatest opportunity for the growth-driving sectors and how does it differ by sector?

Universities in Wales work with a diverse range of countries in support of key areas of R&I strength. Having an open and outward looking industrial strategy that supports international collaboration in a flexible way will be key to securing international investment and bringing in the appropriate skills to advance our growth-driving sectors.

Taking compound semiconductors as an example, there is already considerable engagement and collaboration taking place between Welsh institutions and their US counterparts. As has already been stated, this could be further supported and grown significantly by ensuring match funding to access CHIPS and Science Act funding. However, this is a sector of global interest and significance, and Welsh university partners from Europe, India, South-East Asia and beyond are all keen to further their

collaboration with our institutions – and in many cases already partnering with US (and some UK) universities to advance their own national strategies for semiconductor independence.

28. How should the Industrial Strategy accelerate growth in city regions and clusters of growth sectors across the UK through Local Growth Plans and other policy mechanisms?

For the Industrial Strategy to accelerate growth across the UK, it will need to reflect the distinct differences across different parts of the UK including the different business and labour markets, assets and strengths, and the role of place. For example, although Wales has a relatively low output of research papers, the indexed performance of those papers is notably high, performing towards the top of the range with only London, Scotland and the East of England²² performing better. This suggests opportunities distinct to Wales' ecosystem to capitalise on that strength and increase volume.

Accelerating growth across the UK must also require direct engagement with devolved structures to understand how the different funding ecosystems work along with the qualitative experience of institutions such as universities.

It is important that, if it is to be truly UK-wide, the Industrial Strategy does not overly rely on structures or mechanisms that are England-specific such as MCAs or Skills England. Where structures such as those are used within the Industrial Strategy, consideration will need to be given to equivalent methods of engagement and delivery in the devolved nations.

As set out elsewhere in this response, EU Structural Funds played a crucial role in building research capacity in key areas of growth including net zero, digital, and life sciences. The loss of that funding has had a significant impact on Welsh research, skills and innovation. Reform of the UK Shared Prosperity Fund, as set out in the UK Labour manifesto, would help maintain and grow this activity and secure its impact on growth.

29. How should the Industrial Strategy align with devolved government economic strategies and support the sectoral strengths of Scotland, Wales, and Northern Ireland?

Effective alignment with the devolved nations will require the Industrial Strategy to:

- Reflect the different structures and ecosystems across the UK
- Incorporate engagement not only with devolved governments but also with the main assets and strengths within the devolved nations, including universities and the Wales Innovation Network. The statutory committee for research and

²² <https://www.hepi.ac.uk/wp-content/uploads/2024/01/Regional-research-capacity-what-role-in-levelling-up.pdf>

innovation within Medr, Wales' funder and regulatory of tertiary education and research, should also be a key partner.

- Not rely on England-specific policies and structures to achieve the Strategy's aims. Or, when England-specific policies and structures are used, to ensure that devolved equivalents are also incorporated.
- When designing new regional funds to replace the UK Shared Prosperity Fund, take into account how benefits were previously realised through the EU Structural Funds programme. Also consider regional investment strategies developed within the devolved nations such as the 'Regional Investment Framework for Wales'²³.

31. How should the Industrial Strategy Council interact with key non-government institutions and organisations?

Universities are a key partner in the delivery of the aims of the Industrial Strategy and this should be reflected in the expectations of the Industrial Strategy Council's engagement. In particular, given the relative of importance of universities within the Welsh research, skills and innovation ecosystem, the Industrial Strategy Council will need mechanisms to take account of and engage with universities within Wales through Universities Wales and the Wales Innovation Network.

²³ <https://www.gov.wales/sites/default/files/publications/2020-11/regional-investment-in-wales-framework.pdf>