

Economy, Infrastructure and Skills Committee Inquiry into Research and Innovation in Wales

Response by the Higher Education Funding Council for Wales
(HEFCW)

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Noddir gan
Lywodraeth Cymru
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The Welsh Government says that there needs to be a “major increase” in research intended to help solve specific challenges facing Wales (challenge-led research). It also says this type of research needs to be balanced with the more traditional type of long-term research undertaken by universities which pushes the boundaries of knowledge.

1. To what extent do you agree with this view and how can Welsh Government ensure that an increase in one type of research activity doesn't mean the other type loses out?

- 1.1 We agree that funding for challenge-led research can provide an effective way of focusing research on addressing major issues facing the economy and society, locally, nationally and internationally. However, any funding which Welsh Government provides for challenge-led research in Wales must be in addition to Quality Related funding (QR), the main funding stream for research in universities in Wales (provided by HEFCW) and not at the expense of reducing that funding stream.
- 1.2 The Welsh Government's White Paper, '*Public Good and a Prosperous Wales*' (2017) calls for a balance to be struck between curiosity driven research and challenge-led research and innovation. It states that unhypothecated QR funding for curiosity driven research should remain a fundamental component of the funding to be distributed by the proposed Tertiary Education and Research Commission for Wales. The Welsh Government intends that levels of QR funding should be in line with the recommendations given in the 2016 [Review of higher education funding and student finance arrangements](#) (hereon 'the Diamond Review') and developed further by the [Reid Review](#) (2018) and that additional funds may become available also for challenge-led R&I activities. We welcome this in principle commitment on the part of Welsh Government.
- 1.3 The research funding landscape across the UK is changing. The context in which our universities operate has been defined by the publication of the [UK Government's Industrial Strategy](#) (2017) and the Welsh Government's [Prosperity for All: economic action plan](#) (2018). In support of its ambition to tackle identified global challenges, the UK Government has committed to raise total UK-wide R&D investment to 2.4% of GDP by 2027. Wales, which has a historical deficit in the capacity of STEM academic researchers, needs to be in a position to compete for its share of this resource. This was the purpose of the Reid Review. It proposes action to deal with the shortfall in our research investment, so that Wales can compete on an equal footing with the rest of the UK.
- 1.4 It is therefore essential that any funding for challenge-led research in Wales should be in addition to, and not at the expense of, QR. QR helps support core research infrastructure and investment, including the salary costs of academic researchers, support staff, equipment and facilities. It also gives universities the flexibility to develop new lines of research and provides the foundations for universities to bid successfully for competitive project-based funding streams from other sources. Wales needs to maintain funding for long-term research

activity that pushes the boundaries of knowledge for the reasons outlined above, and also because such research provides the breakthroughs and new insights which can subsequently be used to address specific challenges.

- 1.5 Additionally, care is needed if equating QR solely with the funding of curiosity-driven research. The purpose of QR funding is to underpin the wide breadth of research activities undertaken in universities in Wales, from blue skies curiosity driven activity to more applied activity which might have a more immediate impact on the economy or society. It supports activity linked to the establishment of the Cardiff University-IQE Compound Semiconductor Centre as much as it supports the study of plastics in the freshwater food chain. It supports the establishment of the Swansea – TATA Steel and Metals Institute as well as breakthroughs in antihydrogen research. And it supports medical research across a wide range of areas, including early-stage activity linked to the establishment of Cardiff University's Dementia Research Institute.
- 1.6 It is certainly an ambition of HEFCW that our role to support the research and innovation activities in universities could usefully be expanded to help institutions better position themselves when applying for competitive UK funding. QR undoubtedly enables this, but a more practical and supportive role through HEFCW may be one way in which Welsh Government could use existing functions and bodies, to enable more challenge led research to be based in Wales.

Welsh Government has said it wants to bring all research funding together and that this funding should then be available to small and medium-sized enterprises (SMEs), large private businesses, and other organisations as well as universities and colleges.

2. **To what extent should businesses and other organisations be able to receive Government research funding that might have otherwise gone to universities and colleges? How could this be done without under-funding some organisations – might there be unintended consequences?**
 - 2.1 We would strongly argue that, if businesses and other organisations become eligible to receive Welsh Government research funding, this must come from additional resources, and not from research funding which would otherwise have gone to universities (e.g. QR).
 - 2.2 Our views are also shaped by the following factors:
 - i. Universities are the largest contributor to R&D activity in Wales. A recent Bevan Foundation report records that nearly half of Wales' expenditure on research and development (R&D) can be attributed to universities and, given the link between R&D and productivity growth, university R&D underpins many of Wales' economic gains.
 - ii. Funding to underpin research activity (HEFCW's QR funding) is fundamental for supporting high quality research and generating the ideas which lead to the products and innovations of the future.

- iii. Funding for research and innovation in universities in Wales, currently determined and allocated by HEFCW, is already low compared with the rest of the UK.
- iv. Some of the most active and successful research funding streams are where collaborative funding projects are proposed with universities and business working together. Knowledge Transfer Partnerships, for example, enhance investment into research by organisations, and ensure that academic research is embedded into business practice.

2.3 The current underinvestment in research and innovation in universities in Wales is illustrated by the following:

- Wales currently has 3.9% of total UK QR funding for research, down from 4.5% of the UK total in 2007/08. That proportion was already low, given that Wales' standard share of UK HE activities is normally taken to be 5%.
- HEFCW used to provide Innovation and Engagement Funding of around £8m per annum to universities. This funding underpinned university activity in areas that stimulated and directed the application and exploitation of knowledge, to benefit the economy, society and culture in Wales. HEFCW had to withdraw its Innovation and Engagement funding from 2013/14 because its grant-in-aid from Welsh Government was reduced in order to meet the costs of the Welsh Government's undergraduate tuition fee grant.
- The Diamond Review of Fees and Funding in Wales recommended that QR funding should at least be maintained at 2016 levels in real terms (£71 million per annum). Reductions to HEFCW grant-in-aid means that that was not achieved in either 2016/17, 2017/18 or in the current year 2018/19.
- The impact of the funding position in Wales has been compounded by the fact that, in England, QR funding and the Higher Education Innovation Fund (the English equivalent of our former Innovation and Engagement Fund) have both increased significantly in the last two years.

2.4 The Reid Review, a review of government funding for research and innovation, demonstrates that research and innovation in universities in Wales is currently significantly underfunded, and recommends considerable additional investment. Redirecting part of the already low level of funding away from universities to businesses and other organisations would therefore be contrary to the Reid Review recommendations.

2.5 If businesses and other organisations received Welsh Government research funding which would otherwise have gone to universities, unintended consequences would include:

- The quality and volume of research in universities in Wales would fall and the Welsh Government's ambition to promote the exploitation of research and innovation knowledge for economic benefit would not be realised

because it depends on the availability of high quality innovative research outputs in the first place.

- The sector would lack the resources to compete successfully for the increased R&D funding announced by the Westminster Government to support its Industrial Strategy (an extra £2 billion a year by 2020-21). This funding will be allocated by the Research Councils and Innovate UK on a UK-wide competitive basis through the Industrial Strategy Challenge Fund and similar schemes. These schemes will have a strong focus on boosting economic performance and productivity, and are therefore relevant to the Welsh Government's economic objectives. The Reid Review draws attention to the opportunity offered by the new funding but also emphasises the close correlation between QR funding and success in winning external grant funding and consequently the need for adequate resourcing of the sector.
- There is potential for funding directed to businesses to ultimately lead to research activity that is still carried out by universities, where organisations chose to commission research activity. The unintended consequence here is that research funding for Wales ultimately is 'spent' outside of Wales. In addition, the potential for organisations to use funding to commission research would have the impact of delaying research activity, so to fund businesses rather than universities could potentially hamper the effectiveness of that funding.

2.6 HEFCW's intention is to restore QR funding to the level recommended in the Diamond Review and to reinstate the Innovation and Engagement Fund (IEF) as a consequence of the implementation of the Diamond Review recommendations. The Welsh Government is also looking at ways in which European Structural and Investment Funds, which have been instrumental in supporting innovation activities between universities and businesses in Wales, are to be replaced once access to this source of funding is no longer available.

In a recent review into research funding, it was argued that there was a strong risk of university research and innovation interests overshadowing the research and innovation interests of private businesses. But it didn't then go on to suggest a way of stopping this happening.

3. What needs to be done to ensure businesses and their interests are not over-shadowed by universities when it comes to research and innovation funding and activity?

3.1 We were unclear what was being referenced here, but were grateful for clarification from the Committee Secretariat. The reference is to a point made in the Reid Review on page 27 (fourth bullet): the section in question refers to the implications of including responsibility for funding business innovation within the proposed new Tertiary Education and Research Commission for Wales.

- 3.2 This issue was not a prominent feature of the evidence received by the Reid Review, but Professor Reid offers his personal observations in his report, suggesting that whether or not innovation support comes under the proposed Commission, more effective collaboration is needed on the part of those responsible for funding schemes. He presents some potential advantages, but then goes on to say (on page 27, bullet point four) that, under such a structure *“there would be a significant risk that higher and further education interests would outweigh those of business and innovation and these risks would need to be managed and mitigated at both governance and management levels”*.
- 3.3 Our view, therefore, is that the current Inquiry might have taken this remark from the Reid Review out of context: it is an issue which could potentially arise if it is decided to include responsibility for business innovation funding within the proposed new Commission.
- 3.4 In the technical consultation on the establishment of the Commission, the question of whether or not the business-related funding activities currently operated within Welsh Government would be brought into the Commission appears unresolved at present. We recognise that there is a need for better co-ordination and branding of the totality of the funding which Welsh Government provides for R&D. We also recognise that the vision, purpose and scope of the Commission needs to be firmly established. Whichever way the Welsh Government decides to support business R&D, we suggest the key considerations should be as follows:
- There needs to be better **collaboration and coordination** in how funding is apportioned. HEFCW has worked closely with Welsh Government in the operation of its Innovation and Engagement Fund, as well as the *WG Academic Expertise for Business* and *SMART Expertise Funds*, which focus on collaborative activity between universities and businesses where the emphasis is clearly on the exchange of knowledge and the co-design of R&D activity. We have also worked in partnership to support expressions of interest to UKRI’s new Strength in Places Fund, which will fund clusters of universities and business supply chains to tackle issues of local productivity.
 - There need to be **incentives** for the development of strategic relationships between universities, FE colleges and key organisations/companies in Wales. Good examples include IQE with Cardiff University; Horizon-Hitachi with Bangor University; Natural Resources Wales with Universities Wales. Reid recommends the establishment of a St David’s Investment Fund that would incentivise collaboration between HE, FE and business, though the provision of core infrastructure funding and three industry-led “innovation hubs”. We support this recommendation.
 - Funding available in Wales should be **comparable to that of other UK regions**. The funding available to underpin the research and innovation system in universities in Wales is currently inadequate and causing Wales to fall behind when bidding for highly competitive sources of

external funding. This is the basis of the recommendations presented by Professor Diamond and Professor Reid: the Welsh Government needs to move quickly to invest in its university research base.

In the academic year 2016/17 there were 241 graduate start-ups reported by Welsh universities with an estimated turnover of £56 million, this was almost double the turnover of university staff start-ups in the same year.

4. What is currently in place from universities and Welsh Government to help and support student and graduate entrepreneurs turn their ideas into successful ventures?

4.1 The 2016/17 Higher Education – Business and Community Interaction (HE-BCI) Survey demonstrates that universities in Wales perform strongly in relation to university spin-offs and staff/graduate start-ups across a range of measures. Given their additional teaching, research or support responsibilities we would rightly expect that there would be fewer staff start-ups compared to the graduate body, who might be able to give primary focus to their business ideas. The Inquiry rightly states that 241 graduate start-ups were established in 2016/17. However, the estimated turnover figure of £56 million relates to all active graduate start-up firms (1,543 of these in 2016/17). This is a good news story for Wales.

4.2 The figures are as follows in terms of Wales' performance in relation to the UK as a whole. Considering Wales' population share of the UK is around 5%, *start-ups* (both for staff and graduates) is an area of significant success for our Universities, which should be commended for this strong performance:

- Number of active firms that have survived at least three years: 12.4% of staff start-ups and 13.3% of graduate start-ups are in Wales
- Number of active firms: 10.6% of staff start-ups and 12.4% of graduate start-ups are in Wales
- Estimated employment of all active firms: 14.2% of employment in staff start-ups and 9.1% in graduate start-ups is based in Wales
- Estimated turnover of all active firms: 14.3% of turnover of staff start-ups and 8.8% of graduate start-ups is in Wales.

4.3 HEFCW previously provided recurrent funding support to underpin entrepreneurship activity in all universities in Wales (including student and graduate entrepreneurship) via its Innovation and Engagement Fund. IEF-funded enterprise teams were established to facilitate the embedding of entrepreneurship skills within academic curricula; to provide advice and guidance to students and graduates (including signposting to Welsh Government business support programmes); and to provide financial assistance and/or “start-up” space for new companies. As an example, the Enterprise Support Programme coordinated across Wales by the University of South Wales was closely aligned to Welsh Government Youth Entrepreneurship activity.

4.4 Universities in Wales continue to engage in this activity and the sector's strong performance in relation to graduate entrepreneurship is evidence of this. Some examples of current graduate entrepreneurship activity are provided in **Annex A**. Credit is due to the Welsh Government for providing direct support for Youth Entrepreneurship in HE and HE institutions, including the establishment of a network of entrepreneurship champions and the promotion of competitions and awards. A further round of funding is about to be awarded based on institutional strategies for graduate entrepreneurship.

5. Is this support systematic and consistent across Wales and is there more Welsh Government and others could do?

5.1 As stated above, the withdrawal of HEFCW's IEF in 2013/14 as a consequence of the introduction of full time undergraduate fee grants in Wales mean that this recurrent core support is no longer "systematic and consistent" across Wales. The Reid Review points to the fact that there has been increased investment in equivalent funding streams in other parts of the UK. Both the Diamond and Reid reports recommend that HEFCW's IEF should be reinstated at the earliest opportunity, once changes to the student support regime had started to work their way through the system (and provided that this funding is not hypothecated for other priorities). It is perhaps notable that since 2013/14, the last year HEFCW provided IEF funding, total income reported by Welsh institutions in the Higher Education Business and Community Interaction (HE-BCI) Survey has fallen by -24% (a decline of £48m).¹ Other parts of the UK, where innovation funding has remained available, have continued to experience HE-BCI income growth. We believe this demonstrates a compounded loss for Wales and look forward to IEF becoming available for our institutions again in the future.

The recent review of research made recommendations to help incentivise businesses and universities to work closely together on research and innovation to take their collaborations to "greater heights".

6. What are businesses and universities able to offer each other when they work in collaboration on research and innovation projects?

6.1 We endorse the Reid Review observation that collaboration between businesses and universities could be taken to "greater heights". The context is Reid's recommendation for the reintroduction of HEFCW's Innovation and Engagement Fund in order to better enable such collaboration.

6.2 Collaboration between universities and businesses should be viewed in terms of the exchange, as opposed to the transfer, of knowledge. It offers the following:

- For businesses:
 - Access to world-leading research expertise

¹ <https://www.hesa.ac.uk/news/05-04-2018/business-community-interaction-201617>

- Access to contract research and consultancy services (define from HEBCI)
- Access to specialist or industrial scale facilities and equipment
- Access to specialist courses; focused training; continuing professional development
- For universities:
 - Translating research into real world outcomes
 - Access to real-world challenges and work experience for students and new graduates
 - Access to potential research sites and otherwise hard-to-reach populations
 - Mentoring for student and graduate entrepreneurs
- For both:
 - Co-design and co-production of research
 - Access to skilled professionals and new perspectives

6.3 The Reid Review highlights the strengths in the Welsh research and innovation base and examples of good practice in collaboration (Bangor and Horizon Nuclear Power Ltd; Cardiff and IQE; Cardiff and Renishaw; Swansea and TATA Steel). But there are also inherent weaknesses that, unless addressed, will hamper Wales' ability to adapt to the new UK funding environment. Reid identifies major changes in the research and innovation landscape and his recommendations are designed to ensure that our ambitions should not be limited to playing catch up with the competition in the rest of the UK. Instead, his three recommendations could enable Wales to "leap-frog" levels of investment in research and innovation elsewhere, and reap corresponding levels of economic and societal impact as a result.

7. Should Welsh Government and others be doing anything differently to bring smaller businesses together with universities to collaborate on research and innovation projects? What is working well and what isn't?

7.1 HEFCW's very particular role as a body at arms-length from Government should be noted in this context. As the regulator of higher education provision in Wales, HEFCW determines the level of QR funding (and previously IEF) it allocates and holds universities to account via its financial assurance and governance processes. Our plans to reinstate IEF (once we are clearer on funding released from the implementation of Diamond recommendations on fees and funding) mean that we will be able to construct a funding methodology that can reward universities for their collaboration activities with the SME base.

7.2 One of the Reid recommendations is that the Welsh Government should establish, via a new Saint David's Investment Fund, three industry-led "hubs". These hubs, focused around key areas of strength in Wales, would play a key role in cementing the links between university research expertise with their industrial partners and their supply chains. This is vital in terms of the role that such collaborations play in introducing smaller businesses to funding opportunities available via external funders such as Innovate UK and, depending on the Brexit deal, EU programmes such as Horizon 2020. Increasing the engagement of Welsh SMEs in these programmes should be a

key objective of the Welsh Government. The current Welsh Government SMART Expertise programme provides a good model of SME-university collaboration in this respect.

- 7.3 The Committee's own report *Industry 4.0 – The future of Wales* recommended that work is done to identify the expertise and commercial strengths that exists in Wales (e.g. in compound semi-conductors, insurance and healthcare) and that a review is needed of Welsh Government support to companies in Wales who are seeking support from the UK funds for R&D. We support these recommendations.
- 7.4 Research England is about to consult on the concept of establishing a *knowledge exchange concordat* that will aim to give universities and their staff a clarity of mission, give partners an accurate representation of the approach that individual universities are taking to KE, and give government a broad view of the activity that is taking place in universities. We are engaging in discussions with Research England on this.
- 8. What should Welsh Government and others be doing to help businesses use the knowledge gained from research activity and turn it into marketable products or improved services?**
- 8.1 The report of the National Centre for Universities and Business (NCUB) [Making the Connection](#) published earlier this year sets out a number of recommendations aimed at growing the value of collaboration between universities and business in Wales. The report endorses the Reid recommendations on the need to invest in the research and innovation base within our universities, via underpinning funding streams (QR and IEF) and innovation "hubs". It also recommends the establishment of a new "national innovation compact" between government, universities, business and other key stakeholders in Wales. This could build on the *Be The Spark* initiative, and focus on high quality communication, excellent relationships and strong alignment of interests. The Committee might wish to consider this recommendation in the context of the current inquiry.
- 8.2 We suggest that there is also a role for all stakeholders to engage in promotion of good practice in university-business collaboration. The NCUB includes good examples from Wales in the [success stories](#) published on its website. HEFCW's [Innovation Nation](#) series brings together new collections of case studies that highlight the value to the Welsh economy, and to Welsh communities, of innovation activity in our universities. But more should be done in this respect to promote the exchange of knowledge and expertise between universities and businesses to help turn research outputs into new products and improved services.

Examples of current graduate entrepreneurship activity

USW Exchange

The University of South Wales has committed to supporting Wales's start-up and entrepreneurial activities by focusing on increasing SME contributions to the economy, developing students with relevant skills, and enhancing the status of the University as an institution for business.

Designed to embed activity further within full-time courses, HEFCW funding was used to support "USW Exchange" <https://www.youtube.com/watch?v=o0L7o1r8c1w>, which was officially opened on 18 September 2017 by Wales' Economy Minister Ken Skates and Sir Terry Matthews. USW Exchange now has a presence on all USW campuses and thus offers a region wide provision, covering a broad range of subject areas tailored to each campus: Pontypridd is the hub for general business, Newport for cyber security and Cardiff for creative industries. The initiative offers entrepreneurs in South Wales access to free expert support including that provided by sponsoring organisations, which include Barclays Bank, Alcumus, South Wales Chamber of Commerce, and Capital Law.

In addition to providing a centre for collaboration and interaction, a place to support start-ups and expand existing businesses, and somewhere to build links between industry and graduate talent, USW Exchange also offers an opportunity for discussions around graduate placements, research, consultancy training, and access to industry expertise through local sponsors.

University of Wales Trinity Saint David

Building on an established track record of supporting graduate business start-ups, UWTSU used the HEFCW funding to establish a pipeline of support for students. From the generation of business ideas (supported by the embedding of enterprise skills in the curriculum and extra-curricular activity) through access to incubation facilities and business support services (both in-house and delivered in partnership with external providers), the University considers itself well-placed to support the Welsh Government's ambitions to promote innovation-driven entrepreneurship.

The University took forward a range of activities to support students on the entrepreneurial journey, from idea generation to business incubation and acceleration. This included some minor refurbishment of existing space and resources within the Swansea Business Campus, the Creative Industries Research and Innovation Centre, and SA1:

- Provision and refurbishment of dedicated space, on the Mount Pleasant campus, and support for students considering startup has been made available.
- The Race to Market Competition, based on the Dragon's Den model, was hosted in July with students from across the University participating. Entrepreneurial alumni and business specialists were mentors and judges for the week of activities. Stakeholders such as Business Wales, Simply

Do Ideas have collaborated on competitions encouraging the progression of ideas. Successes include a second year Graphic Design student winning a national competition for his personalised martial arts fightwear.

- The entrepreneurial alumni network is increasing with graduates from across the campuses providing workshops. The University has highlighted the fact that it had more events than any other UK University in Enterprise Week (November, 2016).
- Students have access to IP workshops and on-line materials that have been developed with the UKIPO
- Students and graduates starting up businesses are accessing support from the SBS Incubation Hub, a refurbished facility located on the top floor of the Business School, amongst a suite of offerings.
- Funding opportunities through potential investments as part of the SA1 Joint Venture are being examined, with proposals to set up a fund as part of the activity. Costs to date include legal work undertaken, completed and ongoing consultancy work to engage with the City Deal.
- Bursaries and internships have been accessed across the disciplines enabling students to work with business specialists.