

Agenda – Economy, Infrastructure and Skills Committee

Meeting Venue:	For further information contact:
External Location – External	Gareth Price
Meeting date: 15 November 2018	Committee Clerk
Meeting time: 09.15	0300 200 6565
	SeneddEIS@assembly.wales

Private pre-meeting (9.15–9.30)

1 Introductions, apologies, substitutions and declarations of interest

2 Paper(s) to note

(Pages 1 – 2)

Attached Documents:

EIS(5)–26–18(P1) Letter from Petitions Chair to Committee Chairs

3 Research and Innovation in Wales evidence session

(9.30–10.45)

(Pages 3 – 53)

Professor Paul Harrison, Pro Vice Chancellor Innovation and Dean of Faculty of Computing, Engineering and Science, University of South Wales



Dr David Bembo, Director of Research and Innovation Sciences, Cardiff University

Dr Rachel Bowen, Director of Policy and Development, Colleges Wales

Professor Chris Thomas, Pro Vice Chancellor for Research, Knowledge Exchange and Innovation, Aberystwyth University

Attached Documents:

EIS(5)–26–18(P2) Research brief

EIS(5)–26–18(P3) Evidence from University of South Wales

EIS(5)–26–18(P4) Evidence from Colleges Wales

EIS(5)–26–18(P5) Evidence from Cardiff University

EIS(5)–26–18(P6) Evidence from Aberystwyth University

4 Motion under Standing Order 17.42 to resolve to exclude the public from item 5

(ix) any matter relating to the internal business of the committee, or of the Assembly, is to be discussed.

5 The Future of Transport for Wales

(10.45–10.50)

(Pages 54 – 57)

Attached Documents:

EIS(5)–26–18(P7) Scoping paper for Transport for Wales inquiry

Cynulliad Cenedlaethol Cymru
Y Pwyllgor Deisebau

National Assembly for Wales
Petitions Committee

Committee Chairs
National Assembly for Wales
Tŷ Hywel
Cardiff Bay
CF99 1NA

6 November 2018

Dear Chair

Petition P-05-840 Fair Funding for Neath Port Talbot County Borough Council and all other Local Authorities

The Petitions Committee considered the above petition for the first time on 23 October. Further information on the petition, including the full petition text and correspondence received to date, is available on the Assembly's website at: <http://www.senedd.assembly.wales/ieIssueDetails.aspx?IId=23018&Opt=3>

At our meeting, Members agreed to make you aware of the petition as a Committee with responsibility for scrutinising aspects of funding for local authorities from the Welsh Government's budget for 2019/20.

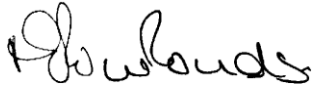
The Committee also agreed to:

- write to all local authorities and the WLGA to seek their views on the Welsh Government's budget process and the current challenges for local authorities; and
- Write back to the Cabinet Secretary to:
 - ask him to provide further details of the draft local government budget allocations once the spending plans have been published on 23 October; and
 - seek clarification on how the £30m of additional funding for Social Care identified in the draft budget will be allocated and provided.



If you would like any further information about the petition please contact the clerking team at SeneddPetitions@assembly.wales.

Yours sincerely

A handwritten signature in black ink that reads "D Rowlands". The signature is written in a cursive style with a large initial 'D'.

David J Rowlands AC/AM
Cadeirydd/Chair



Agenda Item 3

Document is Restricted

University of South Wales

Inquiry into research and innovation in Wales

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?

The above statement suggest that although university research pushes the boundaries of knowledge it may not necessarily help solve immediate challenges facing Wales and indeed beyond. We believe this understanding is incorrect, for a number of reasons, including:

- (a) The significant increase in the assessment of university research impact through the Research Excellence Framework (REF) exercise is already changing the culture of academic research to align it more closely with real world challenges.
- (b) All projects that seek funding, such as those from Research Councils UK require a clear pathway of impact and a route to solve specific challenges whether that be economic, societal or cultural.
- (c) As a university that was founded on the needs of industry, applied research is a key part of our mission and our research activity is already significantly directed at challenge-led research through the various funding programmes within Wales (e.g. aligned to strategic/grand challenge areas) and indeed now more so through UK wide programmes such as the Industry Strategy Challenge Fund.

The PCET consultation highlighted the need for activities (research and innovation) to be developed and funded in a complimentary fashion and not at the expense of each other. The proposed methodology of allocating funds on both a hypothecated (challenge led) and un-hypothecated (e.g. Quality Research Funding as a result of the Research Excellence Framework outcomes) can enable this.

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?

We agree that all research (and innovation) funding for all organisations should be brought together within an overarching organisation such as Research and Innovation Wales. Indeed, we would suggest greater alignment than the proposal as some funders e.g. Health and Care Research Wales, WEFO, SMART, sector deals etc remained outside the scope. It is suggested that all funders, covering all stakeholders and all aspects of RD&I activity, at all Technology Readiness Levels (TRLs) be aligned.

There is an assumption in the question that other organisations would attract funding that universities would have otherwise got. Why would this be the case? There are already significant avenues for funding for business from Welsh and UK programmes. Have there been analyses of these as to whether available funds accessible by businesses and other organisations, such as SMART, Innovate etc are exhausted or oversubscribed? The proposal is also subject to the Reid review implications which include an uplift on funds available to universities of £30M per annum.

Research activity within university's and business may be at different stages of development or translation and it is important not to prioritise one over the other. Priority should be given to bringing the two together, enhancing collaboration and knowledge exchange.

Businesses do not necessarily have the capacity or the equipment to carry out research. Funding them instead of universities would be counterproductive as it would mean that results arising from the funding will be less widely disseminated across the region. There are already significant funding programmes for industry including the ISCF so any further redirection of WG funding to businesses will make little difference in the wider business funding landscape.

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 overshadowed by universities when it comes to research and innovation funding and activity?

The significantly increased importance of impact has already made a marked difference to the research activity within university's and business which may be at different stages of development or translation and it is important not to prioritise one over the other. Priority should be given to aligning the needs of both sectors by increasing funding for collaborative research, knowledge exchange and enterprise activities.

The removal of Innovation & Engagement funding from universities in Wales has hindered this university-business-government interaction and put Wales at a competitive disadvantage to other regions within the UK. Reintroduction of funding for knowledge exchange and enterprise activities where both business and universities mutually benefit is needed.

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?

At the University of South Wales (USW), there are a number of developments that have been initiated to support greater entrepreneurial activity amongst students and graduates.

USW has created the post of Assistant Pro-Vice Chancellor in Enterprise - currently held by Professor Dylan Jones-Evans - to develop and drive forward a new enterprise strategy for the institution that will further embed enterprise education and entrepreneurship across all faculties in the institution.

USW Student Enterprise is the main facility that helps students and graduates start their own business or social enterprise, become self-employed or work on a freelance basis. It also promotes and support the development of enterprise and entrepreneurship skills within the curriculum. For those students and graduates who want to explore a business idea, one to one mentoring appointments, networking opportunities, workshops, funding (through BID and the Alumni Awards Emerging Entrepreneur category) and the USW Freelancers Academy (a Start-up boot camp).

During 2017-18, USW Student Enterprise had the following KPIs:

- 2785 Students engaged with student enterprise
- 90 student and graduate business ideas were supported
- 55 Enterprise, inspiration and skills sessions delivered
- £8,270 seed funding awarded to new start-ups
- Two new entrepreneurship categories were launched at the Alumni awards
- 25 student/ graduate start-ups (final figure tbc)

USW is supporting overseas students to start their own business via Tier 1 Graduate Entrepreneurship Visa programme. For example, Pranavindra Lal (2017 Music Technology graduate) was awarded a visa to develop his business idea PhaseBox.io - an open marketplace for musicians and music professionals.

With support from HEFCW, USW is currently developing its own graduate incubator at its campus in Cardiff. This will have desk space for up to 36 new businesses and will deliver pre-commercial incubation facilities to a minimum of 150 graduate-led SMEs over five years and support to a minimum of 100 students to develop new ideas over the period 2019-2023.

In partnership with BeThe Spark, USW organised the first ever Welsh HE-FE Entrepreneurship Forum in January 2018 which showcased and shared best practice linked to HE Business Links, Enterprise Development and Spin Out programmes.

USW works closely with the Entrepreneurial eco-system in Wales, particularly Big Ideas Wales and Business Wales, referring students to the additional support when relevant so they can benefit from mentoring, workshops and signposting.

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

If Welsh Government is to support graduate entrepreneurship within academic institutions in Wales, then it must understand how this is being supported by universities (which is currently not the situation). This could include the following:

- Evidence that entrepreneurship is a strategic objective of the university and there is top-down support for its development
- Long-term financing of staff costs and overheads for enterprise education and entrepreneurship support is an agreed part of the university's budget.
- Recruitment of academic staff takes into account not only academic experience and expertise but also entrepreneurial attitudes, behaviour and experience
- Incentives and rewards for entrepreneurship educators, professors and researchers who actively support graduate entrepreneurship
- Clear evidence that entrepreneurship education is being integrated into curricula and the use of entrepreneurial pedagogies is advocated across all faculties.
- Dedicated facilities for business incubation on campus or support to gain access to external facilities such as Welsh ICE or E-Spark.

Whilst it is important that each academic institution develops its own strategic approach to supporting entrepreneurship internally, there is also additional support that Welsh Government and other bodies can provide to universities to support greater levels of entrepreneurial activity from the student and graduate population. This would enable entrepreneurship support in universities to be closely integrated into external business support partnerships and networks in Wales and could include:

- Greater financial support from Welsh Government - linked to key performance indicators - to deliver enterprise education and entrepreneurship support across higher education in Wales
- More dedicated business support for graduate businesses via the Business Wales programme (including a specific portal for graduate entrepreneurs)
- A proportion of HEFCW's Innovation and Engagement Fund to be focused on incentivising universities to support higher levels of graduate entrepreneurship, especially in key sectors
- Having a dedicated graduate enterprise manager within the Development Bank of Wales to support access to funding for graduate entrepreneurs.

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?

Universities are able to offer new and novel ways of thinking to deal with a pressing challenge within a business where businesses are offering an

opportunity to deploy this thinking in a real world environment possibly resulting in impact and a range of benefits for all.

University benefit - Curriculum improvements to align with industry skills requirements, demonstrating impact of research and developing new research opportunities. Academic staff are able to maintain knowledge of industrial challenges.

Business benefits – opportunity to accelerate growth and raise investment by absorbing know-how and research results from university.

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?

We know from our work with regional businesses that they struggle to know what universities can offer and how to find out. There is often confusion as to who to contact within the education system and this is a significant barrier to businesses engaging with universities. At the University of South Wales, we have developed a physical and virtual “front door” to business called Exchange. The role of Exchange is to highlight opportunities for engagement which are mutually beneficial to both the university and the external organisation.

Exchange is a single point of contact for organisations to engage with the university, with staff in Exchange “triaging” enquiries and directing them appropriately. Since opening its doors in September 2017, Exchange has welcomed 350 businesses onto the university campus at Treforest. We plan to extend the initiative across all campuses in the coming months.

Smaller businesses often have a lower absorptive capacity for R&D and they are also more susceptible to changes external environment. This can make longer term research projects less appropriate to meeting their needs. Therefore shorter tactic interventions are more appropriate. For example, KTP is a very good scheme which has proven success for transferring knowledge and building capacity within businesses which leads to bottom line improvements. Projects lasting between 1 and 2 years are optimal.

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?

Reinstate the funding for innovation and engagement. The lack of qualified technology transfer professionals to facilitate the commercialisation of university IP by businesses is a major barrier to business growth and raising investment in wales.

Provide more consistent service for business innovation growth in partnership with universities and business. Existing programmes appear to be fragmented and provide little visible impact on developing a culture of collaborative working between businesses and universities. The WG should champion a change in this environment by funding universities and businesses to work together in a shared environment that will see the strengths of both cultures being shared for mutual benefit. Considerable progress was made with the open innovation

programme initiated by WG and this needs to be capitalised on by allowing universities and businesses to co-create innovation projects.



**National Assembly for Wales Economy,
Infrastructure & Skills Committee:**

Inquiry into research and innovation in Wales

12 October 2018

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Introduction

ColegauCymru welcomes the opportunity to respond to the National Assembly for Wales Economy, Infrastructure & Skills Committee's Inquiry into research and innovation in Wales. ColegauCymru represents the 13 Further Education (FE) colleges and FE institutions in Wales.

Response

ColegauCymru notes the inconsistent role envisaged for Further Education colleges in the questions set out by the Committee and in the terms of reference. For example, there is concern to ensure that the research and innovation interests of universities and colleges do not over-shadow the research and innovation interests of industry, but no reference to colleges with regard to the specific issue of how "universities and business (particularly SMEs) interact with each other".

Colleges often work closely with SMEs on areas of applied research and, given their bases in local communities, are well-placed to do so. For example, an innovative project is currently underway to address the agricultural industry's impact on the environment by developing a dewatering and purification system to manage slurry. The project brings together Coleg Sir Gâr's Gelli Aur agricultural campus and Power & Water, a Swansea-based company specialising in electrochemical-based water treatments. ColegauCymru would be happy to facilitate a visit to this college for the Committee to gain a better understanding of the way in which FE colleges contribute to applied innovation.

It is of particular concern to ColegauCymru that FEIs are often themselves ineligible for funds to support their own innovation and applied research functions. Many funding streams are only available to universities. ColegauCymru welcomes the Reid Review's recommendation that in the future, colleges should be able to apply to HEFCW for Innovation and Engagement funding and hopes that the necessary metrics to allow this can be developed as soon as possible. ColegauCymru and FEIs will be very happy to support this process.

ColegauCymru is currently supporting a Welsh Government visit to the TKNIKA centre in the Basque Country which, as part of its core functions, has a role via its TKGUNE¹ to support innovation amongst SMEs working in key economic sectors such as manufacturing, automation, automotive and the creative industries. It is hoped, but not guaranteed, that this visit will help inform Welsh Government policy and support and strengthen the existing work being undertaken by Wales' network of FE colleges. The Committee might like to discuss this with the officials taking part in this visit and raise with the Minister as to how the Welsh Government plans to support innovation and applied research in this way in Wales.

¹ <https://www.tkgune.eus/en/>

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 would broadly agree with the principle of the need for the application of research to the challenges facing business and also public services.

1.2 The circumstances in which Wales finds itself at present call for a change in approach to addressing specific challenges. While there remain long-standing structural problems in Wales which have yet to be overcome successfully, the ongoing (and to a great extent still unknown) challenges posed by the UK's departure from the European Union create specific challenges that will need to be addressed over the years ahead. Some of these challenges, which have been long anticipated, will only be increased with the advent of further automation and the disruption to sectors such as retail, hospitality and tourism as well as sectors such as accounting and financial services².

1.3 ColegauCymru is supportive of the move towards challenge-led research but notes that this needs to be balanced against longer-term research which might develop innovative and unexpected solutions to problems. However, the role that colleges can and could play in challenge-led research needs to be recognised – this should not be confined to universities.

1.4 The development and establishment of TERCW presents an opportunity to address the issue of ensuring that different types of research receive an adequate balance of funding by taking a holistic view of the post-16 sector and its partnerships. ColegauCymru is concerned that in this specific case, and more generally, that the lack of a clear legislative 'slot' for the required PCET bill will hinder the development of a wider frame of reference for supporting research and applied innovation as well as the introduction of the necessary reforms to post-compulsory education.

1.5 We conclude on this point by noting the slow pace of change and in particular the steps required to leverage the role of FE colleges to enable Wales to adapt and prosper.

² C. L. Keenoy (1958) The Impact of Automation on the Field of Accounting. *The Accounting Review*, 33(2), 230-236.

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 It is important to note that colleges do not have the same level of access to research funding as universities. The key issue here is one of partnerships and the avoidance of unhelpful competition. Colleges, universities and businesses of all sizes should be encouraged to work together to form innovative research bids that address specific issues, such as the water purification project outlined above involving Coleg Sir Gar. Research programmes which encourage this sort of collaboration should be facilitated. The decision of the Basque Government to facilitate this level of cooperation via a dedicated facility should be considered as a means of avoiding unnecessary competition.

2.2 The former Strategic Insight Programme (SIP), led by then University of Glamorgan, allowed university academics to spend time in external organisations to help them better understand how their research or area of work could have applicability and impact in a particular organisation or industry sector. It also allowed them to carry out initial scoping work and establish/develop collaborative relationships with companies, organisations, the public sector or not-for-profit bodies.

2.3 Consideration should be given to another pan-Wales scheme of this type but which extends the offer to include FEI staff. As with the original scheme, it should also include the 'Reverse SIP' offer, whereby funding was made available to those from outside the university sector to undertake a placement within the university to develop relationships and understand the potential for specific collaboration in the future. Any new scheme should also include FEIs as hosts.

2.4 It should be noted that current funding via the Sector Priorities Programme (or SPP) which allows FE lecturers to engage directly with business and innovation partners is currently under review. The funding programme recently supported a ColegauCymru-organised visit to ProjectZero in Sonderberg Denmark³ to support the development in Wales of innovative practices in retrofit construction.

2.5 Again, TERCW represents an opportunity to oversee funding for research made available by Government and to ensure that a fair balance which meets need is achieved. The views and participation of employers of all sizes is integral to the success of TERCW. Whilst the development of the Commission is under

³ See <http://www.collegeswales.ac.uk/localnewsprint.php?N=NTEEx> for further information

consideration, the Committee might like to question the Welsh Government on its future plans for innovation funding such as SPP and the impact of its proposed funding review on innovation in FE more widely.

2.6 The importance of future skills requirements is an integral part of this debate. FEIs can and do play a crucial role to stimulate interest and support the development of a talent pipeline which supports the needs of industry across a range of fields. There need to be opportunities for young people to engage with research initiatives and better understand the opportunities which exist in this area.

2.7 As the participation of all colleges in the Project Zero visit showed, FEIs are ready to take a greater role in terms of research and innovation – there is a strong move towards supporting higher level skills development and higher/degree apprenticeships. Collaboration and increased involvement in both domestic and international research projects would support the development of staff and students. There would also be an opportunity for efficiencies to be realised by better promotion of opportunities between industry and colleges which have a vast network of relationships with employers.

2.8 However, it should also be noted that the ongoing uncertainty over Wales' continued participation in Erasmus+ staff and student mobility casts doubt over the viability of these networks in the future. The Committee might like to question the Government on its plans to strengthen rather than lose these networks once the UK has exited the European Union.

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? 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.

3.1 Again, the crucial feature is partnership working and collaboration across the HE, FE and business sectors which balances the interests of all parties. The implications for skills development need to be understood and the curriculum needs to be developed and aligned in line with research which is informed by industry.

3.2 It is also important to create a climate of adequate support while managing risk and expectation of who bears risk. Where businesses will profit from public sector

research support, consideration must be given at the outset as to how the public sector, including education, can also benefit from the developments.

3.3 It should be noted that Wales, like the rest of the UK, lacks the function and often statutory basis of networks which enhance and strengthen collaboration between education institutions, businesses and often the trade unions. Current partnership mechanisms, such as the Wales Employment and Skills Board (WESB) and the Regional Skills Partnerships (RSPs) which seek to bring together education establishments and employers do not support the development of innovation and research.

3.4 The governance and knowledge capacity of these groups, particularly the Regional Skills Partnerships have been reviewed and improvements in both governance and knowledge have been prioritised. However, they remain voluntary groups with no clear constitutional or governance basis, lacking in dedicated staff and the requisite knowledge to adequately inform strategic planning. The Committee might like to ask the Government how it thinks the existing business/skills/social partner networks could be enhanced so as to facilitate planning and bring about real change in research and innovation practice.

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 Again, this question does not really recognise those learners in FE who set up their own businesses or the support available to them to do so from Further Education Colleges. Current initiatives which operate in this space and support provided in an FE context include *Be the Spark*, Welsh Government Youth Entrepreneurship Funding Further and Higher Education, as well as individual college initiatives designed in this space.

4.2 To illustrate one success story from FEIs: Dafydd Jones was a 16-year-old A-level student at The College Merthyr Tydfil, who developed a business idea for an app called “Doze”. This was designed primarily for the underground in London to stop people falling asleep⁴. Between October 2016 and June 2017, key staff from the college worked closely with Dafydd, helping him with his business plan, referring him to Welsh Government initiatives like Boot Camp, where he won one of the five £1000 grants. They also supported him to attend ESpark⁵ which assisted him in developing his app and his business skills.

⁴ See <http://www.merthyr.ac.uk/content/enterprise-support-and-activities?lang=en> for further information

⁵ Details on the ESpark programme can be found here <https://www.entrepreneurial-spark.com>

4.3 Dafydd sat his first year AS qualifications and obtained his results but decided in late August/September 2017 to take a year out from his studies and applied for a place at ESpark. College staff continued supporting Dafydd and he became a recipient of TaffLab funding and support – an initiative developed by the RSA fellows in Wales⁶. In October 2017, Dafydd launched his app in the London Transport Museum. He has gone on to become a TaffLab mentor, a young ambassador for Big Ideas Wales, a fellow of the RSA and is still in ESpark working on a new business idea. He turned 18 in summer 2018.

4.4 The account above demonstrates that innovation takes place amongst the student cohort within Wales' FEIs. Importantly it highlights how the main support for these initiatives currently comes from outside of the mainstream research funding and innovation programmes.

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

5.1 As above, colleges offer support to innovators and entrepreneurs across Wales, but the specifics of the offer may vary. The Welsh Government could consider how to address the issue of support for innovation entrepreneurs and their associated research needs in a post-16 context more holistically, rather than seeing this as a simply a matter for schools or universities.

5.2 ColegauCymru fully supports the ethos of greater collaboration between business and universities. However, this collaboration needs to include FEIs. FEIs have many strengths, including close relationships with business through delivering work-based learning qualifications, for instance. This relationship and understanding of business needs could help to strengthen the impact of research funding. Therefore recommendations to incentivise business and universities to work closer together should be extended to Further Education institutions.

⁶ Tafflab information can be found here <https://www.thersa.org/action-and-research/fellowship-projects/fellowship/taff-lab>

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 This question does not ask about the contribution made by FEIs. This is disappointing as the work on applied research which we have identified is undertaken by colleges in conjunction with local businesses. Some colleges report that the transfer of knowledge between education establishment and business is one of the main drivers in terms of the ‘offer’ and that SMEs in particular would benefit from knowledge transfer. Utilising the Further Education network situated throughout Wales, especially in rural Wales, could provide businesses with greater access to those institutions, strengthening working relationships and increasing the likelihood of success from the research.

6.2 Knowledge transfer needs to extend to also include all aspects of the education system to help inform curriculum, support staff development and inspire the future workforce. There needs to be a better mechanism to provide a platform for engagement with research activities and the associated outputs which often sit purely between the university and industry.

6.3 FEIs are often able to offer a more local base for collaboration and may be less intimidating for those businesses wishing to undertake initial conversations about research and innovation.

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 FEIs should be an integral part of the planning when it comes to collaboration on research and innovation projects with smaller businesses and universities.

7.2 The current HE-FE Collaboration project (funded by HEFCW) is an example of the post-16 sectors working together to develop capability and engagement in partnership with industry. The Committee might like to question HEFCW on its plans for the further development of this fund and the extent to which the allocation of funds via HE routes for collaboration has genuinely led to innovation and collaboration taking place⁷.

⁷ HEFCW (2018) Circular: Enhancing HE-FE collaboration in innovation and engagement activity https://www.hefcw.ac.uk/documents/publications/circulars/circulars_2018/W18%2006HE%20Enhancing%20HE-FE%20collaboration%20innovation%20and%20engagement.pdf accessed 9 October 2018

7.3 It should also be noted that HEFCW circulars and guidance on research funding (both revenue and also capital) do not always require consideration of collaboration with business or FEIs in their current form. This further strengthens our view that the approach currently intended is 'business as usual' with perhaps nominal or marginal changes.

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 promotion of 'successful' collaborations and the process of developing them could be an effective way of highlighting to businesses the benefits of research and innovation activity. This is especially the case where the benefit has been 'product to market' as well as the 'quality of research information'.

8.2 Post-research support is imperative to realise the potential of research outcomes. SMEs may not always have the required expertise or previous track-record to fully exploit the outcomes of the research. Welsh Government could facilitate sharing of expertise in this field to allow those businesses to understand the process, the duration and additional investment required to realise the opportunity.

Dr Rachel Bowen

Director of Policy & Development, ColegauCymru

Introduction

- i. Cardiff University pursues internationally excellent research with global impact for society. In the 2014 Research Excellence Framework—the most recent national benchmarking and assessment exercise—Cardiff University was ranked 5th in the UK for the quality of research and 2nd for the impact of research, with 87% of research assessed as world-leading or internationally excellent. Our impact case studies included:
 - a. [Reducing violent crime](#) through the Violence and Society Research Group’s development of the Cardiff Model of sharing data between hospitals, police and local authorities. Decreases in community violence in Cardiff have been achieved, as well as an adoption of the Cardiff Model by the UK government and College of Emergency Medicine, and in all seven of Amsterdam’s hospitals, funded by the Dutch government.
 - b. A [study](#) found that the reflection of devolution of political power by broadcast news found that viewers were being routinely misinformed about major policy areas such as health and education in Wales, Scotland and Northern Ireland. Our main findings and recommendations were adopted by the King Report and led to a commitment by the BBC to improve their reporting of devolved political issues.
 - c. [Improving the response to victims of violence](#) by providing insights into how multi-agency working provides a more effective response for survivors of domestic and sexual violence. Our research provided evidence for three of the seven policy objectives in the 2008 UK Government report, “*Saving Lives, Reducing Harm, Protecting the Public*”.
 - d. [Reducing waiting times in hospitals](#) to improve patient care through our mathematical models which unravelled the complex reasons behind delays, waiting times in a range of services in hospitals in England and Wales.
- ii. As Wales’ only member of the Russell Group of 24 leading research intensive UK universities, we believe it is important for the right balance to be struck between support for universities to build critical mass in areas of research strength and expertise which have global impact, and strategically targeted funding for research that is of relevance and importance to the Welsh economy.
- iii. We see our institution as a vital part of society, delivering value at scale; the most recent data showed that in 2016/17 we added £3.23bn to the UK economy, which included £2.37bn to the Welsh economy, generating £6.30 for every £1 we spent. Moreover, our *research activity alone contributed £708.7m* to the UK economy. Beyond economic impact, we want to tackle the challenges that matter to the people of Wales, helping to make the nation safer, smarter and more secure. We also recognise the importance of addressing global challenges and ensuring translation of our research internationally.
- iv. Cardiff University’s recently launched overarching strategy, *The Way Forward 2018-23*, positions the institution as a research-focused organisation with a thriving innovation culture. We aim to excel in connecting business, government and society with our academics and students, including developing a pipeline of highly trained graduates supporting the local economy and Welsh / UK businesses.
- v. Through our Innovation System we aim to create economic and social prosperity in the Cardiff Capital Region, Wales and the UK by turning ideas and innovations into technologies, products and spin-out and start-up companies. Examples of key initiatives undertaken as

part of our Innovation System include working with industry in co-creating propositions and value, for example, establishing the Compound Semiconductor Centre joint venture company with the local semiconductor manufacturing company IQE Plc. We have also founded the Welsh Wound Innovation Centre as a joint venture with, and for the benefit of, NHS Wales and have established *Y Lab* as a public service innovation facility in partnership with NESTA (the UK's Government endowment-backed national innovation foundation).

- vi. In addition, we are also working to support the aim for a bilingual workforce and bilingual nation through our successful bid for two Coleg Cymraeg Cenedlaethol funded Research Scholarships, bringing our total up to 11 funded PhD students at Cardiff University.

1) 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.

a) 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?

- i. We agree with the view that Wales needs to increase the focus on challenge-led research. We believe that the benefits of academic breakthroughs should have as wide an impact as possible and would concur that challenge-led programmes provide a helpful focus for research aligned to key societal needs where a step-change in activity is required. This focus on societal (including Welsh) challenges does not necessarily mean a reduction in traditional research: we believe that the two types of research are highly interdependent, with increasing numbers of researchers recognising the value of working with external organisations to enhance translation of their research beyond HEIs.
- ii. Cardiff University is committed to the co-production of research with our collaborators within and external to the University sector, undertaking interdisciplinary and multi-disciplinary research, development and innovation in partnerships across Wales, the UK and worldwide in order to solve specific challenges. Welsh Government funding for research more broadly would add significant value, assuming the right balance can be struck between support for universities to build critical mass in areas where we have international research strength and expertise, and strategically targeted funding for research that is of specific relevance and importance to the Welsh economy. Our international collaborations are critically important for our global visibility and our ability to attract outstanding students and staff to work and live in Wales
- iii. Welsh Government can ensure that an increase in one type of research activity does not come at detriment to another source by fully implementing the recommendations of two of its most recently completed independent reviews: Professor Sir Ian Diamond's independent review of higher education funding and student finance arrangements; and Professor Graeme Reid's independent review of government funded research and innovation in Wales.
- iv. Both the Diamond and Reid Reviews were clear in their recommendations that Welsh Government should implement funding for innovative challenge-led research *in addition* to maintaining the level of quality research (QR) funding. In short, the overall pot of funding should increase rather than being divided differently. This would ensure that Wales does not continue to be at a disadvantage to our UK nations, where there are multiple sources of funding.
- v. The 2016 final report of the Diamond Review recommended that “Welsh QR funding should be maintained in real terms at its current level of £71m per annum over the next five years”

and that Welsh Government should “provide a dual support system of funding knowledge exchange, with around two hubs receiving core funding to enable agile and flexible engagement between HEIs and industry; together with a simple, flexible project based funding of initiatives aimed at projects that will impact on the Welsh economy.”¹

- vi. This year’s final report of the Reid Review recommended that “Welsh Government strengthens the Welsh research base and enables Welsh researchers to attract a greater share of UK-wide funding by implementing Diamond’s recommendation for QR funding and [creates] an additional Future of Wales Fund specifically to incentivise Welsh researchers to win funding from outside Wales.”²
- vii. Welsh Government accepted the recommendations of both reviews and we would like to see these key recommendations, designed to enhance the competitiveness of Welsh research and innovation implemented. QR should be at least maintained, with an additional pot of innovation funding created to support translation of Welsh research to benefit business, industry and society. Indeed, it is our view that such recommendations should be amplified; specifically, the need to *increase the level of funding available to support fundamental QR research which is used to improve research facilities, bring together critical interdisciplinary entities working on cross-cutting research challenges, attract outstanding international researchers and their teams to Wales and provide funds to match-fund external funding bids for Centres / Institutes / capacity building.*
- viii. QR funding is a highly competitive funding source allowing universities to engage in long-term strategic planning for research, and to respond quickly to emerging opportunities, giving them a strategic edge against international competitors. It is also a non-hypothecated funding stream, giving university leaders the freedom to take long-term strategic decisions about their research activities.³
- ix. QR funding underpins all activities, including the nation’s research-led undergraduate teaching of the next generation of researchers / highly skilled graduates. It also supports new high-risk collaborations: universities use QR funding to develop industry, funding and other forms of collaborations and partnerships with a range of organisations. While businesses may find it challenging to invest in risky research, or projects with medium- to long-term returns, QR funding allows universities to share this risk via co-funding, helping to facilitate collaborations between universities and business.
- x. QR also leads to long-term investment and thinking, addressing the challenge that many sources of public funding for research are short-term in nature. By contrast, QR funding is vital in allowing universities to develop and implement long-term research strategies.
- xi. QR leads to research income being secured from other sources: evidence shows universities that have higher research funding (including from QR) are able to generate more research income from other sources.⁴ In other words, the more QR funding allocated to a university, the more evidence of external organisations being willing to pay for a range of research activities and commercialisation.
- xii. QR is the bedrock that enables Cardiff University to compete for Research Council awards, for Doctoral Training Centres and Partnerships, for European and private funding, and for research and innovation to flourish. At £39m, QR funding represents the single largest regular source of research income to Cardiff University’s research activities. These allow

¹ Diamond, Ian, *Review of higher education funding and student finance arrangements* (Welsh Government, 2016), pp. 57–61.

² Reid, Graeme, *Review of Government Funded Research and Innovation in Wales* (Welsh Government, 2018), p. 4.

³ *A Review of QR Funding in English HEIs: Process and Impact*, (Higher Education Funding Council for England / Universities UK, 2014).

⁴ *The Economic Significance of the UK Science Base* (Campaign for Science & Engineering, 2014).

Cardiff University to play a key role in creating and disseminating knowledge, educating a highly skilled workforce for technological and intellectual leadership, and serving the needs of society.⁵

- xiii. Of equal importance is the inequity between England and Wales in relation to access to funding for innovation. The £210M Higher Education Innovation Fund, provided by Research England, is intended to support and develop a broad range of knowledge-based interactions between universities in England and the wider world. There is no equivalent in Wales.

2) 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.

- a) **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?**
 - i. In order for Wales to prosper it is important that levels of R&D funding available to the higher education sector are competitive with those elsewhere in the UK. Cardiff University would have reservations about any measure which served to reduce the level of research funding available to Welsh universities placing them at a further disadvantage compared to our comparator Institutions (e.g., Russell Group for Cardiff University). As previously highlighted a decrease in the level of funding available to support universities would ultimately have a detrimental effect on areas such as undergraduate and postgraduate education, research excellence, engagement and innovation. This would have a negative effect on income generation, matched funding for large-scale Centres /Institutes, attraction to international academics (likely to be challenging anyway due to Brexit) and support for the next generation of researchers working in Welsh industries, business and public sector organisations.
 - ii. We stress the need for the Welsh Government to at least maintain and, preferably, to grow the level of resources available to support collaborative, challenge-led co-delivery between universities, further education and the private, public and third sectors. The University recognises that each of the various actors within the innovation ecosystem has a part to play in generating economic and social benefit. We again stress the risks inherent in not maintaining, or even worse, decreasing the level of funding available to support the discovery research which underpins R&D activities. A strong underpinning discovery base is imperative to research innovation, and in turn business engagement and prosperity.
 - iii. To strengthen productivity it is imperative that the entire ecosystem is engaged – infrastructure, people, research (across the spectrum of discovery to applied) and development. Therefore, whilst funding should be challenge-led, allocating resource to or through business or other organisations will only prove an effective mechanism if HEIs are mandatory participants, enabling the HEI sector to be a key driver of economic growth through collaborative R&D.
 - iv. To reiterate, QR in universities is often the root sustaining later breakthroughs that address challenges—if QR is not funded properly, subsequent innovation will wither on the vine. By way of example, it was decades of publicly-backed fundamental research into biology, chemistry and medicine that allowed the University's Professor Ian Weeks to innovate the

⁵ Wang, Q., Cheng, Y. & Liu, N. (eds.), *Building World-Class Universities: Different Approaches to a Shared Goal* (Sense Publishers,), pp. 1–10.

use of light-emitting biomarkers for disease diagnosis in clinical settings. In addition to delivering immediate benefits for patients, this discovery was licensed to diagnostics companies with a spin-out company creating highly-skilled jobs locally and reinvesting in further research. The contemporary business successors of the original licensees manufacture and market hundreds of millions of laboratory tests each year for the benefit of patients worldwide. These include diagnostic tests for cancer, infections, diabetes and many other illnesses, as well as blood bank tests that screen donated blood for pathogens such as HIV and hepatitis. It was QR funding that served as the building block for this high-value solution to a clinical/industry challenge.

- v. A more effective course of action would be for Welsh Government to adhere closely to the recommendations of the Diamond and Reid Reviews, maintaining QR funding and establishing additional funds for innovation, as discussed earlier in this response. The absence of dedicated innovation and engagement funding has seen Wales fall behind the rest of the UK, with debilitating implications identified.⁶ Such effects include the diminishing of specialised business engagement teams in universities and a removal of the incentives needed for sustainable partnerships with business. Addressing this gap in our funding streams would place us on an even footing with our competitor Institutions elsewhere in the UK, and allow our excellent research outcomes to be fully translated into impact for society.

3) 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.

- a) **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?**
 - i. Development of emerging technologies and new market opportunities is best addressed by research at significant scale. This is reliant upon universities and the private sector working closely together in partnership and co-investing in programmes of work. We do not recognise the possibility that the interests of businesses may be overshadowed by those of universities in research and innovation space as a significant risk.
 - ii. To delineate between 'business research' and 'university research' is to suggest that industry interests are not supported by university research. We disagree with this view and concur with the principles of the Hazelkorn and Weingarten Reviews—both of which were accepted by Welsh Government—that Wales needs an ecosystem approach building on its strengths as a mixed economy.
 - iii. Framing business interests as being 'overshadowed' by universities also suggests wealth-creation is the exclusive domain of dynamic private organisations. Should such a view be adhered to, it is worth considering again that the University's most recently calculated annual impact was £2.37bn in Wales, with the most recent figure for Gross Value Added in Wales standing at £518m.⁷ Almost 1 in 130 jobs in Wales depends on the University, which supports 12,600 jobs across the UK.
 - iv. Business can be encouraged into research relationships with the university sector by supporting initiatives such as CASE studentships, KTP and small-scale pilot R&D schemes. We gratefully acknowledge the support that the Welsh Government has provided for these

⁶ Morgan, K., et al, *Growing the Value of University-Business Interactions in Wales* (National Centre for Universities and Business, 2017), pp. 1–10.

⁷ Kelly, U., McNicoll, I. & White, J., *The economic impact of Cardiff University* (Viewforth Consulting, 2014)

activities, resulting in initiatives such as the Enhanced KTP scheme. At the other end of the scale, the University is increasing its engagement with the private sector as part of its 2018-23 strategy of developing high level strategic partnerships. Cardiff has been supported by the Welsh Government and HEFCW to do this by the provision of financial support for its involvement in the SETsquared Scale-Up Programme (HEFCW Research and Innovation Capital award, 2018).

- v. There needs to be a process of evaluation of which interventions have proven to be the most effective and also more awareness raising to demonstrate to industry the opportunities presented by co-working with universities.
- vi. The UK Government has committed to work with industry to boost spending on R&D to 2.4% of GDP⁸ by 2027, the majority of this flowing through UKRI. This represents the largest increase in R&D investment in any Parliament since 1979. It is worth noting, however, that no funds are earmarked specifically for Wales, so there is no guarantee that any of that increased budget will benefit the Welsh R&I landscape. In addition, the approach taken by the Cardiff Capital Region City Deal Strategic Business Plan states that there will be a focus on making commercial investments in companies within the region to improve access to capital.
- vii. Growing Value Wales identified a list of calls to action for businesses, universities and government. These included the rehabilitation of I&E funding, supporting new models of innovation and better access points to university expertise and resources. Creating an environment—at both a system and institutional level—that encourages the commercialisation of innovative research is also key to success.

4) 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.

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

Cardiff University provides comprehensive support for those interested in starting their own enterprise, becoming self-employed or going freelance. This support is available to current students and graduates up to 5 years after graduating and includes:

- i. Business mentorship from internal and external mentors;
- ii. Workshops on start-up topics such as ideas generation, accounting, market research and intellectual property ;
- iii. Workshops to develop soft skills such as pitching ideas, networking, communication, customer service and problem solving;
- iv. Access to small amounts of seed funding to kick-start an idea;
- v. Recognition and rewards in our Start-up Awards;
- vi. Bootcamps aimed at accelerating a student and their idea to launch;
- vii. Access to desk space for 3, 6 or 12 months at no charge. This is currently subject to availability although we aim to expand provision through the establishment of new premises on our Innovation Campus (i.e. the Innovation Central building).

⁸ The 2.4% target has been described as “extremely ambitious”. Assuming a modest rate of growth, it would mean R&D spend rising by £22 billion (41%) between 2015 and 2027, from £32 billion to £54 billion. This compares to an increase of £6.6 billion (26%) in the period from 2004 to 2015. If the target was met, it is estimated that there would be a total UKRI budget of around £11 billion by 2027.

All of our service provision is based within the Careers and Employability service and is supported by Welsh Government through the Youth Entrepreneurship Strategy which provides funding and support to help deliver the provision. Available resources include a large pool of local and national role models, small and large scale entrepreneurship events and campaigns to boost awareness of Youth Entrepreneurship.

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

The support on offer at Cardiff University is similar to that offered in all universities across Wales, due to the fact that the Welsh Government funds and promotes youth entrepreneurship activity across the nation. Locally, Cardiff University prioritises Enterprise education by core-funding some members of the team, allowing us to increase our provision due to the greater resource.

5) 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”.

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

- i. Cardiff University’s updated *Way Forward* strategy for the period 2018-23 highlights the importance of strategic partnerships with industry, the public and third sectors. Cardiff is committed to increasing the breadth and depth of our relationships with partner organisations, working together more closely in order to deliver additional benefits for all participating organisations.
- ii. We are also very supportive of the findings of the recent ‘Growing Value Wales’ project which brought together key individuals from the private and higher education sectors to focus on practical ways of harnessing the talent being developed in our universities and our strength in ground-breaking research and development for the benefit of the nation’s economy. The taskforce was co-chaired by Cardiff’s Vice-Chancellor and President Professor Colin Riordan and Dr Drew Nelson, Chief Executive of IQE Plc.⁹
- iii. The speed with which private companies can bring innovations to market is a strength, as is industry’s ability to focus on narrow targets, but so is the space and time universities can invest in advancing the frontiers of knowledge.
- iv. To that end, we are committed to increasing the breadth and depth of our relationships with partner organisations, working together more closely in order to deliver additional benefits for all participating organisations. *Encouraging collaboration, sharing of facilities, secondment of staff and provision of catalyst innovation funding to see ideas through to being taken up by business is the approach we would most support.*
- v. Creating an environment which encourages the commercialisation of innovative research is also key to success, alongside funding. In recognition of this, Cardiff University is investing £300m in the development of its Innovation Campus including £50m to house an Innovation Centre offering high-quality, affordable space, advice and support, together with a Social Science Research Park (SPARK), whose research is contiguous with commercial and public innovation. The new campus will bring together researchers, businesses, public sector backers and students to unlock ideas that drive economic growth. This combination of activities will provide an entrepreneurial environment for the acceleration of University staff and student start-up activities, working alongside existing businesses, professional

⁹ <http://www.ncub.co.uk/what-we-do/growing-value-wales-task-force>

advisors and investors. In addition, start-up companies will benefit from close proximity with academic researchers and professional services to help drive business growth through innovation. We believe that the creation of such creative space to support interdisciplinary, commercial activities will provide an example of good practice for the future.

- vi. On this point, the quality of university infrastructure is an attractive proposition for businesses seeking to research and innovate and the funding of such facilities is worth examination. Although our level of research income secured from UK Research Council and Innovate UK sources (the precursors to UKRI) far outweighs income from EU sources (primarily Horizon and Structural Funds), these sources support activities which are subtly different to those which are supported by European monies in Wales. In particular, the use of Structural Funds by Welsh universities to undertake knowledge exchange activities and large capital projects is well-established. EU funding (delivered via the Welsh European Funding Office) has, for example, provided considerable support for the capital build of our Cardiff University Brain Research Imaging Centre and the industry-facing Institute of Compound Semiconductors.
- vii. Beyond research and innovation collaboration, we are able to offer access to a pool of talented graduates. We are seeking out and responding to opportunities to establish new educational provision in response to industry demand; in response to our successful example set by our National Software Academy. In addition, we are strengthening our provision of Continuing Professional Development and Executive Education to meet the needs of employers.
- viii. An equal partnership between universities and business can deliver knowledge exchange, innovation and the creation of jobs. It brings together practical industry challenges and business-informed horizon scanning with critical mass fundamental and applied research capacity. Properly managed, this can create a highly fertile R&D environment which can drive economic growth. Cardiff is committed to develop the skilled workforce required to energise the economy and our Innovation for All programme is aimed at maximising opportunities for students (as well as for staff) to take part in innovation and entrepreneurship activities, to engage in our societal challenges and work with our external partners. We are seeking out and responding to opportunities to establish new educational provision in response to industry demand, e.g. our successful National Software Academy. In addition, we are strengthening our provision of Continuing Professional Development and Executive Education that meets the needs of employers.

b) 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?

- i. The University is wholly supportive of the Welsh Government's SMART Expertise and related programmes which offers financial support for collaborative projects between industry and Welsh universities, focusing on commercialisation and exploitation of new products and processes and growth in key areas of smart specialisation. As outlined above, we support the development of innovative start-up communities that allow for the sharing of space between researchers and industry. Start-up companies will benefit from close proximity with academic researchers and professional services to help drive business growth through innovation.
- ii. We have, however, also identified a largely unmet need for universities in Wales to have available devolved, in-house funds for proof of concept work which could be deployed more rapidly in an agile and responsive manner in order to accelerate the development of new projects and opportunities. This would mirror the support available in England through

Higher Education Innovation Funding (HEIF), recognised by the Reid Review as a key component which is absent from the innovation ecosystem in Wales.

- iii. We would also refer back to the arguments of the Growing Value Wales project, which found an absence of dedicated innovation and engagement funding to have a particularly negative effect on smaller organisations and, by extension, poorer communities. It noted that whilst “larger HEIs have some capacity to absorb the loss in their overall budgets, smaller HEIs are not in a position to do so, with the result being that the poorest areas will have the least capacity to engage in the knowledge exchange activities that are critical to social and economic regeneration”.

c) 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?

- i. The Welsh Government has been highly strategic in supporting the partnership between Cardiff University and IQE Plc to create their joint venture (Compound Semiconductor Centre) and, subsequently, the world’s first Compound Semiconductor Technology Cluster in South Wales, which includes a dedicated Institute of Compound Semiconductors at the University. This has been coupled with subsequent investment from the Cardiff Capital Region City Deal. The importance of the Welsh Government’s role in facilitating these developments cannot be overestimated. This is an excellent model of how internationally-leading co-directed challenge lead research can be supported to the benefit of both business, HEI and local communities.
- ii. In relation to smaller scale collaborative R&D between universities and the private sector which is often supported by grant funding, it would be beneficial for innovation advisors to track these activities post-completion in order to provide companies with further direct support for commercialisation downstream.
- iii. Funds to enable co-produced research and innovation between HEIs and industry are needed to facilitate problem-focussed collaboration and people exchange. The Research Council Impact Acceleration Accounts have proven to be hugely beneficial in this area, allowing for challenge-focussed workshops leading to collaborative R&D projects, and enabling two-way people exchange to cement relationships between these sectors and enable more effective collaboration. A further benefit of these schemes is the short turnaround time of the funds, with projects assessed and funding distributed within a matter of weeks, allowing for timely and targeted support even at very short timescales.
- iv. The University holds Impact Acceleration Accounts from 3 Research Councils (ESRC, EPSRC, STFC) and translational funding from the MRC (Proximity to Discovery and Confidence in Concept). These provide the University with flexible funds to support impact working with a wide range of external stakeholders. Applications are assessed by panels comprising internal and external reviewers, including representatives from business.
- v. The funds have supported more than 84 projects working with 91 companies and supporting 10 secondments/placements between the universities and businesses.

Cardiff University

8th October 2018



Inquiry into research and innovation in Wales Aberystwyth University submission

‘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?

We agree with the view of Welsh Government. A major increase in funding is required, both because of the new challenges arising and to keep pace with the rest of the UK, and this must be balanced between fundamental and challenge-led research.

Basic, blue-skies, curiosity driven research (‘basic’ research) is a key activity in a research-led university like Aberystwyth and it is the spring for downstream research on solutions to challenges. Funding to support research programmes of this kind is available from UK agencies such as UKRI and major charities, benchmarked against international standards of excellence. Welsh Government does not need to fund this type of research programme directly as these UK-wide competitive funds are available, but it does need to invest in infrastructure, people and support for basic research if we are to be competitive. This can be done through mechanisms such as QR on a par with England.

In parallel, challenge-led research is a key activity to drive economic growth and solutions to issues affecting society. It does so by delivering translation, application, scaling and impact from findings deriving from basic research. The majority of funding to support this type of activity in Wales has come from EU structural funds but this is ending. Competitive UK innovation funding is becoming available. Welsh Government therefore needs to invest in not only strategic infrastructure to keep challenge-led research relevant for Wales at the cutting edge but also recurrent funding to ensure meaningful partnerships and opportunities for end-to-end collaboration with our delivery organisations (particularly business).

For Aberystwyth University, challenge-led research aligns closely with our key objectives for Research and Innovation with Impact, which is to undertake research with impact of world-leading quality and to tackle contemporary

challenges facing Wales and the world in the 21st century. Aberystwyth University would endorse a parity of 'basic' research activity with that which is challenge-led, as both are important for long-term as well as short-term, wins in our economic and societal growth.

Challenge-led research is nearer to market and it is important to feed the pipeline up the Technology Readiness Levels (TRL). With this type of research activity the opportunity is there for other parties (e.g. industry partners) to contribute. A higher TRL will need collaboration with industry to push it forward and so initiatives such as the Welsh Government 'Smart' suite of programmes that involve industrial collaboration and contributions are an excellent mechanism for this. Statistics to benchmark existing industry engagement and evaluate its impact are required before determining whether funding should be increased/reduced. Industry financial (or in-kind) contributions at an appropriate % should be required for access to WG funding for challenge led funding.

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?

Welsh Government should be cautious about weighting too much research funding through business rather than Universities. Universities have established mechanisms to ensure excellence in research and are measured to ensure this. They also have critical mass in their relative areas of expertise and facilities to match, representing a substantial investment and resource. In addition Universities have the administrative functions to manage grants pre- and post- award. Both are important to make sure that Welsh Government gets good value for money from investment in research and innovation. Businesses, especially SMEs, often do not have the in-house expertise to conduct well-designed research with rigor and can find grant administration onerous, administratively difficult and time consuming. Collaborative projects between business and Universities can help overcome these challenges and promote knowledge exchange. Funding to promote collaboration between businesses and other organisations with universities will be beneficial.

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?

By making challenge-led funding applications less bureaucratic to apply to, and less onerous to manage post-award, more businesses may be encouraged to participate. In University-Business collaboration, universities tend to lead because they are set up for the administrative burden associated with managing grants, particularly for collaborations with SMEs. If there is a

risk of under-funding business involvement then these schemes need to be made more accessible and less difficult to manage.

A stream of funding available to businesses to allow them to employ suitably qualified/experienced **administrative staff** to manage funding awards would be a helpful addition to the Welsh Government toolkit to encourage business engagement in research. A cap on University involvement such as the Innovate UK approach would not be unusual and would also work to ensure businesses lead on innovation funding bids.

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?

Aberystwyth University runs an initiative entitled: AberPreneurs <https://www.aber.ac.uk/en/careers/starting-business/enterprise/> Our support for students, graduates and staff with ideas for Business and Social Enterprises includes:

- a. A series of regular extra-curricula Enterprise Events: www.aber.ac.uk/careers/enterprise
- b. An annual £10,000 InvEnterPrize alumni-funded ideas competition
- c. FREE one-to-one start-up mentoring from our partners at Big Ideas Wales, hosted here at the University
- d. An annual BUSINESS START-UP WEEK each June
- e. Access for our students to attend Big Ideas Wales bootcamps in North Wales and in South Wales
- f. Involvement in the Virgin Lifestart Programme
- g. Access to Incubation Space at the University

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

Since the removal of core Innovation and Enterprise funding for Universities administered by HefCW there is no regional government support for Universities to promote spin out activity nor associated technology transfer activity or deliver assistance to businesses in sourcing translational funding. Welsh Universities must find resource from within their student fee or elsewhere to maintain staffing in commercialisation activities. This situation creates regional disparity and in particular disadvantages Wales in comparison to England in the entire regard of enterprise and innovation. The recommendations made by the Diamond Review and subsequently the Reid Review to reinstate funding for innovation and engagement activity should be a top priority, but noting that Welsh Universities will still be playing catch up with their English and Scottish counterparts. The lack of funding to date does not align well with the ambitions of the 'Be the Spark' initiative supported by Welsh Government.

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

Companies identify opportunities and a route to market; Universities offer the expertise to use or create the knowledge required to get from one to the other. The gap in middle is 'facilities'. It is important for Universities and public funders to provide the facilities for higher risk development work as it gives a route for research impact and an environment for companies to carry out more speculative activities by de-risking their product and service development. For example, the Aberystwyth Innovation and Enterprise Campus, part funded by the European Regional Development Fund, BBSRC/UKRI and Aberystwyth University, aims to fulfill this specific role in thematic areas of food and drink and bioprocessing and biorefining. A number of other thematic areas are under-served for specialist facilities in Wales and these include, for example, an agricultural technology data and testing centre and a location for research in Spectrum usage. Both are under development by Aberystwyth University as examples of what we as a university can offer businesses.

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?

The BEACON project (www.beaconwales.org) is a good example of a publically funded project that works well to bring businesses closer to universities. It offers 100% subsidized R&D support. The KESS project (www.kess2.ac.uk) also works well to make university expertise accessible to businesses because the cash contribution required is small and therefore is manageable to small business. Lowering the barrier to entry works well, for example allowing in-kind contribution or small cash contribution, e.g. Smart Partnerships.

The challenge is then transitioning successful businesses into paying more for R&D. One option that may work well here is offering low or no interest loans to businesses to fund further R&D work on the proviso that they keep universities involved to add value and expertise.

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?

a. Businesses need to be better supported to combine their market intelligence with the knowledge gained from the research activities of Welsh Universities. Conversely, the outcomes and opportunities from our University research need to be more visible and accessible to businesses. Investment from Welsh Government could add significant value here.

b. Businesses need support in product management and related commercialization activities – investment by Welsh Government in product

management activities in SMEs in particular would be a mechanism for accelerating products to market and improving the success rate in sales of launched products.

Aberystwyth Innovation and Enterprise Campus are currently conceptualizing support schemes in both these areas.

Agenda Item 5

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