

# Growing the Value of University-Business Interactions in Wales

SUMMARY REPORT  
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## Foreword

The National Centre for Universities and Business addresses issues in the UK's interest, in partnership with policy makers and government.

The National Centre's Growing Value: Wales Task Force aims to investigate the interaction between universities and industry in Wales and to make recommendations for improvements.

Chaired by Dr Drew Nelson, CEO of IQE and Professor Colin Riordan, Vice-Chancellor of Cardiff University, the Task Force brings 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 National Centre's previous Task Forces have had great traction and governmental influence, and are known for their practical actions and recommendations. This Task Force builds on the work of the UK-wide Enhancing Value Task Force, that fed into the science policy and spending review of 2012 and Growing Value: Scotland and its legacy programme Growing Potential: Scotland's Innovation Step-Change, exploring how universities, business and government partner to enable a step-change in business R&D and innovation.

This report is the first in a series on growing the most value from the Welsh innovation system and in particular from its university research. It explores the rapidly changing world of university-business interaction in Wales and identifies the opportunities and threats to collaboration and highlights clusters of excellence, or 'hot spots', in the Welsh innovation landscape with regard to university-business interaction. The approach consisted of an extensive document review followed by qualitative research with stakeholders from large and small business and all Welsh universities. The Research Team consisted of: Professor Kevin Morgan; Dr Adrian Healy; Professor Robert Huggins; Mr Meirion Thomas.

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## Summary of the actions required from this report

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1. Business and universities need to gain a deeper understanding of each other to forge bigger and better partnerships.
2. Building a better strategic approach to collaboration between universities and business is essential.
3. A strong, visible and sustained championing of university-business collaborations by senior leadership in both universities and businesses is crucial.
4. Wales needs to build process and service innovation into its overall strategising on innovation, including social innovation and public service innovation.
5. Universities must take into account the value chain businesses to enhance the impact of collaboration.
6. Investment in university-business collaboration in Wales should be reinstated to allow Welsh universities and businesses to operate on a par with other UK nations and regions.
7. A flexible and responsive tool using a modern digital platform and networking technology is needed to link together all Welsh universities and better inform businesses of expertise and collaboration opportunities. One practical way of doing this is for both parties to work through the [bethespark.com](http://bethespark.com) digital platform which aims to connect all the key stakeholder groups in the knowledge economy.



## The context for university-business interaction

Research, development and innovation are widely recognised as vitally important for the growth and prosperity of the economy – globally, nationally and regionally. The available evidence shows that successful economies are typically characterised by their active knowledge economies and innovation systems, comprising academic, public sector and business R&D and innovation activities supported by flexible public policy mechanisms.

Conventional technological innovation models are being challenged loosening the adherence to scientific discovery as the primary source that feeds innovation. Businesses now focus to a great extent on demand-led innovation inspired by their need to gain a more detailed, and nuanced, understanding of user needs and consumer expectations. In this context, innovation models emerge that are based on a strongly interactive ecosystem that values transformative innovation outputs alongside, but not subservient to, scientific knowledge.

Within innovation ecosystem models, academic literature clearly establishes the important role of university-business collaboration.

Universities are seen to be critical to the functioning of the knowledge economy and have a pivotal place alongside businesses of all types in innovation ecosystems. Globally, policies and strategies typically stress the importance of building a knowledge economy with the smooth and effective exchange of technology and knowledge between the academic and business sectors at its heart<sup>1</sup>.

The knowledge exchange role of universities is, however, multi-dimensional. As well as generating leading-edge basic research, universities also engage with businesses on collaborative research and in consultancy and contract research projects. They are also a key resource for businesses and individuals to meet their need for high level skills and continuing professional development (CPD). Furthermore, universities cannot simply be seen as suppliers of research results or graduate employees but as partners with the capability to collaborate with businesses on strategic research initiatives, engaging in cluster building with large and small companies and helping to mobilise entrepreneurial and innovation cultures in their local areas and within their research and graduate communities.

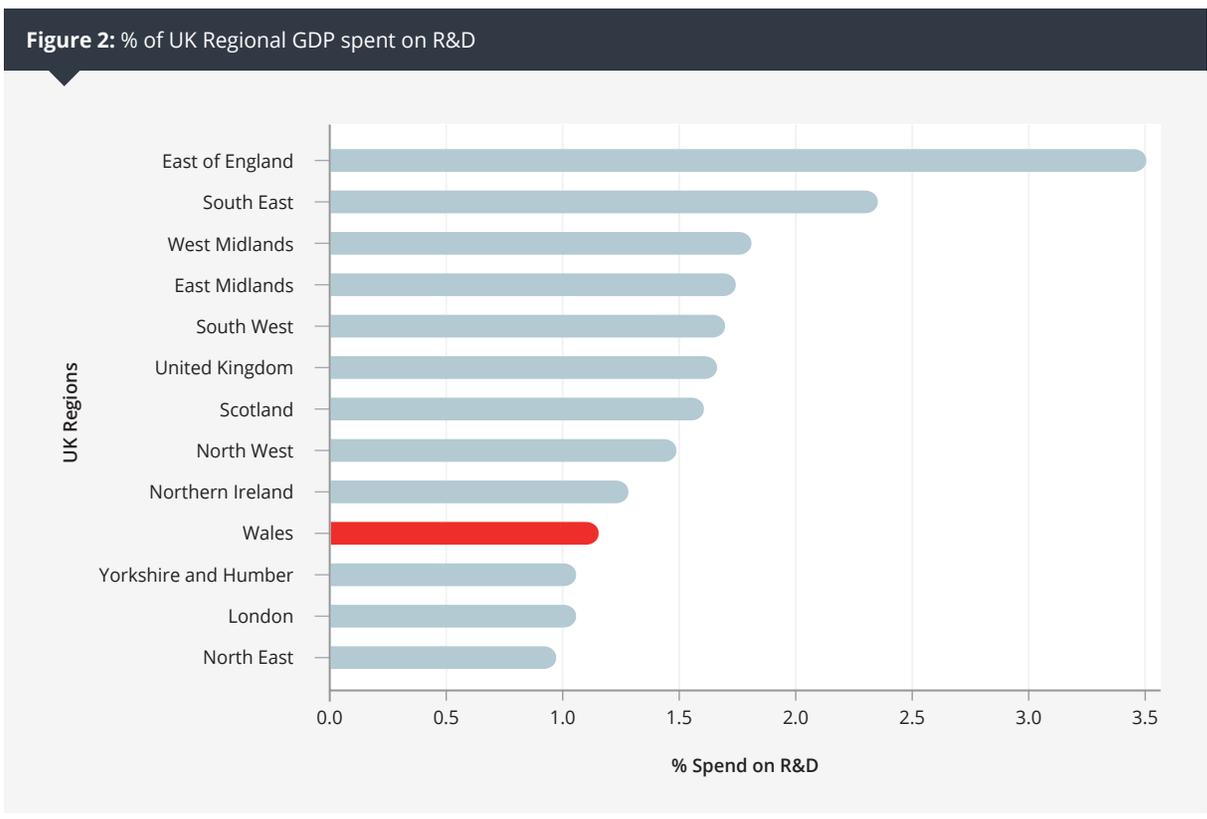
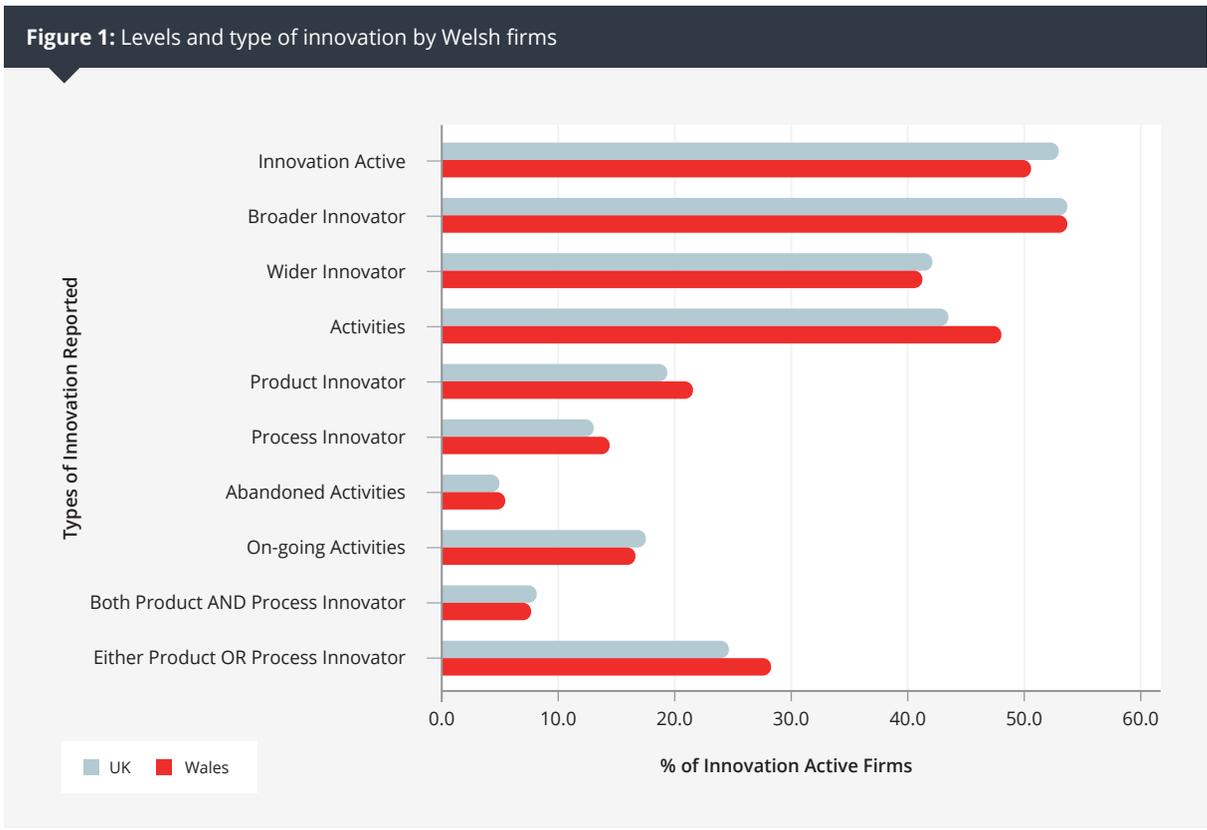
## Welsh business and research & innovation

For much of the past 20 years, innovation and technology has been close to the heart of economic development policy and, as a result, Wales has developed a rich landscape of innovation activities, programmes and supporting organisations including its universities and anchor companies. However, key economic and innovation indicators show that Wales suffers from persistent structural deficiencies and poor economic performance. Consequently, Wales continues to lag behind competitors in the

UK and Europe and while, at an EU level, Wales is classed as a 'Strong Innovator', innovation activity in Wales is not achieving sufficient added value.

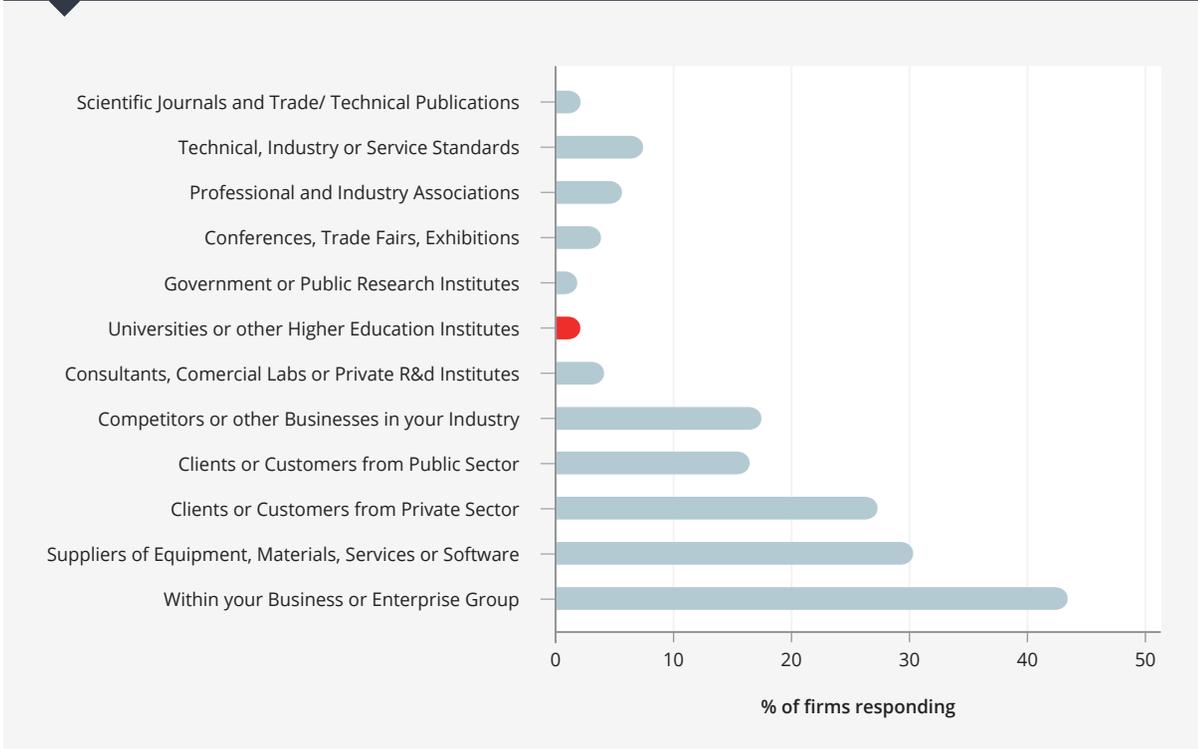
While there is evidence that Welsh firms are on average at least as innovation active as their counterparts in other parts of the UK, Wales is in a relatively weak position with regard to the traditional metrics of research and innovation performance such as the % of GDP expended on R&D investments by firms.

<sup>1</sup> Kitson, M; Howells, J; Braham, R; Westlake, Stian (2009) 'The connected university: driving recovery and growth in the UK economy'. Nesta research report.



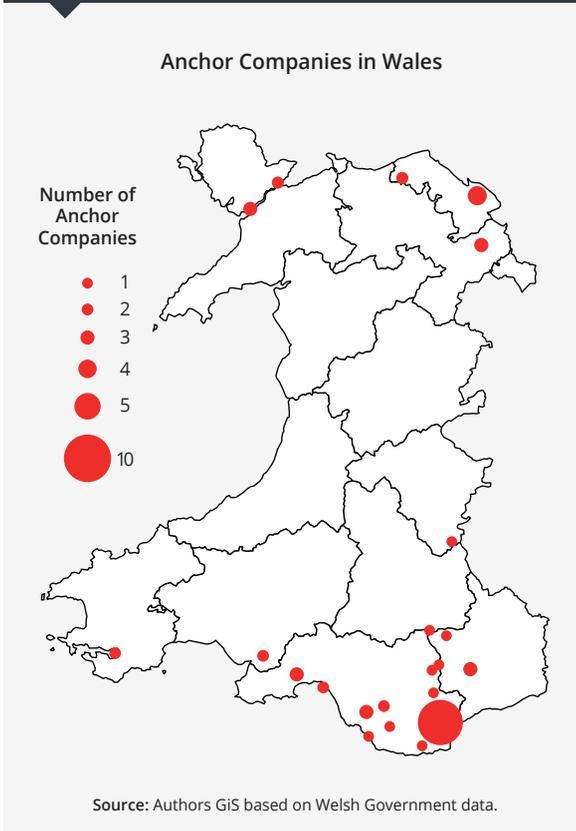
Furthermore, the dominance across much of the Welsh business landscape of global value chains (or supply chains) means that businesses are naturally more likely to look to their own supply chains - suppliers, clients and customers - than seek external sources of innovation (like ideas from universities).

**Figure 3: Sources of innovation rated as 'high' amongst Welsh firms**



As a result, collaboration between SMEs and universities is made more difficult than in economies where value chains are less dominant.

**Figure 4: Distribution of Anchor Firms in Wales**



The spatial location of anchor companies in Wales is of importance to their potential impact on research and innovation performance and business collaboration within the wider innovation system. Despite the global nature of modern economies, when university partners are close by, firms are able to better learn about university expertise, assess their effectiveness as they do so and thus minimise the costs of looking for innovation partners. In addition, local linkages potentially enable higher levels of interaction, increasing the intensity of collaborations and promoting collective learning, trust and understanding.

When this distribution of anchor companies in Wales is set alongside both the number and geographic dispersal of Welsh universities, it can be seen that Wales' anchor companies are rather unevenly distributed and university research excellence is similarly thinly spread, reducing opportunities to interact with anchor companies and their supply chains.

Nesta recently undertook an analysis of the economic complexity of local economies in the UK and concluded that areas with major economic diversity tend to have higher levels of GDP per capita and lower levels of inequality. Only Cardiff, and to a lesser extent Swansea, currently have complex economic structures under this assessment.

## Welsh universities and research & innovation

In 2003, the pivotal Lambert Review of university-business collaboration concluded by stating that the primary problem of knowledge exchange in the UK was the business community's low demand for knowledge from the higher education (HE) sector, and this may be especially pertinent to Wales, where business R&D spending is the lowest of the nations and regions of the UK.<sup>2</sup>

In recent years, the collaborative research income earned by Welsh Universities increased by 19.5% over the period 2012-2015 in cash terms, but its share of UK collaborative research income remained at 6.7% (above the 5% population threshold that HEFCW uses as a benchmark for performance) but amongst the

lowest in the UK. Similarly, levels of contract income were the lowest of all regions and nations in the UK, with consultancy income lowest bar one.

While Higher Education Institutions (HEIs) in Wales must play a major role in the Welsh research and innovation system, they cannot keep abreast of their peers in the other nations and regions of the UK because the budget to fund university-business collaboration in Wales – the Innovation and Engagement (I&E) Fund – has been cut to zero to help fund student fee arrangements while it is increasing elsewhere in the UK. For the first time in recent years the total income figure has decreased, as can be seen in Figure 5.

**Figure 5:** Knowledge Exchange income in UK nations 2014-15 and I&E budgets

	2014/15 I&E Budget	2013/14 KE Income	2014/15 KE Income	% Change In KE Income
	£ million	£ million	£ million	
<b>England</b>	150	3200	3400	6%
<b>Scotland</b>	17.1	412	453	10%
<b>Northern Ireland</b>	3.96	93	121	30%
<b>Wales</b>	0	201	193	-4%

Wales was the only nation in the UK to register negative income growth from knowledge exchange activity in 2014-15 (coming at the end of a period demonstrating a clear relationship between the availability of I&E funding and increases in KE incomes). It therefore seems highly likely that this is related to the abolition of I&E funding and the termination of projects under the previous EU Structural Funds. Although the current EU Structural Funds programme (2014-2020) helps universities to renew their knowledge exchange activity, the Welsh HE sector has been uniquely disadvantaged by the fact that Wales is the only UK nation to have abolished its I&E budget.

The loss of I&E has three debilitating implications for Wales – firstly, career opportunities for specialised business engagement and commercialisation teams in Welsh HEIs have diminished and recruitment and retention made more difficult; secondly, it makes it much more difficult for Welsh HEIs to build sustainable partnerships with businesses; and thirdly, the zero budget for I&E sends a very strong signal to businesses and to academics and researchers that university-business interaction is not valued in Wales and is a poor relation to teaching and research.

<sup>2</sup> Lambert Review of Business-University Collaboration 2003.

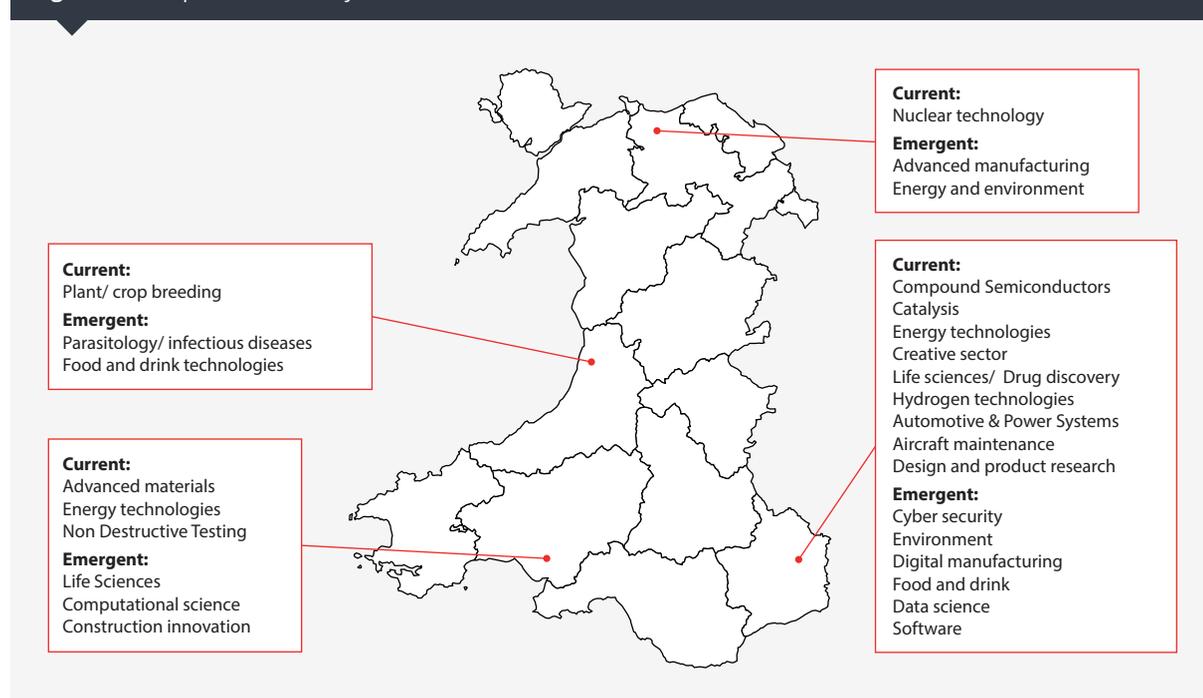
Without I&E investment the capacity of HEIs to support university-business interaction will become increasingly uneven. Although larger HEIs have some capacity to absorb the loss in their overall budgets, smaller HEIs are not in a position to do so, with the result being that the poorest areas will have the least capacity to engage in the knowledge exchange activities that are critical to social and economic regeneration.

The Diamond Review<sup>3</sup> concluded that Wales was at a disadvantage with England and argued that to maximise the social and economic benefits that can be derived from HEIs, Wales needs to find ways to create and enhance partnerships between universities and business.

## 'Hot spots' of university-business collaboration in Wales

As part of this research project, interviews were conducted with all HEIs in Wales to ascertain their own view of their strengths (or "hotspots") in the strategic sectors and technology disciplines most relevant to University / Business collaboration.

**Figure 6:** 'Hot spots' of university-business collaboration



It should be noted that this mapping has not been externally tested but is based on the universities' own perception of where their interaction with business is particularly strong or becoming so<sup>4</sup>. (Additional research is necessary to allow a more nuanced and quantified assessment of hot spots to be made).

The 'hot spot' areas identified in this research are identified across a number of areas and, in the majority of cases, across institutions. They also demonstrate an alignment with priority sectors and technologies as far as businesses and government policy are concerned. In addition, they are aligned with the Smart Specialisation priorities for Wales.

<sup>3</sup> Diamond (2016) "The Review of Higher Education Funding and Student Finance Arrangements in Wales" Welsh Government.

<sup>4</sup> This is not directly equivalent to asking where the University sees itself with regard to its research or teaching capabilities. Clearly, the Research Excellence (REF) and Teaching Quality assessments would provide a more objective picture of these more specialised capabilities.

# Achieving better university-business interaction in Wales

While rehabilitating I&E funding in Wales would be an obvious way to begin correcting the current imbalance in the funding landscape for university-business interaction, this alone will not be sufficient.

A recent report that examines the potential for a National Innovation Body for Wales concluded by saying that “if Wales accepts the status quo in innovation policy, then it will not tread water but will drift backwards, falling further behind our peers as they ‘up their game’ to become more innovative and responsive economies. In short, ‘business as usual’ can no longer be regarded as an acceptable economic policy approach”. Much the same point can be made with respect to university-business interaction.

While the biggest common challenge facing all the universities interviewed for this research was the lack of I&E funding, when discussing weaknesses in this area of activity businesses interviewed for this research tended to identify the same, or similar, challenges to those raised by the universities.

For example, where research and innovation are concerned, businesses commented that universities tend to be too risk averse and too intolerant of failure. While universities acknowledged a poor alignment between the internal culture of universities and the corporate culture of the businesses with which it seeks to interact.

Similarly, businesses believed that business liaison (commercialisation) teams at Welsh universities have been dis-incentivised by the funding and culture around business interaction activity and the universities recognise that a somewhat negative status has attached itself to knowledge transfer activity among the academic community.

One key issue that needs to be addressed as a matter of urgency is the process through which ‘hot spots’ are prioritised and developed. Future ‘hot spots’ need to be identified through a more strategic, transparent and collaborative approach in which business, universities and government are actively involved. This should be supported by the development of clear and distinctive business

models for each ‘hot spot’, recognising that not all will require the same funding mechanisms, partners or operating relationships. Flexibility and creativity will be essential and inter-institutional barriers will need to be overcome - but there are existing examples in Wales that can act as broad templates. For example, Compound Semiconductors, SPECIFIC and Dŵr Cymru/NERC.

The identification of emergent ‘hot spots’ demonstrates that traditional technology metrics may not be the most appropriate route for Wales to take. While technological innovation will always have a favoured place in a competitive global environment, it is no longer sufficient to create and grow the innovation-driven businesses that Wales needs. By recognising the power and importance of value chains and local ecosystems, there are new opportunities that can be developed that rely on timely conversations and better coordination across the ecosystem, where business, researchers and policy makers learn to collaborate for mutually beneficial ends. Constructive and creative conversations will be crucial before investment plans can be developed and funded.

**The universities themselves need to step up their focus on innovation and research through collaboration with business, focusing on achieving strategic leadership of I&E activity internally and ensuring parity of esteem for academic staff who are engaged with business.**

Fragmentation and lack of coordination within Welsh universities needs to be addressed before the private and third sectors are willing to become more deeply engaged. Since Welsh universities will not have access to ERDF sources to fund collaboration programmes (like KEF, Smart Expertise, ASTUTE etc.) in the near future, finding ways to invest limited funds more wisely and with more impact will be the key to future success.

## An action plan to grow value

01

### Strategic vision and approach needed.

**Responsibility:** Welsh Government in partnership with the leadership of Welsh universities, industry and business.

Building a better strategic approach to collaboration between universities and business is essential. The lack of long term vision and ambition to underpin collaboration weakens and dissipates the efforts both are making.

- Future 'hot spots' must be identified through a strategic, transparent and collaborative approach allowing clear and distinctive business models to be developed and resourced for each.
- The strategic approach taken to develop the Institute for Compound Semiconductors is a blueprint for strategic approaches leading to the development of hot spots involving key sectors, businesses and Welsh universities.

02

### Leadership and consistency.

**Responsibility:** Leadership of Welsh universities and industry.

Businesses need strong, visible and sustained championing of university-business collaborations by senior leadership in both universities and businesses. The business community needs to know that its academic partners are equally committed to collaboration and innovation.

- The status of Knowledge Exchange within universities and the career structures, academic resources and rewards must be addressed by university leaders. By working towards 'parity of esteem' between teaching, research and business engagement in universities, the weaknesses identified by universities and recognised by businesses can begin to be overcome.

03

### New models of innovation.

**Responsibility:** Welsh Government, the Innovation Advisory Council for Wales, industry representative bodies, universities and civil society groups.

While technological innovation will always have a favoured place in a competitive economy, it is no longer sufficient to create and grow the innovation-driven businesses that Wales needs. Since manufacturing is as much about process and service as it is about product and technology, Wales needs to build process and service innovation into its overall strategising on innovation, including social innovation and public service innovation.

Universities can play a major role here by mobilising their capacity to be creative, bringing social science and the disruptive power of data science and analytics to bear on the societal grand challenges around which future university-business interaction and 'hot spots' will develop.

04

### Mobilising the innovation potential of value chains.

**Responsibility:** Industry and Welsh universities.

The benefits of universities working with anchor companies and SMEs will be enhanced where the collaboration takes into account the value chain aspects of the business. This will reveal wider research and innovation opportunities for university partners to identify and work with more local SMEs and to outsource some activities to specialist SME providers in the value chain. With key anchor companies engaged, universities should be free to play a creative, project-enhancing role rather than its traditional transactional role based on contract research alone.

05

### Rehabilitation of I&E funding.

**Responsibility:** Welsh Government to implement Diamond Review.

Investment in university-business collaboration in Wales should be reinstated to allow Welsh universities and businesses to operate on a par with other UK nations and regions. The Diamond Review argued that Wales needed an enhanced partnership between universities, business and government to maximise the social and economic benefits that can be derived from HEIs. Therefore, we recommend that Welsh Government, through HEFCW (or its successor body), should provide a dual support system of knowledge exchange funding, consisting of:

- Hubs of university-business interaction receiving core funding of £5 million per annum to enable agile and flexible engagement between HEIs and industry; and,
- A scheme that would allow universities to be more flexible and responsive in their work to promote university-business collaboration projects that have a potentially strong and significant economic impact.

06

### Better access points to university expertise and resources.

**Responsibility:** Welsh universities in partnership with industry bodies and other partners.

A better understanding of the needs and opportunities between universities and businesses, matching up academic expertise with industry needs is a perennial challenge. Businesses require clear knowledge of and easy access to university partners to maximise the impact of research results on their businesses and the economy. By being able to better understand how research results can be captured to boost innovation, product development and process innovation, universities could achieve greater value and economic impact through their knowledge exchange and business collaboration activities.

- Creating a flexible and responsive platform or access point is one of the Diamond Review recommendations. Such a platform could link together all Welsh universities using modern digital platform and networking technology, potentially supplemented by strong SME / Anchor business network capabilities. The Federation of Small Business has suggested itself as a possible partner with 'boots on the ground'.



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