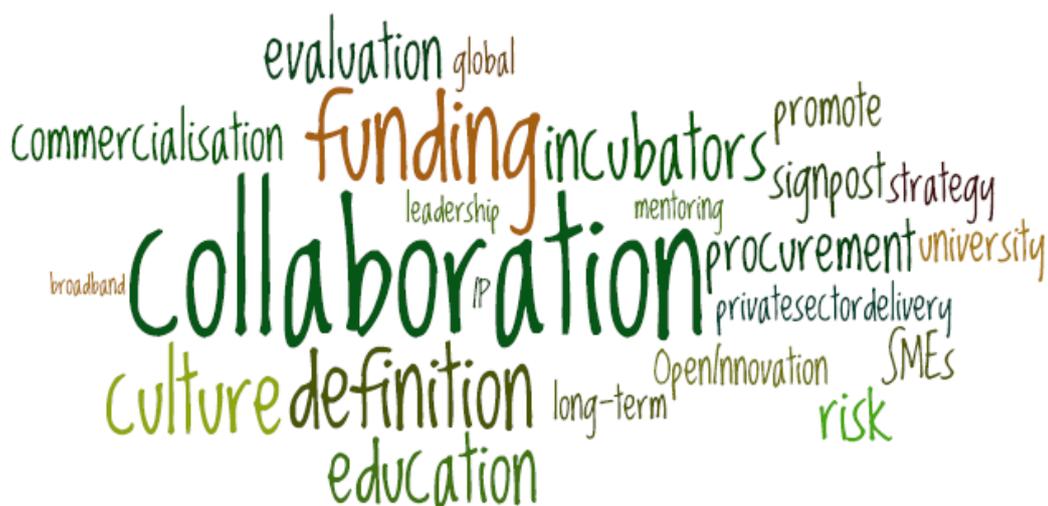




Llywodraeth Cymru
Welsh Government

**Wales: Towards a RIS3
Smart Specialisation Peer Review
Background Information
Brno 13-14 March 2013**



1. Introducing Wales



1.1 Key Statistics:

Capital City:	Cardiff
Government:	Welsh Government
Area:	20,780km ² (8023m ²)
Population:	3.1 million (1 in 20 of the UK population live in Wales)
Population density:	147 persons per square kilometre
Currency:	Pound Sterling
Households:	1.3 million
Life expectancy:	77.6 years for males and 81.8 years for females
Two regions:	West Wales and the Valleys; and East Wales

Wales is a country that is part of the United Kingdom and the island of Great Britain, bordered by England to its east and the Atlantic Ocean and Irish Sea to its west. It has a population of 3,064,000; a total area of 20,779 km² (8,023 sq miles) of which 80% is

devoted to agriculture; measures 274km (170 miles) from north to south, and 96km (60miles) from east to west at its shortest points; has over 1,200 km (750 miles) of coastline; has 3 National Parks, 3 areas of Outstanding Natural Beauty, 41 Blue Flag beaches and 6 UNESCO World Heritage sites; and is largely mountainous, with its highest peaks in the north and central areas, including Snowdon, its highest summit.

1.2 Language

Welsh and English are our official languages, with 19% of the population speaking Welsh, one of Europe's oldest living languages.

Welsh is spoken widely throughout the country and is the first language in some areas - particularly in the north and west. National TV and radio stations broadcast in Welsh; road signs are bilingual; all school children study Welsh up to age 16 and there are Welsh language medium schools, books, newspapers and websites.

1.3 Cities

Wales has 6 cities: Cardiff, Swansea, Newport, Bangor, St. David's and St. Asaph. The biggest of which are Cardiff with a population of 346,100; Swansea has 239,000 and Newport has 145,700

1.4 Education

There are 10 universities in Wales and in 2011/12 there were 131,185 students enrolled in Higher Education institutions. There are 18 Further Education colleges and institutions catering for almost 180,000 learners.

1.5 Administration

After a referendum in September 1997, Wales established a limited devolved government. Additional powers such as the ability to make secondary laws were acquired by the Government of Wales Act 2006, and a further referendum in 2011. The National Assembly for Wales no longer needs to seek UK Government approval before making laws in twenty devolved areas, including agriculture, education, the environment, economic development, health, housing and local government. Non-devolved areas such as general taxation, defence, foreign affairs, and social security remain the responsibility of the UK Government.

The National Assembly for Wales opened in 1999. It is our political body made up of 60 elected Assembly Members (AMs) which makes decisions affecting Wales. They meet in the Senedd building in Cardiff which opened in 2006 and has won an award for its sustainability and green credentials.

The Welsh Government is made up of Assembly Ministers drawn from these elected members and is headed by the First Minister of Wales. The Welsh Government has responsibility for policy and budget priorities and is scrutinised by the legislature, the National Assembly for Wales.

In Wales we elect 40 members to the UK Parliament where responsibility for some non devolved policy areas for Wales resides. On a European level, we elect four members

to the European Parliament which produces legislation for member states of the European Union.

In May 2007, separation between the legislative National Assembly for Wales and the executive Welsh Government took effect under the Government of Wales Act 2006. The Act created a new category of legislation called Measures of the National Assembly and increased the National Assembly's law making powers.

A yes vote in a referendum in March 2011 has secured further law making powers for the National Assembly. It is now able to pass laws on all subjects in the 20 devolved areas without first needing the agreement of the UK Parliament.

1.6 Local government

For the purposes of local government, Wales has been divided into 22 council areas since 1996. These "principal areas" are responsible for the provision of all local government services, including education, social work, environment and roads services.

2. The Economy

Wales is split into two regions, West Wales and the Valleys and East Wales, both are administered by the Welsh Government.

The economy of East Wales is diverse and, for the most part, relatively prosperous, with GVA per head on a par with the UK average when London and the South East are excluded. West Wales and the Valleys has lower GVA per head, with structural issues associated with de-industrialisation continuing to shape economic outcomes resulting in this part of Wales qualifying for EU convergence funding. Several challenges face the economies of both West Wales and the Valleys and East Wales, not the least of which is to regain the losses in output and employment caused by the recession of 2008/2009.

Parts of both East Wales and West Wales and the Valleys suffer from severe deprivation and unemployment, but they do retain important strengths. West Wales and the Valleys has pockets of high GVA per head and the overall employment rate gap with the UK has closed over the last decade. In addition, a substantial number of people choose to live in this part of Wales and commute to employment elsewhere in Wales and England, testament to the area's attractiveness and relatively low cost of living.

One measure of a country's overall economic performance is by an analysis of GVA statistics.

GVA by Area and Component

	2010			2011		
	£ million	£ per head	Index (UK=100)	£ million	£ per head	Index (UK=100)
UK excl Extra-Regio	1281268	20579	100	1310190	20873	100
England	1099713	21054	102	1124881	21349	102
Wales	46320	15407	74	47340	15696	75
Scotland	106080	20314	99	108098	20571	99
Northern Ireland	29155	16203	79	29870	16531	79
Extra-Regio	27694	.	.	31044	.	.

Total GVA in Wales in 2011 was £47.3 billion. GVA per head in Wales was 75% of the UK average.

This figure is the lowest amongst the devolved countries and English regions. GVA however, is not the only measure of economic performance nor is it always the most appropriate. A viable alternative to GVA, and one that is probably a more suitable measure of welfare or wellbeing, is Gross Disposable Household Income (GDHI). Although still below the UK average, GDHI per head places Welsh economic performance in a far more positive light relative to the UK.

Sector Comparison of the Welsh and UK Economies (2009)

	GVA		Workforce Jobs	
	Wales % of total	UK % of total	Wales % of total	UK % of total
Agriculture	0.2	0.6	2.6	1.3
Mining & Quarrying / Elec., Gas, Water	4.4	3.5	1.8	1.2
Manufacturing	15.2	10.3	10.5	8.0
Construction	7.7	7.1	6.8	6.4
Wholesale, Retail Trade & Repairs	11.0	11.1	14.5	15.4
Hotel & Restaurants	3.3	2.9	7.4	6.5
Transport, Storage & Communication	7.3	11.2	5.7	8.7
Financial and Professional Services	20.3	29.6	13.9	20.6
Public & Other Social Services	30.6	23.7	36.6	31.9
Total	100	100	100	100
Total	£44bn	£1,236bn	1.398m	31,886m

For much of the post-war era, Wales traditional heavy industries have been in decline. Today, although manufacturing remains one of the largest and most important sectors of the economy, Wales has a predominantly service-based employment structure and Gross Value Added (GVA).

2.1 Structural Funds

Structural Funds exist to help to address regional disparities, through targeting structural weaknesses in an economy and labour market over the medium to long term. West Wales and the Valleys is recognised as a less developed region by the European Commission. As such, it qualifies for additional support under the European Union's Structural Funds programme to promote economic convergence with the more prosperous regions of the EU because its average Gross domestic Product (GDP) is currently below 75% of the European Average.

3. Business Base

Business statistics show that in 2011 there were over 200,000 active enterprises in Wales, with the vast majority being SMEs. While they accounted for 99 per cent of the number of businesses, SMEs represented a far smaller proportion of total Welsh employment or turnover. Considerable variation is apparent between sectors, with employment in agriculture almost entirely concentrated among micro businesses (93 per cent) while employment in production industries was concentrated in large businesses (53 per cent). Business size structures in Wales and UK in terms of the proportions of enterprises and employment in each size-band were similar. However, turnover in Wales showed a greater concentration in the largest businesses than was the case with the UK (60 per cent compared to 54 per cent, respectively).

Business Structure in Wales by Size Band and Measure

		Number			Percentage of total		
		Enterprise count	Employment	Turnover (£m)	Enterprise count	Employment	Turnover (£m)
All size bands		204280	998800	94554	100	100	100
	Micro (0 - 9)	193010	331400	15901	94.5	33.2	16.8
	0	151515	171300	5536	74.2	17.1	5.9
	1-4	31810	92900	5983	15.6	9.3	6.3
	5-9	9685	67200	4381	4.7	6.7	4.6
	Small (10 - 49)	7780	146300	10605	3.8	14.6	11.2
	10-19	5095	70900	4992	2.5	7.1	5.3
	20 - 49	2690	75400	5613	1.3	7.6	5.9
	Medium (50 - 249)	1910	123600	11907	0.9	12.4	12.6
	50 - 99	1065	56100	4723	0.5	5.6	5
	100 - 199	665	49700	5346	0.3	5	5.7
	200 - 249	180	17800	1838	0.1	1.8	1.9
	Large (250 +)	1580	397600	56141	0.8	39.8	59.4
	250 - 499	445	43400	6955	0.2	4.3	7.4
	500 - 999	365	53200	6793	0.2	5.3	7.2
	1000 +	775	300900	42393	0.4	30.1	44.8

4. Innovation and R&D in Wales

4.1 R&D in Wales

For individual businesses, the development of new products, processes and services is the key to establishing a sustainable competitive advantage and increased productivity. There is significant evidence to demonstrate a link between R&D and innovation activity and business growth. In Wales, an estimated £527 million was spent on R&D in 2010. This represented 2.0 per cent of total UK R&D expenditure and 1.2 per cent of total GVA in Wales. Business R&D accounted for 46 per cent of the total, with higher education accounting for 50 per cent and government making up the remaining 4 per cent.

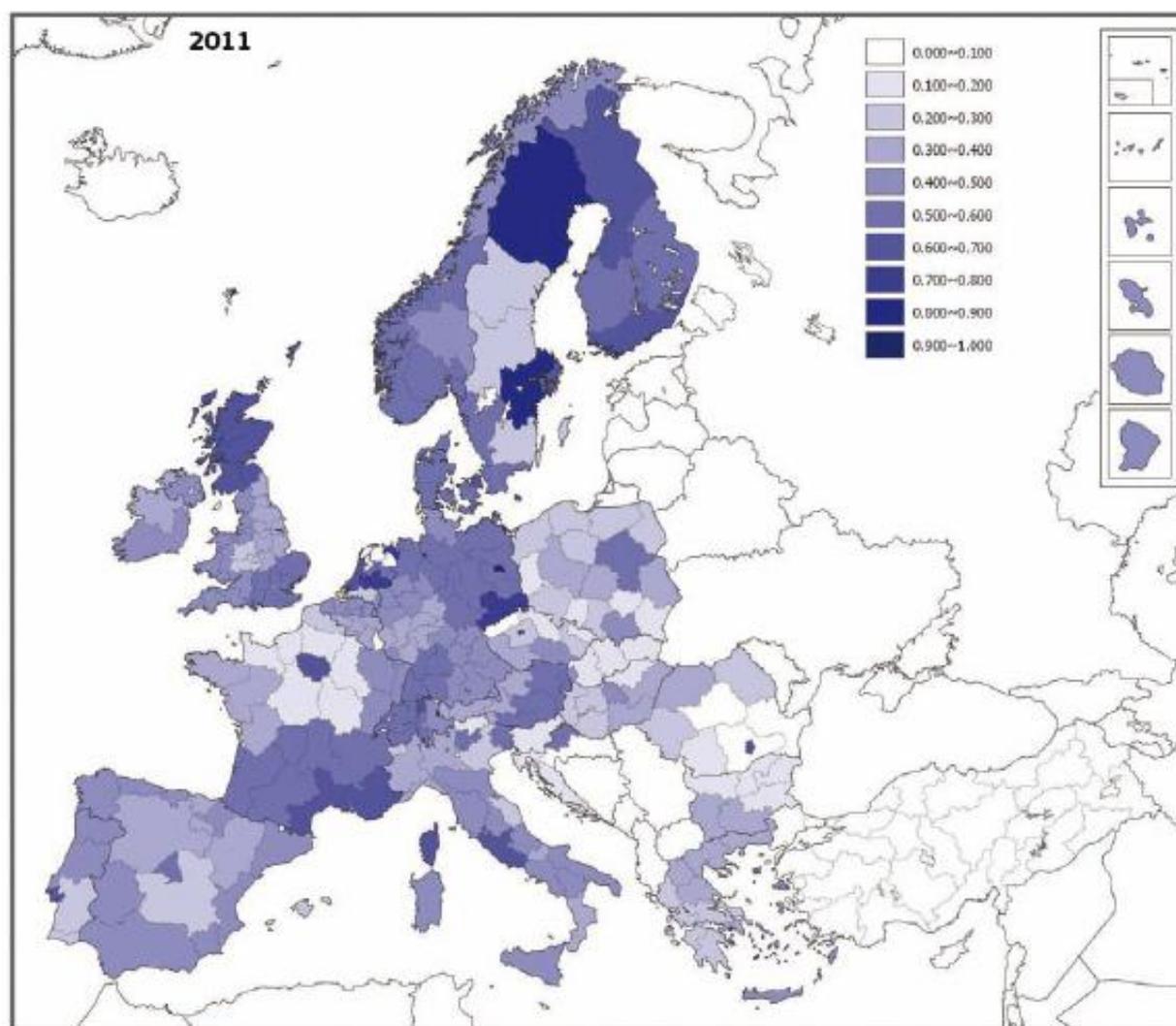
R&D Expenditure in the UK by Area and Type (2010)

	Higher education bodies R&D (£m)	Business enterprise R&D (£m)	Government and Research Councils R&D (£m)	Total expenditure on R&D (£m)
United Kingdom	7130	16053	2512	26362
England	5741	14873	2172	22790
Wales	262	234	21	527
Scotland	968	622	300	1890
Northern Ireland	159	324	19	502

R&D Expenditure by Area and Type as a % of UK Total (2010)

	Higher education bodies R&D (%)	Business enterprise R&D (%)	Government and Research Councils R&D (%)	Total expenditure on R&D (%)
England	80.5%	92.6%	86.5%	86.5%
Wales	3.7%	1.5%	1%	2%
Scotland	13.6%	3.9%	12%	7.2%
Northern Ireland	2.2%	2%	1%	1.9%

Public R&D Expenditure as a % of Regional GDP

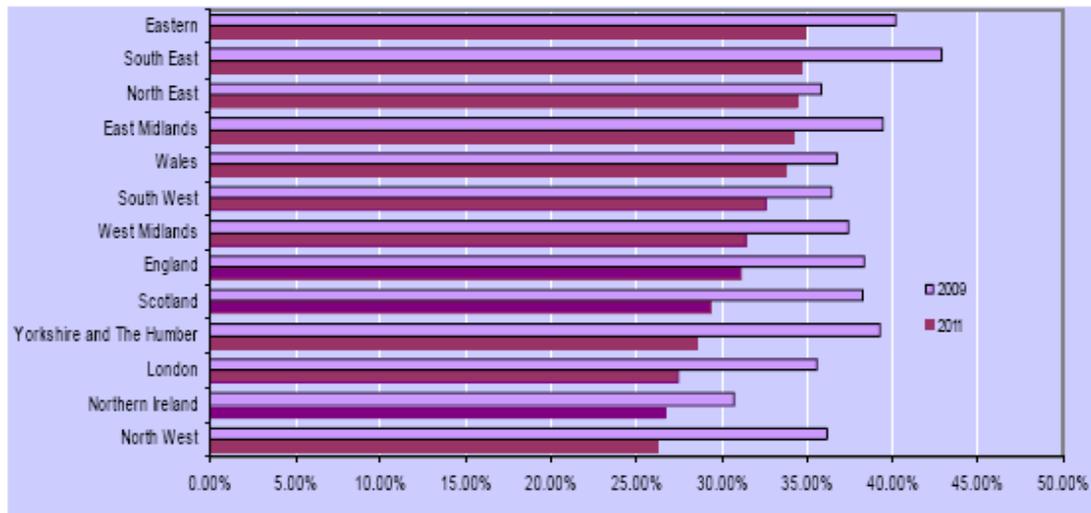


4.2 Innovation Performance in Wales

The table below is taken from the recently published Department for Business Innovation and Skills UK Innovation Survey. It compares the percentage of innovation active businesses in each of the UK regions. An innovation active business according to this survey is defined as an enterprise engaged in:

- Introduction of a new or significantly improved product (good or service) or process;
- Engagement in innovation projects not yet complete or abandoned;
- New and significantly improved forms of organisation, business structures or practices and marketing concepts or strategies.

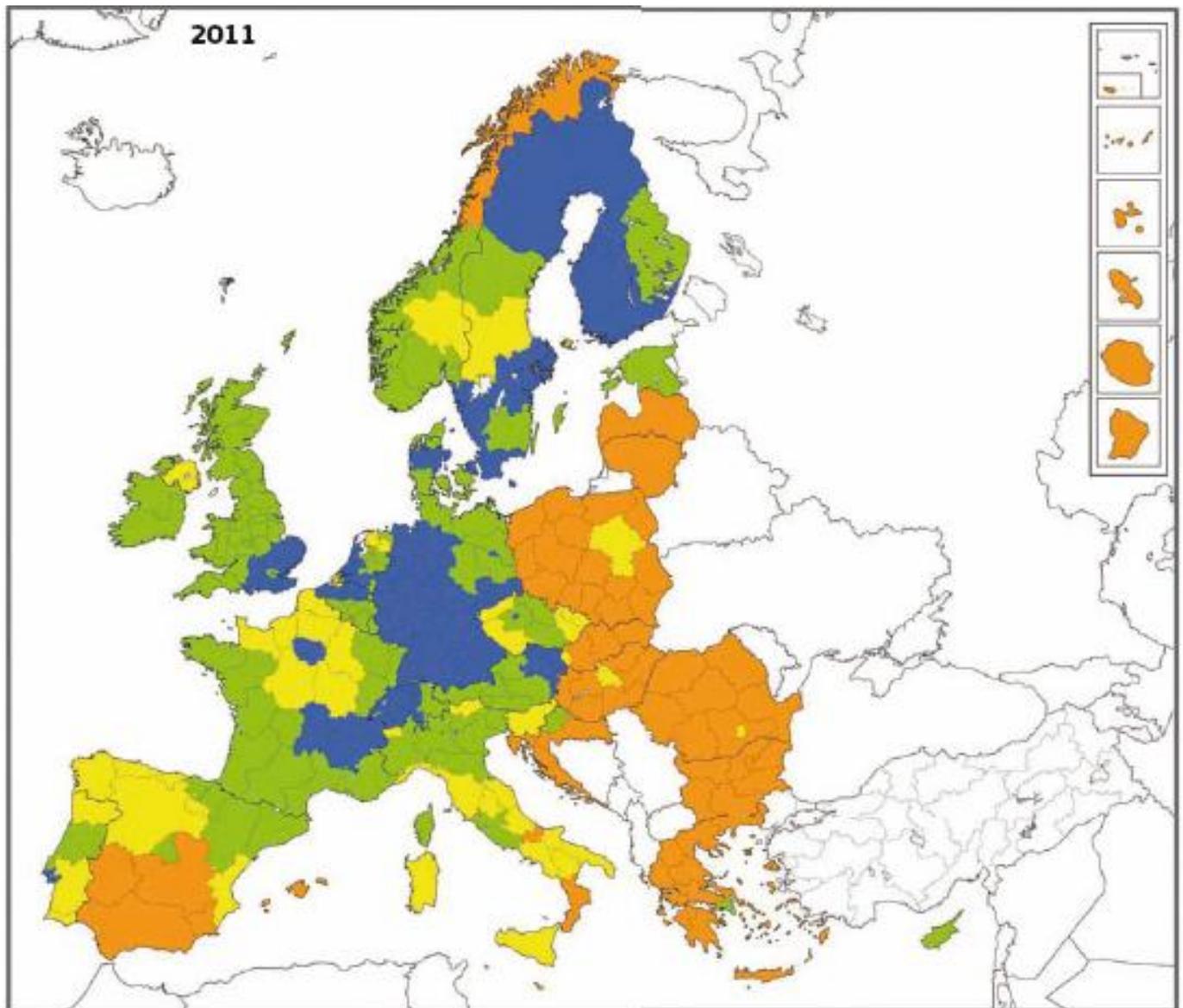
Regional Innovation Patterns



In this survey Wales performs relatively well compared to other parts of the UK, having risen from 7th to 5th position, between 2009 and 2011. (Note there have been some changes in definition of 'innovation active' since 2009)

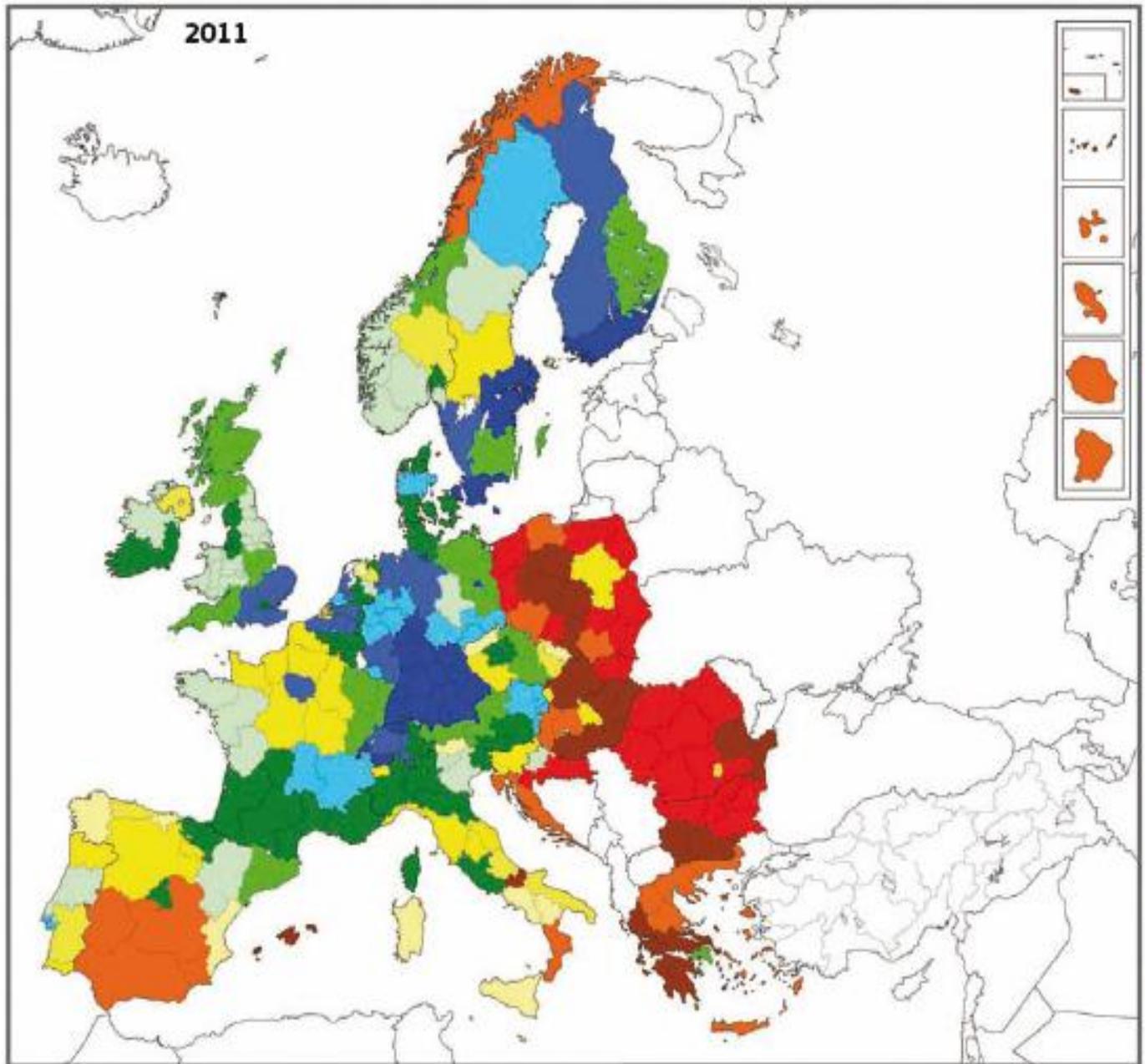
The latest data from the EC Regional Innovation Scoreboard indicates Wales is characterised as an innovation follower, the second rank of innovation performance. However, in a more detailed analysis, Wales' performance is identified as being in the lower spectrum of this category, as can be seen from the maps detailed below. It may be that where we are innovating this is largely in terms of incremental changes to existing products and processes rather than developing new market opportunities and added value.

Regional Innovation Scoreboard Performance Map



- Innovation Leader
- Innovation Follower
- Moderate Innovator
- Modest Innovator

Regional Innovation Scoreboard Detailed Performance Map



4.3 SWOT Analysis for Research, Development and Innovation in Wales

<p>Strengths</p> <ul style="list-style-type: none"> • Wales has pockets of world class expertise in academia in areas with commercial potential • Wales has a number of key multi national ‘anchor’ companies and clusters of smaller companies in niche areas • Wales is part of the UK Research Base which is considered to be world class in e.g. science and engineering graduates • Recent data indicates a well developed and effective knowledge transfer system between HE and business • Wales has many of the aspects deemed important by the OECD for a successful innovation system such as access to a first class knowledge base • The UK is seen as an innovation leader in the area of intangible investments 	<p>Weaknesses</p> <ul style="list-style-type: none"> • Low business and academia investment in R&D. Lack of PLCs and company HQs in Wales • Little evidence of a culture of innovation within Wales • Access to Venture Capital and private funding is poor • Weak external perception of Wales as a base for knowledge based companies • Limited specialised facilities in some areas e.g. Wetlabs • Lack of international trade • Low economic activity, low GVA per head, low wages and lack of employment opportunities • Lack of high level and innovation management skills • Lower business expenditure in R&D than OECD average
<p>Opportunities</p> <ul style="list-style-type: none"> • Adapt established business support to ensure RD&I and commercialisation is given a top priority • Ability to make more strategic use of external funding streams, such as TSB, Research Councils, FP7 • Strengthen STEM teaching in universities and schools • Leverage public procurement where Wales has devolved powers • Ability to trial innovative solutions to areas such as health, transport at a manageable scale using Wales as a test bed for new ideas • Incentivise universities to collaborate with each other and with business within Wales and externally 	<p>Threats</p> <ul style="list-style-type: none"> • Diminishing resources as a result of public sector budget reductions and continuing recession • Wales too inward looking resulting in lack of awareness of global competition • Spreading resources too widely and trying to achieve too many goals • Reduction of funding of universities could damage the research base and the opportunities for commercialisation • Increased competition between HEIs for diminishing resources could damage existing collaborations and threaten sustainability of collaborative research centres • Established multinational companies re-trenching R&D to home markets or off-shoring to lower cost locations

5. Economic and Innovation Policy

5.1 Innovation Policy Context

Wales can reflect that it was one of the first regions of Europe to recognise the link between innovation and economic development. The Wales Regional Technology Plan, produced in 1996 was followed by the Innovation Action Plan in 2003. Both of these strategies gave a commitment to supporting innovation in Wales, and helped determine its form through two successive rounds of European Cohesion funding, 2000 - 2006 and 2006 – 2013.

However, there have been many changes in the economic and political environment since 1996. The previous policies pre-date the creation of the Technology Strategy Board (TSB), which has a UK-wide remit for the support of ‘technology enabled’ innovation. The economic policies of the previous Welsh Government and *Science for Wales* have important ramifications for innovation in Wales.

On a UK level, recent documents such as *The UK Innovation and Research Strategy for Growth* reflect widespread global developments in the understanding of the nature of innovation.

Support for innovation in the UK is now a shared endeavour between the devolved administrations and the UK’s Department of Business, Innovation and Skills (BIS). BIS has primary responsibility for innovation in England, but also supports a number of bodies with a UK-wide remit like the Research Councils and the Technology Strategy Board (TSB). The devolved administrations have their own powers in innovation-related matters like higher education policy and funding, and direct support for business within their borders.

The recently published *Science for Wales* strategy put forward proposals to strengthen the research base, but it also urged the Welsh Government to devise a complementary strategy for innovation to boost Welsh business competitiveness.

The Welsh Government’s economic policy, *Economic Renewal: a new direction*, affirms that “Research and Development (R&D) plays an important role in stimulating innovation, and innovation is a key driver of productivity, economic growth and long-term improvements in wellbeing. Wales must move towards a more R&D-intensive and knowledge-based economy, where the right conditions exist for innovation to flourish. For economic renewal, we need to:

- build upon the expertise that exists within Welsh universities and businesses, developing UK and global recognition of Welsh research;
- encourage businesses to invest in R&D and to harness the commercial opportunities of innovation and research;
- adopt a more focused approach, tackling the barriers to investment in R&D and innovation.”

The *Programme for Government* details the Welsh Government’s commitments for this Assembly. The Growth and Sustainable Jobs theme addresses the immediate challenges arising from the current economic climate, but it also looks to encourage businesses in Wales to develop the new products and processes that will secure future

competitiveness. Innovation is therefore vital to the delivery of key Ministerial priorities for Wales. It will encourage:

- young people in Wales into science and engineering;
- collaboration between our universities and the best universities outside Wales;
- make the scientific knowledge and expertise of our world-leading academic groups available to support innovation and job creation in Welsh companies.

5.2 Economic Policy

The Welsh Government's economic policy, *Economic Renewal: a new direction*, targets nine key sectors for business support:

- Advanced Materials and Manufacturing
- Life Sciences
- Financial and Professional Services
- Energy and the Environment
- Creative Industries
- ICT and Digital
- Food
- Construction
- Tourism

However, recognising that science and innovation are often not constrained within a single business sector, the *Science for Wales* strategy identified three Grand Challenge Areas for Welsh science, based on an analysis of existing research strengths, and potential to contribute to economic growth:

- Life Sciences and health
- Low carbon, energy and environment
- Advanced Engineering and materials
- ICT and the Digital Economy

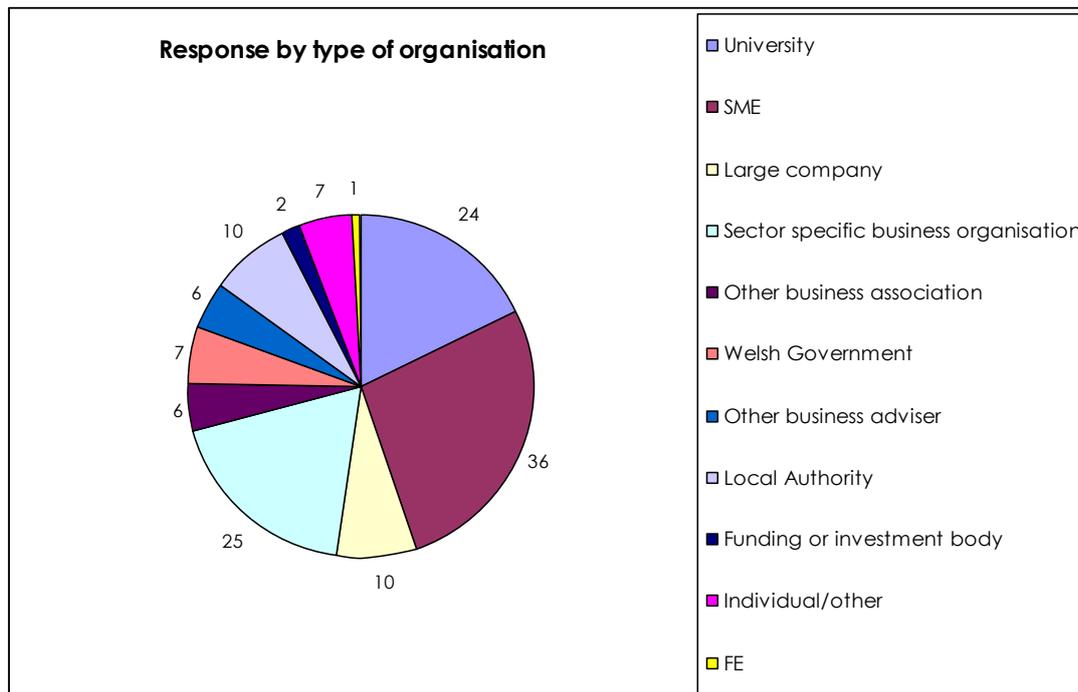
Within Wales, we have some internationally renowned industries and universities. *Innovation Wales* builds on these foundations. Its task is to target investments that will build a culture of continuous innovation, add value to existing investments in Wales and realise the economic potential which innovation can deliver.

We intend to build on the three grand challenge areas identified in *Science for Wales*. These are domains in which Wales has existing strengths, where strong economic opportunities exist and where there is potential to combine our assets across a range of industrial and research sectors. It also enables us to build on past investments.

6. Call for Evidence on Innovation in Wales

The Welsh Government undertook an extensive call for evidence in the production of the strategy and received over 130 responses from all sectors of society in Wales and farther afield. Over 20 meetings were held with various stakeholder groups and 5 events were held across Wales to promote and discuss the strategy with participants from a range of organisations consisting of Higher Education and Further Education, SMEs, large companies, local authorities, business advisers, sector specific business organisations, business associations and funding and investment bodies.

The graph below roughly profiles the type of organisations that responded to the call for evidence.



Overwhelmingly, people and organisations are convinced of the importance of innovation, however they define it, and want to see Wales improve its performance.

There were a number of key themes which recurred frequently in the evidence received and which will underpin our approach to future innovation.

6.1 Improving Collaboration

Innovation is becoming a more open process as universities, companies and individuals increasingly realise that they cannot fully exploit new ideas and technologies on their own. R&D is becoming increasingly expensive and knowledge is widely dispersed. There is a need to see better connections between all agents in the innovation system within Wales, and between Wales and the outside world. An extension of the collaborative principle is the "coffee shop phenomenon"; the embodiment of the random and chaotic nature of innovation. It refers to the creativity that occurs at the intersection of, sometimes very diverse, disciplines and the need to find ways to stimulate networks that help this to happen.

6.2 Promoting a Culture of Innovation

We were reminded frequently of the strong connection between education, entrepreneurship and innovation. Entrepreneurship can be taught. The need to stimulate and teach the principles of innovation at school and college was highlighted as was building innovation into higher education courses. Innovation is not just for the entrepreneur but is needed across an organisation at all levels.

6.3 Providing Flexible Support for Innovation

The problem of financing innovation was a consistent message: financing large scale research, development and innovation (RD&I); bridging the “valley of death”; accessing venture capital to successfully exploit market opportunities. These may require different solutions and approaches but were a common theme and if we are to make a step change in innovation they will need to be addressed.

Allied to the availability of funding is the speed and flexibility with which it is delivered. Slow innovation is not worth pursuing. The pace of innovation and exploitation is accelerating, and the window for exploitation, before products and ideas reach the commodity stage, is shrinking. So, any interventions to enable innovation need to be quick, and this raises questions as to who is best placed to deliver them.

6.4 Innovation in Government

The public sector has the potential to play a significant role in encouraging innovation. This is true even in free markets such as the USA where for example, Government funded defence spending has been shown to have a major effect on the development of innovative businesses. The role of the public sector should not be prescriptive; schemes such as the Small Business Research Initiative (SBRI) have been successful by identifying an issue or challenge and leaving the solution to the open minds in the supply chain. The Welsh public sector should itself be innovative when procuring.

But the role of Government is potentially far greater than what it spends. There are areas of human activity where it has the opportunity to help or hinder the whole environment, or culture of innovation. One of these, given the traditional British system of healthcare, is the Welsh National Health Service, which may be something of a “sleeping giant” in terms of its potential.

6.5 Prioritising and Creating Critical Mass

We need to broaden innovation across the nation and deepen it in everything we do. Government has a role in spreading this message and helping to create an environment that fosters this culture. We also need to be world class in some disciplines, and these are likely to be very limited in number. We need to build capacity and a critical mass of expertise in areas where Wales has existing strengths and significant opportunity. Our current priorities were not clearly understood, especially by those outside Wales, and all wanted a greater degree of focus.

7. Innovation Support currently available from the Welsh Government

The Welsh Government provides assistance and funding to businesses in Wales to promote and facilitate innovation. Technology-based businesses, including manufacturing, engineering and scientific businesses, can benefit from the integrated innovation support package available from the Welsh Government's Innovation Department.

An integrated innovation support package is available which encourages and enables Welsh businesses to:

- invest in Research and Development (R&D) in order to harness the commercial opportunities of innovation and research
- work with universities and other academic institutions to exploit commercially directed research
- adopt a more focused approach, tackling the barriers to investment in R&D and innovation

The support is delivered by a team of Innovation Specialists, design managers, manufacturing managers and Intellectual Property Specialists. They can help businesses access the support and funding it needs at key stages of the innovation process.

7.1 Support and Advice

The Welsh Government can assist with:

- new product development
- design and manufacturing
- managing Intellectual Property (IP) - including obtaining IP information, developing a strategy, funding to protect IP and assistance through the Patent Library (PATLIB) centre
- research and development projects
- commercialisation – access to markets
- sourcing and accessing SMARTCymru Research, Development and Innovation (RD&I) funding from the Welsh Government and other UK and European schemes

7.2 Funding for Innovation

The Welsh Government provides financial assistance at key stages of the innovation process including:

- for the research and development of new, technically innovative products and processes with good commercial potential
- towards proposal preparations to obtain European Framework and external funding for R&D
- to allow businesses and academia to travel abroad to meet potential R&D partners
- to Wales' academic institutions to facilitate closer collaborations with businesses

7.2.1 Innovation Vouchers

Innovation Vouchers worth up to £25,000 in a 12 month period to small and medium sized enterprises (SMEs), and also to larger businesses on a case by case basis are available from the Welsh Government. Innovation Vouchers can be used to commission work on:

- technical problem solving
- product/process research and design
- product development and testing
- prototype design and fabrication
- manufacturing process development
- evaluation and assistance with the introduction of new materials, processes or techniques
- Intellectual Property filing, searches and licensing (related to new products and R&D)
- procure technical consultancy expertise from the private sector
- work with Universities and Colleges and source facilities, equipment and expertise to help solve technical problems and encourage innovation

7.2.2 SMARTCymru Research, Development & Innovation (RD&I)

The Welsh Government offer support and non-repayable financial assistance to Welsh-based businesses for the research and development of new, technically innovative, products and processes which have good commercial potential. The level of support offered depends on the size of your business and the stage of the project being supported. The Welsh Government can help Welsh businesses:

- assess the technological and commercial viability of transforming ideas into new products or processes
- undertake practical research to learn new knowledge and develop a basic working model of a new product or process
- put the results of industrial research into practice by developing a pre-production prototype
- meet the costs of launching a new product or process on the market.

7.3 Innovation collaboration

Businesses can also access technical innovation expertise and facilities in Wales' universities and colleges to enable you to gain the competitive edge. Support from the Welsh Government is available to:

- source and get in touch with the right experts or facilities
- identify academic partners for collaborative R&D
- source quality graduates and postgraduates through placement schemes
- identify and access industry-focussed networks to share expertise and knowledge on emerging technologies

7.4 Knowledge Transfer Partnerships (KTP)

KTP is a UK wide programme supporting UK businesses wanting to improve their competitiveness, productivity and performance by accessing the knowledge and expertise available within UK universities and colleges. The Welsh Government provides KTP support in Wales.

A KTP achieves this through the forming of a Partnership between business and an academic institution (such as university, further education college or research and technology organisation), enabling businesses to access the knowledge, skills and expertise they are lacking.

The knowledge sought is embedded into the business from the knowledge base through a project undertaken by a recently qualified person, recruited to specifically work on that project. KTPs can vary in length from 6 months to three years, depending on the needs of the business and the desired outcomes and companies of all sizes can take part in the programme. The Welsh Government is also supporting enhanced KTP projects aimed at the large companies seeking international knowledge transfer or exchange.

7.5 Academic Expertise for Business (A4B)

A4B is a European Regional Development Fund (ERDF) programme which provides project funding to academic institutions which have the following aims:

- to provide support for academic institutions to strengthen their capability to exploit their knowledge in partnership with companies and in so doing foster R&D, innovation and technology and its commercial exploitation
- to enhance and accelerate the transfer of knowledge and the development of innovative key technologies from higher and, where appropriate, further education institutions to businesses.

A4B provides support in the following areas:

- **Commercialisation of academic IP**
Funding and support is available in the area of commercialisation to enable institutions to evaluate, develop and exploit those technologies with commercial potential. By identifying market requirements and routes to market, the fund gives confidence to academics to source and evaluate ideas in terms of the market potential for a specific application.
- **Knowledge Exchange Activities**
Knowledge Exchange Projects aim to identify and develop effective innovative academic and business knowledge exchanges that can deliver the results and impacts necessary to effect economic change.
- **Knowledge Transfer Centres (KTCs)**
Housed within a Higher or Further Education Institution, KTCs provide an effective interface between academia and Welsh business providing access to research, development, expertise, facilities and knowledge that are both current and relevant to a wide range of technology led businesses.

- Collaborative Industrial Research Project (CIRP)
Funding is available to enable academic researchers to work with groups of companies developing new products processes or services. By combining the expertise and resources available from Welsh Higher Education Institutions and industry in Wales, a CIRP accelerates the development of new, or improvement of existing, products, processes and services, ultimately creating exciting new technologies which are of strategic importance to the Welsh economy.

7.6 Sectors

The Welsh Government support industry-led investment in nine key sectors. Each sector has their own panel made up of private sector business people, who advise Welsh Ministers on the opportunities and needs within the key sectors. They are:

- Creative industries
- Information, Communication and Technology (ICT)
- Energy and Environment
- Advanced materials and manufacturing
- Life Sciences
- Financial and Professional services
- Food and Farming
- Construction
- Tourism

Support and advice is available to businesses who work in these areas including:

- advice on international trade
- advice on research and development and innovation
- finding new business premises
- advice on improving workforce skills
- e-business support
- tendering for public sector contracts
- introducing faster broadband to your business
- business finance subject to availability

7.7 Wales European Funding Office (WEFO)

WEFO is part of the Welsh Government and manages the delivery of the EU Structural Funds programmes in Wales. The funds support the strategies and policies of the EU and Welsh Government, focusing activities on helping people into work and improving the skills of the workforce. They also provide support for businesses, R&D and innovation, strategic infrastructure and sustainable transport.

For the period 2007-2013, £1.9 billion of European Structural Funds was allocated to Wales. With match funding from a variety of public, private and voluntary sources the Structural Funds programmes are worth over £3.3 billion to the Welsh economy. Over 23 projects have been approved within the “Building the Knowledge Based Economy” Priority supporting R,D&I projects amounting to over £171 million.

Wales benefits from the ERDF (European Regional Development Fund) and / or ESF (European Social Fund) through three types of programmes.

- Convergence ERDF and ESF programmes in West Wales and the Valleys
- Regional Competitiveness and Employment ERDF and ESF programmes in East Wales
- Territorial Co-operation, including the Ireland-Wales Cross-border programme

7.7.1 Post 2013

A consultation on the future European Structural and Rural Development Funds for 2014 - 2020 is currently under way in Wales. This consultation invites comments on the Welsh Government's strategy and priorities for future European Structural Funds Programmes.

These proposals for the new Structural Fund programmes have been developed with a clear focus on growth and jobs, which is very much in line with Welsh Government policy, and the Europe 2020 goals of smart, sustainable and inclusive growth.

For the programming period 2014-2020 it is expected that West Wales and the Valleys will qualify as a "less developed region": the highest level of support available under the next round of Structural Funds programmes. It is expected that East Wales will qualify for the lowest level of funding as a 'More Developed Region'.

The actual amount of EU funding that will become available during the next programming period is subject to the outcome of negotiations on the EU budget by the European Council and the European Parliament.

8. Examples of innovation projects supported in Wales

8.1 The Institute of Life Science (ILS)



ILS is a collaboration between Swansea University and the Welsh Government, together with Abertawe Bro Morgannwg University (ABMU) Health Board, IBM and industry and business partners. Partly funded through the European Union Convergence Funding Programme, it is the single largest investment ever made by the Welsh Government on any university campus and is Wales' premier purpose-built medical research facility.

Its vision is to advance medical science through multi- and interdisciplinary research and innovation for the benefit of human health, and to link those benefits to the economy by encouraging interaction with other organisations in a spirit of Open Innovation.

The first phase valued at £52 million delivered a state-of-the-art building housing over 200 professional specialists in medical research, business incubation and technology transfer. The second phase which received £28.8 million funding boasts a further 6000 square metres of facilities including a clinical research facility, an imaging suite provided in conjunction with Siemens Healthcare, further business incubation and healthcare research as well as the Centre for NanoHealth.

The ILS has unique facilities including the EPSRC National Mass Spectrometry Service Centre, the Health Informatics Research Laboratories, the NHS Wales Research Informatics Laboratories and Blue C – the IBM-built supercomputer dedicated to life science research.

8.2 Lightning Effects Research Laboratory for Composite Materials

Cardiff University's Morgan-Botti Lightning Laboratory for composite materials, with around £1.6M joint funding by the Welsh Government and EADS Innovation Works, is the most advanced University based lightning test facility in the UK. The facility is set to tackle the emerging trend of using composites within the airframe (mechanical structure) of an aircraft.



8.3 Life Sciences Fund



The Welsh Life Sciences Fund is the cornerstone of the Welsh Government's strategy to expand life sciences. It aims to help capture the commercial potential of the significant investment being made by the Welsh Government into science research and development in Wales.

The Welsh Government has committed £50 million of funding to the Fund, with the fund managers committed to raising at least another £50 million over the next few years. This is one of the biggest per capita commitments made by any country into a Fund of this type.

Designed to ensure that Life Sciences businesses can start and grow in Wales, investment packages of between £500,000 and £10 million are available to any one company. The Fund is also crucial in putting the life sciences sector in Wales on the map by attracting investors, as well as businesses, to Wales from around the world.

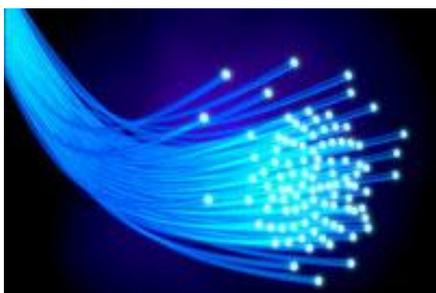
8.4 Institute for Biological, Environmental and Rural Sciences (IBERS)



Aberystwyth University hosts the BBSRC supported Institute for Biological, Environmental and Rural Sciences (IBERS), which, as a recent independent report showed produces almost £60 million for the economy and supports almost 700 jobs, both directly and indirectly. There are over 300 scientists and support staff in the Institute, the largest collection of expertise of its kind in the UK. Projects supported using the Welsh Government's European funded Academic Expertise for Business (A4B) programme include The Grassohol project which brings together representatives of the farming industry, technology companies, fuel manufacturers and distributors with researchers to develop a new sustainable method of

producing biofuel from perennial ryegrass. The related Fibrzymes project is focused on the development and large scale production of novel cell wall degrading enzymes to maximise sugar release from the fibre component of grass, helping to increase production of bioethanol.

8.5 Superfast Cymru project



Welsh Government and BT are working in partnership on the 'Superfast Cymru' programme to develop a nationwide superfast broadband infrastructure.

Superfast Cymru will boost commercial roll-out to deliver high speed fibre broadband to 96% of homes and businesses in Wales by the end of 2015.

This is the largest partnership of its kind currently in the UK and a major infrastructure investment that will take

around three years to complete. To introduce a high speed broadband infrastructure to rural areas on this scale is an immense engineering task - the programme will deploy around 3,000 new fibre broadband cabinets to bring superfast broadband to Wales.

Superfast Cymru is set to transform the broadband landscape in Wales and to promote economic growth and sustainable jobs in Wales. We have estimated that up to 2,500 further full time jobs could be created throughout the Welsh economy over time. It will ensure we are at the forefront of the global digital economy and help to champion Wales as a great place to live, work, invest and visit.

8.6 Creating capacity for innovative thinking and creativity



Innovation depends on creating and developing new ideas and a key component in driving innovation is to provide individuals with the skills and support to enable them to innovate. Young people, in particular, need to understand and appreciate the importance of innovation and develop skills for the future. To support the delivery of STEM activities, the Welsh Government provides the National Science Academy Grant Scheme. Discretionary financial support is available to a wide range of providers and deliverers including further and higher education, training providers, careers companies, STEM societies and UK professional bodies

One example of how education can promote a culture of innovation is the Innovation Awards scheme for students studying WJEC Design & Technology at GCSE, AS and A level. Now in its 14th year, the scheme which is run by the WJEC with support from the Welsh Government encourages students to be technologically innovative and emphasises the importance of design, technology and innovation to both students and teachers. The Innovation Awards are now recognised as a key event in the educational calendar and have played a significant role in embedding innovation, IP (intellectual property) and creativity into the Design & Technology curriculum.

8.7 Swansea Science and Innovation Campus



The new science and innovation second campus for Swansea University has been described as one of the “biggest knowledge economy projects in Europe”. Expected to create 5,000 new jobs and inject £3bn into the Welsh economy over the next decade, work is about to begin on the £200m campus, sited on land originally donated by BP.

In addition to new teaching and research facilities for the university’s engineering, business and economics, maths and computer science departments, an innovation hub and manufacturing facility is planned. Phase one of the development includes a research and testing facility operated in partnership with Rolls Royce, focusing on new and existing materials in the aerospace and aero engine industries.

An exciting project that focuses on research strengths, the new campus promises to be a global exemplar of the developing ‘knowledge hubs’ and illustrates how a research

intensive university can work effectively with industry helping to drive economic regeneration and creating exciting employment opportunities for its graduates.

8.8 The Energy Island Programme



The Energy Island Programme is a partnership between public and private sector organisations, putting Anglesey at the forefront of energy research and development, production and servicing. The aim is to ensure low carbon energy developments come to Anglesey & North Wales enabling job opportunities for local people and local companies. One of the Programme objectives is to meet the needs of indigenous businesses who wish to undertake research and development, innovate, create and share intellectual property to be competitive and to flourish in the energy sector. The Energy Island Programme represents the potential for Wales to develop low carbon energy solutions in collaboration with major international businesses such as Hitachi GE, who have invested in Horizon Nuclear Power and their plans to develop new nuclear generation in Anglesey.

8.9 The SPECIFIC Innovation and Knowledge Centre



A £20 million 5 year project is a collaboration led by Swansea University with Tata Steel and a consortium of industrial partners, drawing funding from the Technology Strategy Board and EPSRC amongst others. It aims to commercialise technologies which will allow buildings to generate their own energy using functional, conductive steel and glass building products on a pilot scale - integrated into the fabric of roofs, walls and ceilings of new and existing buildings. It builds on local industrial strengths in the steel industry and academic expertise in coating technologies.

8.10 Driving innovation through public procurement



With an annual spend of around £4.3 billion, the Welsh public sector has a crucial role to play in stimulating and encouraging innovation. Purchasing new, better and more efficient solutions results in better and more efficient public services, as well as greater value for money for the tax payer. It also encourages businesses to innovate and develop new products and services, which in turn lead to economic growth.

One way in which the Welsh Government is supporting public sector procurement is through the Community Benefits project. An example of the success of this project is the Church Village Bypass a £67m scheme, which involved five major civil engineering contractors, included a partnering approach to design and build, in which the main contractor was engaged to assist in planning the project and estimating its cost before the detailed design stage and completion of statutory processes. The results for the project were a reduction in visual impacts and 90% of the waste being diverted from landfill; 70% of the bypass being constructed from locally sourced recycled aggregate;

75 new jobs for long-term unemployed; and more than 90% of sub-contracts being awarded to local companies based in South Wales. In addition, according to the Community Benefits Measurement Tool, itself another innovative development from Value Wales, there was a return on investment to the Welsh economy of over £130m.