With its rugged coastline, mountainous national parks, friendly cities, pleasant maritime climate and affordable quality of life, Wales is part of the south-west region of the UK with extensive research, cultural and commercial relationships with the rest of the UK, Europe and the world.

Wales is a vibrant nation with its own devolved government and a multicultural society that is open to the world. Known perhaps more for its poets, artists, language, sport and UNESCO world heritage sites, Wales also boasts a growing research profile characterised by excellence, impact, talent, collaboration and international engagement. International awareness and recognition of this excellence however, is less well known. Recognising that a country’s intellectual vitality remains one of its most valuable assets and a geo-political marker of a nation’s intrinsic quality and future economic potential, this supplement showcases some of Wales’s international research, connections and innovative national profile.

A small country of 3 million people, Wales has a proud tradition of achievement in many areas of research, science and innovation. From its recent past, as one of the first industrialised nations based on natural resources to the present knowledge based economy where Airbus, one of the world’s leading aero plane manufacturer makes its wings, and where IQE is a global leader in the design and manufacture of advanced semiconductor wafer products, Wales has produced an impressive list of achievements, many of which are among the first of their kind.

The theory of natural selection, the early development of crystallography, the ideas of Richard Price, the Renaissance philosopher and mathematician who influenced America’s founding fathers, and Aneurin Bevan, architect of the world’s first National Health Service are just some examples of Wales’s innovative contribution. The discovery of free radicals and meson decay, the invention of the microphone, the fuel cell and the teleprinter, ground-breaking research into embryonic stem cells and more recently establishing unique legislation requiring all public bodies to consider the impact on future generations, are all further tangible evidence of Wales’ proud intellectual tradition.

Today, Wales’s eight universities contribute significantly to the world-leading UK research base, second only to the US in its share of global citations. Several of Wales’s universities boast examples of outstanding science research – from Nobel Laureates in the Life Sciences research at Cardiff University, to the award-winning Institute of Biological, Environmental and Rural Sciences at Aberystwyth, Swansea’s innovative advances in materials research and testing, and Bangor’s impressive work in the fields of environmental protection.

Committed to ensuring a strong, sustainable, world-class higher education system, the Welsh government in 2012 launched an ambitious new science strategy, which set out a compelling case to build a stronger research base for Wales in support of the country’s economic and national development. The first phase of Sêr Cymru (Star Wales) was launched in 2013 with the aim of attracting the brightest and best scientific researchers and their teams from around the world to Wales. This was initially backed by £50 million of public funding and collaboration from the Higher Education Funding Council Wales and Universities. The initiative paved the way for the Government and Universities to work together to support three ‘Grand Challenge’ areas: Life Sciences and Health; Low Carbon, Energy, and Environment; and Advanced Engineering and Materials. The first phase secured five world-class academics as Sêr Cymru Research Chairs, (two from the US, one from UK, and one from Switzerland) and supported the development of three national research networks in each of the three ‘Grand Challenge’ areas and funding for large scale doctoral training schemes.

2015 saw the launch of the second phase of Sêr Cymru when £57 million, much from European Union Funding, was secured for growing greater capacity for Wales’ leading university research groups by attracting over 160 rising stars (early-mid career scientists) and promising research leaders, together with support for scientists (particularly with women in mind) returning after a long absence. In addition to appointing another prestigious chair from Australia, Sêr Cymru II has to-date appointed competitive fellowships to researchers from 28 countries including Austria, Australia, Bulgaria, Canada, Chile, China, Denmark, France, Georgia, Germany, Greece, India, Iran, Ireland, Italy, Korea, Mexico, New Zealand, Netherlands, Pakistan, Poland, Portugal, Romania, Spain, Sweden, UK, Ukraine and USA.

The Sêr Cymru initiative has already begun to make significant progress into building Wales’s future research capacity, an essential element for growing a successful, sustainable national economy.
While it comes as no surprise that leading countries on most league tables tend to be the largest, rankings that rely on size-dependent indicators such as wealth or population inevitably overlook smaller, efficient nations. When the ranking playing field is leveled by controlling for population or economic resources, the achievement of several well performing but smaller countries such as Wales, Denmark, Ireland, Scotland and New Zealand come to the fore.

Figures 1 and 2 (page 4) provide a snapshot of national performance for countries with three or more universities ranked in the top-500 ranked in the QS World University Rankings 2016-17 league table. With four universities ranked in the top-500, Wales has one of the highest concentrations of top ranked universities both in terms of population and GDP per capita.

The results on page 4 confirm that for a small country, Wales punches above its demographic weight, securing more universities positioned in the top-500 per million of population than many larger countries.

In addition, Welsh universities also perform well by subject discipline. In the QS Subject rankings (2017), Wales’s universities secured 21 top 200 rankings and 13 top-100 ranked positions covering 46 different subject areas.
**Fig. 1** QS Top 500 Universities per million population, 2016 (only top 30)

(only countries with 3 or more universities in the top 500 included)

- New Zealand
- Scotland
- Finland
- Wales
- Ireland
- Switzerland
- Denmark
- Sweden
- Norway
- Australia
- England
- United Kingdom
- Belgium
- Canada
- Singapore
- Austria
- Portugal
- Taiwan
- South Korea
- Malaysia
- Lebanon
- United Arab Emirates
- Chile
- Kazakhstan
- United States

**Fig. 2** Universities in the QS 2016 top 500 World University Rankings per billion USD GDP (top 15 only)

(only countries with 3 or more universities in the top 500; OECD 2013, current prices, current PPP)

Research Quality

A nation's research base is only as good as the people who work within it. In 2014, the Research Excellence Framework (REF), the UK Government’s five yearly assessment of the quality of research at the UK’s 154 universities showed that Wales had significantly boosted its performance with more than three-quarters of all research submitted to the REF panels assessed as being world-leading or internationally excellent, and almost a third rated as world-leading.

In 2013 and 2016, Elsevier produced 2 independent reports (International Comparative Performance of the Welsh Research Base) showing how academic researchers from Wales compared internationally on a series of established bibliometric measures, compared to other parts of the UK and countries of a similar size.

Key findings included:

- With just 0.14% of the world’s researchers, Wales accounted for 0.24% of the world’s published papers and 0.47% of global citations.
- Wales’s share of the top 1% highest cited papers was over twice that expected based on its overall publication share.
- Wales’s field weighted citation impact exceeded that of England, Finland, Norway, New Zealand and Ireland.
- By 2014, Welsh publications were being cited 68% more often than the world average, compared to 59% back in 2011.
- 1 in 10 research papers from Wales were ranked in the top 5% of most cited publications worldwide.
- Wales receives more citations per one million dollar equivalent of research investment than any other comparator country.
- Wales is one of the most efficient countries at translating its relative low levels of research income into high impact research for countries of a comparable size.

In 2014, 46% of Welsh publications were internationally co-authored.

INTERNATIONAL COLLABORATION

Many of the challenges that the world faces requires global responses. Research excellence also depends on international collaboration. A key contributor to Wales’s impressive research performance has been growing its level of international research, demonstrating the productive outcome of years of international networking.

International collaboration not only accounts for the growing number of the Welsh articles, it also results in the highest field-weighted citation impact. The increase in international collaboration is striking for a small country moving from 25% in 1997-2001 to nearly 46% by 2014.

This collaborative partnership forms part of a virtuous circle of economic growth that benefits Wales while also attracting international researchers. Figure 3 provides a snapshot of Wales’s research publication collaborations with other countries 2007-2011.

Fig. 3 Wales's International Research Publications

Source: The Elsevier report 2015
SOCIO-ECONOMIC IMPACT OF WELSH RESEARCH

In 2014, the UK Research Excellence Framework (REF), required universities for the first time to select and submit their best case studies demonstrating the societal, cultural and economic impact of their research.

A report commissioned by the Learned Society of Wales (Impacts of Academic research from Welsh universities 2017) prepared by the Policy Unit at Kings College London highlighted the impressive research impact of Welsh universities to Wales, the UK and wider society. Despite comprising only 4% of the total UK submissions, Wales’s REF impact results showed that almost half of the research submitted was evaluated as world-leading, with Wales securing the highest proportion of 4 Star impact for any the UK countries.

This authoritative report showed that universities in Wales carry out research into a wide range of areas including bilingualism, policing, flooding, dementia, childcare, mental health, public housing, renewable energy, community violence, poverty, transport management, cancer and agriculture. Research from Wales impacted on a wide number of beneficiaries including:

- Small and medium-sized enterprises (SMEs)
- Commercial sector - a third of case studies submitted by HEIs described some form of commercialisation
- Policymakers.

The study found that the research impacts from Welsh universities covered 102 countries across six continents, with the Life Sciences and selected disciplines from Engineering and Physical Sciences having the greatest tendency to translate into impacts abroad. Small and medium-sized enterprises (SMEs) in Wales were a key beneficiary with many of the impacts relating to economic growth in Wales highlighting complementary research and policy initiatives to support the growth of start-ups and small businesses, and to encourage industry, enterprise and entrepreneurship within Wales.

Figure 4 provides a summary of the top 20 countries where case studies from Wales had a research-related impact.

Fig. 4 Wales International Research Related Impact

With only 2% of the total UK spend on research and development (R&D), Wales’s research base is a national asset, delivering economic, social, cultural and health benefits for the nation and for others around the world.
Higher Education

Universities play a crucial role in the Welsh economy by conducting world-class research and innovation, and developing graduate skills that support local and national economic growth. In addition, universities employ tens of thousands of people in Wales creating an industry in its own right. In 2013, Welsh universities and their students contributed £2.4 billion of GVA to the Welsh economy and supported 46,000 jobs.

A sector with a proud history, Wales’s eight universities and the Open University educate more than 140,000 students every year, ranging from undergraduate and postgraduate degrees to lifelong or work-based learning modules. Wales is home to 12,000 Life Sciences university students.

Over 50% of the Welsh population aged 21 to 64 are college graduates.

With academic provision spanning all major areas including Arts and Humanities, Creative Industries, Science and Technology, Business, Education, Social Sciences, Medicine and Healthcare, around half of the university courses are vocational or professional, providing training for teachers, lawyers, doctors, nurses, and social workers, as well as the public servants of the future.

In 2016, 92% of graduates from full time first degree courses in Wales were employed or in further study six months after leaving. Three and a half years after graduation, the vast majority are in full-time employment. Welsh universities are also successful in recruiting international students. In 2013-14, Wales welcomed over 25,000 international students from over 145 countries comprising 19% of the total student population. Figure 5 shows a breakdown of students from across the globe.

International students contribute significantly to Wales’s economic and cultural prosperity. In 2014, universities generated £330 million of export earnings equivalent to 4% of all Welsh exports. Encouraging domestic students to develop an international outlook is also important. Universities encourage Welsh students and staff to participate in international exchange and research collaborations.

Fig. 5 Wales’s International students come from all over the Globe

Research, Innovation & Business Ecosystem

Strong links between industry and Wales’s tertiary education ensures a skilled workforce with a broad range of technical and research expertise. The automotive industry in Wales features around 150 companies and employs 18,000 people generating £3 billion each year. Wales has around 10% of the UK’s aerospace industry involving 160 aerospace and defence companies employing 20,000 people and a combined turnover of more than £5 billion.

Wales has particular strengths in several key industries that collectively contribute to its national research innovation profile. Many connect closely to areas of significant university expertise including:

Advanced Engineering, Materials & Manufacturing
Wales has a 165,000-strong skilled workforce in this sector. Welsh universities produce over 2,000 engineering graduates every year.

ICT & the Digital Economy
There are some 3,000 tech businesses in Wales, including over 400 electronics businesses and more than 250 telecoms-related companies.

Low Carbon, Energy and Environment
Around 58,000 people work in the energy and environment sectors in Wales, generating over £4.8 billion in revenue.

Life Sciences and Health
This sector is recognised internationally for its research and development excellence and is home to 12,000 Life Sciences university students.

Creative Industries
The creative industries in Wales, range from architecture to software design to TV and film production, employing around 50,000 people and generating a £1.6 billion annual turnover.

Financial Services
There are over 150,000 skilled people working in financial and professional business services across Wales, engaged in key operational areas such as banking, insurance, legal services, accountancy, financial technology and shared service centre operations.

Food and Drink
Around 170,000 people work in the food and drink industry, generating £17.3 billion to the economy.

Tourism
With three National Parks, three UNESCO World Heritage Sites, five Areas of Outstanding Natural Beauty and an award-winning 1,400 km Wales Coast Path, Welsh Tourism is a £5 billion industry drawing visitors from all over the world.
WALES AND THE WORLD

14

19

4

4

Following a shift from an industrial economy based on natural resources to a knowledge-based manufacturing and service economy, Wales has over the past two decades begun to develop a more diverse, technologically advanced open economy, involving partnership between its universities, small industries and anchor companies.

The Royal Mint

A UK government-owned mint located in Llantrisant that under an exclusive contract supplies all the UK’s coinage. The mint exports to an average of 60 countries a year, making up 70% of its total sales. The Royal Mint supplies over 40 countries in 9 continents, 9 Asia and Oceania, 10 America and Caribbean, 12 Africa and Middle East.

National Museum Wales

Dedicated to preserving, presenting and promoting the culture of Wales at 7 sites across the country.

The National Library of Wales

The largest library in Wales, holding over 6.5 million books and periodicals. The Library holds the largest collections of archives, portraits, maps, paintings and topographical prints and images in Wales.

National Botanic Garden of Wales

Houses an amazing collection of over 2000 different plant varieties, spread across 560 acres of beautiful countryside.

Wales: globally connected by research, business, education and innovation

The Welsh Governments ‘Anchor Company’ programme recognises the strategic economic importance of large, global or international companies that work with in Wales to create jobs, growth and wealth within the Welsh economy. These include:

Admiral Group Plc

IODE Plc

Bolam UK Ltd

JCB

British Airways Engineering

Legal & General Assurance Society Ltd

South Wales

Lloyd Banking Group

British Telecommunications (BT) Plc

Nortel Ltd

Calce Manufacturing (UK) Ltd

Neologic Ltd

Carmarthen

Dow Pharma

Daiichi

Diar Cymru Welsh Water

Diageo

Gwynt-y-Dwr

Gwynt-y-Dwr Services Ltd

Hafren Plantation

Gwynt-y-Dwr

Qioptiq Ltd

IAE

Rheol Ltd

Innoplyx Building Society Ltd

Ross Design

Samos Healthcare Diagnostics Products

Rheol Proprietary Ltd

SMI/EC Liberty House

Royal Society of Scotland

Sony UK Technology Centre

SPTS Technologies Ltd

Toko Seiki Co Ltd

Toyota Motor Manufacturing (UK) Ltd

UMI-Immunex (UK) Ltd

UPL Shotron

Wales and West Utilities Ltd

Western Power Distribution (South Wales)/Zodiac Seats (UK) Ltd

Fig. 6: An Overview of some of Wales’s Educational, Research, Innovation and Industry Activities

The RESEARCH, INNOVATION & INDUSTRY LANDSCAPE

1. Life Sciences Hub Wales

2. Jollagen

3. African Conservation (University of South Wales (USW) & Cardiff University)

4. Biowise

5. Swansea University • Institute of Life Sciences

6. Centre for NanoHealth

7. Agoria

8. Health Industries Innovation centre

9. Cardiff University Brain Research Imaging Centre (CUBRIC)

10. Proton Partners International, Rutherford Cancer Centre

11. BBI Group

12. Carbon Nanotechnologies Ltd

13. PCI Pharma

14. Siemens Healthcare Diagnostics Products

15. Topo Special Energy

16. Toyota Motor Manufacturing (UK) Ltd

17. University of Swansea

18. University of Glamorgan

19. University of South Wales

20. Aberystwyth University

21. Aberystwyth University

22. Institute of Biological, Environmental and Rural Sciences (IBERS)

23. Aberystwyth University Innovation and Enterprise Campus (ABIC)

24. ARCH: A regional collaboration for Health (Swansea University and Health Boards)

25. International Centre for Product Design and Research (IPDR) (Cardiff Met)

26. GE Healthcare

27. Cardiff University • Welsh-Ward Innovation Centre (SWIC)

28. MRC Centre for Neuropsychiatric Genetics and Genomics

29. Dementia Research Institute

30. Life Sciences Hub Wales

31. The Hydrogen Centre

32. The Centre for Automotive & Power Systems Engineering (CASPSE)

33. the Materials Research Centre (Swansea University)

34. the Electronic Vehicle Centre of Excellence (Cardiff University)

35. Sustainable Environment Research Centre (SERC) (University of South Wales)

5. Flexible Integrated Energy Systems (FLEXUS) (Cardiff University and others)

6. BEACON Biotransforming Centre (Swansea University and others)

7. Centre of Excellence in Cyber Security Analytics (Cardiff University)

8. Compound Semiconductors

9. IC

10. Microsystems Corporation

11. SPTS Technologies

12. Cardiiff University

13. Institute for Compound Semiconductors Technology; The Compound Semiconductor Centre with others

14. The Compound Semiconductors for Applications (CoSAP) (UK Government)

15. The Futures Compound Semiconductors Manufacturing Hub (EPSRC)

16. Advanced Manufacturing & Research Institute (AMRI)

17. Airbus UK, Broughton

18. GE Aviation Wales

19. University of South Wales

20. Airbus UK, Broughton

21. GE Healthcare

22. Cardiff University

23. University of Swansea, Aerospace Centre

24. Caerphilly University

25. Morgan BioTherapeutics Centre

26. GE Turbine Research Centre

27. Advanced Engineering & Manufacturing Innovation Centre

28. Automotive Design and Test Centre (University of Wales Trinity St David)

29. Airbus 2020 ( Swansea University)

30. Advanced Composite Training and Development Centre (Swansea University)

31. Catalysis Institute (Cardiff University)

32. Zienkiewicz Centre for Computational Engineering (ZCCE) (Swansea University)

33. The National Software Academy (Cardiff University)

34. University of South Wales

35. National Cymru Cyber Security Research Group
The Welsh economy is rooted in the natural resources of the landscape. Agriculture was Wales’s first industry, and it remains important today. But Wales has also been shaped by what lies under ground.

Although renowned for its breath-taking views, the earliest surviving illustrations of the Welsh landscape are of two lead mines, from 1670. The mineral resources of the land saw the development of the copper, iron and coal industries, and by the mid-nineteenth century Wales was one of the world’s first industrial societies.

By the eighteenth and nineteenth centuries, Wales was transformed from a primarily pastoral economy into one of the world’s powerhouses of the industrial revolution. Its resources of copper, slate, manganese, gold, iron ore and especially coal were key to industrial expansion, but also brought very distinctive health problems for the workpeople of this country.

By the late 1800s, a quarter of the global trade in coal came from Wales; it was exported around the world, from Singapore to Valparaiso and fuelled global economic development.

The world’s first million-pound business deal was agreed at Cardiff’s Coal Exchange in 1907.

Wales remains a world-leading energy pioneer today, but has shifted focus to low carbon, renewable and sustainable energy solutions.

Recent developments include:

SPECIFIC
A research-led and industry-inspired innovation centre delivered by Swansea University with Tata Steel, BASF, NSG Pilkington and Cardiff University. The Sustainable Product Engineering Centre for Innovative Functional Industrial Coatings (SPECIFIC) is one of seven Innovation and Knowledge Centres set up to foster emerging industries and close the gap between scientific research and its commercial exploitation.

Set up in 2011 with a £20million commitment over five years comprising grants from the Engineering and Physical Sciences Research Council (EPSRC), Innovate UK and the Welsh Government together with investment from Swansea University and strategic industrial partners, the project will progress the commercialisation of technologies to transform ‘buildings into power stations’ by enabling them to generate, store and release their own solar energy.

The project brings together thematic areas of research including photovoltaics, battery technology and heating coatings that will revolutionise the construction sector – with the strategic ambitions to generate over one third of the UK’s total target renewable energy by 2020; reduce CO2 output by six million tonnes per year and create new jobs in high-value manufacturing.

SPECIFIC has brought together a wide range of industrial partners to share expertise in functional coatings, energy storage, technology scale-up, business development and commercial know-how. The long term vision is the development of a new £1 billion industry with thousands of jobs created and enhanced value in the construction supply chain, addressing one of the biggest global challenges by providing secure, affordable, sustainable energy.

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In 2016, SPECIFIC began phase two with £26 million in funding from EPSRC, Innovate UK and the European Regional Development Fund through the Welsh Government, as well as further investment from Swansea University, the industrial partners and matched funding from Cardiff University.
FLEXIS
Cardiff University’s FLEXIS project brings together world-leading expertise from Welsh universities to tackle some of the most pressing issues currently facing society, such as climate change, rising energy prices and fuel poverty. FLEXIS is designed to meet the diverse, complex and inter-dependent challenges that arise when new sources of energy are integrated into the grid by suppliers.

Leading researchers from the UK and Europe are being recruited to Welsh universities as part of the project, helping to strengthen Wales’ position as a leader in research and innovation within the energy industry. This will address the challenges of: accommodating power supply from multiple places; storing energy when it is not needed; coping with extreme flows of energy into the system; accommodating an ailing infrastructure; and making sure all challenges are met in a socially acceptable, affordable way.

The project aims to prepare for the development of new technologies and job creation in the energy sector, and attract new companies to locate themselves in Wales.

By 2020, over £20 million of additional competitive research income is expected to be secured. FLEXIS aims to establish Wales as a pioneer in energy systems and deliver significant benefits to the nation as a whole, attracting new businesses, creating jobs and training the research engineers of the future.

Public Health and Industry

The history of public health in Wales is inextricably linked with its changing economic and social conditions.

Studies of the mining communities of south Wales carried out by Professor Archie Cochrane in the 1950s helped pioneer randomised control trials; Cochrane argued that since resources will always be limited, only health care proven to be effective should be implemented.

In 2008, Cardiff University established the world’s first Chair in Public Health, named in his honour. The Cochrane Collaboration is now a global network of 37,000 contributors from 130 countries working together to produce accessible high-quality information that inform healthcare decisions.

Recent research projects have considered the legacies of heavy industry in Wales. The Disability and Industrial History project looked at how understandings and experiences of disability were affected by industrial development from the late eighteenth century until the end of the Second World War.

More information can be found on the Energy Island website: www.dis-ind-soc.org.uk/en/index

In north Wales, Bangor University is leading M-Sparc, the Menai Science Park, which will build on Wales’s tradition of energy and innovation. As one of Wales’s first science parks, it aims to drive growth in knowledge-based science, with an early focus on low carbon energy, the environment and ICT sectors.

Anglesey is also home to the Energy Island Programme, a collective effort between several stakeholders within the public and private sector working in partnership to put Anglesey at the forefront of energy research and development, production and servicing. Harnessing a rich mix of energy streams, including nuclear, wind, tidal, biomass and solar; and with associated servicing projects, Energy Island provides major potential to achieve economic, social and environmental gains for Anglesey and the wider north Wales region. More information can be found on the Energy Island website: www.anglesey.gov.uk/business/energy-island-isle-of-anglesey-north-wales
SUSTAINABILITY, EQUALITY AND QUALITY OF LIFE

Wales is on a journey to become a place of global significance. The Well-being of Future Generations (Wales) Act 2015 created a unique framework and opportunity for the development of a low carbon, resource efficient, healthy, well-educated, culturally engaged, and enterprising society, thriving within environment limits.

"What a wonderful thing: to walk the entire length of a country’s coastline, to trace its every nook, cranny, cliff-face, indent and estuary. How better to truly appreciate the shape – and soul – of a nation?"

Lonely Planet

The Green Bridge of Wales off the Pembrokeshire Coast.
The Welsh laws of Hywel Dda (Hywel the Good), of the tenth century included elements of mercy, common sense and respect for women and children, unlike the Anglo-Saxon laws of the time.

Welsh universities were amongst the first institutions in the UK to admit female students. Cardiff and Swansea Universities were amongst the first to appoint female professors in the early twentieth century.

In 2003, the National Assembly for Wales became the first legislature in the world to achieve 50:50 gender balance.

In 2008 Wales became the first fair trade nation in the world. The Welsh Government’s Environment (Wales) Act 2016 aims to deliver at least an 80% reduction in emissions by 2050.

The Welsh word ‘cynefin’ captures the sense of community in place – a sense of habitat and belonging. Cynefin is that place to which one belongs, and how it is understood as a place in time. The landscape, environment and communities are key to the Welsh experience.

A Welshman was the driving force behind the establishment of the world’s first free at point of access national health service in 1948. Aneurin Bevan, as the UK’s Minister for Health, was inspired by community health projects he saw in Tredegar, South Wales.

Wales is currently the only country in the world to have a continuous coastal path stretching its entire length. The Wales Coast Path travels through some of the most beautiful countryside anywhere, and there are 870 miles of public path to explore. It joins with the 177 mile long Offa’s Dyke Path national trail along the Welsh-English border, to create a complete circuit of Wales.

The seven well-being goals of the Well-being of Future Generations (Wales) Act 2015 are:

- A prosperous Wales
- A resilient Wales
- A healthier Wales
- A more equal Wales
- A Wales of cohesive communities
- A Wales of vibrant culture and Welsh language
- A globally responsible Wales

The goals seek to create a more equal society that enables people to fulfil their potential no matter what their background or circumstances. This builds on a long tradition of equality in Wales.

futuregenerations.wales/about-us/future-generations-act

Betws y Coed, North Wales. © Crown copyright (2016) Visit Wales. All rights reserved.
Wales has a vibrant, outward looking, distinctive and welcoming cultural identity, rooted in its traditions. The people of Wales have hundreds of stories which over the centuries have shaped the collective identity of the country today.

CULTURE AND COMMUNITY

Wales has a lively, bilingual culture. Cymraeg (Welsh) is one of Europe’s oldest living languages used every day by thousands. It can be seen and heard throughout Wales, and is part of what makes Wales distinctive.

The annual **Eisteddfod Genedlaethol** (National Eisteddfod) is the biggest Welsh language cultural event, and one of Europe’s largest roaming, cultural festivals. With a history dating to the twelfth century, it encompasses aspects of the arts, literature culture and science. An inclusive and welcoming festival, it attracts thousands of visitors: Welsh learners, Welsh speakers from Wales and the world, as well as those who do not speak Welsh. The two literatures of Wales are a central part of Welsh culture. One of Wales’s most iconic buildings, the **Wales Millennium Centre**, features two poetic inscriptions by Gwyneth Lewis, in six-foot tall letters of stained glass. Dylan Thomas and Roald Dahl are arguably the best-known Welsh literary figures, but there are many more writers to explore. Wales is also home to the internationally renowned **Hay Festival of Literature and Arts**.

Art in Wales dates back to the prehistoric era, and the Mold Cape (1900-1600BC) is one of the most well-known artefacts. The National Museum of Wales in Cardiff houses one of the world’s most remarkable collections of French Impressionist and Post-Impressionist painting. Since 2003, the Venice Biennale has featured a Welsh pavilion, and in the same year the **Artes Mundi** prize was established. This Cardiff-based award is held every two years and is one of the largest visual art prizes in the world.

With its reputation as the ‘land of song’, Wales has a strong musical heritage. The nation boasts a constantly evolving music scene. The **Cardiff Singer of the World** has been recognising excellent opera singers since 1983, and since 1947 Wales has staged the **Llangollen International Musical Eisteddfod**, one of the world’s most inspirational music festivals.

Sport is another important part of the Welsh way of life. Rugby remains popular, but Wales excels at other sports too. Cardiff was the European Capital of Sport in 2014, and the nation has established itself as a leading venue for major sporting events including Ryder Cup and the UEFA Champions League Final. The magnificent Welsh coastline and landscape also provide the perfect playground for sporting activities.

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The future of Wales is as exciting as its past

To learn more about Wales from a variety of perspectives, visit the Open University in Wales’s Hafan website: [www2.open.ac.uk/openlearn/hafan](http://www2.open.ac.uk/openlearn/hafan)
Universities and Related organisations

Aberystwyth University  
www.aber.ac.uk

Bangor University  
www.bangor.ac.uk

Cardiff University  
www.cardiff.ac.uk

Cardiff Metropolitan University  
www.cardiffmet.ac.uk

Glyndŵr University  
www.glyndwr.ac.uk

Open University in Wales  
www.open.ac.uk/wales

Swansea University  
www.swansea.ac.uk

University of South Wales  
www.southwales.ac.uk

University of Wales Trinity Saint David  
www.uwtsd.ac.uk

Higher Education Funding Council for Wales (HEFCW)  
www.hefcw.ac.uk

University of Wales Press  
www.uwp.co.uk

Welsh Government and the National Assembly

National Assembly for Wales  
www.assembly.wales

Sêr Cymru  
businesswales.gov.wales/expertisewales

VisitWales  
www.visitwales.com

Welsh Government  
www.futuregenerations.wales

www.wales.com

www.tradeandinvest.wales

Culture and Heritage

Arts Council of Wales  
www.arts.wales

British Council Wales  
wales.britishcouncil.org

CADW  
www.cadw.wales

Eisteddfod Genedlaethol  
www.eisteddfod.wales

Hay Festival  
www.hayfestival.com

Literature Wales  
www.literaturewales.org

National Botanic Garden of Wales  
www.botanicgarden.wales

National Museum Wales  
www.museum.wales

National Library of Wales  
www.llgc.org.uk

Global Wales  
wales.britishcouncil.org/en/global-wales-welsh-higher-education-partnership

Study in Wales  
www.studyinwales.ac.uk

Universities Wales  
www.uniswales.ac.uk

Welsh Crucible  
www.welshcrucible.org.uk

Welsh Higher Education Brussels  
www.wheb.ac.uk/en

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www.learnedsociety.wales

Reports and further information

Science for Wales – Welsh government science strategy (2012)  
gov.wales/topics/science-and-technology/science/?lang=en

International Comparative Performance of the Welsh Research Base 2010-2014, 2016 update  
www.elsevier.com/research-intelligence/research-initiatives/wales2013


The Economic Impact of International Students in Wales (2015)  

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www.sciencemag.org/careers/features/2013/04/science-wales

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The Case for Growing STEMM Research Capacity in Wales (2015)  
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Impact of academic research from Welsh Universities, by the Policy Unit Kings College London (2017)  
www.learnedsociety.wales/societal-economic-impact-welsh-universities

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