



UK Science  
& Innovation  
Network

# INNOVATION TOOLKIT

## SCIENCE AND INNOVATION NETWORK

INNOVATION IN THE UK

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# INNOVATION IN THE UK:

UNDERSTANDING AND CONNECTING WITH  
THE UK INNOVATION SYSTEM

- CLICK A SECTION TO GET STARTED -

>  
Introduction to the UK  
innovation system

>  
Comparative performance  
of UK innovation

>  
Understanding UK  
Innovation policy

# **INTRODUCTION TO THE UK INNOVATION SYSTEM**

## PUBLIC SUPPORT FOR INNOVATION IN THE UK (FEATURES AND CONDITIONS)

### CREATING KNOWLEDGE

#### **Stable, independent science and research funding sector:**

Research Councils provide competitive grants for specific projects and programmes.

Higher Education Funding Councils provide block grant funding to Universities on the basis of quality measured by the Research Assessment Exercise.

£5.85bn govt spend for science and research from the budget in 2015-16 including both resource and capital expenditure.

- **Universities**
- **Public Sector**
- **Research Establishments**
- **Research Funding bodies**

#### **Good framework conditions for innovation:**

Open and competitive markets, good IP regime, strong business and legal environment.

- **Standards Measurement Accreditation**
- **Intellectual property**
- **Lobbying and influencing policy**

### EXPLOITING KNOWLEDGE

#### **Ranked one of the best countries in the world for University-business interaction:**

- Specific competitive funding streams for knowledge exchange such as the Higher Education Innovation Fund (HEIF).
- Growing networks of university exploitation funds like Fusion IP and IP group.
- Large and diverse public and private commercialisation sector.

#### **Direct and indirect government financial support:**

Direct support for innovation through government agencies (eg £616million in 2014/15 for Innovate UK) is complemented by much larger indirect support – eg a comprehensive R&D tax credit regime (worth £1.2 billion in 2011/12) and further public support for venture capital and angel investment (eg the Enterprise Investment Scheme and the Seed Enterprise Investment Scheme).

### ENABLING INNOVATION

### SUPPORTING INNOVATION

## PUBLIC SUPPORT FOR INNOVATION IN THE UK (INSTITUTIONS)

Over **130** universities

Over **60** public sector  
research establishments

Range of cross-sector  
research partnerships

**7** thematic Research  
Councils

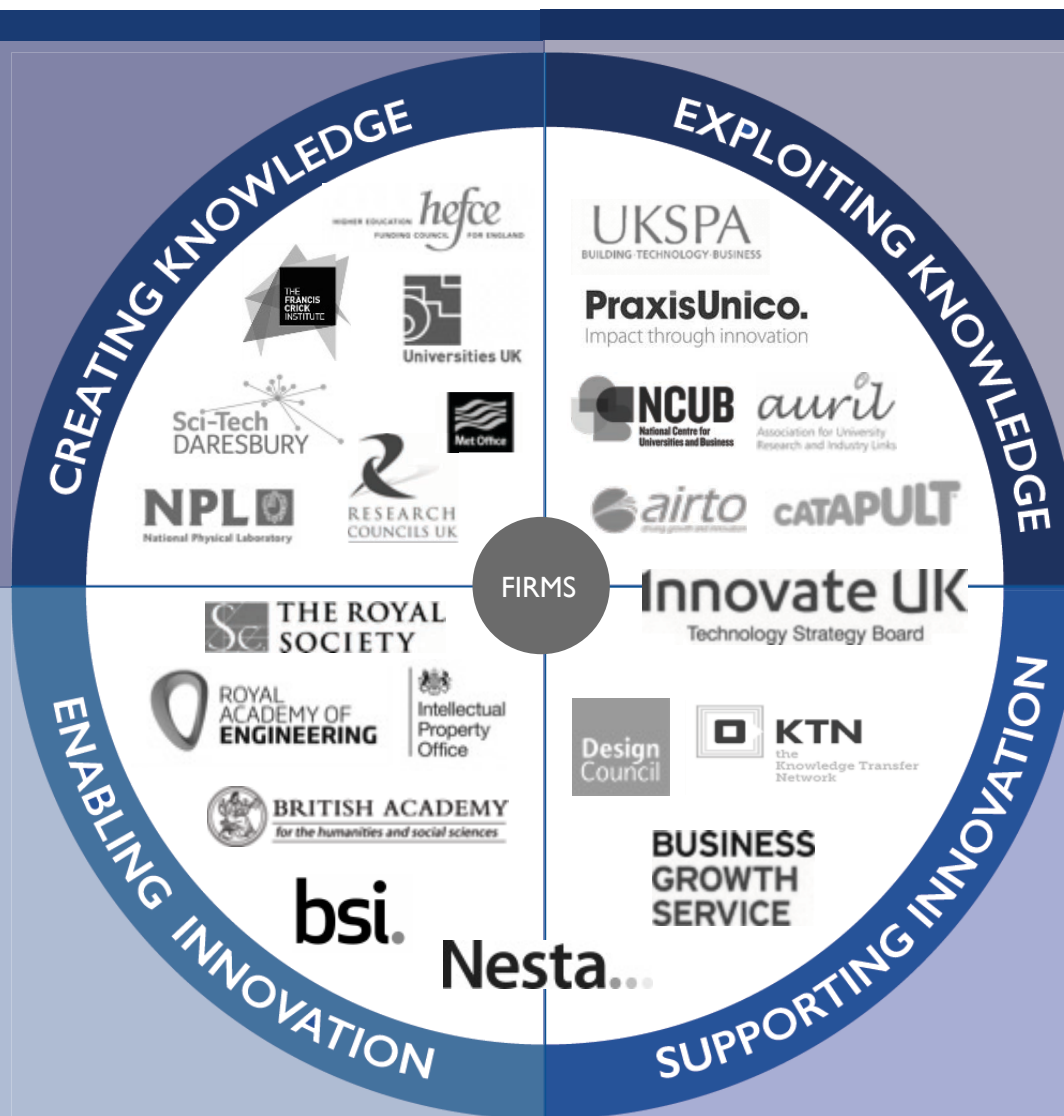
**4** higher education  
funding councils

**4** national academies

**1** national intellectual  
property office

**1** national standards body

Range of think tanks and  
campaigning organisations



Over **100** science and  
innovation parks

Over **50** university  
technology transfer offices

National initiatives bringing  
together universities and  
business

**9** Catapult Centres  
(and growing)

**1** national innovation  
agency (Innovate UK)

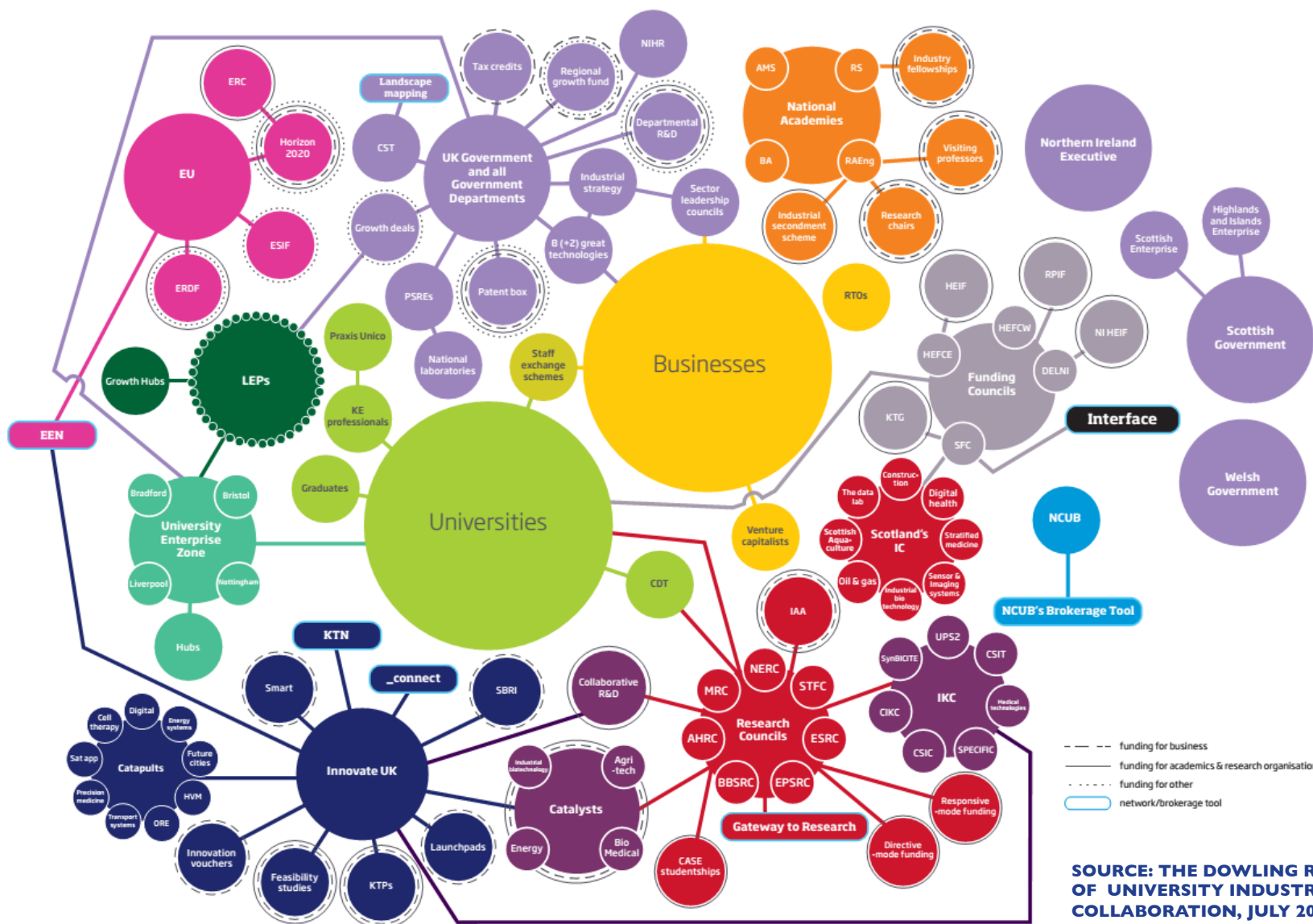
A consolidated Business  
Growth Service

Over **70,000**  
members of the Knowledge  
Transfer Network

Several government-funded  
agencies

Many independent  
organisations that work  
closely with government

## ANOTHER WAY OF LOOKING AT THE COMPLEXITY OF THE UK INNOVATION SYSTEM



**SOURCE: THE DOWLING REVIEW OF UNIVERSITY INDUSTRY COLLABORATION, JULY 2015**



THE UK IS A GLOBAL LEADER IN UNIVERSITY-INDUSTRY COLLABORATION, BUT THERE ARE STILL CHALLENGES. A 2015 UK SURVEY MAPPED THE BIGGEST BARRIERS WITHIN THE SYSTEM

### Rank Top ten barriers for **business**

- 1 IP and other contract negotiations are difficult to complete, processes difficult to navigate, or take too long
- 2 Business find it difficult to identify academic partners or where academic capability lies
- 3 Business and academia operate to different timescales
- 4 Lack of funding
- =5 Lack of alignment of objectives: tension between business and university needs or objectives
- =5 Lack of trust or mutual understanding
- =7 Businesses focus on the short term, rather than long term R&D
- =7 Other funding issues (for example, SME eligibility, subjects within scope)
- 9 Low overall levels of business investment in R&D, including a lack of absorptive capacity
- 10 Lack of understanding within business of potential benefits of working with universities

### Rank Top ten barriers for **universities**

- 1 University metrics, including the REF, prioritise the production of high-quality publications
- 2 IP and other contract negotiations are difficult to complete, processes difficult to navigate, or take too long
- 3 Other pressures on academic time (teaching and research) limit resources for collaboration
- 4 Lack of funding
- =5 Collaborative experience not valued as part of academic career progression
- =5 Lack of time/resource for networking or project development
- =7 Business and academia operate to different timescales
- =7 Tension between academic desire to publish work, and business concerns about competition
- 9 Lack of trust or mutual understanding
- 10 Low overall levels of business investment in R&D, including a lack of absorptive capacity

## INSTITUTIONAL PROFILES

The following slides provide profiles of some of the main institutions in the UK innovation system. For each we:

- Describe its mission and how it works.
- Provide links to further information.

Since this guide was developed with international audiences in mind, we also offer examples of how it works internationally.

# Innovate UK

## CATAPULT



### KTN

the Knowledge Transfer Network



## UK Trade & Investment





## Innovate UK

## INSTITUTIONAL PROFILES: INNOVATE UK

## MISSION

- Innovate UK is the UK's innovation agency.
- Its goal is to accelerate economic growth by stimulating and supporting business-led innovation – bringing together business, research and the public sector; supporting and accelerating the development of innovative products and services to meet market needs, tackling major societal challenges and helping build the future economy.
- Its budget (2014/15: £616m) is directed towards technologies for which it has identified large global market opportunities which are also areas of UK strengths.

## APPROACH

- Innovate UK has invested over £1.5 billion since 2007 in helping UK businesses innovate
- It supports innovation through a range of programmes which provide access to finance and access to knowledge, skills, equipment and partners.
- These include Catapult centres (see separate slide), SMART grants, innovation vouchers, Collaborative R&D programmes, feasibility studies, Knowledge Transfer partnerships and networks, challenge platforms (in energy • built environment • agriculture and food • healthcare • transport) and pre-commercial procurement programme, SBRI
- It has a staff of 325, largely drawn from industry

## INTERNATIONAL COLLABORATION

- Although its work is focused on the UK, strategic international work is increasingly important to Innovate UK:
  - Helping firms access European research and development funding through the Enterprise Europe Network and Horizon 2020 National Contact Points
  - Working with UKTI on international trade missions for innovative SMEs and supporting innovative firms to export
  - A highly prioritised set of international collaborative R&D programmes
  - Implementing the translation strand of the [Newton fund](#), a development assistance programme focussed on developing science and innovation partnerships to promote the economic development and welfare of 15 emerging economies.

## CONTACTS &amp; FURTHER INFORMATION

- Innovate UK funding and support tools
- Innovate UK [delivery plan](#) (2014/15)
- 5 year strategy: Concept to Commercialisation (new strategy due Autumn 2015)
- [Thinking about the future](#) - Breakdown of Innovate UK spending
- Website: [www.innovateuk.org](http://www.innovateuk.org)



## INSTITUTIONAL PROFILES: CATAPULT

## MISSION

- The Catapults are a network of technology and innovation centres created by Innovate UK.
- They have an ambitious goal to transform UK capability in innovation - initially in nine areas selected as priorities for economic growth.
- More than £1bn of public and private investment will be targeted at Catapults over the next few years.

## APPROACH

- Catapults are business-focused technology and innovation centres that make world-leading technical capability available to businesses to solve their technical challenges
- They aim to encourage business investment in R&D by providing facilities and access to expertise to test new ideas
- They actively explore what conditions are needed to enable innovation and seek to influence these on behalf of their sector
- There are currently 9 centres: High value manufacturing, cell therapy, offshore renewable energy, satellite applications, connected digital economy, future cities, transport systems, energy Systems and Precision Medicine.
- They are funded by a mixture of public sector grants and business funded contract research

## INTERNATIONAL COLLABORATION

Each Catapult has its own international strategy, and these are constantly evolving. Common themes across all of the Catapults include

- Promoting their sector internationally, including helping SMEs access international business opportunities
- Helping policy makers in the UK make sense of the international landscape for their sector
- Several Catapults actively seek out international sources of funding, for example the Future Cities Catapult
- Offering services to overseas companies, from data modelling to research facilities

CONTACTS & FURTHER  
INFORMATION

- An [introduction](#) to each Catapult
- The UK [locations](#) of each of the 9 catapults
- [Catapult to Success](#) a review of international technology and innovation centres
- [Contact](#) the catapults
- Website: [www.catapult.org.uk](http://www.catapult.org.uk)

## MISSION

- Knowledge Transfer Network Ltd (KTN Ltd), which is funded by Innovate UK, is an interdisciplinary UK-wide network of knowledge intensive businesses and academics designed to stimulate innovation by promoting collaboration, best practice and knowledge sharing between industry and academia
- The goal of KTN Ltd is to drive knowledge transfer between knowledge creators and knowledge users

## APPROACH

- KTN Ltd was set up in April 2014 to coordinate the work of the former 15 individual Knowledge Transfer Networks.
- It organises events in the UK and internationally for businesses and researchers to network
- KTN missions have a broad focus, from sharing best practice to winning new business.
- KTN Ltd helps Innovate UK focus its funding calls by setting up Special Interest Groups on key emerging areas
- It also has an online community with over 70,000 members, hosted on Innovate UK's [connect](https://connect.innovateuk.org) website

## INTERNATIONAL COLLABORATION

- KTN Ltd organises sector specific missions to priority countries, helping connect researchers and innovators in the UK with overseas opportunities
- It can help UK organisations access overseas funding schemes
- KTN Ltd works closely with Innovate UK on international funding programmes, for example Horizon 2020

## CONTACTS & FURTHER INFORMATION

The websites of each of the 15 KTNs, where you can find individual contact details, strategies and priorities:

<https://connect.innovateuk.org/knowledge-transfer-networks>

## MISSION

- UK Trade and Investment (UKTI) has two main functions: helping UK business **export** and securing **inward investment** from international companies.
- In 2013 UKTI launched its Innovation is Great campaign to improve international perceptions of UK innovation, promoting the UK as a partner of choice to design, build and commercialise new technologies.
- This will see UKTI doing more at international science and innovation events and developing relationships with global science and innovation hotspots.

## APPROACH

- UKTI is target driven. It has targets for trade, investment and the number of businesses helped.
- It offers a range of fee charging services which help UK companies to export and foreign companies to invest in the UK.
- UKTI set up the Innovation Gateway in 2014. It is a 'one stop shop' for securing S&I investment from international funds and companies. Over the next 2 years the organisation is tabled with unlocking £1 billion of investment and creating 500 new jobs.

## INTERNATIONAL COLLABORATION

- UKTI organises overseas trade missions and offers grants for SMEs to attend these. 90 percent of the businesses it helps to export are SMEs.
- Together with other UK government institutions such as the Science and Innovation Network, it organises joint missions that combine research and innovation with business focussed activities.

## CONTACTS AND FURTHER INFORMATION

- For more information on UKTI see: UKTI at a glance
- Website: <https://www.gov.uk/government/organisations/uk-trade-investment>



## INSTITUTIONAL PROFILES: RESEARCH COUNCILS UK

### MISSION

- Research Councils UK (RCUK) is the strategic partnership of the UK's seven Research Councils:
- The Research Councils have 3 objectives:
  - Investing in the creation, application and sharing of knowledge
  - Building partnerships
  - Support of significant innovation infrastructure

### APPROACH

- The Research Councils fund research in universities and research institutes.
- They help researchers deliver social and economic impact by supporting them to engage and collaborate with the public, businesses, government and the third sector.
- This includes the development of collaborative research programmes and the support of impact focussed research facilities, such as Innovation and Knowledge Centres and Research and Innovation Campuses. While RCUK encourages research projects to have industrial partners they cannot fund businesses.

### INTERNATIONAL COLLABORATION

- The work of RCUK is increasingly international: RCUK has offices in China, India, Europe and the US
- RCUK organises joint funding calls in a range of countries, including under the Newton Fund.
- It regularly organises research workshops for UK researchers around the world.

### CONTACTS AND FURTHER INFORMATION

- [The Research Councils' role in supporting innovation](#)
- RCUK's [international strategy](#)
- The [delivery plan](#) for each of the 7 research councils
- Website: <http://www.rcuk.ac.uk/>

## ENABLING INFRASTRUCTURE AND SOURCES OF ADVICE



Helps businesses understand how to manage IP in the UK and internationally. This includes IP attachés in key countries, IP country guides, and online tools.

<http://www.ipo.gov.uk/>

**Design  
Council**

Promotes the importance of design to the economy and also promotes British design internationally.

[www.designcouncil.org.uk](http://www.designcouncil.org.uk)



The learned societies are a source of expertise and also promote UK science internationally.

[www.raeng.org.uk](http://www.raeng.org.uk)

<https://royalsociety.org/>

**bsi.**

The UK's national standards body, the BSI also provides services and seeks to build relationships with international counterparts, to create common standards, which helps UK innovations enter foreign markets.

<http://www.bsigroup.co.uk/>



NPL and the NMO are both UK institutions that focus on measurement and standards, developing and applying the most accurate measurement standards and ensuring accurate measurements are available

<http://npl.co.uk/>

<http://www.bis.gov.uk/nmo>

**BUSINESS  
GROWTH  
SERVICE**

The Business Growth Service is a UK government-backed service that offers a range of support programmes to businesses that have the potential to grow.

<http://www.ga.businessgrowthservice>

[greatbusiness.gov.uk/](http://greatbusiness.gov.uk/)

**Nesta...**

An independent charity with a mission to help bring good ideas to life, Nesta is a leading innovation think tank, an investor in innovative ventures and an innovation lab testing out new approaches to supporting innovation.

[www.nesta.org.uk/](http://www.nesta.org.uk/)

## **COMPARATIVE PERFORMANCE OF THE UK INNOVATION SYSTEM**



RECENT DECADES HAVE SEEN RAPID SHIFTS IN THE DISTRIBUTION OF GLOBAL  
SCIENTIFIC PRODUCTION, AND TO A LESSER EXTENT, EXCELLENCE

**TOP 20 PUBLISHING CITIES 2004-2008, AND THEIR GROWTH FROM 1996-2000.**



**Key**

City with highest publication output in the period 2004-2008; growth is during 1996-2000

- Decreased or stayed constant
- Increased 10-20 places
- Increased 5-10 places
- Increased 20+ places

**SOURCE: ROYAL SOCIETY (2011)  
KNOWLEDGE, NETWORKS, NATIONS**

RECENT DECADES HAVE SEEN RAPID SHIFTS IN THE DISTRIBUTION OF GLOBAL SCIENTIFIC PRODUCTION, AND TO A LESSER EXTENT, EXCELLENCE

### INTERNATIONAL COLLABORATION NETWORKS IN SCIENCE, 1998

Whole counts of internationally co-authored documents



Each node represents a minimum of 10,000 co-authored papers. The thickness of line indicates the intensity of collaboration.

### INTERNATIONAL COLLABORATION NETWORKS IN SCIENCE, 2011

Whole counts of internationally co-authored documents



**SOURCE: OECD CALCULATIONS BASED ON SCOPUS  
CUSTOM DATA, ELSEVIER, VERSION 5. 2012, JUNE 2013.**

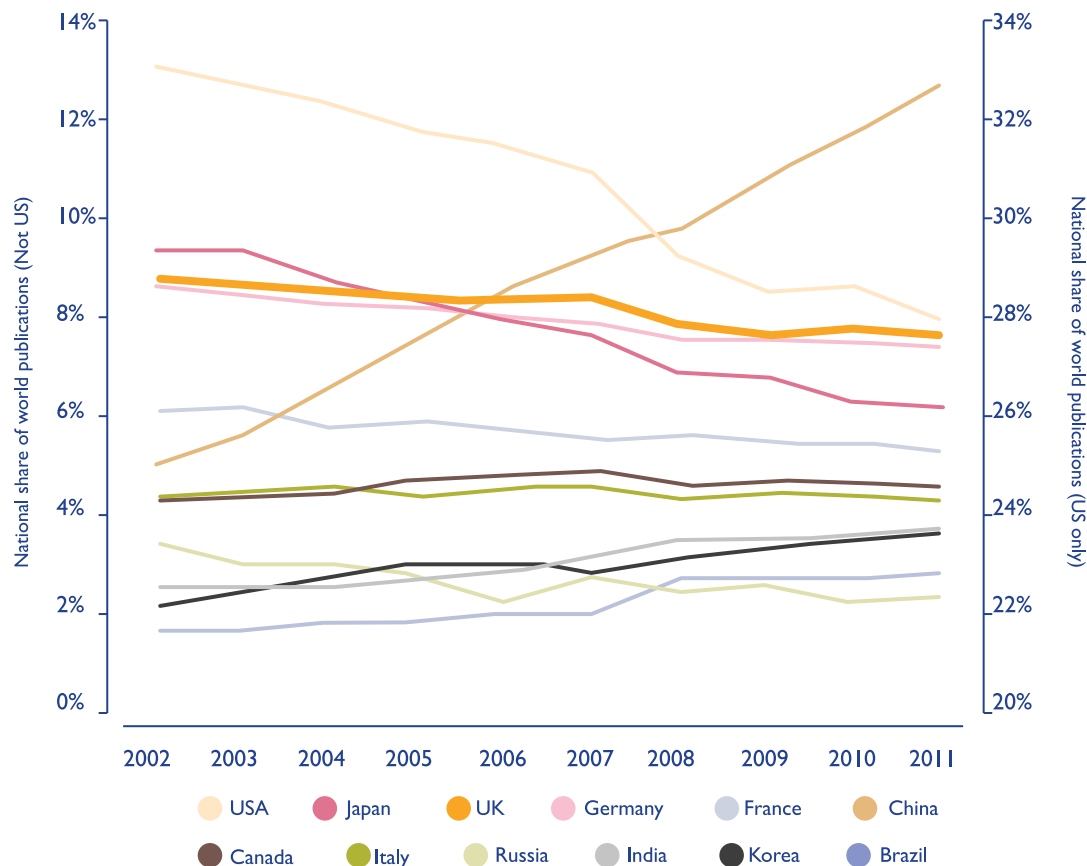
THE UK HAS SO FAR MAINTAINED ITS POSITION AS THE WORLD'S THIRD LARGEST PRODUCER OF RESEARCH, AND RANKS PARTICULARLY WELL ON INDICATORS OF QUALITY LIKE CITATIONS

The UK research system is highly efficient.

With 0.9% of the world's population, 3.2% of global R&D spend, and 4.1% of researchers, the UK accounts for 9.5% of article downloads, 11.6% of citation and 15.9% of the world's most highly cited articles. See learn more box below.

The OECD ranks the UK as second in the world for university hotspots due to concentrations of high impact institutions.

National share of world publications indexed on Thomson Reuters' Web of Science, 2002-2011 (note that the right hand axis is for the US only)



CLICK THE TABS  
TO LEARN MORE:



International benchmarking  
of the UK innovation  
System 2014 (BIS)

SOURCE: NESTA (2013) CHINA'S ABSORPTIVE STATE

A SIMILAR SHIFT IS HAPPENING IN THE GLOBAL GEOGRAPHY OF INNOVATION. WHILE THERE'S NO DOUBT THE UK IS STILL A LEADING INNOVATION NATION, IT CAN BE HARDER TO JUDGE HOW IT COMPARES IN TERMS OF INNOVATION PERFORMANCE

The UK ranked **second** in the Global Innovation Index 2014:

1. Switzerland
2. United Kingdom
3. Sweden
4. Finland
5. Netherlands

Yet the European Commission Innovation scoreboard in 2014 ranked the UK as **seventh** in the EU and an 'innovation follower'.

And London alone ranked **sixth** in the world in terms of its Startup Ecosystem in 2015.

### How should we interpret these results?

All these indices are made up of a different basket of proxy indicators – from patents and publications to high tech industries, education levels of citizens or new products introduced by firms.

Indexes should always be interpreted with caution. Underlying data, collected at different levels of geography may be more helpful guides to policy decision making.

### TOP 10 COUNTRIES BY PATENT (PCT) APPLICATION (2013)



**SOURCE: INFOGRAPHIC FOR WIPO AVAILABLE AT:  
[HTTP://WWW.WIPO.INT/IPSTATS/EN/](http://www.wipo.int/ipstats/en/)**

## THE UK'S EXPENDITURE ON R&amp;D IS LOWER THAN SOME OTHER LEADING S&amp;I NATIONS

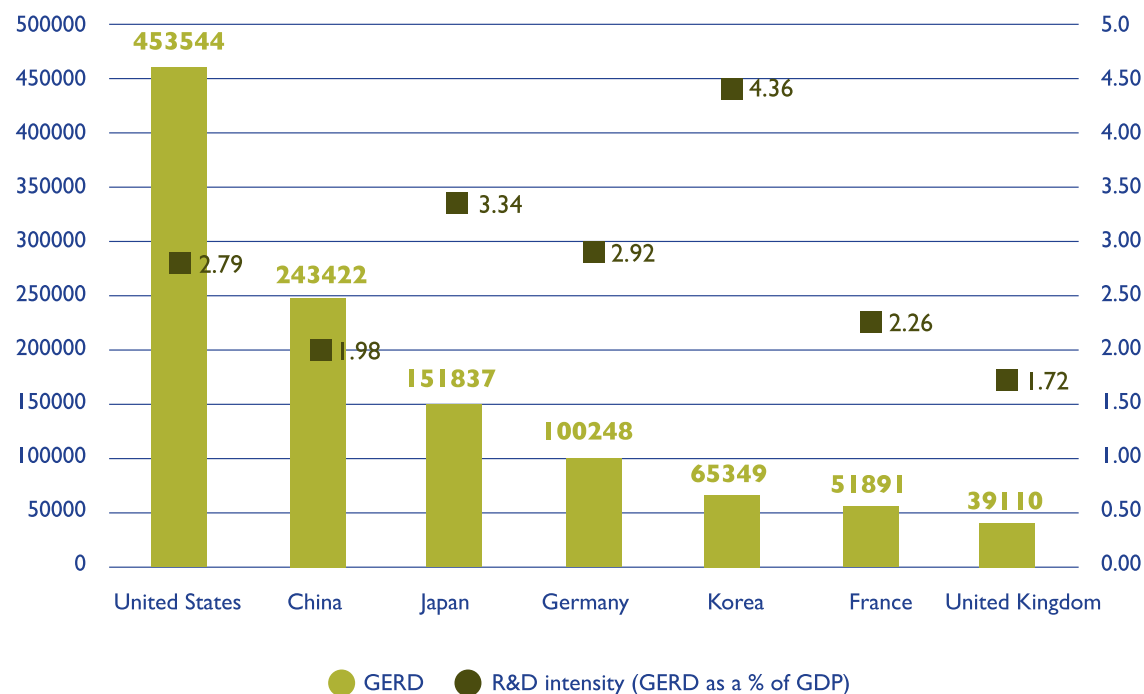
Compared to other advanced countries, the UK has a low level of total investment in R&D (GERD) and a low R&D intensity (GERD as a percentage GDP).

While countries like Germany, France and the USA have seen a steady rise in R&D intensity since the year 2000, it is steadily falling in the UK.

However, it is important to keep this in context: the UK comes in the top 20 of the 75 countries that the World Bank has R&D data for in terms of R&D intensity.

## GROSS DOMESTIC EXPENDITURE ON R&amp;D 2012

## MILLION CURRENT PPP \$



SOURCE: OECD STAT EXTRACTS



WHILE THE INDICATORS WE LOOK AT ARE OFTEN NATIONAL, R&D SPENDING IS CONCENTRATED IN CERTAIN COMPANIES, REGIONS AND SECTORS

**Size of Firm:** R&D spending is concentrated in a few very large firms:

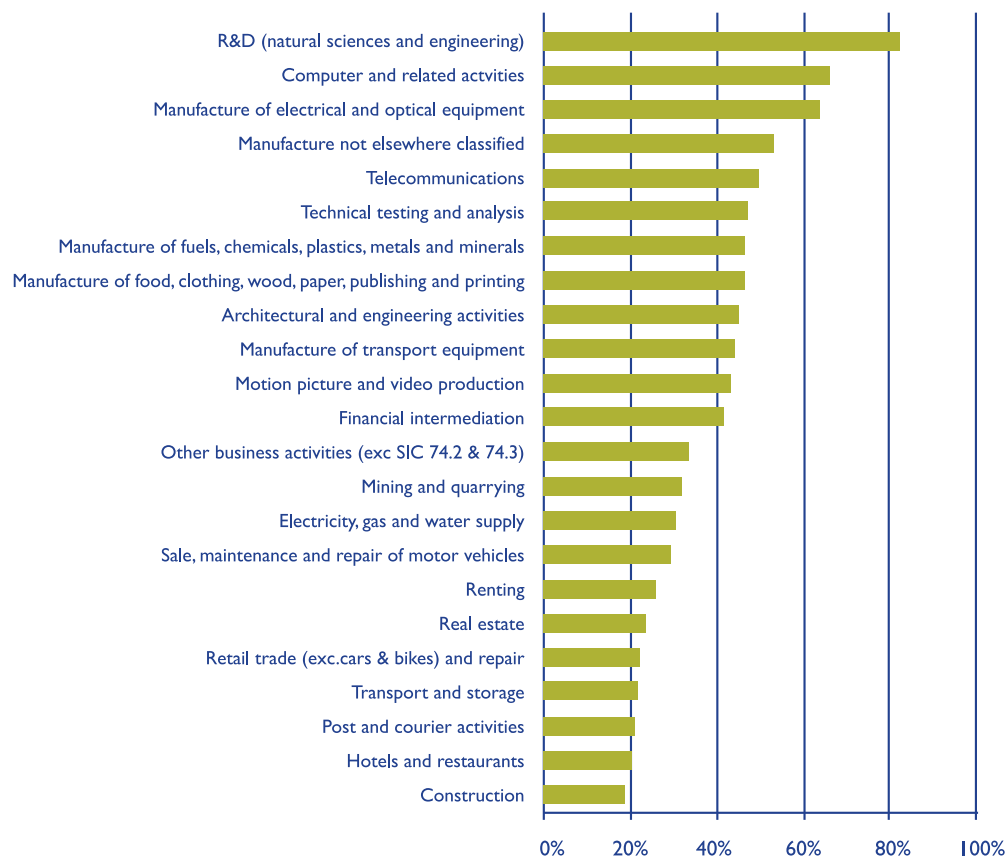
- The 10 biggest R&D spenders in the UK account for 34% of all UK R&D expenditure
- SMEs accounted for only 3.5% of the total R&D spending

**Region:** R&D spending in the UK is not spread evenly across the country:

- The South East and East of England lead the UK's BERD, accounting respectively for 26% and 20.9% of total expenditure.
- Wales, the North East and Northern Ireland spent the least on BERD, collectively accounting for less than 5% of total UK expenditure.

**Sector:** R&D spending is not evenly spread across sectors. Over 60% of firms in computer related industries conduct R&D, compared to less than 20% of firms in the construction industry.

### PERCENTAGE OF FIRMS PERFORMING INTERNAL R&D BY SECTOR



SOURCE: THE UK R&D LANDSCAPE (2012)

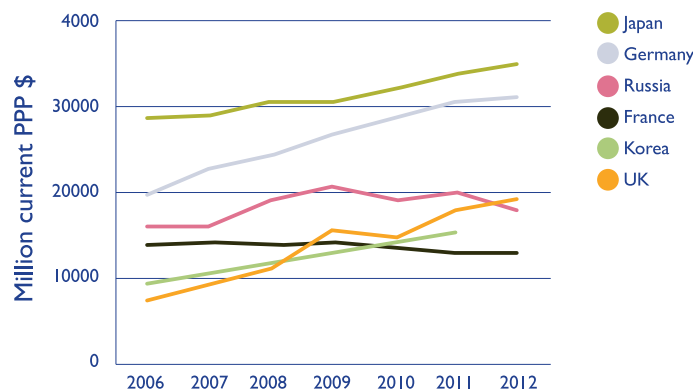


## LOWER INVESTMENT IS A FEATURE OF BOTH GOVERNMENT AND BUSINESSES

The UK has many innovative firms and people, from world-beating creative businesses like Double Negative to its thriving business services sector; from advanced manufacturers like Rolls-Royce to world-class research universities; and from technology giants like ARM to the start-ups of Shoreditch. But their success masks low investment.

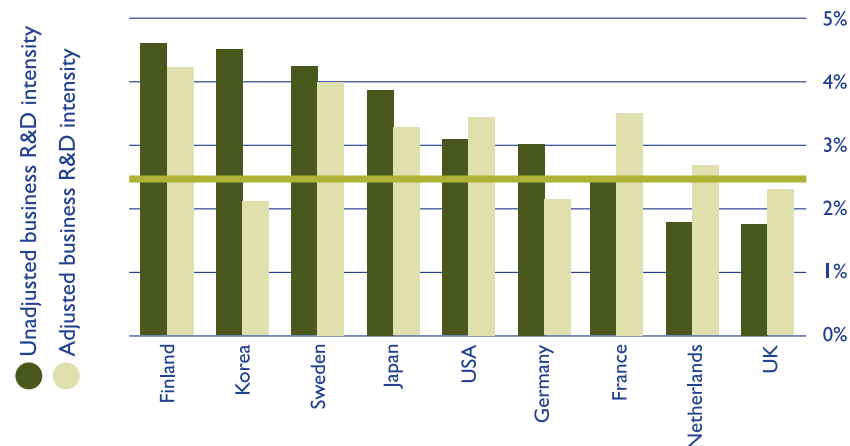
### BY BOTH GOVERNMENT:

#### TOTAL GOVERNMENT BUDGET APPROPRIATIONS OR OUTLAYS FOR R&D (GBAORD)



SOURCE: OECD MAIN SCIENCE AND TECHNOLOGY INDICATORS

### AND ALSO BY BUSINESS:



SOURCE: [HTTP://STATS.OECD.ORG](http://stats.oecd.org)

Between 200,000 and 250,000 new firms are created each year in the UK. R&D spending tends to be concentrated. The Department of Business Innovation and Skills estimates that to secure future economic success, R&D intensity (now under 2%) needs to be closer to the 2.9% average of leading comparator countries.

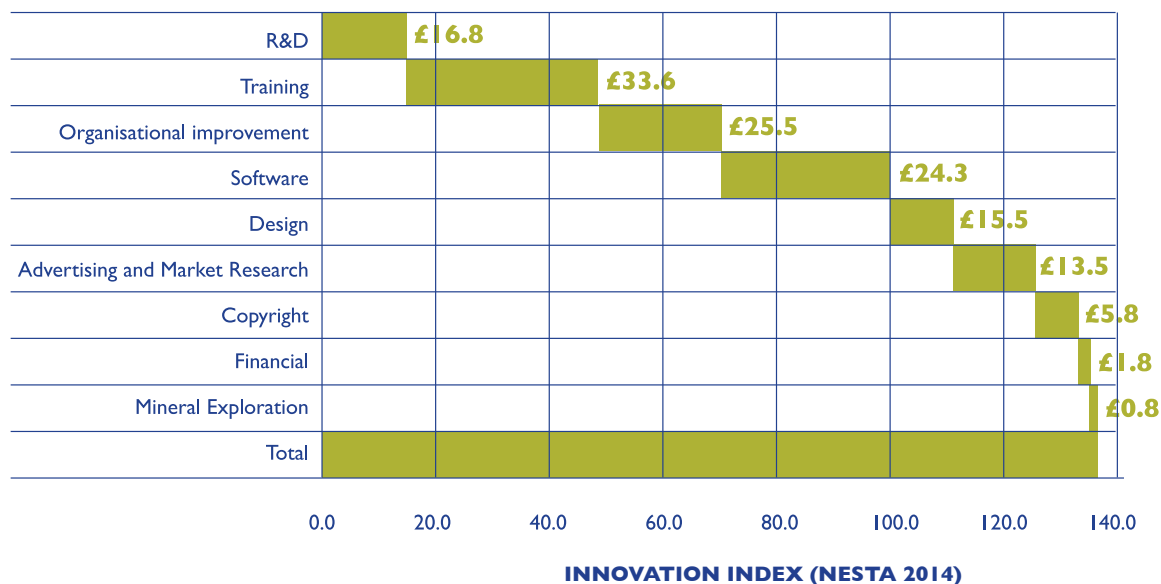




HOWEVER, MEASURING 'INTANGIBLE' INVESTMENTS IN INNOVATION BEYOND R&D SHOWS A MORE USEFUL PICTURE OF UK INVESTMENT, AND ALSO A BETTER INDICATION OF ITS STRENGTHS

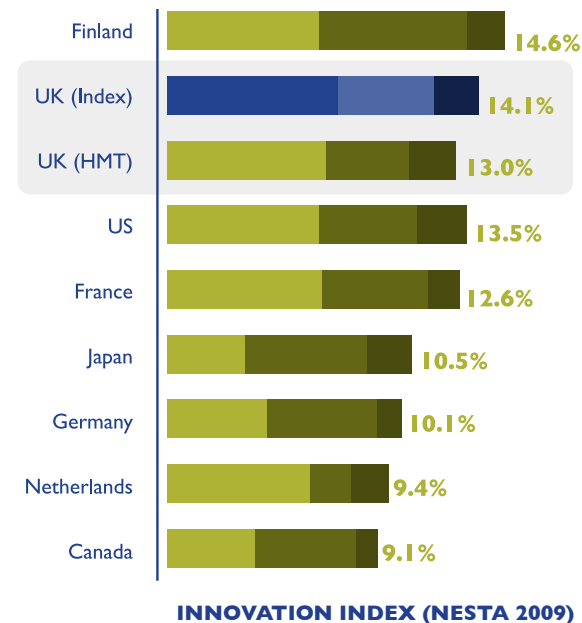
Investment in R&D represents only a small proportion of the overall investment in innovation made by UK firms. Investment in design, branding, software development and organisational improvement are all important complementary innovation investments driving productivity growth.

### Investments in innovation by business in the UK, 2011 (£bn)



The UK performs much better in comparison to other countries when these wider intangible innovation investments are taken into account.

### International comparison of investment in innovation as a share of market sector gross value added



WE SEE THE IMPACT OF THESE INTANGIBLE INVESTMENTS IN AREAS LIKE  
DESIGN AND ADVERTISING IN THE SUCCESS OF THE UK'S CREATIVE ECONOMY

The UK is a world leader in the creative economy - those economic activities which involve the use of creative talent for commercial purposes. For instance, according to Design Council research, every £1 that a UK business spends on design returns £20 in net turnover, £4 in net operating profit and £5 in net exports/new markets.

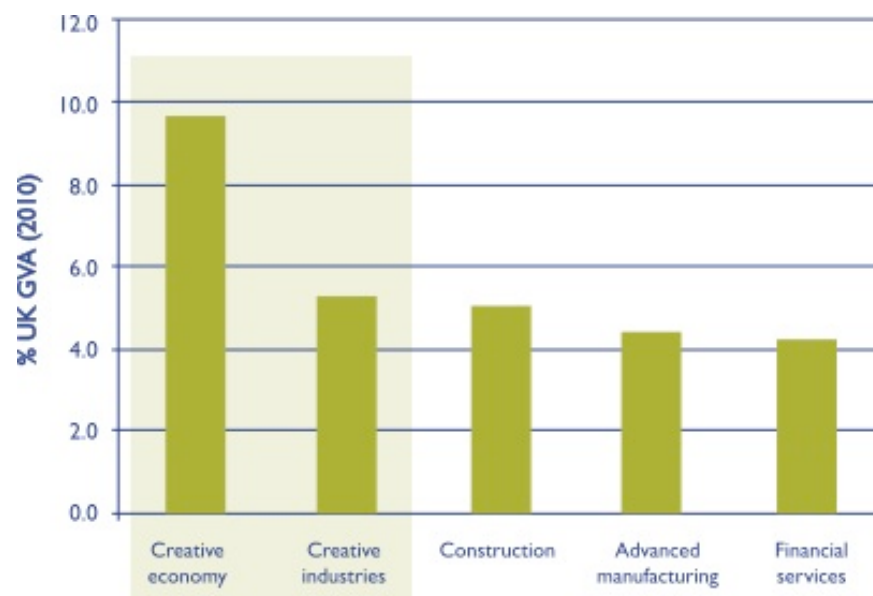
Within the creative economy, the creative industries specialize in the use of creative talent for commercial purposes – for instance film, design, music and video games.

**Mind Candy** is a success story of the British Creative Economy. Formed in 2003, it began developing children's computer game Moshi Monsters in 2007.



Extraordinary growth has led to over 70 million registered users of the game worldwide and a turnover for the London based firm of £46.9 million in 2012.

### THE SIZE OF THE UK CREATIVE ECONOMY (2010)



Creative industries & economy contribute more to GVA than construction, advanced manufacturing or financial services. The creative economy accounts for 5% of the UK's total economy

**SOURCE: A MANIFESTO FOR THE CREATIVE ECONOMY/ DCMS**  
Creative Economy Statistics Estimates  
<https://www.gov.uk/government/statistics/creative-industries-economic-estimates-january-2015>



## THE UK COULD BETTER EXPLOIT FOREIGN INVESTMENTS IN R&D AS WELL AS GROWING DOMESTIC INVESTMENT

### THE UK SCIENCE AND INNOVATION SYSTEM IS HIGHLY INTERNATIONALISED:

Around 46% of the UK's scientific publications have an international co-author, and this share is growing rapidly. A growing proportion of research in UK universities is also funded from abroad.

An exceptionally high proportion of UK business R&D is funded from abroad: In 2011, the UK attracted almost \$7 billion of overseas-financed R&D – the same as Canada, Finland, Japan, China, and Russia combined.

UK innovative firms are far more likely to be active in foreign markets than their counterparts in France, Italy or Sweden.

### BUT IS THE UK GOOD ENOUGH AT EXPLOITING THE BENEFITS OF THESE INTERNATIONAL CONNECTIONS?

According to BIS research, some 80-90% of innovation in advanced economies is based on technology transfer from foreign countries.

An important priority for the UK is to increase its ability to exploit cutting-edge global research and to benefit from rapidly growing investment in innovation around the world.

Researchers at Manchester University celebrated important, ground-breaking achievements with the Nobel Prizes awarded for their work on graphene in 2010. Yet Chinese institutes already have vastly more graphene-related

patents. A Cambridge IP study in 2013 counted over 2,200 patents in China compared to 54 filed so far in the UK.



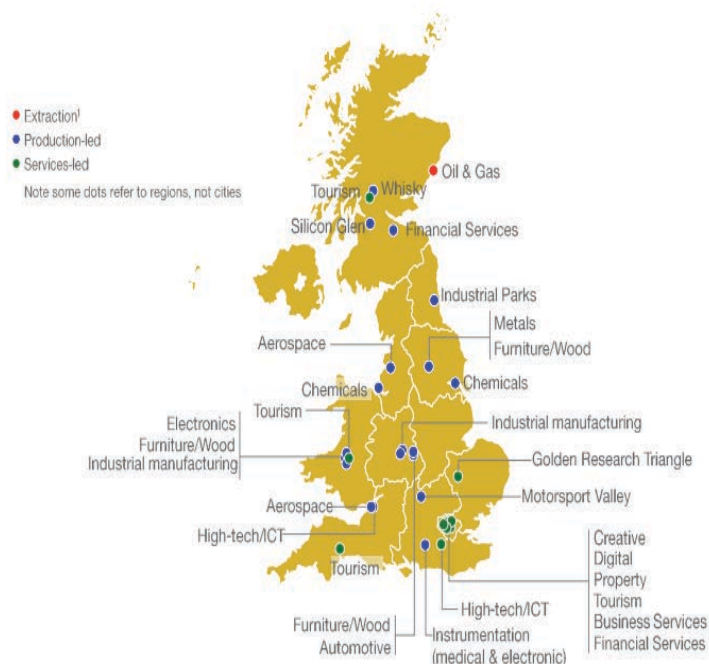
## A RECENT UK GOVERNMENT REPORT AIMED TO TRACK RELATIVE NATIONAL STRENGTHS AND WEAKNESSES IN RELATION TO INNOVATION

A 2014 assessment of the strengths and weaknesses of the UK innovation system relative to other leading comparator countries by BIS makes the following assessment (adapted from the original):

CATEGORY	ASSESSMENT <sup>1</sup>	STRENGTHS	WEAKNESSES
<b>MONEY</b>	<b>Medium/Low</b>	Strong foreign funding of R&D, high private sector investment in intangibles	Comparative to global leaders, lower levels of R&D investment and public support for innovation, issues around access to finance for innovative companies
<b>TALENT</b>	<b>Medium/Low</b>	Attractive to global research talent, high quality higher education system, high number of PhDs	Lower basic skills (ICT, numeracy etc), low number of STEM graduates, lower level of management skills
<b>KNOWLEDGE ASSETS</b>	<b>Medium/high</b>	World class research base (2 <sup>nd</sup> only to US) and research institutions, high proportion of international research collaborations	Smaller number of patent applications than other leading nations
<b>STRUCTURES AND INCENTIVES</b>	<b>Medium/high</b>	Modern IP regime, competitive funding drives excellence, strong university-industry collaboration, strong knowledge networks	Government procurement underperforms its potential to foster innovation, weaker SME/University collaboration
<b>BROADER ENVIRONMENT</b>	<b>Medium/high</b>	Open and competitive markets, positive business environment, strong entrepreneurial activity	R&D concentrated in a few large firms & small number of sectors, low quality of demand, restrictive migration rules
<b>INNOVATION OUTPUTS</b>	<b>Medium (Mixed)</b>	Comparative export advantage in relatively sophisticated products, strong knowledge intensive services and creative sector exports, strong technology balance of payments	Average to low levels of new to market innovations, low number of innovative SMEs

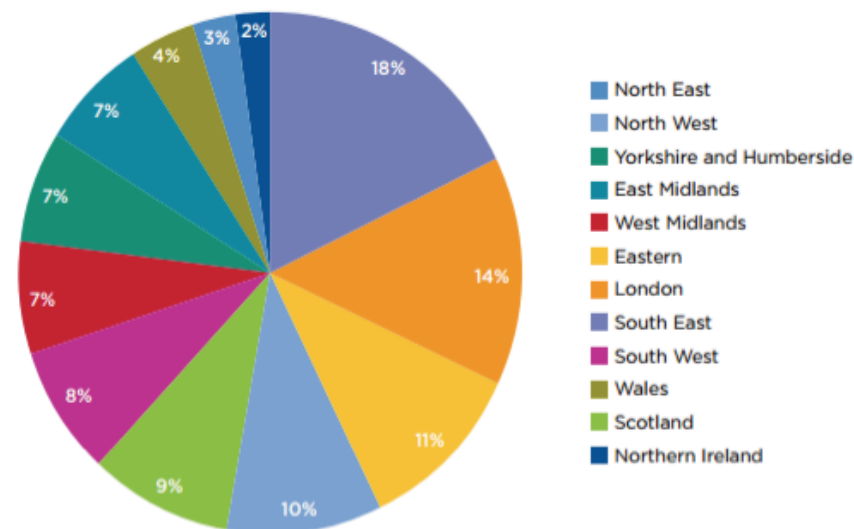
## LOOKING BELOW NATIONAL LEVEL REVEALS DIVERSE INNOVATION STRENGTHS AND WEAKNESSES AROUND THE UK

London and the South East are the most innovation-intensive regions of the UK. However, there are a range of industrial clusters around the UK, and nationwide capabilities.



**SOURCE: INDUSTRIAL REVOLUTIONS, CAPTURING THE GROWTH POTENTIAL, CENTRE FOR CITIES**

These clusters display a range of innovative activity, and high tech employment can be found throughout the country, with notable concentrations for example in Manchester, Edinburgh and Cambridge.



**SOURCE: THE GEOGRAPHY OF THE UK'S CREATIVE AND HIGH-TECH ECONOMIES**



## IF YOU WANT TO DO YOUR OWN ANALYSIS OF UK INNOVATION PERFORMANCE, HERE'S A HANDY GUIDE TO WHERE TO FIND GOOD DATA

**I WANT TO** UNDERSTAND HOW THE UK COMPARES TO OTHER COUNTRIES WHEN IT COMES TO SCIENCE AND INNOVATION

A great place to start is [The OECD World Bank Innovation Policy Platform](#); and regular digests are also produced by the European Commission ([Eurostat](#)) and the OECD; ([OECD Main Science and Technology Indicators](#), [OECD Science, Technology and Industry Scoreboard](#)) or for a wider range of countries the [World Bank](#)

**I WANT TO** GET A DEEPER INSIGHT INTO INVESTMENT IN INNOVATION IN THE UK

Look at the [UK innovation survey](#) which takes place every 4 years or so, or the [ONS statistical bulletin](#) which provides a useful overview of R&D spending in the UK. For a wider understanding of investment in innovation look at Nesta's [Innovation Index](#) or for insights on skills look at [HESA studies](#), or the [UK CES Employer Skills surveys](#)

**I WANT TO** FIND OUT ABOUT THE OUTPUTS AND IMPACTS OF UK SCIENCE AND INNOVATION

The UK government commissions regular reviews like this [Comparative performance of the UK research base](#), but companies like Elsevier and Thomson Reuters hold the (commercial) databases. The IPO frequently publish facts and figures on UK patenting and wider intellectual property, and [WIPO](#) publish helpful country profiles. There is now a [searchable database](#) of the impact of UK research and published reports such as [Research Excellence Framework Impact case studies: Economic Impact of UK science base](#)

**I WANT TO** UNDERSTAND THE UK'S STRENGTHS AND WEAKNESSES WHEN IT COMES TO INNOVATION

For research specialisation look at government reports on [UK research and innovation performance](#); [Comparative performance of the UK research base](#); and for a regional picture, [Mapping local comparative advantages](#). For Innovation specialisation look at individual Industry councils like [ABPI for pharmaceuticals](#) or [UKIE for gaming](#); the regularly updated [BIS growth dashboard](#) or look for published reports on [Eight great technologies: the patent landscapes](#), and [UK's economic strengths](#).

**I WANT TO** GET AN INSIGHT INTO THE UK'S STARTUP ECOSYSTEM

There are vast commercial databases and accessible resources in [companies house](#), and [ONS](#). Organisations like Nesta, [TechCityUK](#) create accessible report collections and [Spinouts UK](#) hold a UK-wide database and support reports like [Profiling UK University Spinouts](#). Lots of companies analyse investment and access to finance. For free public reports try [BVCA](#) which produce reports like [Venture capital activity 2013](#) or Nesta's wider work on startups and [Alternative Finance](#). The European ICT Poles of Excellence project has an [interactive dashboard](#) you could use to compare UK startup ecosystems with those in other European countries

**I WANT TO** BETTER UNDERSTAND THE RELATIONSHIPS BETWEEN UNIVERSITIES AND BUSINESSES IN THE UK

Take a look at the regular surveys by [HESA](#) and [Praxis Unico](#) or reports on [Evaluation of UK knowledge transfer activities](#). For wider Intermediate research organisation data look at reports like [Research and innovation organisations in the UK](#), the [Catapult Centres](#) or the [UK contract research map](#).

**I WANT TO** UNDERSTAND THE INTERNATIONAL CONNECTIONS OF THE UK SYSTEM

Explore FDI involving R&D/High tech exports data in regular digests like [UKTI inward investment report 2014/15](#) or at source from [World Bank](#) and [Eurostat](#); [HEFCE](#), [HESA](#), [Universities UK](#) and [British Council](#) will have data on student flows at a national level, complemented by [OECD](#) internationally.

**UNDERSTANDING UK INNOVATION POLICY  
AND MAPPING FUTURE STRENGTHS**



RECENT UK INNOVATION POLICY AIMS TO TARGET INVESTMENT  
IN AREAS OF CURRENT & FUTURE STRENGTH

Since the late 1970's, UK innovation policy has been based on improving the environment for businesses to innovate and promoting and supporting general R&D investment rather than activist industrial policy.

However the financial crisis brought with it the realisation that the UK needs to rebalance its economy, both away from consumption towards investment and strengthening other sectors in relation to the financial sector.

In 2012 the UK Government launched its new industrial strategy, which shows businesses where and how the government plans to invest. The strategy has 5 strands, of which those directly relevant to innovation are **sectors** and **technologies**

**11 FOCUS SECTORS OF THE INDUSTRIAL STRATEGY:**

[Aerospace](#)

[Agricultural technology](#)

[Automotive](#)

[Construction](#)

[Information economy](#)

[International education](#)

[Life sciences](#)

[Nuclear](#)

[Offshore wind](#)

[Oil and gas](#)

[Professional and business services](#)

**The strategy aims to:**

- increase global competitiveness
- strengthen manufacturing supply chains
- support innovation
- maximise export potential where UK is well placed to take a global lead



## THIS INCLUDES TARGETING INVESTMENT AT A RANGE OF SPECIFIC TECHNOLOGIES



### TECHNOLOGIES:

In 2013 the Government selected 8 technologies as a framework to help focus investment in areas where the UK has a distinctive capability and where new technologies are emerging with identifiable commercial opportunities.

The 8 technologies are:

**big data, satellites, robotics, synthetic biology, regenerative medicine, agri-science, advance materials, energy storage.**

In 2014 government added **quantum technologies** and **the internet of things** to the list.

Click the learn more tab below to find out more about each technology.

### Innovate UK prioritises its investments through understanding:

- how the market is developing within the UK and globally
- where the capability to answer the challenge lies along the development path
- who could be supported to develop products and services that answer the challenge
- what enabling technologies and competencies may be needed.

This analysis is used to create a roadmap of the potential activities required to support successful activities.



INNOVATION POLICY IN THE UK IS DEVELOPED AT NATIONAL LEVEL, AND WITHIN DEVOLVED ADMINISTRATIONS (SCOTLAND, WALES, NORTHERN IRELAND). YET THERE IS AN IMPORTANT ROLE FOR LOCAL ECOSYSTEMS

Innovation policy is currently developed and delivered at a national level, and has been since the closure of the English Regional Development Agencies in 2012.

There are many reasons for this, not least that the vast bulk of the science and innovation budget goes to Higher Education Institutions, based on an assessment of excellence rather than economic need. And of course, the Haldane Principle prevents Government from directing science spend.

However, policy emphasises the importance of local strategies to drive economic growth with innovation across the country, for example in the 'Northern Powerhouse.'

Many of the 39 Local Enterprise Partnerships (LEPs) in England have identified innovation as a priority in their economic development plans, and all have drafted innovation strategies to access European funding that highlight their local comparative advantages (the EU refers to this as smart specialisation)

## LEPS IN ENGLAND

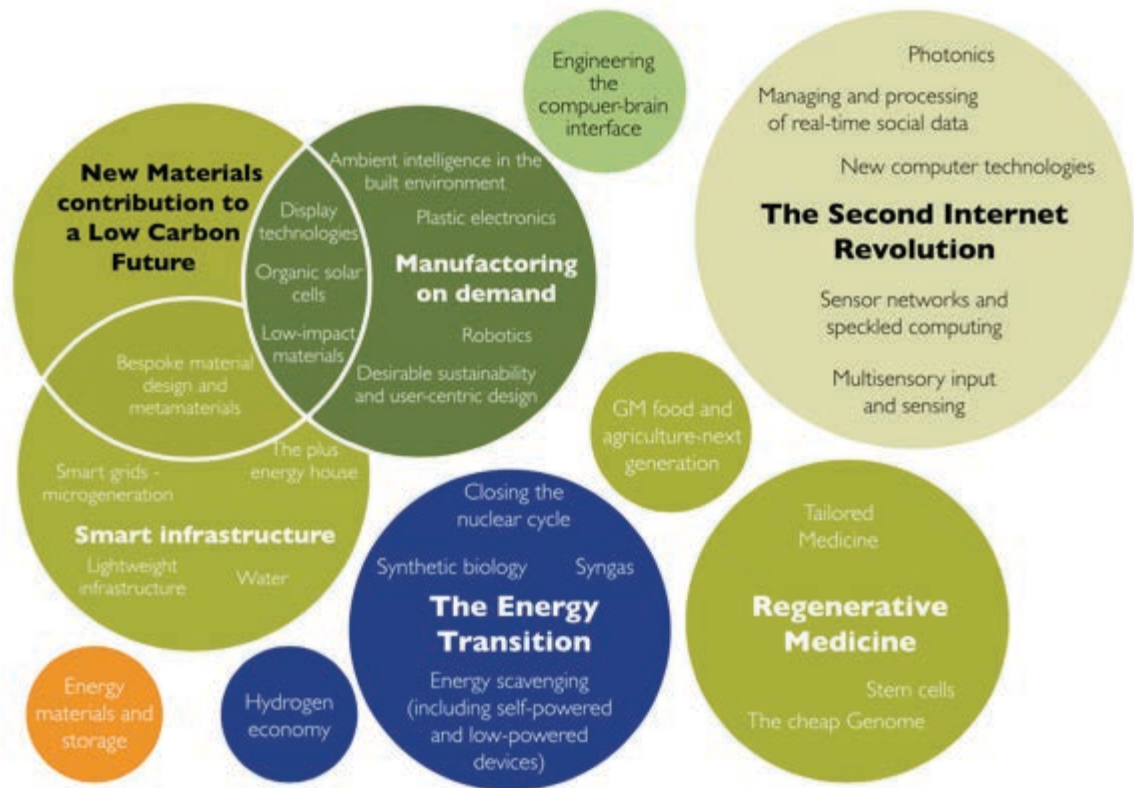


EXPERTS PREDICT OPPORTUNITIES AND STRENGTHS FOR  
THE UK IN A RANGE OF ADVANCED TECHNOLOGIES IN 2020

In 2012 the UK Foresight Horizon Scanning Centre used a futures exercise to set out where the UK has an opportunity to capitalise on its strengths in emerging technologies and markets.

Their research identified 7 cross-cutting areas where the UK's current competitive advantage and the size of the potential market mean that they could provide the UK's specialisms of the future.

These areas are reflected in the priorities of Innovate UK and the Catapult Centres.

AREAS OF TECHNOLOGICAL STRENGTH AND  
OPPORTUNITY FOR THE UK

SOURCE: PLAN I (BASED ON FORESIGHT HORIZON EXERCISE)

## LEARN MORE

TSB funding and support tools: <https://www.innovateuk.org/funding-support>

Royal Society (2011) Knowledge, Networks and Nations. Available at: [http://royalsociety.org/uploadedFiles/Royal\\_Society\\_Content/Influencing\\_Policy/Reports/2011-03-28-Knowledge-networks-nations.pdf](http://royalsociety.org/uploadedFiles/Royal_Society_Content/Influencing_Policy/Reports/2011-03-28-Knowledge-networks-nations.pdf)

TSB (2011) Concept to commercialisation: A strategy for business innovation, 2011-2015. Available at: <https://www.gov.uk/government/publications/innovate-uk-strategy-2011-to-2015-concept-to-commercialisation>

Allas, T. (2014) Insights from the international bench-marking of the UK science and innovation system. Available at: <https://www.gov.uk/government/publications/science-and-innovation-system-international-benchmarking>

TSB priority areas of investment: <https://www.innovateuk.org/our-priorities;jsessionid=D957AA508A0DDB5ABED2530230538E19.I>

Allas, T. (2014) Insights from the international bench-marking of the UK science and innovation system. Available at: <https://www.gov.uk/government/publications/science-and-innovation-system-international-benchmarking>

Catapults in a nutshell infographic: <https://www.catapult.org.uk/documents/2155693/2268412/What+is+a+Catapult/e68c7c90-39e0-45b7-be4b-9ba1e1c51232?version=1.1>

UKIRC (2012) The UK R&D landscape. Available at: [http://ukirc.ac.uk/object/report/6403/doc/CIHE\\_I203RDlandscap.pdf](http://ukirc.ac.uk/object/report/6403/doc/CIHE_I203RDlandscap.pdf)

An introduction to the catapults: <https://www.catapult.org.uk/catapult-centres>

Office for National Statistics (2013) UK Gross Domestic Expenditure on Research and Development, 2011. Available at: <http://www.ons.gov.uk/ons/rel/rdit1/gross-domestic-expenditure-on-research-and-development/2011/stb-gerd-2011.html>

## LEARN MORE

Big Innovation Centre (2013) Catapult to success: a review of European technology and innovation centres. Available at: <http://www.biginnovationcentre.com/Assets/Docs/Catapult%20to%20Success%20report%20final.pdf>

Nesta (2012) Plan I: The case for innovation-led growth. Available at: <http://www.nesta.org.uk/publications/plan-i>

The 15 KTNs: <https://connect.innovateuk.org/knowledge-transfer-networks>

UKIRC (2012) The UK R&D landscape. Available at: <http://www.ncub.co.uk/rdlandscape>

UKTI (2013) UKTI at a glance. Available at: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/294367/UKTI\\_at\\_a\\_glance\\_2013\\_14.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/294367/UKTI_at_a_glance_2013_14.pdf)

UKIRC (2012) The UK R&D landscape. Available at: [http://ukirc.ac.uk/object/report/6403/doc/CIHE\\_1203RDlandscap.pdf](http://ukirc.ac.uk/object/report/6403/doc/CIHE_1203RDlandscap.pdf)

Research Councils UK (2013) Innovation and the research councils. Available at: <http://www.rcuk.ac.uk/RCUK-prod/assets/documents/publications/Innovationbookletfinalweb.pdf>

Nesta Innovation Index. Available at: <http://www.nesta.org.uk/project/innovation-index>

Research Councils UK. Our vision for international collaboration. Available at: <http://www.rcuk.ac.uk/RCUK-prod/assets/documents/publications/international.pdf>

Nesta (2013) A manifesto for the creative economy. Available at: <http://www.nesta.org.uk/publications/manifesto-creative-economy>



## LEARN MORE

UNESCO (2013) Creative economy report 2013. Available at: <http://www.unesco.org/new/en/culture/themes/creativity/creative-economy-report-2013-special-edition/>

The Eight Great Technologies. Available at: <https://www.gov.uk/government/publications/eight-great-technologies-infographics>

BIS (2014) Annual Innovation Report 2014. Available at: <https://www.gov.uk/government/publications/innovation-report-2014-innovation-research-and-growth>

TSB (2011) Concept to commercialisation: A strategy for business innovation, 2011-2015. Available at <https://www.gov.uk/government/publications/innovate-uk-strategy-2011-to-2015-concept-to-commercialisation>

Allas, T. (2014) Insights from the international bench-marking of the UK science and innovation system. Available at: <https://www.gov.uk/government/publications/science-and-innovation-system-international-benchmarking>

BIS (2010) Technology and Innovation Futures: UK Growth Opportunities for the 2020s. Available at: <http://www.bis.gov.uk/assets/foresight/docs/general-publications/10-1252-technology-and-innovation-futures.pdf>

BIS (2013) Industrial strategy: government and industry working together in partnership. Available at: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/245338/bis-13-1208-industrial-strategy-booklet.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/245338/bis-13-1208-industrial-strategy-booklet.pdf)

Global Innovation Index - <https://www.globalinnovationindex.org/content.aspx?page=data-analysis>

The 11 sector strategies. Available at: <https://www.gov.uk/government/collections/industrial-strategy-government-and-industry-in-partnership>

European Union Scoreboard - [http://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards/files/ius-2015\\_en.pdf](http://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards/files/ius-2015_en.pdf)





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TOOLKIT HOMEPAGE**