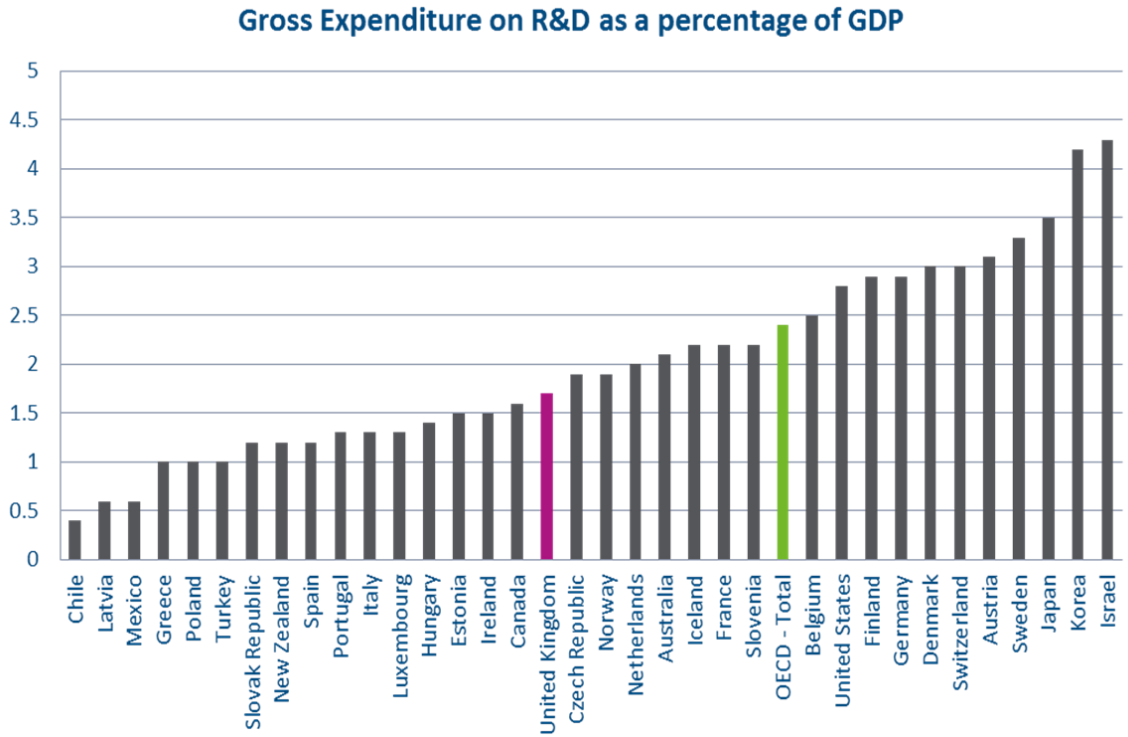
UK Research and Innovation

The UK’s 2.4% R&D target

Dr Helen Pearce, April 2019

Increasing the UK's R&D intensity to 2.4% GDP



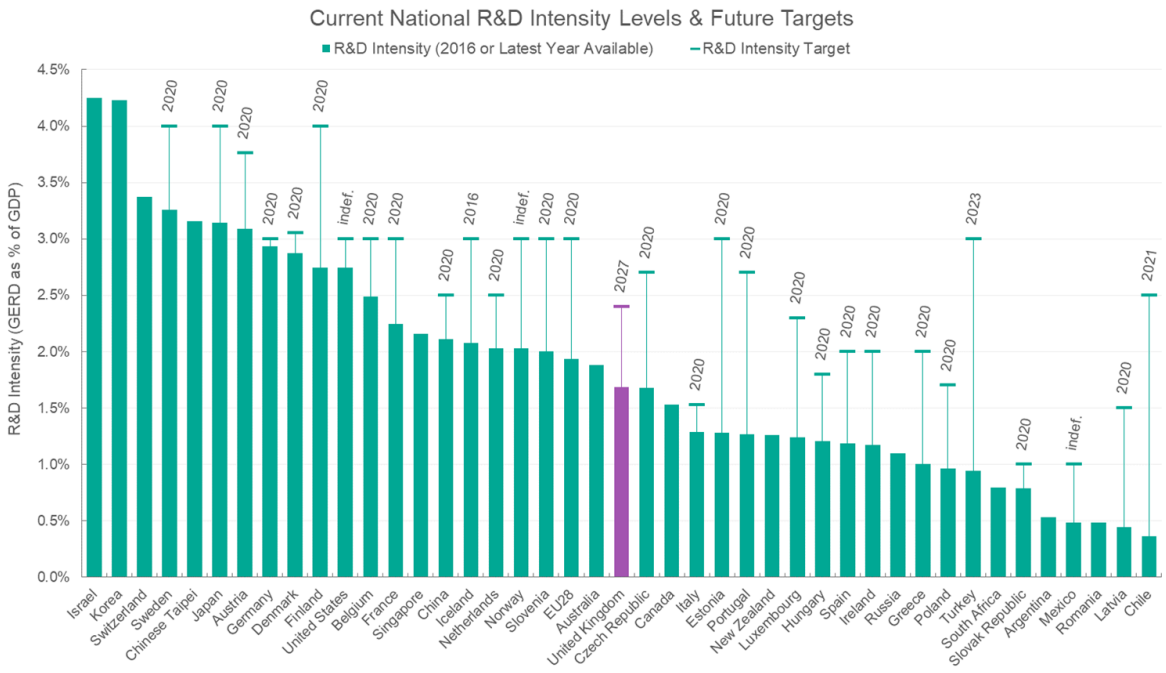
- The UK underinvests in research and development (R&D) (1.69% GDP in 2017) compared to its competitors
- In the 2017 Industrial Strategy White Paper, the UK Government set an ambition for the UK to increase its total R&D expenditure to 2.4% of GDP by 2027, and 3% in the longer term

Source – OECD STI

Why are we aiming for the 2.4% target?

- Advanced economies will only continue to grow and prosper if we leverage knowledge and new ideas to drive innovation and deliver a better and more productive economy
- As well as boosting productivity and employment, R&D impacts positively across people's lives. For example, it leads to improvements in health, safeguarding the environment, increasing our safety and security, improving our cultural and social lives, increasing our wellbeing and happiness and providing efficient and effective public services
- The Industrial Strategy is a long term plan to boost productivity and earning power of people throughout the UK, though five foundations of productivity: ideas; people, infrastructure, business environment; place – the 2.4% target plays a central role in this
- Increased R&D intensity will help deliver the Industrial Strategy's Grand Challenges:
    - AI and data
    - Clean growth
    - Future of mobility
    - Ageing society

Our biggest international partners and leading R&D nations have already accelerated their investment in R&D and have ambitious plans to go further



There are around 30 countries with active R&D intensity targets:

- Between 2000 and 2017 China increased R&D investment from 0.9% to 2.1% of GDP, with a 2.5% target for 2020
- South Korea has also achieved a step change in its R&D performance, raising investment as a % of GDP from 2.2% to 4.5% between 2000 and 2017.
- In Europe, Germany announced a new R&D target to reach 3.5% R&D investment by 2025

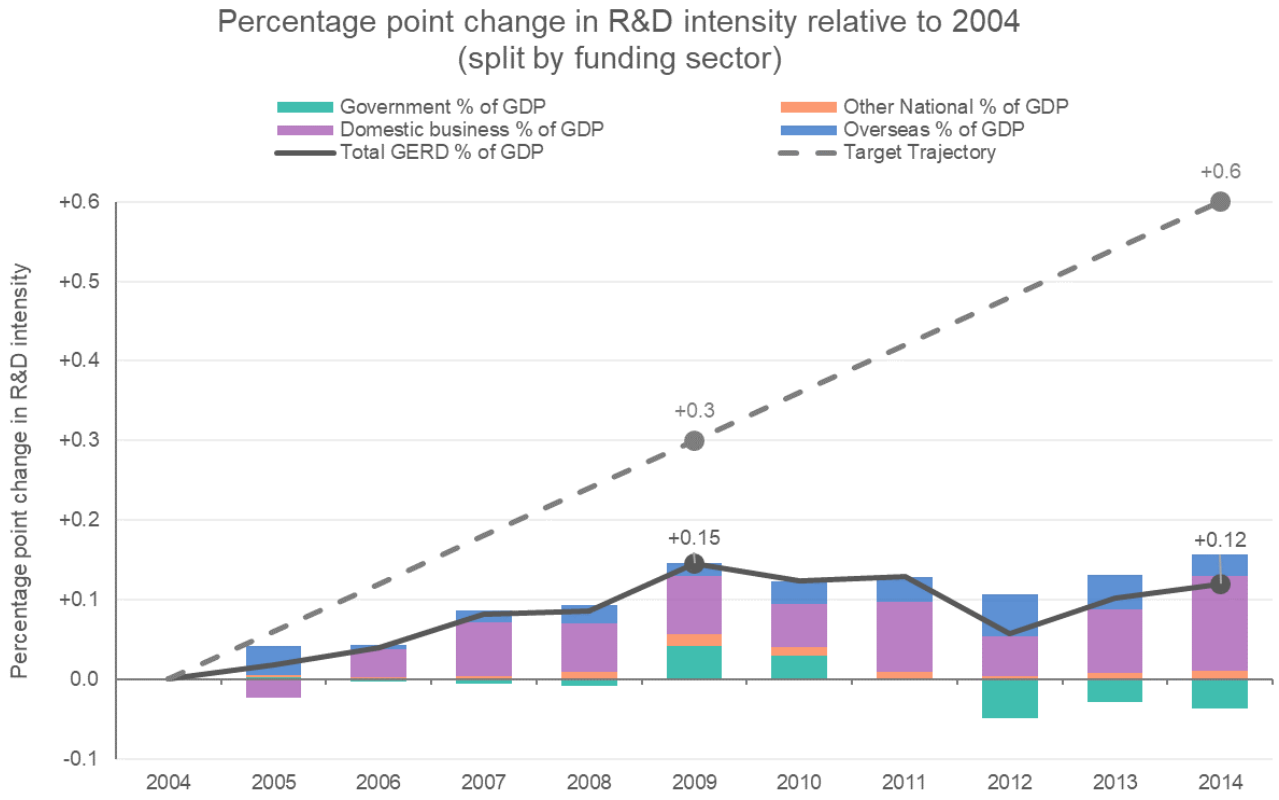
Emerging technologies is a key area in which leading R&D nations are investing heavily:

- France set out their artificial intelligence strategy, including €1.5bn of public investment to fund R&D in the field over the next five years.
- The Chinese Government recent three year action plan on AI set out a commitment to build a $2.1 billion technology park for AI research.

Sources: Carvalho (2017) & OECD MSTI database; Politics + AI (AI *policy* research)

Learning from the 2004 Science and Innovation Investment Framework (SIIF)

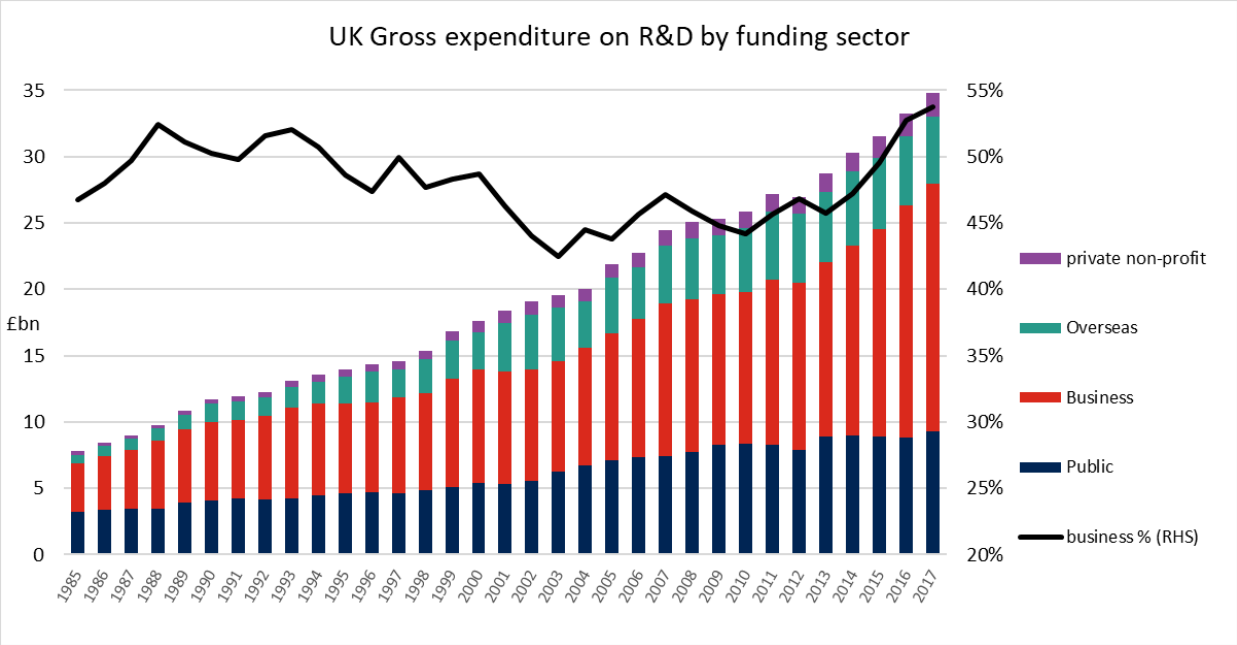
- The 2004 SIIF set out the ambition to increase R&D to 2.5% of GDP by 2014, which was not met.
- We know that successful strategies to increase R&D intensity require long-term public commitment to leverage private investment, cross-government coordination, a strategy that is sensitive to the structure of the economy and builds upon existing strengths, and policy consistency.



Sources: Science and Innovation Investment Framework

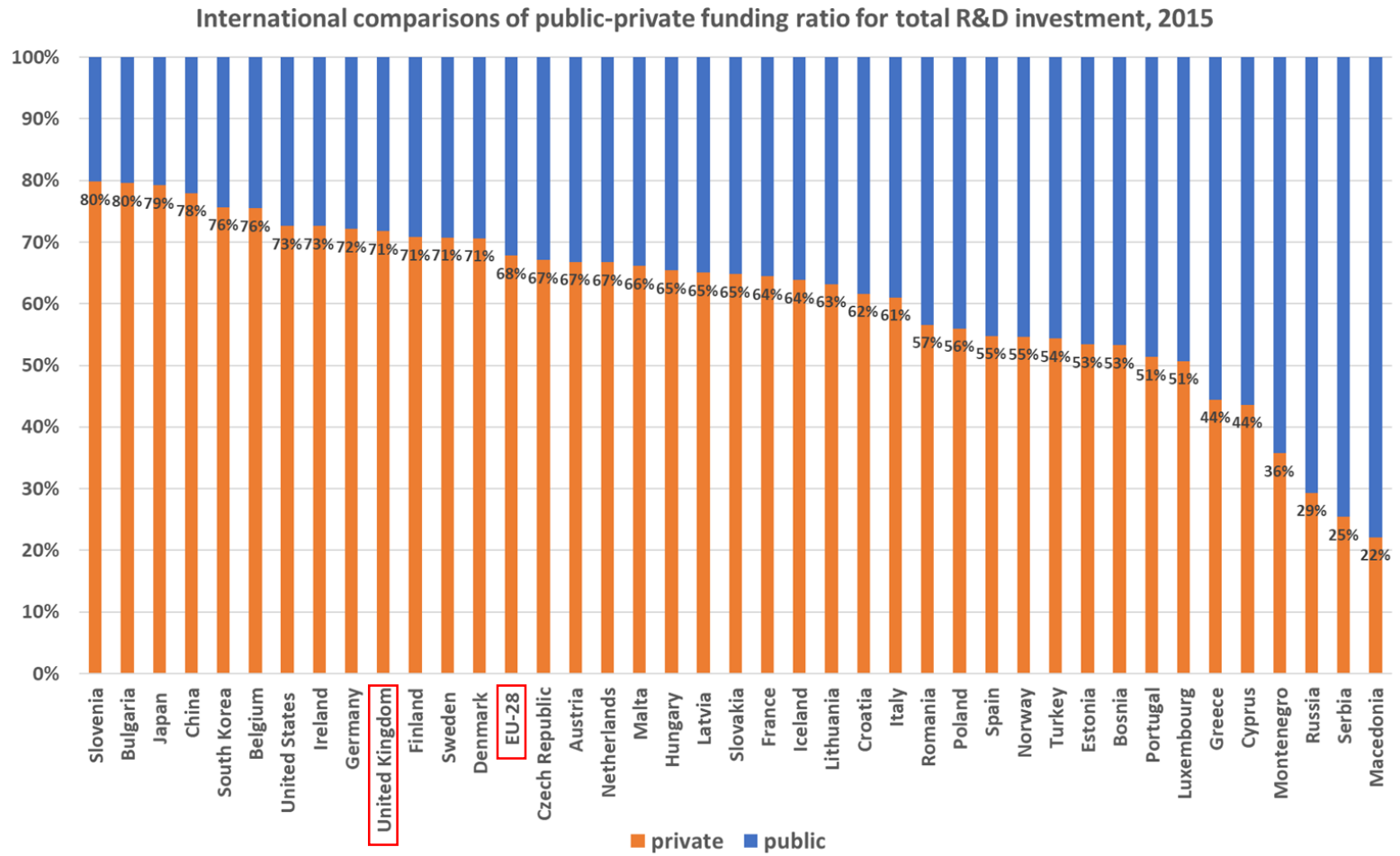
UK based businesses fund over half of overall R&D investment in the UK, nearly £19bn in 2017

- Since 2013 business investment into R&D has been on a rising trajectory and as of 2017 it was worth £19bn.
- Overseas investment has increased in importance as a source of funding over the last twenty years, making up 14% of the total in 2017.
- Business R&D activity is heavily concentrated in just four sectors: pharmaceuticals; automotive; aerospace; and programming, IT and software.



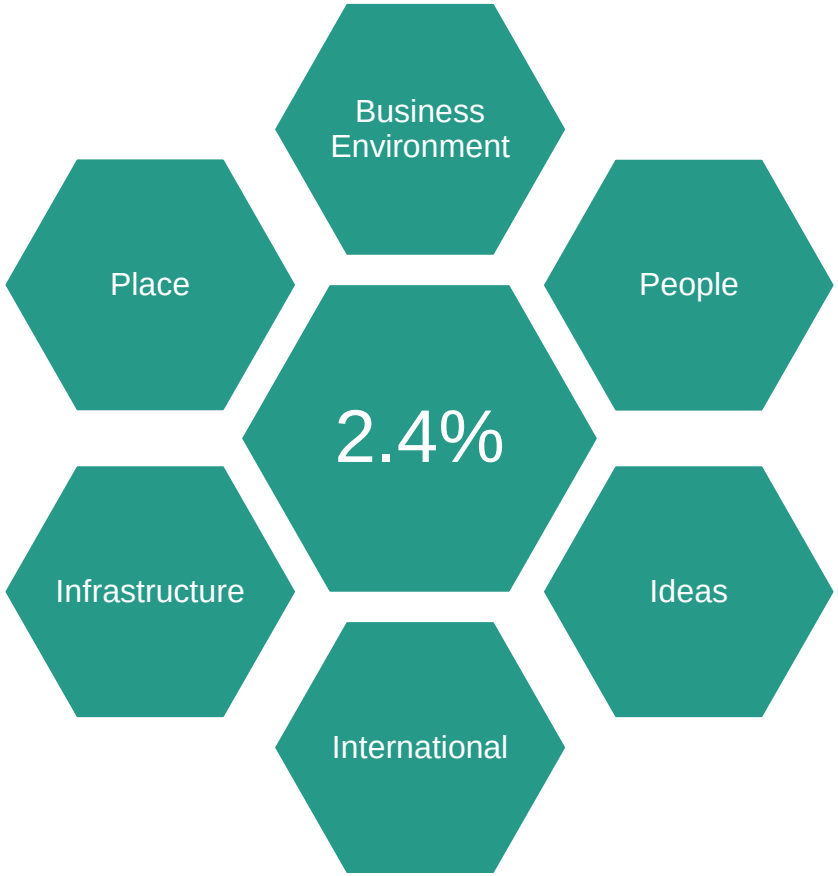
Source: ONS GERD data.

UK ratio of private/public spend is above average but there is room to do even better



In 2015, the UK's private/public ratio of R&D spend (71%) was above the EU average (68%), but behind the ratio achieved by some of the leading R&D nations (e.g. Japan at 79% and US at 73%).

UKRI’s approach



- In the Industrial Strategy White Paper, the government set out five foundations of productivity.
- UKRI is working closely with the Department for Business, Energy and Industrial Strategy (BEIS) to develop the 2.4% roadmap, expected to be published in late 2019
- UKRI is considering how to inform and invest across each of these to drive private sector R&D investment and deliver transformational benefits for the UK.

New approaches to funding

- Industrial Strategy Challenge Fund
  - Challenge-led innovation programme bringing together business and the research base to meet major industrial and societal challenges
  - Aim to increase business investment and align with the IS Grand Challenges
  - Built around areas where UK has research and businesses ready to innovate and the global market is large/fast-growing and sustainable
- Strength in Places Fund
  - Place-based approach to research and innovation funding aiming to support significant regional economic growth
  - Identifying and supporting areas of R&D strength that are driving clusters of businesses with potential to innovate/adopt new technology
  - Enhancing local collaborations by building on the underpinning regional economic impact of universities, research institutes, other R&D facilities
- Strategic Priorities Fund
  - Drive an increase in high quality inter/multidisciplinary research and innovation
  - Ensure UKRI investment links ups with government department priorities
  - Respond to strategic priorities and opportunities

Key considerations and open questions as we develop our plans to reach the UK's R&D intensity target

- How do we maximise the impact of our investment in R&D, in terms of developing economic, societal and cultural impact and pushing the frontiers of knowledge, so it is more than just an input target?
- What is the correct phasing of increased investment so we can create a sustainable increase in R&D capability and capacity (e.g. frontloading investment in people and public research infrastructure)?
- We are already trying new approaches to innovation policy (e.g. the mission focused Industrial Strategy Challenge Fund) – how can we build upon this?
- How do we drive private R&D investment and support innovative businesses to access the capital and R&D they need?
- UK R&D activity is concentrated in the East of England, South East and London – how do we grow excellence across the UK, which will be essential to meeting the R&D target?

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UK Research and Innovation
58 Victoria Embankment, London, EC4Y 0DS

E info@ukri.org

www.ukri.org