



UK Science
& Innovation
Network



UK Science & Innovation Network Country Snapshot:

China

Science and Innovation Landscape

China's science landscape has seen extraordinary growth over the last 40 years. China is second only to the US in terms of PPP-adjusted R&D spending. It is expected that China's rapid development means it will soon surpass the US and take the lead.

In 2019, China's R&D expenditure saw a year-on-year increase of 11%, totalling RMB 2.17 trillion (approx. US\$307bn/£245bn). Last year's spend accounted for 2.19% of the country's GDP (by comparison the UK's R&D spend represented 1.71% GDP in 2018, and the US 2.83%). The main national funders of research in China are the Ministry of Science and Technology, the National Natural Science Foundation of China and the Chinese Academy of Sciences.



China has a large and rapidly growing research base with 1.87m researchers (around 25% of the world's R&D workforce) and an expanding tier of Chinese multinationals having become visible in global rankings. China is the second-largest producer of scientific articles and field-weighted citation impact (FWCI) of Chinese academic papers in 2018 was 1.03, up from 0.83 in 2014 (world average: 1.0). Over the period 2014-2018, China's highest performing research area was chemical sciences (FWCI of 1.17), and most prolific research area was engineering (1.18m papers). Over the past 15 years, the number of foreign-run R&D centres in China has increased from 200 to over 1,500.

Value of exports to China:

£18bn

Value of imports from China:

£42.3bn

ONS Pink Book 2019

'Innovation' is the number one guiding principle in China's 13th Five Year Plan as the path to sustainable economic growth; 83% of China's R&D expenditure is on late-stage commercialisation. The Made in China 2025 strategy aims to upgrade China's manufacturing industry through innovation in ten priority sectors: advanced marine equipment, advanced rail equipment, agricultural technology, aviation and aerospace, biopharmaceuticals and advanced medical equipment, integrated circuits and new generation IT, power equipment and

technology, robotics and high-end manufacturing, new energy vehicles, new materials. China's 168 National Science Parks (or High tech Zones) are one of the key engines of the country's innovation system. National Science Parks contribution to China's GDP are expected to continue to grow; in 2017 this was 12%.

China weights its R&D spending very heavily towards development; of the total spent in 2018, 83% was spent on experimental development, while 11% was spent on applied research and just 6% on basic research. Whilst this limits fundamental science-based innovation it provides a huge capability in refining technologies for the market and scaling up manufacturing processes. Private sector R&D plays a key role, accounting for 77% of the total spend.

www.gov.uk/government/world/organisations/uk-science-and-innovation-network



UK Science and Innovation in China

The UK and China are established science and innovation partners, with November 2018 seeing the 40th anniversary of the first bilateral scientific treaty signed between the UK and China. The UK is China's second-largest science partner in terms of co-publications, while China is the UK's third largest (after the US and Germany); collaborative research output almost doubled over the five years from 2014 to 2018. Collaboration can produce significant impact gains to both countries; 12% of UK-China papers appear in the world's top 5% by citation impact, compared with 9% for UK-only and 5% for China-only papers. The UK-China science and innovation relationship is underpinned by the UK China Joint Strategy for Science, Technology and Innovation Cooperation, signed in 2017. This is the first bilateral science and innovation strategy China has developed jointly with another country, and sets the framework for future collaboration in priority areas from research to commercialisation. A distinct feature of the joint strategy is an annual Flagship Challenge where the UK and China agree to an enhanced level of cooperation in a specific area. In 2018 this was in agri-tech, in 2019 it was in healthy ageing and for 2020 this is under joint discussion. Each flagship challenge lasts for about 3 years.

Under the UK-China Research and Innovation Partnership Fund, part of the Newton Fund, the UK and China are working together in partnership to address global challenges and achieve the UN's sustainable development goals. Since April 2014, over 1000 individual partnerships have been funded. Newton is seeing real-world outcomes tackling global challenges through research and innovation partnerships. This includes: antimicrobial resistance, atmospheric pollution and human health, remote-sensing for agriculture, and a landmark programme to build climate services to respond to a changing climate. www.newtonfund.ac.uk

Through partnership with China's leading funding agencies, UKRI China has facilitated joint research and development programmes with China representing 363 individual projects with a total combined investment value of £360m involving more than 350 partner institutions and businesses.

SIN China recent success stories

SIN China's work focuses on facilitating best-with-best research and innovation links between the UK and China and delivering growth through commercial opportunities. We work across five priority thematic areas: clean growth, ageing society, future of mobility, AI-data, COP26 and various cross cutting areas. We cover the full spectrum of science and innovation activity from basic and applied research to innovation and commercialisation. In the last financial year SIN China facilitated £57m in export wins for the UK, £31m in joint R&D funding and £8m in investment to the UK.

Recent successes include:

- SIN developed the UK China Healthy Ageing Flagship Challenge, working with UKRI to secure £8m of funding, matched by China, to jointly research key health and social challenges facing ageing societies and to develop products and services that help people as they age.
- SIN facilitated new UK-China collaborations in energy and engineering and £300k R&D funding through bringing a delegation of 30 UK experts to the China Innovation and Entrepreneurship Fair in Guangdong. The event saw 600k visitors and an online and TV audience of 350m.
- Following SIN project work through the Prosperity Fund over a number of years, China released new guidelines on ethical laboratory animal welfare, aligning to international best practice in the treatment of research animals to allow better science collaboration in areas such as cancer treatment, infectious diseases research and human vaccine development.



SIN China contacts

**Science and Innovation
Network Beijing,**
British Embassy Beijing
Email:
beijing.science@fco.gov.uk

www.gov.uk/government/world/organisations/uk-science-and-innovation-network

