UK Science & Innovation Network Country Snapshot:

China

Science and Innovation Landscape

China’s science landscape has seen extraordinary growth over the last 20 years. China is second only to the US in terms of R&D spending, accounting for 21% of the world total. It is expected that China’s rapid development means it will soon surpass the US and take the lead by 2022.

In 2017, China’s R&D expenditure saw a year-on-year increase of 14%, totalling RMB 1.76 trillion (approx £195 billion). Last year’s spend accounted for 2.1% of the country’s GDP, and China is on track to achieve its target of R&D spend accounting for 2.5% of GDP by 2020 (by comparison the UK’s R&D spend represented 1.67% GDP in 2016). 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 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 China’s ten-year citation count has increased by 30% over the past ten years. China’s strongest disciplines are Physical Sciences, and Engineering, followed by Mathematics, Biological Sciences, Environmental Sciences, Business and Clinical Sciences in that order. Over the past 15 years, the number of foreign-run R&D centres in China has increased from 200 to over 1,500.

‘Innovation’ is the number one guiding principle in China’s 13th Five Year Plan as the path to sustainable economic growth; 84% 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 2016 this was already 12%.

China weights its R&D spending very heavily towards development; of the total spent in 2016, 84% was spent on experimental development, while 10.5% was spent on applied research and just 5.5% 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 77.6% of the total spend.

Value of exports to China: £16.8bn
Value of imports from China: £42.3bn

ONS Pink Book 2017

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. In 2011, the UK overtook Japan to become China’s second-largest science partner in terms of co-publications. Collaboration can produce significant impact gains to both countries; 12% of UK-China papers are cited four times above the world average, compared with 8% for UK-only and 7% for China-only papers. The UK-China science and innovation relationship is now 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.

Under the UK-China Research and Innovation Partnership Fund, part of the Newton Fund, the UK and China are working together in partnership to tackle global challenges. Since April 2014, over 800 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

Since the establishment of the UK Research and Innovation China (UKRI China) office, a total of £275 million in joint investment across 257 joint projects has been brokered.

As well as the Science and Innovation Network, other key UK partners with a presence in China include UKRI China, the British Council, Department for International Trade (DIT), the UK Intellectual Property Office and the China Britain Business Council.

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, as well as promoting UK science and innovation excellence in China more widely. We work on seven priority areas: agri-tech, clean energy, digital economy, life sciences, space, future manufacturing and future cities. 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 £69m in export wins for the UK, £573m in joint R&D funding and £3.3m in investment to the UK.

Recent successes include:

- SIN supported Innovate UK in securing match funding for their first regional calls in China, with Shanghai, Jiangsu and Guangdong. In total the calls are worth £26m and will tackle industrial challenges and urban innovation challenges through developing ideas that could lead to new commercial solutions and future innovative products, processes or services.
- SIN project work has led to the training of some 400 professionals across China in international best practice in IP and technology transfer. The adoption of international best practice will significantly improve the environment for commercialising UK technology in China.
- UK-China research results, supported with Newton Funding, were pivotal to the Chinese Ministry of Agriculture banning the antibiotic Colistin as an animal feed additive in China, a major step in the fight against AMR. Estimates suggest that AMR could cause over 1 million premature deaths in China alone by 2050, and 52% of antibiotics used in China are in livestock.

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