

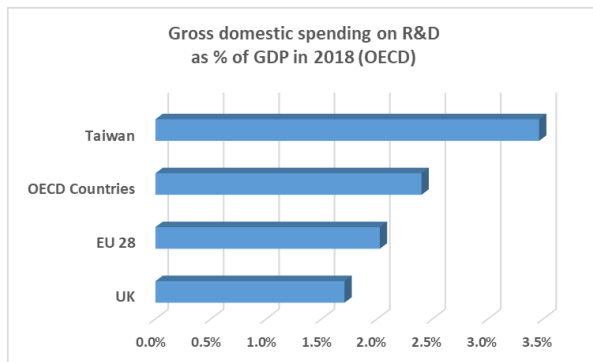
UK Science & Innovation Network Snapshot

Taiwan

Taiwan's Science and Innovation Landscape

Taiwan is the world's 21st largest economy. It spends 3.46% of its GDP on R&D (1.65% for the UK) – one of the highest in the world. Taiwan's total R&D spending in 2019 was £15.9 billion with over 262,000 employed in R&D (251,000 in the UK). It has an internationally renowned tech-sector including the world's largest chipmaker (*TSMC*) and the largest contract electronics manufacturer (*Foxconn*).

4th
Taiwan's position in
2019 WEF's Innovation
Capability Index



The *World Economic Forum* Taiwan ranks 4th in the world for Innovation Capability (UK 8th) and 13th in the *World Bank's Ease of Doing Business* rankings.

UK-Taiwan trade continues to grow rapidly with a 30% increase over the past 3 years. Several major UK engineering and pharmaceutical companies now have operations in Taiwan including: ARM, Astra Zeneca, GSK, Mott Macdonald, ODE Ltd, and Oxford Instruments.

In 2016 Taiwan announced the 5 + 2 policy — a plan to innovate in the fields of Biotechnology, Defence, Green Energy, Smart Machinery and the Internet of Things along with the promotion of two core concepts: the Circular Economy and Agricultural Development. This policy is closely aligned to the 4 *Grand Challenges* of the UK's industrial strategy of AI and Data Economy, Clean Growth, the Future of Mobility, and an Ageing Society.

Taiwan has a highly educated workforce with >95% of high-school graduates entering higher education (UK 50%). There remains a strong technical focus within universities with >25% of all degrees related to engineering although the arts have started to attract more students in recent years. Taiwan has also launched a plan to develop into a bilingual society by 2030.

Despite being famous for several mega-corporations, 78% of all employed persons in Taiwan work for SMEs. These smaller companies are introducing a new 'disruptive innovation' streak into Taiwan's business ecosystem which complements the more structured innovation techniques implemented by the larger corporations.

Beyond its dominance in semiconductor and electronics manufacturing, Taiwan has significant strengths in biotech accounting for 19% of the listed companies in Taiwan (compared to respectively 6% and 7% of China's and Hong Kong's listed companies). It also has ambitious plans to ramp up renewable energy with a target of 15.7GW of offshore wind generation capacity by 2035. Taiwan is currently ranked as the second largest offshore wind market in Asia.



A reputation for strong IP protection has also been important in assisting the development of its tech industries and will assist with future emerging technologies.

Taiwan's northern and western coasts are more industrially developed with electronics and technology clusters in the north, precision machinery on the west coast, and petrochemicals and heavy industry in the south west. Well-developed infrastructure allows efficient transfer of goods within supply chains.

Taiwan S&I Actors

There are a number of world-leading research institutions and universities with funding provided by both the *Ministry of Science and Technology (MoST)*, for pure academic research, and the *Ministry of Economic Affairs (MoEA)*, for applied research. The key research bodies include:



The Industrial Technology Research Institute (ITRI) is one of the world's leading research institutes that has played a key role in Taiwan's economic growth story and its development into a high-tech innovation-driven economy. Established in 1973 and funded by *MoEA*, *ITRI* has nurtured more than 260 companies, including two of the top five global semiconductor companies – *TSMC* and *UMC*. *ITRI's* achievements in technological innovation have led to it being named as one of the world's top 100 innovative organisations by Clarivate Analytics. *ITRI* has nearly 6,000 staff and has registered over 20,000 patents.



Academia Sinica is Taiwan's leading academic institution and conducts research in the areas of science and humanities. Founded in 1928, it consists of 32 research institutes and centres covering a wide range of academic disciplines. It employs over 1800 PhD level researchers, including 8 Nobel laureates. It was ranked 18th in Reuters World's Most Innovative Research Institutions in 2019.



National Applied Research Laboratories (NAR Labs) is a non-profit research institute with a mission to create R&D platform based on fundamental Science and Technology, funded by MoST. It consists of 8 labs focussed on areas including semiconductors, high-performance computing, space science, oceans, and earthquake engineering.

In addition to these institutions, Taiwan's top universities have a good track record as centres for science and innovation. There are 11 Taiwanese Universities in the 2019 QS World University top 500 rankings. National Taiwan University is the highest ranked at 68th place and also ranks 120th in the 2019 *Times Higher Education Rankings*. Taiwan was ranked in the top 10 for maths and science in the 2018 *OECD Programme for International Student Assessment (PISA)*. The *12-Year Basic Education Implementation Plan*, which commenced in 2014, attempts to provide students with a more holistic education with particular attention paid to developing problem solving capabilities and team work with promotion of innovative thought a key targeted outcome.

Science and Innovation Network (SIN) Taiwan

The SIN Taiwan team is based in the British Office Taipei. We work to support UK science and innovation policy objectives including encouraging research and early-stage business exchanges in areas of mutual interest. In 2018 the Innovative Industries Programme (I²P) was launched with the aim of strengthening UK-Taiwan collaboration by sponsoring bilateral researcher placements. If you're interested in exploring cooperation opportunities in Taiwan please feel free to get in touch with us.

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