

Korea's success through innovation – an important partner for the UK

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In the Spring 2007 edition of Science in Parliament my counterpart in the British High Commission, New Delhi, quoted from the recent Demos report: *“Atlas of Ideas: How Asian innovation can help us all”*. This report discusses the current dynamics of technology and science in China, India and South Korea, and suggests how the UK might respond.

South Korea is certainly a country that has derived success – and wealth – through innovation. A largely agrarian economy and a Japanese colony before WWII, the country was then devastated by the Korean War in 1950-53. The South was one of the poorest countries in the world 50 years ago. And much of the industry that had existed previously was in the part of the country that became North Korea.

By the early 1970s there was still little to indicate that Korea would become a developed nation, and the world's 11th largest economy, within three decades. But with support from the US – and following the example of Japan – Korea began to industrialise rapidly. A strong work ethic and rigid social values certainly helped. But innovation was key, and followed the basic formula: take existing technologies and processes from other countries, copy them, improve them and develop them at low cost.

Becoming the 11th largest economy is no mean feat considering South Korea is a nation of less than 50 million people. Of course this is an advantage in that there is not a huge population to support such as in China or India, but the pace of development has been remarkable nonetheless. South Korea is now the world's largest shipbuilder, the second largest steel producer, is involved in the construction of many of the world's tallest buildings, is the largest supplier of DRAM memory chips and is home to two of the

world's leading LCD and Plasma television manufacturers. Around 40% of its electricity supply is generated from nuclear power stations

Samsung is the 3rd largest mobile handset maker in the world, LG refrigerators and air-conditioners boast a range of high-tech functions and almost every car on Korean roads seems to be a Hyundai (with a GPS Navigation System of course). Broadband Internet penetration is the highest in the world (at around 70% of the population), around 4.5m people subscribe to mobile television (broadcast by satellite and terrestrially) and the Government plans to have “a robot in every home” by 2020. Korea is now one of the most high-tech countries in the world, with good infrastructure, a per capita income nearing US\$20,000 and an increasingly high standard of living.

How did it get there? Korea managed to create thousands of engineers and technologists within a few decades. Many took advantage of studying overseas, primarily in the early days in the US. But Korea also expanded its stock of state and private universities and government research institutions. It has separate national research institutes for Electronics & Telecommunications, Chemical Technology, Bioscience & Biotechnology, Energy, Aerospace and many more. The Government is committed to increase gradually the share of R&D expenditure in the national budget to 7%, a quarter of which will be used to support basic research. South Korea now has almost as many scientist and engineers as the UK, more if measured on a per capita basis.

During the peak growth years, a select few Korean companies were given government support in terms of contracts and licences, as well as the freedom to grow independently. This

created a number of large corporations (Chaebols) that grew rapidly and still dominate the corporate landscape. These new companies used innovation to adapt and develop existing technologies and to refine manufacturing and processing methods imported from outside. As the companies grew, their demand for engineers and technologists had a pull-through effect on the talent pool, which helped attract members of the diaspora back to South Korea.

Over two-thirds of R&D expenditure in Korea comes from the private sector. And most of this is by just a few companies (around 40% being from Samsung alone).

It is not hard to see why the British Government believes it is important to maintain and build research links with South Korea. A UK-Korea “Science Technology and Innovation Partnership” was established in 2004. This brought together the existing bilateral programme on basic science with our trade and investment activity in high-tech industry sectors. Each Government commits around £200,000 to supporting bilateral initiatives such as scoping missions, trade missions, seminars and placements. Focus areas have included ICT, alternative energy, Space, nanotechnology and biotechnology.

Outcomes include successful bids for joint research funding, a project under consideration to construct and launch a joint satellite, a UK-Asia forum on influenza vaccine research, UK training courses on science policy and management and initiatives to help promote the participation of women in science and in engineering. The British Council also runs a programme promoting the public understanding of science. The partnership is working. But it needs to be sustained if it is to keep on delivering real outcomes for both parties.