

# International Innovation and Technology Investment

## Minister's Speech

- Thank International Technology Transfer Network, Beijing Technology Exchange & Promotion Centre of the Beijing Municipal Science and Technology Commission for their help in organising this event)
- My visit follows last year's Prime Ministerial Summit, and visits by UK Ministers for economics and finance, education and trade. Number and pace of exchanges demonstrates importance of the relationship between our two countries. Symbolises UK Government's commitment to closer working relationship with China for mutual benefit.
- Central to this is our partnership in science, research and innovation. As Minister for Universities and Science, I seek increased UK collaboration with China to enhance our partners for growth through science, innovation and technology.
- China success story - over 30 years average rate of growth nearly 10% per annum; share of world GDP has risen from 1% to 8.5%. Not only the world's second largest economy, but also the largest exporter of goods.
- China has unequalled history in developing new technology. Leading position continues to this day:
  - world's fastest Tianhe 1 supercomputer
  - now the world's second largest publisher of research
  - already in the world's top three for citation impact in physical sciences, engineering and maths.
- plans for space station;
  - successful Chinese manned flight programme - third nation (after the US and Russia) to independently send humans into space
  - in 2012 China plans to launch two manned spacecrafts, Shenzhou IX and Shenzhou X, to dock with its space module Tiangong-1 due to be launched later this year.
  - the Chinese will probably be the next nation on the moon and plans for mission to Mars

- future plans for the development of Chinese space station,
  - UK remains ready to participate where appropriate,
  - Following the docking experiments the plan is to launch a space laboratory called Tiangong-2 in 2016. The results will be used to develop a space station, planned to be operational by 2020 with 2 / 3 astronauts
  - some of these plans will be discussed at the 7<sup>th</sup> UK-China Space Workshop to be held in the UK at the end of August this year”
- UK science success - 1% of world population authors 8% of global scientific papers and 14% of highest cited papers. From double helix to World Wide Web and last year’s Nobel Prizes in medicine, physics and economics, British research continues at the forefront of breakthroughs, affecting everyone’s lives.
  - UK is home to three of the global top ten world’s best universities. These institutions have a global impact. UK helps educate 85,000 Chinese students annually. 20% of academic staff in our Universities are from abroad, a figure which is much higher in leading research universities.
  - We gain great rewards:-
    - UK attracts more R&D investment projects than any other European country.
    - Quality of our research base is credited as the most important factor in attracting these projects.
  - Importantly, UK achieves excellent, high quality underpinning research through independent and transparent funding decisions, taken through peer review and executed by agencies outside Government.
  - Strong record of exploiting university research and turning it into commercial applications. In the last five years, thirty one university spin outs launched with initial public offering value of £1.5 billion, and ten spin out companies acquired for a total value of £1.9 billion. The UK is already amongst Europe’s leading group of innovative nations [EU Innovation Scoreboard]. We deliver a higher share of growth from science-based innovations than any other industrial nation.

## **UK Growth Agenda**

Global economy has experienced difficulties. Has impacted UK and China in different ways.

Growth rates remain relatively low in Europe and the US. UK Government taken difficult decisions to rein in government spending.

- Yet, recognise science and technological development is a core British strength and key to our recovery. In outlining our domestic strategy for growth the Government promised to put more money into education and training for our young people. We reaffirmed our commitment to science. Despite public spending pressures, the overall level of government funding for science and research programmes has been protected, and in some areas – such as medical research – we are increasing investment.
- To build on our scientific excellence last year, we announced a Blueprint for Technology to promote technology- based innovation as a key driver of growth. Blueprint focuses on three areas:-
  - setting the right framework for enterprise and business investment.
  - getting behind those industries where the UK has clear potential to maintain competitive advantage.
  - making it easier for new businesses and innovation to flourish and help bridge the gap between innovation and commercial success.
- UK is creating a new network of elite Technology and Innovation Centres to commercialise new and emerging technologies in areas where there are large global market opportunities and a critical mass of UK capability. Over £200m is being provided.
- Technology Strategy Board launched a strategy on ‘Concept to Commercialisation’ to help drive economic growth through innovation. It supports the Government’s ambitions and reviews on growth. It focuses on helping business navigate the difficult territory after a concept or idea has been initially developed, but before it can enter the market and be fully commercialised.
- UK are also investing in the £220m UK Centre for Medical Research and Innovation as an entirely new institute with a distinctive vision of how medical research should be conducted. It will play a key role in creating the foundation of knowledge on which this century’s improvements in health will be based.

## **UK and China: Partners for Growth**

- China and UK share the same goals: economic growth; create jobs and prosperity; grow successful companies. To achieve, both need to work together more closely.
- China is important to the UK because of the unprecedented speed and scale of its growth as a research nation:
  - China's output of research papers rose fivefold between 1999 and 2008
  - China's innovation capacity is also rising fast: for example becoming the world's third largest innovator in non-fossil fuels.
- major innovator in non-fossil fuels
  - new 5 year plan targets: non-fossil fuel consumption should increase to account for 11.4% of the nation's total fuel consumption by 2015 and 15% by 2020;
  - A projected \$600bn (£370bn) is committed to growing sectors such as information technology, clean energy, environmental protection and scientific research and innovation
  - The 12<sup>th</sup> five year plans projects rail infrastructure investment to be RMB3 trillion (\$463 billion). This is about over RMB1 trillion greater than the 11<sup>th</sup> five year plan and about 10 times greater than the 10<sup>th</sup> five year plan.
  - The high speed train – Harmony 380A – developed by CSR has hit a speed of 486.1 km/hr.
  - 4G technology is expected to be in place by 2012. China is promoting its capabilities in this area. Network is 50 times faster than current 3G network. Expected to generate huge investment in network construction and services development
  - China aims to have 500,000 new energy vehicles on the roads in the next three years and green cars will account for 5 percent of total passenger car sales. Estimated RMB115 billion (US\$17 billion) investment over the next 10 years for fuel-efficient cars.
- The recent Royal Society report 'Knowledge, Networks and Nations' noted the shift to an increasingly multi-polar world underpinned by the rise of new scientific powers such as China. International is increasingly important. Over a third of all articles published in international journals are internationally collaborative, up from a quarter 15 years ago.

*Reasons for **optimism** – UK & China are ideal partners for growth:*

- *UK-Chinese research strengths complementary*

- *UK is important to China because of our status as the most productive G8 research nation; a strength on which UK economic and social progress is built. UK researchers are strong in theory development, and in research methodologies that put those theories to stringent tests. Our researchers have learned over the past few decades to work across boundaries, encouraged by multi-disciplinary funding opportunities offered by the Research Councils and other bodies. They have learned to consider the potential impact of their discoveries, so that research supported by public funds brings the maximum return in benefits to society.*
- I believe UK have much to offer China. China's researchers themselves see this: that's why the UK is among China's fastest-growing international partners. What then does China offer to the UK? Two benefits stand out. First, China's size and diversity make it an essential site for research in many areas of world importance, including environmental change, public health, and food security. Secondly, China's well-resourced labs and increasing numbers of talented young researchers enable promising lines of research to be pursued more vigorously than would be possible in the UK alone.
- China is already the UK's second largest research partner in engineering and computer science and third largest in materials and mathematics, with overall collaboration quadrupling in a decade. UK-China joint papers show significant impact gains: 12% of the nearly 2000 joint papers a year are highly cited (>4 times world average), compared to 8% for UK only and 7% for China-only papers. [Evidence Ltd for RCUK May 2010]
- Current UK research projects in China, undertaken with Chinese partners, are worth approximately £80m (approx 854 million Chinese Yuan Renminbi). Joint research collaborations are growing more quickly than China's other global collaborations (Evidence Ltd 2008). Leading UK research institutes have already established long standing links.

During my visit

1. the UK's Science and Technology Facilities Council has signed collaborative agreements with the Chinese Academy of Sciences to further develop co-operative research activities in all fields of science and engineering within their respective remits, including advanced Research Infrastructures such as Neutron Sources and

Synchrotrons and their use for Life Sciences, Chemistry, Materials and Nano-Technology research, amongst many others, together with the development of the technologies needed to create such Research Infrastructures.

2. The John Innes Centre of the Biotechnology and Biological Sciences Research Council has signed collaborative agreements with the Chinese Academy of Sciences
  - *BBSRC John Innes Centre agreement with Chinese Academy of Sciences*
    - *The JIC / CAS MoU will be signed by Dale Sanders (Director of JIC), puts in place initial plans for mobility, with a business plan to be developed by end of August 2011.*
    - *possible second phase, should this be agreed, is to establish a joint research centre in China and named "CAS-JIC Joint Center".*
    - *JIC was recently listed as the top laboratory in the world for animal and plant sciences based on citation analyses*
    - *JIC has many alumni and colleagues throughout China.*
    - *first such undertaking the JIC has entered into with another country, a recognition of the value and strength of the research collaborations between the UK and China.*
    - *establish and implement cooperation in the area of Plant and Microbial Research for the pursuit of improvement and impact in addressing Grand Challenges in Food Security, Living with Climate Change, Lifelong Health and Wellbeing and Sustainable Bioenergy.*
3. The UK's University of East Anglia has signed an agreement with Fudan University to establish the Fudan Tyndall Centre to research global environmental change, especially climate change. The two universities have also agreed a commercial joint venture to deliver low carbon design and promotion work. Top on the JV's agenda is establishment of low carbon exemplar/demonstration science parks in Shanghai and in Hebei Province, to undertake research, promotion and demonstration of low carbon practice and concepts. It is hoped that this initiative will effectively help to facilitate collaboration and exchange of international technologies.

In addition

4. China Energy Conservation and Environmental Protection Group (CECEP), China's largest enterprise in energy conservation and environment protection, is already working with the UK's Carbon Trust to invest in low-carbon technologies and to forge

links between low-carbon industries in China and the UK. CECEP recently visited the UK's Rutherford Appleton Laboratory where scientists have developed a novel hydrogen storage material and other technologies that will be key to a clean Energy future

- History of co-operation in space:
    - SSTL on small Earth Observation satellites: have sold one, and are negotiating further leases
  
  - longstanding research institute links
    - Oxford University and Fuwai Hospital established a **£40m Oxford China Centre for International Health Research** in 2009 which is developing treatments for heart disease and strokes.
    - UK and China have jointly invested **over £20m\*** to commercialise science through Innovation China UK and Science Bridges. These programmes have supported the translation of basic science into products and have led to the creation of a spin-out company, patents, and joint research papers including the development of new treatments based on Traditional Chinese Medicine \*UK and China's cumulative funding under the ICUK and Science Bridges – includes £8m China investment into Bradford TCM project
    - first joint UK-China research programme launched in 2009 and the UK has invested over £20m\* into areas including materials, energy, and datasets alongside Chinese funding. [\*cumulative total of EPSRC, ESRC, MRC and BBSRC investment]
    - The UK-China Sustainable Agriculture Innovation Network (SAIN) was set up in 2008 to provide a framework for collaboration on agriculture and climate change. Total funds are £2.3m with UK providing £2m.
5. *BioEden, based on the Daresbury Science and Innovation Campus, has secured investment from the Chinese company TCI International, to set up a Stem Cell storage bank facility in China.*
6. *The UK's Engineering and Physical Sciences Research Council has provided £2.45m, with matched resources from the Chinese Academy of Sciences to fund five research projects to address challenges in solar energy and fuel cells and contribute to tackling energy security and climate change.*

7. *A £10m donation has led to the opening of the Dickson Poon China Centre at the University of Oxford in the UK. This centre will bring together academics and will encourage original research, publications, joint projects and collaboration with scholars and institutions in China, the UK and elsewhere*
  8. *Sharing experience and knowledge through the Global Alliance for Non-Communicable Diseases.*
  9. *UK pharmaceutical companies, notably AstraZeneca and GSK, have established large research operations in China.*
  10. *Other major commercial collaborations include Castrol's R&D base in Pudong and BP's and the Chinese Academy of Sciences' joint Clean Energy Commercialisation Centre.*
- In achieving **growth**, both of our countries see science and innovation as a key element of our strategies – to create jobs, develop society and enhance quality of life. Economic growth through innovation is vital and underpinning this is support for helping business to develop concepts or ideas to commercialisation.
  - In terms of UK and China opportunities for innovation collaboration must mention the Innovation China UK (ICUK) programme, the first UK-China collaboration to promote joint innovation and knowledge transfer.
  - This UK £4.9 million initiative was led by Queen Mary, University of London. The Chinese Ministry of Science and Technology and local governments provided complementary funding to support Chinese part of the joint R&D.
  - Over the last three years of ICUK, there have been:
    - 72 projects in healthcare, materials, engineering and low-carbon technology.
    - involvement of over 270 UK/Chinese academic partners leading to 25 joint research papers submitted for publication.
    - Chinese match funding is worth £1.95 million,
    - seven joint projects have secured £1.3 million follow-on funds from the UK and Chinese public sources in order to develop further.

- Over 80 UK and Chinese companies have been involved and a number of joint projects are expecting commercial outcomes: 14 new patents have been filed, 2 income-generating licensing agreements have been signed and one spin-out company has been created.
- ICUK is widely recognized as a successful programme. Over the next two years ICUK, through Queen Mary University, will work with the British Embassy and today's organisers – Beijing S&T Commission – to continue this work through a series of technology partnering events, including agri-technology, low carbon buildings and water technologies. Such work is key to building a sustainable partnership and developing joint innovation projects.

#### Future collaboration

- Very positive; our best scientists, working together, will become even more successful.
- My visit is to agree with Mr Wan Gang, Minister for Science and Technology, a forward work plan. We meet this afternoon at the UK-China Science, Research and Innovation Joint Commission. The UK envisages an ambitious programme of research engagement with China over the next five years, building on the twelfth five-year plan. This recognises the priorities and strengths of the two countries, the capacity to deliver excellent research and the potential for co-investment from China. As in science, UK believes that excellence and openness are vital for success in international innovation.
- UK appreciates assurances that China places foreign-invested companies and domestic companies on an equal footing. Openness to the best technology, wherever it is sourced in the world, is essential to provide the incentives for companies to develop competitive technology and invest in China.
- The UK has benefitted hugely by welcoming international trade and investment, which in turn has driven up the performance of domestic supply chains. The presence of international companies brings access to new markets and the expertise to innovate in a very complex global environment. UK is open to such business and talent, and proud that 39% of private sector research in the UK is from businesses based abroad.

- This area, like many others, relies on Intellectual Property rights being upheld and enforced. Ultimately, it is in the interests of companies and consumers that intellectual property rights are upheld and enforced. Intellectual property is a key to unlocking innovation, bringing new technologies to our people and reinforcing our strong relationship.
- UK encouraged by China's 2011 Action Plan on Intellectual Property and recent statements from Premier Wen Jiabao about commitment to improve the global intellectual property system.
  - *China's State Intellectual Property Office (SIPO) aims to "deepen bilateral patent co-operation and exchanges with the US, UK, France, Germany, and to implement bilateral IP cooperation agreements."*
  - *China's Ministry of Public Security told the head of the UK IPO that it is keen to co-operate on enforcement policy.*
- Protecting Intellectual Property rights will allow our researchers, our creators and our people to continue to learn, to create and to access new technologies in support of innovation.
- UK strengths across research, high-tech goods and knowledge-intensive services that are highly complementary to China's economy. Scientific research and innovation are no longer purely domestic affairs, and more openness brings benefits. Governments that develop means to support this effectively will be the ones that secure the greatest long term benefits for the countries they govern. The G20 has agreed that it is now more than ever vital to promote open markets as a route to growth.
- Share China's wish to increase exports, including high-tech goods and services. To do this UK wants to put in place strong incentives to make this commercially and scientifically viable.

*Other new measures include:*

- *a new Entrepreneur Visa to make sure that if you have a great business idea, and you receive serious investment from a leading investor, you are welcome to set up your business in the UK.*
- *an independent review of the intellectual property framework, including considering whether there are benefits in a US style 'fair use' copyright provision.*
- *a new 'peer to patent' system which draws on the expertise of people across the globe to help maintain patent quality.*
- *UK also introduced lower business taxes to help boost the economy and attract more foreign investors to come to the UK.*
- *In conclusion, I believe that the UK and China are ideal partners for growth in science and innovation. I am delighted at the achievements that we can already celebrate together and look forward to developing the partnership further.*