

inward investment? Part of the answer lies in the Government's Science and Innovation Network (SIN), which champions UK science and innovation on the global stage.

SIN is a network of 90 experts based in 28 countries. We combine British and local talent and are embedded in Embassies, High Commissions and Consulates across the world. SIN's mission is to identify and help harness the value of science and innovation discoveries and investments overseas for the benefit of the UK. Our small size and regional

... improvements in intellectual property protection ...

structure enables us to respond quickly to local opportunities. The Science and Innovation Network spans four regions: the Americas, Europe, Middle East/Africa/India, and Asia Pacific. And we have three key roles: influencing, informing, and collaborating.

With the emerging science powers, influencing is central to securing new UK innovation opportunities. For example,

... British researchers are the most efficient in the G8 ...

through our network we have achieved significant improvements in intellectual property protection and the Chinese government now recognise the benefits of reform. Our work has paved the way for deals in research and innovation, like a £45m joint R&D fund between Research Councils UK and Chinese counterparts, and a mapping deal for a British satellite company worth £110m.

And we have improved our performance in joint scientific research: the UK has risen from third to second place partner of choice for China, beaten only by the USA.

SIN has an important role in reporting information and analysis from around the world back to UK policymakers. Our expertise and access is critical to inform UK domestic policy and direct our international strategy.

For example in recent years SIN teams have helped the Government to understand where competitor nations are focusing their R&D efforts, to help UK Ministers direct public R&D expenditure to the right areas. We have also reported on new innovation policy interventions and shaped the roll-out of Britain's *Catapult* centres, which are bringing together the best of academic and private sector science to develop new products and economic growth.

SIN works with British organisations to stimulate new science and innovation partnerships overseas. In India, we have supported Research Councils UK to agree over £100m deals in joint programmes including green energy, stem cells and food security. We have also supported new partnerships in Southeast Asia, where top British food researchers are working on a £300k joint programme with Vietnam to develop new strains

of rice that are resistant to climate change. And a new partnering programme in China has already attracted £6.5m Chinese funding into British technologies including heat-sensing coatings to prevent baby burns.

SIN officers are located close to the best opportunities and with the right skills and mission to deliver for the UK. Other established science powers like France and Germany deploy more staff and funding into overseas R&D engagement than we do. But SIN's responsive network and focus on innovation means we are better placed to help Britain go for gold.

Readers of Science in Parliament are invited to make contact with the Science and Innovation Network teams – to find out more, please visit: <https://www.gov.uk/global-science-and-innovation-network>

FRENCH RESEARCH AND HIGHER EDUCATION REFORM



Matthew Houlihan

In March 2013, the French government published a draft law aimed at reforming its university and public research systems which have been criticised for being state-centric, bureaucratic and complex. What are the main measures and what could this mean for the UK?

RESEARCH AND HIGHER EDUCATION IN FRANCE

France has a strong, well-financed research system. The OECD calculates that the equivalent of \$51bn was spent

on R&D in France in 2011 when public and private sector expenditure is totalled up. This compares to \$39bn in the UK, and \$19bn in Spain. This investment produces

internationally renowned researchers – in March this year, for example, Louis Pouzin was announced as a co-winner of the Queen Elizabeth Prize for Engineering for his ground-



breaking research in the 1960s that paved the way for the birth of the internet. Serge Haroche won the Nobel Prize for Physics last year and five of his compatriots have received Nobel prizes in scientific disciplines over the past ten years.

Furthermore, France boasts the largest fundamental research organisation in Europe – the publicly-funded *Centre National de la Recherche Scientifique* (CNRS) which has a budget of near €3.4bn in 2013 and employs 11,415 researchers and 14,090 engineers and support staff. It has other public research organisations to be proud of too – the CEA is a powerhouse of energy research with a €4.3bn annual budget and CNES is Europe’s premier national space agency. France also has one of the world’s most generous schemes to incentivise private sector R&D spend through its tax system.

In terms of Higher Education, France has strong elite universities (the *Grandes Ecoles*) and has some of Europe’s leading business schools.

REFORM

Despite these strengths, the current French government sees the various initiatives introduced by previous French governments to support research efforts and to modernise higher education as confusing and damaging. It has criticised the public support for research as being too complex and recent reforms to universities as leading to funding shortages. French universities are also perceived to be lagging in international comparisons. In the

2012-13 Times Higher Education World University Rankings, for example, the highest placed French university comes in at 59th – there are eight British universities ranked above it (many in France argue that the criteria used to compile these lists work against French universities).

Following a consultation process involving a number of hearings across France, Geneviève Fioraso, France’s Higher Education and Research Minister introduced a draft law which she hopes to use to reduce burden on researchers (eg in terms of evaluation of performance and bidding for funding), widen participation in higher education and simplify its public research system. However, despite modest moves towards greater autonomy for public universities from the state introduced under President Sarkozy, there are no real attempts to advance in this direction.

Some of the main measures in the draft law that could be of interest to a UK audience include:

- Attempts to attract more foreign students to France by allowing more courses to be offered in English. This complements legal changes introduced last year to lift certain restrictions on the ability of non-EU students to work in France following their studies.
- A drastic reduction in the types of degree that can be awarded in France. The French government points out that there are currently around 10,000 different

types of masters degree on offer in France – something that it sees as being confusing to businesses who are looking to take on graduates.

- A doubling of industry placements for students as part of their studies from the current level of 110,000 per year.
- The scrapping of France’s current research and university evaluation agency with the promise of a lighter-touch regime to follow.
- The introduction of more on-line courses, both through existing universities and through a new institution called *‘France Université Numérique’* with a view to widening access to higher education.
- New, internationally visible, knowledge clusters. The government wants to see existing research centres and higher education institutions that are in close geographical proximity working more closely together, sharing a common strategy and objectives, especially relating to research and technology transfer.

FRANCO-BRITISH LINKS

So why does all of this matter to the UK? France is an important research and higher education partner for the UK. Even without considering the deep private sector R&D links, there is a vast amount of collaboration between researchers in France and in the UK. According to the French

Embassy in London, 11.7% of internationally co-authored papers involving a UK academic have a French partner. In this regard, France is only behind the US and Germany as a partner for UK academics. French researchers, businesses and universities are also important partners for the UK when it comes to forming consortia to make bids under the EU’s €10bn per year research funding programme. And France is an invaluable partner when it comes to international research facilities such as CERN and the ITER nuclear fusion research facility that are too expensive for either country to build on its own. Through the Erasmus programme, UK universities received 6,455 French students in 2010/11 with 4,254 British students going the other way and there were 13,325 French students at British Higher Education institutions in 2010/11 in total.

The changes the French government hopes to introduce through the draft law show that France is continuing to seek to up its game in terms of the support it offers its research and higher education communities and a clear recognition that it needs to think more and more internationally to strengthen its institutions. This clearly poses some potential challenges for UK universities, especially in terms of attracting foreign students, but also hopefully opportunities, for example through offering joint courses and ever stronger research collaboration.

The draft law will now pass to the French parliament where it will be debated.

British Embassy Paris Science and Innovation Team

The British Embassy in Paris has a Science and Innovation team which facilitates strategic science and innovation-related collaboration between the UK and France. If you think you could benefit from our help, please contact:

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