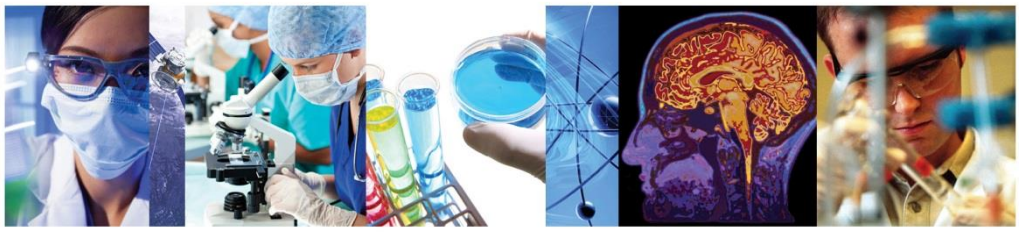
UK Science & Innovation Network



UK Science & Innovation Network Country Snapshot

France

French science and innovation landscape

French position in 2019 Global Innovation Index:

16th

Position of UK in France's European collaboration 2007-16:

3rd

According to OECD data, in 2017 gross domestic spending on R&D for France was 2.19% of GDP (1.66% for the UK, 1.97% for the EU). The French S&I 2020 budget is estimated at €19.6 billion.

France was 7th ranking nation in terms of global scientific publications in 2017 (UK 3rd) and 6th in terms of numbers of citations (UK 2nd). France ranked 11th in the 2018 EU Innovation Union Scoreboard (UK 7th) and 16th in the 2019 Global Innovation Index (UK 5th). On industrial R&D investment by the top 2000 R&D investing companies, France ranks 2nd behind Germany (UK 3rd, DE 1st), and comes 3rd, behind Germany (1st) and the UK (2nd) as being a prime location for the top 2000 R&D spending companies.

France engages in a high level of international collaboration, comparable to that of Germany and the UK. The EU and US are France's top scientific partners globally. As a collaborative partner in the EU's Horizon 2020 research and innovation programme, the UK ranks 3rd for France, whilst France is ranked 5th as a collaborative partner for the UK.

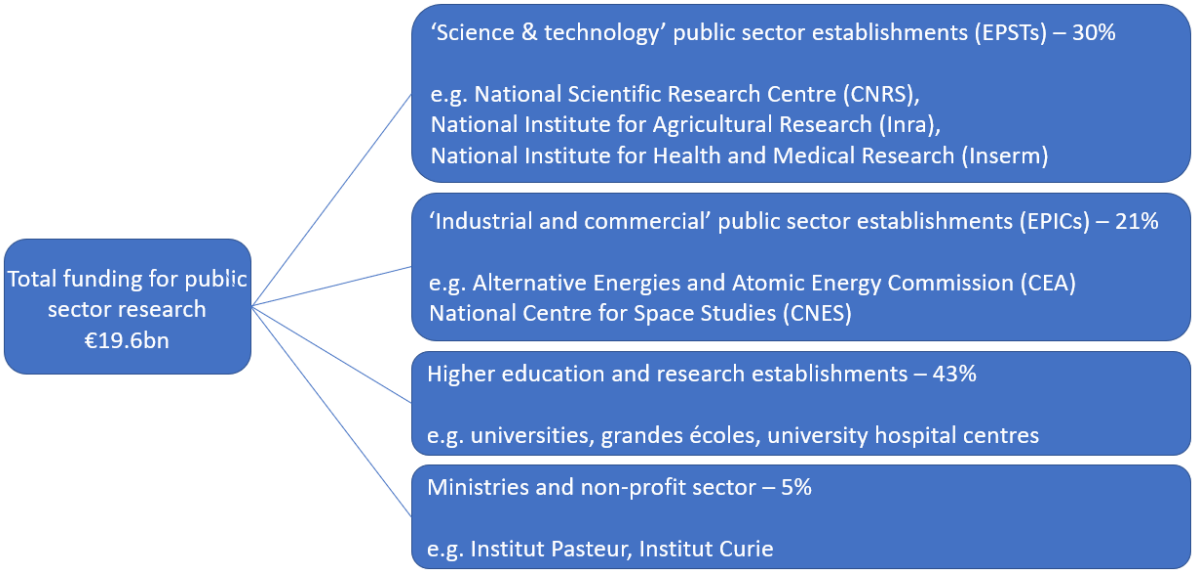
French S&I Landscape and Actors

Public R&D spending in France tends to be dominated by large, state-funded research organisations such as the CNRS (basic and multi-disciplinary science), CEA (alternative energies and atomic energy), INSERM (health and medical research), INRIA (digital science and technology) and INRA (agronomy). A small proportion of public R&D spend is allocated competitively via the National Research Agency, ANR, although the main state-backed players are in pole position to win funding through this route. France also hosts international agencies and research organisations such as the International Thermonuclear Experimental Reactor (ITER), the European Space Agency (ESA), UNESCO and the OECD.

Public sector research in France is conducted in dedicated research institutes (categorised by the French government into 'science & technology' establishments and 'industrial & commercial' establishments), higher education institutes and by Ministries and non-profit organisations (see below).[1]

Funding is mostly awarded in the form of grants to relevant establishments (63%), awarded by the Inter-Ministerial Mission for Research and Higher Education (MIRES), and through competitive funding calls (24%), awarded through public funding agencies such as the National Research Agency (ANR) and the Public Investment Bank (Bpifrance).[2] Other sources include commercial contracts, European and international funding sources, and revenue from IP or licensing agreements (EU funding accounts for around 4% of public sector R&D spending in France compared to around 8% in the UK).[3]

[1] 'L'État de l'Enseignement Supérieure et de la Recherche en France', French Ministry of Higher Education, Research and Innovation, 2019 (in French)
[2] 'Groupe de travail 1 : Financement de la recherche', September 2019, p17 (in French)
[3] 'Horizon 2020 in Full Swing: Three Years On', European Commission, 2018, p28



(Distribution of French budget)

As of 2016, there were around 175,000 employees working in public sector research, of which around 115,000 were researchers and 60,000 were research support staff (technicians, administrative staff etc.).[4] Around 74% of research staff and 87% of research support staff are civil servants ('titulaires de la fonction publique'). Just over half of researchers have a permanent position.

French S&I Strengths

France has S&I strengths across many subjects and sectors. In terms of numbers of publications and field weighted citation index France has particular strengths in medicine; biochemistry, genetics and molecular biology; immunology and microbiology; agriculture and biological sciences; engineering; physics and astronomy, and; computer science. France also has strengths in high tech and science-intensive sectors such as cyber, artificial intelligence, deeptech, blockchain and IoT.

French S&I Priorities and Policies

Reforms to fiscal policies have seen significant investment in R&D and innovation and increased international competitiveness through the Future Investments Programme (PIA in French) worth €57 billion - of which approximately €45 billion have been allocated or spent since 2010. Now in its third phase, the PIA aims to support closer collaboration between higher education and research in order to foster innovation; increase the value of public research through knowledge and technology transfer; and accelerate the modernisation of SMEs and medium-sized companies. In 2017 President Macron also launched an ambitious programme to fund innovation by protecting the research and innovation tax credit (estimated to cost € 6.2 billion/pa) and creating a €10 billion disruptive innovation fund from the disposal of state-controlled companies in the competitive sector whose interest (€300 million in a year) could be invested in innovative projects.

Since 2013, research institutes and higher education institutes have been partnering to form 25 higher education and research clusters across France, with at least one in each mainland region,[5] and with the aim of giving them more weighting in international rankings and more visibility with international students. In 2017, President Macron announced his intention to give universities more autonomy and allocate additional places for new students.

In February 2019, French Prime Minister Edouard Philippe announced the Government's intention to introduce new 'multiannual research programming' legislation in 2020.[6] In addition to providing longer-term clarity, the Government has stated three main objectives for this legislation:

[5] 'France reshapes its Higher Education and Research system into 25 clusters', French Ministry of National and Higher Education and Research, 2016

[6] 'Vers une loi de programmation pluriannuelle de la Recherche', French Government, February 2019 (in French)

- to reinforce the funding capacity for research projects, programmes and laboratories;
- to increase the appeal of scientific careers and attract skilled researchers nationally and internationally;
- to improve France's industrial competitiveness by strengthening collaboration between public and private research.

The proposal is that this reform will also identify 5-7 'grand societal challenges' in which France can develop world-leading technological solutions, and provide strategic support for these over 10-15 years.

UK and France Science & Innovation Cooperation

The UK research base enjoys strong links with France and continues to identify areas for bilateral and multilateral collaboration. As a collaborative partner in Horizon 2020, the UK ranks 3rd for France, whilst France is ranked 5th as a collaborative partner for the UK. France has participated in 5,240 collaborative Horizon 2020 projects, 2,200 projects of which have at least one UK beneficiary. Horizon 2020 projects with French participants have generated 27,600 scientific peer reviewed publications, out of which 18,800 publications were generated by projects with the UK. Horizon 2020 projects with UK participants have generated 37,100 publications. Furthermore, in 2016, 3,900 British students came to study in France a part of the EU Erasmus+ exchange programme (24 % of all Erasmus+ students in France); 7,770 French students headed in the other direction (25%).[7]

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[7] https://ressources.campusfrance.org/publications/mobilite_pays/fr/royaume_uni_fr.pdf (In French)