

Innovation in France: decisive assets

France is well positioned to be one of the most dynamic countries in terms of research and development (R&D) in coming years. Innovation is a longstanding French tradition – and France has a significant scientific culture. For example, among the 44 Fields medal winners rewarding the work of young mathematicians, France placed second in the final standings (nine medals, including one in 2006) after the United States (13).

Today, within the context of the globalisation of research and international competition, France is an attractive country with decisive advantages for establishments R&D activities: high quality scientific manpower, more autonomously reformed universities and renowned research teams, competitive clusters connecting companies and research centres, and competitive business costs.

Advantages of "Made in France" innovation

A concentration of highly qualified R&D human resources

In France, R&D accounts for 380,000 full-time equivalent (FTE) jobs out of all scientific positions. In terms of researchers alone, France ranks **sixth worldwide and second in Europe** (200,000 FTE researchers), behind the United States (1,3 million FTE), China (926,000 FTE), Japan (677,000 FTE), Russia and Germany. With an average growth of over 3% a year, the increase in the number of researchers in France has been one of the strongest in OECD over recent years.

Excellent public research

France boasts internationally renowned public research bodies that are present in all sectors of innovation: CNRS, CEA, Institut Pasteur, INSERM, INRA, INRIA, IRD¹, etc. Several top French schools are partnered with these players – Polytechnique, les Mines, the INSEAD, HEC – and also globally recognized universities (in the top 100 European universities, France ranks sixth with Paris VI according to the Academic Rankings of World Universities 2007 by Shanghai University).

The French system of research and innovation was significantly restructured after 2005. For example: public-private partnerships have been strengthened with the creation of Instituts Carnot. Currently being reformed: the simplification of administrative procedures for researchers, and the strengthening of links between research bodies.

✤ Focus on the CEA (Commissariat à l'Energie Atomique): A key player in R&D in energy, defense and security, information technology and health with:

- More than 15,000 researchers
- A 3.3 billion euro budget
- 97 new high-tech companies created

- Nine research centres, including Leti : 1,000 people dedicated to industrial innovation, one of the leading European centres for applied research in electronics, and one of the driving forces behind the Minatec® innovative cluster, and a member of the Minalogic competitive cluster (Grenoble).

A few French inventions and discoveries :

- Blood transfusions
- Automobile
- Photography
- Photovoltaic batteries
- Rabies vaccine
- Cinema projector
- Artificial radioactivity
- Smart cards
- Gene therapy

NOTE(S

¹Centre National de la Recherche Scientifique, Commissariat à l'Energie Atomique, Institut Pasteur, Institut National de la Santé Et de la Recherche Médicale, French National Institute for Agricultural Research, French National Institute for Research in Computer Science and Control, Institut de Recherche pour le Développement.



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A highly active private research sector

Private research, notably by highly innovative small-to-medium enterprises (SME), accounts for over half of the researchers (53%). It draws talent from all sectors ranging from high-tech bike manufacturers (Time Sport in Bourgogne) to software designers (Allegorithmic in Auvergne), to solar energy pioneers such as Emix (Creuse). It is particularly active in the life sciences sector.

"Business angels" – now numbering 3,000 – are developing rapidly in France in the form of private associative networks or venture capital companies.

✤ France ranked fifth globally and second in Europe behind Germany for the number of international patent applications in 2007 (6,250). In 2007 French companies applied for over 12,000 patents, a 3.3% increase compared to 2006.

Competitive clusters

France has linked key players by networks, and created international visibility through two key methods:

→ Competitive clusters – 71 in total, of which 17 are international – facilitate exchanges between researchers from public or private bodies and manufacturers, whether they be large groups or start-ups. Corporate partners of the clusters launched 455 projects since 2005, mobilizing 10,000 researchers, R&D spending of almost 2.8 billion euros and public financing of 929 million euros. These clusters are globalizing rapidly, as they currently include almost 500 enterprises and 173,500 employees from foreign organizations.

→ Research and higher education clusters (PRES) create local hubs of higher education and research activities to boost their international attractiveness and visibility.

A toolkit for R&D project success in France

France is equipped with the necessary tools to support innovation.

Residency permits that make it easier to attract foreign talent to France

✓ Available since the end of 2007, the Skills and Expertise permit is mainly directed at project leaders, particularly scientific ones. This multi-year residency permit allows the family of the project leader to get residency permits that include an automatic right to work.

✓ The new **"expatriated salaried employees**" temporary residency permit is also a multi-year residency permit which enables mobility of employees within the same company to its French subsidiary, with the same automatic work rights for the employee's family.

A network of high-performing players dedicated to R&D

✓ The European Union's Seventh Framework Programme for Research (2007 to 2013) has a dedicated budget of over 50 billion euros. The sixth Framework Programme gave financial grants to almost 5,000 companies in France.

The London Accords (law of October 29, 2007) has reduced by 25 to 30% the cost of translating European patents by eliminating the requirement to translate technical portions into French.



With 97 integrated projects and 211 targeted research projects², France is the second-biggest project coordinator in Europe, far ahead of the United Kingdom.

✓ The **French Research Agency** (ANR) supports research projects performed jointly by public laboratories and companies. The ANR benefits from a capacity to allocate nearly a billion euros in 2008. Twenty-five per cent of the aid is granted to companies.

✓ "OSEO innovation" is the main provider of aid to innovative SMEs in France, whether through direct aid (460 million euro budget in 2007) or company financing guarantees in co-ordination with the banking network. Its experts teams helped or supported almost 60,000 companies in 2006.

Company competitive funds (FCE) allocates funds (432 million euros in 2007) to R&D projects carried out by competitive clusters or developed in Eurêka clusters.

Private research support without equal in Europe

✓ France provides today the best **research tax credit** (CIR) in Europe. Recently restructured, the 2008 CIR reimburses 50% of the R&D expenses for the first year (up to 100 million euros), 40% of expenses in the second year and 30% in subsequent years.

✓ The **young innovative company** (JEI) status allows SMEs less than eight years old that spend at least 15% of their costs on research to obtain tax benefits and exemption from social security taxes on remuneration linked to research projects.

✓ The young university company (JEU) status encourages the creation of new companies by students or any person involved in the research of higher education institutions. These companies benefit from numerous tax allowances such as total exemption from the annual fixed tax or an exemption from employer costs on R&D employee salaries.

	GERMANY	BELGIUM	DENMARK	FRANCE	IRELAND	ITALY	UNITED KINGDOM
Head of R&D	187,124	192,335	146,791	184,059	159,880	188,648	176,000
R&D Manager	121,689	120,010	94,719	107,300	93,500	116,687	94,910
Engineer	71,802	65,980	58,752	58,343	48,089	46,961	44,920
Scientist	62,662	60,151	52,513	51,854	44,364	42,144	38,661
Laboratory Technician	57,813	56,810	49,186	45,381	39,327	39,136	34,598

Competitive employment costs

Benchmark of employment costs in Europe – in euros per year

Source : OCO Asses 2008 - Based on national statistics and data from Watson Wyatt (2007)

Scientific employment in France benefits from strong stability. "This is the greatest asset of French public research. This aspect of providing young researchers with a permanent position, which to my knowledge is unique in the world, attracts numerous foreigners", says David Prangishvili, a Georgian micro-biologist with the Institut Pasteur³.



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The INRIA⁴ and MICROSOFT, a joint research centre

Inaugurated in January 2007, the joint INRIA-Microsoft Research Centre, based on the Orsay Université business park (Ile-de-France), is the continuation of a collaboration which has been underway for several years now. The public research body and the world's leading software company have grouped together about 15 internationally renowned researchers in mathematics and IT to work on fundamental research.

The INRIA's reputation was a significant criteria. Other than the Ecole Polytechnique de Zurich, it is the only European centre ranked among the top 20 in public or private IT research (according to Thomson Scientific).

The establishment of this joint research centre demonstrates the international recognition of French IT research.

GENZYME chose France

In 2007, American biotech group Genzyme chose France for the construction of a bioproduction site in Lyon. Today Genzyme has over 200 employees in France, all working in the healthcare sector (pharmaceuticals and surgery) and in close collaboration with their European and American subsidiaries.



Fréderic Turner, Managing Director of Genzyme France, explains why his group chose to locate in France: "Our company works in the health industry, in which France has a longstanding tradition. Lyon has created the leading French bio-cluster. Local authorities, health authorities, hospitals and manufacturers are grouped

together within this bio-cluster to invest in the health of tomorrow.

The industry of the future is one of innovation and creativity. The educational system in France is one of the best in the world, as is its health system – ranked No. 1 by the World Health Organisation. This is what we came to find: brain power, and this is what France offers."