



France Country Report

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France

ERA-LEARN:
enabling systematic interaction with the P2P
community

September 2023

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ERA-LEARN Country Reports

This is the ninth in a series of ERA-LEARN Country Reports on participation in European R&I Partnerships (henceforth referred to simply as ‘European Partnerships’ including both Horizon 2020 and Horizon Europe partnerships unless otherwise specified) that are being produced during the course of ERA-LEARN. The previous reports covered Poland, Austria, Spain, Belgium, Finland and Norway, Germany and Estonia¹.

The ERA-LEARN data used in this report mainly refer to public-to-public partnerships that were launched and supported under Horizon 2020. The data also include the participation of countries to the Horizon Europe partnerships, and their role either as coordinators or partners, i.e. Table 1 and Figure 1 of the report. Yet the rest of the data refers to the H2020 partnerships as no financial or project data has been reported yet to the ERA-LEARN database.

The analyses are based on the data available in the ERA-LEARN database by a cut-off date of May 2023. A number of provisos need to be made when interpreting these analyses. In the first instance, it should be noted that the ERA-LEARN database on Partnerships at the cut-off point was around 75-85%% complete, as not all required information (especially project-related and financial data) had been fully updated by the partnerships. It is also important to emphasise that the data collected in terms of pre-call budget committed or actual investments in selected projects do not take into account differences across countries in the eligibility of certain expenses. In some countries, for example, only additional costs of a research project are eligible, while permanent personnel costs are not (which is the case for France).

The country reports provide an analysis of participation and try to explain the ‘performance’ of a country in public R&I Partnerships within the context of their own national and regional research and innovation systems. Data and analyses stemming from a variety of sources are thus drawn upon. These include the EU Semester national reports; ERA Progress Reports; the European Innovation Scoreboard; H2020 Country Reviews; OECD country reviews; OECD and EUROSTAT statistics; special reports by the Policy Support facility; MLE (Mutual Learning Exercise) special reports and national reports on R&I data, policies and strategies.

¹ All the Country Reports are on the ERA-LEARN website [Country Reports — ERA-LEARN](#).

The goal of the country reports is to provide an overall picture of a country's performance in terms of partnership participation, comparing this not only to EU14², EU13 and EU27 averages but also to the performance of a group of countries with comparable research and innovation profiles. In the case of France, these are Germany, Italy, Spain and the UK. The hope is that these reports are useful not only for organisations within the country of interest, which may only have a fragmented picture of the situation but also for organisations in other countries that wish to learn the reasons underpinning the 'position' of a particular country and/or learn from the exemplary performance of other countries.

The Structure of This Report

The report commences with an overview of the French research and innovation system in an international context, as an aid to understanding the environment in which partnership participation takes place. The key R&I funders and performers in France are then identified and areas of R&I strength are described before an analysis of the French participation in research and innovation partnerships. An assessment of the strengths and weaknesses of France's involvement in partnerships is then presented and the report concludes with a section connecting France's development research policies and how this is accommodated and strengthened through the partnerships.

Acknowledgements

We owe special thanks to officials from ANR – an ERA-LEARN partner since 2023 - as well as to individual researchers that shared with us valuable insights, data and information about their experience of participating in European Partnerships. Overall, 11 interviews were carried out³ involving people from the following organisations: ANR, Ministry for Ecological Transition and Territorial Cohesion (MTECT), INSERM, CNRS, and INRAE

Special thanks are also due to the ERA-LEARN partner, Optimat, particularly Katrina Watson for supporting data elaboration, and the ERA-LEARN consortium for commenting on earlier versions of the report and helping to improve it.

² As of 1 February 2020 with the withdrawal of the UK from the EU.

³ Respecting GDPR rules, the names of the interviewees are not disclosed.

Key Highlights

France is among the leaders in relation to participation in European Partnerships in H2020 with 102 partnerships, comparable to the top score of Spain (103 partnerships). This by far exceeds the EU 14 average. More importantly, the type of participation is noticeable as France is not reluctant to take the role of partnership coordinator. In fact, France is in the leading position of more partnerships than any other country with 27 partnership coordinations, with Germany coming second with 24. (Table 1, Figure 1). France is also participating to the 10 JPIs, chairing 4 of them and hosting their secretariat services. Particularly for Horizon Europe, France participates in 43 partnerships while coordinating 3 of them, while Germany participates in 36 and also coordinates 3. The top country in participating in Horizon Europe partnerships is Spain with 55 overall participations but with 2 coordinations.

Of the total of 317 calls that partnerships launched in H2020, French ministries and agencies took part in 255, similarly to German counterparts and slightly less than the Spanish research funders. A slightly different picture emerges with regards to the number of supported projects. French research teams participated in total in 1560 successful projects, but German colleagues took part in 2190 funded projects, which outnumbers the scores in all comparative countries. This can be explained by the smaller research community in France compared to Germany (300,000 vs. 423,000 researchers FTE). The comparable country for France in relation to the size of the research community is the UK which benefited from considerably fewer projects, although presenting a higher R&D intensity⁴.

Table 1: Participation of France and peer countries in H2020 public European R&I Partnerships including JPIs and selected R&I data also in Horizon Europe Partnerships

	FR	D	IT	ES	UK(*)	EU13 aver.	EU14 aver.	EU27 aver.
<i>Number of partnerships</i>	102	99	89	103	75	46	75	64
<i>Partnership participations</i>	214	240	204	260	126	53	146	101
<i>Partnership coordinations</i>	27	24	5	7	5	0.2	7	7
<i>Number of calls</i>	255	255	225	259	133	10	177	143
<i>Supported projects (no HEU data available yet)</i>	1560	2190	1151	1403	1068	6	165	842
<i>Researchers (FTEs) (‘000s – 2015-2020)</i>	300	423	145	135	290			
<i>R&D Intensity (% GDP-2021)</i>	2.21	3.13	1.49	1.43	2.93			

Source: ERA-LEARN database⁵ (cut-off date May 2023); Eurostat; JPI data exclude the associated Cofund data

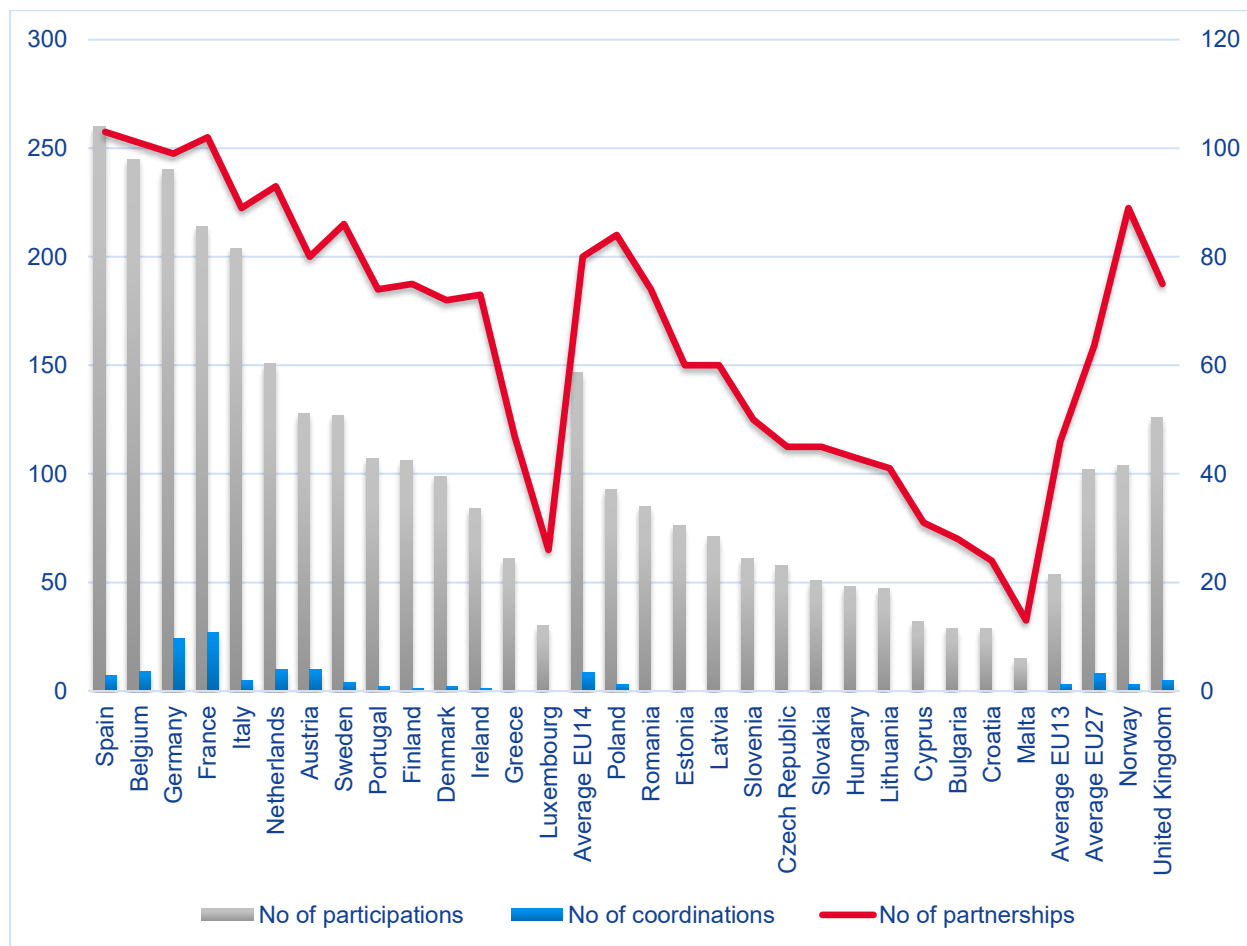
⁴ i.e. Gross Domestic Expenditure (GERD) in R&D as share of Gross Domestic Product (GDP)

⁵ These figures are actually higher considering that around 15-25% of the financial data of the H2020 P2Ps have still to be updated by the P2P networks in the ERA-LEARN database.

(*)Horizon Europe Partnership data not applicable to the UK

(*) Partnership coordinations: number of partnerships a specific country coordinates. Partnership participations: number of partnerships in which a specific country takes part as participant. Call participations: number of partnership calls in which a country takes part. (**) Based on ETAG and MEM data.

Figure 1: Participations and coordinations of Partnerships and number of Partnerships by country in H2020 (including JPIs) and Horizon Europe Partnerships



Source: ERA-LEARN database (cut-off date May 2023).

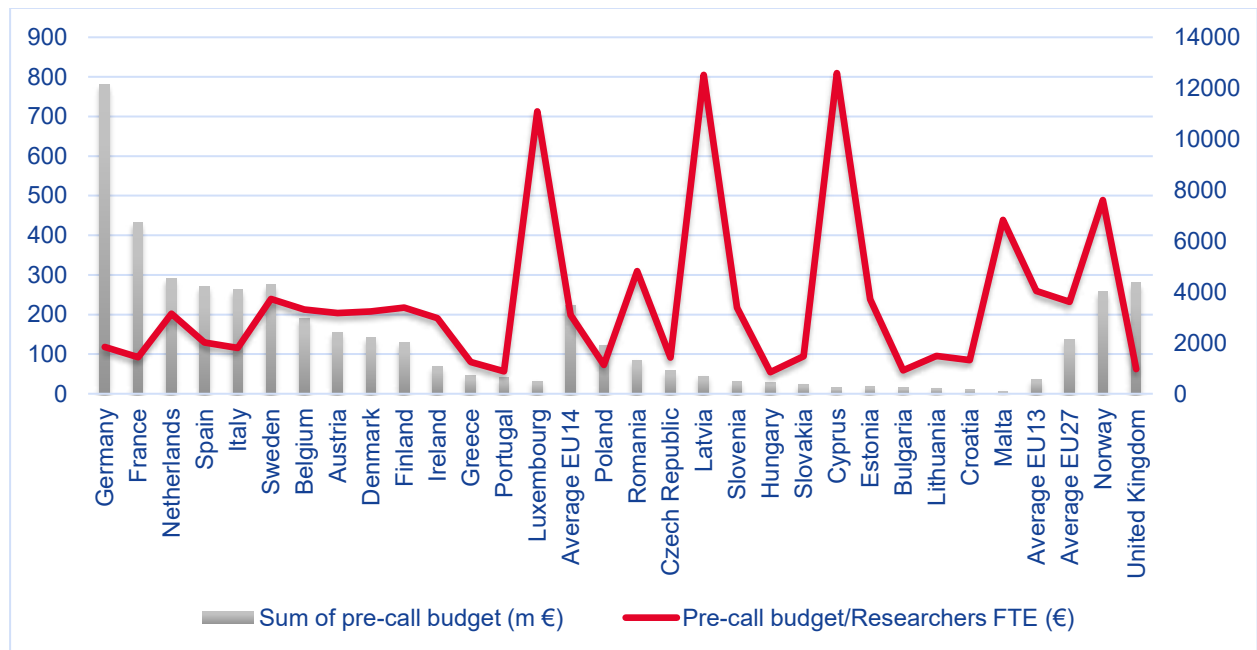
(*) Partnership coordinations: number of partnerships a specific country coordinates. Partnership participations: number of partnerships a specific country takes part as a participant. Total partnership participations: number of partnerships a specific country participates in with any role (i.e. coordinator, participant, observer, other).

The amount of funds that France commits pre-call in absolute terms to support national researchers in granted projects is the second highest after those of Germany (€431M vs. €781M) but very close to that of the UK (€280M) and leaving far behind Italy, and Spain. However, when these figures are normalised by the researchers FTE, then the average amount spent per researcher is estimated to around € 1,436 for France. This is lower in comparison to Germany (€ 1841), Spain (€2008) and Italy (€1797) although above that of the UK (€ 963). In fact, as

Figure 2 shows the average commitments pre-call divided by the researchers' FTE in all countries with relatively large research communities are of the lowest in the EU14. (Figure 2)

This estimation, however, does not take into consideration the differences across countries about what is considered eligible costs in the calls. In France, where the majority of the research community has the status of tenured civil servants, the salary costs are not supported in the allocated grants.

Figure 2: Actual national contributions, in total (€ million) and per researcher FTE (average 2017-2020) (in €)



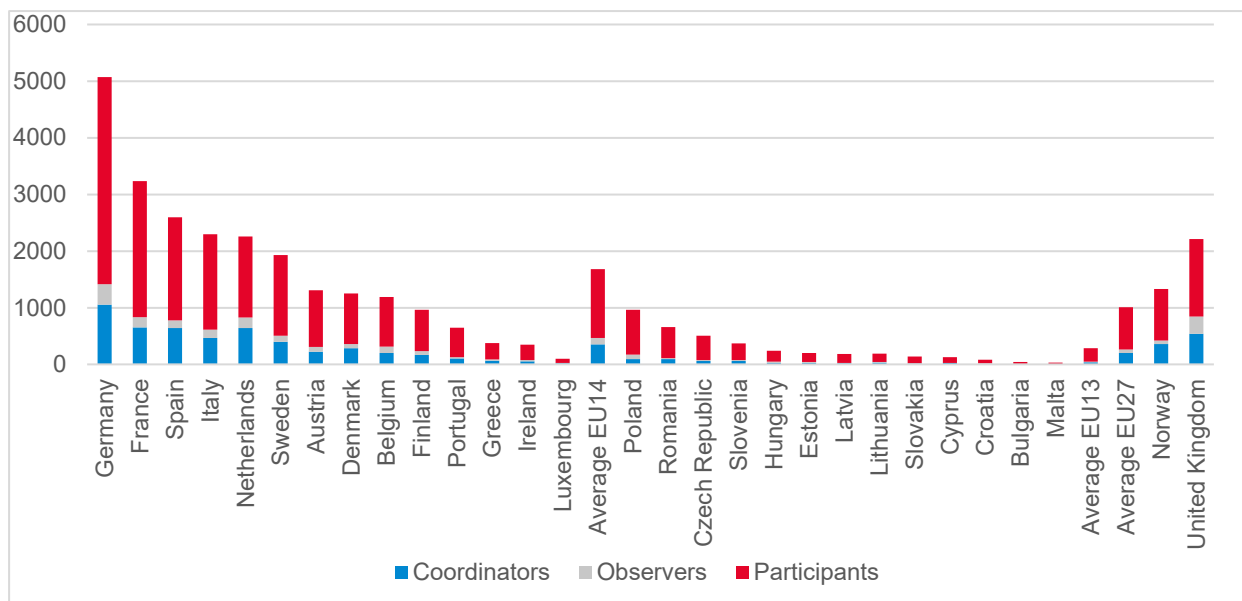
Source: ERA-LEARN database (cut-off date May 2023)

(*) Actual contributions are the funds actually spent by each country to support their researchers in the granted projects.

(**) Actual contributions for each researcher are the total actual funds spent by a country divided by the number researchers in the country estimated in full-time equivalents (FTE). The average is for the years 2017-2020 based on EUROSTAT data.

Based on the available ERA-LEARN data – and considering that the blanks in relation to participants’ roles in the ERA-LEARN dataset are around 10% - French research organisations are less acting as coordinators in projects supported by partnerships than their counterparts in the comparator countries. Around 20% of all the French participants act as coordinators, and this is similar to the shares of German and Italian coordinators. Spain and UK, however, are leaders in this regard as more than 24% of their participants take the lead in the projects they participate in. (Figure 3)

Figure 3: Number of participants, observers and coordinators in partnership projects



Source: ERA-LEARN database (cut-off date May 2023)

European and international collaboration has always been a high-level priority for France. France has taken a few initiatives driving developments, for instance in setting up the PRIMA partnership and the 10 JPIs. Overall, participation in European Partnerships in Horizon 2020 was positively assessed by the interviewees. The networking enabled between the main European players (ministries and funding agencies) was highly appreciated alongside the opportunities for monitoring certain issues, sharing of knowledge/data needs but also of skills/knowledge and the harmonisation possibilities at the EU level where relevant. European policies were better understood and shared, while national policies, know how and initiatives gained in international visibility. Gains were also acquired through the opportunities for concerted influence of European research programming in relation to national and European public policy needs.

The Country Fiche of France included in the BMR 2022 report states several success points retrieved from the experience in participating in European Partnerships:

- The structuring of the area of quantum technologies at the European level, notably through the QuantERA network, has been key for support at the national level, and this domain is now well positioned in terms of national priorities.
- In the area of antimicrobial resistance (AMR), France's participation in joint initiatives, in particular JPI AMR, has led to an increase of projects in this area at the national level, demonstrating impact in terms of topic alignment between European and national research activities.
- The implementation of partnerships (such as ERA-NETs, JPIs etc.) has led to the development of coordinating structures at national level (e.g. mirror groups), which has gradually made it clear the importance of having a structuring approach at the national level in order to be more efficient. In this context, the five national thematic alliances (made up of national research organisations and universities) have had an important role in terms of programming.

The EU glue money, and collaborations in partnerships allowed working together with non-European countries besides Member States, i.e. Associated or Third countries. This has been very important, in particular with Africa and southside Mediterranean countries. It also allowed collaboration with European countries where not much collaboration existed in the past. Moreover, partnerships helped bring communities together whose research efforts were rather scattered around, by joining these efforts around joint goals, for example in biology and health.

“Researchers highly appreciate the partnerships and especially the value of having the opportunity to collaborate with foreign counterparts coming from outside the EU. For instance, In Quanterra the Canadian Research Agency is also a partner and in CHISTERA, Taiwan is also a member with their own funding. This is highly valued by French researchers.” (ANR official)

“Positive impact well demonstrated; the 10 calls of Biodiversa produced high quality research and publications. Their citation index is higher than that of publications coming from national projects.” (ANR Official)

“ERANETs are considered particularly valuable. They are a powerful tool for creating excellent international collaboration, they have enable French SSH researchers to access international consortia to answer multilateral calls and, therefore, opening for them new research themes, they have brought, particularly to the humanities, a much greater awareness amongst stakeholders of the huge potential of SSH-led research in Europe.” (ANR official)

“In relation to technicalities, a positive feature is that researchers must follow national funding rules and conditions, that are easier to meet than in other calls (like in Horizon) such as the need to create large consortia. This makes things less complicated for them.” (ANR official)

Yet, the fact that in partnership projects the coordinators do not manage the funds of the consortium also brings a limitation in relation to the decreased power they have to manage the consortium and the progress and quality of the work.

“Another concern coming from researchers as well as companies is that partnerships are combining the difficulties of finding foreign partners – which is considered a burden especially in the case where trans-national collaboration is not deemed necessary – while following national rules. There are also cases where companies get higher funding rates directly from Horizon programmes, than through partnerships, i.e. the national rules”. (ANR official)

Furthermore, managing the participation in partnerships can be time-consuming with slow or complicated decision-making processes which take even longer in partnerships with numerous members. Appropriating and operationalising the results and outputs of the SRIA and the portfolio of activities may also prove challenging.

The French context presents specificities that enable partnership participation but also faces challenges. Officials from the Ministry of Ecological Transition and Territorial Cohesion (MTECT) noted the good coordination at the national level that is possible among the Ministry of Higher Education and Research (MESR) and other ministries) and within National Cluster Groups

involving public research organisations and private competitiveness clusters. The fact that there is a dedicated person at the MESR for the role of NCP animator for each Cluster is also beneficial. There is also a research department within each of the sectoral ministries with dual scientific and policy-related expertise. This ensures more availability of resources and a real commitment to get involved as active partner in Horizon Europe programming, although it can lead to additional work for the transfer of partnerships' outputs to policy officers in charge of defining public policies and strategies.

The set up of the so-called Mirror Groups also improves coordination at the national level. Thematic mirror groups are set up covering the themes addressed by the partnerships and JPIs. These include the relevant ministries (e.g. on the environment, agriculture, etc.) and representatives of the 'Research Alliances' of research performing organisations. Dedicated mirror groups are also assigned to cover the themes addressed by the new partnerships under Horizon Europe. The Mirror Groups are interconnected as some people may sit in several of them.

At the same time, there are certain barriers and challenges including, for instance, the language skills of people, the difficulty to engage operational directorates that have to do with time constraints, language barriers, or difficulties to understand the complex processes of partnerships or the inability to absorb and utilise the multiple funding sources that exist at national and European level for certain areas. To remedy this, there exist specific units supporting researchers to find the relevant calls, build a consortium, etc., but only in the large research institutions (CNRS, INRAE, IFREMER, CEA, INSERM).

Although being very broad in scope, the new partnerships under Horizon Europe are oriented towards solutions. This may create an obstacle in supporting more fundamental research. The lack of a partnership in social sciences and humanities is also another gap that needs to be remedied. Additionally, the management of the new partnerships under Horizon Europe is particularly complex and requires strong efforts and resources which may hinder certain countries/agencies from taking a leading role. The alignment of the procedures and regulations in relation to financial aspects, decision-making procedures, eligibility criteria, etc. across the different funding agencies is still a pending issue, while there are new challenges facing the new partnerships such as the conflicts of interest for research institutions when they take part as both partnership members and as project beneficiaries.

Another area that needs continuous efforts is the creation of synergies across partnerships and between partnerships and other instruments like missions. Enabling the possibility to develop joint calls with other partnerships is key because it is very complex to make separate complementary calls which, moreover, do not facilitate the transdisciplinarity of projects. Facilitating partnership collaboration within the thematic clusters is another step in the right direction, and supporting better visibility on the contribution of clusters to the various partnerships (budgets and motivations), including trans-cluster institutional partnerships (e.g. Chips). Encouraging the involvement of local and regional authorities (regions, overseas territories) is another important topic that still needs particular attention. However, mobilizing regional authorities to participate in the new Co-funded Partnerships has been a failure up to now due to the lack of clear procedures to use ESIF funds.

Notwithstanding the above, the performance of France in European R&I partnerships places the country among the leaders in the EU and reflects a policy context that is favourable to collaboration across countries and internationally. The France Europe 2020 strategy⁶ was organised along societal challenges that largely mirrored those of H2020's pillar 2. This facilitated a significant level of alignment with the EU and with individual countries. The new Research Programming Law (LRP) 2021-2030⁷ supporting a significant increase in the national research budget is another positive step.⁸

The existence of measures rewarding exceptional performance in European projects like the European Star trophy⁹ are also worth mentioning. The trophy rewards and promote the European commitment of teams of researchers who have distinguished themselves by the success of their projects, to highlight their work and to encourage - by their example - their colleagues to respond in ever greater numbers to calls for proposals under the European Framework Programme. Each year, twelve winners are chosen by an independent jury. Thanks to their work, the influence of France has been strengthened in Europe and internationally. The trophy is presented by the Minister at the Horizon Europe Forum held at the end of the year in Paris. 107 Projects have been awarded the trophy since 2013.

France's development research policy¹⁰ is another major component of the country's international profile. France provides support for African research platforms, such as the International Centre for Medical Research of Franceville (CIRMF) in Gabon and the Niamey Centre for Medical and Health Research (CERMES) in Nigeria, a member of the international network of Institutes Pasteur. Through the Research, Development and Innovation Clubs run by the embassies and consulates located abroad, meetings and networking events between public and private research and innovation actors are regularly organised, for instance in China, India, Japan or the US.¹¹

⁶ https://www.enseignementsup-recherche.gouv.fr/sites/default/files/imported_files/documents/strategie_nationale_recherche_397269.pdf

⁷ [LPR: The main provisions of the law | enseignementsup-recherche.gouv.fr](https://www.enseignementsup-recherche.gouv.fr/lpr)

⁸ The new programming Law along with the PIA4 and the Resilience and Recovery Plan are described in the following section about the Ministry of Higher Education and Research.

⁹ [Our successes in Europe | Horizon-europe.gouv.fr](https://www.horizon-europe.gouv.fr/our-successes-in-europe)

¹⁰ [France and development research - Ministry for Europe and Foreign Affairs \(diplomatie.gouv.fr\)](https://www.diplomatie.gouv.fr/fr/france-et-recherche-developpement)

¹¹ [Research and innovation through public-private partnerships - Ministry for Europe and Foreign Affairs \(diplomatie.gouv.fr\)](https://www.diplomatie.gouv.fr/fr/innovation-et-recherche)

Similar to the other 'heavy weights' in European Partnerships, France, like Germany, Spain or Italy, presents a high level of participation and funded projects. France enjoys a mission-oriented policy approach that very much favours a leading position in both the European Partnerships and the wider EU policies discourse. National coordination in the R&I policy arena is high and there are structures enabling wide consultation and mobilisation of research actors in international cooperation. Transnational/international collaboration has always been a high-level priority for France, that has taken a number of initiatives driving developments in European Partnerships. French researchers appreciate the opportunities for collaboration especially with non-EU countries as well as with those that have been less addressed in the past. Although there are several areas of improvement and certain issues persist in the new partnerships established under Horizon Europe, France shows strong commitment in exploiting the partnership instrument to the full.

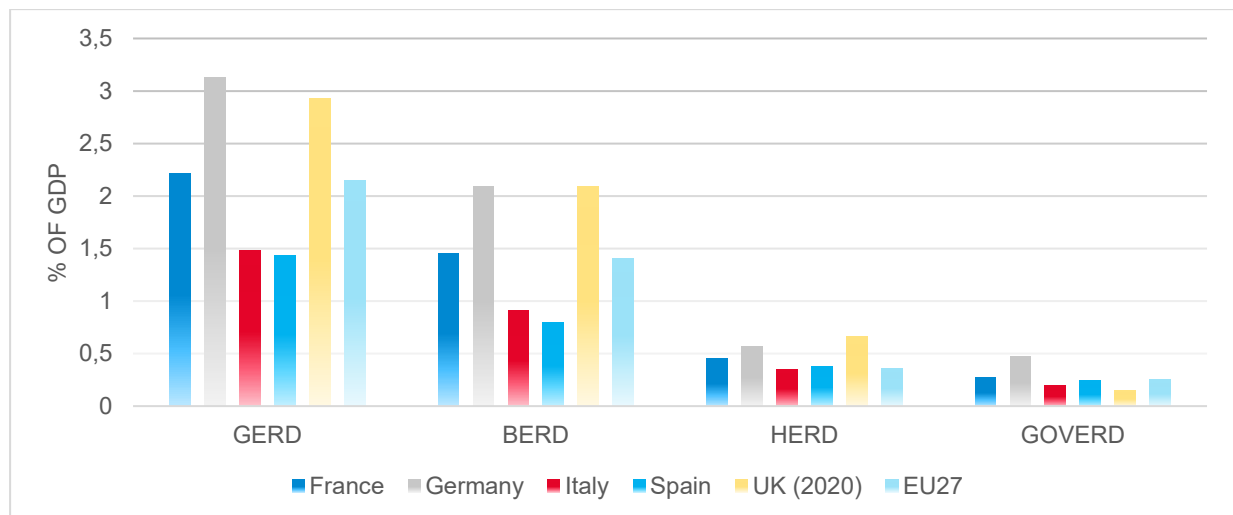
1. French Research and Innovation in an International Context

According to the OECD France Economic Snapshot¹², France recovered rather quickly from the economic slow-down due to the coronavirus crisis. With regards to research and innovation, the 2022 European Semester Country Report on France notes that the performance of the public research system and the low degree of science-business cooperation still remain challenges for France. The report also marks the steady decline in public R&D intensity between 2009-2019 (0.71% in 2019 compared to 0.82% in 2009), and the score below the EU average for public R&D financed by businesses. Business R&D intensity is stagnating despite the high level of public support for business R&D including a generous R&D tax incentive scheme.

These challenges lead to the inclusion of a wide reform in the Recovery and Resilience Plan with a multiannual programming law on research (LRP, 2021-2030)¹³, aimed at gradually increasing public research and innovation (R&I) funding and promoting science-business linkages.

In relation to the comparator countries, France scores similarly to Spain regarding the gross expenditure in R&D (GERD) as well as the business expenditure (BERD). This is far behind though from Germany and the UK. Differences across the comparator countries are slighter when it comes to the R&D expenditure in the higher education sector (HERD) or the public sector (GOVERD). (Figure 4)

Figure 4: Main R&D indicators for France and the comparator countries and EU27 averages (2021 data)



Source: OECD, Main Science and Technology Indicators 2022

¹² [France Economic Snapshot - OECD](#)

¹³ [LPR: The main provisions of the law | enseignementsup-recherche.gouv.fr](#)

In 2020, the research and development effort amounted to 2.34% of GDP, which is still below the 3% target initially set. This ratio marked an increase from the 2019 value of 2.19% after a declining trend since 2014, when it was around 2.28%. This increase, however, should be mainly attributed to a sharp decline of the GDP during the coronavirus period¹⁴, notwithstanding the increase in national R&D budget with the new programming law 2021-2030.

Public research, which accounts for 34% of GERD, is carried out in research organizations (53% of GERDA in 2019), universities, higher education and research institutions (engineering schools) and university hospitals(41%), the voluntary sector (5%), and ministries and other public institutions (1%). Companies have a share of around 66% in performing R&D in France. Although close to the EU average (66%), this is lower than in the United Kingdom (68%) and Germany (69%).¹⁵

Based on the European Innovation Scoreboard 2022¹⁶, France is a Strong Innovator with performance at 105.4% of the EU average, although this is below the average of the Strong Innovators (114.5%) and lower than the rate of increase of the EU (9.9%-points). The strengths of France include, among others, the number of foreign doctorate students, the government support for business R&D, including an attractive R&D tax incentive scheme for the private industry, and the population with tertiary education.

The relative weaknesses refer to the barriers between research innovation and industry, difficulties to attract private funds for start-up innovative firms, the sales of innovative products, and the low levels of funds for non-R&D innovation expenditures.

The ‘attractiveness’ of the French research system¹⁷ is relatively medium in the European Innovation Scoreboard 2022. France ranks 14th in the composite indicator among the EU27 countries plus Norway and the UK (Figure 5), being surpassed by moderate innovator countries such as Estonia and Portugal.

France has been implementing measures to attract international talent to the country like the French “Tech Visa” created in June 2017. In addition, In July 2021, France launched a complementary strategy for international tech talent, aimed at supporting the growth and vibrancy of the French Tech ecosystem through measures facilitating moving in or returning to France of experienced French and foreign profiles, in view of addressing the brain-drain issue.¹⁸

¹⁴ [The research and development effort in France](#)

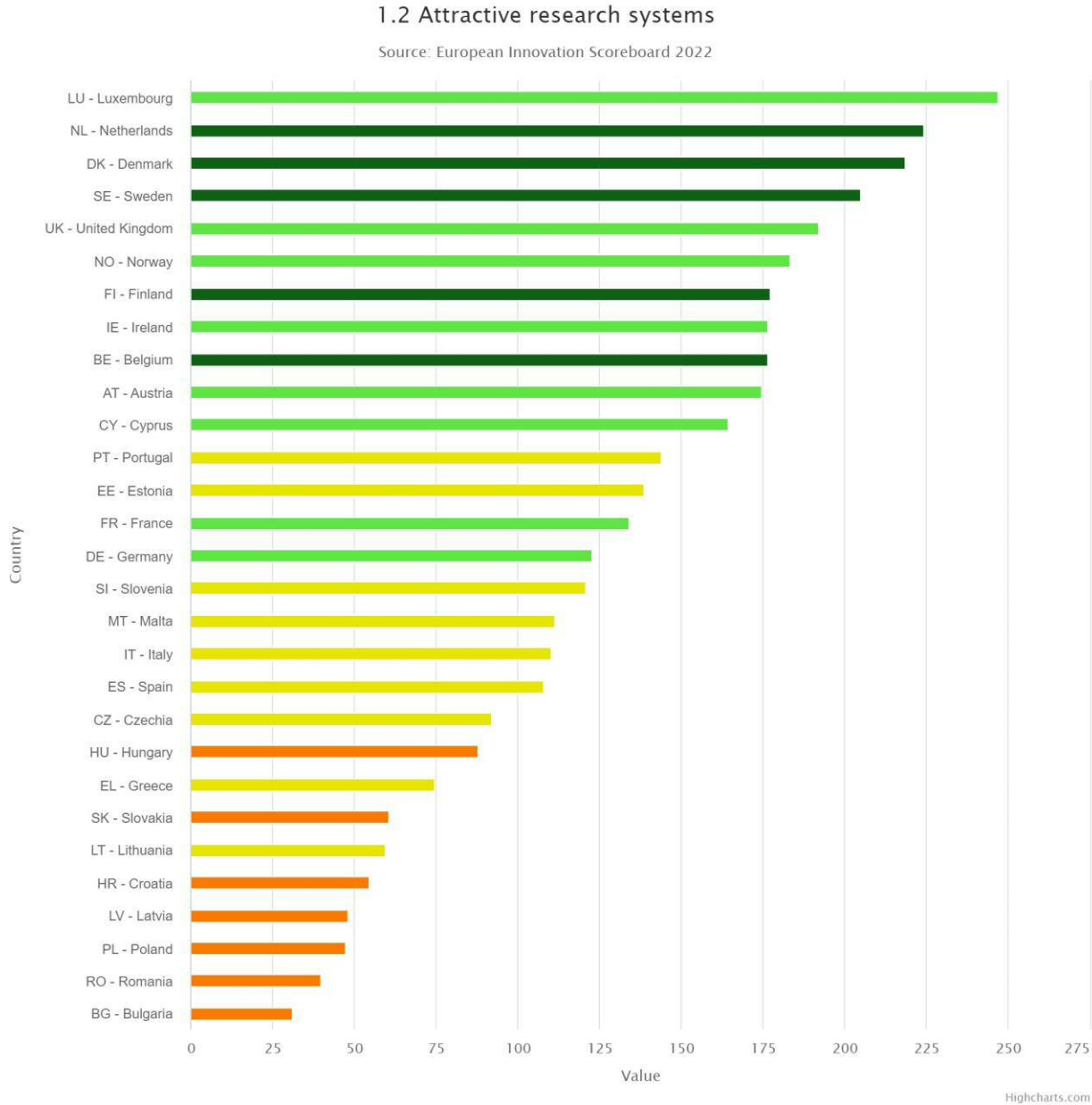
¹⁵ [Domestic expenditure on research and development - State of Higher Education, Research and Innovation in France n°16 \(enseignementsup-recherche.gouv.fr\)](#)

¹⁶ [RTD - European Innovation Scoreboard 2022 \(europa.eu\)](#)

¹⁷ Attractive research systems includes three indicators and measures the international competitiveness of the science base by focusing on International scientific co-publications, Most cited publications, and Foreign doctorate students ([EIS 2020 Methodology report.pdf](#)); https://interactivetool.eu/EIS/EIS_2.html

¹⁸ [Promoting France's attractiveness - Ministry for Europe and Foreign Affairs \(diplomatie.gouv.fr\)](#)

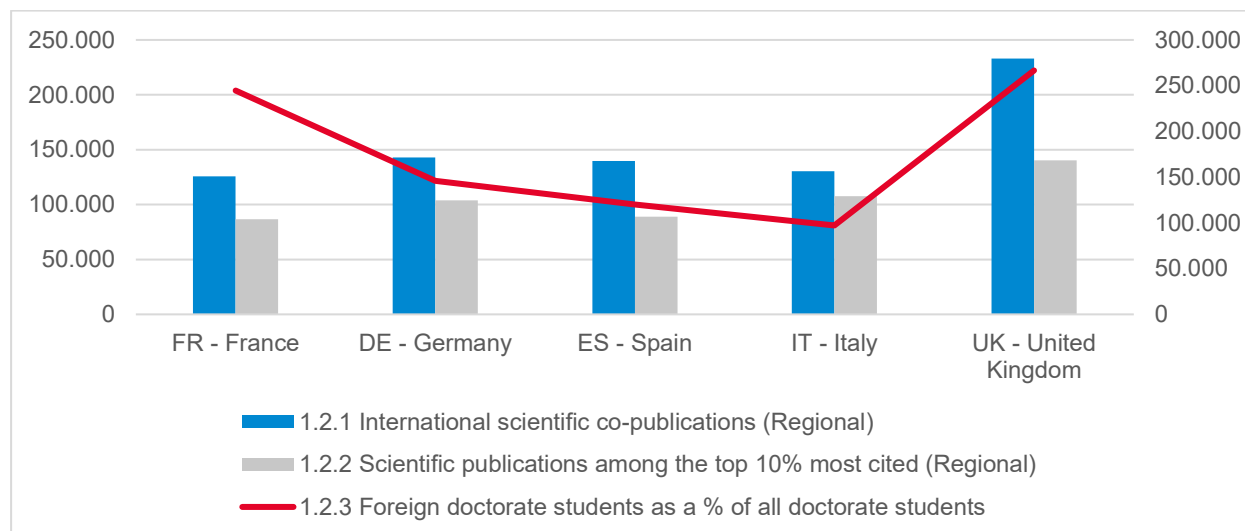
Figure 5: EIS 2022 indicators for 'Attractive research systems' for all EU 27 countries



Source: EIS 2022

Compared to its peers and in relation to the individual indicators of 'attractiveness of research systems', France leads the group together with the UK in the number of foreign doctorate students. However, it is last in the comparator group with regards to the international scientific co-publications and the publications among the top 10% most cited ones, although with small differences from Italy or Spain (Figure 6). As noted in The scientific position of the France in the world through its publications, the share of France, as of other research-intensive countries, in global publications is declining with the emergence of new scientific powers (China, India, Brazil). In 2020, it was 9th in terms of participation in global publications behind Canada and ahead of Australia, while the impact index of French publications was the 10th highest among the top 15 producers. With regards to the origin of the co-authors, this is mainly found in the EU and the US.

Figure 6: EIS 2022 indicators for 'Attractive research systems' for France and the comparator countries



Source: European Innovation Scoreboard 2022. Elaborated using the data provided at <https://ec.europa.eu/research-and-innovation/en/statistics/performance-indicators/european-innovation-scoreboard/eis>

In summary, France is a Strong Innovator and leads the group of the comparator countries, together with the UK, in the number of foreign doctorate students. However, there is room for improvement with regards to the international scientific co-publications and the most cited publications world-wide. The attractiveness of the French R&I system is rather moderate, but there are promising measures oriented to attract foreign talents and businesses and reverse the brain drain issue. The wide reform in the Recovery and Resilience Plan that provides for a gradual increase in public research and innovation (R&I) funding and promoting science-business linkages are also steps in the right direction.

2. Who are the key R&I funders in France?

The responsibility for preparing the R&I policies primarily lies with the Ministry of Higher Education and Research (MESR). Yet, other bodies are also involved including, for instance, the Ministry of the Armed Forces, the Ministry for Solidarity and Health, Ministry of Ecological Transition and Territorial Cohesion and the Ministry of Energy Transition. The Ministry of Economy and Finances is also involved in fiscal aspects of R&D policies. There are several agencies which are responsible for managing a number of research and innovation funds under the supervision or co-supervision of the MESR and/or the other ministries involved in research and innovation activities. The most important of these agencies is ANR (National Research Agency) which was created in 2005. ANR supports basic as well as applied research and innovation and contributes to the transfer of technology produced by publicly funded research. The other agencies are ADEME (Agence de l'Environnement et de la Maîtrise de l'Energie), ANRT (Association Nationale de la Recherche Technique). The support of SMEs is the mandate of Bpifrance, a public investment bank, that provides funds for business R&D and innovation projects, especially to SMEs. (Aminian, 2019) There also exists ADIT (Agence pour la Diffusion de l'Information Technologique), whose shares are owned by private funds and Bpifrance. INCA, the French National Cancer Institute should also be mentioned, co-supervised by the Ministry for Solidarity and Health and MESR.

The coordination between policy makers, and research actors operates through five “Research Alliances”: AVIESAN on life and health, ANCRE on energy, ALLISTENE on digital science and technologies, ALLENI on environment and ATHENA on humanities and social science. (JRC Country Report, 2017)

One of the main moves to improve the coordination of R&I policy since 2015 has been to concentrate competences in very few operators – ANR, Bpifrance, CDC (Caisse des dépôts et consignations) and ADEME. The preparation of national R&I policies and strategies involves several sectoral consultative groups driven by the MESR in cooperation with other ministries and the five ‘Research Alliances’, whose role is to contribute to the French national research strategy, including also the commitments of ANR.

Regarding the participation in European Partnerships in Horizon 2020, the most active funders, based on ERA-LEARN data are ANR and ADEME, while the major research institutions of the country, namely CNRS, INSERM and INRA have a strong presence in the partnerships and their calls. Coordination of participation in European Partnerships is under the responsibility of the Direction of International and European Affairs (DAEI) within the General Directorate of Research & Innovation (DGRI) of MESR. DAEI that steers the involvement of France in the EC Framework Programme including partnerships in terms of strategy, financial commitments, data analysis and performance monitoring and reporting.

The decision-making process regarding which partnership to join involves consultation with the so-called Mirror Groups and the Research Alliances representing the research communities.

There is also the GCTE - Groupe de Concertation Transverse Européen (European consultation group), which brings together the French research stakeholders. The DAEI unit of MESR conjures it about 3 times a year, mainly to receive information but also for consultation purposes as in the EC consultation on H2020 and Horizon Europe. DAEI also consults the GTN (Groupes thématiques nationaux - national thematic groups) - one thematic group per strategic configuration of the Strategic Coordination Process – about the corresponding work programmes.

The final decision is taken by the Ministry of Higher Education and Research. ANR provides evidence on various aspects such as level of participation if a partnership is a continuation of a past one and makes suggestions accordingly. ANR utilises the CPP (Comité de pilotage de la programmation / the programmes' steering committees), where officials from ANR, MESR and other ministries, and the relevant Research Alliances and actors join and provide feedback on the strategic topics for both national and international programmes. In addition, ANR organises special workshops to receive feedback from the researchers when the call topics of partnerships are being formulated.

Based on the ERA-LEARN data, the most active funding agencies and research actors (measured by the number of partnerships they participate in) include:

- National Research Agency (ANR)
- National Centre for Scientific Research (CNRS)
- National Institute for Agricultural Research (INRA)
- Ministry of the Environment, Energy and the Sea (MEEM)
- Agency for Environment and Energy Management (ADEME)
- Ministry of Higher Education and Research (MESR)
- National Institute of Health and Medical Research (INSERM)



2.1. Ministry of Higher Education and Research (MESR)

The French research and innovation policy has been oriented towards societal challenges for a number of years. The France Europe 2020 strategy was organised along societal challenges that largely mirrored those of H2020's pillar 2. These included: resources management

and adaptation to climate change; clean, safe and effective energy; industrial revival; health and wellbeing; food safety and demographic challenge; sustainable urban transports and systems; information society and communications; innovative, integrative and adaptive companies; a spatial ambition for Europe and freedom and security for Europe and its residents.¹⁹

¹⁹ https://www.enseignementsup-recherche.gouv.fr/sites/default/files/imported_files/documents/strategie_nationale_recherche_397269.pdf

The latest development in the R&I scene in France is the Research Programming Law (LRP) 2021-2030²⁰. This is the first programming act, since 1982, planning various organisational aspects of higher education, research and innovation with the time horizon of 2030. Certain strategic features are also included, for instance orientations towards bringing the public research closer to private innovators, better embedding science in society, etc. It also allows for strategic planning with the concept of Priority Research Programmes; twenty-three such Priority Research Programmes and Equipment (PEPR) are included in national thematic strategies that address strategic and priority investments including technologies of the future such as green and digital technologies, medical research and health industries, the cities of tomorrow, adaptation to climate change and digital technology for education.²¹

Although not explicitly referring to European Partnerships, the Act places special emphasis in bringing together public research and innovation actors, public and private actors as well as societal actors. Three priority fields of action are proposed²²:

1. create new leaders based on discoveries from the public research and which will create the market disruptions of tomorrow;
2. significantly increase the breadth, depth and continuity of the public-private, public-public and public-civil society interactions;
3. significantly improve simplicity, agility and speed in order to effectively and fully reveal the potential of partnership research and of innovation in public laboratories and empowering innovation players.

The French [Recovery Plan for Higher Education, Research and Innovation | enseignementsup-recherche.gouv.fr](https://enseignementsup-recherche.gouv.fr) is also to be noted with a total budget of €100 billion, four times more than the 2008 recovery plan, and one of the greatest among European countries. This is an exceptional commitment by France to respond to the challenge of reviving the economy and making France greener, more competitive and more inclusive. It also aims to create new opportunities for young people who want to retrain or acquire new skills.

The Programme d'Investissement d'Avenir' (PIA)²³ currently in its fourth version is the policy implementation tool. This simplified PIA4 (2021-2025) takes better account of territorial conditions and responds to the challenges of ecological transition, competitiveness and independence of the economy. With €20 billion over five years, it is twice as large as the last two programmes launched in 2014 (€12 billion) and 2017 (€10 billion) and complements the resources of the research programming law (LPR) which provides 25 billion euros over 10 years to research. Through the Research Programming Law, the Recovery Plan and the PIA4 ANR benefits from a significantly

²⁰ [LPR: The main provisions of the law | enseignementsup-recherche.gouv.fr](https://enseignementsup-recherche.gouv.fr)

²¹ [National strategies: €12.5 billion | enseignementsup-recherche.gouv.fr](https://enseignementsup-recherche.gouv.fr)

²² [Restitution of the work of the working groups for a draft law on multiannual programming of research | enseignementsup-recherche.gouv.fr](https://enseignementsup-recherche.gouv.fr)

²³ [Presentation of IPA4 | enseignementsup-recherche.gouv.fr](https://enseignementsup-recherche.gouv.fr)

increased budget of €428 million over 2 years. The aim is to increase the success rate of ANR calls for projects to 30% in 2027 (against 17% in 2020)

The importance of partnerships and of transversal issues such as of open science and data is also evident in the research infrastructures of the country. As claimed in the ESFRI National Roadmap 2021, the new ESFRI roadmap differs from the previous ones by the will to display a more developed strategic analysis of the research infrastructures landscape, as well as by a reinforced attention to the transversal issues of open science and data, in accordance with France's commitments in this area. The new ESFRI roadmap highlights the importance of collaborating with other national and European infrastructure, under EU Partnerships like EOSC.



2.2. ANR

ANR is the main funding agency managing most of the national public research funds for R&I. The experience of ANR in European Partnerships goes back to their launch in FP6. ANR has been involved in ERA-NETs and JPIs, ERA-NET Cofunds, EJPs and now in Co-funded Partnerships, plus several CSAs.

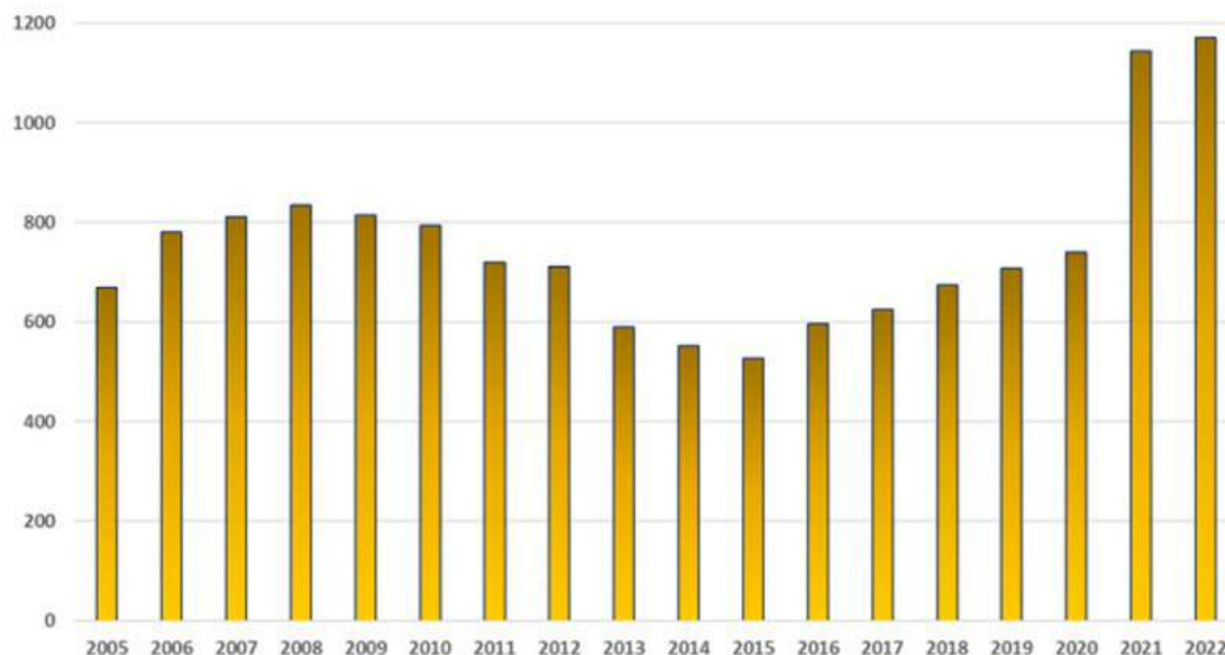
ANR has its own budget, that is voted every year by the Parliament, and the ANR Board decides on the allocation of the budget across the various instruments including partnerships. There is no separate budget handled by the MESR. Yet, other Ministries may have research budgets (such as those related to environment, agriculture, culture, etc.) but ANR may also manage their funds on their behalf. Sometimes, ANR also handles funds from other funders in relation to supporting projects funded by European calls, international calls or national calls. This has been the case with the AFD (French Agency for Development) or some French Regions. It also joins forces and combines direct funding with other funders such as the Biodiversity Office or ADEME, along various financial arrangements.

Since 2010, ANR is also managing specific funds in addition to its budget for the Investments for the Future Programme (PIA), with the aim to stimulate employment, boost productivity and increase the competitiveness of French businesses by encouraging investment and innovation in priority sectors. The France 2030 programme, launched in 2021, continues the commitments of the PIAs and has a budget of €54 billion, including €20 billion from PIA 4. ANR is the national operator of France 2030 programme in the field of higher education and research.²⁴

International funding accounts for about 15% of the total budget of ANR. Roughly half of this is for multi-lateral collaboration and the rest account for the bilateral agreements with funders from individual countries. Within the multilateral part, more than 80% consists of EU-related collaboration, be it Horizon 2020 or Horizon Europe Partnerships. Yet, the funds committed and allocated to partnership compared to the funding of national programmes are marginal. In the energy area, for instance, France invests annually between €40-50 mil as grants, while for international cooperation through partnerships it invests less than €3 mill.

²⁴ <https://anr.fr/en/France%202030/>

Figure 7: Budget evolution of ANR funds for projects in million €



Source: ANR

The budget going to national programmes has increased dramatically in the past years with the aim to increase the success rate of proposals. The aim is to reach 30% as success rate and this is inscribed in the new Programming Law that was voted at the end of 2020 and defines the organisation and means of research and higher education from 2021 to 2030. The international budget has increased too but less sharply than the national funds. Whereas international collaboration may not seem a central instrument to achieve national priorities given these figures, it is very important in strategic terms, i.e. in supporting networking, comparing ideas, fostering excellence, pooling resources, and addressing cross border issues at cross-national scale.

In relation to partnerships, France may commit €2 mil per call and expect to fund 7-8 projects. The average funding of multilateral projects however has been more than €275 000 over the last 4 years. Efforts are dedicated to have relevant caps in project funding for national teams to ensure a fair distribution of the EU top-up and a reasonable number of funded projects. ANR departments can adjust these caps to project funding based on the feedback they get from the national community. French researchers seem relatively satisfied with the amounts made available per project. The new Programming Law²⁵ that is valid for the next ten years will further increase the level of funding to research performing organisations as the eligible overheads for funding will increase from 15% of the total project budget to up to 40% by 2027.

ANR is a versatile entity with a wide scientific and technological scope and being able to fund both public and private entities (following the State Aid rules). Administrative capacity is not a major issue for ANR as in some other European countries. However, there is an official limit in relation to employment/overheads that cannot be crossed, albeit with exceptions. In such cases,

²⁵ LPR: The main provisions of the law | enseignementsup-recherche.gouv.fr

ANR needs to find external funding, which makes the EC contribution to management costs important.

Besides research project funding, ANR provides a range of activities and services to support and promote European and international cooperation of the national research community. Under the national Plan for Improvement of France's participation in FP (PAPFE), ANR runs four schemes to foster participation: MRSEI, the most well-known one, which supports French public organisations to network with potential partners and undertake the role of coordinator in projects; T-ERC, which funds projects that were rated of top quality by the ERC but were not eventually funded due to lack of funds; SRSEI, a fast track scheme that releases funds to help projects selected at the 1st step of 2-step evaluation calls to prepare their step-2 proposal and increase their chances of success; and Access-ERC, supporting researchers to prepare an application to an ERC Starting Grant. In addition, ANR offers a bonus of €50-75,000 in most multilateral partnership calls to reward French organisations that undertake a leading role as coordinators. ANR also provides dedicated info days and webinars to help researchers to prepare for the calls and to explain and promote the calls after their launch by the partnerships.

In addition, there is a mechanism to promote alignment at the project level between national projects across different countries within the partnerships. The initiative is called TAP actions (Thematic Annual Programming). In the case that similar calls were launched across different countries, the awarded projects have the opportunity to get a top-up funding from the respective funder for networking to create international synergies across national projects in the same area. This was applied in the case of Water JPI and is planned to be used in the SBEP, Biodiversa+ and Water4All partnerships in Horizon Europe.

ANR pays special attention to limit the burden in relation to proposal submission and project reporting when it comes to partnerships. In multilateral calls such as those of Horizon 2020 partnerships, submission of applications and project reporting is done centrally in most cases, at the level of the partnership. This is done in English with only a summary being asked in French for funded projects. ANR injects in its own IT systems the projects they eventually fund. Joint scientific advancement reports replace the ANR forms that are normally filled in at national level. Financial reporting is however done according to national formats and requirements. In some cases, ANR requires parallel national application for all projects in a call through their IT system and may increasingly do so in the future, to allow automatic connections to the in-house IT system and more complete data gathering and elaboration. The ANR submission, evaluation and monitoring tool is at the disposal of the different partnerships and is currently used by some ERA-NET Cofunds and JPIs. A new submission and reporting system/tool is currently being developed in ANR including also projects funded by multilateral calls in general and European Partnerships in particular. As a result, reliance on joint scientific reports only may no longer be possible. The objective will, however, be to keep the workload for grantees to the minimum, which is a firm principle of ANR. Interoperability across IT systems, databases, and national and European level monitoring is important in this respect.

As ANR officials pointed out the response of the national community in partnership calls is, overall, satisfying, although below the level one would expect given the research capacity and specialities of the national research community.

“The number of applications including French applicants in Horizon (including partnerships) is lower than applications coming from other countries – e.g. Italy or Spain

that have similar numbers of researchers or below those with Dutch or Austrian applicants (that have considerably less researchers' capacity). Instead, participation is satisfactory in national programmes, where, however, the ability to collaborate with foreign counterparts is limited. Yet, there are bilateral agreements with certain countries like Germany, Austria, Switzerland, that are partly covering this gap as they allow bilateral, but not multilateral, collaboration. Another reason might be the fact that the French research community is one of the largest in the EU covering a wide spectrum of themes. This means that complementary expertise needed for collaborative projects exist in the country. This may affect participation in areas where transnational perspectives / data are not highly relevant or important... The success rates of ANR programmes reach 25%. When finding partners aboard is not considered necessary, this makes partnership calls less attractive" (ANR Official)

Interestingly, however, the success rates of the applications submitted under European partnerships are in most cases higher than 25%. As Table 2 below shows, based on the ANR data, in 12 calls out of the 45 calls that involved 2-stage evaluation, i.e. 27% the success rate (number of approved applications/number of pre-proposals) was above 25%. This share rises to a remarkable 64% in the case on 1-stage evaluation calls where in 16 out of the 25 calls, success rates are 25% or above, while in 8 out of 25 (32%) they are 40% or even higher. Overall, French researchers seem to enjoy an average success rate of 21% in 2-stage evaluation calls (number of projects/pre-proposals), while this rises to 35% in the case of the number of projects / full proposals overall.

Based on the number of pre-proposals or full-proposals (in 1-stage evaluations), Table 2 also shows that French researchers are particularly responding to calls in the areas of climate and biodiversity (BIODIVCLIM, JPI Climate), and health (ERA PerMed, E-Rare-3, EuroNanoMed 3, JPND, JPI AMR, JPI HDHL, NEURON) as well as quantum technologies (QuantERA), materials (M-ERA.NET) and graphene and human brain research (Flag-ERA 3) . They are also very responsive to PRIMA²⁶ section 2 calls, where they also played a key role in the setting up of the partnership.

ANR is also very active in bilateral agreements – the one with DFG in Germany is very important, while the different departments enjoy several additional agreements, for instance with Austria in energy or Austria, Brazil, Hong Kong, Luxemburg, Quebec, Switzerland, Taiwan in SSH. In addition, ANR is a member of the [Belmont Forum](#), an international network of funding agencies, representing France together with [AllEnvi](#) and co-chairing the Steering Committee.

Yet, European Partnerships are important for supporting international collaboration. In the area of energy, for example,

"France entered two Horizon Europe Partnerships (Clean Energy Transition - CET and Driving Urban Transitions - DUT), although the country was not a member of any predecessor partnerships in energy. The reason for this was that the earlier partnerships used to support high TRL levels, which was not in line with the mandate of ANR. In the new partnerships lower TRLs (3-5) are not excluded, and this opened the door for ANR to

²⁶ PRIMA is an Article 185 partnership on agriculture, water and food security around the Mediterranean basin

take part although with not a leading role due to little prior experience. On the contrary in DUT, France has been quite active both in the preparation and the implementation of the Partnership based on the long history of participation in JPI Urban Europe.” (ANR Official)

ANR is also very active in the areas of environment and agriculture with coordinating three partnerships (Biodiversa+²⁷, Water4all²⁸, and Food systems²⁹) and also being vice-coordinator for the Agroecology³⁰ Partnership and vice-chair for SBEP³¹.

In the area of SSH, ANR officials hope that a new partnership will also be dedicated to the area in Horizon Europe, considering the experience of the ERA-NETs and ERA-NET Cofunds particularly valuable.

As pointed out by ANR officials, the new Co-funded Partnerships in Horizon Europe are quite complex to set up and the negotiating process is currently a challenge. There is also lack of pertinence in the features of the new partnerships and multiple technical difficulties that are hopefully on way to be resolved. The management of calls (with significantly increased budgets and expected number of proposal) is expected to be more laborious than in the past. A rotating system of call secretariats following the Water4All example may prove useful. The issues of the in-kind contributions or that of the firewall concerning the participation of research performing organisations when they are also members of the partnerships have not been entirely resolved. In addition, there are no clear rules or examples yet on the use of ESIF for supporting partnerships.

The new partnerships also place particular emphasis on creating synergies among them as well as with other relevant instruments like the Missions. Examples of joint activities besides joint calls, which, however, were found to be difficult to implement in the past, include, for instance, activities to increase impact of projects (through publications, communication events, etc.); activities to build a portfolio of projects (clusters) from various partnerships and also from Horizon Europe, or Interreg, and bring people to work together to exchange data and results, co-publish, carry out comparative analysis, consolidate results, prepare policy briefs, make contacts with industry, etc. This process was applied by the JPIs in the past, where several projects were brought together in the area of AMR to write a joint publication or policy brief. Such a portfolio of projects per region or per thematic area is under development in SBEP in association with Water4All and Biodiversa+. ANR is also responsible for developing Knowledge Hubs in the new partnership, DUT, to bring together national hubs that may exist in other countries for networking and sharing knowledge, results, stakeholders, etc.

²⁷ European Partnership for rescuing biodiversity to safeguard life on Earth

²⁸ European Partnership water security for the planet (Water4All)

²⁹ European Partnership for Safe and Sustainable Food Systems

³⁰ European Partnership accelerating farming systems transition: agroecology living labs and research infrastructure

³¹ European Partnership for a climate neutral, sustainable and productive Blue Economy (SBEP)

France presents a strong commitment to international collaboration in research and innovation that is backed by a well-functioning coordination mechanism managed by MESR and including sectoral ministries, the major funding agencies and the research actors. This supports the coordination of decisions in relation to European Partnerships, while measures also exist promoting and rewarding excellent performance in the European/international R&I scene. France takes part in partnerships for a number of reasons, i.e. to offer the researchers the benefits for transnational/international collaboration, to collaborate/align with other countries in developing policies and strategies in areas of strategic importance for the EU, as well as to contribute to driving developments in certain areas of interest. French researchers are attracted to a variety of partnership calls, in most of which they actually achieve quite high success rates (>25%).

Table 2: Participation of French organisations in partnerships under H2020 (2014-2022) managed by ANR

Network(s)	Pre-proposals requesting ANR funding	Full-proposals requesting ANR funding	Number of projects granted by ANR	Success rate (nb projects granted/pre-proposals)%	Success rate (nb projects granted/full-proposals) %	National budget initially committed by agency (M€)	Actual national budget allocated by agency (after selection of proposals) (M€)
Aquaticpollutants	N/A	29	7	N/A	24%	2,21	1,55
AXIS	16	16	2	13%	13%	1,00	0,27
BIODIVCLIM	107	46	8	7%	17%	2,00	1,74
BIODIVERSA 3	N/A	110	26	N/A	24%	6,00	6,30
BIODIVERSA+	82	48	17	21%	35%	2,00	2,50
BIODIVSCEN	57	57	9	16%	16%	2,00	1,74
BIODIVRESTORE	66	42	10	15%	24%	2,07	2,40
CHIST-ERA 3	64	39	14	22%	36%	4,00	3,48
CHIST-ERA 4	N/A	74	19	N/A	26%	6,50	4,58
EJP RD	327	91	42	13%	46%	11,00	11,26
EJP Soil	N/A	26	4	N/A	15%	1,00	1,18
ENSUF	36	9	5	14%	56%	1,00	0,82
EN-SUGI	15	5	2	13%	40%	1,50	0,34
EN-UAC	N/A	29	6	N/A	21%	2,20	1,53
EN-UTC	20	10	5	25%	50%	1,50	1,17
ERA CoBioTech	N/A	39	14	N/A	36%	3,25	3,38
ERA4CS (Climate Services)	26	20	9	35%	45%	4,00	3,99
ERACoSysMed	55	35	14	25%	40%	4,00	3,30
ERA-CVD (Cardiovascular disease)	N/A	75	34	N/A	45%	9,00	7,40
ERA-GAS	13	10	7	54%	70%	1,00	1,00

Network(s)	Pre-proposals requesting ANR funding	Full-proposals requesting ANR funding	Number of projects granted by ANR	Success rate (nb projects granted/pre-proposals)%	Success rate (nb projects granted/full-proposals) %	National budget initially committed by agency (M€)	Actual national budget allocated by agency (after selection of proposals) (M€)
ERA-HDHL	N/A	48	14	N/A	29%	6,00	3,76
ERA-MIN 2	N/A	37	11	N/A	30%	1,70	1,94
ERA-MIN 3	22	19	7	32%	37%	1,00	1,20
ERA-NETs Cofund FOSC & Susfood2	N/A	2	0	N/A	0%	0,50	0,00
ERA-NETs Cofund SusAn, ICT-Agri & ERAGAS	N/A	10	4	N/A	40%	1,00	0,84
ERA-NETs Cofund SusAn, ICT-Agri, ERAGAS & Suscrop	N/A	11	4	N/A	36%	2,07	0,81
ERA PerMed	379	138	52	14%	38%	12,50	15,36
E-Rare-3	322	85	37	11%	44%	6,50	7,97
EuroNanoMed 3	344	139	46	13%	33%	9,50	9,87
FACCE SURPLUS	N/A	24	13	N/A	54%	3,00	2,37
FLAG-ERA 2	28	22	14	50%	64%	2,50	2,23
FLAG-ERA 3	N/A	69	26	N/A	38%	4,00	5,18
Forest Value	N/A	22	3	N/A	14%	1,50	0,54
FOSC	N/A	15	6	N/A	40%	2,00	1,29
GenderNet Plus	23	10	3	13%	30%	0,45	0,36
HDHL-INTIMIC	79	42	14	18%	33%	6,00	3,81
ICRAD	64	38	15	23%	39%	2,45	2,63
ICT-AGRI-FOOD	8	2	2	25%	100%	0,41	0,28
IC4WATER (JPI WATER)	28	21	6	21%	29%	2,00	1,30
JPco-fuND	189	57	19	10%	33%	5,50	4,47
JPCofuND2	N/A	63	26	N/A	41%	7,80	5,76
JPI AMR	N/A	26	9	N/A	35%	2,10	2,09
JPIAMR-ACTION	N/A	40	16	N/A	40%	4,20	3,98

Network(s)	Pre-proposals requesting ANR funding	Full-proposals requesting ANR funding	Number of projects granted by ANR	Success rate (nb projects granted/pre-proposals)%	Success rate (nb projects granted/full-proposals) %	National budget initially committed by agency (M€)	Actual national budget allocated by agency (after selection of proposals) (M€)
JPI Climate	N/A	67	10	N/A	15%	4,00	3,30
JPI Climate- JPI Oceans	N/A	10	4	N/A	40%	2,00	1,26
JPI Cultural Heritage and global change	N/A	37	8	N/A	22%	1,78	1,75
JPI-EC-AMR	N/A	69	27	N/A	39%	6,05	5,51
JPI FACCE	4	4	2	50%	50%	1,00	0,64
JPI HDHL	N/A	62	12	N/A	19%	4,00	4,11
JPI JPND	N/A	42	9	N/A	21%	3,00	1,77
JPI MYBL	N/A	12	4	N/A	33%	2,02	1,00
JPI Oceans	N/A	20	5	N/A	25%	2,00	1,07
JPI Urban Europe	N/A	14	2	N/A	14%	1,00	0,54
JU EuroHPC	N/A	N/A	14	N/A	N/A	N/A	4,49
LEAP-AGRI	60	24	7	12%	29%	2,00	1,74
LEAP-RE	48	19	7	15%	37%	1,00	1,01
MARTERA	25	19	13	52%	68%	3,00	3,00
M-ERANET 2	50	26	7	14%	27%	1,00	1,41
M-ERANET 3	118	13	10	8%	77%	2,00	2,00
NEURON Cofund (NEURON 3)	207	108	38	18%	35%	8,60	10,24
NEURON Cofund 2 (NEURON 4)	103	53	20	19%	38%	4,70	5,43
NORFACE (DIAL)	24	11	4	17%	36%	2,40	1,09
NORFACE (T2S)	38	9	2	5%	22%	0,85	0,44
NORFACE (Governance)	35	12	5	14%	42%	1,40	0,90
PRIMA	288	143	65	23%	45%	22,00	15,10
Public spaces (HERA 4)	56	17	5	9%	29%	1,50	0,96
QuantERA	128	75	24	19%	32%	5,00	5,22

Network(s)	Pre-proposals requesting ANR funding	Full-proposals requesting ANR funding	Number of projects granted by ANR	Success rate (nb projects granted/pre-proposals)%	Success rate (nb projects granted/full-proposals) %	National budget initially committed by agency (M€)	Actual national budget allocated by agency (after selection of proposals) (M€)
QuantERA 2 - Quantum Technologies	49	33	16	33%	48%	3,00	4,09
Solar 2	10	8	4	40%	50%	1,00	0,83
SusAn (SAP Sustained livestock production)	29	14	7	24%	50%	2,00	1,35
SusCrop	84	44	16	19%	36%	3,94	3,16
SUSFOOD 3	15	7	2	13%	29%	1,50	0,34
WATERWORKS 2016	26	16	8	31%	50%	2,00	1,71
WaterWorks2015	60	22	6	10%	27%	2,00	1,05
Totals		2760	964	21%	35%	249,66	224,48

Source: ANR (June 2023)

Please bear in mind that the data included in the table provides a snapshot in time, without clear boundaries between the Framework Programmes. In addition, calls under the same partnership may widely differ in nature. Some are for research projects, but others aim to create networks, or “action groups”, for example. This is the case especially in the biology/health area in Cofunds like JPCofund, Action-AMR or NEURON that launch one such call per year. As a result, means on numbers of projects submitted, projects funded, or on success rates and amounts granted should be considered with caution. Please also note that :

- Some lines in the table present data for a single call, while others aggregate the data of several calls
- Some large initiatives were funded through several contracts with the EC and are thus presented in several lines
- Some calls were jointly created and launched across several partnerships and are thus listed separately from those of the individual partnerships.

3. Who are the key R&I performers in France ?

The main research actors in France are the Public Research Organizations (PROs) and the Higher Education Institutes. The PROs are subdivided in two main categories:

- Industrial and Commercial Public Institutions (EPICs) like the “Commissariat à l’Energie atomique” (CEA), Ifremer (Institut Français de Recherche pour l’Exploitation de la Mer), etc. These institutions are mainly devoted to a specific area of R&D activity such as nuclear, health, information technology, etc., and a significant part of the budget comes from contracts with the private sector.
- Scientific and Technological Public Institutions (EPSTs), which are dedicated to academic or fundamental research. The most important of those are the National Centre for Scientific Research (CNRS), which covers all the academic disciplines; the French National Institute for Agriculture, Food and the Environment (INRAE); the National Institute for Research in Computer Science and Control (INRIA); and the National Institute for Health and Medical Research (INSERM). There are also other important research foundations such as the internationally renowned Pasteur Institute in the area of biomedical research.

The Higher Education Sector includes 2 main components:

- 1) 74 universities including 3 universities of technology. The Higher Education and Research Universities system employs 55,000 research faculty members under more than 3,000 research laboratories. They are developing 275 doctoral schools with 13,600 PhD researchers per year. Universities attract people from all over the world as 40% of doctoral students are foreign nationals.³²

At the local level, research is organised into joint research units (UMR) being part of the same laboratory university components with other RPOs. Public Universities are financed by the MESR.

At national level, all the research actors are coordinated by 5 thematic Research Alliances to apply the National Strategy for Research and Innovation.

- AVIESAN, National Alliance for Life Sciences and Health;
- ANCRE, National Alliance for the Coordination of Research on Energy;
- ALLISTENE, National Alliance of Digital Sciences and Technologies;
- AllEnvi, National Alliance for the Environment;
- ATHENA, National Alliance for Humanities and Social Sciences.

³² [https:// French Public Universities, by the Numbers | France Universités \(franceuniversites.fr\)](https://frenchpublicuniversities.bythenumbers.fr/franceuniversites/franceuniversites.fr)

- 2) 140 public and 82 private “Grandes Ecoles” that play a significant role in research, particularly in the engineering science, but also in the economy and management, arts and architecture.³³

Below follow the experiences of getting involved in European Partnerships of three of the major institutions based on interviews conducted for the purpose of the report.



3.1. National Institute for Health and Medical Research (INSERM)

INSERM, with 15000 scientists on human health, has been involved in a number of partnerships in H2020, including for instance, EDCTP, IMI, EJP RD, or HBM4EU. The involvement took two main forms: participation of researchers in the calls launched by the partnerships, and participation of INSERM officials in the different strategic boards in the governance of the partnership, with the necessary firewalls applied to avoid conflict of interests.

In addition, INSERM Transfert, a subsidiary of INSERM, coordinates EJP RD. This was quite instrumental in proving the ability of INSERM to manage an ambitious partnership. In EDCTP, INSERM was also a key player making it also possible to fund researchers outside the country through the ANRS (special funding agency for HIV and hepatitis hosted by INSERM as an independent agency).

The experience with JPIs has also been positive. JPND that was led by INSERM facilitated a good alignment of national strategies. This is why INSERM pushed for the follow-up partnership on brain health, to avoid the need to apply for individual ERA-NETs or CSAs and keep the continuum in supporting the research. JPI AMR also worked quite well and INSERM is supportive of the creation of a new partnership on One Health/AMR.

INSERM provides the researchers with administrative support with proposal application, project management and the financial administration of EU projects. There is also extra help if they decide to be project coordinators from its subsidiary, INSERM Transfer, that assists projects coordinators in managing the projects and in preparing the implementation and impact plan.

Regarding the experience of French research in taking part in the partnership-supported projects, most researchers in INSERM are happy to participate in ERA-NET calls. They consider them covering a gap existing in funding low TRL cooperative research.

“Researchers appreciate that the administrative burden is not as high as in the H2020 calls and that they also get the opportunity to collaborate with European counterparts. The partnerships are seen as seeds for creating the capacity and ambition to try for larger projects/consortia in H2020 starting with something smaller. In the cases where Horizon rules need to be followed, as in EDCTP or IMI more efforts are required. Thus, INSERM researchers may prefer applying for national calls. However, when the researchers do get

³³ <https://www.campusfrance.org/fr/recherche/theme/etablisements>

engaged with H2020 projects they see that the burden is not so high as they thought it would be.” (INSERM Officials)

As a negative aspect, it takes time to explain new procedures and processes when a new instrument is launched. This is the case, for instance, for the new Co-funded partnerships which also present a more complicated administrative system. The fact that there are other instruments like the Missions where countries need to dedicate resources as well, does not simplify the situation. There is a need for simplification in the administration of the new partnerships and for a single-entry point to serve the needs of the different partnerships for launching calls, applying and project reporting in a unified way.

Regarding the countries that are important for strategic collaboration for INSERM these are reflecting in the bilateral collaborations that exist with all the Nordic countries, where there is already very good collaboration with several institutes. INSERM is also interested to increase collaboration with institutes in Germany, and the UK where the connections have been reduced due to BREXIT. The opportunities offered through the partnerships to collaborate with Third Countries like Canada are appreciated. Overall, INSERM is interested in boosting collaboration with counterparts in countries that are most active in EU calls and with which there are not strong links yet. Other possible countries to focus on with bilateral agreements would for instance be the Czech Republic as well as Spain and Italy.



3.2. National Centre for Scientific Research (CNRS)

CNRS is a very large institution with 33,000 people dedicated to research under more than 1,100 laboratories in France and abroad. CNRS is active in all the domains with an important contribution to basic research. CNRS is particularly interested in boosting European and international collaboration in research. Based on the recent [CNRS European strategy](#), the overall aim is to increase CNRS participation in EU Framework Programmes (FPs) including the European Partnerships, by applying a pro-active approach in promoting CNRS interests in the development of the respective research agendas of the FPs and also the partnerships. The CNRS Brussels office has existed for 30 years. The initial aim was to raise awareness of CNRS researchers and the French research communities at large, about the benefits of European collaboration and opportunities for funding. As part of the recent European strategy, CNRS is in the process of hiring 100 so-called European project engineers that will assist researchers to apply for EU grants.

International collaboration is also very high on the CNRS agenda. In nearly 85 years of existence, the CNRS has built a strong network of collaborations world-wide. There are several CNRS offices abroad (e.g., Australia, US, Canada, Brazil, Singapore, China, etc), nearly 80 international research labs, and several International Research Centres have been set up with institutions in Arizona, London, Tokyo, etc. This network and similar initiatives are supported by seed funding provided by CNRS to support the initiation of cooperation with international partners, including

European partners. When the level of collaboration with European or international partners is mature enough, CNRS researchers are encouraged to apply for EU grants.

Regarding European Partnerships, CNRS focuses on basic research, which is not the main type of research supported by partnerships. Yet, participation in partnerships offers space to have a say in the formulation of the EU strategic areas supported by the FPs also including the partnerships. Currently CNRS is taking part in 5 Co-Programmed and 4 Institutionalised Partnerships. This proves the high relevance of basic research in the challenge-driven research areas addressed by these partnerships.

“CNRS is committed to leveraging basic research for technological development and disruptive innovation to the benefit of society. The assets that CNRS offers in partnerships is the interdisciplinary approach, including social sciences and humanities, in doing research and the institute’s strong connection with industry, reflected in running more than 225 joint labs with private stakeholders.” (CNRS officials)

The strategic sectors for cooperation with industry include: energy, automotive, water, electronics, health, aeronautics, cosmetics, chemical materials and cybersecurity. At the same time, promoting the value of basic research in these partnerships is key, as it is an essential ingredient of the technology focus they address.

“We need to make room for basic research. This is not always easy in industry-driven partnerships where visions are more of a short-term nature. Yet it is also true that disruptive innovation and the questions posed by industry rely on a strong basis of basic research. In this sense, a better balance needs to be built in the partnerships’ agendas between basic and applied research.” (CNRS officials)

Regarding the benefits for French researchers to participate in partnership-supported projects CNRS official note that the partnerships are quite efficient instruments to collaborate with industry, something that does not exist for instance in collaborative projects of Pillar two of Horizon Europe. However, efforts are still needed to accustom French researchers to applying for competitive grants, although competitive funding has been the norm for some 25-30 years now. In addition, the participation of French researchers in European collaborative research programmes might slow down in the next years due to the strong increase of national research funds as prescribed in the new Programming Law.



3.3. National Institute for Agriculture, Food and the Environment (INRAE)

With 5000 researchers and engineers on agriculture, water and food, INRAE is a major actor for transnational collaboration . It provides opportunities for researchers to develop co-publications and is also a way to increase visibility among other strong institutions that have similar thematic foci, and thus influence the international research landscape. H2020 and Horizon Europe are good opportunities for funding research as are the European Partnerships.

INRAE has been actively involved in ERA-NETs and JPIs. The new Partnerships are not considered as just another funding tool, but also as spaces where strategic topics in the areas of interests are commonly defined and INRAE is keen to be part of such spaces. INRAE is interested in joining a number of the new partnerships (e.g. on agro-ecology, food systems, animal health, agri-data) both in the strategic fora and governance structures and as potential project beneficiaries provided the conflict-of-interest issue is effectively addressed.

“This proves that we increasingly value Partnerships and the opportunity to be more visible and have capacity to say what is important especially in addressing challenges that we cannot tackle alone.” (INRAE officials)

As previously noted by CNRS, the assets that INRAE brings to the partnerships through their participation, refer to the multi-disciplinary approach and connections to the users.

“We are used to apply a multi-actor, multi-disciplinary research approach. We also apply methods such as the living labs also engaging users/farmers in a co-creation mode. This is an asset when participating in partnerships as we can provide links to the end-users and thus towards impact.” (INRAE officials)

In an internal survey that is being conducted by INRAE, about the experience of participating in Horizon projects, French researchers value the opportunities for inter-cultural exchange when working with colleagues abroad, the new methodologies being co-created and the learning from each other, the networks and opportunities for co-publications that present higher citations when coming from EU projects than bilateral collaboration for instance. More than 40% of them state they are happy with their experience of participating in EU projects, but, at the same time, a share as large as 20% state they were happy to do it but would not do it again mainly due to the high administrative burden. Indeed, the Horizon project consortia are usually very large, meaning that the funds made available to each partner are limited. Thus, it is sometimes hard to persuade French researchers to take part when they can address the transnational dimension through the bilateral agreements, or when the transnational dimension is not as important, and they can cover their needs through national programmes which are less complex to manage.

Regarding partnerships, that follow national and not Horizon rules, the burden might still be high especially in the cases where they are required to submit two project progress reports (one centrally at the partnership and another one at the national funding agency), which was the case in some ERA-NETs.

The new partnerships under Horizon Europe present several challenges. The governance of the new partnerships is very difficult and complex and for a research institute like INRAE the management resources available to participate in such complex governance structures are limited. It is doubtful whether such governance approaches can allow the flexibility needed to carry out other than research activities, for instance in relation to communication, engaging stakeholders, capacity building, dissemination of research results, alignment activities, etc. The conflict-of-interest issue and the high administrative burden both at the level of partnership members and project beneficiaries also need to be addressed. Better coordination and avoidance of overlap is also important in the call topics between partnership calls, Horizon Europe calls and those of the Missions.

3.4. Performance in H2020

Overall, France belongs in the top 10 beneficiary countries in H2020. France has kept its third position after Germany and the UK in the amounts received as EU net contribution. French organisations received 10.98% of H2020 funding and signed 9.62% of the grants. They presented a success rate of 17.49% which is above the total average as well as that of the comparator countries. However, although project proposals are of high quality, French teams responded less frequently than their Spanish, Italian, German or UK counterparts as reflected in the number of applications. (Table 3) In addition, with 9.5% of coordinated projects, France is in the fourth place after Germany, Spain and Italy.

Table 3: Key features of H2020 participation for France and the benchmark countries

	EU NET Contribution ³⁴ (€ billion)	Signed grants	Participations	Applications	Success rate
France	7.5	8,455	18,400	77.682	17.49
Germany	10.1	10,564	22,372	107.803	16.84
Spain	6.3	9,212	19,960	110.441	14.31
Italy	5.7	8,195	17,987	109.383	13
UK	7.8	10,958	18,447	100.255	15.29
Total H2020	68.3	37,265	191,323	1.001.908	15.30
France's % in H2020	10,98%	22,69%	9,62%		

Source: Author's elaboration based on the H2020 data provided at https://dashboard.tech.ec.europa.eu/qs_digitt_dashboard_mt/public/sense/app/1213b8cd-3ebe-4730-b0f5-fa4e326df2e2/sheet/0c8af38b-b73c-4da2-ba41-73ea34ab7ac4/state/analysis

In H2020 data, France has received €7.5 billion in net EU contributions, and is in the third position after Germany and the United Kingdom (Table 3). When the contribution of France to H2020 budget is considered (€9.25 billion), it becomes clear that the French contribution to the EU research budget is around 20% higher compared to what the country receives in return. This is an important issue for French Ministries, and MESR in particular developed a plan to support and increase the participation of French scientists to Horizon Europe (2018 PAPFE)³⁵.

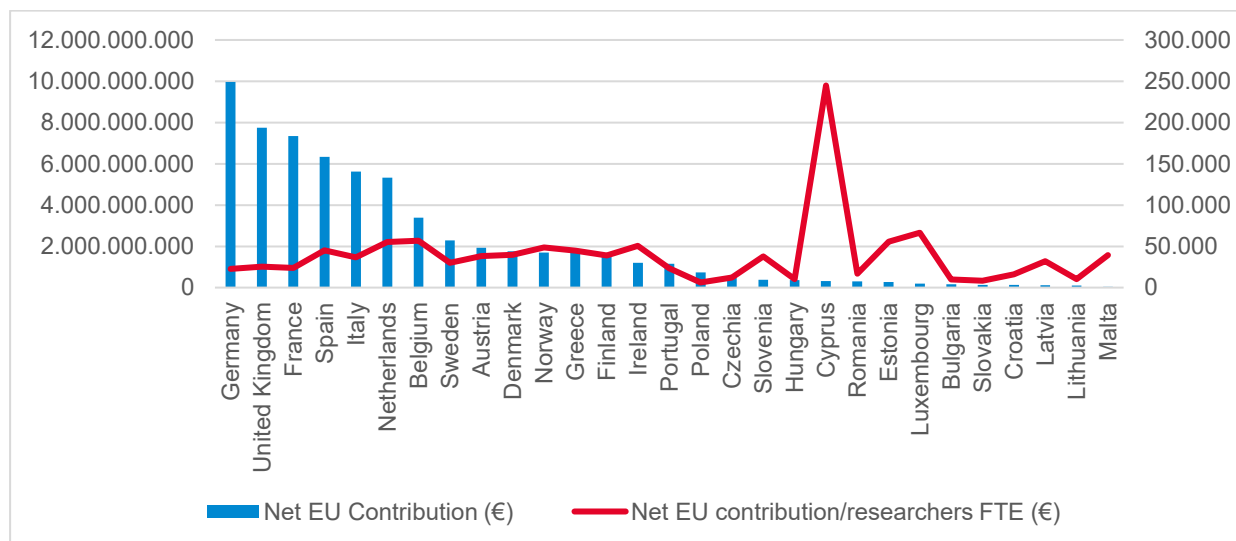
However, when the net contributions are normalised by the number of researchers (in full-time equivalents), the picture reverses as the top beneficiaries with large research communities occupy the last positions in the ranking, i.e. invest on average small amounts of funds per researcher. In detail, France funds each researcher with around € 23.6 K. This is slightly above the figure for Germany (€ 22.5 K) but below those of the UK (€ 25.4 K), Spain (€44.4) or Italy (€36

³⁴ Funding received by the projects' participants after deduction of their linked third parties funding.

³⁵ <https://www.enseignementsup-recherche.gouv.fr/f/Le-plan-d'action-national-d'amélioration-de-la-participation-française-aux-dispositifs-européens-de-financement-de-la-recherche-et-de-l'innovation> | enseignementsup-recherche.gouv.fr

K). The top countries are the Netherlands, Belgium and Ireland with €50,000 – 55,000 per researcher, next to Luxembourg with €65,000 and Cyprus, which is an exceptional case. (Fig. 8).

Figure 8: EU Net Contributions per country and EU Net Contribution divided by researchers FTE in H2020



Source: H2020 data (June 2022)

Table 4: European Commission contribution to top 20 French participants in H2020

Nr.	Organisation (ENG)	EU Net contribution (€)
1	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS	1.179.099.791,20
2	COMMISSARIAT A L ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES	693.859.179,32
3	INSTITUT NATIONAL DE LA SANTE ET DE LA RECHERCHE MEDICALE	316.032.618,21
4	INSTITUT NATIONAL DE RECHERCHE POUR L'AGRICULTURE, L'ALIMENTATION ET L'ENVIRONNEMENT	141.965.240,87
5	AIRBUS OPERATIONS SAS	105.382.191,87
6	INSTITUT NATIONAL DE RECHERCHE EN INFORMATIQUE ET AUTOMATIQUE	105.133.563,27
7	SORBONNE UNIVERSITE	101.235.902,41
8	INSTITUT PASTEUR	78.879.736,71
9	OFFICE NATIONAL D'ETUDES ET DE RECHERCHES AEROSPATIALES	76.446.243,91
10	UNIVERSITE D'AIX MARSEILLE	72.280.331,13
11	UNIVERSITE GRENOBLE ALPES	65.958.583,05
12	THALES AVS FRANCE SAS	62.841.377,36
13	BULL SAS	50.233.400,65
14	SAFRAN AIRCRAFT ENGINES	49.276.835,97
15	DASSAULT AVIATION	44.480.858,75
16	AGENCE NATIONALE DE LA RECHERCHE	44.355.860,49
17	THALES LAS FRANCE SAS	43.125.534,06
18	INSTITUT CURIE	42.272.086,87
19	UNIVERSITE DE BORDEAUX	38.502.514,61
20	UNIVERSITE DE STRASBOURG	38.316.974,78

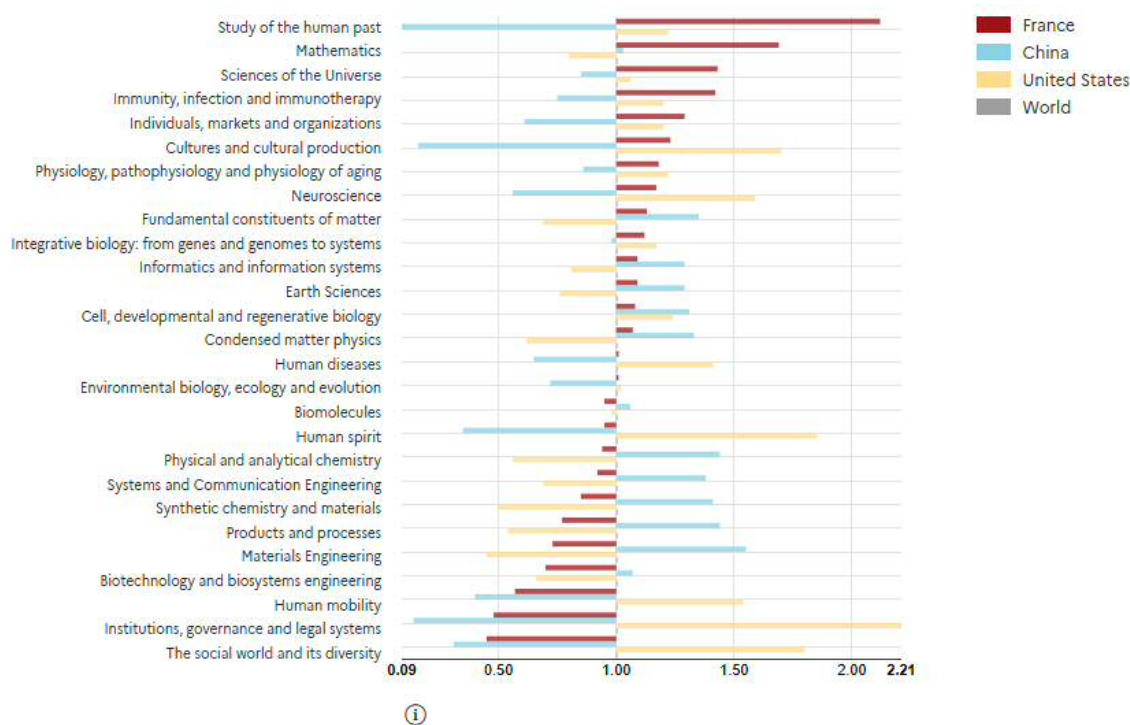
Source: eCORDA, July 2023

The major French research institutions are clearly committed to and have started taken up a stronger role in the European Partnerships. They are increasingly appreciating the opportunities offered in both shaping the EU R&I thematic priorities and benefiting French researchers with the collaboration with counterparts at the EU level or internationally. Notwithstanding the persisting difficulties, and new uncertainties, the European Partnerships are valued as a stepping-stone towards larger collaborative endeavours under Horizon, or as an important supplement to other European initiatives (Horizon programmes). The opportunities to connect with users/industry are also highly appreciated. French researchers may apply less frequently and be more reluctant to take up the coordinators' role in H2020 projects than their peers in the comparator countries, but they enjoy higher success rates when they do apply.

4. In which R&I areas is France strong?

Based on data from the scientific publications elaborated by MESR³⁶, France has a strong specialisation in the fields of Study of the Human Past (HS6, index 2.0) and Mathematics (PE1, index 1.8). Moreover, the share of the fields of Immunity, Infection and Immunotherapy (LS6), Sciences of the Universe (PE9) and Cultures and Cultural Production (SH5) in French publications is 30% to 50% above their share in world publications. (Figure 9)

Figure 9: 2021 Specialisation Index by Scientific Field (France, China, United States)



¹ Scientific fields defined by the European Research Council (ERC).

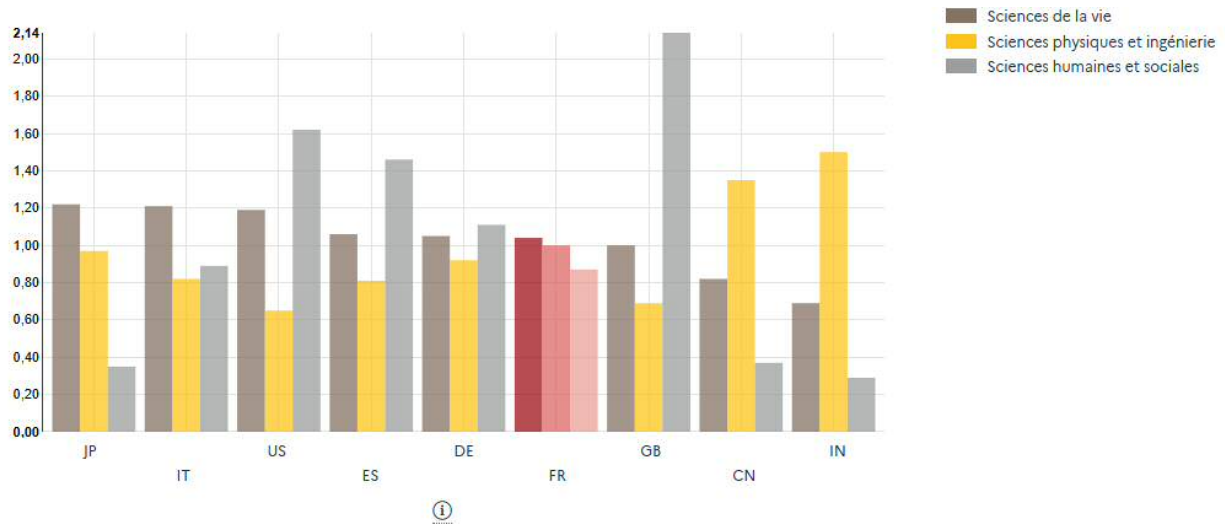
Source: Base OST, Web of Science (Clarivate Analytics), HCERES-OST calculations, at [The scientific profile of the France through its publications - State of Higher Education, Research and Innovation in France n°16 \(enseignementsup-recherche.gouv.fr\)](https://www.enseignementsup-recherche.gouv.fr)

Compared to the peer countries (Germany-DE, United Kingdom-GB, Spain-ES, Italy-IT) France seems to be more specialised in physical sciences, engineering, and the environment including climate change. Similar specialisation level features in life sciences in the case of France, Spain, Germany and the UK, while Italy is slightly more advanced. French researchers also seem to be much less

³⁶ [The scientific profile of France through its publications - State of Higher Education, Research and Innovation in France n°16 \(enseignementsup-recherche.gouv.fr\)](https://www.enseignementsup-recherche.gouv.fr)

specialised in social sciences and humanities than their counterparts in the UK and they also fall behind the scores of Germany in this area, although being similar to Italy. (Figure 10).

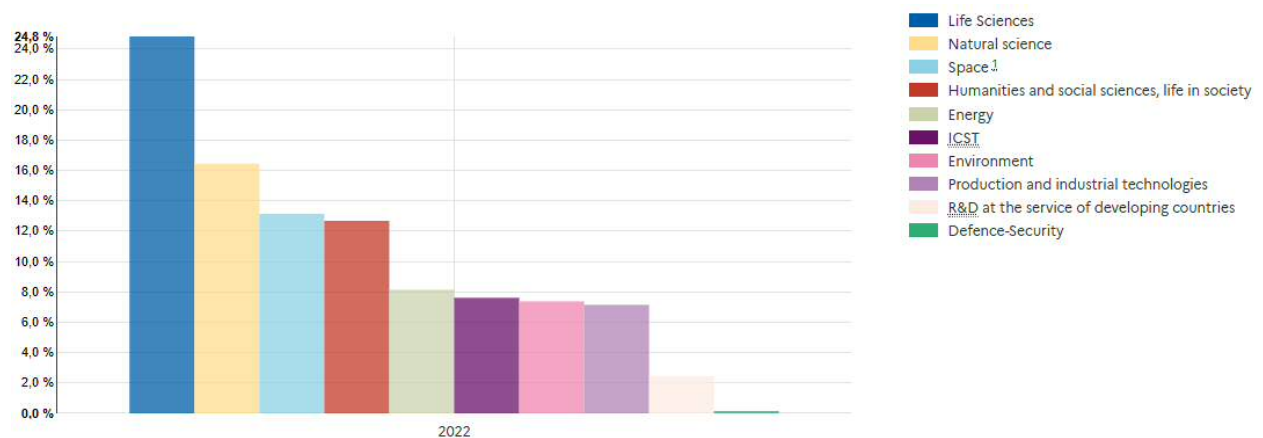
Figure 10: 2021 Specialization index by major scientific fields (Life sciences, Physical sciences and Engineering, Social Sciences and Humanities)



Source: Base OST, Web of Science (Clarivate Analytics), HCERES-OST calculations, [the scientific profile of the France through its publications - State of Higher Education, Research and Innovation in France n°16 \(enseignementsup-recherche.gouv.fr\)](#)

In terms of funding at national level, life sciences (health, agriculture, life sciences, and biodiversity) receive the largest share (23%), while research in the natural sciences including physical sciences consumes 15% of budget appropriations. Research carried out by public bodies in the exploration and exploitation of space accounts for 12% including the French contributions to space research (ESA and EUMETSAT). SSH absorbs 11% of the appropriations, while information and communication sciences and technologies (ICTS) accounts for 7%. Around 16% is dedicated to research into industrial production and technologies, and energy.

Figure 11: Distribution of research budget appropriations for the Mires 2022 by socio-economic objectives - Main objectives (in € billion)



Source: MESR-DGESIP/DGRI-SIES at [the socio-economic objectives of the budget appropriations devoted to research - State of Higher Education, Research and Innovation in France n°16 \(enseignementsup-recherche.gouv.fr\)](#)

In relation to research performed by businesses, more than half of companies' domestic R&D expenditure is allocated to six research branches (automotive, aeronautics and space, professional, scientific and technical activities, pharmaceuticals, IT activities and information services and chemistry).³⁷

In Horizon 2020 Partnerships there is complementarity in terms of the areas that are supported. As Table 5 shows below, the public partnerships (Member-State driven) are primarily covering the needs for supporting the health area along side climate and the environment and food and agri-culture. The Joint Undertakings and cPPPs, where industry and businesses play a primary role, are particularly addressing transport along with ICT, reflecting some of the key areas of business R&D orientation.

Table 5: Distribution of funding under the different H2020 instruments (P2Ps, JUs, cPPPs and other H2020 projects, i.e. CSAs, RIAs, IAs, etc.) across thematic priorities

	P2Ps	JUs	cPPPs	Other H2020
Nanotechnologies, Advanced Materials, Advanced Manufacturing and Processing, Biotechnology	7,13%	1,78%	4,64%	8,52%
Climate action, environment, resource efficiency and raw materials	18,16%	0,37%	1,25%	4,92%
Europe in a changing world - inclusive, innovative and reflective Societies	2,45%		10,37%	5,55%
Food security, sustainable agriculture and forestry, marine and maritime and inland water research	17,66%	6,45%		5,98%
Future and Emerging Technologies	5,07%		2,13%	7,51%
Health, demographic change and wellbeing	45,83%	11,15%		14,23%
Information and Communication Technologies		19,74%	78,84%	15,89%
Secure, clean and efficient energy	2,87%	2,61%	2,76%	11,52%
Smart, green and integrated transport	0,82%	57,90%		25,88%
	100,00%	100,00%	100,00%	100,00%

Source: Biennial Monitoring Report 2022 – Country Fiche France; ERA-LEARN database (cut-off date June 2021) based on actual national contributions for P2Ps; eCORDA based on net EU contribution; Values are calculated as the share of investments of the specific instrument in the specific theme in the total investments under the specific instrument

As noted by ANR officials, no research areas are excluded from funding, as long as the specific research domain is strategically important for France. In highly important domains, support may be attributed at all levels, i.e., national, bilateral and international, as has been the case of anti-microbial resistance for example. In addition, for the last 2 years there has been a high focus on energy through the Priority Research and Equipment programmes, with more than €7 billion

³⁷ Domestic expenditure on research and development

dedicated to the national strategy on energy although the respective research programme is only equipped with €80 mill for 7 years. Feedback on the topics to be addressed in partnership calls is received at national level through the Programming Committees and the Mirror Groups mentioned earlier, but also from researchers themselves who may send emails directly to the governing boards of the partnerships. ANR also analyses data to see if the topic has been funded, for how long, what the impact has been in terms of publications, etc. to estimate the level of interest of the national research community and based on this whether to take part in partnerships/calls or not.

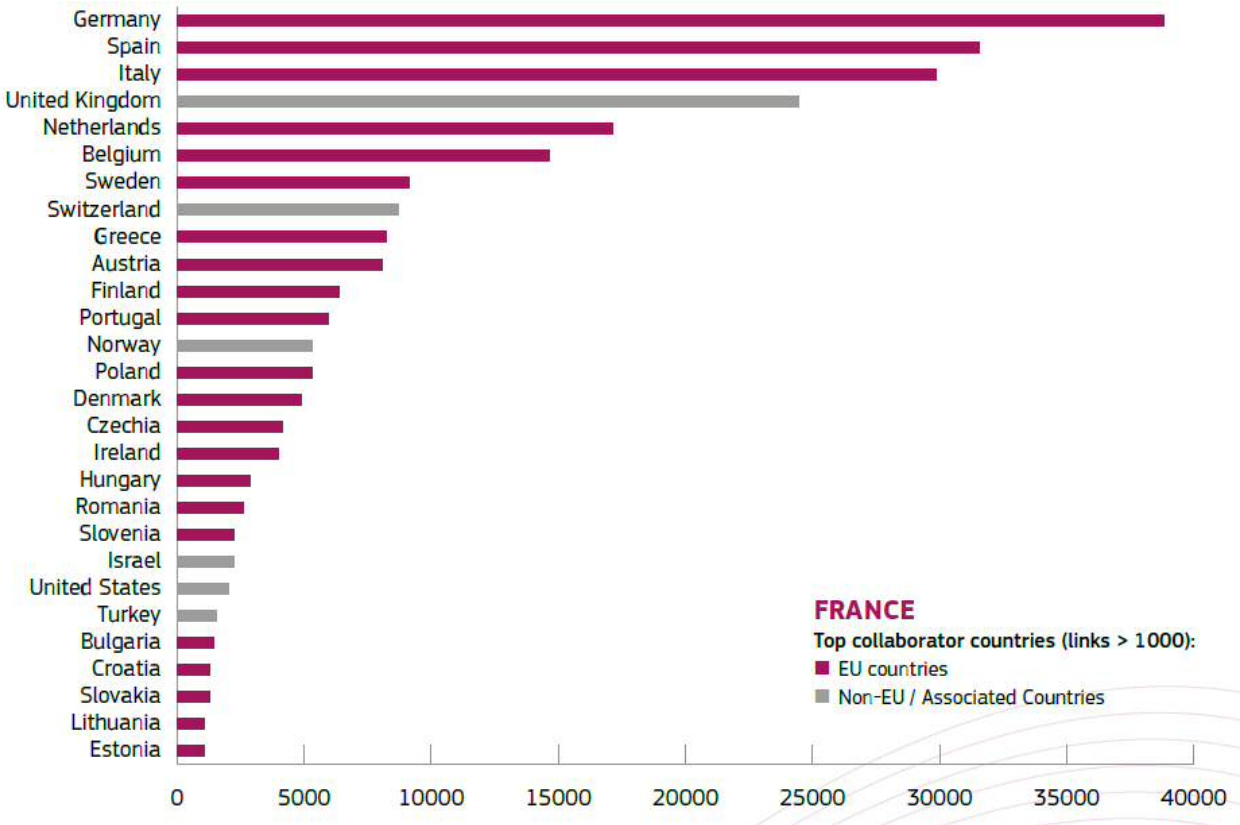
Based on the elaboration of publication data by MESR, as presented above, and albeit language biases prevalent in databases such as Web of Science, France has a stronger profile in physical sciences and engineering and life sciences, than social sciences and humanities in relation to the comparator countries. Yet, all these areas, together with space, receive the bulk of the national budget appropriations in R&D. European Partnerships are used to cover the needs of the areas of expertise in a complementary mode, with the public partnerships addressing more the areas of health, food and agriculture, while the industry/businesses-driven ones focus more on the transport and ICT areas reflecting some of the strengths of the business R&D efforts in the country.

5. With whom does France collaborate in R&I and why?

Based on the study of the international co-publications³⁸ French researchers mostly collaborate with counterparts in the United States, with which they produce more than a quarter of international co-publications. Second comes the United Kingdom and then Germany. France is also an important partner for Italy, Spain, Switzerland, Canada, the Netherlands and especially Belgium.

In a similar vein, the H2020 data (Figure 12) shows that the top 5 collaborators of French researchers come from Germany, Spain, Italy, the UK and the Netherlands. As noted by ANR officials, there is long-lasting strategic bilateral collaboration between ANR and DFG (Germany) supporting research topics in any discipline that may be identified bottom-up by the researchers.

Figure 12: Top collaborators of French researchers under Horizon 2020 projects (including P2Ps, JUs, cPPPs, and other H2020 projects) showing countries where links >1 000 links



Source: eCorda – Horizon 2020 Dashboard – as included in the BMR 2022

³⁸ [The scientific position of France in the world through its publications - State of Higher Education, Research and Innovation in France n°16 \(enseignementsup-recherche.gouv.fr\)](https://enseignementsup-recherche.gouv.fr)

Generally, the target countries for collaboration reflect the specialisation areas of the countries, or similar conditions in a specific topic. For instance, Italy is targeted for the urban studies due to similarity in the legal and cultural framework with France. Spain is targeted because of the high skills in solar thermodynamics.

Beyond this, the partnerships have boosted collaboration with countries that were less addressed in the past. One such example is Norway, while other cases also reflect historical ties.

“The number of projects co-funded with Norway is one of the most striking features of the geography of joint funded projects...Historical and linguistic ties also exist, e.g. under PRIMA the collaboration with Tunisia, Algeria and Morocco (historical ties), or with Canada and Québec more specifically.” (ANR officials)

Partnerships have also been instrumental in boosting the collaboration with non-EU countries, an area strongly supported by France through its development policy. As stated in France’s country fiche included in the BMR 2022,

“French teams have successfully participated in networks and partnerships targeting developing countries (LeapAGRI, Water JPI, PRIMA, etc.), which have helped to pull the European Research Area towards the Global South. Numerous success stories during H2020 show how these projects have had an impact on research policies in these countries.” (BMR 2022, France Country Fiche)

France is also active in multilateral cooperation through the [Belmont Forum](#), an international network of funding agencies, by participating to the majority of research calls oriented towards the advancement of transdisciplinary science. The Forum operations are guided by the [Belmont Challenge](#), a vision document that encourages international cooperation. AllEnvi and ANR are members representing France and ANR is co-chairing the Steering Committee.³⁹

French researchers partner with counterparts from a wide range of countries including the US, as well as the most active countries in both H2020 and European R&I Partnerships (Germany, Netherlands, Spain, Italy and the UK). Partnerships are used to strengthen existing collaborations but also to connect with countries that are active in research and innovation but have been less addressed such as Norway. Partnerships are also an important tool to support France’s development policy by strengthening collaboration with non-EU countries in the Global South.

³⁹ <https://belmontforum.org/>

6. What are France's S&W in relation to participation in European R&I Partnerships?

Strengths

- European and international collaboration, a high level priority for France; Strategic collaborations and bilateral agreement with several European as well as non-EU countries.
- Existence of development research policy targeting non-EU countries.
- France is in the leading position with regards to partnership coordination.
- A well-functioning coordination system for partnership participation at the national level.
- Measures and incentives for increasing European and international collaboration of researchers and rewarding exceptional performance in European projects.
- Organisation of national priorities along challenges and goals similar to the EU goals.
- A strong Innovation in EIS terms with high number of foreign doctoral students.
- A new Research Programming Law including a gradual but radical increase in national R&I funds aiming at increasing the success rate of applications to national programmes to 40%.
- Provision of support by ANR as well as major research institutes of the country to applicants and incentives to take up the role of coordinator in collaborative projects.
- Multi-disciplinary approach in research applied by the research institutes in the country and links to users/industry, although collaboration between research and industry still limited at national level

Weaknesses

- French research organisations are responding less than their European counterparts to partnership or Horizon calls, although with a higher success rate, and are less acting as project coordinators.
- Relatively medium attractiveness of the French research system although measures taken to remedy this.
- Room for improvement in the international scientific co-publications and the publications among the top 10% most cited ones.

7. Country-specific focus areas for France: Development research policy and partnerships

France attaches great importance to development. This translates into its research & higher education policy, which puts a strong emphasis on development and cooperation with developing countries, as well as in its research and innovation system. Such attention is necessary to tackle global challenges as well as to ensure a balanced development between France -and more widely the EU- and neighbouring countries or regions for the mutual benefit of all parties. As a result, many French research and higher education bodies host departments, laboratories or teams who dedicate their efforts to development-oriented activities, whether in research organisation such as INRAé and CNRS, or in universities. The French R&I system also comprises two research organisations entirely dedicated to research for development: [CIRAD](#) (in agricultural research) and [IRD](#) (research for sustainable development in cooperation with developing countries), both under the MESR and the [MAEE](#). Additionally, in the field of biology and health, the [Pasteur foundation](#) is notorious for its activities on vaccines and with the [ANRS|MIE](#) on emerging diseases affecting developing countries.

Wherever relevant, France also promotes multilateralism in the field of cooperation for development and favours acting at the European level rather than bilaterally. As a result, France is involved in European R&I initiatives geared towards cooperation with developing countries by actively taking part in the design, by taking up responsibilities, and by investing large amounts of money, into research projects. For example, building upon the experience and success of [ERANETMED](#) under FP7, the [PRIMA](#) Partnership was created under H2020 in 2017 following a European Council decision based on article 185 TFEU. This was strongly supported by the French authorities. PRIMA was created along with 19 other countries that committed in totally € 274 million, thus allowing a total of € 220 mission as matching funds from the EC under Horizon 2020. France committed a total of € 40 million over 7 years. The French authorities mandated ANR to represent the country and fund national teams in PRIMA section 2 calls. From 2018 to 2022, 4 calls took place and 65 projects involving French teams were funded for a total amount of € 19.6 million allocated through the ANR. Additionally, French teams were also funded directly by the PRIMA Foundation in the programme's sections 1 and 3 with EC funds. The aim of PRIMA is to strengthen the capacities of research and innovation and to develop joint knowledge and innovative solutions for agri-food systems and water supply in the Mediterranean region to make them sustainable, in line with the United Nations Program of Action for sustainable development by 2030.

The strong commitment of France for development-oriented research at the European level may also be illustrated by the fact that France, through ANR, coordinated three ERA-NETs Cofund Actions under H2020 with increased emphasis on development.

The first one was [LEAP-Agri](#), a joint Europe and Africa Research and Innovation initiative on Food and Nutrition Security and Sustainable Agriculture, launched through an ERA-NET Cofund contract including 34 organisations from 22 countries and the EC. Developed under the aegis of the overarching [Europe Africa dialogue in Science and Technology \(the HLPD\)](#) and building on earlier experiences such as [ERAfrica](#), [PRO-IntensAfrica](#) and [ERA-ARD](#), it started in 2016 for a

duration of 5 years. The aim of the call launched through this scheme was to finance research and innovative proposals with the objective of contributing to food security in Africa, by promoting more sustainable agriculture and aquaculture, a better understanding of the relationship between food and health, and an analysis of access to food products in connection with commercial cycles. Through the initiative, ANR granted 7 projects with €1.88 million.

As a continuation of the cooperation, that was subsequently labelled as the Long-term EU-AU Research and Innovation Partnership (LEAP), a second partnership was created, the [LEAP-RE](#) «Long term Europe Africa Partnership on Renewable Energy». Funded as a Research and Innovation Action by the EC and 33 countries from Africa and Europe for 5 years (2020-2025), LEAP-RE seeks to create a long-term partnership of African and European stakeholders. LEAP-RE is intended to fund transnational research and innovation projects on renewable energies in Africa in order to increase their use. To date 1 call took place and 7 projects involving French teams were funded for a total allocation of €1,48million through the ANR. France co-coordinates this initiative with the MESR of Algeria. Moreover, ANR coordinates the pillar dedicated to joint calls for proposals and France is one of the 13 countries that participated financially in the first LEAP-RE call, which included 5 African countries and 8 European countries.

The third and last one is [FOSC](#), a trans continental initiative (Europe-Africa-Latin America) in the field of food systems and climate, also launched under H2020 as an ERA-NET Cofund, which brings together 28 partners from the three continents. FOSC calls support basic and applied research and focus on the interactions between climate change and food systems: assessing the consequences of climate change on agri food markets and developing sustainable and resilient food value chains in the context of changing food needs and patterns. To date, FOSC implemented two joint calls for proposals: one in 2019 and one in 2021 in cooperation with SUSFOOD, and France, through ANR, participated in both. Through this initiative, ANR granted 6 projects with € 1,32 million.

Additionally, in the field of biology & health research, France has been involved in the [EDCTP](#) (Global Health European and Developing Countries Clinical Trials Partnership) from its inception. EDCTP was launched in 2003 and renewed in 2014 as an institutionalized partnership based on Article 185 TFEU, and it was extended again in 2021 as a Joint Undertaking under Horizon Europe (based on Article 187 TFEU) with funding through to 2031.

Through its evolution, the EDCTP programme has been the focal point for EU support for global health research in Africa, and a visible sign of the EU's commitment to the Millennium Development Goals and more recently the Sustainable Development Goals. With the support of the EU, EDCTP has brought together the combined strengths of its European Participating States with those of their sub-Saharan African counterparts and interested third parties to address the global challenge of fighting poverty-related infectious diseases, which is beyond the capacity of individual countries. EDCTP facilitates cross-border research in Europe and sub-Saharan Africa and contributes to the development of the European Research Area. The programme also promotes sustainability and African ownership through support of capacity building in sub-Saharan African countries. Through EDCTP, European countries have a coherent and coordinated voice internationally and a common strategy for clinical research to fight poverty-related infectious diseases in sub-Saharan Africa.

Importantly, not only does the programme require the cooperation of African and European teams in every funded project, but it is co-coordinated by European and African counterparts, and the

programme governance also requires African-European representation on an equal footing at every level.

From the point of view of France, the programme came as valuable extension and upscaling of its existing bilateral cooperation in the field of health and clinical trials in Africa. It promised better strategic multilateral coordination as well as more resources for these activities, by aligning the existing cooperation of several European countries and involving the EC. It is a complement to other multilateral development-oriented health initiatives supported by France, such as the Global Fund and Unitaid. However, as research is rather marginal in the latter, EDCTP stands as the major multilateral programme for health research in developing countries supported by France. France also played an important role in the evolution of the funding model from EDCTP1 to EDCTP3 (from a cash driven initiative, to an in kind supported one).

From 2014 to 2019, France made a € 62 million in-kind contribution to EDCTP, in addition to an in-cash € 2 million transfer to the association. 80% of the in-kind contribution consists of collaborative clinical trials and clinical studies, 18.5% in clinical research capacity building, and the rest 1.5% in fellowships. During this period, according to the figures available on the EDCTP website, 59 projects involving French partners were included under the umbrella of the initiative, out of which 29 projects were granted with EDCTP funds, for a total amount of € 19.4 million. Overall, the French contribution accounted for 7% of the total national contributions, making it the 4th largest national contributor after the UK, Sweden and Germany (the UK accounting for 61,5% of the national budgets).

Annex

Main indicators for P2Ps in H2020 (*)	France	Germany	Italy	Spain	UK	EU14 average H2020	EU13 average H2020	EU27 AVERAGE
Total actual investments in P2P partnership calls (€ m)	317	731	209	214	245	185	21	102
Number of funding organisations participating in P2Ps	47	53	40	40	29	25	10	18
Number of P2P calls with specific country participation	255	255	225	259	133	176	106	142
Number of full-proposals submitted to P2P calls (***)								
Number of eligible proposals submitted to P2P calls (***)								
Success rate (funded/full-proposals) (***)								
Number of projects funded under P2P calls	1560	2190	1151	1403	1068	842	165	516
Number of total project participations from country	2460	3827	1892	2032	1755	1318	220	790
Total costs of project participation (000€)	766,883	1,283,789	352,024	507,761	624,151	389,511	36,868	219,720

Source: ERA-LEARN database (cut-off date May 2023), Estimated missing data 15-25%%; (***) Data to be collected by the networks in the future.

Main R&I indicators	France				Germany	Italy	Spain	UK	EU 27 average
	2018	2019	2020	2021	2021	2021	2021	2021	2021
GERD (as % of GDP)	2,20	2,19	2,30	2,21	3,13	1,43	1,43	2,93 (2020)	2,15
Percentage of GERD funded by the business sector	56,63	56,75	56,77		62,61 (2020)	52,84 (2020)	49,18 (2020)	57,49 (2020)	57,08 (2020)
Percentage of GERD funded by government	31,53	31,53	31,53		29,7 (2020)	33,69 (2020)	38,51 (2020)	19,55 (2020)	30,83 (2020)
Percentage of GERD funded by rest of the world	7,71	8,05	7,72		7,31 (2020)	11,28 (2020)	7,71 (2020)	11,9 (2020)	9,81 (2020)
Percentage of GERD performed by the business sector	65,54	65,92	66,02	65,59	66,63	61,39	56,21	71,22 (2020)	65,60
Percentage of GERD performed by higher education	20,45	20,11	20,31	20,26	18,27	23,35	26,59	22,45 (2020)	21,80
Percentage of GERD performed by government	12,44	12,33	11,71	12,23	15,11	13,47	16,87	4,99 (2020)	11,84
GOVERD (% of GDP)	0,27	0,27	0,27	0,27	0,47	0,20	0,24	0,15 (2020)	0,25
percentage of GOVERD financed by the business sector	7,96	6,92	7,60		9,79 (2020)	3,79 (2020)	7,99 (2020)	2,08 (2020)	7,68 (2020)
HERD (as % of GDP)	0,45	0,44	0,47	0,45	0,57	0,35	0,38	0,66 (2020)	0,47
percentage of HERD financed by the business sector	2,83	2,96	2,97		12,94 (2020)	6,02 (2020)	5,16 (2020)	8,78 (2020)	6,96
BERD (% of GDP)	1,44	1,44	1,52	1,45	2,09	0,91	0,80	2,07	1,41
percentage of BERD funded by the business sector	83,63	83,53	83,23		88,16 (2020)	82,26 (2020)	83,21 (2020)	79,30	83,37 (2020)
percentage of BERD funded by government	7,45	7,67	8,53		3,19 (2020)	4,71 (2020)	9,58 (2020)	7,08	5,83 (2020)
percentage of BERD funded by rest of the world	8,60	8,67	8,16		8,49 (2020)	12,87 (2020)	7,06 (2020)	13,04	10,59 (2020)
Total national public funding to transnationally coordinated R&D (€ million) (EUROSTAT)									
Total researchers (full-time equivalent)	305.438	313.373	321.549	340.004	459.510	172.718	154.125	295842 (2017)	1.991.440
International scientific co-publications per million pop				125716,00	142832,00	130305,00	139692,00		
Share of country's publications in top 10% most-cited worldwide				86768,00	103729,00	107567,00	89044,00		
PCT patent applications EIS 2022				96205,00	123934,00	73104,00	59933,00		
ERC grantees by country per call year (mar 2023)				1711	2324	867	877	2459	

Sources: OECD STI Indicators, https://stats.oecd.org/Index.aspx?DataSetCode=MSTI_PUB&_ga=2.10058678.2035126309.1548251117-1585184866.1542984834; EIS 2022 <https://ec.europa.eu/research-and-innovation/en/statistics/performance-indicators/european-innovation-scoreboard/eis>; <https://erc.easme-web.eu/#>; <https://ec.europa.eu/eurostat/web/main/data/database>



References

Reports

- RIO/JRC Country Report France 2017
- ESFRI National Roadmap France 2021
- 2022 European Semester Country Report on France
- Aminian, N., K.C. Fung (2019) Silicon Valley, Japan and France: A Comparative Study of Innovation Systems and Policies, http://apeaweb.org/confer/fuku19/papers/Aminian_Nathalie.pdf

Links

- [CNRS European strategy](#)
- [Domestic expenditure on research and development](#)
- [Domestic expenditure on research and development - State of Higher Education, Research and Innovation in France n°16 \(enseignementsup-recherche.gouv.fr\)](#)
- [EIS 2020 Methodology report.pdf](#); https://interactivetool.eu/EIS/EIS_2.html
- [France and development research - Ministry for Europe and Foreign Affairs \(diplomatie.gouv.fr\)](#)
- https://dashboard.tech.ec.europa.eu/qs_digit_dashboard_mt/public/sense/app/1213b8cd-3ebe-4730-b0f5-fa4e326df2e2/sheet/0c8af38b-b73c-4da2-ba41-73ea34ab7ac4/state/analysis
- <https://ec.europa.eu/research-and-innovation/en/statistics/performance-indicators/european-innovation-scoreboard/eis>
- https://www.enseignementsup-recherche.gouv.fr/sites/default/files/imported_files/documents/strategie_nationale_recherche_397269.pdf
- [LPR: The main provisions of the law | enseignementsup-recherche.gouv.fr](#)
- [National strategies: €12.5 billion | enseignementsup-recherche.gouv.fr](#)
- [Our successes in Europe | Horizon-europe.gouv.fr](#)
- [Presentation of IPA4 | enseignementsup-recherche.gouv.fr](#)
- [Promoting France's attractiveness - Ministry for Europe and Foreign Affairs \(diplomatie.gouv.fr\)](#)
- [Recovery Plan for Higher Education, Research and Innovation | enseignementsup-recherche.gouv.fr](#)
- [Research and innovation through public-private partnerships - Ministry for Europe and Foreign Affairs \(diplomatie.gouv.fr\)](#)
- [Restitution of the work of the working groups for a draft law on multiannual programming of research | enseignementsup-recherche.gouv.fr,](#)
- [RTD - European Innovation Scoreboard 2022 \(europa.eu\)](#)
- [The research and development effort in France](#)
- [The scientific position of France in the world through its publications - State of Higher Education, Research and Innovation in France n°16 \(enseignementsup-recherche.gouv.fr\)](#)
- [The scientific profile of the France through its publications - State of Higher Education, Research and Innovation in France n°16 \(enseignementsup-recherche.gouv.fr\)](#)
- [The socio-economic objectives of the budget appropriations devoted to research - State of Higher Education, Research and Innovation in France n°16 \(enseignementsup-recherche.gouv.fr\)](#)

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