



**FRANCE  
EUROPE  
2020**

**A STRATEGIC AGENDA**  
FOR RESEARCH, TECHNOLOGY  
TRANSFER AND INNOVATION

TAKING ON THE CHALLENGES  
OF SOCIETY AND  
CONTRIBUTING TO THE  
NATION'S COMPETITIVENESS

"INVESTING  
IN KNOWLEDGE  
MEANS BUILDING  
THE FRANCE  
OF TOMORROW"

Address by FRANÇOIS HOLLANDE  
PRESIDENT OF FRANCE  
Collège de France (*February 4<sup>th</sup> 2013*)



## "FRANCE EUROPE 2020", A RESEARCH AGENDA FOSTERING GROWTH, SOCIETY, AND THE NATION'S RECOVERY.

GENEVIÈVE FIORASO,  
MINISTER FOR HIGHER EDUCATION  
AND RESEARCH

Investing in research is believing in the power of competitiveness, in a world of technological, scientific, economic, societal and environmental change. Both our neighbours and emerging countries have been quick to realise this, listing higher education and research amongst their national priorities.

Public financing for research, which the Government has kept high, amounted to €19.2 bn<sup>1</sup> in 2010, comparing to total national R&D expenditure of €44.6 bn (2.3% of GDP). It is a collective investment that calls upon the State to step up to its role as strategist, guiding and planning for the nation.

The newly-instituted Strategic Agenda for Research, Transfer and Innovation, "**France Europe 2020**" illustrates this new policy. It comprises a national research strategy, the core principle of which I ensured was incorporated into the Act on Higher Education and Research, along with specific measures to foster transfer and innovation and secure our Nation's place in the European Research Area.

Through this Agenda, the aspiration is to collectively set out the priority areas

1. L'État de l'Enseignement supérieur et de la Recherche en France [n° 6 - édition 2012]. ] The State of Higher Education and Research in France.

for progress in knowledge and technology, taking into consideration the key challenges which our Nation faces, and to lay down the foundations needed for them to be implemented. The priorities will be determined based on the results of close consultation with the scientific community, social and economic partners, the relevant Ministries and local authorities.

The National Research Strategy will be revised regularly, under the coordination of the Ministry of Research, and will be implemented through multi-year contracts concluded with research institutions, higher education institutions, the National Research Agency's (ANR) planning department, and other public research funding agencies.

The central aim of the "France Europe 2020" Agenda is to enable all areas of French research to better take on the scientific, technological, economic and societal challenges of the decades to come. Health, food safety, reasoned resource management and climate change, the energy transition, mobility and sustainable urban systems, development of the digital economy and space technologies, or re-industrialisation of our territories are all some of the major challenges on which research and innovation players must focus.

In addition to these efforts in response to societal challenges, we will work to safeguard our basic research. This is not only one of our nation's sources of pride, but also a key to the future. Scientific research as a whole will be mobilised to help bring knowledge forward, to the highest international standard. This long-term, high-risk, exploratory research, "with no immediate application", remains central to national scientific strategy.

In order for the Strategic Agenda to be successful, efforts must be made to both simplify and ensure consistency in the relevant structures and their financing mechanisms, provide support for innovation and transfer, and better coordinate regional, national, European and international strategies.

In order to alleviate the often heavy administrative burden and make it possible for basic research to enjoy the peace and confidence needed for long-term endeavours, action has already been initiated to rebalance financing for research. The ANR's efforts have been refocused and its programming made consistent with

the “France Europe 2020” Agenda, which in turn connects in with the European programming for the new framework programme, “Horizon 2020”.

In order to guarantee consistency and clarity at the local level, a true site policy will be implemented in each local territory. This policy will be designed to better take into account the local anchoring of all higher education and research institutions and their integration within an innovation ecosystem, and to ensure consistency between all regional, national and European strategies.

As the progress made by research must also give rise to job openings and new business sectors, emphasis will be placed on transfer and innovation. The transfer mission has been explicitly stated for the first time under the law, and the “France Europe 2020” Agenda includes provisions to improve its efficiency. Technological research, currently too weak, will be developed in conjunction with the European KET and EIT programmes.

To make our industry more visible and improve its competitiveness, joint efforts and large-scale European and international cooperation programmes will be developed. It is through a determined, incentive-building and supportive policy that France will build a Europe of Higher Education and Research. It will foster student mobility, including vocational and technological degree programmes, as well as mobility for researchers, thanks to which it will enjoy the benefit of outside skills and be a stakeholder in global debate.

Consistent with the commitment made by the President of France, on February 4<sup>th</sup> 2013, in his address at Collège de France, the strategic agenda “France Europe 2020” will bring French research back to its fundamental role as a vehicle for knowledge creation, and strengthen innovation through its decisive contribution to France’s recovery. With priority given to student success, the new aspiration for research will give higher education and research prime importance in the construction of the new French model championed by the Government.

A handwritten signature in blue ink, appearing to read 'A. H. H.', is positioned at the bottom right of the page. The signature is stylized and fluid.

THE NINE  
PROPOSALS  
OF THE  
STRATEGIC  
AGENDA  
"FRANCE  
EUROPE 2020"

- 1. MOBILISE PLAYERS AROUND MAJOR SOCIETAL CHALLENGES**
- 2. REFORGE RESEARCH COORDINATION AND GUIDANCE SYSTEM IN FRANCE**
- 3. PROMOTE TECHNOLOGICAL RESEARCH**
- 4. DEVELOP DIGITAL TRAINING AND INFRASTRUCTURES**
- 5. FOSTER INNOVATION AND TECHNOLOGICAL TRANSFER**
- 6. ENSURE UPTAKE OF THE SCIENTIFIC CULTURE**
- 7. DEVELOP PROGRAMMES TAILORED FOR MAJOR RESEARCH AND INNOVATION PRIORITIES**
- 8. BUILD CONSISTENCY BETWEEN SITES**
- 9. STEP UP THE PRESENCE OF FRENCH RESEARCH IN EUROPE AND ABROAD**

Each of the lines of action is briefly presented hereafter.

**1. MOBILISE  
THE RESEARCH  
COMMUNITY  
AROUND  
MAJOR SOCIETAL  
CHALLENGES**



**G**overnments of the world's great nations are mobilised to take on challenges that combine economic development with social development: the balance between these two is vital to the harmonious development of our societies.

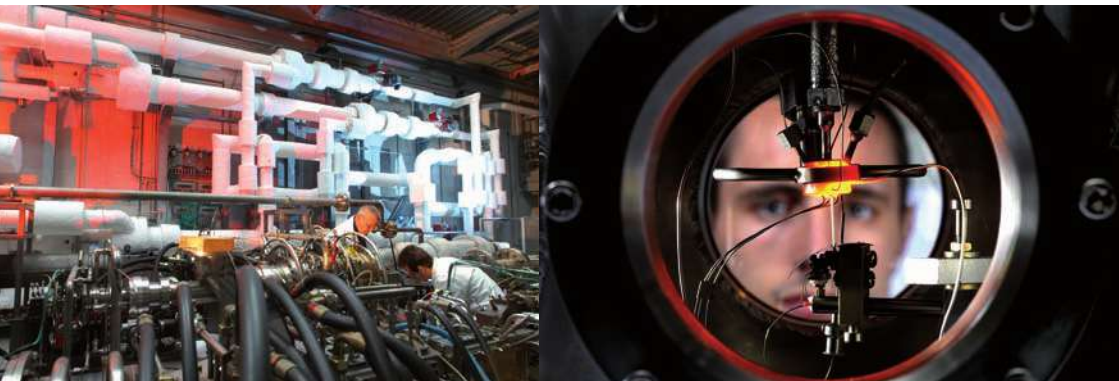
The work carried out further to the preparation of the European framework programme for research and innovation, "Horizon 2020", in conjunction with the forward-looking discussions held by the research institutions and universities in the five Alliances, the CNRS and the CNES, have resulted in the identification of 9 major societal challenges around which French research must mobilise:

- 1. Reasoned resource management and adaptation to climate change**
- 2. Clean, secure and efficient energy**
- 3. Stimulating industrial renewal**
- 4. Health and well-being**
- 5. Food safety and the demographic challenge**
- 6. Sustainable mobility and urban systems**
- 7. Information and communication society**
- 8. Innovative, integrating and adaptive societies**
- 9. A spatial aspiration for Europe**

The responses to these challenges must weave together both basic technological research, and lead, using the appropriate systems, to innovation of different kinds (technological, usage, organisations, etc.). Societal challenges will require collective action in order to serve a national interest that is both socio-economic and environmental. The contribution of research is based on collaborative projects at the national and European, as well as sometimes international levels, and must be supported by improved dialogue with society.

Only using a highly inter-disciplinary approach will it become possible to elaborate the new concepts and achieve the technological breakthroughs on par with these challenges, thanks to cross-fertilisation between the scientific fields and strategic technological sectors involved: nanoelectronics, nanomaterials, micro- and nanofluidics, software technologies, robotics, biotechnologies, embedded system technologies, etc. The development of and proficiency in these enabling technologies of the future – the cornerstones of our competitiveness – form a major crosscutting issue that must mobilise all areas of fundamental and technological research.

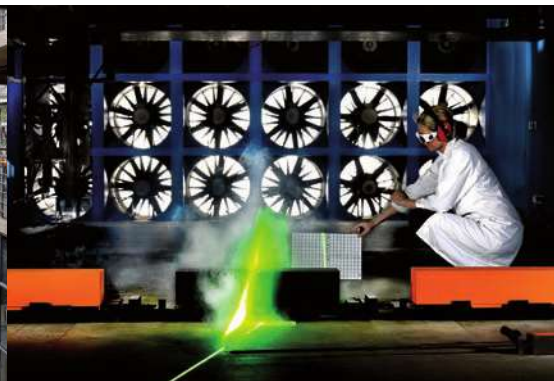
As the economic and financial crisis runs on, spurring us to rethink the foundations of our competitiveness, including through improved flexibility and higher-grade products and services, environmental imperatives and dependency on raw materials are guiding France toward a new conception of production, consumption, living, travel, work and training, now seen as life-long. We must prepare and support the nation's industries in the transition to the "factory of the future" and stimulate industrial revival, which has been lacking these last twenty years, by focusing investments and R&D on fields with very high business impact: advanced products and engineering, and new manufacturing, production, inspection and robotics processes. We will achieve this by fostering innovation and funding innovative enterprises.



A new National Research Strategy must, in other words, be determined with precise avenues for research and priority lines of action (defined framework programmes, national research programmes). These avenues must be able to stimulate the innovation ecosystem and offer an R&D response suited to each major societal challenge identified, in accordance with the needs of the nation. They must take into account existing skills and the economic fallout which they may generate.

The priorities need to be clear, structured and shared by all of the stakeholders involved, from Ministries to higher education and research institutions, researchers and industrial players. Citizens must be able to take full ownership of them. It will be the responsibility of the Steering Committee and the Strategic Research Council, founded in order to make this aspiration a reality, to see that this happens.

This strategy is not only interconnected with, but will also supply the Government's other thematic strategies, such as the National Energy Research Strategy for the Energy Transition, the National Healthcare Strategy or the National Sustainable Development Strategy. It will, furthermore, take into account forward-looking discussions such as those initiated by the Innovation 2030 Commission.



# CHALLENGE 1

REASONED  
RESOURCE  
MANAGEMENT  
AND ADAPTATION  
TO CHANGE

It is estimated that the costs resulting from climate and environmental change could well exceed 5% of GDP in 2030, if no suitable adaptation and remediation policies are instituted in time.

On the other hand, the gradual institution of remediation and adaptation policies will have an in-depth impact on the development of energy-related, industrial and agricultural policies. Taking part in the production of knowledge in these areas is a matter of strategic importance: it means gaining the dimension needed so that France can have a bearing on political negotiations and, ultimately, on environmental standards. This implies supporting, firstly, the development of knowledge about climate change and its regionally specific consequences and, secondly, research and innovation on the raw materials supply chain as a whole: from prospecting to extracting, transformation, reutilisation, recycling and substitution. France must make a commitment on the major issues that are new materials and new "eco-processes", as well as on the development of integrated and lasting observation and information systems, at each of the interconnected levels, from local to global.

Directly in line with the Government's road map on the ecological transition, three major avenues will be developed as a priority:

- **Achieving progress in understanding and using marine bio-resources in order to foster the development of applications in the healthcare and cosmetics sectors, and on the future of energy, all the while preserving the environment**
- **Modelling and predicting the development of ecosystems to better support the ecological transition**
- **Better understanding the functioning of socio-ecosystems in order to preserve the environment without compromising economic development**

## CHALLENGE 2

ENERGY THAT IS  
CLEAN, SECURE,  
AND EFFICIENT

During the Environmental Conference held in September 2012, the President of France announced his determination to see France embark on the energy transition. While the energy challenge is global, France's place within it, given its leading position in nuclear energy, is a distinct one. In compliance with the commitments made by the President of France, including the targeted reduction of the percentage of nuclear energy in total electricity generation from 75% to 50% by 2025, a major investment will need to be made in renewable energies and energy efficiency, anticipating both the rarefaction of fossil raw materials and global warming due to greenhouse gases.

In order to achieve the target set for 2025, it is now necessary to set out the most economically, ecologically and socially fair course of action for this energy transition.

Research will thus need to be mobilised in all of the energy sectors. One of the first angles of attack for this will involve improving assessment and prediction of renewable resources, such as marine and wind resources, or biomass. It will also be important that new technologies be developed so that these power generation sectors, such as solar, can enjoy a better yield.

Efforts will also need to be made in order to develop combined sources and mobilise efforts on power generation storage and the hydrogen/fuel-cell battery sector. Special attention will be paid to smart grids, the architectures, reliability and flexibility of which will become strategic within the energy mix, yet not overlooking nuclear-related issues. All of these are key areas in which research and innovation will need to bring about technological breakthroughs.

The behaviour of society, both individual and collective, face to the changes to come will, furthermore, be the focus of studies, to ensure that the energy transition is implemented in a manner compatible with the expectations of society.

## CHALLENGE 3

# STIMULATING INDUSTRIAL REVIVAL



The deindustrialisation of our economy over the last twenty years has given rise to such phenomena as offshoring not only of manufacturing sites, but also R&D sites and the services activities connected with manufacturing operations in some sectors.

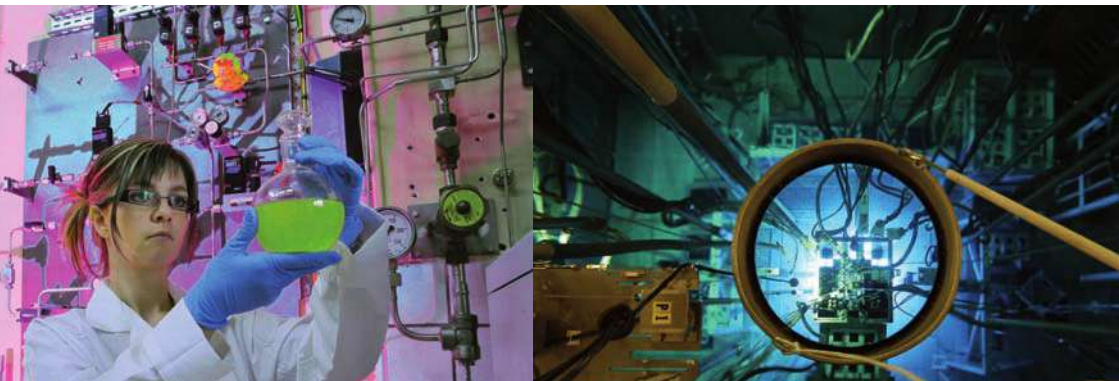
According to the European Union's innovation performance chart, France is, as of 2012, one of the "follower countries". In order to turn this trend around, the challenge will be to prepare our country and its industry for the "factory of the future", new manufacturing modes and full proficiency in breakthrough technologies, which must contribute to ramping up the nation's products and services. The national re-industrialisation effort will be able to draw upon innovation to boost our productivity and foster our export.

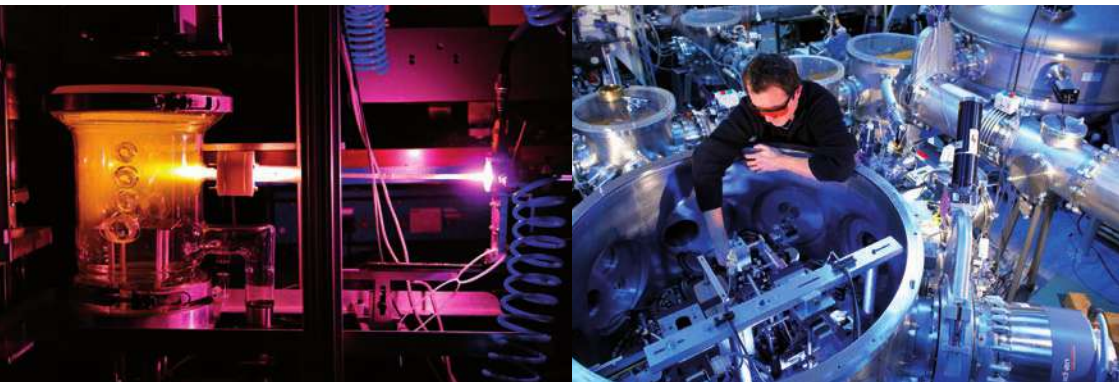
The productivity of our production processes is an important issue to which new technologies can offer highly beneficial responses. The Anglo-American term "advanced manufacturing" encompasses all of the technologies that help improve the making of products throughout their life cycle, from design to production, distribution up to the end of their life cycle and recycling. These technologies can apply to all industrial sectors and to existing plants as well as to new facilities. Research and innovation forces need to be mobilised and better focused on advanced processes and engineering, new manufacturing, production, inspection, robotics, and other processes.

The aim is also to enable significant differentiation between new products, with the arrival of yet-unseen performance capabilities or, better yet, new functionalities that pave the way for new services and new uses.

Expertise in the technology involved will be a major source of leverage in taking up the challenge of re-industrialisation. France must become fully proficient in the enabling technologies of the future, which will be decisive factors in achieving competitiveness through quality. To do so, it will need to combine flexibility in adaptation with new markets (by fostering cross-fertilisation in various areas), with support to identified strategic technological sectors: nanoelectronics, nanomaterials, micro- and nano-fluidics, software, and miniaturised intelligent systems.

It is precisely the conclusion of the High Level Group Key Enabling Technologies of the European Commission, which identified 6 KETs for Europe's industrial future: advanced materials, advanced manufacturing, nano-electronics, nano-technologies, photonics, and biotechnologies. These recommendations have given rise to a Commission paper entitled: "A European Strategy for Key Enabling Technologies – A Bridge to Growth and Jobs".





# CHALLENGE 4

## HEALTH AND WELL-BEING

Healthcare is a strategic driver of economic and social development, both because our fellow citizens expect effective responses to unpredictable health events, as a condition for well-being and personal development, and thanks to the economic activity that results from this. The field of healthcare and prevention also holds strong potential for innovation, as a source of growth and jobs.

From the scientific standpoint, life sciences and health form an ever-changing field, whether with respect to the concepts, the multi-disciplinary approaches taken and the scientific, technological, health-related and socio-economic issues at stake.

The major challenges which our research must address as a priority pertain to: prevention, screening and treatment for pathologies connected with longer life expectancies (neurodegenerative diseases); maintained place of living and self-reliance for patients; care strategies for chronic, multi-factorial and environment-related diseases; the emergence or re-emergence of infectious diseases; the development of “personalised” medicine and “e-medicine”; and the new economic models related to them.

Scientific forward-looking studies applied to societal issues will guide the National Research Strategy in response to the potentialities of technological advances such as synthetic biology, stem cells or progressing functional brain imaging for instance.

The challenge will also be to amplify the contributions of research when it comes to defining and assessing policies on health & safety and the environment, provide key information for discussion on improving the effectiveness and efficiency of the healthcare system and public health and prevention policies, and promote research on health across the population, to its full inter-disciplinary extent. Consideration for economic aspects, including control of growing healthcare expenses, which result from the impact of economic interests in healthcare issues, as well as questions of equity in access to healthcare, is of growing importance. It is on these objectives that the scientific research and innovation priorities will be coordinated with the National Healthcare Strategy.

## CHALLENGE 5

# FOOD SAFETY AND THE DEMOGRAPHIC CHALLENGE

The demographic challenge raises the global problem of how to cover food requirements in quality and quantity for 9 billion individuals in 2050. The aim will be to develop resource-efficient production systems, preserve biodiversity, and establish the related eco-systemic services over the long term and building competitive, low-carbon supply chains.

In France, the question of food safety is more qualitative than it is quantitative: the aim is first of all to establish safe, high-quality supply. The agro-food sector is France's second-largest industrial sector behind the automotive industry, but has been weakened: 90% of the industries are SMEs employing fewer than 250 people, when the challenge is to very quickly shift into the paradigm of the bio-economy and massively commit to biotechnologies. Research laboratories need to be mobilised in order to support the deployment of this new economy in favour of developing an agro-ecology, which the Minister of Agriculture has made a priority.

The development of the bio-economy requires greater efforts in research and innovation in the field of bio-resources, biosciences and biotechnologies, as well as their coupling with chemistry and process engineering. The aim is, in other words, to promote research on the replacement of conventional industrial products with bioproducts that can be manufactured in a more resource- and energy-efficient manner. All of the research that needs to be carried out in these fields requires a change in scale, from the laboratory to the industrial pilot.

This change in paradigm furthermore requires that new models be developed, making it possible to assess performance and identify the impacts of these new processes, products and sectors in all of their dimensions (economic, ecological, health-related and social).

Lastly, there must be a better understanding of domestic practices in order to identify the causes and suggest avenues for limiting food product loss or waste, often due to the form of the industrial supply.

# CHALLENGE 6

## SUSTAINABLE MOBILITY AND URBAN SYSTEMS



At the crossroads between energy and environmental challenges, new responses must be given to the needs for mobility and living comfort expressed by the planet's citizens.

Action must be taken to keep citizens' spending for transport under control, while also deploying an environmentally friendly policy. This shift calls for innovative intermodal transport solutions (in particular road/rail), newly-developed services and alternative modes and, more generally speaking, transport modalities for users that offer ever-better performance on energy-related and ecological criteria, such as comfort, safety and efficiency.

This challenge combines societal issues (lowering CO2 emissions and the impact on the climate, reducing the expenses caused by traffic congestion in cities as well as by accidents), economic issues in that, for Europe and more specifically France, transport accounts for a large percentage of GDP (6.3% on average in Europe). Investing in the field of research and innovation will make it possible to create new services, which are sources of economic growth and job creation.

These drivers make a combined approach necessary, one that is concurrently technological, organisational and societal, with research action that mobilises both engineering sciences and human and social sciences, in a "vehicle-infrastructure-user" system. Such developments can be optimised in the field of Intelligent Transport Systems, around which an industrial sector could be established in France to great benefit.

Sustainable urban systems must be rethought in light of economic, ecological and societal developments. A systemic approach needs to be adopted in order to take into account both the kinetics, which vary depending on the scales involved (building, block, neighbourhood, etc.), the land occupation modes (housing, tertiary, public infrastructure, etc.), the grids and their sizes (energy, transport, water, etc.).

# CHALLENGE 7

## INFORMATION AND COMMUNICATION SOCIETY

Today's new information and communications technologies are shaking our society to its foundations.

Information, services and applications are available anywhere, anytime. New uses and avalanche of data that result from this are profoundly changing our lives and behaviours. Digital thus represents a three-fold issue: an economic issue, first of all, in that it represents a major factor for European growth, to an extent similar to that of transport (5.9% of GDP).

It is also an issue of national sovereignty, in that data are now constitutive components of political power. Lastly, it is a societal issue, as digital is of major impact on fields such as culture, health, training or governance of society (social networks and the Open Data movement). For instance, the modelling of living organisms and the application of that knowledge to healthcare have brought about remarkable progress. The major challenge today is to incorporate the (spatial and temporal) scales specific to living organisms, cells, organs, individuals, populations and ecosystems. Digital capabilities can contribute to some of the key issues in healthcare, both in terms of developing tools for the description of biological and physiological phenomena, diagnosis and prevention (multi-modal imaging), treatment (pharmacological, surgical procedure assistance tools), as well as re-education.

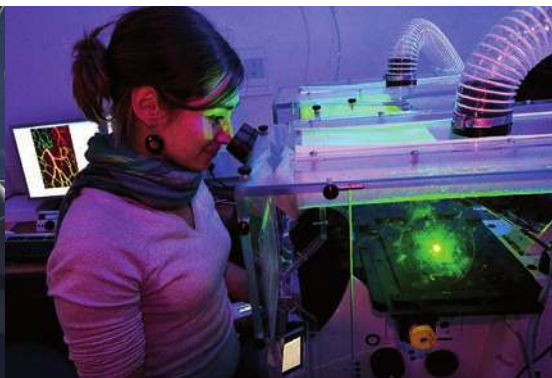
From this perspective, several issues have emerged as being of strategic importance, and the governmental seminar on digital technologies held in February 2013 confirmed this: big data, cybersecurity, the Internet of Things, intensive computing and robotics.

Ever since information has become represented, transferred, stored and digitized, questions have been voiced about the safety or security of the systems using them. By bringing these skills together around major projects for digital security, the protection of confidential information and respect for individual privacy brought together, France would make significant strides toward its digital sovereignty and industrial and societal economic environment management objectives.

All digital systems produce and circulate very large masses of data – known as big data – from various points of origin: data resulting from calculations, emerging from sensors or produced by human data entry. A National Action Plan on hardware and software technologies needs to be implemented in order to foster the high-performance calculation vital to various areas of activity, such as research, defence and security, industry, meteorology, healthcare, etc.



Special attention will furthermore be paid to the need to even further develop high-performance digital networks, without consuming more energy. The aim will be to become fully proficient in the technology underlying those components that are to become the foundation of future digital infrastructures (servers, HPC, cloud, SmartGrids), future consumer products resulting from convergence between nomads, personal computers, and multimedia systems. France's academic and industrial communities will need to step up their partnership research in order to play a leading role at the European level.



## CHALLENGE 8

INNOVATIVE  
INTEGRATING  
AND ADAPTIVE  
SOCIETIES

European societies today must increase their ability to innovate (not only from the technological standpoint, but also with regard to their organisation and governance modes), integrate their various components (in order to achieve social cohesion that holds above and beyond generational diversity, beliefs and lifestyles), and lastly, effectively adapt to today's swift, global changes.

This adaptation will require heightened research efforts in the field of human and social sciences. A number of measures will need to be taken in order for this effort to be effectively deployed:

- considering the largely comparative nature of the research involved, trans-national systems will need to be developed (formation of databases, trans-European and international mobility, and researchers and doctoral students);
- appropriate research infrastructures, consisting not only of databases, but also the programmes that will enable longitudinal studies in the field of healthcare and education, will need to be established and made both operational and accessible;
- instruments needed for systematised, exacting and shared identification of European cultural heritage (material and immaterial) in digitised format: the significant achievements made in this field, further to ESFRI, must now be consolidated and uniformised.

In particular, it is advised that the reference base system be renovated. The changes and innovative advances needed in France and in Europe cannot be reached without citizen support for these targets, and without their confidence having been restored prior to this and their access to public goods preserved. It is important, within this setting, that different development indices of traditional output measurements be established, and that for any change foreseen (urban, technological, political, etc.), its social acceptability and impact on the relevant populations be considered.

The second crosscutting problem relates to understanding the processes that determine behaviour and shifts therein, both individually and collectively. The persistence of irrational individual behaviours (dietary, addictive, etc.), when definite information confirming them as harmful does exist; or the existence of inappropriate collective action taken when it would have been inevitable, should be cause for concern. This is a phenomenon to which responses are needed, and without these, we may make progress on none of the major challenges we are facing today.

The aim will also be to consider the channels through which information is shared and distorted within social groups, the mechanisms by which opinions are formed, as well as the social software systems that often stir agents to adopt the most appropriate behaviour in settings where the “right decisions” can be discerned unambiguously (dietary habits, etc.). The contribution of cognitive sciences, sociology, political philosophy and media studies is needed here.

A particular effort will need to be made to further the analytical study of the precautionary principle in various forms: it is well-known that the extension of this principle and of the actual procedures implemented in applying it to specific instances, now sometimes hinders potentially flourishing innovation. Interdisciplinary efforts, involving philosophers, psychologists, sociologists, economists, legal specialists and scientists specializing in any number of areas in which this principle is invoked, need to be undertaken.

In order for European companies to enjoy greater potential for integration, special efforts need to be made in the field of education, to which research may, clearly, contribute. In addition, educational methods will increasingly make use of digital tools, and the related research will generate a radically new approach to the transfer and sharing of knowledge. The resulting innovation will need to be tested out and “demonstrated” (large-scale experimentation, randomized control groups, etc.), in order, in particular, to fight the phenomena of school dropout, which is now, as such, a national challenge.



The priority status given to research on education, which will require close cooperation between the Human and Social Sciences, ICTSs and Life Sciences, will not be able to be correctly addressed unless the cognitive sciences are at last effectively structured, in which France's potential for basic and applied research is considerable (linguistics and language industries, ergonomics and man-machine interaction in complex working environments, etc.).

The dissemination, uptake and study of Europe's cultural heritage (textual, but also iconographic, musical, cinematographic, relating to the performing arts, etc.) are conducive to greater integration across the Continent. Consequently, it is advised that close attention be paid to contemporary forms of research in the field of Humanities (study of texts, languages and arts), which, in entering the digital age, are doing much more than merely becoming pieces of cultural heritage in digitised form. Works preserved in digital form, along with the metadata that establish the historical and social context of their production, are the opportunity and medium for intellectual activity and emotional states, which must be kept possible and developed.

Research in history and, more generally speaking, any research regarding "memories", is in and of itself, and in many respects, a contribution to taking up the challenge of integration, as well as that of innovation and adaptation. Cultural heritage (monuments, landscapes, etc.) is, moreover, a major source of jobs that by essence cannot be offshored, because of the tourist activity which they generate (a recent OECD report<sup>1</sup> on cultural tourism establishes that it accounts for approximately one half of international tourism). The development of this sector, which is essential to France (tourism as a whole accounts for 7% of GDP, 1 million direct jobs and 1.5 million indirect jobs), is a priority to which research on humanities can contribute. This will take place through interdisciplinary projects that closely interlink the Humanities and the ICTSs.

1. [http://www.tava.gov.lv/sites/tava.gov.lv/files/dokumenti/petijumi/OECD\\_Tourism\\_Culture.pdf](http://www.tava.gov.lv/sites/tava.gov.lv/files/dokumenti/petijumi/OECD_Tourism_Culture.pdf)

## CHALLENGE 9

# A SPATIAL ASPIRATION FOR EUROPE

France, for both historical and political reasons, plays a leading and uniting role in the spatial field in Europe, and a significant one across the world, in particular through the European Space Agency (ESA). This is reflected by its high-profile industrial players (40% of the European space industry, including the world's leading players on commercial markets open to competition), a scientific community at the best global level, an innovative space agency recognised on the international scene, and an annual space budget (civil and military) amounting to approximately €2 bn.

France has benchmark status in five major strategic areas: access to Space, Earth observation, telecommunications and positioning/navigation, spatial sciences, security and defence.

France was one of the European nations that served as a driving force in this process, which, under the Treaty of Lisbon, culminated in the European Union's developing a shared capability in the field of Space. It is France's responsibility to promote the far-reaching implementation of this spatial policy, so that the Union's political dimension and its irreplaceable critical mass help buttress the major spatial programmes in operation.

As the European Union gains in power, however, this should not call into question the accomplishments jointly secured through the European Space Agency. It is no more the aim that already-existing skills be duplicated. For this reason, close cooperation between the European Union, the ESA and their Member States is vital. This question, namely that of the optimal mode of governance for spatial Europe, was addressed at the ESA's last Ministerial Council meeting, which took place in Naples in November 2012.

On that occasion, the Council also decided upon several programmes that are emblematic of the strategic challenges which Europe must take up, including: ensuring access to sustainable Space, with the commissioning of the new Ariane 6 launcher that will succeed the Ariane 5 in approximately 2022; maintaining the competitiveness of the telecommunications satellite industry, with the new platform for the future NeoSat programme, run by prime contractors Astrium and TAS; referencing operational meteorology, with the Metop Second Generation programme; continuing the scientific Earth observation programmes.

**2. REFORGE**  
THE RESEARCH  
COORDINATION  
AND GUIDANCE  
SYSTEM  
IN FRANCE

**A**s French Member of Parliament Jean-Yves Le Déaut states in his report on the key lessons from the National Convention on Higher Education and Research: *“it is urgent that the lack of steering noted these past few years, primarily in the field of research, but also in that of higher education, be remedied. During the Convention, the Ministry of Higher Education and Research was often criticised for having shirked its strategic role, passing it on to various other structures: the ANR, Alliances, etc.”*

It is for this reason that the Strategic Agenda for Research, Transfer and Innovation “France Europe 2020” was designed to establish a far-reaching action plan, aimed at determining the major scientific and technical priorities and outlining the measures needed to implement them.

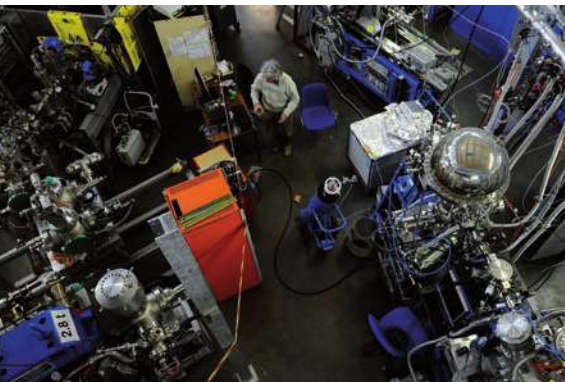
In order to ensure that the agenda can be jointly supported by all players, from political decision makers to scientists, industrials and the general public, a tight governance mechanism will be established, involving a highly-interministerial dimension:

- **a Strategic Research Council**, placed under the Prime Minister and involving high-level scientists and experts from France and abroad, as well as prominent figures from the socio-economic world. It will be chaired by the Prime Minister or, by delegation, the Minister of Higher Education and Research, and shall replace the High Council of Science and Technology, a consultative body created by law in 2006, and the Higher Council for Research and Technology. This Council will propose the scientific and strategic priorities for research and innovation to be included in the “France Europe 2020” Agenda for adoption by the Government.
- **an Interministerial Steering Committee**, chaired by the Director General for Research and Innovation, involving academic and industrial research community members, Members of Parliament (Parliamentary Office for the Assessment of Scientific and Technological Decision-Making – OPECST), which will be in charge developing and implementing the strategic research agenda, under the aegis of the Strategic Research Council, to which it will report.

- **The National Thematic Research Alliances:** from Aviesan for life sciences to ALLEnvi for the environment, Ancre for energy, Allistene for the digital sciences and technologies, and Athena for the human and social sciences, all of the alliances have helped improve the public research system and initiate strategic dialogue between the State and its operators. The Alliances transcend the boundaries and scope of the operators involved and, as such, offer a coordinated vision of French research today. French research, when coordinated in this manner, can interact more effectively with the major international bodies and better promote its proposals to the European Commission. The Alliances, the business community's natural counterpart in dialogue, will be able to state the scientific priorities for the research of the future and, in this manner, play a key part alongside CNRS in building the strategic research agenda.

The priorities of the "France Europe 2020" Strategic Agenda will be developed in all of the contracts which the State draws up with its research operators, and guide the ANR's programming strategy. Through a number of indicators drawn up jointly with the players, the State will regularly track, for each priority, the mobilization of its operators, the scientific strides made and the technological progress secured.





## ACTION 1

DEVELOPING  
THE "FRANCE  
EUROPE 2020"  
STRATEGIC  
AGENDA



## OBJECTIVE

The objective is to determine a simple and effective process, shared by the entire research community, and by which the strategic agenda can be drawn up. This process is to be premised on a consistent interministerial vision of the major priorities to be addressed.

## PROCESS FOR BUILDING THE STRATEGIC AGENDA "FRANCE EUROPE 2020"

The proposed process is based on simplified governance structured around 2 bodies:

- Strategic Research Council – *strategic level*
- Interministerial Steering Committee – *leadership level*

The Strategic Agenda "France Europe 2020" will be regularly revised and the strategy it advocates will be documented in a bi-annual OPECST report, so that the scientific and strategic priorities can be adjusted in accordance with the new needs.

### STRATEGIC RESEARCH COUNCIL

The Council is appointed by a decree from the Council of Ministers. The Prime Minister, the law expressly providing that his powers can be delegated to the Minister of Research, chairs it.

It is composed of 12 to 15 scientists, prominent figures and qualified experts, representing the research, economic, innovation and international community. It meets 1 to 2 times each year.

#### Duties

- Defining the priorities based on proposals drafted by the Steering Committee
- Proposing supporting measures for the implementation of the scientific and technical priorities
- Ruling subsequently on the performance/effectiveness of the agenda.

It shall draw upon the Steering Committee to operationally carry out its duties.

The Secretariat General shall be served by the Director of Strategy, Research

and Innovation.

### **STEERING COMMITTEE**

Chaired by the DGRI, this Committee will be composed of 12 to 16 members, representing the directorates of the relevant Ministries and higher education and research institutions the presidents of thematic alliances, CNRS, CNES, private research community members and socio-economic players, the regions and OPECST.

It is the operational steering body in the development of the strategic agenda.

#### **Ses missions :**

- Providing the Strategic Council with the scientific and economic information needed to carry out forward-looking studies and international benchmarking (Strategic Analysis Centre, Observatories, etc.) and build the key strategic aims of the Strategic Agenda.
- In response to the demands of the Strategic Council, mobilising players (Alliances, etc.), coordinating work and summarising contributions (rapporteur function).
- Ensuring consistency in the contributions made on topics crosscutting to the Alliances and summarising them.
- Overseeing the interministerial dimension and structuring the process and timeline.

The Secretariat shall be run by the DGRI Director in charge of Strategy, Research and Innovation.

## **Both of these bodies will draw upon the Alliances and the CNRS:**

### **The Alliances and CNRS**

The 5 Alliances and, by its highly multi-disciplinary nature, the CNRS, will be mobilised alongside the Strategic Committees in the sectors and thematic agencies (CNES, ADEME, etc.), to carry out preliminary research and propose roadmaps on the basis of the major strategic lines. They will be responsible, on behalf of the Steering Committee, for the following:

- Mapping out the strengths and weaknesses in research and innovation, in accordance with the ecosystem.
- Coupling the National Council on Industry with the competitiveness hubs.
- Coordinating intelligence, discussion, roadmap development and recommendation drafting work.
- Identifying the challenges, both scientific and technological, that need to be taken up in response to societal challenges.
- Identifying the European and international bilateral cooperation programmes that deserve priority.

### **3. PROMOTE TECHNOLOGICAL RESEARCH**

**T**echnological research makes it possible to conceive of and construct the technical solutions that will become the foundation for the products and applications of the future.

A full-fledged bridge between basic research and industrial development, this approach to research is essential to placing a sufficiently differentiated offer on the competitive industrial stage of tomorrow. The technological research needed in order to fill this gap has become a real bottleneck in our innovative process, when it holds high stakes for the competitiveness of enterprises. The vigorous global competition in which they engage has stirred us to rethink the foundations of our competitiveness, through improved productivity and higher-grade products and services.

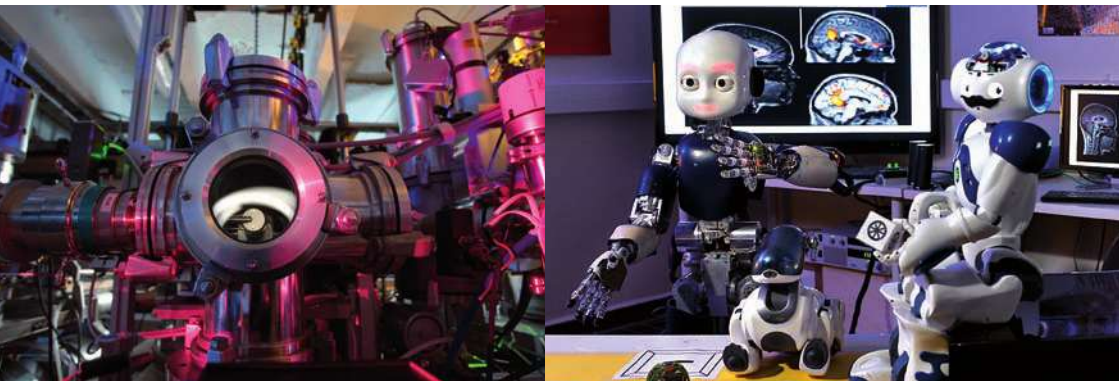
Applied research is of importance to all scientific disciplines and, through the wide variety of applications and sciences that it mobilises, is by nature interdisciplinary and integrating.

The cornerstone of this research will be technology, which has consistently fallen by the wayside in French innovation. Full proficiency in “key technologies” will be an issue of capital importance and must be made the focus of a true policy for protecting and asserting property, through patents. A number of recent very high-profile acquisitions have illustrated the fundamental role of patent portfolios in winning over the world’s major markets.

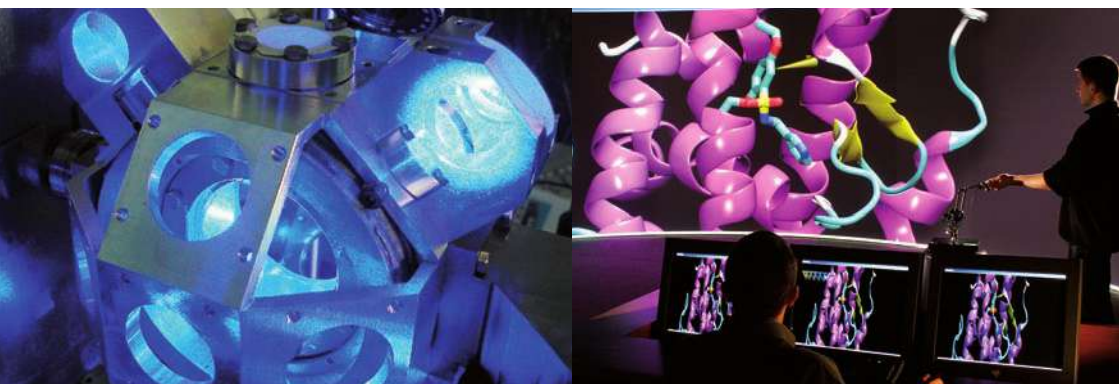
Unlike science, which is a form of heritage open to all of humanity, technology must thus be shaped into a clearly protected and better-used body of national heritage. This is a major characteristic of technology, which has been the focus of massive efforts on the part of countries such as Korea for the last 30 years.

The European Commission has fully integrated this issue and is considering the possibility of mobilising several European Union policies in an entirely new manner, to serve an industrial strategy in the field of key enabling technologies (KET). Over € bn are planned for the KETs and the integration of KETs (“multi-KET projects”) in the future “Horizon 2020” programme. Beyond their significant growth potential, the KETs form an opportunity at both the European and French levels for bringing basic research closer to industrial research and bringing out new industrial channels.

France can boast many strong assets, such as its competitiveness hubs, the Instituts Carnot, the Technological Research Institutes (IRTs), the Excellence Institutes in the field of Carbon-Free Energies (IEEDs). Yet it also shows a weakness, in the intensity of its companies’ R&D, due to its productive structure (R&D expenditure by companies compared to the gross domestic product remains lower (1.4%) than the OECD average (1.6%) and financing by research companies carried out by public laboratories remains inadequate.



The issue, as reflected in the strategic agenda "France Europe 2020", is to improve technological and partnership-based research in France, in particular through programmes that incentivise exchange between companies and research laboratories (enhanced research tax credits, Instituts Carnot, etc.), which will be expected to pay special attention to industrial property issues.



## ACTION 2

# STRENGTHENING TECHNOLOGICAL RESEARCH CAPACITY

### CENTRAL ISSUES:

It is vital that France's industrial production fibre (in its entirety, with special attention paid to SMEs/ISEs) be equipped with the tools needed to produce, master and massively transfer innovative technologies.

In particular, France does not currently have a system as structured or as powerful as that of the Fraunhofer Institutes in Germany. We want to equip ourselves with the resources needed to strengthen our technological research capabilities, currently inadequate, by protecting this national heritage, through well-controlled industrial property and a culture of incubator creation.



## ACTION PLAN

- **CEA-Tech** – Kick off an initiative for disseminating key enabling technologies, drawing upon the successful experience of the CEA's Technological Research Division in Grenoble and Saclay. The first stage has been in the experimental stage in Bordeaux, Nantes and Toulouse, since January 2013, and studies are underway for possible experimentation in Lorraine, to support economic development through innovation. CEA-Tech is working in partnership with Institut Mines-Telecom and the CNRS on this first experiment, which is to be extended and possibly become the standard, should it be successful, as the Prime Minister announced in Nantes, on 15 October 2012. The experimentation has made it possible to very quickly establish, in these three cities, agile and adaptable technological institutes, on the same turf as the local companies. As suppliers of key enabling technologies, they address all of the major regional industrial sectors. These applications institutes will work in close conjunction with the academic establishments to gain scientific resources and set up the required partnership agreements.
- **Carnot 3.0** – Step up support to the Instituts Carnot, in order to promote partnership research in France. The structuring by business sector will improve visibility for the companies, by taking advantage of the territorial fabric formed by the 34 Instituts Carnot. The mid-term review carried out in 2014 will make it possible to determine "Stage 3" for these budding institutes, so as to achieve the aim of establishing in France institutes that are comparable to the Fraunhofer Institutes in Germany.
- **Technology** – Step up and focus priorities on breakthrough technology issues, enabling and capacity-building technologies, and their integration in systems.
- **KETs/FETs/EIT** – Interlinking ANR programming with KETs (*Key Enabling Technologies*), FETs (*Future and Emerging Technologies*) and the EIT (*European Institute of Innovation and Technology*) at the European level in order to identify the maximum leverage effect and energise the positive peer pressure that can develop in the local ecosystems.
- **Call for ANR "LabCom" Projects** – The target is to create 100 laboratories shared by SMEs and academic research.

# 4. DÉVELOP DIGITAL TRAINING AND INFRASTRUCTURES

**T**he digital sciences and technologies have become the central nervous system to enterprises and companies. They have become an unimpeachable part of the lives of virtually every French citizen.

The nation's productivity increasingly depends, in the everyday, on our mastery of information systems, our ability to gain information, store, send and apply it appropriately.

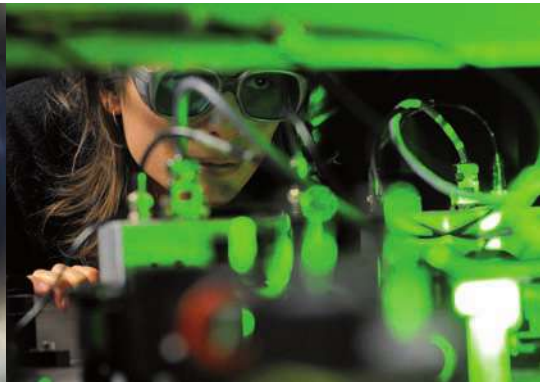
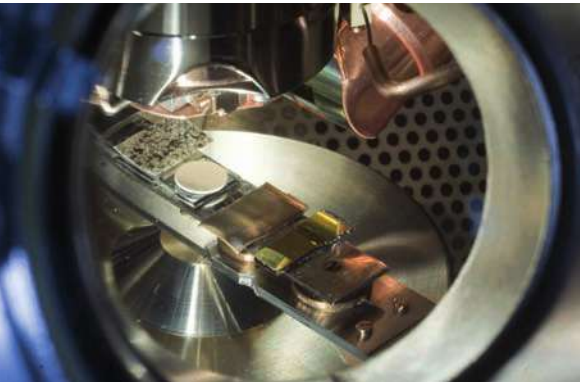
These issues of considerable import naturally bear growth (growth in the digital sector is on average 7 times greater than that of other sectors in Europe) and many jobs (900,000 jobs created in Europe by 2015). The training offered in digital professions must thus be kept up, especially as Europe estimates that the lack of qualified personnel in this sector at 700,000, and between 7,000 and 10,000 in our country.

Digital is a driver for student success and the reputation of our establishments. It is a catalyst for forward movement in many aspects of teaching, in higher education. The development of open online courses needs to be strongly encouraged, so that France can become a magnet for digital training. The "France Université Numérique" Programme, initiated by the Ministry of Higher Education and Research, must facilitate the coordination of the many initiatives involved. Any scientific approach must structure the academic community to foster capitalising on knowledge and fully bring out a multi-disciplinary area of research around e-education.

Digital is also a tool serving all sciences and all technologies. Digital simulation makes it possible to bring about spectacular strides in many scientific disciplines. It also paves the way for very innovative applications in fields of high socio-economic impact: aeronautics, transport, energy, medicine, biology, materials, environment, etc. Digital simulation and big data mining are key enabling technologies and represent major issues for scientific and technological research, innovation and the nation's competitiveness.

France must thus strengthen its research “e-infrastructures” in high-performance computing and develop cloud computing for research data. These tools and the scientific teams using them will be mobilised to transfer skills to companies, with special attention paid to SMEs/ISEs. In France, GENCI (Large National Infrastructure for Intensive Computing) is the reference operator for this policy, serving public research. It contributes to the necessary European dynamic through its involvement in PRACE (Partnership for advanced computing in Europe), the European programme based on heightened cooperation with Germany.





## ACTION 3

DEVELOPING  
DIGITAL  
INFRASTRUCTURES  
CONDUCTIVE TO  
RESEARCH  
AND TRANSFER

## ACCESS TO POWER COMPUTING

The French intensive computing programme, led by operator GENCI, will be continued over the long term, with its European extension (PRACE 2), ensuring that it benefits the scientific community and that it supports competitiveness, in particular innovative SMEs/ISEs. In addition to hardware investments, an R&D programme enabling simplified access to supercomputers for industrial players and scientists, already initiated with Oséo and public laboratories, will be ramped up.

## BIG DATA STORAGE AND PROCESSING

A nationwide academic "cloud", capable of hosting very large data volumes and providing services dedicated to research will be implemented. It will draw upon existing structures, in particular, by developing high interoperability. The RENATER network will be stepped up to facilitate access to new cloud services for all institutions.

## TRAINING THROUGH DIGITAL "FRANCE UNIVERSITÉ NUMÉRIQUE"

The success of "France Université Numérique" will necessarily require structuring of the interdisciplinary research community in e-education and through the construction of scientific databases for the assessment of e-education projects. Working alongside the teaching researchers, researchers from the various organisations will be encouraged to contribute to content development.

# 5. FOSTER INNOVATION AND TECHNOLOGY TRANSFER



The world's 6<sup>th</sup>-ranking nation in terms of number of scientific publications, France is one of the great scientific nations. Yet based on the impact indicator established on the European Performance Chart on Innovation, it ranks 10<sup>th</sup> in Europe in terms of public-private joint publications, an indicator reflecting actual R&D cooperation, despite significant public financing in collaborative research. Lastly, resource and performance indicators on innovation rank France 15<sup>th</sup> world-wide (including the United States, Japan, Korea and Switzerland), when our R&D is better positioned (between Number 6 and Number 8 world-wide, depending on the methods used).

More than a matter of aligning its knowledge base with the sectors in which France wishes to develop, it is fundamental that we improve its transfer capacity in order to bring more out of this recognised scientific potential.

In order to achieve this, knowledge transfer is now explicitly listed as a mission in the ESR Act of 2013, which makes specific provisions to improve its effectiveness. The mission is integrated in the strategic agenda "France Europe 2020".

For public research to serve the transfer mission, many factors must be present: the appropriate culture and training for public research and those working in it, conducive economic conditions or efficient systems dedicated to transfer. There is no single model that guarantees effective transfer, hence the wide variety of avenues taken currently. Effort must nonetheless be made to ensure clarity and consistency throughout the system.

Public policy must remove the obstacles that hinder the effectiveness of the transfer system: inadequate transfer culture and training, lack of steering due to the fragmented financing systems and structures, organizational and regulatory blockage points, etc.

On the basis of this diagnosis, a set of 15 measures has been set out, with a view toward developing a strongly driven policy to remove the obstacles identified. The measures pertaining to the creation of innovative enterprises and support to them will be able to draw upon such contributions as the Report produced by the Commission that operated under Jean-Luc Beylat and Pierre Tambourin, submitted in April 2013.

## ACTION 4

# FOSTERING INNOVATION AND TECHNOLOGICAL TRANSFER

As announced in the statement delivered by the Minister of Higher Education and Research, in conjunction with the Minister of Economic Recovery, to the Council of Ministers on 7 November 2012, a new transfer policy on research is to be implemented.

The policy is structured around a set of 15 measures covering all of the blockage points identified.

## THERE WILL BE GREATER STEERING, SUPPORTING AND MONITORING PLAYERS IN THEIR ACTION TO FOSTER KNOWLEDGE TRANSFER

1. The knowledge transfer mission for public research will be reaffirmed in the Law and incorporated into the Code of Research.
2. An action programme will be instituted so that knowledge transfer projects in which researchers and teaching researchers take part are given greater recognition in the career assessment mechanisms specific to them.
3. A new set of monitoring indicators will be developed for transfer-related activities, focusing on their economic impact, rather than on the activity itself, and a directory of data and monitoring processes will be established to better the transfer policy.
4. A strategic steering committee dedicated to transfer and innovation will be instituted at the level of each territorial site.

## ACTION WILL BE TAKEN TO DEVELOP THE SPREAD OF THE TRANSFER AND INNOVATION CULTURE IN PUBLIC RESEARCH

5. A training programme will be instituted for public research civil servants.
6. A network of training programmes dedicated to knowledge transfer professions will be established.
7. Courses on innovation and entrepreneurship will be set up in all higher education programmes.

## A NEW FRAMEWORK FOR MANAGING INTELLECTUAL PROPERTY RESULTING FROM PUBLIC RESEARCH WILL BE DEVELOPED IN ORDER TO ENSURE GREATER EFFICIENCY

8. Measures will be instituted to simplify multi-ownership of intellectual property between different public research players.
9. Action will be taken to foster industrial and commercial use of technologies from public research, preferably by SMEs and EISs operating on French soil.

## TRANSFER TO INNOVATIVE SME AND EIS ENTITIES WILL BE STEPPED UP

10. Players in partnership research, in particular the Instituts Carnot, will be structured by business sector, consistent with the sector policy, in order to develop high-impact collective initiatives and make them clearer to innovative SME/EISs.
11. A support programme aimed at joint laboratories involving research laboratories and SMEs and EISs, LabCom will be set up by ANR, and “challenges” issued under ANR programmes, in order to mobilise research teams alongside innovative SMEs and EISs.
12. Direct relations between researchers and SME/EISs will be fostered by newly clarified guidance systems for SMEs.
13. Integration of PhD students in SMEs and EISs will be facilitated, in particular through the CIFRE system (Industrial Agreement for Training through Research).

## ACTION TO FOSTER TRANSFER THROUGH ENTREPRENEURIAL ACTIVITY WILL BE STEPPED UP

14. An enhanced support programme for transfer through entrepreneurship (detection, maturity-building, incubation, seeding) will be instituted, including the revitalisation of the National Entrepreneurship and Innovative Technologies Competition, and the development of SATT activities (Technological Transfer Acceleration Companies) to improve the maturing process and development capacity of start-ups resulting from research.

## RESEARCH ON TRANSFER AND ENTREPRENEURSHIP WILL BE BUILT UP AND MOBILISED IN SUPPORT OF PUBLIC POLICIES

15. A networked “ideas reservoir”, dedicated to the innovation economy will be established in order to coordinate public research in the field, capitalise on and consolidate the relevant data, and supply assessments and analysis supporting public policy on research and innovation.

**6. ENSURE  
UPTAKE  
OF THE  
SCIENTIFIC  
CULTURE**

**F**or over two centuries now, our societies have, throughout their development, cultivated the scientific approach, premised on rationality, methodological exactingness and critical thinking, as a full-fledged value.

Today, science has become an integral part of everyday living, by virtue of the connection which it maintains with technologies and through its presence at the core of our societies' major issues: healthcare, energy, environmental matters, digital technologies, etc. It is now a matter of course that the media and decision-makers should turn to scientists to have phenomena explained and solutions offered. In France, 92% of the population trust researchers, but 80% feel they are inadequately informed or consulted on the debates and issues central to research.

Fuelled by natural disasters, industrial accidents and health crises, wariness in many forms is developing with regard to progress in knowledge, putting the scientific experts called upon in crisis situations in a dire position, as they find themselves alternately blamed or accused of partiality.

Scientific and technological progress must now take place at such an accelerated pace that it has become hardly imaginable for anyone to develop an extensive and thorough scientific culture. The excellence of our scientific and technological centres, institutions and museums, the quality of scientific works for the layman, the unflagging efforts by scientific journals and the amazing source of scientific information the Internet offers are not enough to do away with the distance between science and citizens. All too frequently, these resources remain in the hands of those for whom scientific culture is already a value, much like musical, artistic or literary culture.

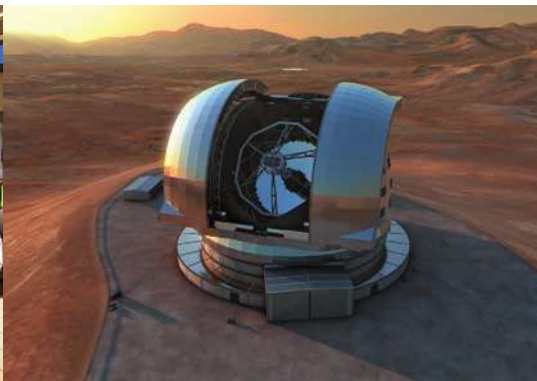
Lastly, as dedicated as science teachers may be today, scientific disciplines appear too strenuous and insufficiently rewarding to much of the young generation, and are thus not often seen as an attractive career path.

For all of these reasons, we have chosen to institute action rooted in the importance of:

- **research and innovation for the future development of our society**
- **the ability of all citizens to use their critical thinking skills**, drawing upon knowledge and the scientific approach, also embracing the doubts and uncertainties inherent in it
- **the education of future generations**, to heighten the appeal of scientific and technological disciplines and approaches with them
- **the complementarity between experimental – so-called exact – sciences, and the human and social sciences and humanities** (philosophy, arts, literature)
- **the need to encourage researchers from all areas to reach out to the public**, in particular that which is not fortunate enough to have access to scientific culture in the home, and to reward that effort through recognition within their careers
- **maintaining the ties between researchers and citizens**, in particular through discussion of the professional and general ethics of researcher expertise and social responsibility







## ACTION 5

ENCOURAGING  
SCIENTIFIC AND  
TECHNOLOGICAL  
CULTURE  
AND DIALOGUE  
BETWEEN  
SCIENCE  
AND SOCIETY

## DEVELOPING A SCIENTIFIC, TECHNOLOGICAL AND INDUSTRIAL CULTURE (CSTI)

- Working in cooperation with the other Ministries responsible for scientific, technological and industrial culture (Ministry of Culture and Communication, Ministry of Education, Ministry of National Recovery, etc.), the Ministry of Higher Education and Research will formulate the national strategic guidelines in terms of scientific and technological culture. It will coordinate the development of national action plans and set them before the National Council on Scientific, Technological and Industrial Culture (CNCSTI) for approval.
- Depending on Phase III of the Decentralisation process, the Regional Councils will be empowered to coordinate the territorial CSTI networks, based on the people's education approaches and main specialized centres (CCSTI). They will set their regional action plans before the CNCSTI;
- The academic institutions will put forth a strategy for the dissemination of the scientific culture, which will be assessed and incorporated into their contract with the Ministry. Training for doctoral students will include dialogue with the public on the objects of science. Each research unit will be connected with a school class.
- Awareness-raising about the dissemination of the CSTIs will be provided for in the training curricula to be followed by higher schools of teaching and education (ESPE), in recognition of the prime role which secondary school teachers play in spreading the scientific and technical culture, in particular with respect to younger audiences
- The standing call for projects by the *Investissements d'avenir* Programme, on "developing a scientific and technological culture and equal opportunity" will encourage submissions from structure-building projects (Web portal of existing projects, sharing of best practices, information to audiences, national- level networked development of proven innovative methods). In the field of scientific culture, it will extend the range of disciplines covered, regarding programmes aimed at school audiences, and develop new mass media programmes (web, radio, etc.).

- The role of the SHSs and humanities in large-scale research programmes, in connection with the environment, sustainable development, human rights and the rights of populations, healthcare, access to energy, water, etc., in which a greater understanding of humanity (its roots, cultures, fears, endeavours) must be secured and better promoted. A programme fostering familiarity with these disciplines, aimed first and foremost at researchers and educators will be implemented, in conjunction with the "Maisons des Sciences de l'Homme".
- Specific action will be aimed at the economic decision-makers, media channels and elected officials whose support is essential to the plea for innovation and support for research (possibly in conjunction with IHEST – the Institute of Advanced Studies in Science and Technology and OPECST). They will be offered conferences and regular seminars. Discussion will be initiated with the relevant establishments as to how training modules on the scientific approach can best be incorporated into journalism school curricula. Ties with the French and European Association journalist associations (*European Union of Science Journalists' Association*) will be tightened and discussions initiated on the relationship between science and media.

## FOSTERING DIALOGUE BETWEEN SCIENCE AND SOCIETY

- An intelligence unit will be set up to monitor developments on issues of controversy in science and relating to the scientific expertise available to the Ministry of Higher Education and Research.
- Nationwide discussions will be initiated on expertise and the connections between professional ethics, expertise, discussion and discord management.
- An interdisciplinary and comparative discussion will be initiated on the best practices identified in France and internationally, as concerns dialogue between science and society



**7. DEVELOP  
PROGRAMMING  
SUITED TO THE  
MAJOR PRIORITIES  
IN RESEARCH AND  
INNOVATION**

**T**he National Research Agency (ANR) founded in 2005 was one of the major changes in France's research landscape and financing modes. It sparked researchers to develop and advocate top-level research projects, by stimulating a "project-based culture" capable of pacing the work of teams around performance-oriented, collaborative research. It has helped establish new inter-laboratory and often inter-disciplinary cooperation projects and direct certain areas of research toward societal issues (energy, healthcare, etc.) open to industrial or international cooperation.

The ANR now enjoys recognised know-how in implementing calls for projects, and this know-how needs to be deployed fully for the benefit of the future strategy, founded on our major societal challenges and breakthrough technological research geared at transfer and innovation.

The Ministry of Higher Education and Research wishes to refocus the ANR on its fundamental responsibilities, from as early as 2013. A number of action programmes have been initiated with the aim of: intensifying dialogue with the National Research Alliances in order to determine programming priorities; simplifying procedures; and better connecting the national and European calls for tender with a culture of subsidiarity and complementarity where research is concerned.

The 2013 Programming already implements a number of turning points in favour of projects, whether foundational or finalized and partnership-based, focusing on the major scientific and societal challenges today, in a setting where a new balance is being sought between project funding and recurring financing for research laboratories. Stronger support for partnerships between public research, SMEs and EISs has been proposed through financing for 100 joint laboratories and a dozen major challenges, under the LabCom project. This approach will be continued under the future ANR programming years, guided by the priorities that are identified gradually under the strategic agenda "France Europe 2020".

Particular attention will be paid to basic research, which is of outstanding quality in France, and which we wish to protect and stimulate in the years to come. Organisations and universities are driving this research, supported by a long-term vision. It requires an assessment process that respects its specific pace and allows boldness, creativity, exemplarity and originality to express themselves. The ANR will focus on providing support to young talents in order to foster creativity and heighten France's attractiveness on the international scene.

## ACTION 6

# REFOCUSING ANR CORE DUTIES



## ANR WILL CONTINUE TO REFOCUS ON ITS CORE DUTIES SO AS TO:

- **Facilitate access to Europe.** This will require a better interconnection between national and European programming. From as early as 2013, beneficiaries of the "Young Researchers" Programme will be offered preparatory courses in order to take compete in the *Starting Grant* programme run by the European Research Council (ERC).
- **Support interdisciplinary research** in particular focused on major societal challenges.
- **Step up the impact of research for recovery in the manufacturing sector** and competitiveness through support for partnership-based and technological research (Instituts Carnot, academic chairs dedicated to industry, etc.), and the creation of instruments that will enable France to be more competitive in the new programmes instituted by the European Community (such as key enabling technologies or KETs, or the European Institute of Innovation and Technology, EIT).
- **Simplify call for project procedures.** A two-step project selection process will be established, consisting of simplified pre-proposal submissions and financing mechanisms
- **Push back the boundaries of knowledge with a corpus of programmes in order to:**
  - Develop creativity, stimulate bold action and scientific risk-taking
  - Give priority to young talents
  - Establish and interconnect with the ERCs at the European level

Each year, the Strategic Agenda's Steering Committee will readjust the priorities defined for ANR programming, in accordance with the progress made over the course of the previous year and the new issues at stake.

## **8. BUILD CONSISTENCY BETWEEN SITES**

**T**here have always existed significant territorial inequalities where research is concerned. This stems from the fact that national and European research policies, in encouraging academic research of the highest international standard, naturally encourage a concentration of talents and the formation of major research hubs, which become more attractive as they develop.

It is essential, however, that care be taken to ensure creating overall consistency in the national research system and to support everywhere the emergence of high-quality scientific projects, capable of becoming the shining stars in our system tomorrow. The heightened competition between the sites, resulting from the very large number of calls for projects these past few years, has however deepened the gaps between different territories, with funding sources sometimes overlapping in specific very well-endowed territories, while brilliant research initiatives are left to abandon in others.

The strategic agenda “France Europe 2020” is designed to tighten the organisation between academic sites and foster the emergence of full-fledged ecosystems that bring together all players involved: universities, schools, organisations, etc., in order to facilitate cooperation between the academic world and economic players.

The aim, in implementing true “site policies”, is to bring together all of the local players involved in higher education and research around a single scientific aspiration and shared strategy. The aim is to foster the emergence of a more effectively-structured landscape for higher education and research, by better interconnecting the local ecosystems, consistent with the “intelligent specialisation” strategy currently being developed by the French regions, pursuant to the future Policy for the Cohesion of the European Union (2014-2020), and its framework research programme “Horizon 2020”.

## ACTION 7

# DEVELOPING A SITE POLICY

## GIVING A NEW FACE TO CONTRACTUAL DIALOGUE BETWEEN THE STATE AND THE UNIVERSITIES BY INSTITUTING A SINGLE-SITE CONTRACT WITH ALL ESTABLISHMENTS

Within a given academic or inter-academic district territory, a “site contract” will be concluded between the State and community of universities, replacing the multi-year State-university contracts. These are to become the main instruments of the “site policy”. They will be based on a site strategy – a shared, consistent, clear and sustainable scientific priority statement, supported by all of the players (universities, schools, research institutions) operating within the site, in line with the strategic aims set for them by the State. The site policy will have three main aims:

- to give new impetus to training, research and innovation in each territory, thanks to resource allocation decisions that better take into account the strengths and weaknesses of the system with regard to higher education institutions.
- to convey a clear view of how the strategic agenda is to be embodied and enacted at the territorial level;
- to better integrate the higher education and research policies within the territories and, in return, better take into account, when developing the institutions’ and organisations’ strategy the expectations of the local authorities and socio-economic players.

The site contract will be supplemented with specific agreements concluded with the research organisations and other higher education institutions (not under the authority of the Ministry of Higher Education and Research).

## SUPPORTING THE TERRITORIES ON THE EUROPEAN UNION COHESION POLICY ERDF FUNDS AND LOCAL AUTHORITIES, CHARITY ASSOCIATIONS AND OTHER MINISTRIES

- Unify public financing tools, by bringing together Caisse des Dépôts et Consignations, the BPI, Oséo, the Strategic Investment Fund (SIF) and regional tools supporting research in companies.
- Assist the regions that have decided to federate, respond to national and European calls for tender (European Union Cohesion Policy) to make them converge with common objectives that address both national and regional expectations

## STRENGTHENING REGIONAL SUPPORT AND MANAGEMENT SYSTEMS FOR EUROPEAN RESEARCH AND INNOVATION PROJECTS

- Strengthen and structure the relevant systems, located close to the teams, thanks to ERDF funding.
- Contribute to the effectiveness of these systems by interconnecting their action with that of the national system carried out by the Ministry for Higher Education and Research.



**9. HEIGTEN**  
THE PRESENCE  
OF FRENCH  
RESEARCH  
IN EUROPE  
AND ABROAD



In June 2010, the Heads of State and Government of the European Union adopted the Europe 2020 Strategy for “smart, sustainable and inclusive growth”.

Presented by the European Commission as early as October 6<sup>th</sup> of the same year, the Innovation Union is the flagship initiative of the European strategy, aimed at strengthening the entirety of the research and innovation chain and remove the obstacles that prevent ideas and discoveries from reaching the markets.

The new framework research programme, “Horizon 2020”, which will launch in a few months and run from 2014-2020, ushers in a new paradigm. It will bring together, for the first time, all of Europe’s research and innovation programmes (FPRD, Framework Programme for Innovation and Competitiveness, European Institute for Innovation and Technology) in a single framework programme for rationalising funding to foster growth and support projects all along the research and innovation chain.

The strategic agenda “France Europe 2020” proceeds from the same desire to closely interconnect, within a single national strategy, research and innovation policies based on three pillars: scientific excellence, response to societal challenges and industrial primacy, and improved consistency in implementing the aforementioned at the various levels – European, national and territorial.

French research is open to the world, with 46.6% of its publications involving international teams and is ranked 6<sup>th</sup> worldwide when it comes to scientific publications. Its impact indicator is rising and already above the global average, yet its contribution to total publications in percentage continues to fall, like that of its main European counterparts. France thus needs to improve its visibility, foster student and researcher mobility and develop European and international partnerships.

Within Europe, France is the Number 3 beneficiary of FPRD-7 funding, far behind Germany and the United Kingdom, even though it is the Number 2 contributor to the European Union’s budget, with 16.4%. Despite a success rate that exceeds the European average, the participation rate of French teams over FPRD-7 as a whole reflects a 1.4% slip, emphasizing the need for special effort to be made promptly, in order to step up France’s participation in European projects.

The strategic agenda “France Europe 2020” will offer the implementation of a driving, incentive-building and supportive policy for the development of consistent European, Euro-Mediterranean and international cooperation programmes.

## ACTION 8

# STEPPING UP FRENCH PARTICIPATION IN EUROPEAN PROJECTS

In order to prepare the scientific community for the new European framework programme "Horizon 2020", the strategic agenda "France Europe 2020" will put forward a comprehensive support and incentive-building system that will contribute to improving the openness and influence of the French community to Europe, by stepping up the presence of its players (both public and private, in particular by contributing to SME support) in European projects. Intergovernmental agreements will be issued further to this action to promote European partnerships.

## ORGANISING AND STRENGTHENING THE NATIONAL SUPPORT SYSTEM TO MOBILISE FRENCH TEAMS ON EUROPEAN PROJECTS

- **With a view toward supporting project owners under "Horizon 2020"** the Ministry of Higher Education and Research will deploy, steer and coordinate a new network of National Contact Points (PCN):
  - Professionalization of the function: PCN vested with a formal role, established via terms of reference and a mission statement
  - High national visibility: a new network of players run by the Ministry of Higher Education and Research, Thematic Alliances and other structures serving the entirety of the community; the creation of a French Web portal for European research and innovation programmes
  - A territorial support and assistance network with the most extensive coverage possible: action coordinated with the operational network of players in the regions, Innovation Regional Agencies and Enterprise Europe Network - EEN.
- The ability of French players to respond to European calls for tender will be further improved by a series of actions carried out **upstream from the European programming process**:
  - Putting together and anticipating contributions to European programming: France's representatives on the programme committees for "Horizon 2020" will be responsible for representing and championing the interests of the French research, development and innovation community (RDI) before the European Commission.

They will advocate France's position by drawing upon national thematic groups representative of the community as a whole, by domain.
  - Developing an opinion-shaping strategy aimed at the European Union

institutions: all RDI community players will be involved in Ministry for Higher Education and Research consultation sessions on the key issues to the European Research Area, in particular through the Ministry for Higher Education and Research's horizontal coordination group dedicated to Europe; researchers will be encouraged to take part in the expert panels and assessment panels set up around "Horizon 2020".

- Sharing and organising lobbying for the French research, development and innovation community in Brussels.

## PROMOTING MEASURES TO INCENTIVISE PARTICIPATION IN THE HORIZON 2020 PROGRAMME

Providing recognition for and rewarding activities connected with European projects, in particular during the assessment processes, whether they relate to the researchers themselves or the structures for which they work; creating a new Prize, under the Ministry for Higher Education and Research, for French teams leading European projects.

Promoting institution strategies (higher education and research institutions) in order to foster participation in European programmes, tracking participation in FPRD-7 using indicators, under the performance contracts.

Promoting, in the establishments, the support functions for European projects and the professionalization of specific aspects within them (project development, legal and financial support).



## ACTION 9

# DEVELOPING THE INTERNATIONAL DIMENSION IN RESPONSE TO SOCIETAL CHALLENGES AND IMPROVING COMPETITIVENESS

The international dimension is a crosscutting component of the strategic agenda "France Europe 2020".

Four major lines of action are proposed.

## ADOPTING A STRONGLY DRIVEN POLICY

- Defining an opinion-building strategy (positioning experts in international institutions, alumni networks)
- Stepping up the use of European financing in international cooperation.

## OPENING ESTABLISHMENTS TO THE INTERNATIONAL ENVIRONMENT THROUGH SITE CONTRACTS

- Setting geographic priorities consistent with the site's scientific priorities
- Integrating international mobility for students and teaching-researchers into the strategies of higher education and research institutions

## FOSTERING IN-COMING AND OUT-GOING MOBILITY FOR STUDENTS AND RESEARCHERS

- Developing ANR's "post-doctoral return" programme into a broader mechanism, open to joint financing from the European Commission under "Horizon 2020"
- Making programmes more attractive to foreign students by offering courses in foreign languages, under agreements with foreign universities or programmes funded by the European Union.
- Giving recognition for international mobility in hiring, assessment and career review
- Giving recognition for participation in international calls for tender and projects
- Bringing the legislation and regulations forward by the end of Year 2013 to offer better conditions to foreign students and researchers in France, attracting talents

## STEPPING UP EURO-MEDITERRANEAN COOPERATION EFFORTS

More than stepping up partnership activity in higher education and research with emerging countries, which base their development on raising qualification levels and research standards, the aim here is to tighten bonds with Africa, in particular Sub-Saharan Africa and North Africa, from which over 50% of foreign students enrolled in higher education in France hail, and where they contribute to the reputation of a higher education system that continues to be attractive. It is also through exchange with the African continent, where China has already established extensive presence, that part of Europe's economic development will be determined.

- **Developing innovative educational projects** that fit in with the creation of an enhanced Euro-Mediterranean area for higher education and research, open to the African continent, and based on innovation and higher training standards:
  - joint degree programmes created, common educational teams formed
  - higher education institutions established locally
  - joint higher education establishments established, in particular for technological and vocational programmes
  - doctoral colleges created
  - shared classroom platforms developed, best educational practices and legal frameworks shared, as part of the digital university project
  - student mobility stepped up, including in enterprises
- **Developing cooperation in the field of research**, around jointly determined priority areas (in particular health, urban systems and integrated and sustainable mobility, renewable energies, water management and the environment).







# CONCLUSION

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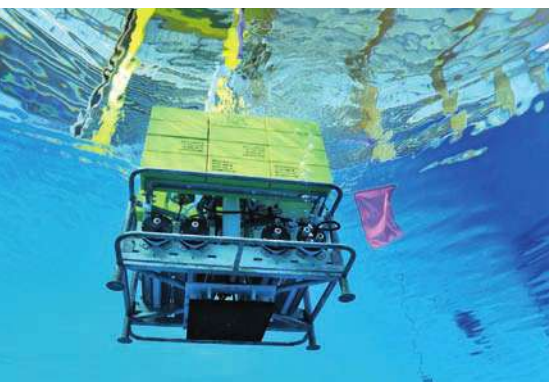
**T**he Strategic Agenda for Research, Transfer and Innovation, **"France Europe 2020"**, is aimed to address societal, scientific and technological issues and take up the challenges of competitiveness.

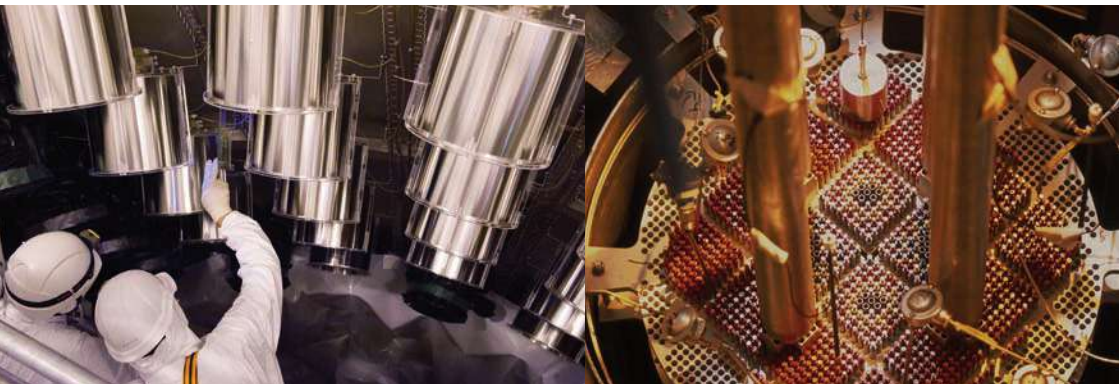
In the words of French President François Hollande, *"Research must turn to the future, anticipate and project into the future, and thus break free from reaction and be able to offer solutions"*.

Where research and innovation are concerned, we have considerable advantages. The excellence of our training programmes and researchers is recognized, and meets the highest international standards in many fields. We must be proud of this and capitalise on this potential.

With **"France Europe 2020"**, France is now equipped with a strategic agenda for research, transfer and innovation that will guide public research support policy over the long term.

**"France Europe 2020"** is intended to enable the State to fully play its role as strategist, set the priorities for national programming, simplify organisation, and review research assessment and indicators. The aim is also to optimise coupling and coordination with European programmes, thanks to greater consistency and better involvement, and thus to have a bearing on Europe's future and enjoy the needed critical mass at the global level. Our research, incorporated into a European partnership network, will grow even stronger at the international level, all the while making a decisive contribution to a society of progress and to the long-term recovery of our nation.





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