

ASSESSMENT OF THE 'FRANCE EUROPE 2020' NATIONAL RESEARCH STRATEGY

BY

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By the very nature of its activities, the Parliamentary Office for Scientific and Technological Assessment (OPECST) is constantly interacting with the world of research and technology and, in light of its experience, can provide an analysis of the conditions under which research is organized in France.

This report is the first assessment by OPECST of the first national research strategy entitled 'France-Europe 2020', as provided for by Article 15 of the 22 July 2013 Higher Education and Research Act. The strategy covers the period 2015-2020..

CONDITIONS OF ASSESSMENT

This first assessment published in March 2017 may appear premature since the national research strategy was officialised at the Conference on 'Research: challenges and adventures' only on 14 December 2015 at the Quai Branly Museum, in the presence of the Prime Minister.

However, the public consultation on the 'challenges' was already concluded in May 2014 and the assessment work on the national research strategy was sufficiently advanced by summer 2014 for two budget years, those of 2015 and 2016, to already in fact bear the mark of the national research strategy. The assessment thus fully complied with the two-yearly interval.

Also, insofar as OPECST contributed, at the beginning of the XIVth legislature, to the institutionalization of the national research strategy, it was important that it be able to make this assessment before the end of the legislature.

As a matter of fact, OPECST has been very closely involved in the 'Meetings on higher education and research' process which put forward, during autumn 2012, among the many proposals for reform, that of an institutionalization of the State as a strategist in the fields of higher education and research. It organised at the National Assembly, on 4 December 2012, a public hearing allowing a

debate between members of parliament and the participants of the Meetings with a view to fine-tuning the operational conclusions to be drawn from the 121 proposals made at the Meetings.

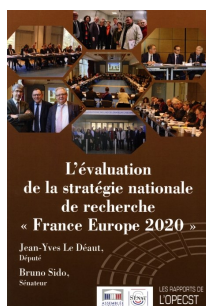
Jean-Yves Le Déaut was appointed as the parliamentary commissioner to prepare the legislative implementation of these proposals. On 15 January 2013, he handed the Prime Minister a report entitled 'Overhauling universities, boosting research, cooperating better for success'. In the report, he stressed in particular the need to rethink the strategic steering of research through OPECST's involvement.

Three public hearings were organized in 2016, more specifically to shed light on some important aspects of the drafting and implementation of the national research strategy.

The first took place on 30 June 2016 and was attended by the Secretary of State for higher education and research and the General commissioner for investments. It focussed on the instruments and means to exploit research results.

The second, on 6 October 2016, analysed the training conditions of scientists and engineers. Particular attention was paid to checking the alignment between their training courses and the future skill needs identified by the national research strategy.

The third, on 8 December 2016, was focussed more specifically to the conditions under which the national research strategy has been drafted and implemented. It thus made it possible in particular to: measure the methodological progress accomplished since the previous national research and innovation strategy covering the 2009-2013 period; appreciate the interministerial dimension of the strategy and outline current and future efforts under way or to be accomplished to allow, at a future date, a quantified or quantitative assessment of the efficiency of the national research strategy in terms of government policy.



GLOBALLY RELEVANT THEMATIC PRIORITIES

The national research strategy is a 46 page soft-cover document. It sets out ten 'societal challenges', each specifying research guidelines. It also outlines fourteen 'action programmes', five being considered as priorities because of their *'specific urgency'* and the need for multidisciplinary mobilization. The requirement of the Act of 22 July 2013 that a strategy be drafted that *'meets the scientific, technological, environmental and societal challenges'* is thus fully met.

The choice of the ten identified 'challenges' appears robust.

We welcome the pragmatism that led to the creation of 'action programmes' which take the cross-cutting nature of some research fields into account.

However OPECST felt that three scientific fields should be more supported.

The ten 'challenges'

Sober management of resources and adaptation to climate change,
Clean, safe and efficient energy,
Stimulating industrial renewal,
Health and welfare,
Food security and the demographic challenge,
Mobility and sustainable urban systems,
Information and communication society,
Innovative, integrative and adaptive societies,
A European space project,
Freedom and security of Europe, its citizens and its residents.

The five priority 'action programmes'

Big Data
Earth System: observation, forecasting, adaptation,
Systems biology and applications,
Laboratory bench to bedside,
Men and culture.

Research on biotechnologies has experienced a breakthrough with the recent invention of genome editing techniques. The development of these accurate, effective and inexpensive techniques will revolutionize biology in the coming years and major scientific countries (United States, Japan, United Kingdom...) are investing to secure powerful positions in this field. However, the national research strategy does not fully take the ongoing revolution into account. As a cross-cutting discipline requiring urgent mobilisation and management in a multidisciplinary framework, biotechnologies would have deserved to be made considerably more visible in the form of a **sixth priority action programme on the convergence of Nano-Bio-Info-Cogno (NBIC) technologies.**

Material science, whether it concerns chemistry, physics or engineering, appears scantily in the explanations of several challenges or action programmes. However, its strategic and cross-cutting dimension would have justified it being the subject of a **fully-fledged seventh priority action programme.**

Last, OPECST felt that **human and social sciences**, although recognized in the 'Innovative, adaptive and integrative societies' challenge, and in the 'Men and Cultures' priority action programme, should be the subject of greater emphasis due to their **synergies with technological and medical sciences** in the heart of the other strategic avenues.

A STRATEGY THAT FAILS TO TAKE THE PRACTICAL CONDITIONS OF RESEARCH INTO ACCOUNT

The word 'strategy' etymologically refers to the determination of a set of goals and means that guide the activities of an organization in the medium and long term. OPECST is sorry that the national research strategy is limited to establishing a list of priority research themes without addressing the practical challenges encountered in scientific research.

This was the approach adopted by the Meetings and taken up in Jean-Yves Le Déaut's report to the Prime Minister of January 2015, which evoked the need for a genuine 'strategic agenda'.

In line with the remarks expressed by the Strategic Research Board (CSR), OPECST therefore identified at least six challenges to the implementation of the national research strategy.

The first two of these already appeared among the demands made by the Meetings and still remain to date without a satisfactory solution. These concern:

↳ **The inadequate balance between ongoing funding and project funding:** basic research relies on successive calls for projects, which can lead researchers to make unrealistic promises regarding the possible markets ... As the Strategic Research Board warned, this leads finally to a loss of confidence in research.

↳ **The status of women and men in higher education and research:** this is characterized by insufficiently attractive careers and a number of young researchers remaining 'trapped' in successive fixed-term contracts and, then, dismissed close to the date of the obligation laid down by the Sauvadet Act to switch to a no-term contract after six years. In 2012, this

concerned 8,400 people at universities and 1,400 in research organizations. An effort has been made at universities but not in research.

Two other obstacles are already the subject of a government policy effort, but require an even greater stimulus.

These concern:

↳ **The persistent weakness of French system in supporting innovation** does not allow a sufficient number of projects to come to fruition at the industrial stage in the French territory to create jobs in these areas;

↳ **The French education system is still overly rigid.** It lacks cross-disciplinarity and the recognition of non-traditional or non-linear training paths. This can preclude young people from finding their niche and reveal their talent.

The latter two obstacles were explicitly addressed in the Act of 22 July 2013, but nevertheless persist owing to a shortfall in its implementation. These obstacles are:

↳ **The lack of social recognition for those who have doctorates in France**, which can be measured in particular by the resistance of public administrations in granting them a route of recruitment and of upgrading as category A executives;

↳ **The difficulty of setting up strong university poles** in the framework of mergers, of associations or of groupings in COMUE (groupings of higher education and research establishments), owing to insufficient government involvement in favour of a more pronounced integration that nevertheless respects the identities and characters of the member establishments.

NEED FOR ADDITIONAL FUNDING

The White Paper on higher education and research confirmed that four of these obstacles were the result of lack of funding. In 2000, France and Germany allocated 2.15% of their gross domestic product (GDP) to research and development (R&D), including public sector funding and private company expenditure. In 2016, Germany reached 3% while **France progressed to only 2.25% of its GDP.**

It was planned that some of the funding allocated to the National Research Agency (ANR) be redeployed to research organisations, to better meet ongoing needs. The ANR's subsidies for calls for projects was indeed cut from 555 million euros in 2012 to 390 million in 2015. But the budgets of research organizations have stagnated. There has been no transfer.

In this context, OPECST underlined the need for the enacting of a programming bill providing for resources commensurate with the challenges, at the rate of an additional 1.2 to 1.5bn euros a year, higher than those envisaged in the White Paper. This enshrines the funding of basic research, upgrade personnel careers, set up a specific system to reduce precariousness and establish additional funding assigned to support for the grouping policy (construction of major research universities and roll-out of a locally shared research strategy).

IMPROVING THE OVERALL ORGANISATION OF RESEARCH

The assessment also led OPECST to ask for several developments as regards the context of the implementation of the national research strategy:

- Re-establishment of a fully-fledged ministry for higher education and research⁽¹⁾;

- A more select set-up of the Strategic Research Board, the latter having to meet regularly under the effective chairmanship of the Prime Minister, in the presence of the ministers concerned, the General commissioner for investments and the presidents of the National Research Agency and of the High Council for Evaluation of Research and Higher Education (HCERES);

- Strengthening of the co-supervisory power of the minister for higher education and research, the latter having to play a leadership role with respect to any higher education or research establishment coming under several technical supervisions;

- An elaboration process of the next national research strategy based on broader consultation more open to the university and scientific community, social and economic partners, territorial communities, especially

regions as well as associations and civil society.

THE ISSUE OF IMPACT ASSESSMENT

The report notes that the carrying out of a retrospective quantified assessment to highlight, according to the words of an expert, 'what would not have happened in the absence of public action', will form a fully-fledged project.

The various discussions already held in this respect, especially at the Strategic Research Board, have confirmed that impact assessment will necessarily take place over a long period: fifteen to twenty years for the economic impact, especially if it is widened to the implications for human development and the environment; nearly forty years for the scientific impact.

Of course, the Science and Technology Observatory (OST) can provide indicators on the evolution of scientific output, publications, patents and international comparisons, even if it is not easy to make a bibliometric analysis by research area.

But the analysis of France's remarkable success as regards international awards during the past decade (eight Nobel prizes, four Fields medals and a Turing prize) implies some reflections on the long term evolution of science policies. The consequences of that should be drawn during the forthcoming revisions of the national research strategy.

OPECST therefore recommends that specific means be devoted to impact assessment efforts as it will be essential to have feedback to steer the future five-year revisions of the national research strategy.

(1) Which is the case of the Government appointed following the spring 2017 elections.

This report can be found at OPECST's site:
<http://www.assemblee-nationale.fr/commissions/opecest-index.asp>
<http://www.senat.fr/opecest/index.html>

June 2017