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Monitoring Policy and Research Activities on Science in Society in Europe (MASIS): National Report, France

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DG Research

**Monitoring Policy and
Research Activities on
Science in Society in
Europe (MASIS)**

National Report, France

October 2011

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DG Research

Monitoring Policy and Research Activities on Science in Society in Europe (MASIS)

National Report, France

October 2011

Written by

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0 Introduction

The EU recognises the importance of ensuring that European research and research in Member States is firmly rooted in the needs of society, particularly in light of the constantly changing Europe. Efforts to reinforce the societal dimension of research are channelled through the 'Science in society' (SIS) programme. The SIS programme supports activities focusing on the governance of the research system, research ethics, public engagement in science, women in science and the promotion of scientific education and science communication.

The Monitoring Policy and Research Activities on Science in Society in Europe (MASIS) initiative is a major undertaking under the SIS programme. Its aim is to map, steer and monitor the SIS landscape in the European Research Area (ERA) (http://ec.europa.eu/research/era/index_en.htm), in order for EU citizens and society to benefit the most from SIS efforts. MASIS also covers the eleven Associated Countries.

The national MASIS reports are cornerstones in this endeavour, as they contain the knowledge gathered by a network of national correspondents on SIS. The reports will be updated every six months. The reporting format was developed on the basis of advice from the network of national correspondents, as well as discussions with authors of the initial MASIS report (see this LINK, ftp://ftp.cordis.europa.eu/pub/fp7/sis/docs/sis_masis_report_en.pdf). In addition, the Commission and a network of national validators offered comments and advice.

In total, 38 national reports covering 38 (EU and associated) countries have been produced. This is the report on France. It consists of four main sections:

1. National context
2. Priority setting, governance and use of science in policy-making
3. Research related to SIS
4. Activities related to SIS
5. The Fukushima accident.

The intention of this report is to provide a good general overview of the SIS situation in France, including public engagement in science, different models and use of scientific advice and expertise for policy-making, activities related to assessment and ethical issues of science and technology, SIS research activities and scientific culture as well as trends, policies, actors and activities. The last

chapter on the Fukushima accident was added later to the original report and contains information on the national coverage and the role of scientific advice in connection with the accident.

Please note, in accordance with the terms of reference for the MASIS project, that the issue of ‘women in science’ is **not included** in the mapping as this has been extensively mapped and reported in other European projects. Please note also that the present report follows the initial MASIS report in using the term ‘science’ in its broadest sense, as in the German ‘Wissenschaft’, covering also the social, economic and human sciences. A few subsections are concerned only with the natural sciences, and in these cases it is explicitly indicated.

Statistical data sheet, France

	2000	2005	2006	2007	2008	2009	2010	EU27 average/total, 2008
Research and development								
Gross domestic expenditure on R&D (GERD), in % of GDP ¹	2,15	2,10	2,10	2,04	2,02	-	-	1,89
GERD by source of funds, % of total GERD ¹ :								
- Business enterprise sector	52,5	51,9	52,3	52,0	50,5	-	-	55,0
- Government sector	38,7	38,6	38,5	38,3	39,4	-	-	33,5
- Higher education sector	0,8	1,0	1,3	1,3	1,3	-	-	0,9
- Private non-profit sector	0,9	0,9	0,8	0,8	0,8	-	-	1,6
- Abroad	7,2	7,5	7,0	7,5	8,0	-	-	8,9
Number of R&D personnel ¹ , % 1000	13,5	13,9	14,4	14,5	-	-	-	
Number of R&D personnel by sector of performance ¹ , % of total R&D personnel:								
- Business enterprise sector	327.466	349.681	365.814	372.326	-	-	-	2.455.192
- Government sector	54%	56%	57%	57%	-	-	-	52%
- Higher education sector	16%	14%	14%	14%	-	-	-	14%
- Private non-profit sector	27%	28%	28%	28%	-	-	-	33%
- Abroad	2%	2%	2%	2%	-	-	-	1%
Patents								
Patent applications to the EPO, total ²	7285	8195	8363	8371	-	-	-	
Patent grants at the USPTO, total ²	6623	6972	7176	8046	-	-	-	
Triadic patent families, total ²	2278	2437	2460	2462	-	-	-	
Patent applications filed under the PCT, total ²								

	2000	2005	2006	2007	2008	2009	2010	EU27 average/total, 2008
Human resources in science and technology								
Total, % of labour force ¹	16	17	18	18	19	-	-	16
- Scientists and engineers, % of labour force ¹	-	5,0	-	-	-	-	-	-
Networks and projects								
National share of FP6 SiS budget	-	8%	7%	11%	-	-	-	-
No. of FP6 SiS projects managed in France	-	30	20	16	-	-	-	-
National share of FP7 SiS budget	-	-	-	15%	8%	41%	-	-
No. of FP7 SiS projects managed in France	-	-	-	5	20	19	-	-
Tertiary/higher education								
Students at ISCED levels 5-6 enrolled in the following fields: science, mathematics, computing, engineering, manufacturing, construction - as % of all students ¹	-	-	24,6	25,4	-	-	-	24,9 ⁴
Academic staff (ISCED 5-6), total in full time unit ¹	-	-	-	-	-	-	-	-
Public Understanding of Science (only 2005 og 2010 data) se pdf dokumenterne								
% of population very interested in new scientific discoveries and technological developments	-	39	-	-	-	-	41	30

	2000	2005	2006	2007	2008	2009	2010	EU27 average/total, 2008
% of population feel very well informed about new scientific discoveries and technological developments		16	-	-	-	-	21	11
% of population regularly or occasionally attend public meetings or debates about science and technology	-	9	-	-	-	-	8	9
% of population regularly or occasionally sign petitions or join street demonstrations on matters of nuclear power, biotechnology or the environment	-	15	-	-	-	-	12	13
% of population 'agree' and % of population 'disagree' that thanks to science and technology, there will be more opportunities for future generations	-	71/15	-	-	-	-	67/16	75/8
% of population 'agree' and % of population 'disagree' that science makes our ways of life change too fast	-	56/26	-	-	-	-	55/28	58/22
% of population 'agree' and % of population 'disagree' that we depend too much on science and not enough on faith	-	32/39	-	-	-	-	29/44	38/34
% of population 'agree' and % of population 'disagree' that because of their knowledge, scientists have a power that makes them dangerous	-	62/23	-	-	-	-	54/27	53/24

	2000	2005	2006	2007	2008	2009	2010	<i>EU27 average/total, 2008</i>
% of population 'agree' and % of population 'disagree' that in my daily life, it is not important to know about science	-	40/45	-	-	-	-	38/48	33/48

Notes: 1) Data from EUROSTAT, 2) Data from the OECD, 3) Data from EuroBarometer 73.1 (2010) and EB 63.1 (2005) 4) Data from 2007 **In red, EB 73.1 (2010)**

1 National context

This section sets the scene and describes political developments, public debates and policy initiatives of major relevance to the place of science in society in France.

1.1 The place of science in society - current debates

The main debates concerning science and technology over the past 5 years were, ranked roughly by order of importance of media coverage, about:

- **Environment** including biodiversity and climate change. The debate takes place in the political, academic and public arenas and is "endemic". However, it culminated in a public debate called "Grenelle de l'environnement" (a reference to historic salary negotiations in 1968 that took place in a ministry in rue de Grenelle, in Paris). This was a very innovative procedure in French policy-making tradition. Climato-scepticism has also been present, fed by the positions of geophysicist Claude Allegre, former research minister and very popular as a science writer. Citizens are informed, and consulted. Proactive groups played a role in the Grenelle debate (see section 2.1.1).
- **Biotechnology**, with GMO's regularly appearing in the news. It takes place in the political and public arenas and is "endemic". Citizens are informed but some groups are proactive (mainly anti-GMO).
- The **reform of the University**. The new Law of Reform of Universities (LRU - Loi de réforme des universités, n° 2006-450, 18 April 2006) among other reforms allows the universities to become autonomous with respect to the State and encourages them to group together. The debate takes place in the political, academic (strongly) and public arenas and is fairly "endemic". It provoked a long students' strike in 2009. Citizens were only informed.
- The renewal of the law on **bioethics** which included a public debate in 2009 (États généraux de la bioéthique – again a historic reference that can be translated as Bioethics Round Table Talks). The debate took place in the political and public arenas and is "epidemic", focused on the parliamentary procedure. Citizens were informed and consulted.

- A public debate on **nanotechnology** was run from October 2009 to February 2010 by the Commission Nationale du Débat Public (National Commission for Public Debate). It was highly conflictual, globally unsuccessful and only moderately present in the media. The issue can be called "epidemic". The aim of the public debate was to inform and to consult citizens. One of the reasons for its failure was the lack of potential effect either on legislation or on the industrial development of nanotechnologies that is already well engaged.
- The possible adverse effects of **electromagnetic waves** (high voltage power lines, mobile telephones) regularly appear in the media. The discussion takes place in the public arena and is "endemic". Citizen groups have actively set the agenda.
- A recurring debate concerns the **history** of France. It mainly involves the government and historians (mobilisation of specific events, creation of museums, etc.). It is quite present also in the public sphere, citizens have been informed and the issue can be qualified as "epidemic" with recent crises.

1.2 Policy goals and priorities

The main science policy goals over the past 5 years have concerned the development of a research strategy, the reorganisation of the research system and increasing private sector research and public/private exchanges (the last two points are discussed in section 2.2). Measures have been taken giving more autonomy to Universities, grouping them and strengthening them in relation to the large research organisation, in particular CNRS (Centre National de la Recherche Scientifique). Along with this reform, a single agency for competitive research funding was set up as well as an evaluation agency. The programmatic law governing these changes can be found at:

http://www.legifrance.gouv.fr/html/actualite/actualite_legislative/decrets_application/2006-450.htm

In 2007, the university reform law (LRU) was voted despite a long student strike. This law:

- increased the power of the president of University (mandate of 4 years, authority over the entire institution, chairs the Scientific Advisory Board, directs university's expenditures)
- reduced the power and size of the Board of Administrators. The board is composed of 30 members instead of 60 and is open to non academics appointed by the President. It determines the policy of the institution, approves the budget, adopts internal rules and rules for the examinations, makes research policy.
- gave budgetary autonomy and the management of human resources over to the Universities, instead of the Ministry

- introduced new responsibilities. Universities can establish foundations, they can request ownership of property allocated to them, and they must establish an Office for assistance in the professional integration of students. (http://www.legifrance.gouv.fr/affichTexte.do;jsessionid=FEB078172150FA5F56A3F8769423F58B.tpdjo07v_2?cidTexte=JORFTEXT000000824315&categorieLien=id)

The proportion of competitive funding of research by projects was strongly increased with the creation of the National Research Agency (Agence nationale de la recherche, ANR, www.agence-nationale-recherche.fr) in 2007. It funds fundamental but also applied research and industry-academia partnerships. Approximately 50% of the funding now goes to non-thematic calls, an increase from the original proportion that was below 30%.

An Agency for the Evaluation of Research and Higher Education (Agence de l'évaluation de la recherche et de l'enseignement supérieur, AERES, <http://www.aeres-evaluation.fr>) in 2007. AERES is formally an Independent Administrative Authority and is responsible for the evaluation of institutions of higher education and research, research organizations, research units and higher education programmes and for the validation of the procedures for evaluating University personnel.

In 2008, the Ministry of Higher Education and Research developed a National Strategy for Research and Innovation¹. Quite a wide consultation was carried out, which is a new process for French science policy making. Stakeholders (industry, NGO's, etc.) were included in the workgroups and an Internet forum was run in parallel. The first edition (2009-2012) sets three priorities:

1) Health, well-being, food and biotechnology. Among the aims: to set up capital-backed foundations in ten "centres of excellence" for clinical research and development on major public health challenges, including neuroscience, genetic diseases, cardiology, cancer, rare diseases, infectious diseases, plastic surgery and nutrition; to analyze the natural biodiversity of plants; to create innovative technology processes; to observe the long-term impact of social and environmental factors on the health of the population.

2) Environmental emergency and environmental technologies. The aims concern: electric vehicles; marine energy; innovative observation technologies, particularly the automatic analysis of ecosystems; climate and the environment; sustainable transport.

3) Information, communication and nanotechnology. The aims are to support industry-research partnerships and develop a distributed computing platform; to accelerate transfer of technology (e-science); to build a very large centre for

¹ Elaborated under a steering committee composed with only 11% women.

nanoscience research (Saclay); to create foundations in the field of nanoscience.²

A Council for the development of the humanities and the social sciences was set up in 2009 to make policy recommendations in that area. It does not include stakeholders. It is focussed more on the conditions of practice of the social sciences and humanities than on prioritizing specific themes.

<http://www.enseignementsup-recherche.gouv.fr/pid23414/conseil-pour-le-developpement-des-humanites-et-des-sciences-sociales-cdhss.html>

All these reforms are recent and not yet fully evaluated – evaluation being one of the weaker points in the French research system according to the INNO-Policy Trendchart for France³. Their impact will no doubt be large as they quite deeply reorganise the research system. They have met with considerable opposition in academia (<http://www.sauvonslarecherche.fr/>, <http://www.sauvonsluniversite.com/>). The ERAWATCH report for France can be referred to for an in-depth analysis of these research policy changes (<http://cordis.europa.eu/erawatch/index.cfm?fuseaction=ri.content&topicID=4&countryCode=FR>).

1.3 National challenges, opportunities and trajectories

Science does not appear to be an absolute priority in France, as illustrated by the steady decrease in the share of resources that goes into Research and Development. Investment in that area was only 2.02% of the Gross National Product in 2007, which is well below the Lisbon target of 3%. The proportion has been decreasing steadily (2.32% in 1990, see table also). Nevertheless, S&T have been somewhat protected in the recent budget cuts.

Science and Technology are only moderately present in the general media. For instance, a count of news items in the main TV bulletins in 2009 gave 1.8% of all news items for science and technology, 3.7% for environment and 6.1% for health.⁴ On the other hand, the country has quite a flourishing market of science magazines and a dense network of local science, history or ethnography museums or centres.

France has a relatively top-down technocratic tradition of governance. However, some signs of increasing attention to the science/society interface have appeared recently, such as the creation of a Science and Society unit in the Ministry of research (Secteur Science et Société, <http://www.enseignementsup-recherche.gouv.fr/pid20007/sciences-et-societe.html>) or the nomination of a Science and Society advisor in CNRS (who however disappeared from the organisation chart at the last change of president). Some specific funding pro-

² Stratégie nationale de recherche et d'innovation, <http://www.enseignementsup-recherche.gouv.fr/pid20797/la-strategie-nationale-de-recherche-et-d-innovation.html>

³ <http://www.proinno-europe.eu/page/innovation-and-innovation-policy-france>

⁴ *Ina Stat* N° 16, 2010 (<http://www.ina-sup.com/ressources/ina-stats>). A detailed analysis of S&T television news by topic can be found in *Ina Stat* N° 20, December 2010

grams have also appeared (see section 3.3). The role played by the regional and local levels in increasing, through the strengthening of Regions as actors in science policy-making, the autonomy of Universities, the creation of regional competitiveness clusters (poles de compétitivité), etc.

2 Priority setting, governance and use of science in policy-making

This section focuses on the different actors involved in shaping the relationship between science and society and the processes for governing science at national level. This includes government initiatives, institutions and organizations as well as public involvement and policy-making processes at all levels related to science and technology.

Different themes will be elaborated in the French context, including ethics in science and technology, equality, diversity and inclusiveness in scientific institutions, and ethnic or social minority groups in scientific contexts and careers. Moreover, this section will highlight actors in science communication and technology assessment. Public involvement in science and technology decision-making as well as the use of science in policy-making at the national level will be covered in this section.

2.1 Public engagement in priority setting

2.1.1 Formalised procedures for citizen involvement

In France, citizens tend to be informed (and occasionally consulted) about S&T decisions and developments. As mentioned below, there have been a number of public consultations, but they are not systematic. However, law n°2010-788 of 12 July 2010 known as Grenelle 2 has widened the scope of public debate, around any environment-related topic.

Debates take various forms and the latest, on nanotechnology, was a spectacular failure: there was too much conflict to allow any exchange (<http://www.debatpublic-nano.org/>). One of the main problems concerning the involvement of citizens is the link between the public consultation and policy implementation - the debate coming too often after the political decision.

The traditional form of inclusion of civil society in policy setting (including science policy) is through the Economical, Social and Environmental Council (CESE, Conseil Économique, Social et Environnemental, http://www.conseil-economique-et-social.fr/ces_dat2/som-en.htm) which includes trade unions, economic actors, mutual benefit societies and family associations among its members. It issues opinions and recommendations at the request of the gov-

ernment or on its own initiative. There have been recent publications on health and environmental topics.

A National Commission for Public Debate (Commission Nationale du Débat Public, CNDP, www.debatpublic.fr/) was created in 1997 and its field of action enlarged in 2002 and 2010. The agency is responsible for setting up debates, at its own initiative or at the request of the government, around issues concerning national scale development and equipment. It covers a number of general topics, often environment-related (eg. creation of airports or fast train line) but also questions concerning science and technology (nanotechnology, nuclear waste).

An exceptionally ambitious public debate, called "Grenelle of the environment" - in reference to historic salary negotiations that took place in a ministry in Rue de Grenelle after the massive strikes of 1968 - was set up in 2007 (<http://www.legrenelle-environnement.fr/-Version-anglaise-.html>). It included environmental groups, trade unions, employers, local authorities and the State and produced a long series of recommendations about environmental problems and their governance, a number of which have been transcribed into law (Grenelle Laws 1 and 2, <http://www.legrenelle-environnement.fr/-Lois-.html>).

On a smaller scale, a public consultation on bioethics (Etats généraux de la bioéthique, <http://www.etatsgenerauxdelabioethique.fr/>) was set up in the framework of the renewal of the bioethics law in 2009.

Cité des Sciences, the main French science centre (now part of Universciences) has also organised a number of public consultations, often in the framework of EU funded Science and society projects such as "Meeting of Minds" on brain research (<http://www.cite-sciences.fr/en/cite-des-sciences>).

The Parliament Office for the Evaluation of Scientific and Technological Choices (Office parlementaire d'évaluation des choix scientifiques et technologiques, OPECST, <http://www.senat.fr/opecest/>) has plans to set up a citizen's committee along side its science one.

2.1.2 Citizen- or CSO-initiated activities with political impact

Beyond publicly organized debates, a number of NGO's advocate citizen's empowerment about technological and scientific choices, mostly when they involve risk for human health or for the environment.

Foundation Sciences Citoyennes (Citizen Science Foundation <http://sciencescitoyennes.org/>) created in 2002, aims to empower citizens in scientific and technological choices. It pays particular attention to mobilizing scientists.

Vivagora, an NGO created in 2003, organises public debates on science questions and monitors news on public debate and sharing governance. (<http://www.vivagora.org>). It has run 6 cycles of thematic debates since 2003: The ownership of life in 2004, Health and Environment in 2005, The

Nanoworld in 2006, NanoViv cycle in 2006, Brain and Mental Health in 2007, Synthetic biology in 2009.

The NGO Sciences et démocratie (Sciences and democracy”, www.sciences-et-democratie.net) was created in 2005 to promoting the participation of citizens in scientific and technological choices. The main questions discussed on their web site are nanotechnology, biotechnology, environment, genetic testing, scientific expertise.

More specialized NGO's such as InfOGM (<http://www.infogm.org>) on GMOs and biotechnology or Alliance citoyenne sur les enjeux des nanotechnologies, (Citizen's alliance on the stakes of nanotechnology, <http://nano.acen-cacen.org>) on nanotechnology are also active.

2.1.3 Importance of upstream engagement

There is not a great deal of upstream engagement in France. Some examples are:

The Environment Ministry (MEEDDM, Ministère de l'Écologie, de l'Énergie, du Développement durable et de la Mer) created in 2009/2010 the REPERE Program (<http://www.programme-repere.fr/>). Its aim is to fund research projects carried out by researchers and civil society. It runs an observatory of citizens' participation in research and expertise: (<http://www.programme-repere.fr/observatoire/#>).

An experiment in citizen empowerment is being carried out by the National Institute for Agronomical Research, (INRA Institut scientifique de Recherche Agronomique) concerning transgenic grape vines, started in 2001. It has suffered a lot from destruction of the grape vines by radical opponents to GMO's. (http://www.inra.fr/la_sciences_et_vous/dossiers_scientifiques/ogm/questions_de_recherche/porte_greffe_transgenique_de_vigne)

Other examples mainly concern the field of health. Collaboration with scientists in research on AIDES treatments was imposed by patient groups in the 1980's. At present, the main medical research organisation INSERM (National institute for health and medical research, Institut national de la santé et de la recherche médicale) has organised relations with patient groups (Reflection Group with Patient Association, Groupe de réflexion avec les associations de malades, GRAM, <http://extranet.inserm.fr/associations-de-malades/la-recherche-avec-les-malades/le-gram>).

2.2 Public - private interaction

Technology transfer to industry has been a preoccupation in France for many years. France has a relatively low ratio of private to public research spending and the government regularly tries to improve the synergies between the public and private sector and to increase research investment in the private sector. On the latter point, one of its main tools is a tax rebate for private companies that

carry out research activities. It is a somewhat debated measure and seems to be more profitable to large than to small companies which were to be the main target (INNO-Policy).

The other important element of this policy is structural measures taken to increase public-private interaction. In 2004, the government created competitiveness clusters (Pôles de compétitivité, <http://competitivite.gouv.fr/>) which associate, on a territorial basis, universities, research organisations and the business sector as well as local authorities in various sectors: biotechnology, aeronautics, energy, materials, transport, etc. At present, there are 71 clusters that involve 9000 researchers.

Funding measures followed in 2005, when the National Research Agency (ANR) created "Carnot Institutes" in order to reinforce links between research and industry. They certify laboratories or institutions particularly engaged in public-private collaboration in the technological field and give them extra funding. At present, the ANR funds 33 Carnot Institutes. It also supports the competitiveness clusters and processes the requests for tax rebates for research activities (<http://www.agence-nationale-recherche.fr/partenariats-public-privé/partenariats-et-competitivite/>).

Specifically aimed to support small and medium sized businesses, OSEO (http://www.oseo.fr/oseo/oseo_in_english2) is an agency that helps promote business-research contacts in the "hard" sciences. ANVIE similarly mediates between businesses and research in social sciences and the humanities (<http://www.anvie.fr/>).

2.3 Use of science in policy making

2.3.1 Formal procedures and advisory bodies involved

A number of Councils take part in defining science policy - too many according to the Cour des Comptes⁵ (the Audit Court that evaluates public spending). A technology assessment office (OPECST) advises the Parliament. The Academies also issue positions. These bodies both advise on science policy and on scientific and technological dimensions of other policies.

At the legislative level, the main body that allows the use of science for policy making is the Parliamentary Office for the Evaluation of Scientific and Technological Choices (Office parlementaire d'évaluation des choix scientifiques et technologiques, OPECST, <http://www.senat.fr/opecest/>). Its mission is "to inform the Parliament on the consequences of scientific and technical choices with the aim of enlightening its decisions".

⁵ Rapport public thématique de la Cour des comptes « La gestion de la recherche publique en sciences du vivant », March 2007

The High Council for Science and Technology (Haut Conseil de la Science et de la Technologie, created in 2006 and reformed in 2008, <http://www.hcst.fr/>) advises the Government on all matters relating national science policy. It includes members the business sector (8 out of 20) - this reflects the governmental aim to link research and business. Its main functions are to counsel on major national S&T priorities and link them to European and international policies, on the organisation of the research system and its relations with industrial research and finally on science culture and science and society relations

The High Council for Research and Technology (Conseil Supérieur de la Recherche et de la Technologie, created in 1982 and reformed in 2008) has members representing the world of research and its industrial partners, the cultural sector and regions, and it now includes representatives of NGO's and stakeholders in the professional, social, cultural and regional areas. It gives advice on research organisation and S&T matters, including the budget and plays the role of a watchdog analyzing "signs of alert". <http://www.enseignementsup-recherche.gouv.fr/pid20301/conseil-superieur-de-la-recherche-et-de-la-technologie-c.s.r.t.html>

The Academy of Science (Académie des sciences, http://www.academie-sciences.fr/actualites/nouvelles_gb.htm), among other more research-related missions, studies societal issues related to development of science and makes recommendations, ensures the quality of science education and encourages public diffusion of scientific culture.

The Academy of Technology (Académie des technologies, established in 2000, <http://www.academie-technologies.fr/>) makes proposals and recommendations for policy makers in the field of technology, contributes to the social debate on technology and educates the public.

An example of a more specialized advisory body is the High Council on Biotechnology (Haut conseil sur les biotechnologies, created in 2008). It is composed of a scientific committee and an economic, ethical and social committee. It is not yet very active, having produced only one position on agricultural production circuits free of GMO's. It apparently has no website⁶.

2.3.2 Trends at national level

Science has always been quite present in policy making, if only indirectly. A sizable proportion of higher civil servants having been educated in S&T in the Grandes Écoles (high level engineering schools). This tradition was quite technocratic so the fact that lay stakeholders are slowly being given more space is a deep change. For instance, the creation of lay committees (within in the High Council for Research and Technology and the High Council on Biotechnology) are innovative in French policy making as is the organisation of wide debates such as the Grenelle de l'environnement.

⁶ http://www.developpement-durable.gouv.fr/spip.php?page=article&id_article=16750

According to INNO-Policy, the weak points in science policy making are the lack of systematic and regular evaluation of all policies and the poor take-up of scientific information in the policy making process.

2.4 Key actors

2.4.1 Ethics in science and technology

Name of actor and web-link	Type of actor	Sector	Brief supplementary description
National Ethics Advisory Committee (Comité consultatif national d'éthique CCNE, www.ccne-ethique.fr/reseau)	Ethics councils / committees	public	Main ethics committee. Focus on relaying information to the general public.
Ethics committee for medical and health research of INSERM (Comité d'éthique pour la recherche médicale et en santé de l'Inserm, www.inserm.fr/qu-est-ce-que-l-inserm/organigramme/comites/ermes)	Ethics councils / committees	public	Ethics committee of the main medical research organisation, INSERM.
Ethics committee of CNRS (Comité d'éthique du CNRS, COMETS, www.cnrs.fr/fr/organisme/ethique/comets/index.htm)	Ethics councils / committees	public	Ethics committee of main research organisation, CNRS.
Common consultative ethics committee of CIRAD and INRA (Comité consultatif commun d'éthique CIRAD - INRA www.inra.fr/l_institut/organisation/l_et_hique/comite_d_ethique)	Ethics councils / committees	public	Ethics committee common to the two main agricultural research organisation, INRA and CIRAD (Centre de coopération internationale en recherche agronomique pour le développement).
Ethics committee of IRD (Comité d'éthique de l'IRD, www.ird.fr/l-ird/organigramme/instances-et-comites/le-comite-consultatif-de-deontologie-et-d-ethique)	Ethics councils / committees	public	Ethics committee of main development research organisation (Institut de recherche sur le développement).
The Catholic Church www.eglise.catholique.fr/accueil.html	Religious institutions	private	The Catholic Church (as well as other churches) takes position mainly on bio-ethical questions.
WWF (www.wwf.fr/), Greenpeace (www.greenpeace.org/france/), France Nature Environnement (www.fne.asso.fr/),	Environmental organisation	private	Many environmental organisations take positions that can be considered ethical on climate, biodiversity, GMO's etc. The French branches of WWF (World Wildlife Fund) and Greenpeace are among the most vocal.

2.4.2 Equality, diversity and inclusiveness in scientific institutions and in educational systems

Name of actor and web-link	Type of actor	Sector	Brief supplementary description
Haute autorité de lutte contre les discriminations et pour l'égalité (HALDE, High Authority for fighting against discrimination and for equality), www.halde.fr/	Independent agency	public	General authority fighting discrimination has attended to some cases (eg. when CNRS was given an all male administrative council or discriminated on age in promotion procedures)
Mission de la parité et de la lutte contre les Discriminations (MIPADI, Mission for parity and to fight discrimination, www.enseignementsup-recherche.gouv.fr/pid20161/mission-parite-lutte-contre-mipadi.html)	Government and ministries	public	Within the Ministry for Research, covers gender, handicap and other discrimination
Sciences Po (http://www.sciencespo.fr/en)	Universities and other higher education institutions	public	This higher education institution specialized in political science opened a special programme to recruit students from poor suburbs. A number of higher education institutions have followed this example.

2.4.3 Science communication

Name of actor and web-link	Type of actor	Sector	Brief supplementary description
Ministère de l'enseignement supérieur et de la recherche (Ministry of higher education and research), www.enseignementsup-recherche.gouv.fr/	Government and ministries	public	Organizes a Science Week (Fete de la science)
Centre National de la Recherche Scientifique (CNRS, National Centre for Scientific Research), www.cnrs.fr/	Research organisation	public	Organises a science film festival, "Sciences et citoyens" meetings between young people (450/y) and researchers
Institut National de la Recherche Agronomique (INRA, National agricultural research organisation, www.inra.fr)	Research organisation	public	Organises public conferences Agrobiosciences (http://www.agrobiosciences.org/)
Universciences, the product of the recent fusion of Cité des sciences et de l'industrie (City of Science and Industry) and Palais de la découverte (Palace of discovery) http://www.universcience.fr/fr/accueil/	Museums	public	CSI is 5th most visited museum in France. Organises public debates on S&T.
Centres de Culture Scientifique Technique et Industrielle (CCSTI, Centres for scientific, technical and industrial culture), http://www.ccti.fr/	Network	NGO	A network of local science centres with activities and resources, more or less developed according to regional policy.
Collectif Inter associatif pour la Réalisation d'Activités Scientifiques et Techniques Internationales (CIRASTI, Collective NGO)	Network	NGO	A network of NGO's active in science communication and popular education. Organises « Exposcience » where young

group for International science and technology activities), www.cirasti.org/article_patrice.php?id_article=108			people present science and technology projects.
France 3 (www.france3.fr/)	Media	mixed	A public TV channel that combines popular audience and science
Sciences et Avenir (Science and Future), www.sciencesetavenir.fr/	Media	private	An example of a middle -range science magazine.

2.4.4 Technology assessment

Name of actor and web-link	Type of actor	Sector	Brief supplementary description
Office parlementaire d'évaluation des choix scientifiques et technologiques (OPECST, Parliamentary office for the evaluation of scientific and technological choices) http://www.senat.fr/opecst/	Parliamentary body	Public	The parliamentary technology assessment body composed of members of parliament.
Haute Autorité de santé (HAS, High authority on health), www.has-sante.fr/portail/jcms/j_5/accueil	Independent public authority	Public	Evaluates medical procedures and medicines
Commission de recherche et d'information indépendantes sur la radioactivité (CRIIRAD, Commission for independent research and information on radioactivity) http://www.criirad.org/	NGO	Private	An independent organisation on nuclear energy
Comité de Recherche et d'Information Indépendantes sur le Génie Génétique (CRIIGEN, Committee for independent research and information on genetic engineering) www.criigen.org/	NGO	Private	An independent organisation on genetic engineering
Union Fédérale de Consommateurs (UFC Federal union of consumers), www.quechoisir.org/	NGO	Private	One among several consumer organisations that assess technologies that reach the market

3 Research related to Science in Society

This section is concerned with research activities related to science in society. The purpose is to describe the efforts in France, including the SIS research being undertaken and how SIS issues are embedded in mainstream research. The section will also elaborate on how SIS research is being funded and what the scale of funding is.

A distinction is made between *SIS research* on the one hand and *SIS issues embedded in mainstream research* on the other. SIS research are the studies particularly targeting public understanding of science, governance of science, science policy, science education, science communication, ethics in science and technology, the reciprocal relations of science and culture, young people and science and similar issues. However, SIS issues may also be present in other research activities, in which the main objectives of research are *not* SIS related issues, but in which SIS practices or perspectives are embedded. This could include studies within the natural sciences which apply innovative or extensive use of public involvement in the research process, new ways of communicating research results, ambitious efforts to bring ethical and societal issues into research, innovative ways of involving a variety of stakeholders (politicians, NGOs, industry, social scientists etc.). Such efforts are referred to as SIS issues embedded in mainstream research.

The section provides examples of French research projects and funding programmes related to SIS, cross-cutting and emerging themes of SIS. Moreover, the role of SIS in evaluative practices of research programmes and institutions are elaborated.

It should be noted that this section is concerned with mapping research activities which are **not fully EU funded**. The subsections are concerned with national as well as international research efforts, but not activities funded solely under the European framework programs. Such research activities are already well-documented elsewhere.

3.1 Research on Science in Society

3.1.1 Research projects

In 2009 the funding agency ANR opened a program called « Science, technology and knowledge in society. Current issues, historical issues.» ("Sciences,

technologies et savoirs en sociétés. Enjeux actuels, questions historiques"⁷). The programme only ran one year. This was the only major SiS call in recent years. We list below all the 20 funded projects to illustrate the type of research being carried out.

Name of project	Local, national or cross-country	Institutions participating	Budget and funding source	Field of study
BENCHMARK : Governance by numbers and change in democratic state		Coord: GSPM (EHESS-CNRS)	162 000€ ANR	Sociology
BIOFAMILLE : Impact of biomedical practices on family	National	Coord: Univ.Rennes	ANR	Law
DPN-Hp : Prenatal diagnosis and handicap prevention/ science and public action http://www.cermes3.cnrs.fr/spip.php?article84	Brésil, FranceNet herlands UK	CNRS, Inserm EHESS, Univ. Rouen Coord. Cer- mes (EHESS-CNRS)	ANR	sociology, history, anthropology, philosophy
EURÉQUA : Quantifying Europe, the harmonisation of socio-economic nomenclatures http://www.msh.univ-nantes.fr/14992188/0/fiche_article/	Europe	ENS –EHESS - CNRS, Univ. Versailles Saint Quentin MSH Nantes (coord.)	ANR	science politique, sociologie, démographie, économie
EXPEBIODIV : On contemporary nature study expeditions		Coord. INRA	ANR	Anthropology, Sociology
GEOSCIENCE : the local, national and world-scale activities of academic science institutions www.lisst.univ-tlse2.fr/anr_geoscience/anr_geo.htm	International	Univ Toulouse Mirail, Univ Grenoble CNRS, EHESS IRD	ANR	Sociology, economy, history, geography
ICCM: Circulation of S&T knowledge in China (XVI- XX c.)		Coord REHSEIS (CNRS, Univ. Paris 7)	ANR	History of science
IMPROTECH : Technology and improvised music, ehess.modelisationsavoirs.fr/improtech/R01-IMPROTECH1jul10.pdf		EHESS	ANR	Mathematics
MeDIan : Mediterranean societies and the Indian ocean : origine of representations, cultural interactions and formation of knowledge http://cartogallica.hypotheses.org/216		Univ Reims (coord), Univ Paris 1, CNRS BNF	ANR	History, cartography
PAN-Bioptique : emerging biodiversity institutions : inventorying and counting nature https://pan-bioptique.cemagref.fr/		Cemagref (coord), IRA, CNRS	ANR	Sociology, Political science
PARTHAGE : Democratic participation and		Coord. Univ. Lille 2	ANR	Political sci-

⁷ <http://www.agence-nationale-recherche.fr/programmes-de-recherche/projets-selectionnees/sciences-technologies-et-savoirs-en-societes-enjeux-actuels-questions-historiques-2009/>

cooperative research on Environnement http://www.participation-et-democratie.fr/fr/node/124		CNRS		ence
PHARMASUD : Local knowledge, markets and globalisation : pharmaceutical innovation in the South http://www.cermes3.fr/spip.php?article85	India, Brasil	Cermes (CNRS, EHESS Univ. Paris Descartes)	ANR	Sociology
PNEUMA : theories of space, pneumatology et physico-theology in Newton's times http://www.jaffro.net/PNEUMA_resume.html	National	Univ Paris 1	ANR	History, philosophy
PREST-ENCE : From prestige to excellence: the making of academic quality http://www.prestence.org/	France Switzerland, Italy, USA	Univ. Paris Est (coord.) CNRS, Univ.Méditerranée, Ecole Fr. de Rome)	ANR + Swiss and Italian support	Sociology
PROFUTUR : Knowledge and anticipation of the future - Europe, 18-19th C. http://www.hstl.crhst.cnrs.fr/research/anr/profutur/?page_id=20	Europe	Coord. CRH (EHESS CNRS)	ANR	History
PROPICE : Intellectual Property : Commons and Exclusivity	National	CRDST (Univ. Paris 1, CNRS, coord.) NSERM IRD Univ.Méditerranée	ANR	Law
SCHUSOCRU : The building of social sciences in Russia: 18th C. - 1920 http://www.msha.fr/cercs/	Russia	Coord : Univ Bordeaux 3	ANR	Philosophy
SCIENCEPEINE : Science, knowledge and policy of et politiques de l'exécution des peines in France (1911-2011) http://www.criminocorpus.cnrs.fr/article624.html	National	Centre A. Koyré (EHESS, CNRS, coord), Univ. Rouen, Sciences Po, Univ. Versailles St. Quentin, Min. Justice	ANR	history, sociology
TRAVCHER : Producing knowledge : portrait of the scientist as a salaried worker http://www.idhe.cnrs.fr/spip.php?article103	National	Coord : IDHE (CNRS, Univ. Paris 1, 8, 10)	ANR	Economy
VSN-RAP : The "social life" of neurosciences : the rôle of patient groups http://www.cermes3.cnrs.fr/spip.php?article79		Coord CERMES (CNRS, Inserm, EHESS, Univ. Paris Descartes)	ANR	Sociology

3.1.2 Trends in research

A number of research laboratories work on Science and Society questions but they tend to be rather dispersed. Nevertheless, research laboratories in the field are building links, which begin to overcome their traditional dispersion. Two examples of clusters of such laboratories that have appeared recently are:

- CLUSTER 14 ERSTU (Stakes and Representations of science, technology and their uses in society, Enjeux et Représentations de la Science, de la Technologie et de leurs Usages dans la société, <http://erstu.ens-lyon.fr/>) in the Rhone-Alps region around Lyon and Grenoble. It groups research teams working on six themes including science communication, representations of science, science Policy, science education.
- The French Institute for Research, Innovation and Society (Institut Francilien Recherche Innovation et Société, IFRIS, <http://www.ifris.org/>) was established in April 2007 and it brings together over 120 researchers working in the field of Science, Technology and Society in and around Paris. IFRIS members cover a wide range of disciplines in humanities and social sciences (sociology, management, history, economics and political science).

Among emerging research topics are public participation and scientists' views on communication. Environmental topics are very present and health topics are at present receiving a lot of support, these themes being among the national priorities (see section 1.2).

3.2 Main stream research embedding Science in Society issues

3.2.1 Trends and good examples

The decree that organized the National research agency (ANR) stipulates that it should select the project it funds “on criteria of scientific and technical quality, taking into account their social, economic and cultural objectives”⁸. ANR systematically includes a chapter concerning the stakes for society in the presentation of each of its research programmes. What is less clear is how these points are integrated into the selection process, few social scientists being present on the more technical programme committees.

3.3 Funding for research on Science in Society

There is very little funding focussed on SiS topics. A specific call was run for one year only in 2009 by the National Research Agency (ANR) (see section 3.1.1) and CNRS has a small funding programme. SiS research can also be funded under the non-thematic ANR calls or it can be funded by Health, Environment or other ministries or agencies. A number of these are risk-oriented.

⁸ Décret n 2006-963 du 1 août 2006 portant organisation et fonctionnement de l'Agence nationale de la recherche

Name of program	Primary funding agency	Total budget in € per year	Total amount in € applied for per year	Average no. of applicants per year	Average no. of successful applicants per year
Science, technology and knowledge in society. Current issues, historical issues. http://www.agence-nationale-recherche.fr/programmes-de-recherche/projets-selectionnes/sciences-technologies-et-savoirs-en-societes-enjeux-actuels-questions-historiques-2009/	ANR	Recommended budget range for projects 20 000-200 000 €			20 Only ran one year (2009)
CNRS Institute for Communication Sciences (www.iscc.cnrs.fr) Includes SiS issues (expertise and controversy in 2009)	CNRS	Very low recommended budget: 5 000-10 000 €		20 in 2009	12 in 2009
Consultation, decision and environment (Concertation, décision, environnement), www.concertation-environnement.fr/index.php?option=com_content&task=view&id=87&Itemid=47 On the governance of environmental issues.	Ministry of Ecology	918 339 € TTC in 2009	918 339 € TTC in 2009	30 in 2009	10 in 2009
REPERE Program (Réseau d'échanges et de projets sur le pilotage de la recherche et de l'expertise, Network for exchange and projects on guidance of research and expertise), http://www.programme-repere.fr/ Funds research projects carried out by researchers and civil society	Ministry of Ecology				8 in 2010
Partenariats Institutions Citoyens pour la Recherche et l'Innovation (PICRI, Institutions' and citizens' partnerships for research and innovation), http://www.iledefrance.fr/recherche-innovation/dialogue-science-societe/partenariats-institutions-citoyens-picri/	Ile de France Region (around Paris)	Maximum budget 50.000€ pa.			

3.4 Importance of Science in Society issues as evaluative elements for national research programmes and academic institutions

The national evaluation agency AERES (<http://www.aeres-evaluation.com/>) evaluates academic institutions on all their missions, one of which is "diffusion of scientific and technical culture and information" according to the new university law (LRU, see section 1.2). This in itself is not a particularly participatory vision of science and society relation.

AERES's 2010 guide for the evaluation of universities includes two objectives entitled "Relations with local authorities" and "Relations with socioeconomic environments". The latter includes two points "Place of socioeconomic environments in the institution's bodies" and "Place of professionals in research and training activities". Communication activities are described as "Affirmation of the institution's identity through a communication policy" with the objective "Develop a sense of belonging". No real focus is put on SiS activities.

4 Activities related to Science in Society

This section relates to SIS as a field encompassing a variety of different activities particularly concerned with public communication of science and technology in France. The issues addressed are formats for science communication and the actors involved in science communication as well as trends at the national level.

4.1 National science communication trends

In France, science communication takes many forms : magazines, television channels, websites, museums and science centers, festivals, science cafés, etc.

Television has always been fairly weak in the field, radio being relatively more present. France has an extensive range of science magazines, from nearly professional to very popular ones. It also has a dense network of smaller museums and science centres. Festivals and cafés attract quite a numerous public. However, reaching a less educated and less enthusiastic public always remains a problem.

4.1.1 Good practises

A number of activities can be considered good practice, perhaps the first among them being the Fête de la science (science week or festival) that originated in France (<http://www.fetedelascience.fr/>).

Another example is the organisation of an exceptional occasion to visit museums when they remain open overnight (Nuit des musées⁹). Another special occasion is Heritage Days when exceptional sites, including places such as observatories, are accessible (Journées du patrimoine¹⁰).

A dense network of science centres, as well as of small museums allows for science communication on a local level (<http://www.ccasti.fr/>).

The Institute for advanced studies in science and technology (Institut des hautes études pour la science et la technologie, IHEST, <http://www.ihest.fr/l-institut/presentation/presentation-of-the-institute>) focuses on the training of de-

⁹ <http://nuitdesmusees.culture.fr/index.php?l=FRA>

¹⁰ <http://www.journeesdupatrimoine.culture.fr/node/133>

cision-makers in science and technology issues and organises public debate on SiS issues.

4.2 Science journalism and training activities

The French Association of Scientific Journalists (L'Association des journalistes scientifiques de la presse d'information, AJSPI : <http://www.ajspi.com/>) includes science journalists working with all types of media: newspapers, radio, television, Internet. Their website lists university training programs in the speciality¹¹.

A number of universities run courses on science communication and/or science journalism:

The University of Paris 7 (Paris Diderot) proposes a Master in Cinema, documentary and media (Cinéma, documentaire, médias) with a speciality in scientific journalism

(<http://www.univ-paris-diderot.fr/sc/site.php?bc=formations&np=SPECIALITE?NS=854>)

The School of journalism and communication of the University Aix-Marseille II runs a Master course called "Media, health and communication"

http://www.ejcm.univmed.fr/index.php?option=com_content&view=article&id=70:media-sante-et-communication&catid=40:pro&Itemid=2

The Advanced School in Journalism of University Lille I runs a Master called "Journalist and scientist"¹².

University Louis-Pasteur in Strasbourg proposes a Science Master, speciality "Science Communication", <http://master-cs.u-strasbg.fr/>.

University Nancy 2 has a Communication Science Master course specialized in Scientific and technical information and economic intelligence, <http://formations.univ-nancy2.fr/ALED/PGMNC2-PROG16194>.

Universities Bordeaux I and III propose a Master in "Science mediation"¹³.

University Stendhal in Grenoble runs a Master course in "Scientific and technical communication"¹⁴.

¹¹ <http://www.ajspi.com/index.php?ID=18>

¹² <http://www.esj-lille.fr/spip.php?rubrique104>

¹³ <http://www.u->

[bor-](http://www.u-)

[deaux3.fr/fr/formations/offre_de_formation/master/information_et_communication/master_professionnel_mediations_des_sciences.html](http://www.u-bordeaux3.fr/fr/formations/offre_de_formation/master/information_et_communication/master_professionnel_mediations_des_sciences.html)

¹⁴ http://www.u-grenoble3.fr/MTPCOST/0/fiche_02_formation/

4.3 Young people and science education in schools

4.3.1 Skills and interest

ASTEP (Acompanymnt in S&T at primary school, Accompagnement en Sciences et Technologies à l'Ecole Primaire¹⁵) is a government program for scientific education in the primary school, with the help of scientists and students. The program aims to connect the school with the world of scientists, to make accessible science to a young public, to develop scientific disciplines and create vocations, to encourage experimentation and acquire new knowledge. It proposed activities may involve several areas (astronomy, biology, ecology, energy, mechanics) and organizes training for teachers who want to acquire teaching skills in science.

An educational program of Canadian origin, "La main à la pate" provides assistance in the field of science and technology for nursery and elementary school. The program was launched in 1996. The aim was to teach science and technology in primary school by an approach based on a experimental investigation. (<http://www.lamap.fr/>)

An NGO called "Les petits débrouillards" promotes activities and organize events to increase young people's awareness of science and technology. The members of the association develop and disseminate educational material for scientific education and information. Each year the association organises the "Festival of explorers" (Festival des explorateurs) an event that provides activities, workshops, performances, exhibitions around one or several themes. Another initiative launched by the association is the project "Wikidébrouillard", a website to share scientific experiments. The web site contains a collection of nearly 400 experiments, some illustrated by videos. (www.lespetitsdebrouillards.org/)

Another actor in scientific education is "Planète sciences". Since 1962, "Planète sciences" and its delegations offer to young people scientific and technical activities for a spare and school time, with the support of major scientific and industrial organizations. "Planète sciences" stimulates and organizes scientific events in France and abroad, prepares leaders and teachers in scientific activities, contributes to the training of young people, promotes exchanges between them and the research and industrial community.

Cirasti organises Exposciences

http://www.cirasti.org/article.php3?id_article=113, and Sciences buissonnières (http://www.cirasti.org/article.php3?id_article=114)

4.3.2 Societal issues and critical reflection

Most of these approaches articulate scientific learning and citizenship education.

¹⁵ <http://www.education.gouv.fr/cid52100/mene1000474c.html>

4.4 Communication activities

Means	Much less	Less	Same	More	Much more
Science TV programmes			X		
Radio				X	
Newspapers		X			
Magazines			X		
Large scale festivals				X	
Web-based communication					X
Museums, exhibitions			X		
Citizen or CSO initiatives				X	

4.4.1 TV programmes

Programme title	Frequency	Duration (in minutes)	Target audience	Themes covered
"ADN Accélérateur de neurones" (DNA Neuron accelerator) on France2, http://programmes.france2.fr/adn/index.php?page=article&numsite=4214&id_article=12425&id_rubrique=4217	Weekly	50 min	General public	Science and technology
"C'est pas sorcier" (it's not difficult/sorcery) on France 3, http://c-est-pas-sorcier.france3.fr/	Weekly	26 min	Young people	Science, nature
"E=m6" on M6, http://www.m6.fr/emission-e_m6/	Weekly	26 min	General public	Science, history, geography
"Magazine de la santé" on France 5 (Health Magazine), http://www.france5.fr/magazinesante/	Daily	50 min	General public	Medicine
"360° GEO" on Arte, http://www.arte.tv/fr/Comprendre-le-monde/360_C2_B0--GEO/103048,CmC=103238.html	Weekly	50 min	General public	Scientific expeditions
"Extinctions" on France 5, http://documentaires.france5.fr/series/extinctions	Weekly	50 min	General public	Animals

4.4.2 Radio programmes

Programme title	Frequency	Duration (in minutes)	Target audience	Themes covered
"CO2 mon amour" (CO2 my love) on France Inter, http://sites.radiofrance.fr/franceinter/em/co2monamour/	Weekly	55 min	General public	Environment
"La tête au carré" (a pun between squaring a number and battering someone's head) on France Inter, http://sites.radiofrance.fr/franceinter/em/late-teaucarre/	Weekly	55 min	General public	Science
"Vivre avec les bêtes" (Living with animals) on France Inter, http://sites.radiofrance.fr/franceinter/em/vivre-avec-les-betes/	Weekly	60 min	General public	Animals
"Continent sciences" on France Culture, http://www.franceculture.com/emission-continent-sciences.html-0	Weekly	60 min	General public	Science
"La marche des sciences" (the march of science) on France Culture, http://www.franceculture.com/emission-la-marche-des-sciences.html-0	Weekly	60 min	General public	Science
"Science Publique" (Public science) on France Culture, http://www.franceculture.com/emission-science-publique.html-0	Weekly	60 min	General public	Science
"Les Savanturiers" (an invented name, a cross between scientist and adventurer) on France Inter, http://sites.radiofrance.fr/franceinter/em/savanturiers/	Weekly	25 min	General public	Science

4.4.3 Popular science articles in newspapers and magazines

Newspaper science sections:

Title of newspaper	Frequency of science section	No. of print runs	Target audience	Themes covered
Le Monde www.lemonde.fr	Daily	400.000	General public	Science, medicine environment
Figaro www.lefigaro.fr	Daily	400.000	General public	Science
Libération www.liberation.fr	Daily	160.000	General public	Science and environment

Popular science magazines:

Title	Frequency	No. of print runs	Target audience	Themes covered
La Recherche (Research) http://www.larecherche.fr/	Monthly	73.000	General public	All sciences
Pour la Science (French edition of Scientific American) http://www.pourlascience.com/	Monthly	62.000	General public	All sciences
Science et Vie (Science and life) http://www.science-et-vie.com/	Monthly	400.000	General public	All sciences
Science et Vie Junior http://www.labosvj.fr/	Monthly	200.000	Young people	All sciences
Science et Avenir (Science and future) http://www.sciencesetavenir.fr/	Monthly	320.000	General public	All sciences
Ça m'intéresse (That's interesting), http://www.caminteresse.fr/	Monthly	350.000	General public	All sciences, general culture
Sciences humaines (Human sciences) http://www.scienceshumaines.com/	Monthly	70.000	General public	Social sciences and Humanities
Ciel et Espace (Sky and space) http://www.cieletespace.fr/	Monthly		General public	Astronomy

There are also a number of more specialised magazines on astronomy, archaeology, etc. Compared to other European countries, France has a lot of science magazines.

4.4.4 Festivals, science weeks, etc.

Activity title	Activity type	Organiser	Frequency	Number of participants	Venue	Short description
Fête de la science, http://www.fetedelascience.education.gouv.fr/	Science festival	Ministry of Research and higher education, CCSTI, associations, local communities	Annual	1.000.000	National	Exhibitions, workshops, visits to laboratories, natural and industrial sites, conferences, discussion, movies.
Nuit des chercheurs (Scientists' night), http://www.nuitdesch	Science festival	Scientipôle Savoirs et	Annual	200.000 (over	National /Europea	Researchers' night, launched in 2005 by the

ercheurs-france.eu/contact/		Société		Europe)	n	European Commission. Various institutions participate. Not yet a major event.
Semaine du développement durable (Sustainable development week), http://www.semainedudeveloppementdurable.gouv.fr/	Event related to environmental issues	Ministry of Ecology and ADEME (agency for the environment and the controlled use of energy)	Annual	4.300 participants in the call for projects	National	Events organised to promote sustainable development, present in the media, etc.
Parisciences, http://www.science-television.com/pariscience/accueil.php	Scientific movies	Association science & television	Annual	7.300	Paris	Scientific movies and debates
Cinemascience, http://www.cnrs.fr/cinemascience/	Scientific movies	CNRS	Annual	6.000	Bordeaux	Scientific movies and debates
Journée du patrimoine, http://www.journeesdupatrimoine.culture.fr/	Heritage day	Ministry of culture and communication	Annual	11.000.000	National	Free visits to museums, archaeological sites, ...

A number of other local science festivals are organized in Paris, Marseille, Rennes, Chamonix, ...

4.4.5 National portals, blogs

Activity title	Activity type	Number of users	Themes covered	Short description
http://www.sciences-et-democratie.net/	Web portal		Science and technology	SiS debates
http://www.savoirs.essonne.fr	Web portal		Science and technology	Popular science for young peoples
http://www.futura-sciences.com/	Web portal		Science and technology	Web magazine of popular science
http://www.lemonde.fr/planete/	Web portal		Science technology, environment	Science news managed by newspaper "Le Monde"

http://www.lefigaro.fr/sciences/	Web portal		Science and technology	Science news managed by newspaper "Le Figaro"
http://www.pourlascience.fr/	Web portal		Popular science	Web site of magazine "Pour la science"
http://nouvellestechnos.science-et-vie.com	Web portal		Technology	Web site of magazine « Science et vie » dedicated to technology
http://www.cite-sciences.fr/fr/cite-des-sciences/	Web portal		Popular science	Web site of "Universcience", institution located in Paris that assembles the "City of Sciences" and the "Palace of Discovery"
http://agora.hypotheses.org	Web portal		Popular science	Web sites of sociales sciences
http://interstices.info/jcms/jalios_5127/accueil	Web portal		Informatics	Site web dedicated to informatics and its applications
http://www.science.gouv.fr/index.php	Web portal		All sciences	Web site of government for diffusion of popular science
Science au carré (square science), http://sciences.blogs.liberation.fr/home/	Blog		Science and technology	Debates to SiS issues and policies by Sylvestre Huet, journalist in newspaper "Libération"
En quête de sciences (In the quest of science), http://sciences.blog.lemonde.fr	Blog		Science and technology	Blog by journalist of newspaper "Le Monde" (Jonathan Parienté with Benjamin G.)
La science au XXI siècle (21 st century science), http://science21.blogs.courrierinternational.com/	Blog		Science and technology	Collective blog by journalists of newspaper "Courrier International"
C@fé des sciences, http://www.cafe-sciences.org/	Blog		Science and technology	Collective blog on science

4.4.6 Science museums and centres

Activity title	Activity type	Number of visitors/year	Themes covered	Venue	Short description
Cité des Sciences and Palais de la découverte (City of Science and the Palace of discovery),	Science center	CSI, 3.000.000	Science and technology	Paris	Two very different science museums recently administra-

http://www.cite-sciences.fr/fr/cite-des-sciences/ and http://www.palais-decouverte.fr/index.php?id=309		Palais 550 000			tively joined
Museum National d'Histoire Naturelle (National natural history museum), http://www.mnhn.fr/museum/office/transverse/transverse/accueil.xsp?cl=en	Museum	1.900.000	Botanic, palaeontology, geology, zoology	Paris	Natural history
Musée des Arts et Metiers (Museum of arts and crafts), http://www.arts-et-metiers.net/?lang=ang	Museum	250.000	Energy, mechanics, scientific instruments, construction	Paris	Historical of technology
Musée du Quai Branly, http://www.quaibranly.fr/accueil/?L=2	Museum	1.300.000	Art, techniques, ethnography	Paris	Ethnography
Nausicaa, http://www.nausicaa.co.uk/	Acquarium and Science centre	600.000	Marine sciences	Bologne sur Mer	Aquariums, underwater explorations, exhibitions, etc. about the sea.
Cité de l'espace (City of space), http://www.cite-espace.com/en#accueil	Science centre	270.000	Space technology	Toulouse	Space
Memorial de Caen (Caen-Normandy Memorial), http://www.memorial-caen.fr/portailgb/	Museum	400.000	History	Caen	World Wars
http://lareunion.crihan.fr/	Network of local science centers	2 000 000	Regional science centers	In most main cities	

4.4.7 Citizen- or Civil society organisations initiatives

Activity title	Activity type	Frequency	Number of participants	Short description
Forums « Sciences et Défis du XXIème Siècle »	Debates on SiS issues	Annual		Forum located in the south of France

« Forum science, recherche et société »	Debates on science and technology	Annual		Forum located in Paris on science and technology (Health, environment, energy, internet) for non specialist public
"Les sciences en bobines"	Debates on SiS issues	Annual		Debates on citizenship and science
« Boutique des Sciences » (Ecole normale supérieure de Cachan)	Citizen involvement in scientific research			Sciences shops (FP7 supported)

5 The Fukushima accident

5.1 Media coverage and public debate

Without a doubt, the Fukushima accident was widely covered in all countries. Among the **immediate risks**, fusion of the core of the reactors and spreading of radioactivity were very present, menacing the surrounding environment, the sea in particular, and extending to neighboring countries.

Media highlighted **health risks** due to a massive destruction of cells, particularly bone marrow, the intestinal mucosa, and the basal cells of the skin. Health risks specially affected professionals (firemen, soldiers and “liquidators”) exposed to very high doses of radiations but also the whole Japanese population, predictions being made of numbers of victims dying from acute radiation or by cancers in the future. The impact of radioactive iodine was discussed.

Risk of contamination of the **food** chain was very present in the media, particularly via the marine environment, and was presented as increasing the risk of food shortages in Japan where people consume 70 to 80 kg of fish per year. Media reported on the abnormal levels of radioactivity in food in areas near the nuclear plant but also on the risk of importing contaminated products from Japan.

Concerning **environmental risk**, media expressed much concern for the spread of contaminants in the atmosphere and ocean. The evolution of the radioactive cloud was followed on maps and the danger of air contamination in other countries was discussed. Media also presented other industrial disasters linked to the earthquake such as the fire that affected an oil refinery.

Economic risks due to the heavy impact of the earthquake on production activities were also discussed, particularly in upper-market media. According to “Le Monde” the Japanese nuclear industry, which provides between 25% and 30% of national electricity production, was meeting the most serious crisis in its history. Electricity production was sharply reduced, the Minister of Industry calling on companies to reduce their consumption. The impact on the car industry and on the computing industry was much discussed.

A consequence of the Japanese nuclear accident was the emergence of a wide debate about the legitimacy of the nuclear industry which produces about 75% of the electricity in France. So far, it has not been followed by fundamental changes in energy policy.

A lot of emphasis was put on the strict control said to be provided by the Nuclear Safety Authority and its communiquees on the Japanese situation were very often reported by the media. The need for nuclear energy for reasons of independence and the reduction in CO₂ production with the positive impact that it has on climate change were also put forward as arguments in favour of nuclear energy.

Nevertheless, the safety of French nuclear facilities has been in debate, media emphasizing the unpredictability of Nature and the need for wide safety margins. The Japanese nuclear complexes were theoretically built to withstand an earthquake with a magnitude of 7 but the 2011 one had a magnitude of 8.9. France has had severe earthquakes in the past and this was widely discussed in the media. The safety of the nuclear plants that France exports abroad was also in debate.

A wide public debate was called for by several media. The discussion has been ongoing in the media and was quite present in the Socialist Party primary elections that took place in October 2011. It will probably be central in the coming presidential elections in May 2012.

In summary, in the public arena in France, industrial responsibility (specially that of Tokyo Electric Power Company) and the shortcomings of technical rationality were in the fore. The question of energy choices was clearly framed as political. Fundamental science was more or less absent from the debate but the question of independent expertise and control was very present.

5.2 Levels and modes of public involvement

No official public debate has been organized on the topic. (One was run in 2005 on a reactor now under construction: <http://cpdp.debatpublic.fr/cdpd-epr/debat/centrale-nucleaire.html>).

However, nuclear energy has been present in the general political debate in preparation for next year's presidential elections. The Socialist primary election in October 2011 was won by the candidate that proposed a slower, perhaps only partial, reduction of the proportion of nuclear energy among France's energy sources. (This was of course not the only issue at stake but it shows that promising to drop nuclear energy was not necessary to win.) The question will probably remain very present in the coming election campaign.

Smaller scale events were organized, often by NGO's involved in the network "Sortir du nucléaire" (Get out of nuclear energy – for example <http://groupes.sortirdunucleaire.org/Debat-public-sortir-du-nucleaire>) or by the ecological political parties.

Opinion polls were often reported on by the media. Apparently contradictory results by polls run for the electricity company and for the Green party were widely discussed.

5.3 Political responses and scientific advice

In France, the main governmental response to the Fukushima accident was a complete audit. The Nuclear Safety Authority (ASN, Autorité de sûreté nucléaire), the administrative authority responsible for monitoring the civil nuclear activities, has promised a short-term analysis of nuclear power plants in five areas: resistance to earthquakes, flood resistance, total loss of electricity, loss of cooling system and accident management. The audits are to be carried out by the companies running the reactors themselves, under the control of ASN. The fact that an outside evaluation is not being made was criticized.

Schematically, the present political majority (right wing) is for nuclear energy, the Greens are strongly against and the Socialist Party, predicted to win the next elections, is somewhat hesitant, proposing a reduction in the proportion of nuclear energy. At present, it provides three quarters of France's electricity.

Non governmental scientific advice is provided by the NGO CiiRAD (<http://www.criirad.org/>). It provides information (including a dossier on Fukushima in English and Japanese http://www.criirad.org/actualites/dossier2011/japon_bis/en_anglais/english.html) but also carries out analyses of potentially contaminated samples (including in Japan) and sells radiometers.

Pro nuclear information usually comes from the very powerful industrial actors in the field, such as EDF (<http://www.edfenergy.com/>) or AREVA (<http://www.areva.com/scripts/home/publigen/content/templates/Show.asp?FORCE=Y&L=EN&P=57>).