

WORK PROGRAMME 2016

GENERIC CALL FOR PROPOSALS

IMPORTANT DATES

(See detailed preliminary calendar in section §B.1)

STAGE 1

**CLOSURE OF PRE-PROPOSAL
SUBMISSION (PRC, PRCE, JCJC) AND
REGISTRATION (PRCI) PHASE**

13 October 2015 at 1 p.m. (Paris time)

**STAGE 2: CLOSURE OF
FULL PROPOSAL SUBMISSION PHASE**

The date of closure for the full proposal submission phase is set for early April 2016; this date will be specified upon invitation to submit full proposals (second call stage).

CONTACTS

ANR will not provide any information beyond that found in the call for proposals page's FAQ and information obtained through the following e-mail address: aap.generique@anr.fr

Applicants are advised to carefully read the entire document as well as regulations pertaining to the conditions of allocation of ANR funding (<http://www.anr.fr/RE>) before submitting a research project proposal.

Web Address:

<http://www.agence-nationale-recherche.fr/en/funding-opportunities/current-calls/generic-call-for-proposals-2016-2016/>

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A Objectives of the Generic Call for Proposals

The Generic Call for Proposals is the largest of any of the planned calls for proposals in ANR's Work Programme 2016¹; it encompasses both basic and applied research.

A.1 SOCIETAL CHALLENGES AND THE OTHER-KNOWLEDGE CHALLENGE

The 2016 Work Programme's Generic Call for Proposals lists nine of the ten societal challenges defined in the National Research Strategy (SNR), as well as the Other-knowledge challenge (see §E in this document):

- Societal challenge no. 1: Efficient resource management and adaptation to climate change
- Societal challenge no. 2: Clean, secure and efficient energy
- Societal challenge no. 3: Industrial renewal
- Societal challenge no. 4: Life, health and well-being
- Societal challenge no. 5: Food security and demographic challenges
- Societal challenge no. 6: Sustainable mobility and urban systems
- Societal challenge no. 7: Information and communication society
- Societal challenge no. 8: Innovative, inclusive and adaptive societies
- Societal challenge no. 9: Freedom and security of Europe, its citizens and its residents
- "Other-knowledge challenge"

A.2 FUNDING INSTRUMENTS

The Generic Call for Proposals is divided up into two instrument categories.

A.2.1 Collaborations

For these instruments, genuine collaboration is expected, meaning collaboration between at least two independent parties², aimed at sharing knowledge and technology, or achieving a common objective and based on a distribution of work implying joint definition of the collaborative project's scope, equal contribution and shared risks and findings. Research contracts and the providing of research services are not considered forms of collaboration. These principles may also apply to non-funded partners.

As a guide, the grants attributed to these projects (PRC, PRCE, PRCI) are in general between €100 and €800 k for periods of 24 to 48 months.

A.2.1.1 Collaborative Research Projects (PRC)

PRC are collaborative projects between at least two public research team partners³, designed to achieve results through the pooling of skills and resources. Economic partners⁴ are excluded from the PRC instrument. By facilitating collaboration, such grants expedite proposed research. The goal is to encourage academic or public sector research teams to work on projects for which collaboration provides added scientific value, either because it makes research possible, or because it paves the way for more ambitious or higher-quality results. Proposals for multidisciplinary research work are welcome in this instrument category. Projects entailing extremely advanced science may in exceptional cases be allowed to apply for a grant even if the project is only being proposed by a single team.

¹ ANR's Work Programme 2016 lists every call to be launched by the agency in 2016 and can be found here: <http://www.agence-nationale-recherche.fr/en/funding-opportunities/work-programme-2016/>

² For collaborative research projects (PRC), independence is evaluated in terms of scientific governance.

³ A public research partner is: a public or assimilated partner whose main purpose is to carry out research, such as universities, French public scientific and technical research establishments (EPST), French cultural and professional public institutions (EPSCP), industrial or commercial public establishments (EPIC), and so on.

⁴ Economic partner: commercial company or assimilated structure, such as public limited companies, private limited companies, etc.

A.2.1.2 Collaborative Research Projects involving Enterprises (PRCE)

The PRCE funding instrument is designed to enhance collaboration between actors from academia and the business world. PRCE are jointly administered with at least one public research³ and one economic partner⁴. This instrument generates results benefiting both parties by developing their ability to innovate.

For PRCE, genuine collaboration between public research-based and economic partners is crucial.

A.2.1.3 International Collaborative Research Projects (PRCI)

The PRCI funding instrument aims to enhance international collaboration. ANR establishes agreements with foreign funding agencies in which each funding agency funds its respective "national teams"⁵. PRCI must include at least one French³ public research partner.

Each of these agreements stipulates the thematic areas for which PRCI projects are possible. This information can be found in agreements' annexes on each call's publication page.

Strong synergy is expected between PRCI project partners. Equitable scientific and financial contributions are expected from each respective country, and one scientific coordinator is to be named for each country.

The following is a tentative list of countries concerned by these agreements at the time of this call's publication:

- In Europe: Germany, Austria, Switzerland, and Luxembourg
- Internationally: Canada, Mexico, Brazil, Turkey, India, China, Singapore, Taiwan, Hong Kong, and Japan

The definitive list of agreements established by ANR for this call for proposals will be posted on the ANR website no later than 15 September 2015. All related annexes will also be made available by this date at the latest.

A.2.2 "Young Researchers" (JCJC)

The "Young researchers" (JCJC) instrument aims to empower young researchers within the public research partner institution³ employing them.

The objective of this funding instrument is to prepare the new generation of young research talent to become leaders and pioneers in French scientific research and expand the scientific influence of the laboratories hosting them. It aims to encourage young researchers to take on greater responsibilities and prompts them to tackle scientific or technological obstacles and adopt original approaches through:

- Independent exploration of a theme area expanding on the ANR-funded project; concepts already explored within their laboratory do not fall *a priori* in this framework;
- The assembly or consolidation of a preliminary team;
- The unleashing of innovative talent.

JCJC is also a springboard for young French researchers who, thanks to initial support from ANR, are given a leg up as they respond to calls from the European Research Council (ERC).

ANR does not finance projects partly or entirely funded by the European Union or other funders; one may not benefit from a JCJC grant concurrently with another grant of the same type, designed to encourage the formation and development of independent research teams led by young researchers, funded by the French Research ministry, ANR, research organisations (ATIP-avenir, etc.), the ERC (The European Research Council's starting grant), and so forth.

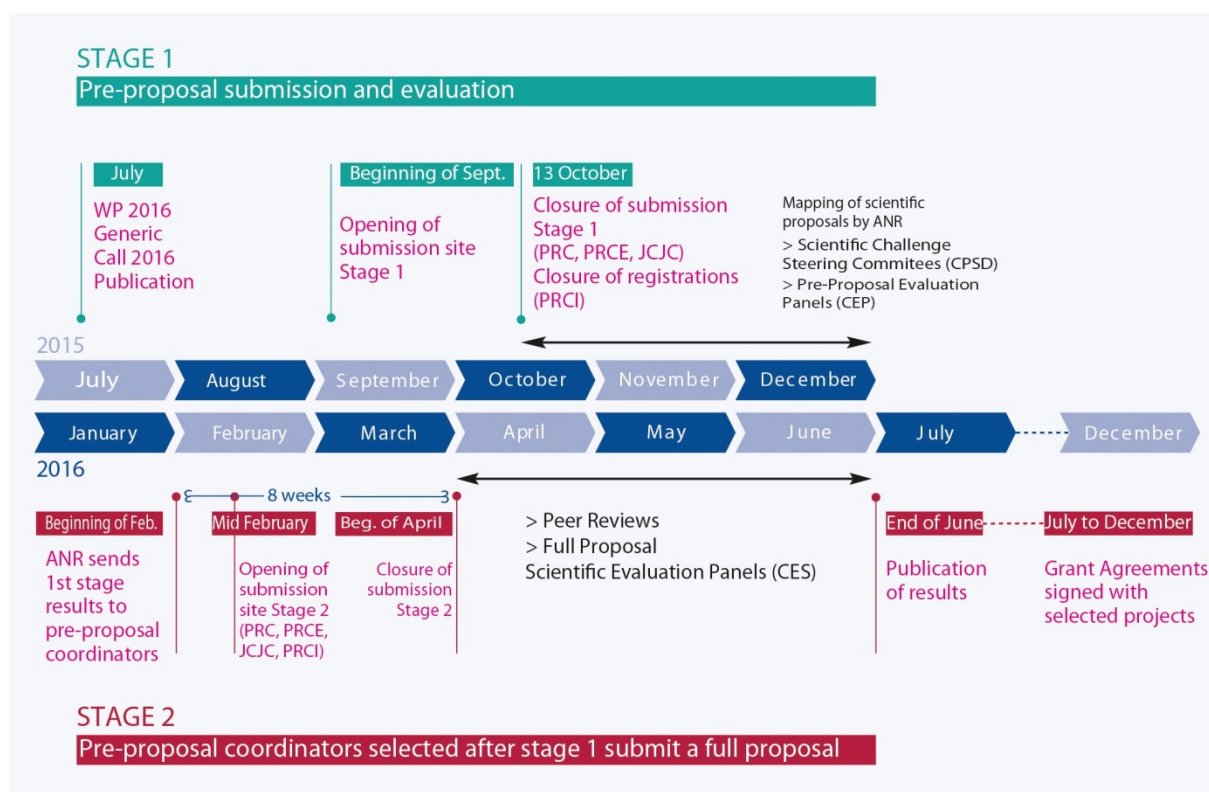
⁵ For the European Union, the "national teams" are partners with a branch or establishment in the State where the funding agency is headquartered

This instrument, intended for individuals, is not collaborative and provides for the funding of the young researcher's team alone (not possible to fund partners and collaborations). Funding is therefore directed to the young researcher's organisation of affiliation; said organisation is necessarily a public research partner. As a guide, the grants attributed to these JCJC projects are in general from €100 k and €300 k for periods of 24 to 48 months.

B Description of selection process stages

B.1 OVERVIEW AND PROVISIONAL CALENDAR

The selection process for projects submitted via the 2016 Generic Call for Proposals consists of the two stages described below.



Please note: Results achieved by PRCI projects are published later on since they depend on the calendars of ANR's foreign partner agencies.

B.1.1 General Cases

During the first stage of selection (excluding PRCI), the best pre-proposals (5 pages) are selected based on the pre-proposal evaluation criteria set out in §B.3. Upon completion of the first stage, the scientific coordinators of the best pre-proposals will be invited to submit a full proposal.

During the second stage of selection (PRCI included), the best full proposals are selected using the evaluation criteria for full proposals set out in §B.4.

B.1.2 Features specific to PRCI projects

Important: The PRCI instrument only applies to international projects for which a theme-specific collaboration agreement was established between ANR and a foreign funding agency. If the full proposal **does not fall within the scope of such an agreement**, the proposal must be submitted as a collaborative research project (PRC) or a

collaborative research project involving enterprises (PRCE). Please note that ANR does not fund foreign partners⁶.

The **country-specific annexes** set out **collaborative theme areas** and specific submission, eligibility, and selection procedures. The country-specific annexes can be downloaded on the ANR website's Generic Call page.

For certain international agreements, a Lead Agency agreement has been concluded with certain agencies. In such cases, the project is submitted to only one agency, the Lead Agency, responsible for peer review evaluation and project selection. Each agency then funds its country's teams according to its own conditions and procedures.

B.1.2.1 PRCI, of which ANR is the Lead Agency

For the PRCI projects in collaboration with **Luxembourg (FNR)** or **Brazil (FAPESP)**, ANR plays the role of Lead Agency. Consequently, these projects need only be submitted to ANR in the present Generic Call for Proposals, by opting for the "PRCI" instrument following the conditions described below. The foreign partners will nevertheless be required to provide certain administrative information to the foreign agency following the procedures described in the country-specific Annex found on the ANR website.

B.1.2.2 PRCI with foreign Lead Agency

For PRCI projects in collaboration with **Germany (DFG)**, **Austria (FWF)** or **Switzerland (SNF)**, these agencies play Lead Agency roles. Consequently, these projects must be submitted to the different agencies following their respective conditions. Registering with ANR is not mandatory. The scientific coordinator and other partners of the French component must provide certain administrative information to ANR, following the procedures described in the country-specific annex found on the ANR website.

The proposal submitted must clearly indicate the French partners and identify their scientific coordinator(s).

The same scientific coordinator cannot coordinate several projects (all instruments together), including for PRCI projects in which a foreign agency is the Lead Agency.

B.1.2.3 Non-Lead Agency PRCI

For PRCI projects in collaboration with all the other countries with which ANR has agreements, projects must be simultaneously submitted to both agencies. ANR submission must be carried out within this Generic Call for Proposals through selection of the PRCI instrument in the conditions described below and the country-specific annex found on the call's online page.

B.1.2.4 Provisions common to all PRCI projects submitted to ANR

This paragraph applies to PRCI projects submitted to ANR, including "Non-Lead Agency PRCI" and "PRCI, of which ANR is the lead agency," above.

PRCI project selection is carried out over a single phase, corresponding to the second phase of the Generic Call for Proposals' other funding instruments, following the procedures described below.

However, due to time constraints imposed by international agreements, the French component's scientific coordinator must absolutely register their intention to submit a project via the ANR website following the conditions set out in §B.3.

⁶ For the European Union, "foreign partner" designates any partner without an establishment or branch in France.

B.2 ACTORS CALLED UPON BY ANR

The ANR-led project selection is based on the principle of peer review evaluation. This selection involves organising committees and calling in external peer reviewers

- The **Scientific Challenge Steering Committees (CPSD)** are made up of members appointed by ANR, including stand-out personalities from the scientific sphere and the business world, delegates from research Alliances, and institutional representatives (ministries, agencies). Committees propose pre-proposal selection thresholds to ANR based on the number of pre-proposals submitted and guidelines set out in the Work Programme. Committee members are also consulted on evaluation units' boundaries and balance as well as the scope of the Scientific Evaluation Panels (CES) (see B.3.5.2).
- **Scientific Evaluation Panels** are composed of highly qualified French or foreign persons from the research community concerned by the challenges chosen by ANR for their science expertise. The panels participate in the evaluation of pre-proposals during stage 1 and evaluate full proposals during stage 2.
- **Peer reviewers specialised in one or several of the fields covered by the project** draft written evaluations of one or several pre-proposals (or for the full proposals) and do not take part in panel meetings.

The provisions set out in ANR's Code of ethics⁷ apply to all persons and actors involved in project selection.

B.3 STAGE 1: PRE-PROPOSALS

B.3.1 Submission procedures for PRC, PRCE and JCJC pre-proposals

Pre-proposal must include:

- An online application form filled out with the information mentioned in Annex G.1.1.
- A descriptive document of the project following the model in annex G.1.2.

All of these documents must be submitted via the pre-proposal submission site (see link on the Generic Call for Proposals publication page) **by 13 October at 1 p.m.** (Paris local time).

B.3.2 Eligibility of pre-proposals (PRC, PRCE, JCJC)

The eligibility criteria below are cumulative.

ANR will only take into consideration information provided through the submission site before the closing date for submission. All information provided in this manner will be taken into consideration regardless of errors or discrepancies between said information and the project's descriptive document.

- **Completeness of pre-proposals**
Pre-proposals must be submitted via the submission site no later than 13 October 2015 at 1 p.m. (Paris local time), the closing date for pre-proposal submissions. No documents and materials will be accepted after this date. Complete pre-proposals must include:
 - A completely filled out online form (see G.1.1)
 - The project's descriptive document (must be under 5 pages) in the format specified in annex G.1.2.

⁷ <http://www.anr.fr/CharteDeontologieSelection>

- **ANR's thematic action areas**
Pre-proposals must fall under one of ANR's thematic action areas and not overlap with those of other funding agencies (particularly INCa, ANRS, et al)

- **Single scientific coordinator**
Scientific coordinators may not coordinate several registrations, pre-proposals, or full proposals at once (all instruments together, including for PRCI projects in which a foreign agency is the Lead Agency).

Multiple pre-proposals, full proposals and registrations submitted by a single scientific coordinator are ineligible.

ANR checks that coordinators are not involved in multiple projects using the scientific coordinator's identity as a private individual, for all of the instruments (PRC, PRCE, JCJC, PRCI). For PRCI with a foreign agency is Lead Agency, this condition is verified using information transmitted to ANR by the foreign agency in question.

- **Uniqueness of the pre-proposal**
A pre-proposal cannot entirely or partially resemble any other pre-proposal submitted or funded. Similar pre-proposals are ineligible.

Similarity is established when two pre-proposals (in their entirety or in part) set out the same main objectives OR are closely inspired by another AND involve mostly the same teams.

- **Composition of the consortium**
Consortium entities must correspond to those intended for the instrument chosen (see explanations and definitions in §A.2).

- **JCJC only**
The scientific coordinator must have earned his or her **research doctorate degree** (or any other degree or qualification equivalent to the international PhD) after 1 January 2005⁸.

Pre-proposals deemed ineligible will not be evaluated⁹.

B.3.3 Early registration procedures for PRCI proposals

The submission procedure for "international collaborative research projects" (PRCI) is a **single-stage process** with an **initial registration procedure**. Registration is mandatory. Registering signals applicants' intention to submit a proposal within the framework of the PRCI instrument defined in §B.1.2.1 and §B.1.2.3. Early registration applicants are therefore not required to submit pre-proposals.

These applicants will subsequently be asked to submit a full proposal concurrently with PRC, PRCE or JCJC instrument applicants selected during stage 1.

Registration includes:

- An online application form filled out with the information mentioned in annex G.1.1.

⁸ This limit may be deferred for the following reasons after completion of a PhD: maternity leave, parental leave, long-term sick leave (over 90 days), and national service. The limit is deferred by a duration corresponding to the event's actual length. It is deferred one year for every dependent child. It does not apply to mothers and fathers with more than 3 children or persons with recognised work handicaps. The deferral request and reasons justifying exceptional status must be clearly stated in the pre-proposal. Supporting documents must be provided at the time of the full proposal's submission.

⁹ Please keep in mind that this verification stage mostly focuses on pre-proposals' presentation. Presentation alone may be grounds for rejection of pre-proposals without evaluation of content by panel members.

French Scientific coordinators must register using the pre-proposal submission site (see link on the generic call for proposals publication page) no later than the 13 October 2015 at 1 p.m. (Paris local time).

B.3.4 Eligibility of registrations (PRCI)

The eligibility criteria below are cumulative.

➤ **Completeness of registrations**

Registration must be done via the submission site no later than the closing date for pre-proposal submissions: 13 October 2015 at 1 p.m. (Paris local time). No documents or materials will be accepted after this date.

Registration is over when the online form is completely filled out (see annex G.1.1).

➤ **ANR's thematic action areas**

- The registration must fall under one of ANR's thematic action areas and must not overlap with those of other funding agencies (particularly INCa, ANRS, et al).
- Registrations fall under the thematic area described in the country-specific annex established between ANR and the foreign agency.

➤ **Single scientific coordinator**

A single scientific coordinator cannot coordinate several whole registrations, pre-proposals or full proposals (all funding instruments together, including for PRCI projects in which a foreign agency is the Lead Agency.)

Multiple pre-proposals, full proposals and registrations submitted by a single scientific coordinator are ineligible.

ANR checks that coordinators are not involved in multiple projects using the scientific coordinator's identity as a private individual, for all of the instruments (PRC, PRCE, JCJC, PRCI). For PRCI for which a foreign agency is Lead Agency, this condition is verified using information transmitted to ANR by the foreign agency in question.

➤ **Composition of the consortium**

Consortium entities must correspond to those intended for the instrument chosen (see explanations and definitions in §A.2).

Registered projects deemed ineligible will not be invited to submit a full proposal.

B.3.5 Evaluation of pre-proposals

Pre-proposals are grouped into evaluation units based on data provided at the time of submission (theme, principal research topic, principal research application, keywords, etc.).

Only the information listed on the submission site at the submission closing date will be considered by ANR. The aim of the pre-proposal stage is to select the best applications using the below-listed evaluation criteria. Scientific coordinators will be invited to submit a full proposal on this basis.

ANR's goal is to obtain four evaluations for each pre-proposal. Evaluations are performed from the standpoint of the various challenges as well as the funding instrument opted for, using the nine criteria listed below.

B.3.5.1 Evaluation criteria

○ **Quality and originality of research proposed**

- Clarity of objectives and research hypotheses
- Innovative nature and potential for progress with relation to the state of the art
- Feasibility, particularly with regard to methods and management of scientific risks

- **Project organisation and resources implemented**
 - Skills, expertise, and involvement of the scientific coordinator
 - Quality and complementary nature of the consortium, quality of the collaboration for PRC and PRCE or quality, complementary nature and potential of the team for JCJC
 - Appropriate resources for objectives
- **Overall impact of the project**
 - The societal impact in terms of the project's capacity to address issues related to the challenge and the instrument
 - Scientific impact and strategy for disseminating results
 - Economic impact and valorisation strategy

Each of these evaluation criteria is rated on the scale from 1 to 5 below. Ratings are relative to the pre-proposal portfolios submitted to evaluators. Evaluators back up and explain their ratings with comments.

Rating	What it means
5	Excellent: pre-proposals scoring a 5 are very satisfactory, with only minor improvements possible.
4	Very good: pre-proposals scoring a 4 are satisfactory. A few improvements could be made.
3	Satisfactory: pre-proposals scoring a 3 are somewhat satisfactory, but there is room for improvement.
2	Could be better: pre-proposals scoring a 2 have serious shortcomings and could greatly benefit from improvements.
1	Incomplete: Could not evaluate because of qualitatively or quantitatively incomplete information.

B.3.5.2 Ranking

Pre-proposals are ranked in their evaluation unit in decreasing order based on the average rating assigned by the evaluators.

For each evaluation unit, a selection threshold is determined according to the number of pre-proposals received and the Work Programme's guidelines. Only pre-proposals above the threshold will be invited to turn in full proposals.

B.3.5.3 Results

Upon completion of the first stage, 1,800 to 2,300 scientific coordinators of pre-proposals will be invited to submit a full proposal.

ANR simultaneously announces the results of the first stage to all scientific coordinators. All applicants receive their pre-proposal evaluations.

B.4 STAGE 2: FULL PROPOSALS

B.4.1 Submission procedures for full proposals

Full proposals consist of:

- An online application form filled out with the information mentioned in annex G.2.1.
- A scientific document submitted via the submission site following the model of annex G.2.3,
- A financial and administrative document generated by the submission site upon completion of the online form (see annex G.2.2) signed by the legal representative of each partner applying for a grant.

All documents and materials must be submitted using the full proposal submission site by the date indicated in the invitation message sent by ANR to the scientific coordinator. This message contains a link to the submission site.

B.4.2 Eligibility of full proposals

The eligibility conditions of PRC, PRCE, and JCJC instrument pre-proposals defined in §B.3.2 and registrations for the PRCI defined in §B.3.4 apply. These conditions apply in addition to conditions below.

ANR will only take into consideration information provided through the submission site before the closing date for submission. All information provided in this manner will be taken into consideration regardless of errors or discrepancies between said information and the project's scientific document.

ANR will only take into consideration information provided through the submission site by the closing date for submission. Incorrect or irrelevant information in the project's scientific document will be disregarded.

- **Invitation to submit a full proposal**

Only the Scientific coordinators for pre-proposals selected after the first stage are called back to submit full proposals.

For PRCI, only scientific coordinators who registered eligible proposals early are invited to submit full proposals.

- **Completeness of proposals**

All documents and materials must be submitted to the full proposal submission site by the date indicated in the message sent by ANR to the scientific coordinator inviting them to submit a full proposal. No documents or materials will be accepted after this date. Complete full proposals must include:

- the online form filled out with the information mentioned in annex G.2.1,
- A scientific document to be submitted via the submission site following the model in annex G.2.3, including the 30 page limit mentioned,
- The financial and administrative document, as generated by the submission site (see annex G.2.2) signed by the legal representative of each partner applying for a grant and containing requested information.

- **Uniqueness of the full proposal**

A full proposal cannot entirely or partially resemble another full proposal submitted or funded. All similar full proposals are ineligible.

Multiple pre-proposals, full proposals and registrations submitted by a single scientific coordinator are ineligible.

Similarity is established when two full proposals share all or some of their main objectives OR are closely inspired by another AND involve mostly the same teams.

➤ **JCJC only**

If the scientific coordinator earned his or her **research doctorate degree** (or any other degree or qualification equivalent to the international PhD) before 1 January 2005, documents justifying deferral of the cut-off date (see §B.3.2) must be turned in with the signed administrative and financial document (see annex G.2.2). ANR shall determine the validity of justifying documents.

➤ **Compliance with the pre-proposal**

The full proposal must describe the same project as that presented in the pre-proposal. The funding instrument and the scientific coordinator must absolutely be the same as for the pre-proposal. The relevance of other discrepancies will be assessed. In case of a significant deviation, the proposal is ineligible and will not receive ANR funding.

Full proposals deemed ineligible will not be scientifically evaluated and will not receive ANR funding.

In the case of agreements established with ANR and other funding agencies (PRCI and French co-funding as indicated in **§D.3**), specific criteria unique to these agencies may apply. These will be elaborated upon in the cofunding-specific and country-specific annexes found on the call page.

B.4.3 Evaluation of full proposals

The thematic scope of the scientific evaluation panels and the distribution of full proposals among the different committees based on information available are defined by ANR pending consultation with the CPSD.

ANR's goal is to obtain two peer reviews for each full proposal. The peer reviewers do not take part in meetings held by the scientific evaluation panels; they operate individually and do not interact with panel members or project partners.

The only elements at their disposal are the materials in the pre-proposal and in the full proposal as submitted by the scientific coordinator by the closing date of the second submission stage. ANR will only take into consideration information provided through the submission site before the closing date for submission. All information provided in this manner will be taken into consideration regardless of errors or discrepancies between said information and the project's scientific document.

Full proposals are collectively evaluated by the scientific evaluation committee (CES) based on the peer reviews. An evaluation report is drawn up by the project's rapporteur within the panel.

B.4.3.1 Evaluation criteria

For all instruments (PRC, PRCE, PRCI, JCJC)

The following are the evaluation criteria for full proposals. The rating scale used is that indicated in §B.3.5.1.

- **Quality and originality of the research proposed**
 - Clarity of objectives and research hypotheses
 - Innovative nature and potential for progress with regard to the state of the art
 - Feasibility, particularly with regard to methods and management of scientific risks
- **Project organisation and resources implemented**
 - Skills, expertise, and involvement of the scientific coordinator
 - Quality and complementary nature of the consortium, quality of the collaboration for PRC and PRCE or quality, complementary nature and potential of the team for JCJC
 - Appropriate resources for objectives
- **Overall impact of the project**
 - The societal impact in terms of the project's capacity to address issues related to the challenge and the instrument
 - Scientific impact and strategy for disseminating results
 - Economic impact and valorisation strategy

For the PRCI instrument

Full proposals applying for grants through the "International collaborative research project" instrument are evaluated according to additional specific criteria indicated in the annexes found on ANR's Generic Call for Proposals page:

- **Balanced scientific and financial contributions from respective countries' partners**
- **Added value through European cooperation, benefits for France for cooperation outside Europe**

For the JCJC instrument

Full proposals applying for grants through "Young researchers" are evaluated according to a specific extra criterion:

- **Project gives scientific coordinator greater autonomy.**

B.4.3.2 Ranking

The Scientific Evaluation Committee establishes a ranking of proposals submitted by comparing and contrasting them. A final evaluation report summarises the scientific evaluation panel's consensus.

Based on CES rankings, ANR gathers all of the proposals from various themes and instruments together and develops a final per-challenge ranking within the budget allocated to the Generic Call for Proposals.

B.4.3.3 Results

The decision of whether or not to select is made by ANR based on the rankings established by the scientific evaluation panels and its budget capacity.

ANR posts the list of selected projects on its website.

ANR announces the results of the second stage to all of the scientific coordinators. They are provided with the CES evaluation report explaining the reasons their project was selected.

B.4.3.4 Funding of proposals selected

Those proposals selected will be funded by ANR, on the condition that a grant agreement is signed with each of the partners benefiting from a grant.

ANR's funding allocation procedures are set out in the "Funding regulations" (<http://www.anr.fr/RF>). Partners are advised to read this material carefully as they set up their project, especially provisions regarding budget needs.

It is stated that adjustments to the higher education service set out in paragraph 4.2.3.1 of the regulations concerning ANR's grant allocation procedures only constitute eligible expenditures for the "Young Researchers" funding instrument.

C Recommendations for setting up a project proposal

Information for establishments

The scientific leaders of each partner establishment in the full proposal are invited to inform the persons authorised to commit on behalf of their establishment as early as possible, so that they may submit the signed documents required for stage 2 by the full proposal phase's date of closure.

Involvement of the scientific coordinator

The scientific coordinator should dedicate at least 35% of his or her research time to the project.

Job precarity rate

The project's job security risk should be lower than 30%. This specific rate is calculated as follows, by using data expressed in months of work (person.month):

$$\text{Job precarity rate (\%)} = \frac{\text{non – permanent personnel funded by ANR}}{\text{total temporary and permanent personnels funded and not funded by ANR}}$$

Only establishment personnel for which funding is requested by ANR factor into the equation (foreign partners in particular are not counted). Doctoral students and interns are excluded from calculations (though they remain eligible for ANR funding)

D Specific tools

D.1 VERY LARGE RESEARCH INFRASTRUCTURES (TGIR)

Projects relying on resources from very large research infrastructures are asked to make this clear at the time they submit their pre-proposal. A strategy independent from ANR project submission must be undertaken to ensure that appropriate resources are obtained in cases where such resources predicate the proper functioning of the project. The full proposal may be used to demonstrate this need.

D.2 COMPETITIVENESS CLUSTERS

Projects seeking assistance in setting up their projects from competitiveness clusters must state this during the first stage of the selection process. The scientific coordinator must have the consent of other partners (including foreigners, when appropriate) in the pre-proposal. Project partners agree that the information in the pre-proposal be made available to competitiveness clusters that ask for it.

To this end, partners are encouraged to contact the concerned competitiveness clusters as early as possible and inquire on the commitments they make if support from clusters is approved (particularly membership in the cluster, transmission of projects' mid-term and final reports).

The competitiveness clusters will inform ANR of their decision on projects for which support has been requested. The clusters are to highlight how pre-proposals fit into their roadmap.

After the first stage, competitiveness clusters can choose whether or not to grant their label at the second stage's closing.

Information relating to support from the competitiveness clusters will be brought to the attention of the Scientific Challenge Steering Committee (CPSD) and Scientific Evaluation Panels (CES).

D.3 FRENCH CO-FUNDING (EXCL. PRCI)

ANR establishes partnerships with other funders (see paragraph A-3 in Work Programme 2016).

The projects selected in the Generic Call for Proposals may be co-funded by:

- The Ministry of Defence, the Defence Procurement Agency (DGA)
- The General Secretariat for Defence and National Security (SGDSN),
- The Ministry of Health (General Directorate for Care Provision, DGOS)
- The Ministry of Culture and Communication (MCC),
- The Ministry of Food, Agriculture, and Forests (MAAF's agro-economic plan),
- APIS-GENE,
- The National Solidarity Fund for Autonomy (CNSA),
- The Research Foundation for Aeronautics and Space (FRAE),
- The Muscular Dystrophy Canada (MDC).

The Generic Call for Proposal's list of co-funders will be updated on the ANR website's Generic Call for Proposals page.

Co-funding means that the grant attributed to the project associates a financial contribution from ANR and a co-funder partner showing interest for the research work in question.

Co-funding does not grant the co-funding organisation any property rights. For those projects selected, co-funding can be an additional opportunity to disseminate and highlight results (springboard to other funding opportunities, contact with users, etc.). This is why in certain cases, representatives from co-funder organisations are given access to specific information concerning projects by means of invitations to kick-off meetings, progress and closing reviews as well as mid-term and final project reports. When applicable, these particular obligations are mentioned in a co-funding-specific annex on the Call for Proposals page and in the grant agreements.

E Annex 1: Societal challenges and the Other-knowledge challenge

The societal challenges defined in the National Research Strategy - France Europe 2020 (SNR) are an integral part of ANR's Work Programme 2016, with the exception of the space sector, which comes under the purview of the CNES. These challenges are complemented by the Work Programme's "Other-Knowledge" challenge, designed for funding projects which do not fall directly within societal challenges' defined scope.

Scientific and technological scopes and the theme-based structure were defined in a collective, concerted manner with input from the National Research Strategy, the five national thematic Alliances, CNRS, requests made by the French Research Ministry (coordinates interministerial action between relevant ministries) and Scientific Challenge Steering Committees featuring national and international experts as well as industrial and institutional representatives.

The nine societal challenges support thematic, multidisciplinary and integrative research revolving around major societal issues. Following recommendations from the National Strategic Council for Research, each of these challenges covers fundamental research work in line with its objectives. These knowledge bases are listed as specific themes if they encompass entire challenges, or are given an introductory mention if they only make up one component of the themes concerned. In addition to providing opportunities to fund projects not directly covered by societal challenges, the "Other-Knowledge challenge" promotes original interdisciplinary research and contributes to preserving the diversity of French research and providing a long-term vision of future challenges.

A summary of WP 2016's challenge objectives is provided below. For each societal challenge, work conducted by the SNR has aided to determine the priority research areas set out in the table in section F. Project coordinators will be asked to specify whether their project fits in these priority areas at the time of submission. Pre-proposals for research projects falling under these priority areas will be given preferential selection.

E.1 CHALLENGE 1 - EFFICIENT RESOURCE MANAGEMENT AND ADAPTATION TO CLIMATE CHANGE

In light of world population growth and ever-increasing needs in terms of energy, raw materials, products and services, environmental changes are becoming an increasingly pressing matter at all levels, from landscape scale to global scale (climate, biodiversity erosion, soil degradation, air quality, freshwater and marine pollutions, etc.).

This challenge is primarily directed at gaining insight into the mechanisms underlying these changes and their local and regional impacts on resources, human societies and human activities – particularly those that depend on ecosystem services. Addressing this challenge will require social, political and economic innovations to avoid or reduce impacts, compensate or restore environments, and adapt to new constraints and opportunities. This challenge works within the framework of the European Research Area, notably through the Horizon 2020 programme "Climate Action, Environment, Resource Efficiency and Raw Materials", contributing to major international initiatives in the field. Given the complexity of the systems in question and depending on the particular topic, a wide variety of multi/inter/transdisciplinary projects is expected, ranging from academic research to partnerships with the private sector, public sector and civil society.

Challenge 1 is structured around six themes (one of which is integrated), with particular attention given to projects concerning coastal areas (irrespective of their theme):

- Theme 1: Understanding and anticipating environmental change
- Theme 2: Ecosystem dynamics to improve their sustainable management
- Theme 3: Health-Environment (health risks in the face of environmental change) (common to challenges 4 and 5)

- Theme 4: Scientific and technological innovations aimed at anticipating or remedying environmental risks
- Theme 5: Societies in the face of environmental change
- Theme 6: Integrated approaches to environmental development: toward more efficient solutions

In addition to the national generic call, challenge 1 will also receive support from a set of multilateral calls launched within the European framework (joint programming on climate, water, biodiversity, oceans, agriculture, and the Mediterranean) and via international frameworks (Belmont Forum, linking together G7 and Emerging Countries agencies and the European Commission) in order to enhance the visibility and leadership of French research.

Work by the National Research Strategy has resulted in the listing of five priority research areas covered by this challenge:

- Priority 1: Smart monitoring of the Earth system
- Priority 2: Sustainable management of natural resources
- Priority 3: Assessment and control of climate and environmental risk
- Priority 4: Eco- and biotechnologies to support the ecological transition
- Priority 5: The coastal areas as a natural laboratory

Project coordinators will be asked to specify whether their project fits in these priority areas at the time of submission, or where appropriate in other SNR priorities such as priority 15 (Sensors and instrumentation) or priority 20 (An integrated approach to production systems).

E.2 CHALLENGE 2 - CLEAN, SECURE AND EFFICIENT ENERGY

This challenge will enable ANR to elicit top-notch scientific and technological expertise to tackle the energy transition challenge in the context of the French "Factor 4" approach (reduction of greenhouse gas emissions by a factor 4 by 2050) and, more generally, at world level.

Achieving this goal will mean promoting systemic, integrative and multidisciplinary approaches often required to address energy-related issues (sciences of matter, engineering sciences, Earth sciences, life sciences, mathematics, information and communication sciences, and social sciences and the humanities, etc.). It will also require supporting the exploration of radical and groundbreaking new ideas and concepts which break away from existing paradigms through the provision of technological proofs of concept, which may include developing laboratory experiments or the integration into existing experimental sites. This challenge's scope of intervention is limited to relatively upstream levels (Technology Readiness Levels 1 to 5), and complements other R&D funding aimed at more downstream phases, both at national level (ADEME, BPI France etc.) and European level (Horizon 2020).

Challenge 2 is structured around the seven themes detailed in the annex below:

- Theme 1: Exploratory research and groundbreaking concepts
- Theme 2: Renewable energy production and energy harvesting
- Theme 3: Use of the underground for energy purposes
- Theme 4: Conversion of primary resources into fuels and platform molecules, carbon chemistry
- Theme 5: Storage, management and integration into energy grids
- Theme 6: Energy efficiency of processes and systems
- Theme 7: Social sciences and humanities-based approaches to the energy transition

Apart from theme 1, dedicated to groundbreaking concepts and theme 7 with its strong focus on social sciences and the humanities, the remaining themes cover energy issues from primary resource capture to end use, particularly in the industrial sector, including the interconversion of energy vectors, storage and distribution. Each theme includes research aimed at enhancing fundamental knowledge in the field concerned.

Work by the National Research Strategy has resulted in the listing of five priority research areas for this challenge:

- Priority 6: Dynamic management of energy systems
- Priority 7: Multiscale governance of new energy systems
- Priority 8: Energy efficiency
- Priority 9: Reducing dependency on strategic materials
- Priority 10: Fossil carbon substitutes for the energy and chemical sectors

Project coordinators will be asked to specify whether their projects fit in these priority areas at the time of their submission, or where appropriate in other SNR priorities such as priority 14 (Design of new materials) or priority 21 (Biomass: from production to varied uses).

E.3 CHALLENGE 3 - INDUSTRIAL RENEWAL

Research funded through challenge 3, "Industrial renewal" is intended to prepare an industrial evolution which takes into account the following societal aspects:

- The need to establish sustainable competitiveness (with corresponding jobs and efforts towards social cohesion),
- The needs to create wealth (by keeping resource consumption to a minimum),
- The challenges facing us in the early 21st century, especially environmental: CO₂ and water footprints, energy efficiency, reducing pollution, eliminating toxic substances, saving natural resources, recycling, etc.

French industry must progressively work towards domestic, sustainable manufacturing, promoting a circular economy in which it remains a step ahead of its competitors. Optimising human capital, the social role of industry, flexible production processes, adapting production processes to digital developments, as well as attractiveness and competitiveness are also key factors in industrial renewal.

The aim of this challenge is to support research projects that will facilitate these developments in the medium to long term. This challenge concerns very broad industrial fields (manufacturing industries, chemical industries, agrifood industries, etc.) and scientific disciplines (organisation of labour, labour law, ergonomics, industrial engineering, robotics, economics, physics, chemistry, mechanics, materials, process engineering etc.).

In line with the European Union's Horizon 2020 programme for research and innovation, especially the "Industry Leadership" pillar and the "key enabling technologies" area (KET), challenge 3 supports research covering a wide range of TRLs (Technology Readiness Levels), ranging from fundamental research (TRL 1) well upstream of potential applications, to research that touches on industrial issues (up to TRL 4).

Echoing work carried out in the National Research Strategy (SNR) supplemented by the Scientific Challenge Steering Committee, themes have been clarified, the overlap between challenges delineated and better scientific consistency achieved. The challenge is structured around five themes. These themes will also allow for an integrated assessment of research projects, from upstream research to future applications:

- Theme 1: Adapting work to industrial renewal
- Theme 2: The factory of the future
- Theme 3: Materials and processes
- Theme 4: Sustainable chemistry, products, related processes
- Theme 5: Nanomaterials and nanotechnologies for products of the future

Work by the National Research Strategy has resulted in the listing of five priority research areas for this challenge:

- Priority 11: The Digital factory

- Priority 12: The green and people-friendly factory
- Priority 13: Flexible, human-centred manufacturing processes
- Priority 14: Design of new materials
- Priority 15: Sensors and instrumentation

Project coordinators will be asked to specify whether their projects fit in these priority areas at the time of submission, or other SNR themes where appropriate such as priority 4 (Eco- and biotechnologies to support the ecological transition), priority 9 (Reducing dependency on strategic materials), priority 10 (Fossil carbon substitutes for the energy and chemical sectors), priority 21 (Biomass: from production to varied uses), and priority 29 (Human-machine cooperation).

E.4 CHALLENGE 4 - LIFE, HEALTH AND WELL-BEING

The "Life, health and well-being" challenge covers a wide research field. This major public policy challenge responds to the natural desire of human communities to optimise their health and well-being via the implementation of health policies.

The development of highly fundamental research on living mechanisms falls under for this challenge. Emerging knowledge in biology has had a high impact in several societal areas: health, which goes without saying, but also agriculture, economics and education.

This challenge links together three key approaches:

(i) The first focuses on decoding the multiscale cellular, physiological, developmental and ageing mechanisms that take place in living organisms – this being an essential step towards understanding and diagnosing pathologies caused by malfunctions in these mechanisms.

(ii) The second aims to expand knowledge of pathological processes and to pave the way for risk reduction strategies, both at individual and community levels and for implementing compensation strategies.

(iii) The third pillar concerns public health and health-oriented social sciences.

"Life, health and well-being" is therefore a challenge at the frontiers of knowledge offering a wealth of opportunities transferable to individuals and societies, but also a vector of innovation and economic growth for industrial sectors such as biotechnology, pharmaceuticals, diagnostics and medical devices.

Echoing work carried out in the **National Research Strategy (SNR)** and the **AVIESAN Alliance**, supplemented by the **Scientific Challenge Steering Committee**, WP 2016's Life, health, and well-being challenge is divided up into thirteen themes detailed in the annexes below supporting research projects from upstream stages through to future applications:

- Theme 1: Molecular study of biological systems, their dynamics, interactions and interconversions
- Theme 2: Decoding basic biological functions and their integration
- Theme 3: Research into systems and organs during normal and pathological function: physiology, physiopathology, ageing
- Theme 4: IT and digital systems, phenotyping, virtual organisms and pathologies, methodological, computer systems and statistical research to meet the conceptual and technological challenges of health research development
- Theme 5: Genetics and genomics: genotype-phenotype relations, genome-environment interactions, epigenetics
- Theme 6: Microbiome and microbiota-host relations
- Theme 7: Exploration of the nervous system during normal and pathological function
- Theme 8: An integrated approach to immune responses

- Theme 9: Public health: French social inequalities in terms of health: preventive health care, primary care and social services (common to challenge 8)
- Theme 10: Translational health research
- Theme 11: Medical innovation, nanotechnologies, regenerative medicine, innovative therapies and vaccines
- Theme 12: Healthcare technologies
- Theme 13: Health-Environment, based on the One Health concept (common to challenges 1 and 5)

Work by the National Research Strategy has resulted in a list of three priority research areas for this challenge, including priority 16: Multiscale analysis of the diversity and evolution of living organisms and priority 17: Collecting and processing biological data.

Project coordinators will be asked to specify whether their project fits in these priority areas at the time of submission, or where appropriate in other SNR priority research areas.

E.5 CHALLENGE 5 – FOOD SECURITY AND DEMOGRAPHIC CHALLENGES

World demographic growth is a major challenge for our societies' future, particularly in terms of food security and the various uses of biomass from renewable carbon. This challenge is set against a backdrop of changing dietary patterns, globalised production circuits, trade in raw materials and processed products, scarce resources, increasing climatic hazards and environmental concerns related to the exploitation of productive ecosystems. Within this context, challenge 5's objectives are the following:

- Innovate to boost economic, social and environmental performance
- Achieve food security in quantitative and qualitative terms
- Promote the regional bioeconomy

Challenge 5 is structured around five themes detailed in the annex below:

- Theme 1: Animal biology, plant biology, micro-organism biology, and adaptation to environmental change
- Theme 2: Ecosystem dynamics to improve their sustainable management
- Theme 3: Health-Environment (common to challenges 1 and 4)
- Theme 4: Food, healthy and sustainable food systems, world food security
- Theme 5: Bioeconomy: from production to the diverse uses of biomass

These themes concern the acquisition of fundamental and applied knowledge in biology, agricultural and ecological sciences, social sciences and the humanities, and the interfaces between these disciplines. Such themes involve systemic research initiatives demanding a high level of conceptualisation and the integration of data and knowledge from a variety of disciplines, relating to different organisation levels and spatial and temporal scales.

Work by the National Research Strategy has resulted in a list of three priority research areas for this challenge:

- Priority 19: Healthy and sustainable diet
- Priority 20: An integrated approach to production systems
- Priority 21: Biomass: from production to varied uses

Project coordinators will be asked to specify whether their project fits in these priority areas at the time of submission, or where applicable in other SNR priority areas such that priority 2 (Sustainable management of natural resources), priority 3 (Assessment and control of climate and environmental risk), priority 10 (Fossil

carbon substitutes for the energy and chemical sectors) or priority 16 (Multiscale analysis of the diversity and evolution of living organisms).

E.6 CHALLENGE 6 – SUSTAINABLE MOBILITY AND URBAN SYSTEMS

This societal challenge aims to explore the extent to which urban systems, buildings and transport can be transformed to embrace sustainable development. This requires developing increasingly integrated and systemic approaches in order to improve our understanding of physical, environmental, political and socio-cultural processes while highlighting any vulnerability. Urban areas lie at the intersection of issues concerning habitat, mobility and, more broadly, living together in society. Towns and cities, which account for 70% of Europe's energy consumption, also contribute greatly to the greenhouse effect and environmental pressures while also being sensitive to environmental damages and to the consequences of global change. Other major challenges include the performance of buildings and transport, the organisation of urban systems that encourage smooth, efficient access to resources and services, the emergence of digital society to support, develop and promote the use of sustainable transport and to provide more intelligent urban management (the “smart city” concept), and the longevity and adaptation of infrastructures and networks to meet existing and emerging needs.

Research work developed in this framework must meet several scientific goals:

- Constitute new bodies of knowledge focused on energy efficiency, environmental impact and usability, for components (vehicles, buildings, etc.) and buildings on different scales, examining the interactions between these criteria and scales;
- Develop methods for modelling phenomena to back design, decision-making, and performance assessments.
- Assist in developing a palette of methods and technologies that are useful for designing, building, restoring and adapting to new energy and environmental requirements, but also more efficiently managing the existing heritage and the various components of urban and transport systems by actively involving users.

The challenge 6 is structured around seven themes detailed the annex below:

- Theme 1: Sustainable urban systems
- Theme 2: From buildings to a sustainable built environment
- Theme 3: Clean, safe vehicles
- Theme 4: Efficient networks and services

Work by the National Research Strategy has resulted in a list of four priority research areas for this challenge:

- Priority 22: Urban observatories
- Priority 23: New conceptions of mobility
- Priority 24: Tools and technologies for sustainable cities
- Priority 25: The integration and resilience of infrastructures and urban networks

Project coordinators will be asked to specify whether their project fits in these priority areas or where appropriate in other SNR priorities such as priority 3 (Assessment and control of climate and environmental risk), priority 4 (Eco- and biotechnologies to support the ecological transition), priority 8 (Energy efficiency), priority 26 (5th generation of network infrastructures) and priority 29 (Human-machine cooperation).

E.7 CHALLENGE 7 – INFORMATION AND COMMUNICATION SOCIETY

The "Information and communication society" challenge concerns the use of digital sciences and technologies for the benefit of society. The challenge has two main objectives: using digital technology for the benefit of society and designing and developing digital technologies of the future through innovative concepts, methods and tools. Mastering digital technology is therefore an increasingly strategic national issue affecting France's autonomy and competitiveness.

This challenge aims to mobilise the French research network to address challenges affecting digital societies. Proposals for research and development projects are expected to yield significant advances in areas of micro- and nano-electronics, IT and mathematics; subjects which serve as a bedrock for digital sciences and technologies. Collaborative project proposals integrating a social science and humanities dimension are also expected to encompass joint research fields.

When possible, researchers are encouraged to take advantage of infrastructure and large already-existing databases, and to promote their results via open access solutions. Researchers are also encouraged to coordinate their proposals with other national or international initiatives in the field (H2020, PIA, DGE, etc.).

Challenge 7 applies to the entire research and innovation chain, from the most fundamental research to the design and development of pre-industrial tools and methods.

These are structured around eight themes:

- Theme 1: The digital revolution: our relationship with knowledge and culture (common to challenge 8)
- Theme 2: Foundations of digital sciences and technologies
- Theme 3: Software sciences and technologies
- Theme 4: Interaction, robotics, content
- Theme 5: Data, Knowledge and Big Data
- Theme 6: Numerical simulation: from high-performance computing to big data
- Theme 7: Infrastructures for communication, processing and storage
- Theme 8: Micro- and nanotechnologies for information and communication processing

Work by the National Research Strategy has resulted in a list of five priority research areas for this challenge:

- Priority 26: 5th generation of network infrastructures
- Priority 27: Connected objects
- Priority 28: Exploiting big data
- Priority 29: Human-machine cooperation

Project coordinators will be asked to specify whether their projects fit in these priority areas at the time of submission, or when applicable in other SNR priority areas such as priority 16 (Multiscale analysis of the diversity and evolution of living organisms), priority 17 (Collecting and processing biological data) or priority 32 (Data availability and extraction of knowledge) or 33 (Social, educational and cultural innovations).

E.8 CHALLENGE 8 – INNOVATIVE, INCLUSIVE AND ADAPTIVE SOCIETIES

Challenge 8, "Innovative, inclusive and adaptive societies" encourages research focused on societies' ability to innovate, integrate and adapt. Going beyond French society, researchers are to study societies spanning every possible cultural area and open up their research across the humanities and social sciences, practising the most transdisciplinary approach possible, englobing: history, archaeology, arts and letters, philosophy, linguistics, anthropology, sociology, demography, geography, political science, religious studies, psychology and cognitive sciences, as well as law, economics and management.

Projects submitted in this challenge may apply a variety of methods: *in situ* observation, interviews, experiments, modelling, simulations, the compiling and use of archives and corpora, analysis of texts, statistical surveys, administrative data, artistic or literary sources. Applicants are advised to inform evaluators about the sources and methods used by devoting at least a page of the pre-proposal to them.

When possible, researchers are encouraged to take advantage of infrastructure and large already-existing databases, including international longitudinal surveys recognised by the European roadmap for research infrastructures. Within the limits of existing financial resources, challenge 8 may partly fund the conducting of surveys or the constitution of corpuses (texts, images, oral archives) on three conditions: 1/ That they coincide with a research project ; 2/ that open data be provided 3/ that there is an instrument for perpetuating them.

In response to work by the SNR and the ATHENA Alliance with input from challenge 8's Scientific Challenge Steering Committee, the 2016 edition has undergone a massive overhaul. Novel theme areas have been introduced which are likely to interest new research communities. The challenge is structured around eight themes corresponding to an integrated assessment of research projects, from upstream stages to future applications:

- Theme 1: Social innovation and attitudes toward risks
- Theme 2: Inequalities, discrimination, integration and radicalisation
- Theme 3: Changes in labour and employment, changing organisations
- Theme 4: Life-long education, cognitive skills, socialisation and training
- Theme 5: Cultures, creation and heritage
- Theme 6: The digital revolution and social change
- Theme 7: The digital revolution: our relationship with knowledge and culture (common to challenge 7)
- Theme 8: Public health (common to challenge 4)

Work by the National Research Strategy has resulted in the listing of five priority research areas for this challenge:

- Priority 30: Study of cultures and integration factors
- Priority 31: New innovation capacity indicators
- Priority 32: Data availability and extraction of knowledge
- Priority 33: Social, educational and cultural innovations

Project coordinators will be asked to specify whether their project fits in these priority areas at the time of submission, or where appropriate in other SNR priority areas such as priority 28 (Exploiting big data).

E.9 CHALLENGE 9 – FREEDOM AND SECURITY OF EUROPE, ITS CITIZENS AND ITS RESIDENTS

This challenge covers but is not limited to any research which may contribute to the government's sovereign missions of security and protection, as well as the protection of infrastructures and public and private operators vital for the proper functioning of the nation. It also encompasses research on non-sovereign security issues concerning individuals or legal entities such as organisations and companies. All freedom and security issues are to be considered against a backdrop of the accelerating development of new technologies, particularly digital technologies, which offer opportunities to citizens, administrations and businesses but also create vulnerabilities. The increasingly dense movement of people, commodities (goods, energy, water, etc.), capital and information needs to be taken into consideration to ensure security for all, at all levels.

Research relating to the freedom and security of European citizens and residents requires an integrated approach to risk management both in physical space and in cyberspace. This ranges from the characterisation of threats and vulnerabilities to the management of consequences, as well surveillance, prevention and protection mechanisms.

This challenge invites proposals from all types of research: fundamental or highly upstream research is also important to build up a body of knowledge on which public policies and ambitious future projects can be based. In all cases, regardless of whether or not the aim of the project is technology-related, an integrated approach is often needed, in which scientific and technical disciplines that do not usually meet are brought together: natural and environmental sciences, computer sciences, engineering, and social sciences and humanities (analyses of individual and collective behaviour, public law, public policy analysis, ethics, geography, etc.).

Challenge 9 is structured around five themes detailed in the annex below:

- Theme 1: Fundamental research related to the challenge
- Theme 2: Risks, management of crises of all types, resilience of systems
- Theme 3: Security of people and entities; fight against crime, terrorism and violent radicalisation
- Theme 4: Cybersecurity: freedom and security in cyberspace, securing information systems, fighting cyberterrorism
- Theme 5: Protecting vitally important infrastructures and networks, monitoring sovereign areas

Research work by the National Research Strategy has resulted in the listing of three priority research areas for this challenge:

- Priority 39: Preventing and anticipating risks and threats
- Priority 40: An integrated approach to crisis management
- Priority 41: Resilience of security systems

Project coordinators will be asked to specify whether their project fits in these priority areas at the time of submission, or where appropriate in other SNR priorities.

E. 10 "OTHER-KNOWLEDGE" CHALLENGE

The "Other-Knowledge challenge" complements the mechanisms dedicated to the nine major societal challenges, they themselves eligible for basic research in their clearly identified theme-based area.

There is a strong desire to uphold, for all the scientific communities, opportunities for funding projects to prepare our societies for the future through actions which do not fall in the immediate scope of the societal challenges from both a knowledge base and themes standpoint.

- **Research at the frontiers of knowledge**

The Other-Knowledge Challenge aims to encourage prospective or exploratory research with the potential to expand the frontiers of knowledge. Such research is particularly valuable when one considers that society constructs its capacity to evolve and project itself into the future based on these frontiers. This thirst for knowledge, from the quest to understand the world around us and the laws that govern it to the desire to develop abstractions, will have major impacts on future decisions far exceeding the bounds of initial queries.

This challenge supports scientific advances anchored (or not) within schools of thought and generated essentially from curiosity, observation, and creativity. The knowledge and know-how which form the core of this challenge's projects should also be a driver of discovery whose implications are not always foreseeable, but which are essential for anticipating change and addressing future societal issues.

The Other-Knowledge challenge also aims to promote advances over the long term, insofar as it has the power to usher in breakthroughs and new concepts and paradigms, certain of which will provide a source of applied or industrial development essential to France's industrial renewal.

Lastly, the challenge may provide an avenue for the development of integral approaches such as the creation of new tools and generic methods or the integration of various inputs in a transdisciplinary research strategy. The impact of such wide potential approaches will not be immediately felt, but merit support rather for their intrinsic internal dynamics, even if they do not neatly fit into the nine societal challenges' priorities.

The objective of the Other-Knowledge challenge is to generate the additional dynamics necessary for the emergence of new scientific and technological ideas constituting a precious capital for the future.

Proposals' scientific excellence is a decisive criterion, since the objective is to respond to questions falling outside the general framework or field of investigation peculiar to a given societal challenge.

- **Special fields of research**

The "Other-Knowledge challenge" provides funding opportunities for research at the frontiers of knowledge which do not fall under the Work Programme's societal challenges. They may involve well-recognised fields outside of these challenges and concern rare disciplines or original interdisciplinary themes containing previously unexplored dimensions.

By way of illustration and in a non-exhaustive manner, research at the frontiers of knowledge in areas such as astrophysics, fundamental physics, particle physics, the structure and history of the Earth, chemistry, certain fields in the humanities and social sciences, certain fundamental biology or fundamental mathematics domains may apply to this funding mechanism for projects lying beyond the scope of the major societal challenges.

The inclusion of rare disciplines which would not otherwise have been included in the new societal challenges stems from the need to use research to stimulate knowledge acquisition in understaffed sectors contributing to the scientific, cultural, societal and economic heritage of our country and to the understanding of movements in contemporary societies. This also concerns scientific disciplines, more specifically those for which waning interest may result in the loss of knowledge needed when new theoretical issues or practices arise; a problem which needs to be addressed.

This challenge is also about promoting original interdisciplinary research through curiosity, observation and creativity, thereby establishing a new rapport between fields thought to be completely distinct. Such research may employ a variety of approaches within these fields. The research projects could also potentially bring about the emergence and perpetuation of interdisciplinary, scientifically and/or socio-economically promising themes.

Project proposals for this challenge can employ all types of approaches, from the theoretical to the instrumental.

F Annex 2: Priority research areas identified in the National Research Strategy (SNR), as related to the societal challenges set out in ANR's WP 2016

SNR	Title	Challenge 1	Challenge 2	Challenge 3	Challenge 4	Challenge 5	Challenge 6	Challenge 7	Challenge 8	Challenge 9
PRIORITY 1	Smart monitoring of the Earth system	P								
PRIORITY 2	Sustainable management of natural resources	P				S				
PRIORITY 3	Assessment and control of climate and environmental risk	P				S	S			
PRIORITY 4	Eco- and biotechnologies to support the ecological transition	P		S			S			
PRIORITY 5	The coastal areas as a natural laboratory	P								
PRIORITY 6	Dynamic management of energy systems		P							
PRIORITY 7	Multiscale governance of new energy systems		P							
PRIORITY 8	Energy efficiency		P				S			
PRIORITY 9	Reducing dependency on strategic materials		P	S						
PRIORITY 10	Fossil carbon substitutes for the energy and chemical sectors		P	S		S				
PRIORITY 11	The Digital factory			P						
PRIORITY 12	The green and people-friendly factory			P						
PRIORITY 13	Flexible, human-centred manufacturing processes			P						
PRIORITY 14	Design of new materials		S	P						
PRIORITY 15	Sensors and instrumentation	S		P						
PRIORITY 16	Multiscale analysis of the diversity and evolution of living organisms				P	S		S		
PRIORITY 17	Collecting and processing biological data				P			S		
PRIORITY 18	National Centres of excellence network for research and healthcare				P					
PRIORITY 19	Healthy and sustainable diet					P				
PRIORITY 20	An integrated approach to production systems	S				P				
PRIORITY 21	Biomass: from production to varied uses		S			P				
PRIORITY 22	Urban observatories						P			
PRIORITY 23	New conceptions of mobility						P			
PRIORITY 24	Tools and technologies for sustainable cities						P			
PRIORITY 25	The integration and resilience of infrastructures and urban networks						P			
PRIORITY 26	5th generation of network infrastructures						S	P		
PRIORITY 27	Connected objects							P		
PRIORITY 28	Exploiting big data							P	S	
PRIORITY 29	Human-machine cooperation			S			S	P		
PRIORITY 30	Study of cultures and integration factors								P	
PRIORITY 31	New innovation capacity indicators								P	
PRIORITY 32	Data availability and extraction of knowledge							S	P	
PRIORITY 33	Social, educational and cultural innovations							S	P	
PRIORITY 34	The Earth observation service chain	ANR WP not concerned								
PRIORITY 35	Competitiveness of the telecommunications and navigation sectors	ANR WP not concerned								
PRIORITY 36	Critical components	ANR WP not concerned								
PRIORITY 37	Technologies for observing and exploring the universe	ANR WP not concerned								
PRIORITY 38	Defence and security of the territory	ANR WP not concerned								
PRIORITY 39	Preventing and anticipating risks and threats									P
PRIORITY 40	An integrated approach to crisis management									P
PRIORITY 41	Resilience of security systems									P

List of corresponding challenges and SNR priorities (P: principal; S: secondary)

F.1 CHALLENGE 1 - EFFICIENT RESOURCE MANAGEMENT AND ADAPTATION TO CLIMATE CHANGE

PRIORITY 1 / Smart monitoring of the Earth system

Monitoring of the Earth system is expected to intensify with the implementation of innovative and sustainable instruments (infrastructure, sensors, models, large amounts of data) to increase knowledge about how the Earth system works, enabling the development of services geared toward industry and public policy (including real-time climate information and environmental data). New instruments for observation and experimentation will be integrated in the European and/or international networks. These instruments will be deployed on the ground, placed on-board oceanographic and air fleets, in satellite infrastructures, and even on new types of fleets being developed (drones etc.).

PRIORITY 2 / Sustainable management of natural resources

The study of natural resources must go beyond discipline-restricted "silo thinking" action on ecosystems, biodiversity, water, soil, subsoil resources, and territories if we are to develop a more comprehensive overall vision. Research must be reinforced with regard to the cost-benefit analysis of exploiting resources, integrating impacts on economic activity and employment, such as effects on health, the environment and biodiversity. This priority is tasked with setting up an up-to-date national inventory of "critical" mineral and energy resources, with an overview of their availability, uses and potential conflicts over use.

PRIORITY 3 / Assessment and control of climate and environmental risk

Climate disruption associated with the densification of land use and growing populations have rendered current predictions of climate and environmental disturbances inadequate for assessing and controlling risk; there is a need to strengthen our understanding of these disturbances through research accounting for natural, technological and industrial hazards. This priority is designed to document high-risk areas and assess the impacts of a hydro-climatic or hazardous toxicological event, to develop pre-operational forecasting services and validate new toxicological and ecotoxicological testing. It will also be necessary to consider ecosystems' adaptability and analyse the economic impact of their decline.

PRIORITY 4 / Eco- and biotechnologies to support the ecological transition

Research on eco- and biotechnology should be encouraged in order to further develop industries with little environmental impact (low use of resources, improved efficiency, curative technologies). In particular, life cycle analyses will serve as a rough methodological basis, enabling a greater focus on specific ecosystem and management issues.

PRIORITY 5 / The coastal areas as a natural laboratory

Coastal areas provide a natural laboratory and are host to myriad natural and man-made risks, with issues linked to subsoil resources, primary biological resources, energy and transport, the development of urban planning, land-use planning and tourism, and the preservation of natural and cultural heritage. More specifically, this priority was created to support information collection and the construction of modelling and scenario-building tools on the land-sea continuum to conduct research on how these different risks interact with one another.

F.2 CHALLENGE 2 - CLEAN, SECURE AND EFFICIENT ENERGY

PRIORITY 6 / Dynamic management of energy systems

Increasingly numerous, both diversified and localised renewable energy sources require effective and dynamic methods for integrating these energies in distribution networks using technical solutions for an optimal combination of often irregular 'low-carbon' energy sources with programmable electricity sources. This implies the development of different energy vectors, storage and conversion technologies, as well as safe and smart energy grids allowing the distribution of electricity at the local level, for example transport via the major European networks.

PRIORITY 7 / Multiscale governance of new energy systems

This priority sets out to examine the evolving needs of local, regional, national and European policies on the evolution of market regulation in order to design effective and equitable governance which gives just consideration to a growing number of small-scale producers. To this end, it will be necessary to work on optimising interfaces between the different scales, from local to global. Governance models will analyse energy management at territorial levels and reconcile it with management at the national level; analyses must include costs associated with energy systems and anticipate impacts on businesses and private individuals.

PRIORITY 8 / Energy efficiency

Research and innovation efforts must be pursued to reduce energy needs in the domains of construction, transport and production systems. To be effective, the solutions developed must combine several innovative technologies (new insulations, heat recovery, optimisation of engines, smart meters etc.), changing actors' behaviours and introducing collective logical and incentive mechanisms and providing for their dissemination.

PRIORITY 9 / Reducing dependency on strategic materials

Reducing energy systems' need and use of strategic materials requires the setting up of a thought process on the chain connecting extraction, use, and recycling. Skills and expertise must be channelled into these three components to support the emergence of a sustainable sector (production methods, clean and innovative recycling). This will involve studying materials' behaviours under multiple stresses, seeking out substitute materials, and optimising yields and service life.

PRIORITY 10 / Fossil carbon substitutes for the energy and chemical sectors

The production of biofuels and applications derived from bio-based chemistry are in early stages of development. If these alternative development sectors are to become sustainable, we will have to break away from field-specific thinking and regard chemical processes and biofuels rather in terms of concurrent applications, the scales (local or otherwise) at which the resource and the products are used and manipulated, the conditions for obtaining them, possibilities of recycling, and the existence of other substitute materials.

F.3 CHALLENGE 3 - INDUSTRIAL RENEWAL

PRIORITY 11 / The Digital factory

The use of digital tools in industry has generated major efficiency gains applicable to engineering design, controlling production mechanisms, making information sharing smoother, and more. The idea is to maintain momentum by conducting research on digital technology to improve factories' operation effectiveness and interactions with external partners, potentially including the end customers. These research efforts will need to be integrated into an overall vision of the production process in order to ensure a coherent and collaborative chain from the design phases to the finished product.

PRIORITY 12 / The Green and people-friendly factory

In a world where resources (energy, raw material, water, air, soil etc.) are scarce and increasingly costly, the factory of the future must be economical and responsible. The aim of research will be to come up with integrated industrial systems for managing energy, raw materials and risks. These systems will adhere to circular economy and eco-design philosophies by saving raw materials, recycling and reusing waste materials for other purposes, and finding substitute materials for unsustainable resources.

PRIORITY 13 / Flexible, human-centred manufacturing processes

This priority sets out to invent and deploy large-scale flexible manufacturing models suited to the needs of customers, as well as simple and user-friendly production control systems (human-machine cooperation, industrial robotics). This new field must bring together researchers in the engineering sciences and social sciences and the humanities to devise user-friendly production systems.

PRIORITY 14 / Design of new materials

The products of the future will be more complex and mix several materials endowing final products with unique advantages (lightness, conductivity, resistance, hardness etc.). Combinations of basic components are becoming increasingly diverse. The forming and implementation processes of multi-materials (assembly technologies, additive manufacturing, powders, surface treatments, etc.) therefore pose a major challenge. It will also be necessary to classify these new materials, validate them and assess their tolerance to damage and ageing.

PRIORITY 15 / Sensors and instrumentation

There can be no smart machines or products without reliable fine physical measurements at acceptable economic costs. This priority will support the instrumentation and metrology sectors, in which France is a trail-blazer, to meet industry's new innovative needs. Research will mainly focus on designing and producing micro-sensors, integrating them into materials and processes, as well as imagining and developing systems for high-performance collection and processing of collected data.

F.4 CHALLENGE 4 - LIFE, HEALTH AND WELL-BEING

PRIORITY 16 / Multiscale analysis of the diversity and evolution of living organisms

This priority revolves around identifying, quantifying and formalising the properties of all living organisms at different scales (from molecules to populations) by calling upon mathematics, physics, chemistry, computer science and human and social sciences. The challenge is to study elementary biological functions as well as these functions at different levels of integration within biological systems. Studies relying on the diversity of experimental models will specifically benefit to the development of synthetic and systems biology and will help open up new pathways in industrial, environmental and medical fields.

PRIORITY 17 / Collecting and processing biological data

The treatment of large masses of data has become essential for research in biology and medicine; such research is based on an increasingly integrated and systemic approach. The aim will therefore be to foster the development of platforms for the collection of biological data and imaging, the constitution of patient cohorts and the opening of administrative databases to research. Particular emphasis will be placed on technological and medical innovation processes enabling data collection: development of diagnostic instrumentation, self-monitoring devices and sensors, and collecting sociological data...

PRIORITY 18 / National Centres of Excellence network for research and healthcare

The network's primary mission will be to increase the quality and attractiveness of clinical research and the number of tests carried out in France via improved coordination between centres cooperating with industrial partners in a simplified regulatory context better adapted to the methodological developments and more favourable to innovation.

F.5 CHALLENGE 5 – FOOD SECURITY AND DEMOGRAPHIC CHALLENGES

PRIORITY 19 / Healthy and sustainable diet

Fundamental knowledge on the human diet will need to be revisited in light of studies on human microbiota involved in digestion. Knowledge about how these microbes decompose food into molecules able to be absorbed by the body will in effect change the way we view the link between populations' health and their diets. This will be achieved by pursuing research aimed at understanding these microbe populations and developing new technologies (metagenomics, metabolomics) to explore their functions and subsequently measure and monitor the nutritional status of the human being. To enable sustainable food production, we will have to re-evaluate food's processing, storage, and supply chain from the perspective of their energy consumption; energy-consuming transformation and storage processes will need to be improved and alternative processes found.

PRIORITY 20 / An integrated approach to production systems

Industry, research laboratories and groups of farmers are behind multiple technological and organisational innovations, though these approaches are strongly compartmentalised by sector (livestock, plants, agricultural mechanics). It is necessary to develop an integrated approach for production systems, using the evaluation of their grouping in a global instrumented system to identify the constraints, benefits and risks of these innovations, as well as possible synergies. In addition, agroecology has yet to come into its own as a field; we must strive to better understand and measure what ecosystems can contribute to production systems and how to use them without creating unbalances. These studies will be based on experimentation, observation and comparative approaches. Predictive biology will also be broadly solicited and work will be conducted at the scale of the individual, the plot, the herd and the farm, but also at the territorial level in systemic approaches. It will be necessary to design multi-criteria assessment tools for the various system sustainability and transaction cost systems.

PRIORITY 21 / Biomass: from production to varied uses

Optimising the total usage of biomass according to its many possible transformations (food, materials, energy) in particular by avoiding competition with usage for food purposes is an issue central to the development of the bioeconomy. It is necessary to develop an integrated vision based on novel tools for modelling complex systems. These tools enable society to evaluate actors' incentives, the functioning of ecosystems and interactions, and implement subsequent policy decisions. Research will also be focused on reassessing technological and biological processes in this framework, especially for processing food, overcoming technological and scientific obstacles related to bio-refining and, finally, developing concepts, methods and tools for use in synthetic biology.

F.6 CHALLENGE 6 - MOBILITY AND SUSTAINABLE URBAN SYSTEMS

PRIORITY 22 / Urban observatories

To complement existing databases and data from international comparative studies and surveys, this priority sets out to develop observatories to provide information on the urban built environment as well as systems as well as flows of energy, materials and people in urban settings. These observatories will promote interdisciplinary approaches to mobilise all actors concerned with diagnostics, modelling and forecast scenarios. Observatories will also assess urban integration into regional and international systems to evaluate public policies and test new solutions invented.

PRIORITY 23 / New conceptions of mobility

The aim will be to devise new ways to move around combining various means of transportation relying on technological and organisational innovation. This objective breaks down into two research domains. The first is the design of new innovative vehicles with smaller environmental footprints (mini-vehicles, electric aircraft, and unmanned aerial vehicles, also known as “drones”) and multiple uses based on new concepts for automation, increased delegation, as well as connectivity and traffic management. The second is the production of technology or organisational breakthroughs in response to the "last mile" problem and change the point of view of the actors involved in establishing shared systems such as carpooling, car-sharing, and transport interfacing.

PRIORITY 24 / Tools and technologies for sustainable cities

It will be necessary to fit out contracting authorities with measuring instruments and digital design tools for low environmental footprint urban systems, not on the scale of individual buildings, but of entire neighbourhoods. In addition, innovation efforts must be maintained if technologies and tools are to optimise buildings' energy and environmental efficiency; this applies for example to heat pumps, cooling production systems, new insulation materials, waste disposal systems and indoor air and water quality control, etc.

PRIORITY 25 / The integration and resilience of infrastructures and urban networks

To optimise their establishment and usage, it is necessary to develop those concepts and tools enabling an integrated vision of the various urban networks (water, gas, electricity, telecommunications and transport) as early as the design phase. This priority also sets out to develop solutions for adaptation and resilience to unforeseen technical, social and climate risks.

F.7 CHALLENGE 7 – INFORMATION AND COMMUNICATION SOCIETY

PRIORITY 26 / 5th generation of network infrastructures

One of the foremost twenty-first century digital challenges is overcoming scientific and technical obstacles and developing the 5th generation of network infrastructures; this will be especially important for Europe. Beyond mobility, this generation of digital infrastructure will bring about the large-scale deployment of the Internet of things, the digital basis for smart cities, smart roads, and new energy systems... Updating infrastructure is a challenge both economically and from a sovereignty standpoint.

PRIORITY 27 / Connected objects

The connected object revolution requires research about hardware, for example involving very low consumption electronics or the field of communication protocols, as well as software, particularly embedded software and distributed software architectures. Research concerning data protection issues will also be developed in order to foster user trust in digital space.

PRIORITY 28 / Exploiting big data

Research on the means of collection, storage and processing of large masses of data will be fostered. The main issues relating to the diversification of objects and networks for data collecting, the development of algorithms performing smart mining of very large masses of unstructured data (sometimes remotely) and the optimisation of the material means of calculation necessary to these algorithms (high performance computing architectures, with particular emphasis on optimising energy consumption).

PRIORITY 29 / Human-machine cooperation

This priority area will revisit the ways in which men and machines interact from the standpoint of natural behaviour and human progress in autonomous machine operations and decision-making. In order to develop a genuine collaboration between humans and machines, research on self-learning processes between humans and machines must be expanded, with machine capable of adapting to the unpredictable aspects of operators' behaviour, with development of a greater interactional richness for "smart" automation.

F.8 CHALLENGE 8 - INNOVATIVE, INCLUSIVE AND ADAPTIVE SOCIETIES

PRIORITY 30 / Study of cultures and integration factors

In a globalised world, public authorities and businesses have a vital need to know and understand the diversity of cultures, both in their historic depth, languages and religions, their societal and institutional structures and the ways in which they interact and evolve. Among other issues, it is essential to analyse factors of social cohesion, economic development and well-being, focusing in particular on the roles and the forms taken on by acceptance and risk aversion. A special importance will be given to research mechanisms to understand levers to act on to allow our society to offer the best integration framework to fight against inequalities and promote economic development.

PRIORITY 31 / New innovation capacity indicators

Determining the fundamental basis by which societies innovate requires the development of new indicators for scientific activity and innovation. The priority will attempt to determine the capacity of education to capitalise on initiatives, demonstrate a sense of experimentation and creativity, and identify the most effective models for transmitting tacit knowledge. To do this, it is necessary to study both individual behaviours in response to risks and social attitudes vis-à-vis progress, research and science, and also representations of risk and the roles played by education systems, in particular the stigmatising of failure. This work should build on existing large infrastructures in the social sciences such as the European Social Survey (ESS), to study the mechanisms that underpin confidence in the future and the ability to project into the future.

PRIORITY 32 / Data availability and extraction of knowledge

Large masses of data and associated questions constitute a new and centrally important field which has assumed a strong interdisciplinarity with Information and Communication Sciences and Technologies. Research will focus on how to extract knowledge from non-hierarchical information flows. Emphasis will be placed on the creation and enrichment of open European databases for working on large cohorts and drawing comparisons.

PRIORITY 33 / Social, educational and cultural innovations

The study of social, educational and cultural innovations constitutes a new field facilitating the adaptation of the entire population to social transformations. In particular, it will be necessary to develop new methodologies presenting a rigorous comparative dimension and new frames of reference to assess social progress and account for subjective variables such as well-being. Dedicated national and transnational infrastructures, such as SHARE (Survey of Health, Ageing and Retirement in Europe) or ESS (European social survey)-type surveys will need to be developed. Research will focus on thematic areas such as innovative teaching devices or social representations, their dynamics and their dissemination.

F.9 CHALLENGE 9 - FREEDOM AND SECURITY OF EUROPE, ITS CITIZENS AND ITS RESIDENTS

PRIORITY 39 / Preventing and anticipating risks and threats

Security issues must be taken into account when designing physical or digital systems, particularly for the sizing of infrastructure and networks. Since human beings are at the core of these systems, it will be essential to study individual and collective behaviour in the face of risk, but also determine the principles for establishing rules and preventive standards which are both effective and respect public rights and freedoms.

PRIORITY 40 / An integrated approach to crisis management

Crisis management is tasked with integrating all information on critical events, their likely evolution, actors' response capacity, and so on. In order for this management to be effective, it will need to develop the modelling and simulation of critical phenomena (natural or human-made events), the capacity to acquire and process hybrid and multi-source data in real time in order to pinpoint relevant information and develop decision-making tools based on a hazard assessment and appropriate human/machine interactions.

PRIORITY 41 / Resilience of security systems

It will be necessary to develop scientific foundations and methodologies for analysis of interconnected complex systems' resilience including security systems and to integrate resilience processes starting at the design phase. Research will be based in particular on network theory, the analysis of decentralised processes, and coordination mechanisms; it will also set out to develop approaches and tools to aid in the design of resilient devices (fault tolerance, sabotage, and degradation) as well as methodologies for still underused ex post analyses.

G Annex 3: Required documents

G.1 1ST STAGE: PRE-PROPOSAL (PRC, PRCE AND JCJC) AND REGISTRATION (PRCI)

G.1.1 Online form

The following items and information must be provided.

For **PRCI projects**, the following information must be filled in by both French and foreign partners.

Project identity

Project acronym	30 characters maximum, only alphanumeric characters, as well as the following characters: - _ The choice of acronym is definitive and cannot be changed during stage 2. If two pre-proposals choose the same acronym, ANR may require that a new acronym be chosen.
Title in French	Enter title
Title in English	Enter title
Provisional grant amount requested (k€)	Amount - enter amount This amount must be exactly equal to (+/- 15%) the amount requested in the full proposal
Duration	Select from a list: 12 months, 24 months, 36 months, 42 months, 48 months
R&D Categories ¹⁰	Select from a list: Basic research, Industrial research, Experimental development

Partnership

This chart must indicate the project's key individuals, as well as all partners (research organisations, companies, foreign partners, and other partners for which no funding has been requested...).

For each person:

- Sex (male/female)
- First name, surname
- E-mail address (Professional e-mail address is preferable)
- Unit code, name of laboratory, company name...
- Organisation of affiliation
- Postal code, city, country (information concerning place where research is performed)

Project information

The following project information is used to divide up pre-proposals and registrations (PRCI) into evaluation units so that they may be assessed. This information cannot be changed during phase 2.

¹⁰ See definitions in the Regulations pertaining to the conditions of allocation of ANR funding (<http://www.anr.fr/RF>).

Funding instrument ¹¹	Select from a list: Collaborative research project, Collaborative research project involving enterprises, International collaborative research project (PRCI) Young researchers (JCJC)
JCJC only	Year research doctorate was earned (or any other degree or qualification equivalent to an international PhD)
PRCI: country and agency	Choose from the list of collaborations possible for a given challenge (see annexes for international collaborations)
Challenge	Choose a challenge from the list, see §E and detailed description in Work Programme 2016.
Challenge theme	One thematic area must be chosen in the list specific to each societal challenge, leave incomplete for the "other-knowledge challenge."
Inclusion in an SNR (national research strategy) priority research area	Pick between the list of SNR priority research areas, see §F. Applicants may also choose the absence of inclusion in an SNR priority research area.
Principal object of research	One principal object of research must be chosen in the list specific to each societal challenge; leave incomplete for the "Other-knowledge challenge."
Principal research application	When applicable, pick a principal research application from a list specific to each challenge's theme area. Leave incomplete for the "other-knowledge challenge"
Keywords related to the principal research object	List specific to each challenge's theme; leave incomplete for the "Other-knowledge challenge" Choose one to three keywords relating to the principal research object
Keywords relating to the principal research application	List specific to each challenge's theme; leave incomplete for the "Other-knowledge challenge" Choose one to three keywords relating to the principal research application
Keywords by discipline	Choose from the list derived from the <i>European Research Council (ERC) panel descriptors</i>
Any keywords	Keywords (optional)

In the case of the "Other-knowledge challenge," pre-proposals are grouped into evaluation units based on the funding instruments and the keywords chosen from the list derived from the *European Research Council (ERC) panel descriptors*.

Other information

Does this project require a very large research infrastructure (TGIR)?	Yes / No If yes, choose the required TGIR in the menu bar
Does this project require the support of one or several competitiveness clusters?	Yes / No Choose the competitiveness cluster(s) from a list
Interested in co-funding?	Yes / No If yes, choose "yes" in the menu bar

Scientific abstracts

- Abstract (non-confidential) in French (1,000 characters maximum)
- Abstract (non-confidential) in English (1,000 characters maximum)

¹¹ See description in the Work Programme (paragraph B)

At least one of the two abstracts must be completed. The abstract in English is mandatory for PRCI.

Reviewers requested to abstain from evaluation (if appropriate, provide during this stage)

This field allows applicants to indicate peer reviewers (individuals) or establishments with potential conflicts of interest preventing them from evaluating a proposal.

ANR manages conflicts of interest. ANR may only exclude peer reviewers for which a conflict of interest situation exists.

G.1.2 Project description uploaded via the submission site (except PRCI)

Note: this description is not required for the PRCI project

Pre-proposals' descriptive texts comprising **5 pages** maximum in non-protected **PDF format** (non scanned, written using word processing software) must be turned in through the submission site. The number of pages is ALL INCLUSIVE; NO ANNEXES will be accepted. **The submission site will not upload any document which does not comply with requirements.**

Applicants are advised to use an **easily read document layout** (A4 pages, times 11 or equivalent, single spaced, 2 cm margins, numbered pages).

Applicants are advised to turn in a scientific document written in English to enable non-French-speaking reviewers to read the document. If the document is written in French, a translation may be requested.

The descriptive document must include the following information following the chart below:

- Reminder of the pre-proposal's acronym, the instrument, the challenge and the year (2016) in the header.
- COMPLETE TITLE of the pre-proposal

1. Scientific and technological objectives (recommended maximum: 2 to 3 pages)

The content of this section allows for a more accurate evaluation of the criterion "Quality and originality of research proposed" (see § B.3.5).

The purpose of this section is to set out scientific and technological objectives, research hypotheses, methodology and/or capacity to generate results, potential to advance a given field, ambition, novelty, potential to break new ground, methodology, scientific risks and the ways they are handled.

2. Project organisation and resources implemented: (recommended maximum: 1 to 2 pages)

The content of this section allows for a more accurate evaluation of the criterion "Project organisation and resources implemented" (see § B.3.5).

The purpose of this section is to give information on the expertise required to conduct the project by naming the scientists involved, the identities of institutions they are affiliated with and 2-3 relevant references directly related to the pre-proposal (publications, R&D highlights, patents, science prizes, products, processes, licenses, services...), and all other items providing a framework for judging the quality of partners and consortia where appropriate.

The role and experience of the scientific coordinator should also be noted; a short resume of the scientific coordinator may be a useful addition to this information.

Also specify how the grant requested will be provisionally divided up between partners and major expenditure items (equipment, personnel, services, other operating expenses) and research resources needed.

3. Project impact (Recommended maximum: 1 to 2 pages)

The content of this section allows for a more accurate evaluation of the criterion "Overall impact

of the project" (see § B.3.5).

This section describes:

- The societal impact, that is to say the project's ability to respond to societal challenges in select areas, including basic research
- the ability to meet goals with regard to chosen funding instruments,
- the expected scientific impact and strategy for disseminating results
- the economic impact and valorisation strategy

G.2 2ND STAGE: FULL SUBMISSION

Full proposals must include the following items:

- an online form,
- A scientific document uploaded via the submission site,
- An administrative and financial document signed by the legal representative of each partner applying for a grant on the submission site.

G.2.1 Online form

Scientific coordinators called back to submit a full proposal at the end of the first stage of the selection process receive a message with the submission site's URL.

Certain fields are pre-filled with information provided during pre-proposal submission; most fields are blank and must be filled in, however. Applicants are strongly advised to take into account the time it takes to gather and enter information. Additionally, two documents relating to the pre-proposal (pre-proposal descriptive document and online form in pdf format) are found on the submission site as annexes to the full proposal. These documents are integral to the full proposal made available to the evaluators for the selection process's second stage.

The following information must be entered online.

- Identity of the project (acronym, funding instrument¹², title in French and English, duration, ...);
- The identity of each Partner (specifically full name, abbreviated title, category of Partner and system for calculating grant amounts, type and unit number, managing and hosting authorities for a research organisation laboratory, name of the person authorised to legally represent the managing establishment to sign the financial and administrative document; SIRET number and workforce numbers for Enterprises, name of the person in charge of financial and administrative details, other financial support...);
- Names of the scientific leaders and work address for each Partner;
- Financial data, details per expenditure item and per Partner;
- Scientific abstracts (maximum 4000 characters per field): Project's scientific abstract (non-confidential) in French and English, overall objectives, scientific/technical obstacles, work programme and scientific, technological, and economic impacts.
- Experts requested to abstain from evaluation.

Foreign partners fill in administrative information for their online submission to ANR at the time of full proposal submission. Providing detailed budgetary information is not required.

¹² The acronym and the funding instrument must be the same as those used for the pre-proposal; they may not be modified.

G.2.2 Administrative and financial document signed

The administrative and financial document is generated using the submission site ("download the document to be signed" in the "project submission" tab) once all the information has been submitted online.

For public research partners, the document must be signed by the scientific leader, the laboratory director, the host unit, and when appropriate, by the legal representative of the managing establishment (**person authorised to sign a grant agreement, for successful projects**). For all other partners, the scientific leader and the legal representative sign the document. Should the project involve foreign partners, only the scientific leaders must sign.

Once signed by those partners applying for a grant, the document is scanned and must be submitted by the scientific coordinator via the ANR submission site by the closing date for submissions.

In certain cases, specific information must be scanned with the administrative and financial document¹³:

- Documents justifying deferral of the cut-off date for young researchers who earned their PhD before **1 January 2005** (see §B.3.2);
- Specific documents requested for certain kinds of co-funding, set out in annexes found on the Generic Call for Proposals webpage.

G.2.3 Scientific Document

The scientific document must be uploaded to the submission site in non-protected **PDF format** and may take up no more than 30 pages (non-scanned, written using word processing software). The number of pages is ALL INCLUSIVE; NO ANNEXES will be accepted. **The submission site will not upload any document not complying with requirements.**

Applicants are advised to use an **easily read document layout** (A4 pages, times 11 or equivalent, single spaced, 2 cm margins, numbered pages).

Applicants are advised to turn in a scientific document **written in English** so that non-French-speaking reviewers may read the document. If the document is in French, a translation may be requested. The document written in English is mandatory for PRCI.

For PRCI, the scientific document submitted to ANR must absolutely specify the contributions of the French team as well as those of foreign teams. Sufficient information must be provided to accurately evaluate the respective contributions of teams from each country in terms of scientific input, resources and financial request.

The full proposal's scientific document must include the following information according to the chart below:

- Header: project acronym, funding instrument and title "Generic Call for Proposals 2016";
- COMPLETE TITLE of the pre-proposal
- Table of contents
- Project abstract (4000 characters maximum ; should be the same as the abstract entered onto the submission site)
- Summary table of persons involved in the project (see details below)
- Possible ways in which the full proposal differs from the pre-proposal (maximum 1 page).

The content of this section will be used to evaluate the "Compliance with the pre-proposal" criterion.

Specify and justify any significant changes made since the drafting of the pre-proposal, in particular changes in duration, requested grant amount, scientific and technological objectives and composition of the consortium.

¹³ Since only one document may be uploaded, you must merge them into a single document.

1. Context, positioning, and objective of the full proposal (5 to 10 pages)

The content of this section allows for a more accurate evaluation of the criteria "Clarity of objectives and research hypotheses" and "Innovative nature and potential for progress with regard to the state of the art".

Present the state of knowledge on the subject. List contributions by project partners in the state of the art, including any preliminary results achieved.

When appropriate, describe the project's context by presenting, in terms of the objectives envisaged, an analysis of social, economic, regulatory, environmental, and industrial issues... Clearly delineate the project's positioning vis-a-vis current and previous projects, research competitors, patents and standards ... In the instance of project proposals following up on previous project(s) funded by ANR, scientific document must go into detail, with a clear assessment of results achieved and new problems posed, as well as new goals benefiting from hindsight on the previous project.

Position the project at the national level (specify any links with a structure or a regional /national platform, with a project supported through the Investments for the Future programme etc.), and other European and international programmes.

2. Scientific and technical programme, project organisation (10 to 15 pages)

The contents of this section allow for a more accurate evaluation of the criteria "Feasibility, particularly with regard to methods and management of scientific risks", "Project organisation and resources implemented", "Skills, expertise, and involvement of the scientific coordinator", "Quality and complementary nature of the consortium, quality of the collaboration for PRC, PRCE and PRCI or quality, complementary nature and potential of the team for JCJC" and "Appropriate resources for objectives"

For PRCI projects, the contents also enable assessment of the "Balanced scientific and financial contributions from respective countries' partners" criterion.

Set out the scientific programme and justify the work programme's attribution of tasks with regard to the objectives being pursued.

For each task, list the objectives and potential indicators of success, the leader and partners involved, the complete work programme, deliverables, partners' contributions, methods and technical decisions, risks, and fall-back possibilities. Calendars for respective tasks and their dependencies may be included if justified by graphical evidence (Gantt chart for example).

Demonstrate the quality and the complementary nature of the consortium, or the team for the Young researchers (JCJC).

Where appropriate, demonstrate the link between scientific disciplines and the complementary nature of skills called upon. For research projects dealing with subjects that might violate human, environmental or animal rights, discuss the ethical aspects of the project.

Provide a sound partner-by-partner scientific and technical justification with requested resources consistent with the information provided on the submission site, listed by major expenditure item (excl. management and structural fees): equipment, personnel, operating expenses.

Indicate, when applicable, the conditions of access to a very large research infrastructure (TGIR).

Short curriculum vitae of the scientific coordinator and his or her main partners could make a useful addition for this section.

3. Project impact, strategy for valorisation, protection and use of results (2 to 3 pages)

The content of this section allows for a more accurate evaluation of the criteria "The societal impact in terms of the project's capacity to address issues related to the challenge and the instrument", "Scientific Impact and strategy for disseminating results", and "Economic impact and valorisation strategy".

For PRCI projects, the contents also allows for evaluation of the criterion "Added value through European cooperation, benefits for France for cooperation outside Europe".

For JCJC projects, content allows for evaluation of the criterion "Project gives scientific coordinator greater autonomy".

Specify how the project fits in with the challenge for which it has been entered.

Clarify how the project meets the specific objectives of the funding instrument chosen.
 Specify the scientific impact and the actions of scientific communication, actions promoting scientific and technical awareness and education (outreach to other scientific communities, the general public, etc.), and contributions to higher education curricula.
 Specify how results will be promoted and create value, including a rough plan for using and protecting results, scientific, technical, industrial, and economic benefits...
 When appropriate, specify the project's positioning within the industrial strategy of the project's industrial partners, additional impacts (standardisation, creating awareness among government bodies, ...), deadlines and the nature of expected techno-economic benefits, the possible impact on employment, creation of new business opportunities...

- **Bibliographic references**

Summary table of persons involved in the project (example):

Partner	Name	First name	Current employment	Involvement throughout the the project's duration (person.month)	Role & Responsibilities within the project (4 lines max)
University X/ Company Y	SUNFLOWER	Tryphon	Professor		Scientific coordinator Characterisation of recombinant transcription factors in in-vitro systems...
					Scientific leader (partner #x)
					Other member (partner x)