



Horizon 2020 LEIT-Space 2016- 2017

How to prepare a good
proposal

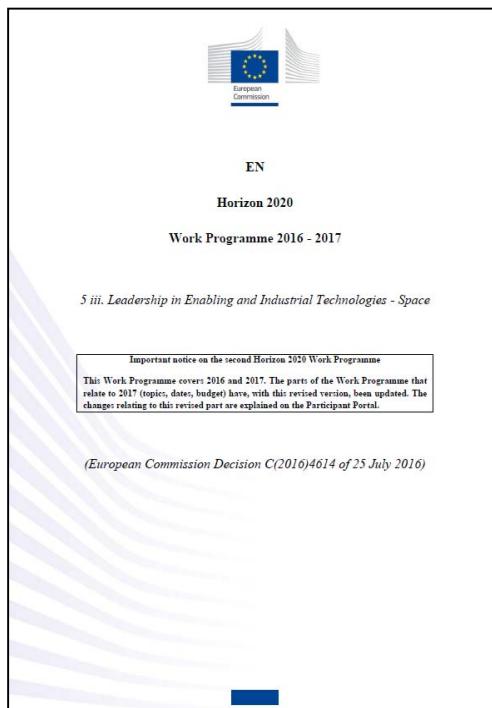
European Commission
Research Executive Agency
REA.B1 Space Research

External vs internal success factors



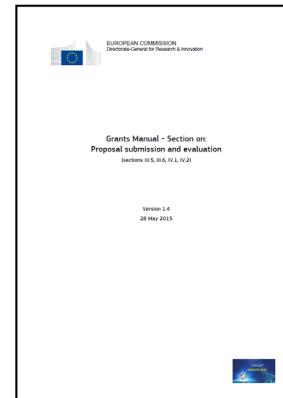
Call Content

- Open or top-down Topics
- Budget availability

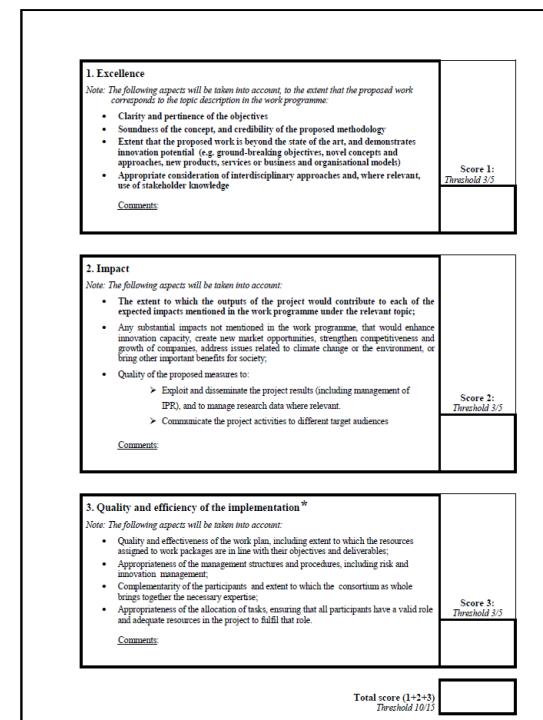


H2020 Rules

- Eligibility
- Admissibility



Evaluation criteria



Proposal structure



Know your success factors



Two side-by-side screenshots of the Horizon 2020 Work Programme 2016-2017. Both screens show the title "EN Horizon 2020 Work Programme 2016 - 2017". The left screen shows section "5 iii. Leadership in Enabling and Industrial Technologies - Space" with a note about the second Horizon 2020 Work Programme. The right screen shows section "20. General Annexes".

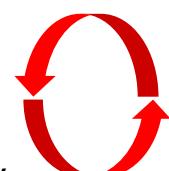
A screenshot of the "Horizon 2020 space - guidance documents for the 2016 calls for proposals" page. It includes an introduction about the Horizon 2020 programme, a call for proposals H2020-EO-2016, and a call for proposals H2020-COMPET-2016. The page lists various topics and their corresponding guidance documents.

- **Carefully read the Call topics text and additional documents:** proposal content and consortium composition should answer scope and expected impacts of the Call topic.

- Your idea may fit better in other calls?
Check the Calls launched within
 - the "**Excellent Science**" Programme
 - the "**Societal Challenges**" Programme
 - **SME actions**
 - **Fast track to Innovation Pilot**

• Resubmissions:

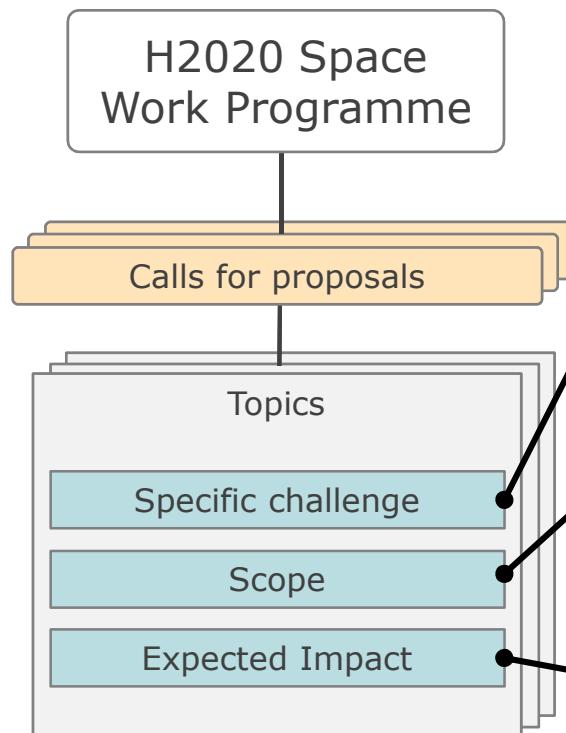
- The call topic may have slightly changed from previous call
- Update it as 2-3 years is a long time in science / technology



WP structure of the 'calls' & 'topics'



4



The 'problem'

Identifies the aspects of the challenge that needs to be tackled.

WP text does not outline the expected solutions to the problem, nor the approach to be taken by the applicant ("non-prescriptive" approach)

The 'problem in detail'

Provides **more details on the specific challenge** by specifying a perimeter to the problem described

The 'change' to be achieved

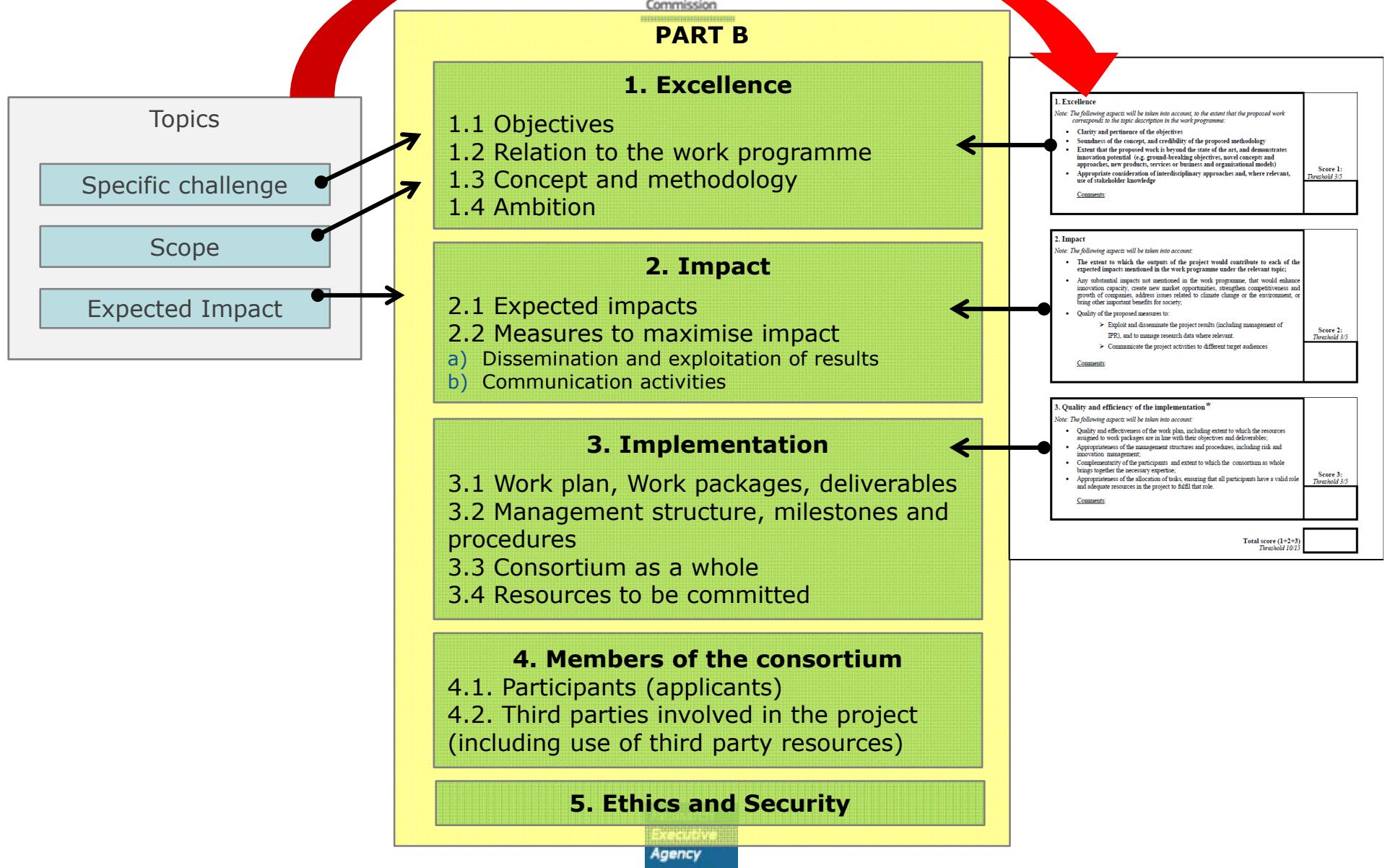
Provides a broad **description of what is the impact to be achieved through the project(s) to be funded.**

The **dissemination and exploitation** of future research results are vital for the impact

WP structure of the 'calls' & 'topics'



5



1. EXCELLENCE



PART B - 1. Excellence

1.1 Objectives –
clear, measurable, realistic and achievable within project duration

Crt 1.1 - Clarity and pertinence of the objectives

1.2 Relation to the work programme
explain how your proposal addresses the **specific challenge and scope** of the **work programme topic**

Crt 1.2 - Soundness of the concept, and credibility of the proposed methodology

1.3 Concept and methodology

(a)Concept

- Describe and explain the **overall concept** + main ideas, models or assumptions involved.
- Technology Readiness Levels**
- Links with other projects/activities
- Identify any **inter-disciplinary considerations** and, where relevant, **use of stakeholder knowledge**;

⚠ BE CAREFULL with TRL ≥5 and plan well the activities needed to reach it

Crt 1.4 - Appropriate consideration of interdisciplinary approaches and, where relevant, use of stakeholder knowledge.

⚠ Who are your USERS, CUSTOMERS? How do you plan to use their knowledge ?

(a)Methodology

- Describe and explain the **overall methodology**

1.4 Ambition

- advance beyond the state-of-the-art**
- extent the proposed work is ambitious
- Describe the **innovation potential**

Crt 1.3 - Extent that proposed work is beyond the state of the art, and demonstrates innovation potential e.g.

- ground-breaking objectives, novel concepts and approaches – RIA
- new products, services or business and organisational models – IA / RIA

2. IMPACT



PART B - 2. Impact

2.1 Expected impacts

- each of the expected impacts mentioned under the relevant topic
- any substantial impacts not mentioned in the work programme
- Describe any barriers/obstacles, and any framework conditions

2.2 Measures to maximise impact

a) Dissemination and exploitation of results

- draft 'plan for the dissemination and exploitation of the project's results'
- Business plan where relevant
- Outline the strategy for knowledge management and protection (incl IPR)
- Open Research Data -> information on how the participants will manage the research data generated and/or collected during the Project

a) Communication activities

- promoting the project and its findings
- > tailored to different target audiences, including groups beyond the project's own community

Crt 2.1 - The extent to which the outputs would contribute to the **expected impacts listed in the work programme** under the relevant topic

Crt 2.2 - Any substantial **impacts not mentioned in the WP**, that would enhance **innovation capacity**; create new market opportunities, strengthen competitiveness and growth of companies, address issues related to climate change or the environment, or bring other important benefits for society

Innovation dimension in H2020



H2020 aims for a balanced approach to research and **innovation**, not only limited to the development of new products and services on the basis of scientific and technological breakthroughs (*=research dimension*), but also incorporating aspects such as the **use of existing technologies in novel applications, continuous improvement and non- technological and social innovation** (*=innovation dimension*).

Innovation ≠ Invention

(an invention can grow into innovation by proper exploitation)

Innovation in the Evaluation criteria



1. Excellence

Note: *The following aspects will be taken into account, to the extent that the proposed work corresponds to the topic description in the work programme:*

- Clarity and pertinence of the objectives
- Soundness of the concept, and credibility of the proposed methodology
- Extent that the proposed work is beyond the state of the art, and demonstrates innovation potential (e.g. ground-breaking objectives, novel concepts and approaches, new products, services or business and organisational models)
- Appropriate consideration of interdisciplinary approaches and, where relevant, use of stakeholder knowledge

Comments:

Score 1:
Threshold 3/5

2. Impact

Note: *The following aspects will be taken into account:*

- The extent to which the outputs of the project would contribute to each of the expected impacts mentioned in the work programme under the relevant topic;
- Any substantial impacts not mentioned in the work programme, that would enhance innovation capacity, create new market opportunities, strengthen competitiveness and growth of companies, address issues related to climate change or the environment, or bring other important benefits for society;
- Quality of the proposed measures to:
 - Exploit and disseminate the project results (including management of IPR), and to manage research data where relevant.
 - Communicate the project activities to different target audiences

Comments:

Score 2:
Threshold 3/5

3. Quality and efficiency of the implementation *

Note: *The following aspects will be taken into account:*

- Quality and effectiveness of the work plan, including extent to which the resources assigned to work packages are in line with their objectives and deliverables;
- Appropriateness of the management structures and procedures, including risk and innovation management;
- Complementarity of the participants and extent to which the consortium as whole brings together the necessary expertise;
- Appropriateness of the allocation of tasks, ensuring that all participants have a valid role and adequate resources in the project to fulfil that role.

Comments:

Score 3:
Threshold 3/5

Total score (1+2+3)
Threshold 10/15

Innovation potential : (e.g. ground-breaking objectives, novel concepts and approaches, **new products, services or business and organisational models**).



Enhancing innovation capacity : (Any substantial impacts not mentioned in the WP, that would enhance innovation capacity; create new market opportunities, strengthen competitiveness and growth of companies, ..)

- Addressing **barriers/obstacles**, and any **framework conditions** such as **regulation and standards**;
- of the participating organisations/research community by enabling **new processes or partnerships** beyond the project consortium.

Innovation management = is a **process** which requires an understanding of both market and technical problems, with a goal of successfully transfer the innovations developed.

- *Is innovation management clearly assigned?*
- *How will innovation management be taken care of?*
- *Are concrete innovation tools identified? ...*

2. IMPACT



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a) Communication activities

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-> tailored to different target audiences, including groups beyond the project's own community

Crt 2.3 - Quality of proposed measures to
• exploit and disseminate project results (including IPR, manage research data where relevant)

BUSINESS PLAN – IA

⚠ • communicate the project activities to different target audiences

Dissemination ≠ Communication



Dissemination – one direction path (mainly presenting results)
e.g. presentation to conferences, publication in peer review journal, etc.



- **Dissemination plan:** Raise awareness about project outputs

Communication – two directions path (results & project activities)
e.g. organising workshop with users, discuss with customers, etc...



- **Communication plan:** Tailored to the needs of various audiences, including the public policy perspective of EU research and innovation funding

Often only general reference to communication activities made and these consist more of dissemination actions !!!



Dissemination ≠ Communication ≠ Exploitation

Exploitation plan:

- At which technical readiness level (TRL) do you start and how will you reach the TRL you aim for as expressed in the objectives of your proposal?
- What are the needed business model and marketing activities and how will they be decided amongst partners?

Common mistakes in Exploitation:

- **Lack of clear exploitation strategy** (especially relevant for IAs)
- **Lack of clear indication which results which will be exploited**, in which way, by whom
- **IPR issues** (access to background, results exploitation) left to the Consortium Agreement only

IPR



- **Management of Intellectual Property Rights (IPR):** Demonstration of specific measures in scope ownership, access/use, etc. *during and after* the project:

1. Identify your **own background** (*data, know-how and/or information held or identified by participants prior to their accession to the action*)
2. Verify if **background of third parties** is needed. If yes, what are their access rights? Need for authorisation to use and exploit the results?
3. Check the state-of-the-art: **existing patents**? E.g. via database provided by the European Patent Office: *Espacenet*

1. Specify the **ownership of the results**: Who owns what? Any transfers? On which conditions?
2. Is there a need to **protect the results**? If yes, assign cost. Ensure appropriate access and usage right for key IP during AND after the project (results & background)

A short reference to the IPR "to be developed in the Consortium Agreement" is not sufficient

Open Access to scientific publications



Open Access to scientific publications is an obligation under H2020
=> online access at no charge to the user **to peer-reviewed scientific publications**

Two main OA publishing models:

- *Self-archiving: 'traditional' publication plus deposit of manuscripts in a repository ('Green OA')*
 - Both versions contain the same peer-reviewed content, but may be differently formatted / usually, but not always, with embargo
- *OA publishing: immediate OA provided by publisher ('Gold OA')*
 - Usually, but not always, 'Author-pay' model (APC)
 - Some journals offer both subscriptions and open access publishing to selected on-line articles (hybrid journals)

http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-pilot-guide_en.pdf

NEW: Open access to research data



- Open research data sharing applies to the **data needed to validate the results presented in scientific publications**
- Additionally, projects can choose to **make other data available** open access and need to describe their approach in a **Data Management Plan (DMP)**, included as a deliverable in the project
- Costs related to data management and data sharing are eligible for reimbursement during the project duration
- Now by **default obligatory** for all new topics
 - **except if they decide to opt-out** for example for commercial or security reasons (see WP Annex L). Projects can opt-out at any stage.
 - Proposals will not be evaluated more favourably for participating or penalised for opting out.

http://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/open-access-data-management/open-access_en.htm

3. IMPLEMENTATION



PART B – 3. IMPLEMENTATION

3.1 Work plan – Work packages, deliverables

- **overall structure** of the work plan
- timing of the different work packages **Gantt chart**
- detailed work description (**WP, deliverables**, etc..)
- Pert chart or similar (**inter-relation of the WPs**)

3.2 Management structure, milestones and procedures

- **organisational structure** and the **decision-making mechanisms** + why they are appropriate to the complexity and scale of the project.
- where relevant, **innovation management**
- Describe **any critical risks**, relating to project implementation + **mitigation measures**

3.3 Consortium as a whole

- Describe the **consortium**
- Describe the **contribution of each partner**
- If a participant requesting EU funding is based in a country or is an international organisation that is not automatically eligible for funding, **explain why the participation of the entity in question is essential to carrying out the project**

3.4 Resources to be committed

- table showing number of person/months required
- table showing '**other direct costs**' for participants where those costs **exceed 15% of the personnel costs**

Crt 3.1 Quality and effectiveness of the **work plan**, including extent to which **resources assigned in work packages** are in line with objectives/ deliverables

Crt 3.2 - Appropriateness of **management structures** and procedures, including **risk** and **innovation management**

Crt 3.3 - Complementarity of the participants which the **consortium** as a whole brings together expertise

Crt 3.4 - Appropriateness of allocation of tasks, ensuring that all participants have a **valid role** and **adequate resources** in the project to fulfil that role

AVOID EMPTY SHELLS !

⚠ Explain well HIGH OTHER DIRECT COSTS !

4. IMPLEMENTATION



PART B – 4. Members of the consortium

4.1. Participants (applicants)

- a description of the legal entity and its main tasks
- a curriculum vitae + profile of the persons
- a list of up to 5 relevant publications, and/or products, services
- a list of up to 5 relevant previous projects or activities
- a description of any significant infrastructure and/or any major items of technical equipment



This section is not covered by the page limit.

*The information provided here will be used to judge the **operational capacity***

4.2. Third parties involved in the project (including use of third party resources)

- Does the participant plan to **subcontract** certain tasks (please note that core tasks of the project should not be sub-contracted)
- Does the participant envisage that part of its work is performed by **linked third parties**
- Does the participant envisage the use of **contributions in kind provided by third parties** (Articles 11 and 12 of the General Model Grant Agreement)

⚠ Explain well THE REASON FOR SUBCONTRACTORS, especially if the related costs are high, and be careful with predefined subcontractors !

5. Ethics & Security



- Each applicant is responsible for:
 - ✓ **identifying** any potential ethics issues
 - ✓ **handling** ethical aspects of their proposal
 - ✓ **detailed** how they plan to address them in sufficient detail already **at the proposal stage** so to **conform** to **national, European and international regulations**

- ✓ Part A in SEP – ethics self-assessment
- ✓ Part B section 5

How to complete your
ethics self-assessment



Guideline for applicants



The image shows the cover of a document titled "How to complete your ethics self-assessment". The cover features the European Commission logo at the top left, followed by the text "EUROPEAN COMMISSION" and "Directorate-General for Research & Innovation". Below this is a large, empty rectangular area. At the bottom right, there is a small section with the word "Guidance" above the title "How to complete your ethics self-assessment". At the very bottom right, the text "Version 3.0" and "3 February 2015" is printed.

In Space: Dual Use, export licenses, 3rd countries



- Does this research have the **potential for military applications?**
 - *Exclusive civilian focus of the research must be demonstrated*
- Do you need **export licenses** (for dual use items)?
 - *E.g., GNC, TPS etc.*
- Risk mitigation strategies for:
 - **Mission creep:** *change of focus toward military*
 - *Leak of "sensitive" information (**misuse**)*
- Does the participation of Third Countries, i.e., non-EU, beneficiaries or other, raise ethical issues? Export/Import Control?

The Regulation: Council Regulation (EC) No 428/2009 of 5 May 2009 setting up a Community regime for the control of exports, transfer, brokering and transit of dual-use items:
http://trade.ec.europa.eu/doclib/docs/2009/june/tradoc_143390.pdf

Quality = key to success



Demonstrate WHAT – WHY – HOW !

An **excellent idea** is the basis of a good proposal but **is not sufficient....**
The **expected impacts** and **implementation aspects** are as important !

The proposal should **excel in each single criterion !**

Be **specific in your objectives and expected impacts** and **clearly demonstrate** how you aim to **implement and sustain** them

1. Excellence <i>Note: The following aspects will be taken into account, to the extent that the proposed work corresponds to the topic description in the work programme:</i> <ul style="list-style-type: none">• Clarity and pertinence of the objectives• Soundness of the concept, and credibility of the proposed methodology• Extent that the proposed work is beyond the state of the art, and demonstrates innovation potential (e.g. ground-breaking objectives, novel concepts and approaches, new products, services or business and organisational models)• Appropriate consideration of interdisciplinary approaches and, where relevant, use of stakeholder knowledge <p><u>Comments:</u></p>	Score 1: Threshold 3/5
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2. Impact <i>Note: The following aspects will be taken into account:</i> <ul style="list-style-type: none">• The extent to which the outputs of the project would contribute to each of the expected impacts mentioned in the work programme under the relevant topic;• Any substantial impacts not mentioned in the work programme, that would enhance innovation capacity, create new market opportunities, strengthen competitiveness and growth of companies, address issues related to climate change or the environment, or bring other important benefits for society;• Quality of the proposed measures to:<ul style="list-style-type: none">➢ Exploit and disseminate the project results (including management of IPR), and to manage research data where relevant.➢ Communicate the project activities to different target audiences <p><u>Comments:</u></p>	Score 2: Threshold 3/5
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3. Quality and efficiency of the implementation* <i>Note: The following aspects will be taken into account:</i> <ul style="list-style-type: none">• Quality and effectiveness of the work plan, including extent to which the resources assigned to work packages are in line with their objectives and deliverables;• Appropriateness of the management structures and procedures, including risk and innovation management;• Complementarity of the participants and extent to which the consortium as whole brings together the necessary expertise;• Appropriateness of the allocation of tasks, ensuring that all participants have a valid role and adequate resources in the project to fulfil that role. <p><u>Comments:</u></p>	Score 3: Threshold 3/5
Total score (1+2+3) Threshold 10/15	

Optimise your chances to success



Understand the domain and its challenges

R&D but also market, IPR and regulations, competition

Be clear and explicit

Evaluators must judge only what they read and not on the proposal potential. They have limited time

Do a mock evaluation

Ask a colleague to conduct a self-assessment of the proposal against each evaluation sub-criterion. If you don't find the right answer easily in the text, the evaluators won't find it either!

Optimise available time to prepare your proposal

- Last minute preparations are often reflected in a lower quality which largely reduces the changes in success;
- Start a draft early + Submit on time
- Incomplete submission is not an Obvious Clerical Error
- **Late** submission in IT system = **inadmissible** proposal. Deadlines are strict!

Do not be afraid of letting the Commission see the **abstract of your proposal** in order to help us identify the best possible expert.

Some links



Grants Manual - Section on: *Proposal submission and evaluation*

http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/pse/h2020-guide-pse_en.pdf

Work Programme 2016-2017:

https://ec.europa.eu/programmes/horizon2020/sites/horizon2020/files/05iii.%20LEIT%20Space%202016-2017_pre-publication.pdf

Guidance for evaluators of Horizon 2020 proposals

http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/pse/h2020-evaluation-faq_en.pdf

Call pages: <http://ec.europa.eu/research/participants/portal/desktop/en/opportunities>

Templates for mock evaluations:

http://ec.europa.eu/research/participants/data/ref/h2020/call_ptef/ef/h2020-call-ef-ria-ia-csa_en.pdf

H2020 reference documents:

http://ec.europa.eu/research/participants/portal/desktop/en/funding/reference_docs.html

Communication guidelines for projects:

http://ec.europa.eu/research/participants/data/ref/h2020/other/gm/h2020-guide-comm_en.pdf

Guide on beneficiary registration, validation and financial viability check Manual:

http://ec.europa.eu/research/participants/docs/h2020-funding-guide/index_en.htm

ETHICS

How to complete your ethics Self-Assessment:

http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/ethics/h2020_hi_ethics-self-assess_en.pdf

Ethics Issues Table template:

http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/ethics/ethics-eit_en.pdf



In these slides the EO and COMPET 2017 Work programme text has been matched into relevant H2020 evaluation criteria.

The purpose is to draw the attention of the applicants and evaluators to salient points in the WP text, and to ensure consistency of the evaluation at a topic level.

What is quoted here is only the unaltered WP text, what should be taken in consideration in addition is the general guidance to the evaluation criteria.



EO-1-2017

Downstream applications

Excellence

EO-1



1.1. Clarity and pertinence of the **objectives**

... **foster market development exploiting the added value of ... foster market development exploiting the added value of integration of EO observation technologies** ... with positioning ones and ICT ... across different market segments through the development of applications, The **outcome** of this innovation project should be a **commercial service platform**, sustained by a production process capable to deliver to the user a product which is **validated and accepted as a marketable product**

1.2. Soundness of the **concept**, and credibility of the proposed **methodology**

This needs to be achieved in an environment **integrated at the level of the user**, in order for users to accept the innovative potential which the product promises. This will require also specific attention to be given to the various **processes in place in the users' workflows** which incorporate the EO information.
Copernicus should be considered as **part of the solution** which may include other space or non-space inputs. The choice of **EO application is left to the proposer**.

1.3. Extent that the proposed work is beyond the **state of the art**, and demonstrates **innovation potential** (e.g. ground-breaking objectives, novel concepts and approaches, new products, services or business and organisational models)

... and encourage their **insertion into the market**.

1.4. Appropriate consideration of **interdisciplinary approaches** and, where relevant, use of **stakeholder knowledge**

For such applications and developments to succeed in the market, the **product needs to be shaped according to users' needs and their value to users must be openly demonstrated** to the wider user community. **Service level models** are to be developed, with appropriate quality of service definitions for the application.

Impact EO-1



*2.1. The extent to which the outputs of the project would contribute to each of the expected impacts mentioned in the **work programme** under the relevant topic*

- Establish sustainable supply chains for innovative EO value added products and services with **demonstrated commercial value** with **targeted client communities**. Complete integration, based on international standards, into the customer's existing business processes and processing chains, as well as the **economic viability of the application is to be demonstrated**;
- Enhance the **European industry's** potential to take advantage of market opportunities and establish leadership in the field, and to boost business activity;
- Lead to **new or improved products, processes or services on the market**, by industry including SMEs, which are **capable of generating, after the end of public funding, turnover and thus create new jobs**.

*2.3. Quality of the proposed measures to **exploit and disseminate** the project results (including management of IPR), and to manage research data where relevant and to **communicate the project activities** to different target audiences*

A **business model**, and a value chain market analysis, which includes the phase of the project following the end of the public funding, **should be part of the proposal**.

Transnational collaboration has a key role to play in this context, as it enhances access to markets beyond the national borders,

Corresponding **validations and customisations** are to be undertaken, and the **business case for the application is to be demonstrated**.

Application products are expected to adopt **open standards** for data documentation, data models and services including data processing, visualisation and cataloguing.



EO-2-2017

EO Big Data Shift

Excellence EO-2



*1.1. Clarity and pertinence of the **objectives***

Activities are expected to address **adaptation of big data technologies to Copernicus** user scenarios and should concentrate on the **intermediate layers** describe above.

[...] **enable Copernicus services, public and intermediate commercial users** to engage with and serve their constituency with localised/specialised higher value services.

[...] without having to build up storage and processing capacities for Copernicus data and information but benefiting from the storage and processing services provided by ICT companies.

*1.2. Soundness of the **concept**, and credibility of the proposed **methodology***

Activities should include the **development of tools** allowing for the chaining of different value adding activities increasing incrementally the information and knowledge content of EO and non EO data

Activities should address **any relevant aspect of the data lifecycle which can solve EO big data challenges**, in particular **data management activities** [...] and **usage activities**[...].

Big Data, activities shall **bridge the gap between Earth observation and information technology sectors** ... and aiming at **developing innovative solutions** taking into account the needs of

- 1) non-expert users like policy makers involved in societal challenges,**
- 2) experts involved, and**
- 3) small and medium innovative enterprises.**

Activities shall rely on **open source software/tools/modules/plug-ins** and shall **include small-scale demonstrations**.

*1.4. Appropriate consideration of interdisciplinary approaches and, where relevant, use of **stakeholder knowledge***

Activities shall be **complementary to activities enabled by the ICT and research infrastructures** work programmes which address generic challenges in the area of data mining, open linked data, web ontology, digital earth.

Impact EO-2



2.1. The extent to which the outputs of the project would contribute to each of the expected impacts mentioned in the work programme under the relevant topic

- Enable value adding services on generic data and information storage and processing facilities which can **allow public and commercial users effective production environment** to interact with and serve their user base without deploying their own storage and processing facilities.
- Make **access to the Copernicus data and information easy and user friendly through scalable dissemination and exploitation software** based on international standards.
- Foster the establishment of **interoperable access facilities** to all EU Member States.
- Link with other big data initiatives.
- Provide **user community tools** including best-practices.
- Ensure **resilience of the overall dissemination and exploitation system**.
- Optimise the use of Copernicus data by **non-traditional user communities to meet societal challenges**.



EO-3-2017

Preparation for a European capacity to monitor CO₂ anthropogenic emissions

Excellence EO-3



1.1. Clarity and pertinence of the **objectives**

...**independent European capacity for CO2 anthropogenic emissions**, which includes space-borne observation.

The following **four areas need to be coordinated** to prepare a suitable and operational European approach:

1. **Reconciling top down and bottom up estimates**
2. **Library of simulations for emissions and atmospheric transport**
3. **Uncertainty trade-off for fossil fuel emissions**
4. **Attributing CO2 emissions from in-situ measurements**

1.2. Soundness of the **concept**, and credibility of the proposed **methodology**

...the CSA is expected **to act as an accompanying scientific and technical support to the CO2 monitoring task force**, which in turn will provide the necessary programmatic guidance.

...it has **to build on past activities of the European Space Agency (ESA)** and **will be coordinated with the ESA's on-going and future programmes**

Activities will encompass the **coordination of ongoing efforts**, include mutual **identification of research and infrastructural gaps**, and facilitate a **cooperation of further research and development** to be undertaken...

1.3. Quality of the proposed coordination and/or support measures

Initiating **the establishment of this community** while delivering first concrete elements **is** at the heart of this action to **cluster all relevant existing competences within Europe** on the CO2 emissions topic and thus reach the critical mass required for addressing such a challenging endeavour.

...will need the involvement of various players, such as **space agencies, operators of insitu measurement stations and of numerical weather prediction, leading experts for modelling and data assimilation**.

Impact EO-3



*2.1. The extent to which the outputs of the project would contribute to each of the expected impacts mentioned in the **work programme** under the relevant topic*

The proposal is expected to **lay the mature foundation for an independent space-borne observation capacity for CO₂ in the context of Europe's Climate Change challenges**.

Coordination and networking efforts are expected to lay the **foundation for the operational integration of all relevant European capacities** as a subsequent step.

- Make a **significant contribution** to addressing the unresolved **issue of ground-based versus space derived estimates of CO₂ fluxes**.
- **Generate a large database of CO₂ sources, sinks and atmospheric transport processes** to help dimensioning the various elements to develop an operational EU anthropogenic CO₂ emission monitoring capacity.
- **Establish a set of requirements regarding the accuracy as well as spatial and temporal resolutions for anthropogenic CO₂ emissions estimates**, such that the policymakers can be provided with reliable CO₂ emission trends to evaluate the impact of (I)NDCs.
- **Shape the appropriate dimension and distribution of a surface network** to separate biogenic from anthropogenic CO₂ emissions.

Implementation EO-3



3.3. Complementarity of the participants and extent to which the consortium as whole brings together the necessary expertise

...have the ability to **network with suitable research actors to fill the knowledge gaps**, and have the required **expertise to assess the needs for an end-to-end operational system**, with due attention to potential international cooperation opportunities for tackling this global challenge.



COMPET-1-2017

Technologies for European non-dependence and competitiveness

EXCELLENCE COMPET-1



Your Proposal

Please choose an acronym for your proposal. It will appear also in the "General Information" section of the submission form Part A and can also be updated there.

Acronym* Please restrict acronym to latin characters only

Short Summary (max. 2000 characters)*

Character count: 0

Technology lines* Please select

[next >>](#)

1.1. Clarity and pertinence of the **objectives**

Activities shall address technologies identified on the list of Actions for 2015/2017

Critical Space Technologies for European Strategic Non-Dependence – Actions for 2015/2017"
(<http://ec.europa.eu/growth/sectors/space/research/horizon-2020>)

- U09 – Cost effective multi - junction solar cells for space applications
- U16 – Space qualified GaN components and demonstrators
- U17 – High density (up to 1000 pins and beyond) assemblies on PCB and PCBs
- U21 – Very high speed serial interfaces
- U23 – Development of large deployable structures for antennas
- U26 – Space qualified carbon fibre and pre-impregnated material sources for launchers and satellite subsystems

1.2. Soundness of the **concept**, and credibility of the proposed **methodology**

High level specifications and key requirements can be found in the list of actions for 2015-2017.

1.3. Extent that the proposed work is beyond the **state of the art**, and demonstrates **innovation potential** (e.g. ground-breaking objectives, novel concepts and approaches, new products, services or business and organisational models)

...go **beyond the present state-of-the-art** or, preferably, the expected state of the art at the time of completion if alternative technologies are being developed outside Europe.

1.4. Appropriate consideration of **interdisciplinary** approaches and, where relevant, use of **stakeholder knowledge**

Technological spin in and/or bilateral collaborations should be enhanced between **European non-space and space industries** and proposals are expected to provide advanced critical technologies that are of common interest to different space application domains (e.g. telecom, Earth observation, science, etc.), or even with applicability to terrestrial domains.

2.1. *The extent to which the outputs of the project would contribute to each of the expected impacts mentioned in the **work programme** under the relevant topic*

- **Reduce the dependence on critical technologies** and capabilities from outside Europe for future space applications ...
... by developing in a timely manner **reliable and affordable space technologies** that in some cases may already exist outside Europe or in European terrestrial applications;
- **Enhance the technical capabilities and overall competitiveness** of European space industry satellite vendors on the worldwide market;
- **Open new competition opportunities for European manufacturers** ...
- Enable the European industry to **get non-restricted access to high performance technologies** ...

2.3. *Quality of the proposed measures to **exploit and disseminate** the project results (including management of IPR), and to manage research data where relevant and to **communicate the project activities** to different target audiences*

Proposals should include **a work package dedicated to the development of a commercial evaluation of the technology**, and should address how to **access the commercial market with a full range (preload) of recurring products**.



COMPET-2-2017

Competitiveness in Earth observation mission technologies

Excellence COMPET-2



*1.1. Clarity and pertinence of the **objectives***

The specific challenge, for the mid-term is to bring the Technology Readiness Levels (TRL) forward for a number of Earth observation technologies and to ensure the readiness of European solutions to ensure the readiness of European solutions to propose and support new mission **concepts taking advantage of nano-, micro- and mini-satellites**.

The aim of this topic is to **demonstrate, in a relevant environment, technologies, systems and sub-systems for Earth observation**.

Proposals are sought with relevance in the domain of technology development for space in the fields of:

- **Optical technologies for high precision sensing**
- **Detector technology and complete detection chain enhancement in the domains of CMOS and Infrared for Earth observations**
- **Sensors and mission concepts** delivering high accuracy parameters **for emission measurements**
- **Active antennas for radar, digital beam-forming and waveform generation, large deployable reflectors.**
- **Sensors, actuators and control technologies** for high precision Attitude and Orbital Control Systems (**AOCS**), in particular for small satellites, and Guidance, Navigation and Control (**GNC**).
- Technologies to advance in **fractionated systems and formation flying** for Earth Observation.

*1.2. Soundness of the **concept**, and credibility of the proposed **methodology***

Proposals should **address and demonstrate significant improvements** in such areas as miniaturisation, power reduction, efficiency, versatility, and/or increased functionality... Proposals that develop technologies **targeting TRL 6, or lower TRLs**, are welcome.

*1.3. Extent that the proposed work is beyond the **state of the art**, and demonstrates **innovation potential** (e.g. ground-breaking objectives, novel concepts and approaches, new products, services or business and organisational models)*

Substantially **improved in-depth state-of-the-art technologies** in key areas such as optical and radar systems, sounders, lidars and detectors for Earth observation.

*1.4. Appropriate consideration of **interdisciplinary** approaches and, where relevant, use of **stakeholder knowledge** ...should **demonstrate complementarity to activities already funded by Member States and the European Space Agency..***

Impact COMPET-2



*2.1. The extent to which the outputs of the project would contribute to each of the expected impacts mentioned in the **work programme** under the relevant topic*

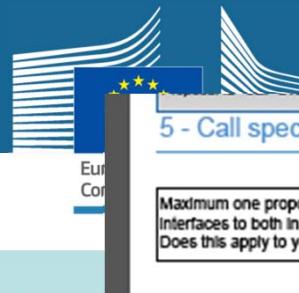
- The proposals must describe how the proposed developments will contribute to **strengthening Europe's position in industrial competitiveness in technologies for Earth observation payloads and mission**, despite the target platform size and scalability.
- The technologies to be addressed in the proposals should represent **significant improvements compared to existing Earth observation missions** in terms of capability, precision, efficiency or other characteristics, **opening new avenues for future space systems**.
- **Greater industrial relevance of research actions** and output as demonstrated by deeper involvement of industry, including SMEs, and **stronger take-up of research results**.
- Fostering links between academia and industry, **accelerating and broadening technology transfer**.



COMPET-3-2017

High speed data chain

Excellence COMPET-3



5 - Call specific questions

?

Maximum one proposal exploiting NRT/QRT quality of data, with due regard to interoperability of interfaces to both innovative ICT dissemination architecture and applications will be selected for funding.
Does this apply to your proposal?

Yes No

1.1. Clarity and pertinence of the objectives

Activities shall aim at providing **advanced on-board data handling and transfer** for Earth observation and Telecommunication systems, **and its management and exploitation in mission ground segment**.

1.2. Soundness of the concept, and credibility of the proposed methodology

A...proposals **addressing the full data chain** (processing and compression, storage and transmission), **or a coherent part of it**....:

- Re-configurable **high data rate links** [...]
- **On-board data processing**, implementation of complex data algorithms [...]
- **On-board data compression** systems to improve on-board data **storage** [...]
- **High data rate image** (optical and/or radar) **and video processing** [...]
- Improved **on-board data storage** ensuring efficiency and reliability [...]
- Anticipate how the **ground segment** will cope with higher data rates to improve the overall data throughput [...]

B Anticipate the need to link innovative ground segment architectures based on new ICT technologies, including **cloud**, in the "Big Data" domain and the rise in user demand for wide access to **Near Real Time (NRT) and Quasi Real Time (QRT) data in social media and mobile applications**.

1.3. Extent that the proposed work is beyond the **state of the art**, and demonstrates **innovation potential** (e.g. ground-breaking objectives, novel concepts and approaches, new products, services or business and organisational models)

Faster processing, larger storage, and high bandwidth transmissions to users will be needed. Moreover, **smart on-board data compression and optimisation** will become a growing necessity. All these improvements will be required to efficiently support the next generation of data intensive missions. To support this future scenario, innovations must be brought to the **payload data management system** (including data optimisation processes), to **inter-satellite links**, to **satellite-ground communication**, and to the **ground segment data handling system**.

Impact COMPET-3



*2.1. The extent to which the outputs of the project would contribute to each of the expected impacts mentioned in the **work programme** under the relevant topic*

- To provide elements for the **high speed data chain management** (including processing and compression, storage and transmission) and to support technologies for **data intensive next generation of Telecommunications and Earth observation systems**.
- Greater industrial relevance of research actions and output as demonstrated by **deeper involvement of industry**, including SMEs, and **stronger take-up of research results including support to standardisation** (CCSDS34).
- Fostering links between academia and industry, accelerating and broadening technology transfer.



COMPET-4-2017

Scientific data exploitation

Excellence COMPET-4



*1.1. Clarity and pertinence of the **objectives***

This topic will cover the **exploitation of all acquired and available data provided by space missions** in their operative, post-operative or data exploitation phase **focusing on astrophysics (including exoplanets), heliophysics and the Solar System exploration, including the Moon.**

*1.2. Soundness of the **concept**, and credibility of the proposed **methodology***

Projects selected under this call may rely on the **data available through all the available ESA Space Science Archives** when possible or other means (e.g. instrumentation teams). **Combination and correlation** of this data with **international scientific mission data**, as well as with relevant data produced by **ground-based infrastructures** all over the world, is encouraged...

*1.3. Extent that the proposed work is beyond the **state of the art**, and demonstrates **innovation potential** (e.g. ground-breaking objectives, novel concepts and approaches, new products, services or business and organisational models)*

... to further **increase the scientific return and to enable new research activities using existing data sets.**

Impact COMPET-4



*2.1. The extent to which the outputs of the project would contribute to each of the expected impacts mentioned in the **work programme** under the relevant topic*

- [i] higher number of scientific publications based on Europe's space data,
- [ii] high-level data products made available through appropriate archives,
- [iii] tools developed for the advanced processing of data,
- [iv] add value to existing activities on European and international levels,
- [v] enhance and broaden research partnerships.

2.2. Any substantial impacts not mentioned in the work programme, that would enhance innovation capacity, create new market opportunities, strengthen competitiveness and growth of companies, address issues related to climate change or the environment, or bring other important benefits for society

Resulting analyses should help **preparing future European and international missions**.

*2.3. Quality of the proposed measures to **exploit and disseminate** the project results (including management of IPR), and to manage research data where relevant and to **communicate the project activities** to different target audiences*

When possible, **enhanced data products should be suitable for feeding back into the ESA archives**.

IMPLEMENTATION COMPET-4



3.3. Complementarity of the participants and extent to which the consortium as whole brings together the necessary expertise

International cooperation is encouraged in particular with countries active in space exploration and science, or where their participation is deemed essential for carrying out the activities of this topic.



COMPET-5-2017

Space Weather

Excellence COMPET-5-2017



*1.1. Clarity and pertinence of the **objectives***

Exploratory work studying **space weather with a view to enhancing the understanding of space weather and its impact**. Proposals can cover **the full range of space weather phenomena** from the solar cycle, flares and coronal mass ejections to the effects of the solar wind in the near-earth environment and the evolution in between.

*1.2. Soundness of the **concept**, and credibility of the proposed **methodology***

This activity shall address **space weather and its effects, impacts and mitigation techniques with application to aerospace and ground systems**.

IMPACT COMPET-5-2017



*2.1. The extent to which the outputs of the project would contribute to each of the expected impacts mentioned in the **work programme** under the relevant topic*

Proposals are expected to improve the

- i. **understanding of Space Weather phenomena** and
- ii. their **impact on space systems and terrestrial infrastructure**, and
- iii. are also expected to **analyse viable mitigation strategies**, and
- iv. to **demonstrate how these add value compared to existing mitigation strategies**.

Implementation COMPET-5-2017



*3.3. Complementarity of the participants and extent to which the **consortium** as whole brings together the necessary expertise*

There is scope for **cooperation with international partners with relevant expertise** (entities from third countries could benefit from EU funding under this topic).



COMPET-6-2017

Space portal

Excellence COMPET-6



*1.1. Clarity and pertinence of the **objectives***

..[a]single space web portal for space research in Europe to act as **archive and outreach tool of research institutionally funded** and **promote European results and publications towards professionals and citizens alike**.

*1.2. Soundness of the **concept**, and credibility of the proposed **methodology***

Provide **a repository of all relevant information regarding FP6, FP7, Horizon 2020 funded space projects (including public deliverables, data, software tools where possible)**.

Implementation of an effective space web portal for Europe, **able to point to relevant resources as required** and depending on the type of queries.... The space portal should act as a platform to **access appropriate information** on research projects leading to personalised networks of projects with common interests.

*1.3. Extent that the proposed work is beyond the **state of the art**, and demonstrates **innovation potential** (e.g. ground-breaking objectives, novel concepts and approaches, new products, services or business and organisational models)*

Provide a one stop-shop **user-friendly** and **visually appealing knowledge oriented project**

...

....to become the **main reference and entry point** for **European citizens and professionals** interested in space research activities.

It should be **complementary to initiatives of NCP networks**.

*2.1. The extent to which the outputs of the project would contribute to each of the expected impacts mentioned in the **work programme** under the relevant topic*

The centralisation of projects will allow

- I. the **easy search for projects** that fall **under a particular domain, cluster or theme** and
- II. serve **as archive from a scientific and technological angle**.
- III. It will also allow to **identify potential partners and showcase European results and publications**.
- IV. It would also provide European citizens and professionals with a **single entry point for space research activities** related information.

2.2. Any substantial impacts not mentioned in the work programme, that would enhance innovation capacity, create new market opportunities, strengthen competitiveness and growth of companies, address issues related to climate change or the environment, or bring other important benefits for society

The proposal should present **a realistic plan for the sustained operations of the portal** after the end of the EU-funded project period.

... European citizens and professionals ...



COMPET-7-2017

Technology transfer and business generators

Excellence COMPET-7



*1.1. Clarity and pertinence of the **objectives***

This activity ... **should assist entrepreneurs and other innovation agents overcoming financial, administrative and networking barriers to innovation.**

*1.2. Soundness of the **concept**, and credibility of the proposed **methodology***

In particular, it should **contribute to access public funding opportunities**, such as the SME instrument of the **European Union**, as well as potentially other funding opportunities from **Member States, ESA and regional authorities**.

The take up of applications developed in the context of Galileo, EGNOS and Copernicus is encouraged.

*1.3. Extent that the proposed work is beyond the **state of the art**, and demonstrates **innovation potential** (e.g. ground-breaking objectives, novel concepts and approaches, new products, services or business and organisational models)*

This action should be **complementary to the ESA BICs** (that already offer space-specific support) **and the European Enterprise Network (EEN) approach**, and should **encompass other incubation centres that support space-related companies**, particularly those exploiting the **applications of space data and services**.

Impact COMPET-7



*2.1. The extent to which the outputs of the project would contribute to each of the expected impacts mentioned in the **work programme** under the relevant topic*

Creating opportunities for new and existing start-ups coming from space and non-space sectors by:

- Facilitating **access to finance** through outreach and networking;
- Maximising opportunities offered by the SME instrument for space;
- Assisting the **development of viable business cases**;
- **Accompanying start-ups in commercial phases**.