DG GROW - Internal Market, Industry Entrepreneurship and SMEs

GROW/I1 - Space Policy and Research Unit

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Journee d'Information H2020 – Espace, Paris, 17/09/2015

Following the positive opinion of the Horizon 2020 Space Programme Committee on the draft work programme (WP) 2016-2017 a pre-published draft version (part 05iii LEIT-Space) is available on the Commission website:

http://ec.europa.eu/programmes/horizon2020/en/draft-work-programmes-2016-17

The associated draft guidance documents (referred to in the WP text) for the 2016 calls have been pre-published as well:

http://ec.europa.eu/growth/sectors/space/research/horizon-2020/

Please note that the information available in the webpages indicated above and in the following slides constitute working documents not yet endorsed by the European Commission and therefore their content does not prejudge the final decision by the Commission

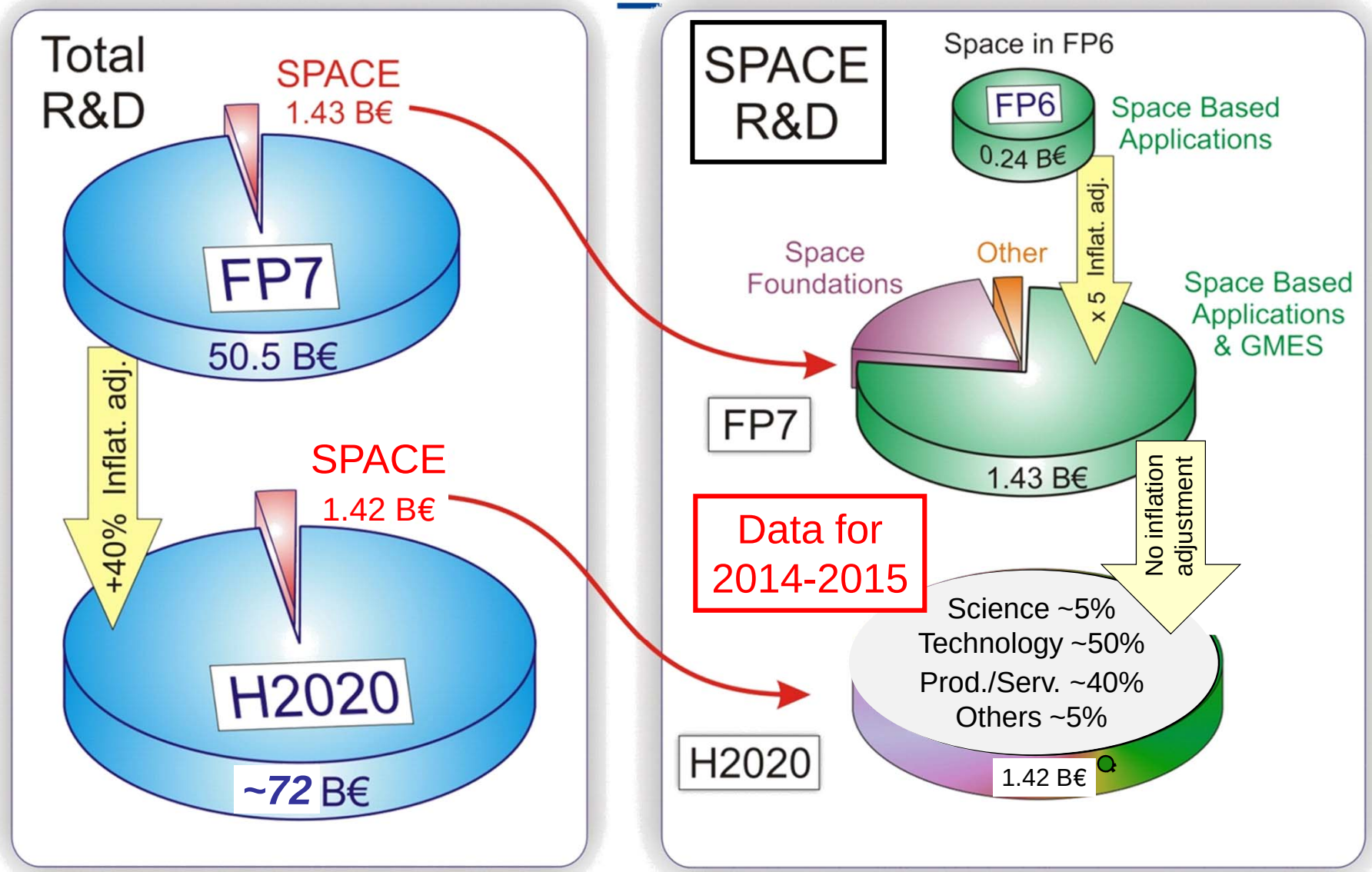
SUMMARY

1 - Space activities in the EU Programmes

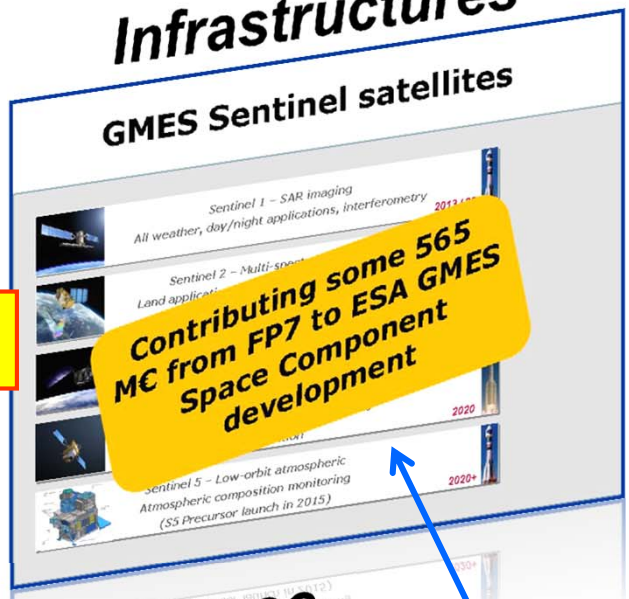
1.1 - Space Research activities in FP7-Space (2007-2013)

Framework RTD programmes

Space from FP6 → FP7 → H2020



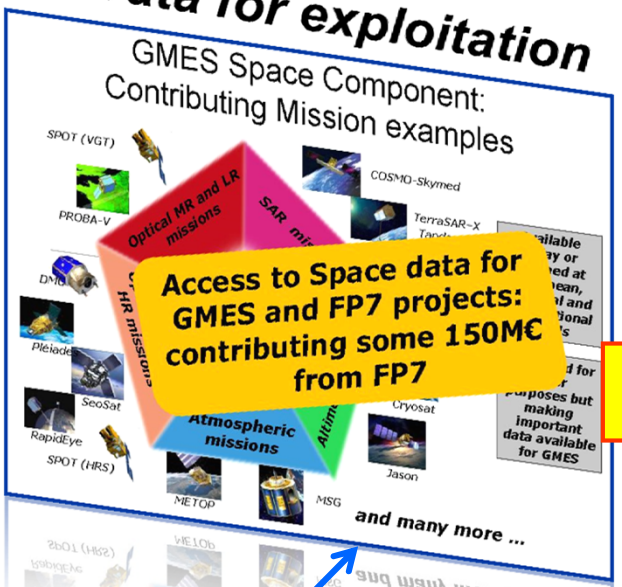
Infrastructures



41.0 %

565 M€

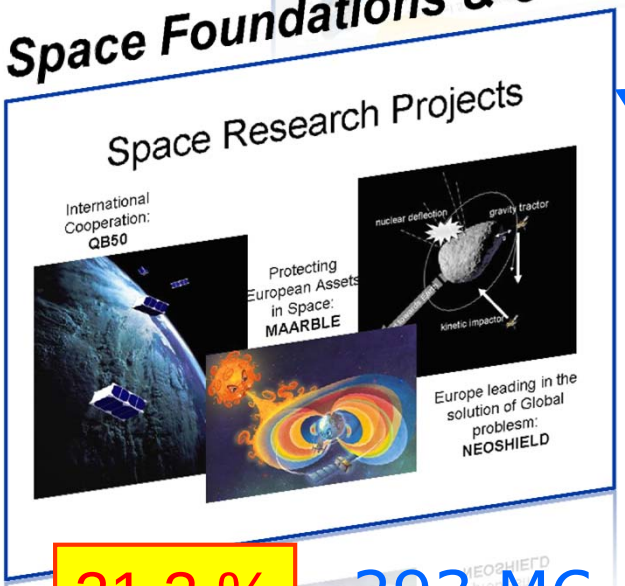
Data for exploitation



10.9 %

150 M€

Space Foundations & CC



21.3 %

293 M€

Activities developed under the FP7 / SPACE

Applications & Services

369 M€

26.8 %

RTD projects
in FP7 / Space

999 PROPOSALS submitted in 6 CALLS

262 PROJECTS funded by EC with ~ 662 M€

2007

1st Call

2009

2nd Call

2010

3rd Call

2011

4th Call

2012

5th Call

2013

6th Call

Further information available at

http://ec.europa.eu/enterprise/policies/space/research/resources/index_en.htm

1.2 - Space Programmes in the Multiannual Financial Framework 2014-2020

EU Space Programmes

European Commission

Multiannual Financial Framework 2014-2020

~ 12.000 M€

~ 3.800 M€

Copernicus
The European Earth Observation Programme

~ 1.400 M€

~ 6.300 M€

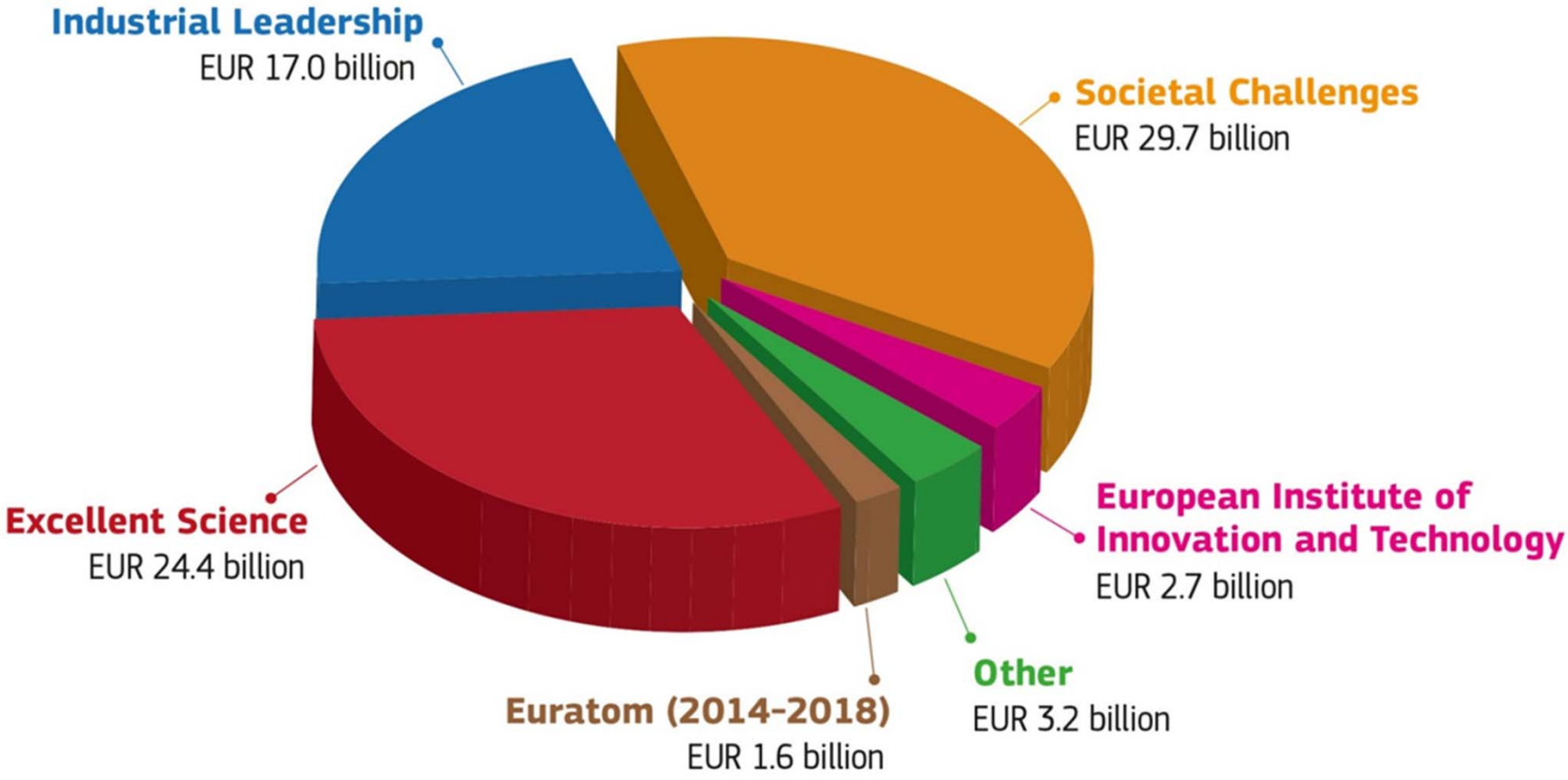
GALILEO EGNOS

HORIZON 2020

European Commission

HORIZON 2020 BUDGET (in current prices)

€ 79 billion from 2014 to 2020



Horizon 2020 Space

2 - General introduction to Horizon 2020

European Commission

What is Horizon 2020?

The new European Union programme for research and innovation for 2014-2020 with a budget of €79 billion (in current prices including inflation)

A core part of Europe 2020, Innovation Union & European Research Area:

- Responding to the economic crisis to invest in jobs and growth
- Addressing people's concerns about their livelihoods, safety and environment
- Strengthening the EU's global position in research, innovation and technology

What is new in Horizon 2020?

- **A single programme** bringing together three separate programmes/initiatives*
- **Coupling research to innovation** – from research to retail, all forms of innovation
- **Focus on societal challenges** facing EU society, e.g. health, clean energy and transport
- **Simplified access,** for all companies, universities, institutes in all EU countries and beyond

** The 7th Research Framework Programme (FP7), innovation aspects of Competitiveness and Innovation Framework Programme (CIP), EU contribution to the European Institute of Innovation and Technology (EIT)*

Simplification: summary

- **Single set of** simpler and more coherent participation **rules**
- New **balance between trust and control**
- Moving from several **funding rates** for different beneficiaries and activities to just two
- Replacing the four methods to calculate overhead or «indirect costs» with a **single flat rate**
- Major simplification under the **forthcoming financial regulation**
- **Successful applicants to get working more quickly:** time-to-grant of 8 months; exceptions for the ERC and in duly justified cases

Strong participation by SMEs

- **Integrated approach** - around 20% of the total budget for societal challenges and LEITs to go to SMEs
- **Simplification** of particular benefit to SMEs (e.g. single entry point)
- A **new SME instrument** will be used across all societal challenges as well as for the LEITs
- A dedicated activity for research-intensive SMEs in **'Innovation in SMEs'**
- **'Access to risk finance'** will have a strong SME focus (debt and equity facility)

New approach to work programmes and calls

- **More strategic**
- **Two year work programmes**
- **Less prescriptive calls**
- **Two parts**
  - Calls for proposals
  - Other actions

Horizon 2020 priorities

Priority 1 – Excellent science:

Why?

- World class science is the foundation of tomorrow's technologies, jobs and wellbeing
- Europe needs to develop, attract and retain research talent
- Researchers need access to the best infrastructures

Priority 2 – Industrial leadership:

Why?

- Strategic investments in key technologies (e.g. advanced manufacturing, micro-electronics) underpin innovation across existing and emerging sectors
- Europe needs to attract more private investment in research and innovation
- Europe needs more innovative small and medium-sized enterprises (SMEs) to create growth and jobs

Priority 3 – Excellent science:

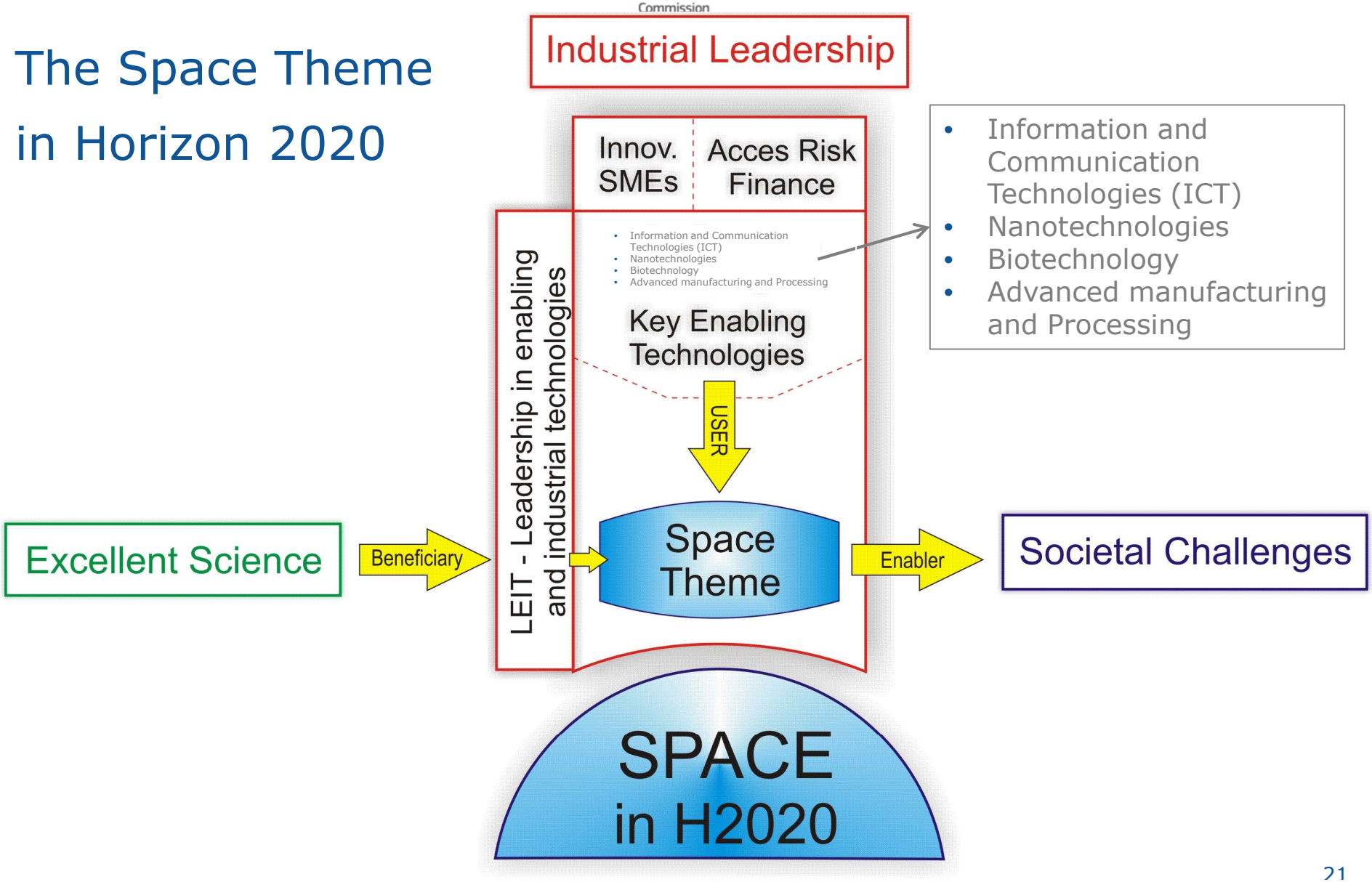
Why?

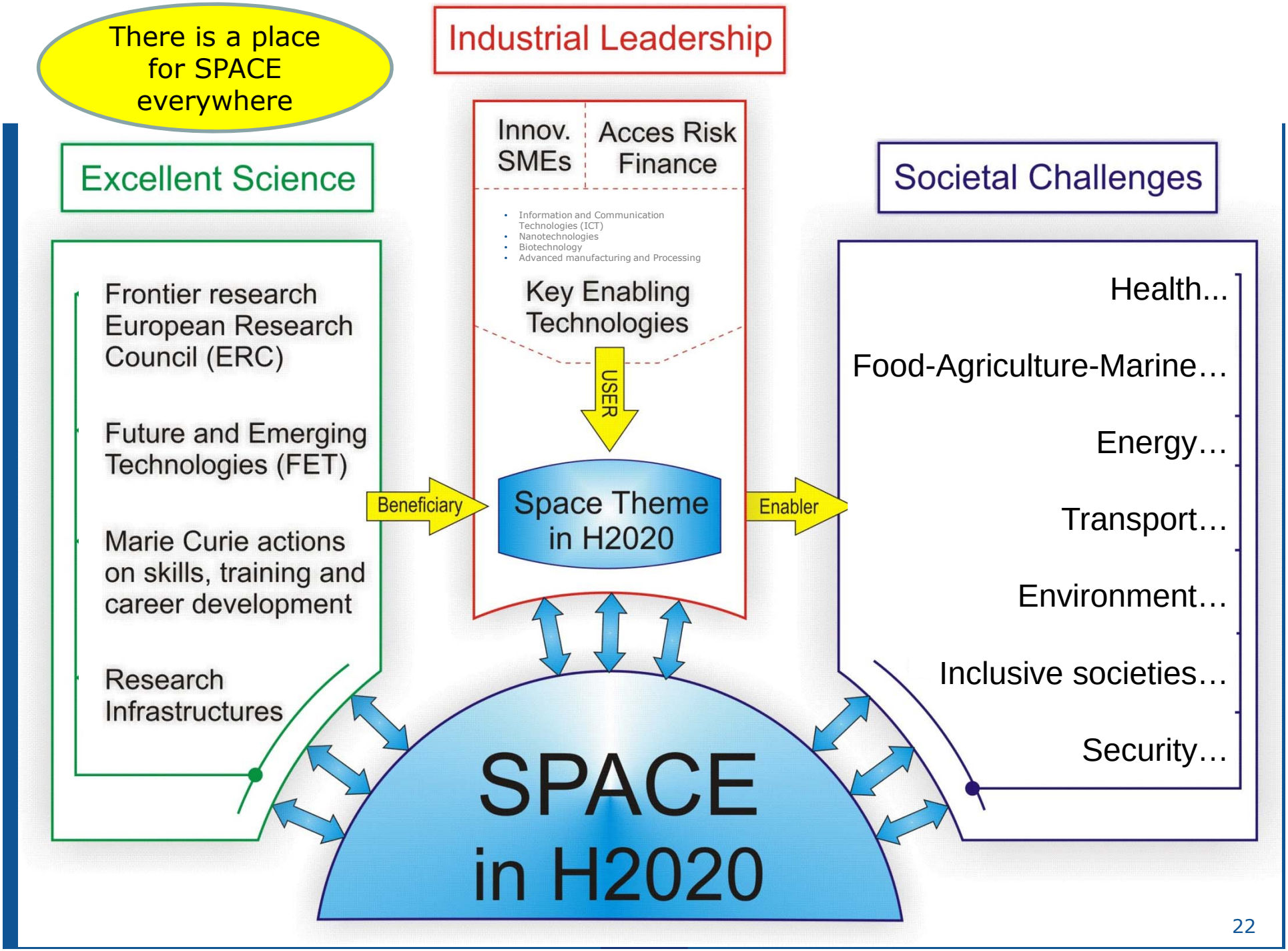
- Concerns of citizens and society/EU policy objectives (climate, environment, energy, transport, etc) cannot be achieved without innovation
- Breakthrough solutions come from multi-disciplinary collaborations, including social sciences & humanities
- Promising solutions need to be tested, demonstrated and scaled up

Horizon 2020 LEIT

- **Leadership in enabling and industrial technologies (LEIT)**
  - Information and Communication Technologies (ICT)
  - Nanotechnologies
  - Biotechnology
  - Advanced manufacturing and Processing
  - **Space**
- Access to risk finance
- Innovation in SMEs

The Space Theme in Horizon 2020




There is a place for SPACE everywhere
Industrial Leadership
Innov. SMEs
Acces Risk Finance
Information and Communication Technologies (ICT)
Nanotechnologies
Biotechnology
Advanced manufacturing and Processing
Key Enabling Technologies
USER
Excellent Science
Frontier research European Research Council (ERC)
Future and Emerging Technologies (FET)
Marie Curie actions on skills, training and career development
Research Infrastructures
Beneficiary
Space Theme in H2020
Enabler
Societal Challenges
Health...
Food-Agriculture-Marine…
Energy…
Transport…
Environment…
Inclusive societies…
Security…
SPACE in H2020

3 - Leadership in Enabling Industrial Technologies

SPACE

Horizon 2020 LEIT-Space specific programme

- Enabling European competitiveness, non-dependence and innovation of the European space sector
  - ✓ Safeguard and further develop a competitive, sustainable and entrepreneurial space industry and research community and strengthen European non-dependence in space systems
  - ✓ Boost innovation between space and non-space sectors
- Enabling advances in space technologies
- Enabling the exploitation of space data
- Enabling European research in support of international space partnerships

For more information please consult Council Decision of 3 December 2013, OJ L 347/993.

Horizon 2020 LEIT-Space work programmes

Horizon 2020 is being implemented through a sequence of **biennial** work programmes (WP)

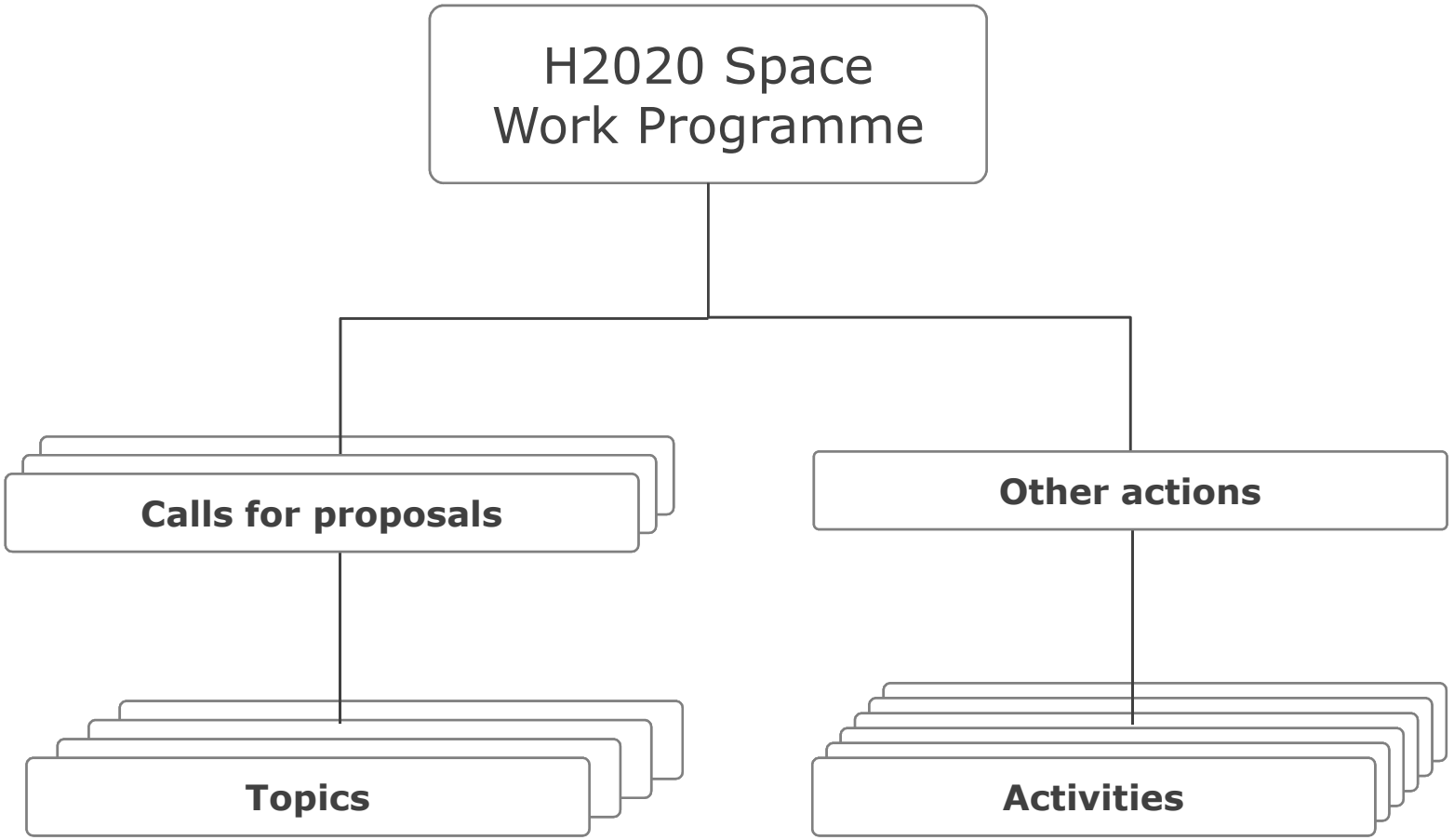
Horizon 2020 Space Work Programmes

WP 2014-2015	WP 2016-2017	...	...

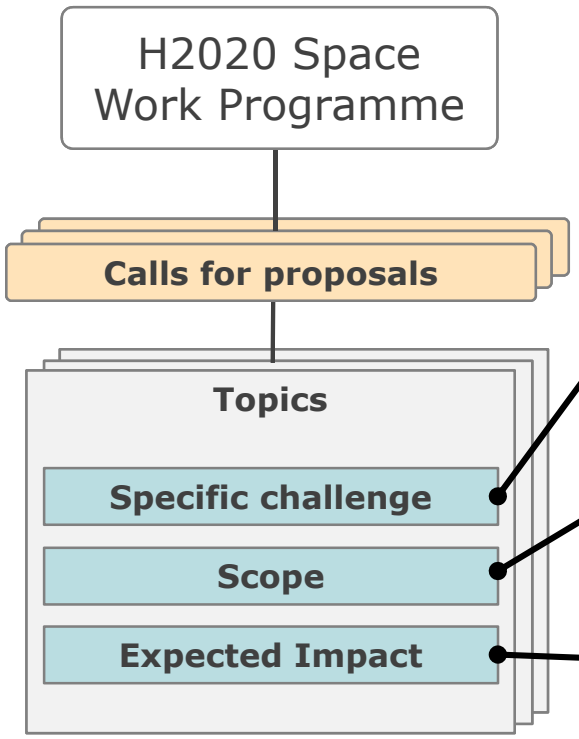
2014: **167.57 M€** 2016: **165.67 M€**

2015: **182.05 M€** 2017: **181.40 M€**

Horizon 2020 Space WP structure



Horizon 2020 Space 2016-17 – Structure of the 'calls'



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

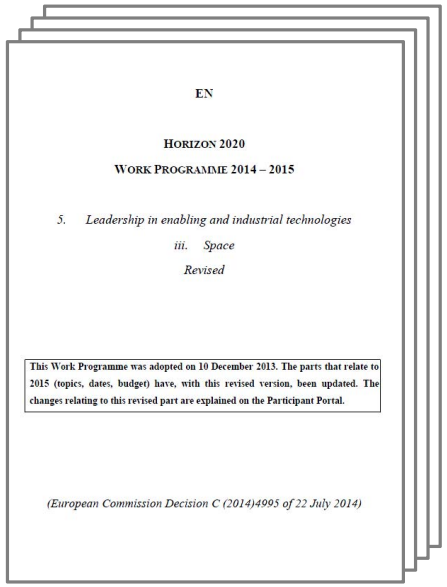
Provides a broad description of what is the impact to be achieved through the projects to be funded. The dissemination and exploitation of future research results are vital for the impact

Horizon 2020 Space work programmes

2014-2015 work programme published in 10 December 2013

2014 call: call closed, grants signed,
projects launched in January 2015

2015 call: call closed
projects in the of 'grant preparation' phase



EN

HORIZON 2020

WORK PROGRAMME 2014 – 2015

5. Leadership in enabling and industrial technologies

iii. Space

Revised

This Work Programme was adopted on 10 December 2013. The parts that relate to 2015 (topics, dates, budget) have, with this revised version, been updated. The changes relating to this revised part are explained on the Participant Portal.

(European Commission Decision C (2014)4995 of 22 July 2014)

2016-2017 work programme to be published on 14 October 2015

2016 call: call deadline 3 March 2016

2017 call: call deadline 1 March 2017

WP pre-published draft version (part 05iii LEIT-Space) is available at:

http://ec.europa.eu/programmes/horizon2020/en/draft-work-programmes-2016-17

The associated draft guidance documents are available at:

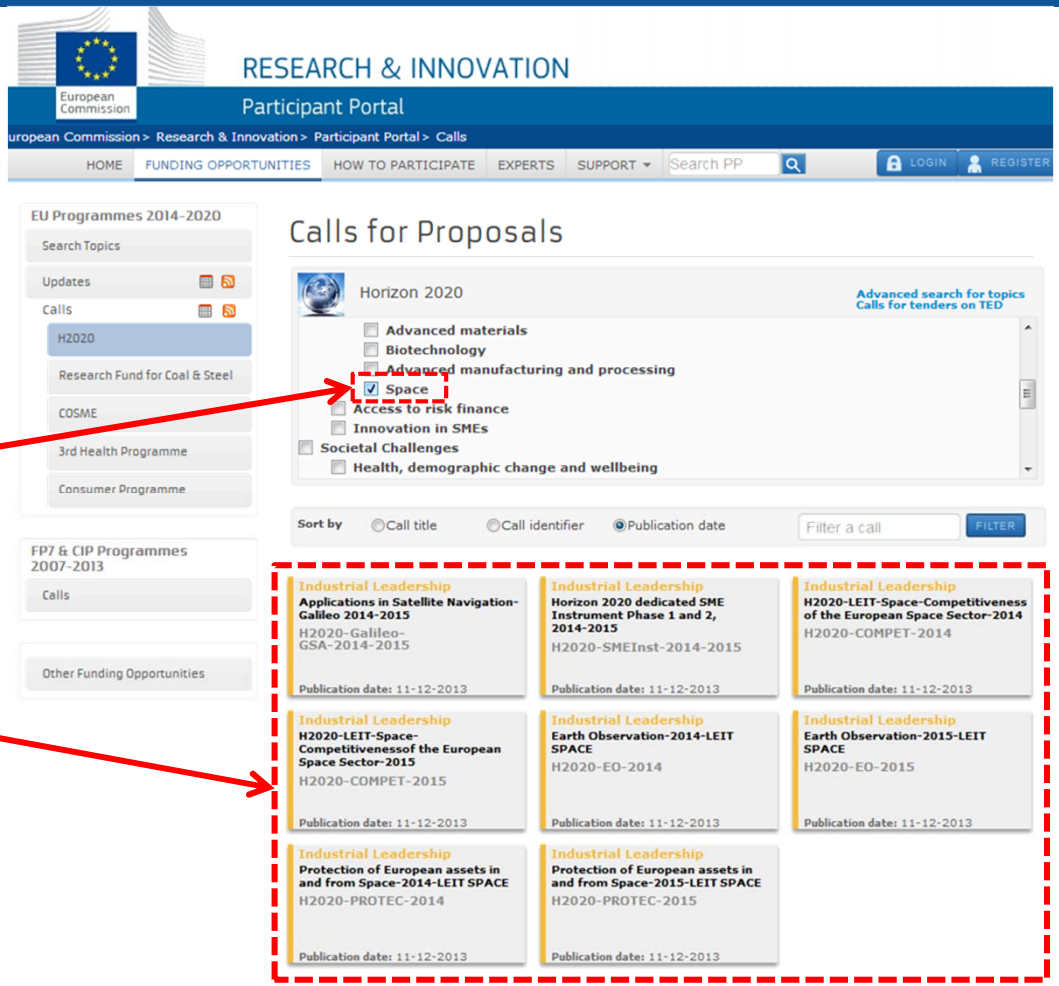
http://ec.europa.eu/growth/sectors/space/research/horizon-2020/

Horizon 2020 Space 'calls'

Horizon 2020 Participants Portal:
http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/

H2020 Space Work Programme

Calls for proposals



Space Research implementation

European Commission

EU Agencies involved

Industrial Leadership
Earth Observation-2014
H2020-EO-2014
Pub.Date: 11/12/2013 Deadline: 26/03/2014

Industrial Leadership
Earth Observation-2015
H2020-EO-2015
Pub.Date: 11/12/2013 Deadline: 27/11/2014

Industrial Leadership
Protection of European assets in and from Space-2014
H2020-PROTEC-2014
Pub.Date: 11/12/2013 Deadline: 26/03/2014

Industrial Leadership
Protection of European assets in and from Space-2015
H2020-PROTEC-2015
Pub.Date: 11/12/2013 Deadline: 27/11/2014

Industrial Leadership
H2020-LEIT-Space-Competitiveness of the European Space Sector-2014
H2020-COMPET-2014
Pub.Date: 11/12/2013 Deadline: 26/03/2014

Industrial Leadership
H2020-LEIT-Space-Competitivenessof the European Space Sector-2015
H2020-COMPET-2015
Pub.Date: 11/12/2013 Deadline: 27/11/2014

Research Executive Agency (REA) ⇧

Call handling, receipt of proposals, evaluation process, grant agreement preparation, grant agreements signature, receipt of reporting, reviews, payments, audits

New Mandate for Horizon 2020 and continued implementation of FP7 Space projects

European GNSS Agency (GSA) ⇨

Industrial Leadership
Applications in Satellite Navigation-Galileo 2014
H2020-Galileo-2014-1
Pub.Date: 11/12/2013 Deadline: 03/04/2014

Industrial Leadership
Applications in Satellite Navigation-Galileo-2015
H2020-Galileo-2015-1
Pub.Date: 11/12/2013 Deadline: 04/02/2015

Executive Agency for SMEs (EASME) ⇩

ex-Executive Agency for Competitiveness and Innovation (EACI)

Industrial Leadership
Horizon 2020 dedicated SME Instrument - Phase 1 2014
H2020-SMEINST-1-2014
Pub.Date: 11/12/2013 Deadline: 17/12/2014

Industrial Leadership
Horizon 2020 dedicated SME Instrument - Phase 2 2014
H2020-SMEINST-2-2014
Pub.Date: 11/12/2013 Deadline: 17/12/2014

Industrial Leadership
Horizon 2020 dedicated SME Instrument - Phase 1 2015
H2020-SMEINST-1-2015
Pub.Date: 11/12/2013 Deadline: 16/12/2015

Industrial Leadership
Horizon 2020 dedicated SME Instrument - Phase 2 2015
H2020-SMEINST-2-2015
Pub.Date: 11/12/2013 Deadline: 16/12/2015

Space Research implementation

Types of actions / Funding rates

- **Research and innovation actions** (**Funding rate: 100%**): Projects aiming to establish new knowledge, new or improved technology by possibly including basic and applied research, technology development, testing and validation on a small-scale prototype.

- **Innovation actions** (**Funding rate: 70% - exception: 100% for non-profit legal entities**): Projects aiming to produce plans, arrangements or designs for a new or improved product, design, process or service by possibly including large-scale product validation and market replication.

- **Coordination and support actions** (**Funding rate: 100%**): Projects consisting of accompanying/complementrary measures (standardisation, awareness-raising, communication, policy dialogues, networking, studies, etc.)

*Full detailed description can be found in the **General Annexes 20 – part D** of the Work Programme 2016-2017*

Space Research implementation

Types of actions / Funding rates

Pre-commercial procurement (PCP)

- **Definition:** Union co-funding to a **group of procurers** ("buyers group") to undertake together one joint PCP procurement (=one joint call for tender, one joint evaluation of offers, a lead procurer).
- "Buyers group"= at least **two independent legal entities** (public procurers) established in two different MS or associated countries.
- Individual financial contribution of each procurer to the total budget necessary to jointly finance the PCP.
- Eligible activities include two phases: **a) Preparation phase** (expected outcome: completed tender documents, signed procurement agreement, confirmation of the lead procurer), **b) Execution phase** (expected outcome: Procurement and implementation of PCP contacts, validation and comparison of the performance of the competing PCP solutions in real-life operational conditions, dissemination of results)
- ***EU contribution*** *= max 90% of the total eligible costs (which include R&D services procured via the joint PCP and the costs of the eligible coordination and networking activities)*

Full detailed description can be found in the ***General Annexes 20 – parts D and E*** *of the Work Programme 2016-2017*

4 - H2020 LEIT - Space work progamme 2016-2017

Call for proposals

Horizon 2020 LEIT-Space implementation building blocks

Satellite Navigation (Galileo and EGNOS)	Earth Observation (Copernicus)	Competitiveness of the European Space sector	Protection of the European Space Assets
Applications	Applications	Technologies for European non-dependence and competitiveness	Space Surveilance and Tracking
EGNSS evolution	Data	Independent access to space	Space Weather, Space Debris, Near Earth objects
	Copernicus evolution	Space Science and Exploration	

Bottom-up engagement of SMEs in space R&D (SME Instrument)

Fast Track to Innovation pilot

Horizon 2020 Space 2016-17 WP structure

EGNSS
Galileo & EGNOS applications and infrastructure

Calls for proposals:
- EGNSS applications

Other actions:
- Evolution of EGNSS infrastucture, mission and services

EO
Earth Observation applications and services

Calls for proposals:
- EO downstream applications
- Evolution of Copernicus services
- EO "big data" shift

COMPET
Competitiveness of the European Space sector: Tecnology and Science

(incl. Space Weather)

Calls for proposals:
- Critical space technologies
- EO & SatCom technologies
- Science and Exploration
- Space Weather
- Space Portal
- Technology transfer

Other actions:
- ESA Engineering support
- Horizon prize on low-cost access to space

SST
Space Surveillance and Tracking support framework

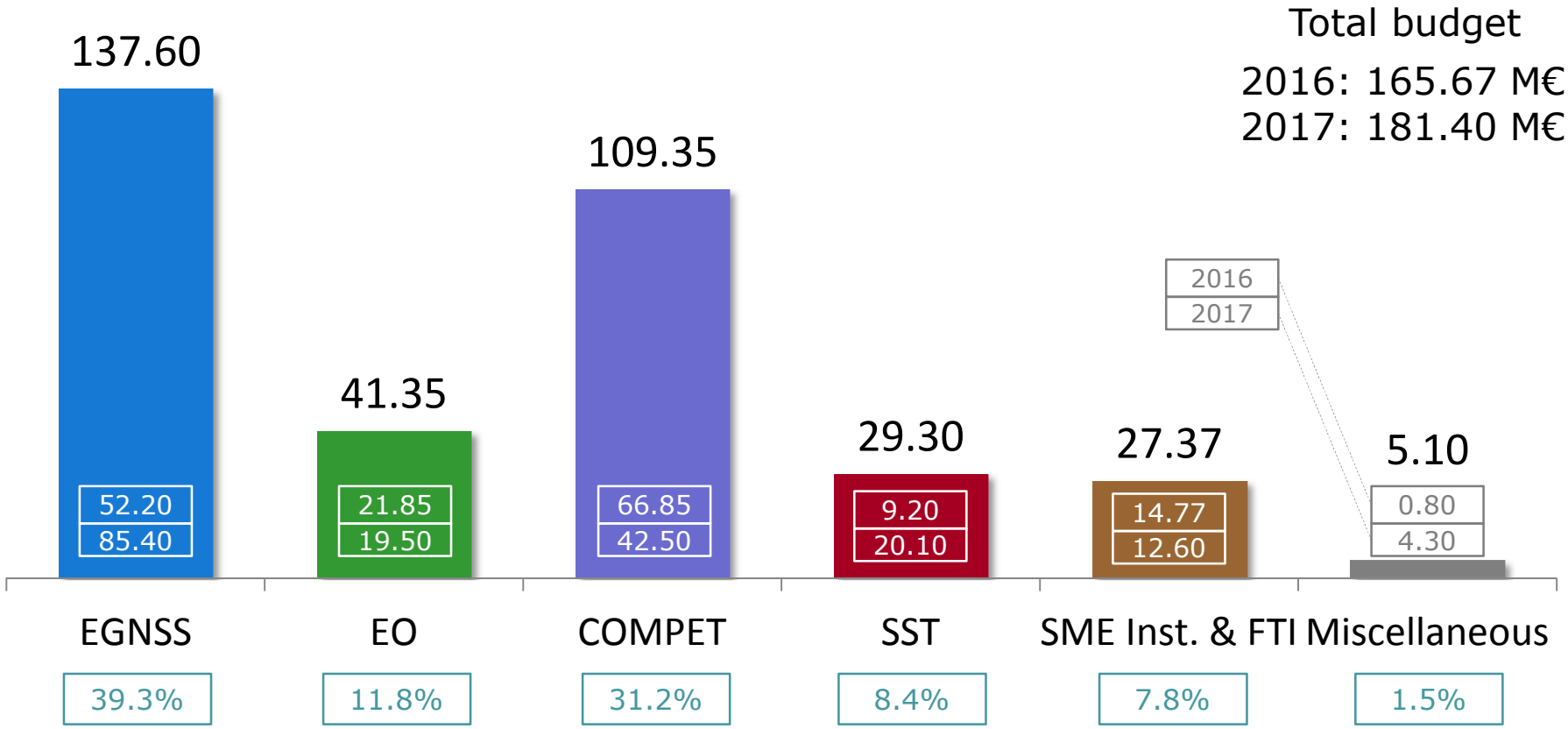
Other actions:
- Contribution to the SST support framework
- Improving the performance of SST at European level

SME Instrument

Fast Track to Innovation 'pilot'

Horizon 2020 Space WP 2016-17 indicative budget

LEIT-Space 2016-2017 WP indicative budget (figures in M€)
Calls for proposals + "Other actions"



2016 call topics

Earth observation

Indicative budget: **21.85 M€**

Deadline: 3 March 2016

Space

Earth observation

Reccomended project size
Indicative budget
Type of action

EO-1-2016

Downstream applications

Proposals may address a wide variety of applications stemming from the use of Earth observation and its smart integration with other related technologies…

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…

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

The choice of EO application is left to the proposer…

1 to 2 M€

9,85 M€

Innovation Actions

Earth observation

Reccomended project size
Indicative budget
Type of action

EO-2-2016

Downstream services for public authorities

To launch demand-driven innovation actions by public authorities aiming at customising Copernicus information as part of the solution for their needs…

…Application products are expected to adopt open standards for data documentation, data models and services…

The choice of Copernicus service and associated downstream EO-based services left to the proposer…

Coupling with European Structural and Investment Fund (ESIF) actions could facilitate this process and can ensure continuity

3 M€

Pre-Commercial procurement

Earth observation

Reccomended project size
Indicative budget
Type of action

EO-3-2016

Evolution of Copernicus services

The RIA should aim at demonstrating the technical operational feasibility of a specific service evolution proposal.

The proposers are expected to demonstrate at the proposal stage an active link with the Copernicus service by suitable means...

… project should aim at providing a proof-of-concept or a prototype for a proposed evolution of the Copernicus services, respecting the border between Copernicus services and downstream services.

…should allow to demonstrate the appropriateness to implement the proposed evolution later on at European level, i.e. potentially with operational Copernicus funding.

…the activity should as well result into one or more possible scenarios how this evolution could potentially be integrated

1 to 2 M€

9 M€

Research and Innovation Actions

European Commission

TABLE OF CONTENTS

GUIDANCE DOCUMENT: RESEARCH AND INNOVATION NEEDS OF COPERNICUS OPERATIONAL SERVICES

DRAFT VERSION: 3 (17/7/2015)

Related Earth Observation activities

Blue Growth – demonstrating an ocean of opportunities (H2020-BG-2016-2017):

- BG-9-2016: An integrated Arctic observing system
- BG-12-2016: Towards an integrated Mediterranean Sea Observing System

Sustainable Food Security – resilient agri-food chains (H2020-SFS-2016-2017):

- SFS-43-2017: Earth Observation services for the monitoring of agricultural production in Africa

Climate Action, Environment, Resource Efficiency and Raw Materials – Earth Observation (H2020-SC5-2016-2017):

- SC5-18-2017 - Novel in-situ observation systems
- SC5-19-2017 - Coordination of citizens' observatories initiatives
- SC5-20-2016 - European data hub of the GEOSS information system

Earth Observation (H2020-EO-2016 and H2020-EO-2017)

- EO-1-2016 and EO-1-2017: Downstream applications
- EO-2-2016: Downstream applications for public sector users
- EO-3-2016: Evolution of Copernicus services
- EO-2-2017: EO Big Data Shift

Competitiveness of the European Space Sector: Technology and Science (H2020-COMPET-2017)

- COMPET-2-2017: Competitiveness in Earth observation mission technologies

SME Instrument (H2020-SMEInst-2016-2017), although not dedicated uniquely to Earth Observation, is particularly well suited for SMEs addressing space based applications

- SMEInst-04-2016-2017: Engaging SMEs in space research and development
- SMEInst-12-2016-2017: Boosting the potential of small businesses in the areas and priorities of Societal Challenge 5

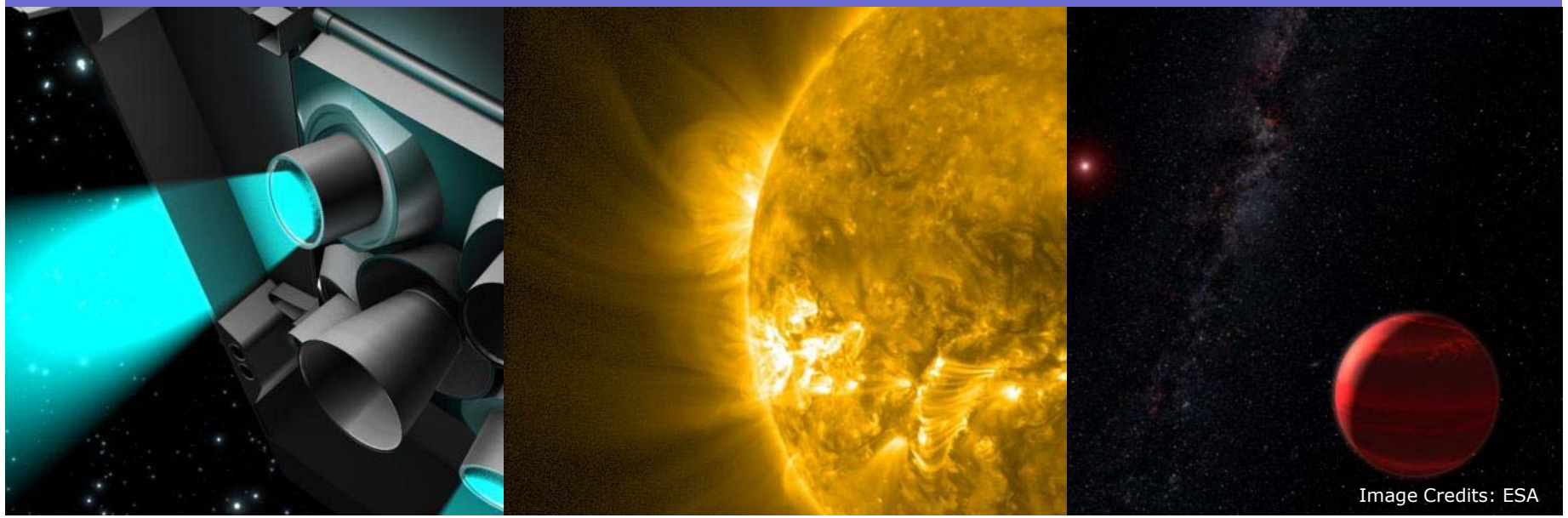
Earth observation

WP 2016/2017		
	2016	2017
Call for proposals	Indicative budget (M€)	Indicative budget (M€)
EO-1-2016/2017: **Downstream applications**	**9.85**	**12.0**
EO-2-2016: **Downstream services for public authorities**	**3.0**	**-**
EO-3-2016: **Evolution of Copernicus services**	**9.0**	**-**
EO-4-2017: **EO Big Data Shift**	-	**7.5**
Total EO-2016/2017	**21.85**	**19.5**

European Commission

2016 call topics

Competitiveness of the European Space Sector Technology and Science

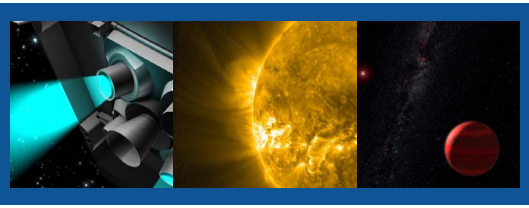


Indicative budget: **65.85 M€**

Deadline: 3 March 2016

Space

Competitiveness of European Space Sector



Reccomended project size
Indicative budget
Type of action

COMPET-1-2016

Technologies for European non-dependence and competitiveness

Activities shall address technologies identified on the Joint EC-ESA-EDA Task Force list of Actions 2015-17

- *U14 - Active discrete power components*
- *U18 - Enhanced performance and space qualified detectors*
- *U19 - High speed DAC-ADC based on European technology*
- *U20 - Very high performance microprocessors*
- *U22 - ASICS: Deep Sub-Micron (DSM)*
- *N27 - RF components*

2 to 5 M€

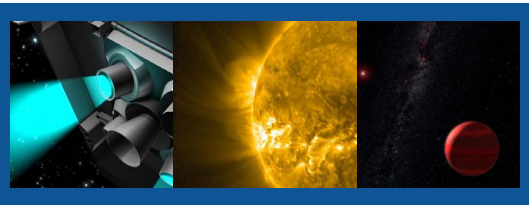
14,85 M€

Research and Innovation Actions

The aim of identified actions is to contribute to ensuring European Non-dependence:

- "Independence" would imply that all needed space technologies are developed in Europe.
- "Non-dependence" refers to the possibility for **Europe to have free, unrestricted access** to any required space technology.

Competitiveness of European Space Sector



COMPET-1-2016

Technologies for European non-dependence and competitiveness

Excerpt from

Critical Space Technologies

for

European Strategic Non-Dependence

Actions for 2015/2017

V1.16

Update for the 2016 Call of Horizon 2020

July 2015

Labels for Actions

Description and needed Action
Estimated Initial TRL:
Target TRL
Applicable Mission Class(es)*
Order of Magnitude of numbers of restricted export licences in the last 10 years for this function
Order of Magnitude of numbers of units sold per year worldwide
Industrial Non-Dependence Concern
Delegations/Agencies voicing non-dependence concern on the item
Reference(s):
Remarks / Justifications
Date of Entry / Last Date of Change

4.3 U19 – High speed DAC-ADC based on European Technology

Description and needed Action	Current status: the existing 10 & 12 bit high speed ADC and 12 bit DAC were developed and are successful products on the market. The 12 bit high speed DAC has even gained world leadership in the market and the 12 bit high speed ADC has world-class performance parameters. Future needs: - Fast, Low power Dual Channel ADC ; the next generation of European ADC (DUAL12b) has started development on BiCMOS process. - New DAC generation today not planned . Serial/deserial I/O are being considered (see also U21- Very high speed serial interfaces) - 1.5 Gsamples per Second target
Estimated Initial TRL:	2 (for next generation), > 6 for current generation
Target TRL	6 (for next generation)
Applicable Mission Class(es)*	Navigation, Earth Observation, Telecommunications, Science Mission, Human Spaceflight, Space Transportation, Robotic Exploration, Defence Applications
Order of Magnitude of numbers of restricted export licences in the last 10 years for this function	500 – 1000 (before the European products became available)
Order of Magnitude of numbers of units sold per year worldwide	> 100
Industrial Non-Dependence Concern	Consensus confirmed at the Non-Dependence Meeting (13 February 2015)
Delegations/Agencies voicing non-dependence concern on the item	Consensus confirmed at the Non-Dependence Meeting (13 February 2015)
Reference(s):	
Remarks / Justifications	Note 1 (2015): Additionally, photonic assisted ADC will be considered as a possible candidate to go beyond the limits of the current technology. This technology will be very useful for telecom digital payloads and digital antennas. EDA activities: on-going THIMS project, planned PICTURE project.
Date of Entry / Last Date of Change	1.9.2014

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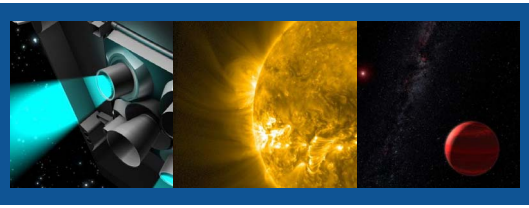
http://ec.europa.eu/growth/sectors/space/research/horizon-2020/

Competitiveness of European Space Sector



Reccomended project size
Indicative budget
Type of action

COMPET-2-2016

Maturing satellite communication technologies

The aim of this topic is to demonstrate, in a relevant environment, technologies, systems and sub-systems for satellite communications…

2 to 4 M€

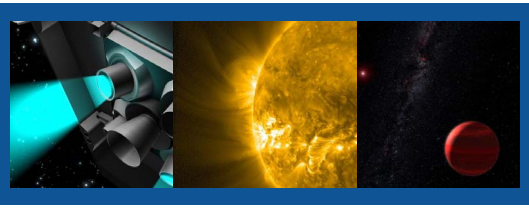
7 M€

Research and Innovation Actions

Proposals, **targeting TRL 6**, are sought with relevance for space in the following fields:

- *Advanced communication technologies…*
  … preparing satellite networking in the Terabit-throughput… including optical / RF…
- *Photonics technology…*
- *Active antennas building blocks…*
- *Flexible repeater…*
- *Reconfigurable coverages…*
- *New generation of waveforms and related protocols…*
- *End to end system enablers…*

Competitiveness of European Space Sector



Reccomended project size
Indicative budget
Type of action

COMPET-3a-2016

In-Space electrical propulsion (EP) and station keeping - Incremental Technologies

Proposals shall enable incremental advances in technologies for Electric Propulsion systems based on:

1 - Hall Effect Thrusters (HET)

2 - Gridded Ion Engines (GIE)

3 - High Efficiency Multistage Plasma Thrusters (HEMPT)

HET 7.5 to 11 M€

GIE 5.5 to 7.5 M€

HEMPT 4.5 to 5.5 M€

18 M€

Innovation Actions

COMPET-3b-2016

In-Space electrical propulsion (EP) and station keeping – Disruptive Technologies

Proposals on potentially disruptive concepts in of EP which in the long term could change the landscape, addressing:

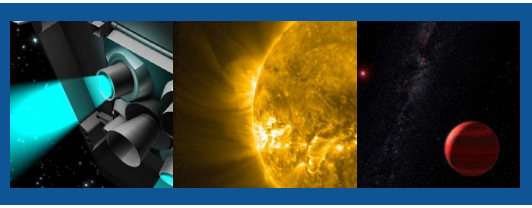
- *Transversal technologies for disruptive EP systems (not thrusters) → Maximum 1 proposal*
- *Technologies devoted to specific disruptive EP thrusters Maximum 4 proposals*

1 to 1.5 M€

5 M€

Research and Innovation Actions

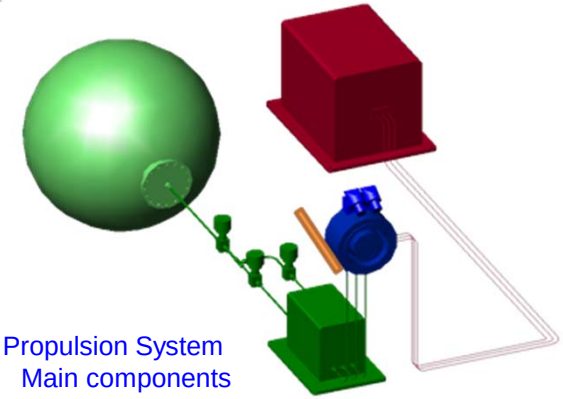
Guidelines for the Electric Propulsion SRC



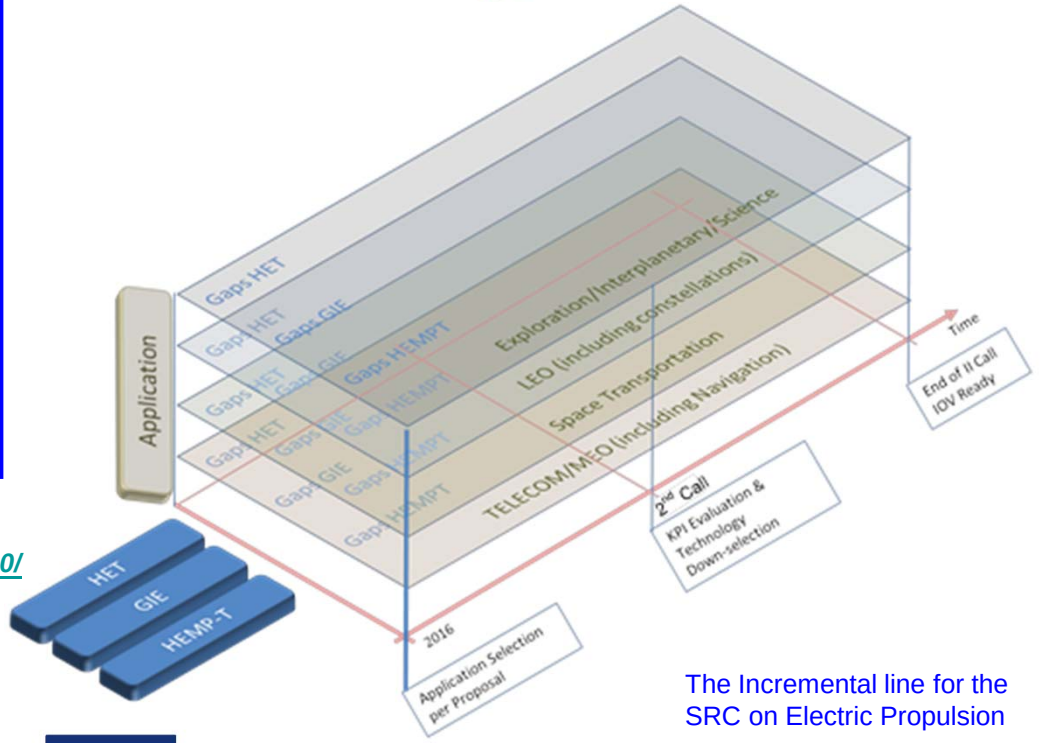
European Commission

GUIDELINES FOR STRATEGIC RESEARCH CLUSTER ON IN-SPACE ELECTRICAL PROPULSION AND STATION KEEPING HORIZON 2020 SPACE CALL 2016

http://ec.europa.eu/growth/sectors/space/research/horizon-2020/



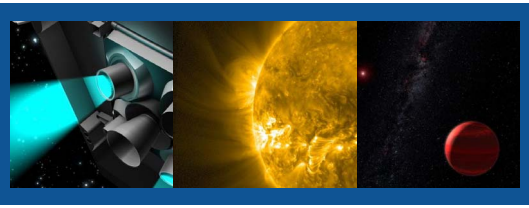
Electric Propulsion System
Main components



The Incremental line for the SRC on Electric Propulsion

Space

Competitiveness of European Space Sector



Reccomended project size
Indicative budget
Type of action

COMPET-4-2016

SRC - Space Robotics Technologies

Proposals shall address one of the following six specific robotic building blocks:

a) *Space Robot Control Operating System*

b) *Autonomy framework Time/Space/Resources planning and scheduling*

c) *Common data fusion framework*

d) *Inspection Sensor Suite*

e) *Modular interfaces for Robotic handling of Payloads*

f) *Validation Platforms and Field Tests*

Building blocks

a) - e): 3 to 3,5 M€

f): 1 M€

18 M€

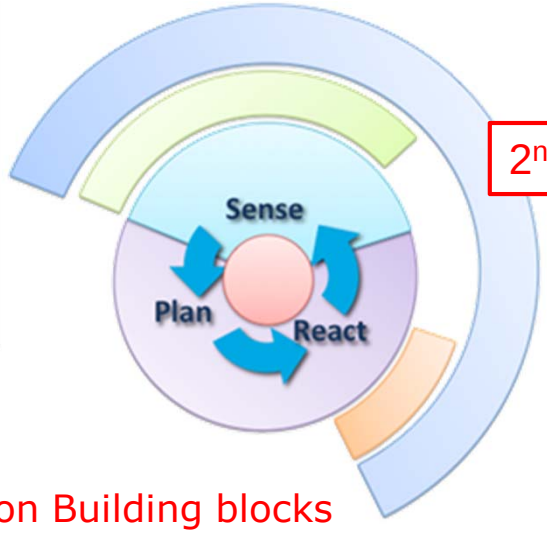
Research and Innovation Actions

Guidelines for the Space Robotics SRC

European Commission

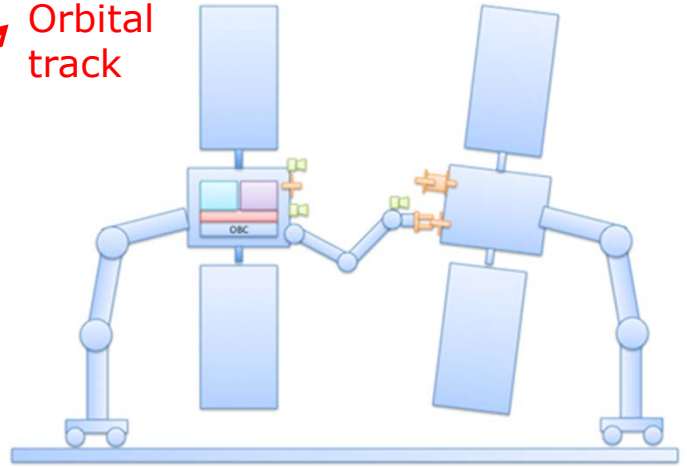
GUIDELINES FOR STRATEGIC RESEARCH CLUSTER ON SPACE ROBOTICS TECHNOLOGIES HORIZON 2020 SPACE CALL 2016

Call 2016

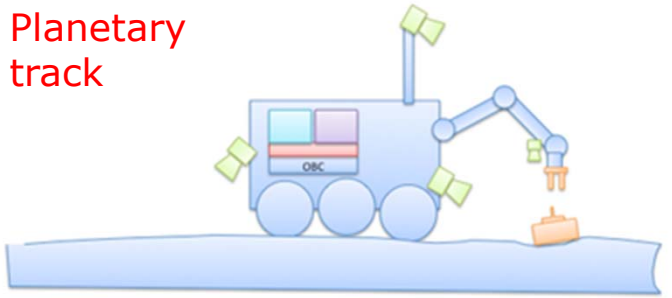


2nd Call

Orbital track



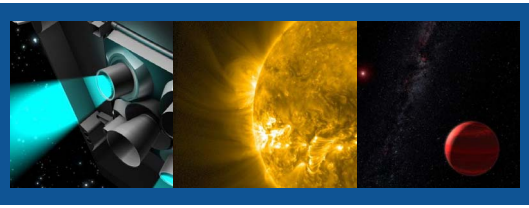
Planetary track



Common Building blocks

OG1	Produces the software base on which all other software OGs will run
OG2	Produces the generic "thinking and acting" core of a robot
OG3	Produces the generic perception core of a robot
OG4	Produces the generic suite of perception means
OG5	Produces the a suite hardware interfaces by which a robot can interact with man-made environment
OG6	Provides the physical test environments in which the above OGs can be installed and exercised

Competitiveness of European Space Sector



Reccomended project size
Indicative budget
Type of action

COMPET-5-2016

Scientific Instrumentation

Scientific instrumentation is understood in this context as mission payloads that perform scientific tasks

Proposals may cover different stages of development of scientific instrumentation from concepts, to breadboarding and prototype demonstration.

Proposals are particularly welcome that develop novel and advanced technologies, such as new sensors and other sub-systems that may be used in scientific instrumentation

Projects should address planned and future European scientific and exploration missions, as well as collaboration in the context of third country missions as a European contribution to global efforts.

1.5 to 3 M€

3 M€

Research and Innovation Actions

Competitiveness of the European Space Sector: Technology and Science

WP 2016	
Call for proposals	Indicative budget (M€)
COMPET-1-2016: **Technologies for European non-dependence and competitiveness**	**14.85**
COMPET-2-2016: **Maturing Satellite Communication technologies**	**7.0**
COMPET-3-2016: **SRC – In-Space electrical propulsion and station keeping**	**23.0**
COMPET-4-2016: **SRC – Space Robotics Technologies**	**18.0**
COMPET-5-2017: **Scientific instrumentation**	**3.0**
Total COMPET-2016	**65.85**
Other actions (Part B)	Indicative budget (€ million)
Activity 7 - **Engineering support by ESA**	**1.0**

WP 2017	
Call for proposals	Indicative budget (M€)
COMPET-1-2017: **Technologies for European non-dependence and competitiveness**	**15.0**
COMPET-2-2017: **Competitiveness in Earth observation mission technologies**	**7.0**
COMPET-3-2017: **High speed data chain**	**10.0**
COMPET-4-2017: **Scientific data exploitation**	**5.0**
COMPET-5-2017: **Space Weather**	**3.0**
COMPET-5-2017: **Space portal**	**0.5**
COMPET-6-2017: **Technology transfer and business generators**	**1.0**
Total COMPET-2017	**41.5**
Other actions (Part B)	Indicative budget (€ million)
Activity 11 - **Horizon Prize for low cost access to space (4M€ prize from 2020 budget)**	-
Activity 18 - **Engineering support by ESA**	**1.0**

Satellite Navigation – Galileo and EGNOS

2016 Other actions

Satellite Navigation – Galileo and EGNOS

WP 2016	
Other actions (Part B)	Indicative budget (M€)
Activity 1 - Galileo Evolution, Mission and Service related R&D activities	**3.3**
Activity 2 - EGNOS, Mission and Service related R&D activities	**0.9**
Activity 4 - GNSS evolution, infrastructure-related R&D activities	**48.0**

WP 2017	
Call for proposals	Indicative budget (M€)
GALILEO-1-2017: EGNSS Transport applications	**14.5**
GALILEO-2-2017: EGNSS mass market applications	**9.0**
GALILEO-3-2017: EGNSS professional applications	**8.0**
GALILEO-4-2017: EGNSS awareness raising and capacity building	**1.5**
Total GALILEO-2017	**33.0**
Other actions (Part B)	Indicative budget (€ million)
Activity 12 - GNSS Evolution, Mission and Services related R&D activities	**3.4**
Activity 13 - EGNOS, Mission and Service related R&D activities	**0.5**
Activity 15 – GNSS evolution, infrastructure-related R&D activities	**48.5**

Satellite Navigation – Galileo and EGNOS

Activity 1 (Galileo Evolution, Mission and Service related R&D activities)

- 2nd Generation of Galileo: Development of new and innovative mission concepts fulfiling evolving users needs

Activity 2 (EGNOS, Mission and Service related R&D activities)

- Evolution of the current services (Open Service, Safety of Life, …)
- Development of innovative concepts for new services
- Adaptation to international Satellite-based augmentation systems (SBAS) standards

Satellite Navigation – Galileo and EGNOS

Activity 4 (GNSS evolution, infrastructure-related R&D activities)

Implemented through a **delegation agreement with ESA** (to be concluded):

- R&D actions to be implemented through procurement, grants and prizes in the EU R&D community
  - Galileo and EGNOS system R&D
  - EGNSS enabling technologies
  - Scientific research for future EGNSS
- ESA Technical activities
- Management, including e.g. monitoring, road mapping, outreach

General participation limited to EU and associated states, further limitations on a case-by-case basis (e.g. Security)

European Commission

Space Surveillance and Tracking

Image Credits: ESA

2016 Other actions

Space

Space Surveillance and Tracking (SST)

WP 2016	
Other actions (Part B)	Indicative budget (€ million)
Activity 5 - **Framework Partnership Agreement on the SST Support Framework**	**-**
Activity 6 – **SST contribution to the support Framework**	**1.2**
Activity 7 - **Improving the Performances of the SST at European Level**	**8.0**

WP 2017	
Other actions (Part B)	Indicative budget (€ million)
Activity 16 - **SST contribution to the support Framework**	**1.6**
Activity 17 - **Improving the Performances of the SST at European Level**	**15.5**

Space Surveillance and Tracking (SST)

Two strands of SST activities funded by Horizon 2020:

- **SST services:** activities within the SST support framework, which relate to the networking and using of existing national SST assets (**Activity 6** and **Activity 16**).

  These activities are funded by four budget lines (H2020/Space, H2020/Secure societies, Copernicus, GNSS).

- **SST evolution:** activities outside the SST support framework, which relate to the upgrade of existing and development of new SST sensors (**Activity 7** and **Activity 17**).

  These activities are funded exclusively by H2020/space

Space Surveillance and Tracking (SST)

Framework Partnership Agreement (FPA):

WP 2016-2017 establishes a FPA (**Activity 5**) for the implementation of all SST activities (Activities 6, 7 ,16 and 17 of the WP) in order to:

- Better accommodate the long-term programmatic needs of the SST activities, and
- Avoid unnecessary fragmentation of the budget.

Specific Grant Agreements (SGAs):

SST FPA will be implemented through Specific Grant Agreements (SGAs), which will cover the provision of SST services (Activities 6 and 16) as well the SST evolution needs (Activities 7 and 17).

- All SST-related activities of the WP (Activities 6,7,16 and 17) will have the form of SGAs implementing the FPA established under activity 5.
- Type of action for the all SGAs: Research and Innovation Action

SME Instrument and Fast Track to Innovation

Space

SME Instrument and Fast Track to Innovation

WP 2016/2017		
	2016	**2017**
Call for proposals	Indicative budget (€ million)	Indicative budget (€ million)
SME-SPACE-1-2016/2017: **SME instrument Phases 1&2**	**11.37**	**12.60**
Fast Track to Innovation	**2.88**	-

WP 2016/2017 – Call for proposals

SME-SPACE-1-2016/2017: **SME instrument Phases 1&2**	Bottom-up non-prescriptive topic. Highlight: Actions in the areas of applications (Galileo and Copernicus), spinning-in and the development of certain critical technologies.
Fast Track to Innovation	Contribution from H2020 LEIT Space to FTI pilot.

SME Instrument

SME Instrument phases

The SME instrument will be a major part of achieving the target of at least 20% of the combined budget of LEIT and Societal Challenges for SMEs

- ***Initially 5% of LEIT and Societal Challenges budget***
- ***Rising to at least 7% averaged over duration of programme***
- ***Continuously open call with cut-off dates***

SME Instrument

Evaluation process

- Remote evaluation
- At least 4 **evaluators** per proposal => Balancing knowledge of industry/technology, market, finance
- Not more than one evaluator from the applicant's country
- **Short Time to evaluate**:
  - ✓ **Phase 1**: Time to evaluate 2 months+1 month time to grant= **3 months**
  - ✓ **Phase 2**: Time to evaluate 4 months+2 month time to grant= **6 months**
- No consensus meeting
- Standardised but detailed feedback
- Median rating

Evaluation criteria

3 criteria:

- ✓ Possible economic impact
- ✓ Excellence in innovation
- ✓ Implementation

European Commission

Fast Track to Innovation Pilot

THE ULTIMATE BOOST FOR OUTSTANDING BUSINESS INNOVATORS WITH A NEED FOR SPEED...

PREPARE YOUR PROPOSAL

Build your industry-intensive consortium*
minimum 3 partners - maximum 5 partners
(all based in the EU and / or in Horizon 2020 associated countries)

Proposal

Outstanding Business Innovation Concept
(high-readiness level / TRL 6, meaning demonstrated in a relevant environment)

Continuous open call until end 2016

6 months time-to-grant

DEVELOP YOUR INNOVATION

Receive an **EU grant of EUR 1 million to 3 million**
(70% of funding, 100% of funding for non-profit entities)

From Mature R&D
Demonstration
Market-Oriented
R&D
to Market-Mature Innovation

12-24 months for implementation

HIT THE MARKET!

Start your commercial activities

The Market
Market-Maturity to Market Launch

Market-ready result
(finished product, service, process/ TRL 9)

At most 36 months from grant to market

*In a consortium with 3 or 4 partners, at least 2 should be industry, and in a consortium with 5 partners, at least 3; alternatively at least 60% of the project budget should be allocated to industry (i.e. private for profit entities)

... AND EAGER TO COMPETE ON GLOBAL MARKETS...!

ACTIVITIES SUPPORTED

Systems validation in real working conditions – Testing – Piloting – Business model validation – Standard setting – Pre-normative research – EU quality label

Fast Track to Innovation (FTI) pilot

FTI key features

- Follows bottom-up logic (within SC and LEITs)
- One common call, permanently open, 3 cut-offs per year
- Time-to-grant 6 months
- Budget: 200 M€ for 2015/2016 (100 + 100) — ca. 100 projects with average EU contribution of 2 M€
- Funds innovation actions (70%), grant up to 3 M€
- Allows consortia of min. 3, max. 5 members — mandatory industry involvement
- Proposals shall include a business plan (market development strategy)
- Impact criterion has higher weighting in evaluations
- Future of pilot (beyond 2016) only decided after full evaluation

Fast Track to Innovation (FTI) pilot

FTI Pilot – Industry Involvement

- Industry-intensive consortia from EU or Associated Countries meaning:
- Either 2 out of 3-4 partners are "industry" (= private for profit)
- Or 3 out of 5 partners are private for profit
- Or 60% of the budget (= total estimated eligible costs) is to be allocated to consortium partner(s) from industry

- Subcontractors allowed but the core must be in the partners
- SMEs and first-time industry applicants particularly welcome

Why participate?

- Proof of your market potential
- Funding 70% (100% for not-for-profit entities)
- Enjoy higher visibility at EU level (communication about projects, by European Commission)

FTI Pilot – Planning and Implementation

- Topic = Fast Track to Innovation Pilot (bottom-up!)
- Call opening: 6/1/2015
- Planned cut-off dates (or "ranking" dates) > funding decision

Cut-off dates 2015	29/4/2015	1/9/2015	1/12/2015
Cut-off-dates 2016	TBD	TBD	TBD

5 - Other aspects

Calendar for the implementation of the WP 2016-17

Calls	Opening dates	Deadlines
EO-2016 COMPET-2016	10 November 2015	3 March 2016
GALILEO-2017 EO-2017 COMPET-2017	8 November 2016	1 March 2017

Register as expert!

- For proposal evaluation
- For project reviews

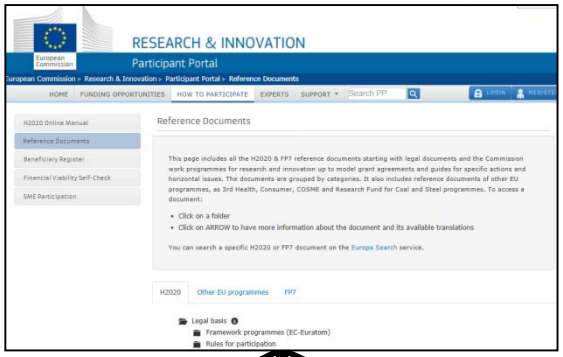
Where?

At the PARTICIPANT PORTAL: http://ec.europa.eu/research/participants/portal/desktop/en/experts/index.html

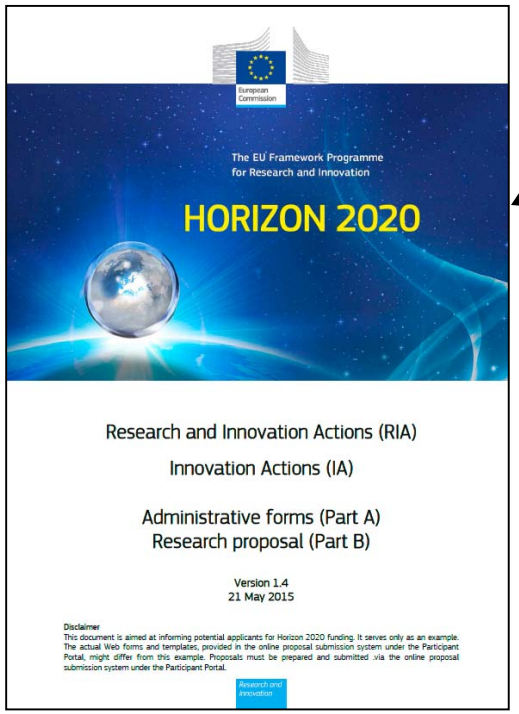
Proposals preparation

European Commission

Some useful links



Link to reference documents



http://ec.europa.eu/research/participants/data/ref/h2020/call_ptef/pt/h2020-call-pt-ria-ia_en.pdf

Link to Horizon 2020 Proposals evaluation – Standard briefing

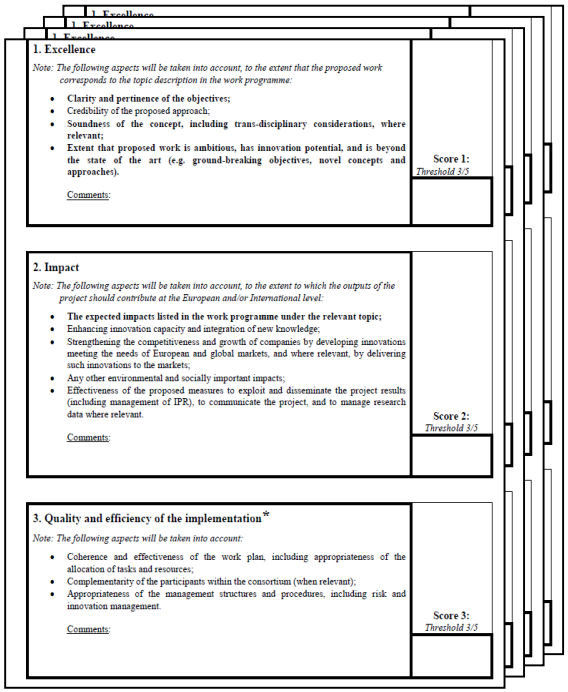
http://ec.europa.eu/research/participants/data/ref/h2020/call_ptef/ef/h2020-call-ef-ria-ia-csa_en.pdf

Research Executive Agency

European Commission

Self-evaluation form

Example for
Research and innovation actions



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;**
- Credibility of the proposed approach;
- **Soundness of the concept, including trans-disciplinary considerations, where relevant;**
- **Extent that proposed work is ambitious, has innovation potential, and is beyond the state of the art (e.g. ground-breaking objectives, novel concepts and approaches).**

Comments:

Score 1: *Threshold 3/5*

2. Impact

Note: The following aspects will be taken into account, to the extent to which the outputs of the project should contribute at the European and/or International level:

- **The expected impacts listed in the work programme under the relevant topic;**
- Enhancing innovation capacity and integration of new knowledge;
- Strengthening the competitiveness and growth of companies by developing innovations meeting the needs of European and global markets, and where relevant, by delivering such innovations to the markets;
- Any other environmental and socially important impacts;
- Effectiveness of the proposed measures to exploit and disseminate the project results (including management of IPR), to communicate the project, and to manage research data where relevant.

Comments:

Score 2: *Threshold 3/5*

3. Quality and efficiency of the implementation*

Note: The following aspects will be taken into account:

- Coherence and effectiveness of the work plan, including appropriateness of the allocation of tasks and resources;
- Complementarity of the participants within the consortium (when relevant);
- Appropriateness of the management structures and procedures, including risk and innovation management.

Comments:

Score 3: *Threshold 3/5*

Research Executive Agency

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

Horizon 2020 Space infodays (in 2015)

Venue	Type of event	Date
FR (Paris)	National infoday	17 September 2015
UK (London)	National infoday	22 September 2015
PL (Warsaw)	National infoday	28-29 September 2015
FR (Toulouse)	National infoday	29 September 2015
ES (Madrid)	National infoday	20 October 2015
IT (Rome)	National infoday	21-23 October 2015
PT (Lisbon)	National infoday	28 October 2015
Brussels	H2020 Space EU infoday	9-10 November 2015
GR (Athens)	National infoday	2 November 2015
SE (Stockholm)	National infoday	9 December 2015

European Commission

Thank you
for your attention

Find out more:
http://ec.europa.eu/growth/sectors/space/research/horizon-2020/index_en.htm