European Commission

HORIZON 2020

SPACE

DG GROW - Internal Market, Industry, Entrepreneurship and SMEs

GROW/I1 - Space Policy and Research Unit

Mario.AMARAL@ec.europa.eu

National Space Infoday, Lisbon, 28 October 2015

Summary

1. Space in FP7
2. Horizon 2020
3. Space research in Horizon 2020
4. Horizon 2020 Space Work Programme 2016-2017
5. Additional information

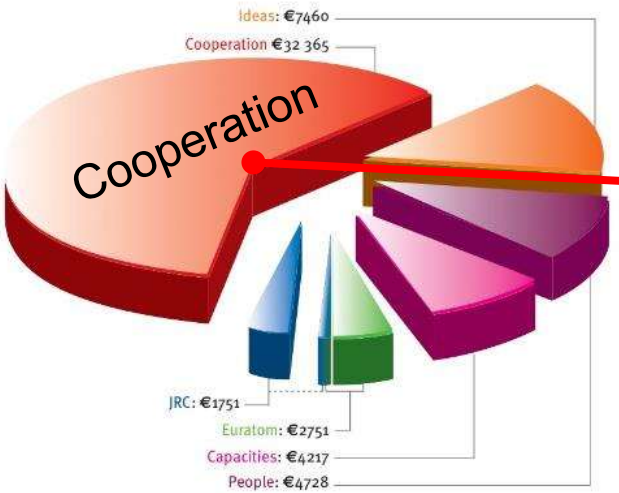
1 - Space in FP7

Space and Transports themes

Space in FP7

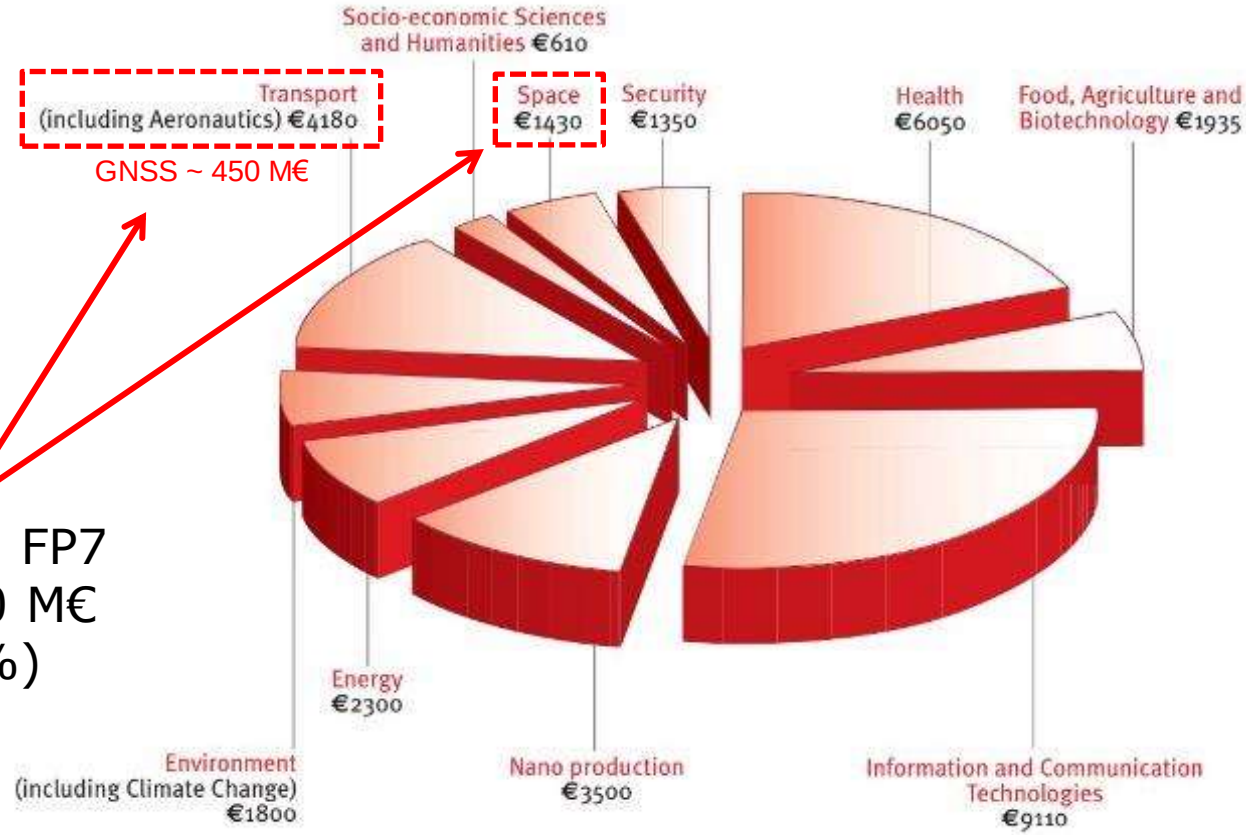
European Commission

The indicative breakdown (€ million) of FP7

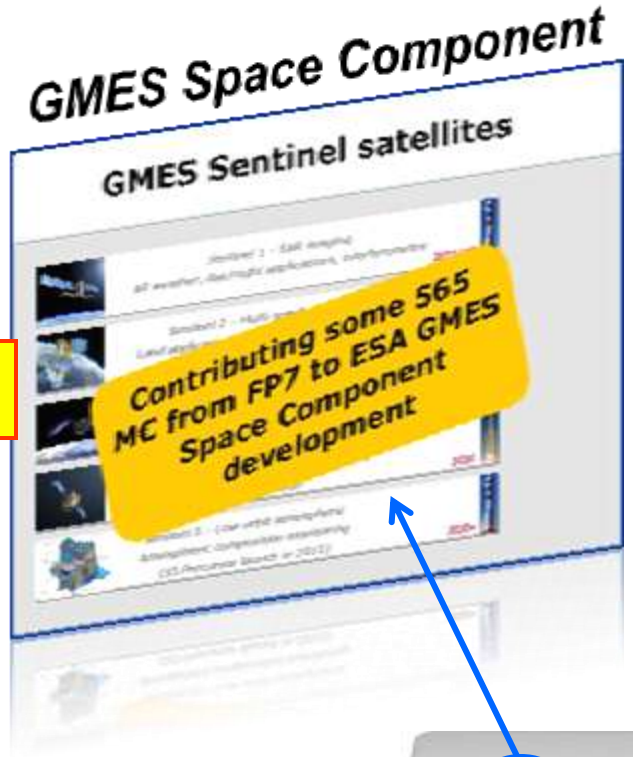


FP7 → 53.272 M€

The Cooperation Programme breakdown (€ million)

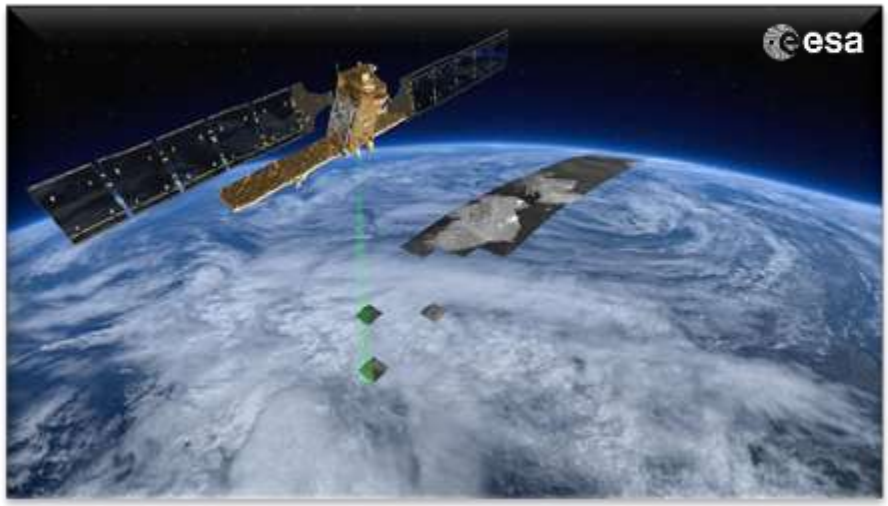


Space in FP7
~ 1.900 M€
(3.6%)



41.0 %

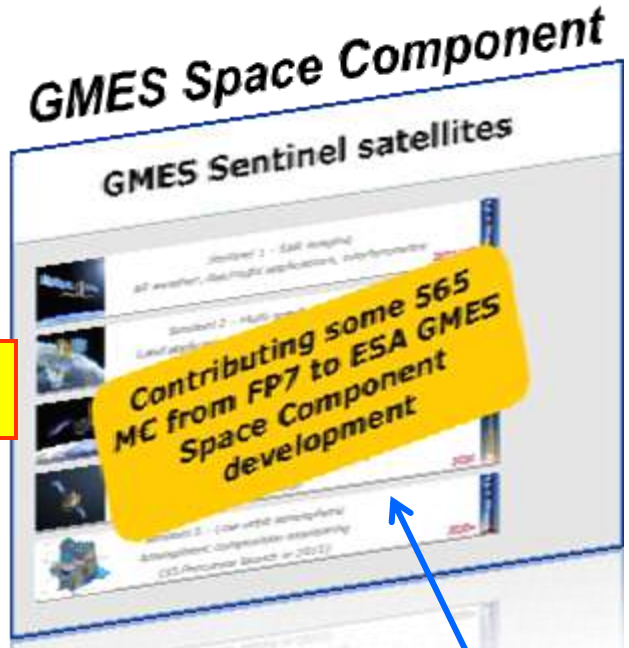
565 M€



Sentinel 1 – Earth Observation satellite (RADAR)

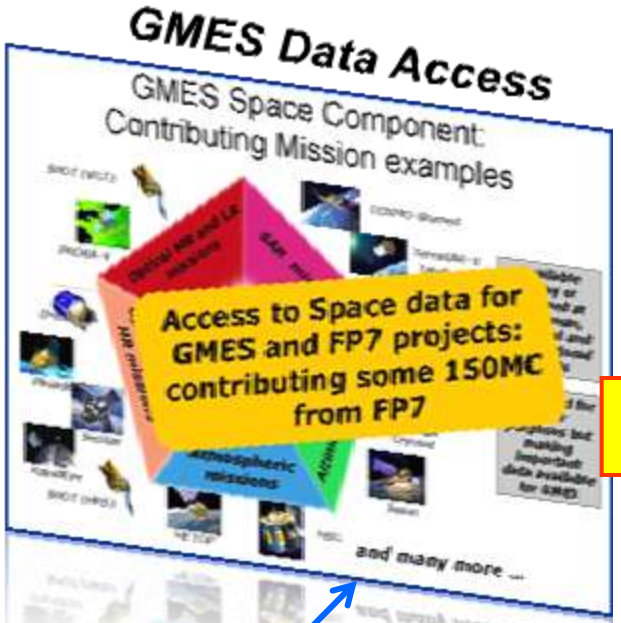
1.377 M€
(operational)

Activities developed in the FP7 / SPACE



41.0 %

565 M€



10.9 %

150 M€

1.377 M€

European Commission

GMES Space Component

GMES Sentinel satellites

Contributing some 565 M€ from FP7 to ESA GMES Space Component development

41.0 %

565 M€

GMES Data Access

GMES Space Component: Contributing Mission examples

Access to Space data for GMES and FP7 projects: contributing some 150M€ from FP7

and many more ...

10.9 %

150 M€

1.377 M€

Applications & Services

GMES Services

Monitoring of Earth systems

Land

Marine

Atmosphere

Horizontal applications

Security

Emergency

Climate Change

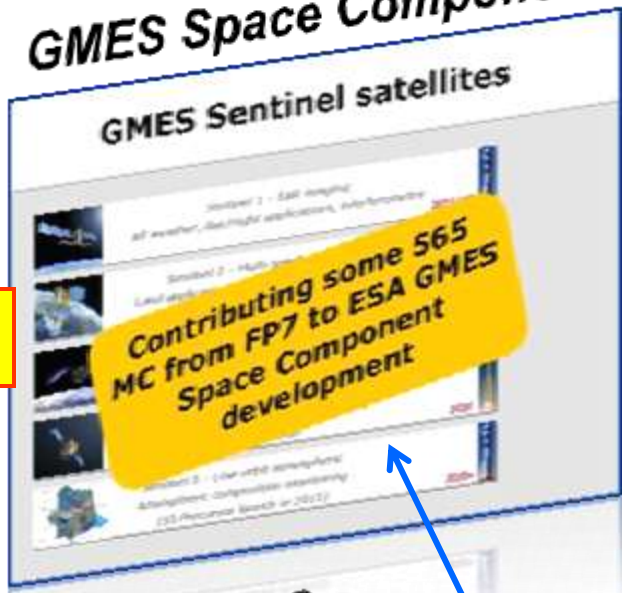
369 M€

26.8 %

http://www.copernicus.eu/project-database

European Commission

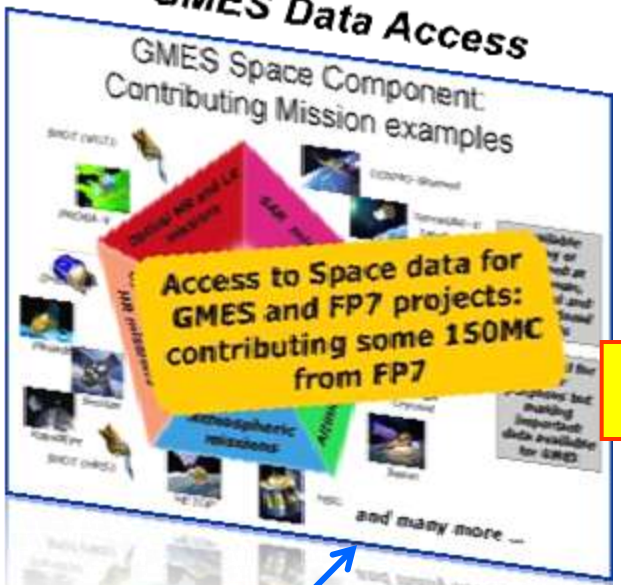
GMES Space Component



41.0 %

565 M€

GMES Data Access



10.9 %

150 M€

Space Foundations & CC

21.3 %

293 M€

Activities developed in the FP7 / SPACE

Operational budgets

Applications & Services

369 M€

26.8 %

RTD Projects in FP7/Space

European Commission

999 PROPOSALS submitted in 6 CALLS

262 PROJECTS funded by EC with ~ 662 M€

2007

1st Call

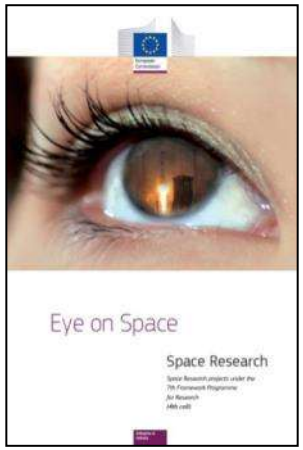
2009

2nd Call

2010

3rd Call

2011



4th Call

2012

5th Call

2013

6th Call

Further information available in
http://ec.europa.eu/growth/sectors/space/research/fp7/index_en.htm

RTD Projects in FP7/Space

European Commission

262 FACT FILES

2007

1st Call

2009

2nd Call

2010

3rd Call

2011

4th Call

2012

5th Call

2013

6th Call

6 BROCHURES

MAARBLE

Monitoring, Analyzing and Assessing Radiation Belt Loss and Energization

Maarble Earth radiation

Ioannis A. DAGLIS
Project Coordinator

STRENGTHENING SPACE FOUNDATIONS

ABSTRACT

MAARBLE aims at shading light on the ways the dynamic evolution of the Earth's radiation belt is influenced by ultra low frequency electromagnetic waves in geospace.

UNDERSTANDING THE DYNAMICS OF Earth'S RADIATION BELTS

The Van Allen radiation belts are two torus-shaped regions encircling the Earth, in which high-energy charged particles are trapped by the geomagnetic field. Radiation belt variability is of outstanding scientific interest and is also of relevance to any human endeavour in space, as it has direct impacts on spacecraft as well as on humans in space.

Although the radiation belts were discovered in the early years of the space era by the Explorer satellites, we still have no complete understanding of radiation belt dynamics. The MAARBLE project employs spacecraft monitoring of the geospace environment, complemented by ground-based magnetometer monitoring, in order to analyze and assess the physical mechanisms leading to radiation belt particle energization and loss. Particular attention is paid to the role of ultra low frequency electromagnetic waves, which are known to play a crucial role in the efficient energization of particles.

MAARBLE will contribute to the scientific understanding of radiation belt dynamics, with distinct merits for robotic and manned space exploration and for the establishment of a European space weather monitoring and forecasting capability. To this end, the project foresees:

- the use of data assimilation techniques to guide the best estimate of the state of the electron radiation belts;
- the creation of a database of ultra low and very low frequency (ULF and VLF) waves in the radiation belts;
- the development of a statistical model of radiation belts' relevant wave activity.

QUESTIONS & ANSWERS

What is the project designed to achieve?
MAARBLE aims at achieving a deeper understanding of the relationships between ULF and VLF waves and radiation belt dynamics, through the development of a statistical model of waves and the incorporation of particle measurements into data assimilation tools.

Why is this project important for Europe?
Most European satellites operate in regions where they can be exposed to intense fluxes of extremely energetic radiation belt particles. Understanding radiation belt dynamics will provide the means to mitigate risk to European space assets.

How does this project benefit European citizens?
MAARBLE will foster new knowledge on the radiation belts variability, which is of direct relevance to the smooth operation of the European satellite navigation system Galileo and numerous other service satellites of interest to European citizens.

MAARBLE

Monitoring, Analyzing and Assessing Radiation Belt Loss and Energization

STRENGTHENING SPACE FOUNDATIONS

LIST OF PARTNERS

- National Observatory of Athens, Greece
- Office National d'Etudes et de Recherches Aérospatiales, France
- Institutet for Rymdfysik, Sweden
- Ústav fyziky atmosféry AV ČR, v.v.i., Czech Republic
- Natural Environment Research Council, United Kingdom
- University of Alberta, Canada
- University of California, Los Angeles, USA

COORDINATOR

National Observatory of Athens, Greece

CONTACT

Ioannis A. DAGLIS
Tel: +30 210 8109185
Email: daglis@noa.gr

PROJECT INFORMATION

Monitoring, Analyzing and Assessing Radiation Belt Loss and Energization (MAARBLE)

Contract N°: 284520
Starting Date: 01/01/2012
Duration: 36 months
EU Contribution: € 1.995.042,90
Estimated total cost: € 2.845.504,37

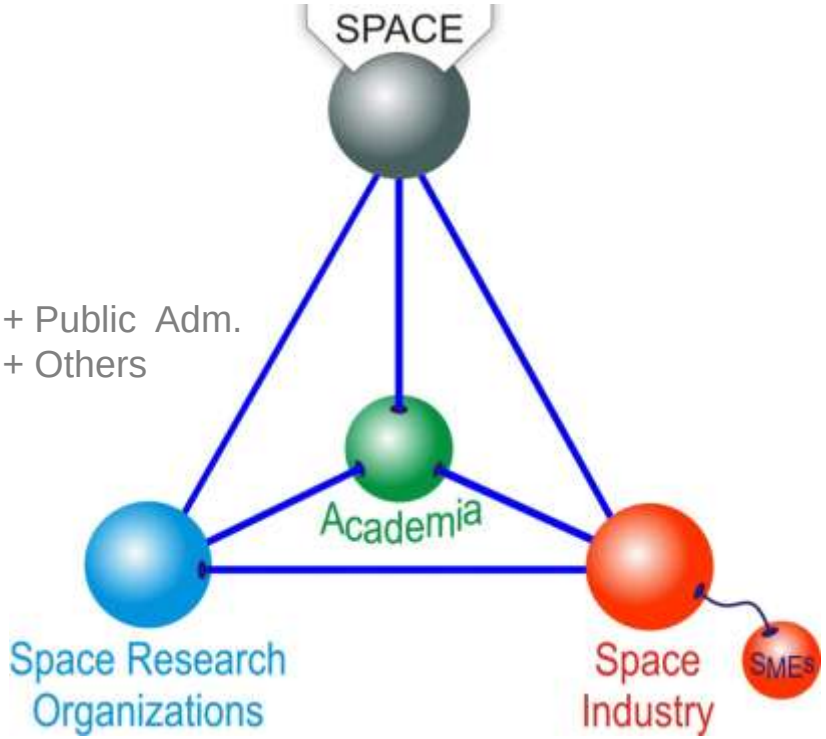
Type of participant in FP7/Space projects

Space Technology
(€197 million)

24 % Universities
33 % Research Organizations
43 % Industry

Science
(€66 million)

50 % Universities
40 % Research Organisations
7 % Industry
2 % Public Administration
1 % Others



GMES services and applications
(€369 million)

16 % Universities
45 % Research Organizations
27 % Industry
10 % Public Administration
2 % Others

% EU Contribution

RTD GNSS projects in FP7/FP6

European Commission

Aviation Agriculture Maritime Road LBS Rail Surveying/Mapping Education, innovation and support
Precision, professional and scientific applications PRS Infrastructure & evolution

GNSS research under FP7

- FP7 supported R&D and innovation on GNSS in 'Transport' theme
- FP7 GNSS applications R&D programme was **€66.5 million**
- A total of **86 projects** were selected for funding out of a total of **299 proposals**

GNSS research under FP6

- GALILEO R&D activities under its ‘Aeronautics and Space' thematic priority (2002-2006)
- Earmarked **€100 million** for GALILEO R&D activities under its ‘Aeronautics and Space' thematic priority (**69 projects**)

Further information available in
http://www.gsa.europa.eu/r-d/gnss-project-portfolio

2 - Horizon 2020

European Union programme for research and innovation for 2014-2020

European Commission

Multiannual Financial Framework 2014-2020

~ 12.000 M€

~ 1.400 M€

Copernicus
Europe's eyes on Earth

~ 3.800 M€

GALILEO EGNOS

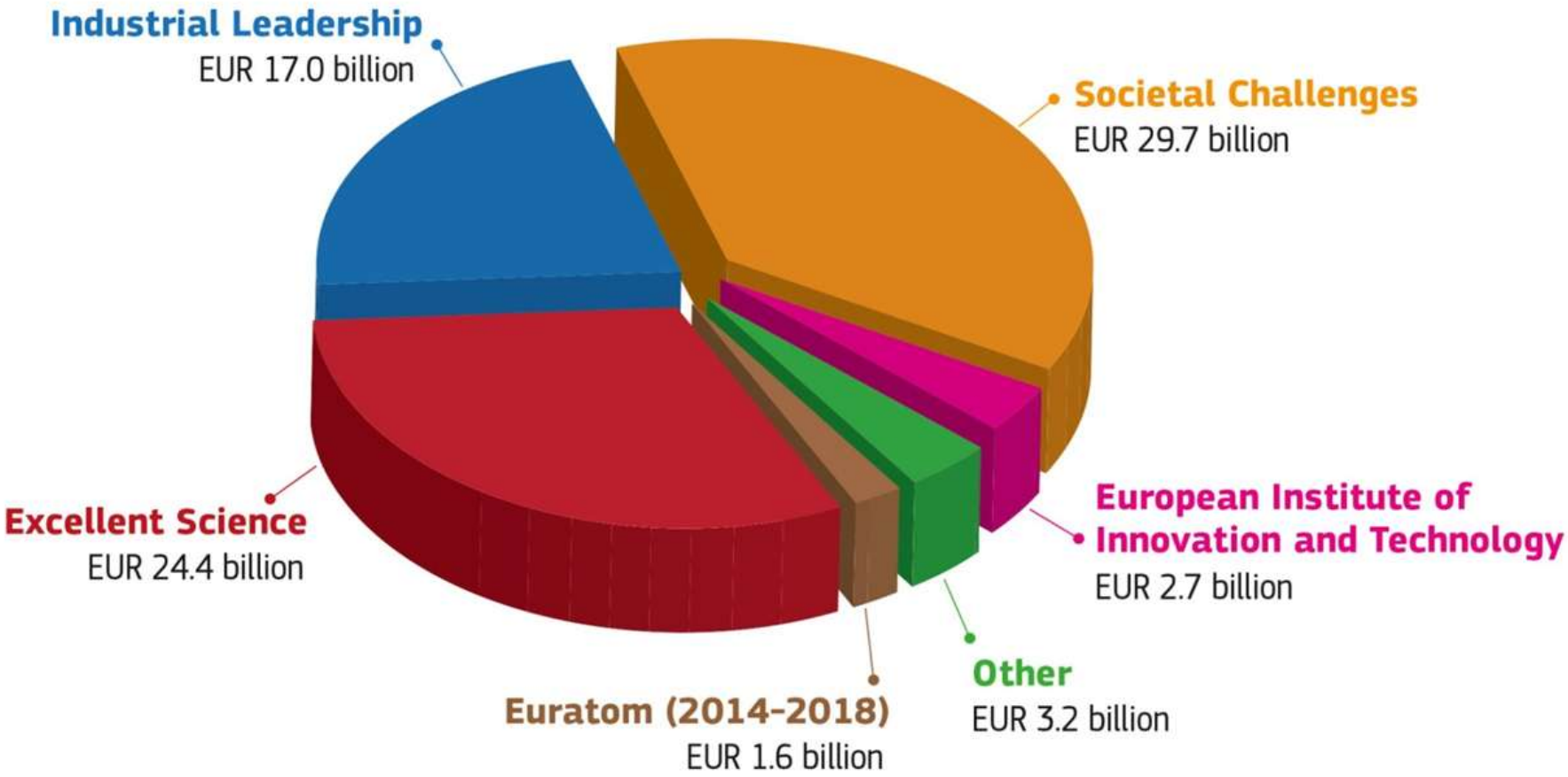
~ 6.300 M€

Horizon 2020

European Commission

HORIZON 2020 BUDGET (in current prices)

€ 79 billion from 2014 to 2020



2013 figures

Horizon 2020 Priorities

Excellent science

Priority 1 – **Excellent science**

- **European Research Council (ERC)**
- **Future and Emerging Technologies (FET)**
- **Marie Sklodowska-Curie Actions**
- **Research Infrastructures**

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

Horizon 2020 Priorities

European Commission

Industrial leadership

Priority 2 – **Industrial leadership**

- **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

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

Horizon 2020 Priorities

European Commission

Societal challenges

Priority 3 – **Societal Challenges**

- **SC1 - Health, demographic change and well-being**
- **SC2 - Food security, sustainable agriculture and forestry, Marine, Maritime and Inland water research, and Bioeconomy**
- **SC3 - Secure, clean and efficient energy**
- **SC4 - Smart, green and integrated transport**
- **SC5 - Climate action, Environment, Resource efficiency and Raw materials**
- **SC6 - Europe in a changing world – Inclusive, Innovative and Reflective societies**
- **SC7 - Secure societies – Protecting freedom and Security of Europe and its citizens**

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

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)

SME support: integrated approach

20 % global budgetary target in LEIT & Societal Challenges

Collaborative projects
13%

SME instrument
7%

'Innovation in SMEs'

Eurostars II
Enhancing Innovation Capacity
Market-driven Innovation

http://www.eurostars-eureka.eu/

Access to Risk Finance

http://ec.europa.eu/enterprise/policies/finance/

Horizon 2020 statistics

http://ec.europa.eu/programmes/horizon2020/en/horizon-2020-statistics

By 1 December 2014 the first 100 calls had closed. What can we tell about the popularity of the programme, the success of SMEs, the degree to which the programme has attracted newcomers - both as participants and as expert evaluators - and the proportion of women experts? Answers below!

"Horizon 2020 - first results" (PDF 3MB) presents information on the first 100 calls for proposals.

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: Rules for Participation

1. A single set of rules:
   - **Adapted for the whole research and innovation cycle**
   - **Covering all research programmes and funding bodies**
   - **Aligned to the Financial Regulation, coherent with other new EU Programmes**
2. One project – one funding rate
   - **Maximum of 100% of the total eligible costs (except for innovation actions, where a 70% maximum will apply for profit making entities)**
   - **Indirect eligible costs: a flat rate of 25% of direct eligible costs**
3. Simple evaluation criteria
   - **Excellence – Impact – Implementation (Excellence only, for the ERC)**
4. New forms of funding aimed at innovation
   - **pre-commercial procurement, inducement prizes, dedicated loan and equity instruments**
5. International participation
   - **facilitated but better protecting EU interests**

Simplification: Rules for Participation

6. Simpler rules for grants
   - **Broader acceptance of participants accounting practices for direct costs, flat rate for indirect costs, no time-sheets for personnel working full time on a project, possibility of output-based grants**
7. Fewer, better targeted controls and audits
   - **Lowest possible level of requirements for submission of audit certificates without undermining sound financial management**
   - **Audit strategy focused on risk and fraud prevention**
8. Improved rules on intellectual property
   - **Balance between legal security and flexibility**
   - **Tailor-made IPR provisions for new forms of funding**
   - **A new emphasis on open access to research publications**

Beyond the Rules: further simplified provisions in the Grant Agreement and implementing procedures to facilitate access to Horizon 2020 (e.g. common IT platform).

Socio-economic sciences and humanities (SSH)

- **Integrated approach:** SSH included as an integral part of the activities, working beyond 'silos' (e.g. understanding the determinants of health and optimising the effectiveness of healthcare systems)
- The **'Inclusive, innovative and reflective societies'** challenge: issues such as smart and sustainable growth, social transformations, social innovation and creativity, the position of Europe as a global actor
- **Bottom-up funding:** ERC, MSCA, Research Infrastructures

Widening participation

Principle of excellence: continue to allocate funding on the basis of competitive calls, selecting only the best projects

Clear division of labour between cohesion policy and Horizon 2020

- **Cohesion policy:** support for regions in building up their research and innovation capacity
- **Horizon 2020:** widen participation, better coordination between the two Union funding programmes, support policy learning reforms

Accompanying measures in Horizon 2020 to ensure that excellence prevails wherever it exists, including: twinning, ERA chairs, support for access to international networks, development of smart specialisation strategies

International cooperation

- **International cooperation is crucial** to address many Horizon 2020 objectives
- **Principle of general openness:** the programme will remain to be the most open funding programme in the world
- Horizon 2020 shall be open to the **association** of: acceding countries, candidate countries and potential candidates and selected international partner countries that fulfil the relevant criteria (capacity, track record, close economic and geographical links to the Union, etc.)
- Targeted actions to be implemented taking **a strategic approach to international cooperation** (dedicated measures in the 'Inclusive, innovative and secure societies' challenge)

Link to the participation of third countries

International cooperation

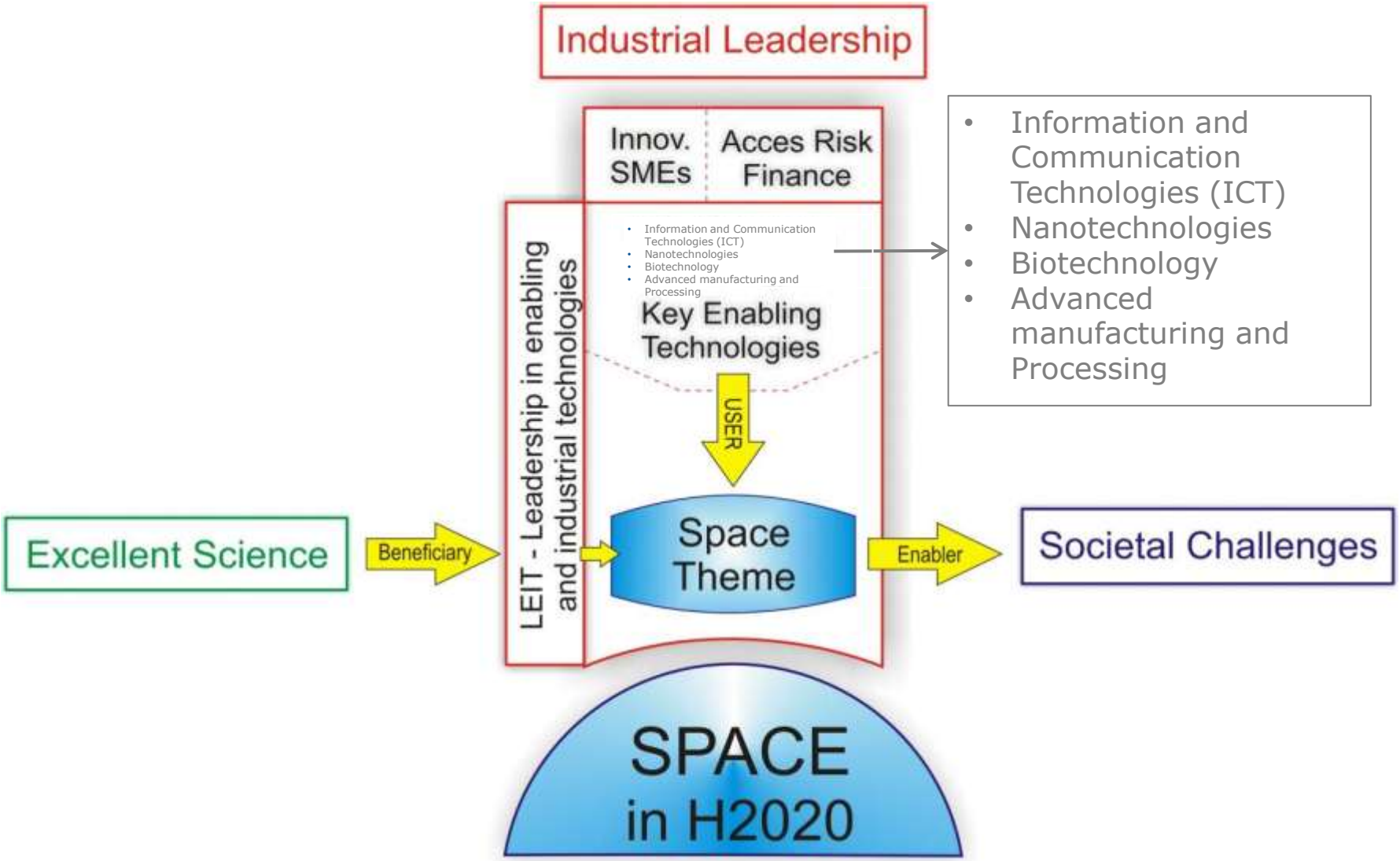
Countries eligible to receive funding (WP General Annex A)

- EU-Member States
- The Overseas Countries and Territories (OCT) linked to the MS:
  Anguilla, Aruba, Bermuda, Bonaire, British Virgin Islands, Cayman Islands, Curaçao, Falkland Islands, French Polynesia, Greenland, Montserrat, New Caledonia, Pitcairn Islands, Saba, Saint Barthélémy, Saint Helena, Saint Pierre and Miquelon, Sint Eustatius, Sint Maarten, Turks and Caicos Islands, Wallis and Futuna
- Horizon 2020 associated countries Check Funding Guide for up-to-date information whether agreements are signed (13 countries as of August 2015):
  http://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/international-cooperation_en.htm

  For Switzerland the agreement has been signed but only for Excellent Science (incl. ERC, FET, RI & Marie Curie actions), actions under specific objectives 'Spreading excellence and widening participation and ITER and EURATOM.
- Third countries listed in General Annex A
- International European interest organisations

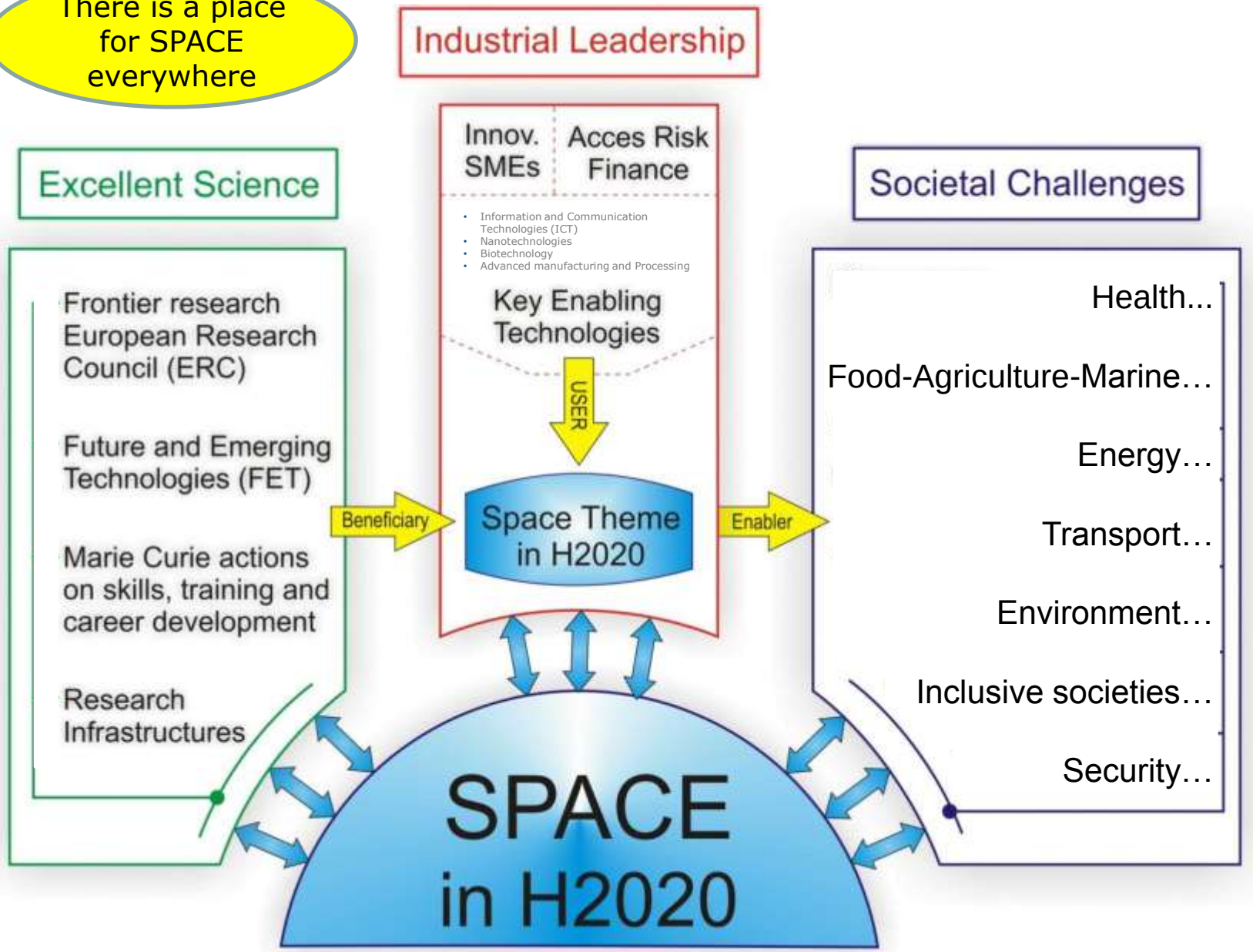
3 - Space research in Horizon 2020

The Space Theme in Horizon 2020



European Commission

There is a place for SPACE everywhere



H2020 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
- The application of space technologies shall be supported through the respective specific objectives of the priority "Societal challenges", where appropriate

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

H2020 Space building blocks

European Commission

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

H2020 Space Work Programmes

Horizon 2020 is being implemented through a sequence of 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€**	

H2020 Space
Calls for proposals

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 phase of 'grant preparation'

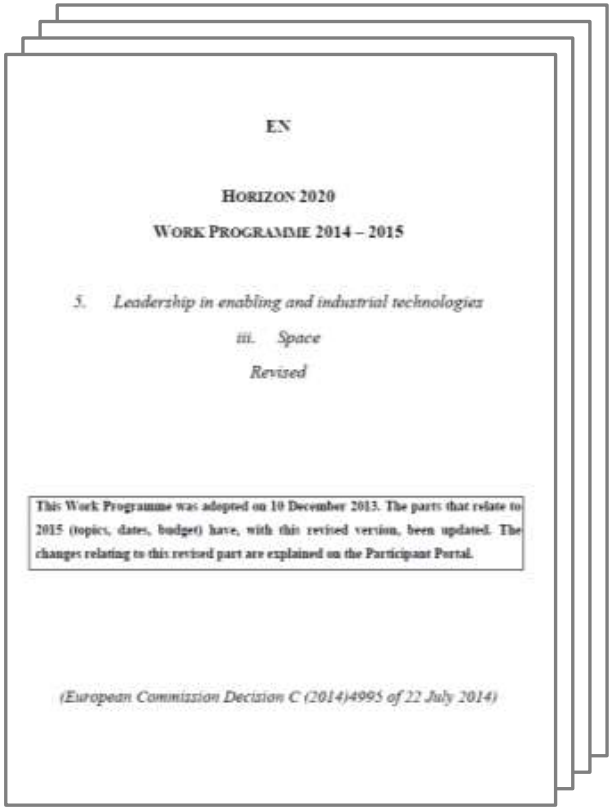
2016-2017

Work programme pre-published (14 October 2015)

Opening date: 10 November 2015

2016 call deadline 3 March 2016

2017 call deadline 1 March 2017



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)

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/

EU agencies involved

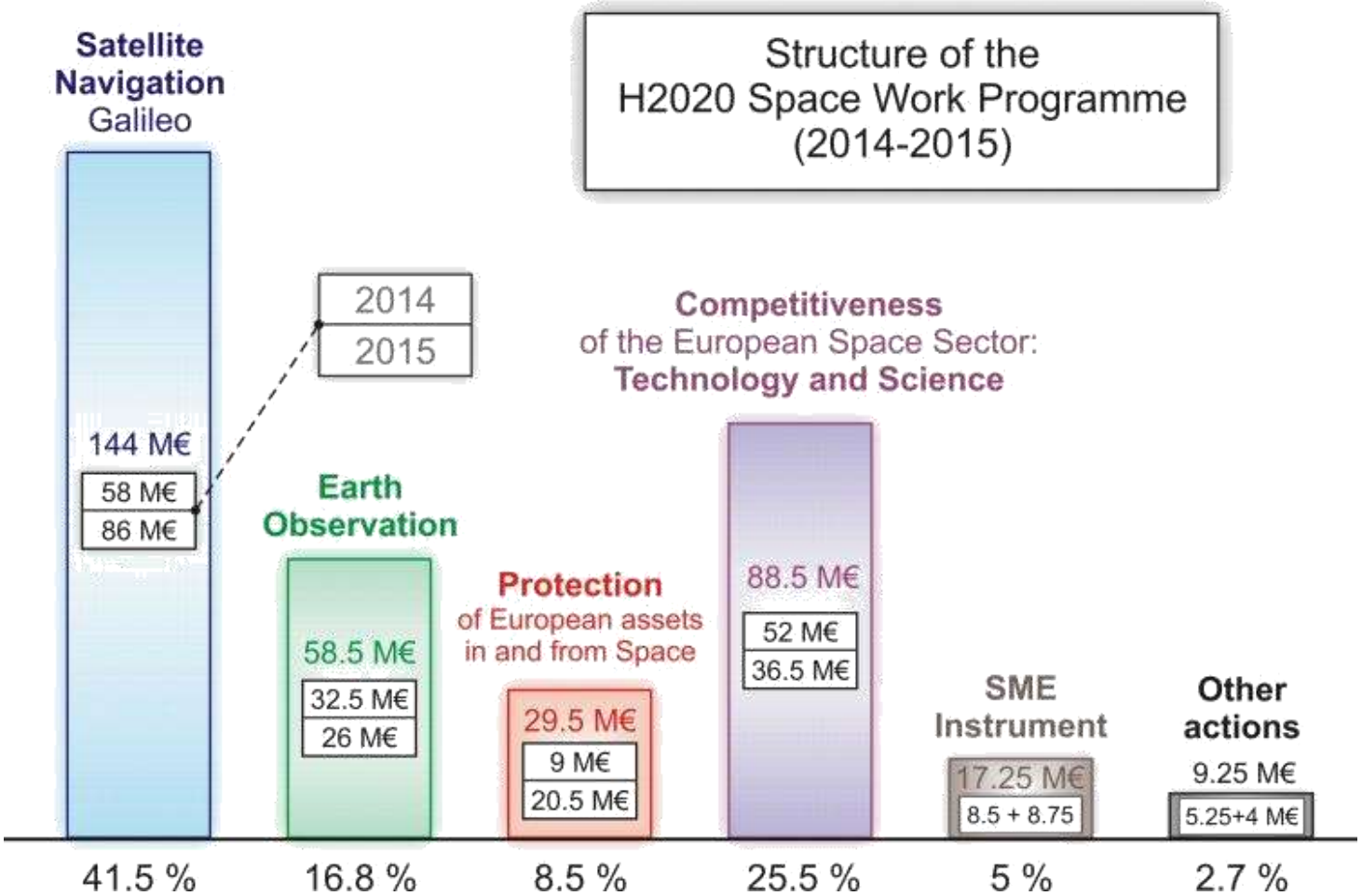
- ***Research Executive Agency (REA)***
- ***European GNSS Agency (GSA)***
- ***Executive Agency for SMEs (EASME)***

TASKS

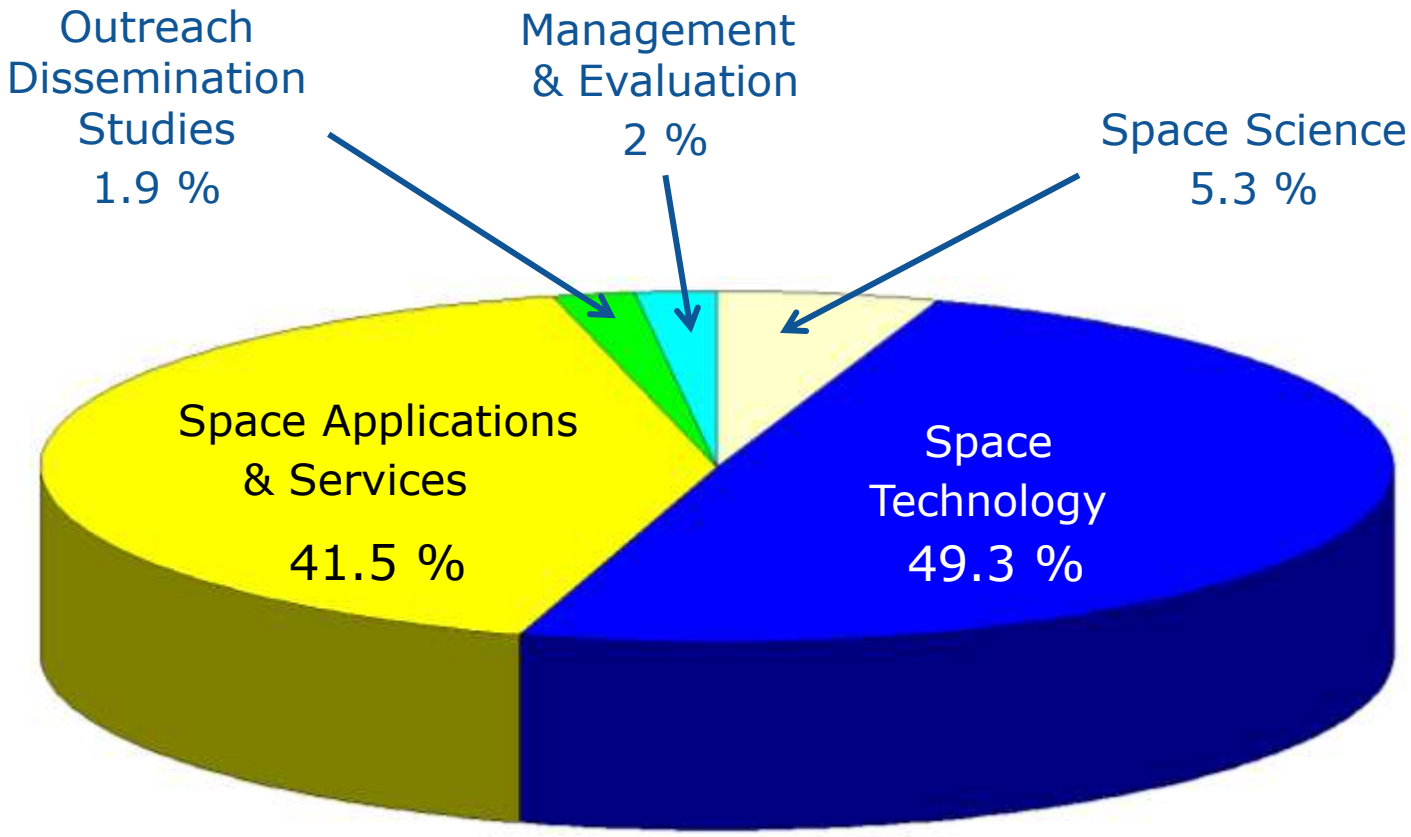
Call handling, receipt of proposals, evaluation process, grant agreement preparation, grant agreements signature, receipt of reporting, reviews, payments, audits…

Work Programme 2014-2015

Overall sctructure and budget for the Work Programme 2014-2015 per building block



Overall budget for the Work Programme 2014-2015 per nature of activities



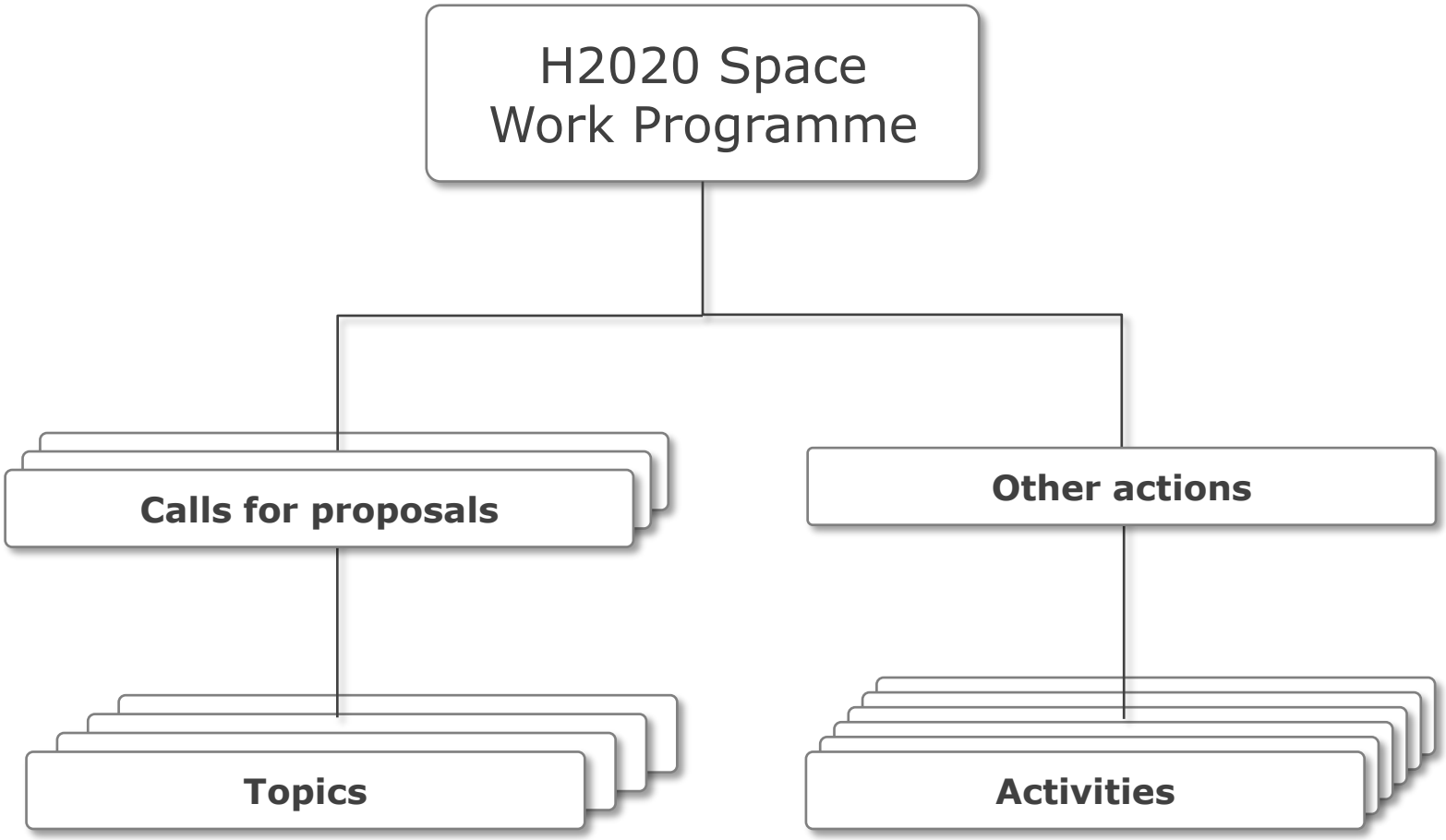
Space projects financed in 2014

Horizon 2020 Space projects

- H2020 Space Projects at REA webpage
- H2020 Space Projects in the GSA webpage

4 - Horizon 2020 Space Work Programme 2016-2017

Horizon 2020 Space WP structure



Horizon 2020 Space WP 2016-17 structure

European Commission

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
- Strategic research clusters
- 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

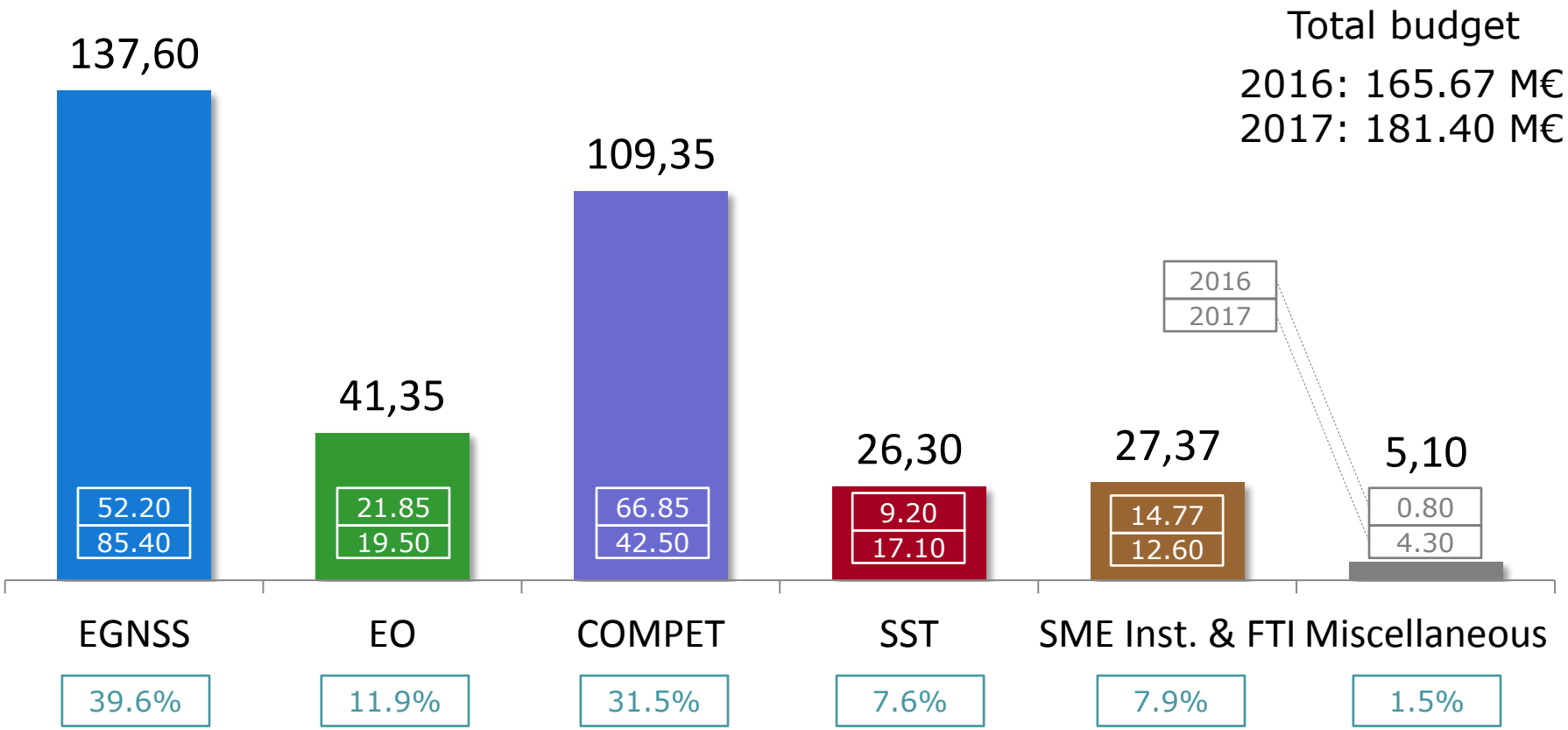
Other actions:
- Contribution to the SST support framework
- Improving the performance of SST at European level

SME Instrument

Fast Track to Innovation 'pilot'

WP 2016-2017
Indicative budget

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



Horizon 2020 Space 2016-2017 'calls'

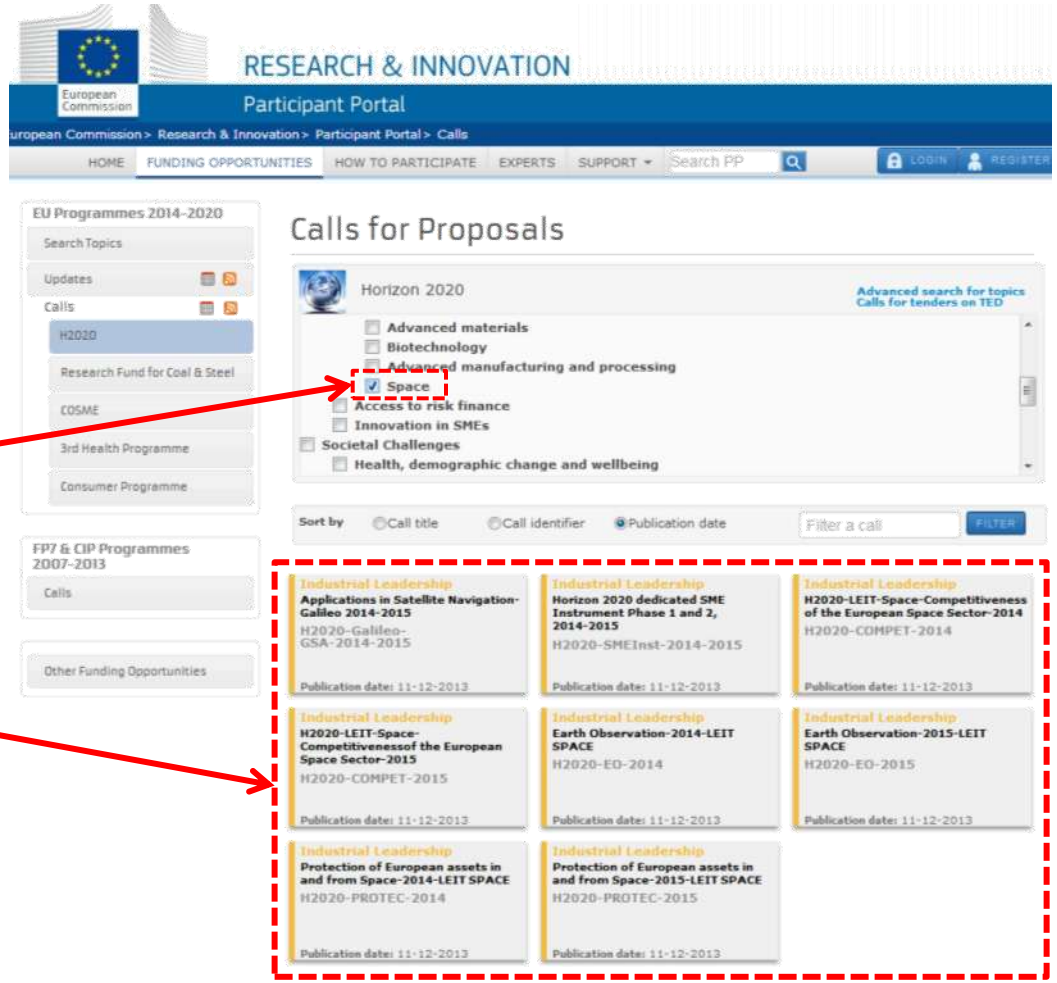
European Commission

Horizon 2020 Participants Portal:

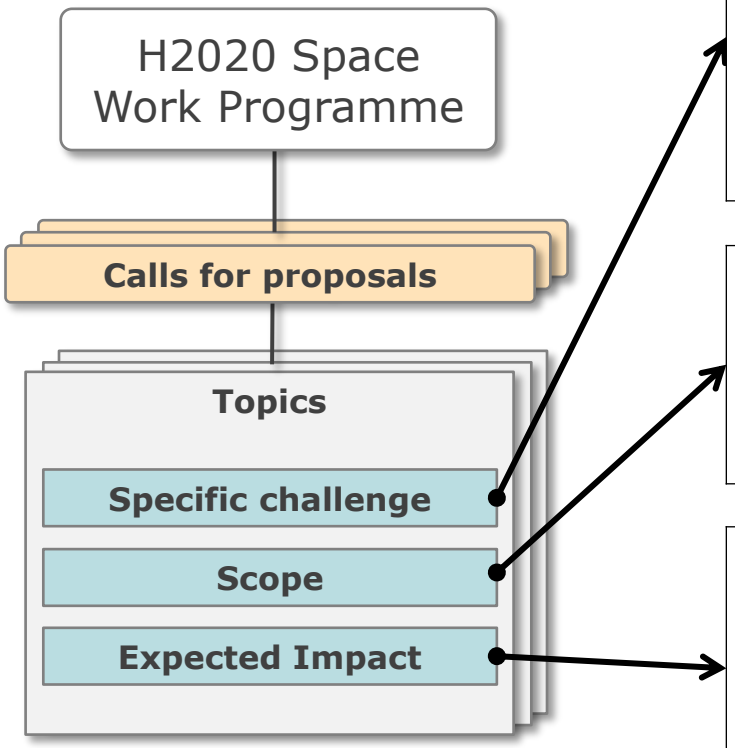
http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/

H2020 Space Work Programme

Calls for proposals



WP 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

Types of actions and 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 [not yet published]*

Pre-commercial procurement (PCP) versus public procurement of innovative solutions (PPI)

European Commission

Public sector is faced with important challenges.

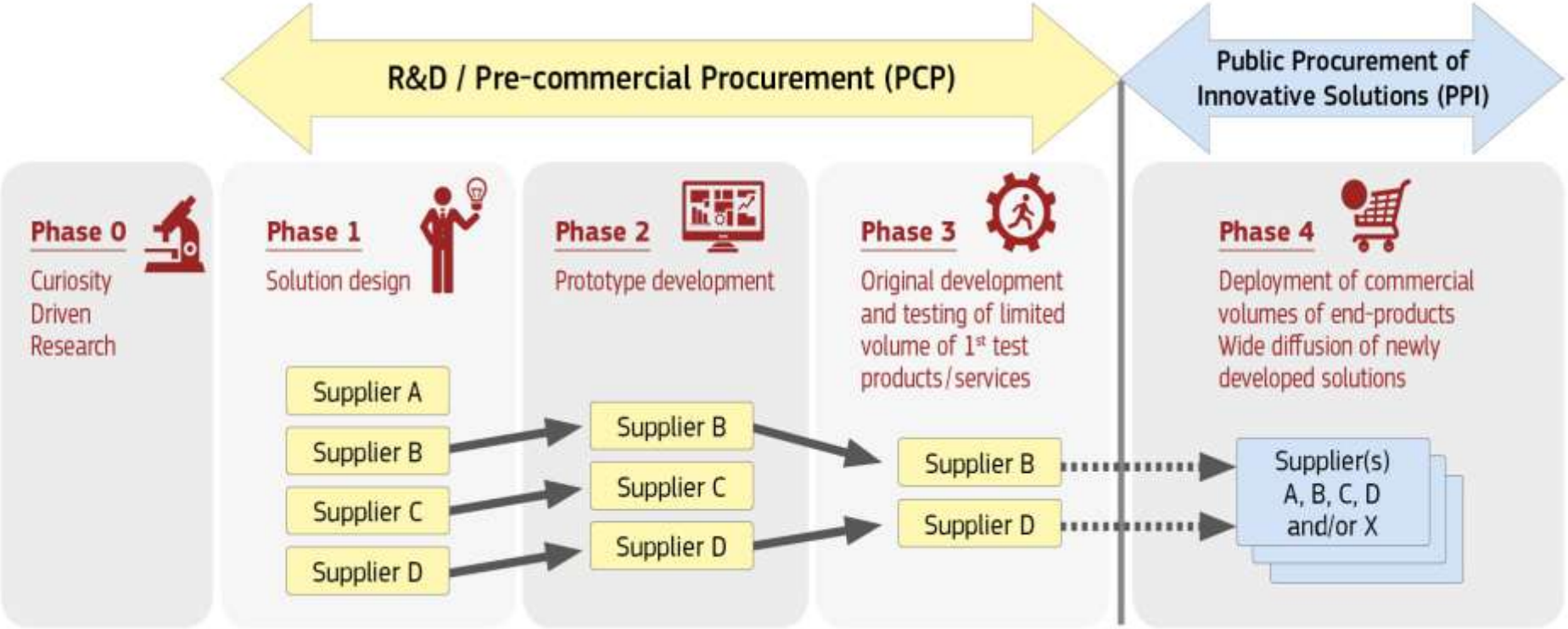
To tackle these challenges often public sector transformations are needed.

- In many cases, solutions are close to the market and would be provided if clear requirements/sufficient demand expressed by market. Incremental innovation (product adaptation, scaling up of production…) or non-R&D innovation (e.g. service innovation) can deliver required quality/price, so no need for R&D procurement. Public sector provides seal of approval for innovative solution by acting as launching customer/early adopter ***(PPI)***

- In other cases, addressing the problem requires radical innovation, there is no available solution 'on' or 'close to' the market yet. There are different competing potential solution approaches but R&D still needed to de-risk and compare different technological alternatives before committing to large scale deployment. Procurer wants to induce step change in market (e.g. moving from proprietary/vendor lock-in to better open systems with multiple vendors incl. new players) ***(PCP)***

Innovation Procurement = PCP + PPI (Complementarity)

- **PCP** to steer the development of new solutions towards concrete public sector needs, whilst comparing/validating alternative solution approaches from various vendors and enabling new players to prove themselves against established ones
- **PPI** to act as launching customer / early adopter / first buyer of innovative commercial end-solutions newly arriving on the market



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*

European Commission

2016 call topics

Earth observation

Image credits: ESA

Indicative budget: **21.85 M€**

Deadline: 3 March 2016

Earth observation

European Commission

COPERNICUS SERVICES

http://www.copernicus.eu/main/overview/

Copernicus
Europe's eyes on Earth

Address six main thematic areas:

- Land monitoring
- Marine monitoring
- Atmosphere monitoring
- Emergency management
- Security
- Climate change

Data access

- Copernicus users can also have a direct access to satellite data

COPERNICUS SPACE COMPONENT

- Earth Observation Satellites

http://www.copernicus.eu/main/satellites

NEW

COPERNICUS Brochure

http://www.copernicus.eu/main/Brochure

GMES Projects in FP7 / Space

Copernicus Service	EU Contribution	%	Projects
Land Monitoring	89.4 M€	24,2%	41
Marine Monitoring	108.0 M€	29,2%	23
Atmosphere Monitoring	45.7 M€	12,4%	8
Emergency Management	58.5 M€	15,8%	12
Security	22.1 M€	6,0%	7
Climate Change	39.3 M€	10,6%	10
Cross-Cutting	6.5 M€	1,8%	6
	369.5 M€		**107**

Distribution by theme (indicative figures)

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…

Reccomended project size
Indicative budget
Type of action

1 to 2 M€

9,85 M€

Innovation Actions

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

Reccomended project size
Indicative budget
Type of action

3 M€

Pre-commercial procurement

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

Reccomended project size
Indicative budget
Type of action

1 to 2 M€

9 M€

Research and Innovation Actions

European Commission

EO-3-2016 – Guidance document

Designed to further elucidate the **research needs as identified in the context of provision of operational services in Copernicus** for the benefit of applicants to Horizon 2020

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GUIDANCE DOCUMENT: RESEARCH AND INNOVATION NEEDS OF COPERNICUS OPERATIONAL SERVICES

DRAFT VERSION: 3 (17/7/2015)

EO-3-2016 – Guidance document

5. IDENTIFIED NEEDS OF OPERATIONAL COPERNICUS SERVICES

5.1. Marine Environment Monitoring Service

5.2. Land Monitoring Service (pan-European and local land)

5.3. Global Land Monitoring Service

5.4. Atmosphere Monitoring Service

5.5. Climate Change Service

5.6. Emergency Management Service (EMS)

5.7. Security Service

5.8. Cross-cutting issues and priorities identified

EO-3-2016 – Guidance document – example of contents:

5. IDENTIFIED NEEDS OF OPERATIONAL COPERNICUS SERVICES

5.1. Marine Environment Monitoring Service

5.1.1. Solving ocean dynamics at kilometric resolution

5.1.2. Designing future observing systems and related assimilation methods

5.1.3. Developing seamless information chains linking dynamics, and ecosystem essential variables

5.1.4. Seamless interactions between CMEMS and coastal monitoring systems

EO-3-2016 – Guidance document – example of contents:

5.1.1. Solving ocean dynamics at kilometric resolution

To support Copernicus users and decision-makers there is an increasing demand for model information on fine spatial scales and for a more complete representation of dynamical processes. This is relevant to all areas from the open ocean where the dynamics is significantly impacted by mesoscale to sub-mesoscale dynamics, to transition areas connecting coastal seas. It is also crucial that numerical models develop a resolution capacity compliant with the spatial scales that will be captured from space by future EO observing platforms (e.g. wide-swath altimetry, geostationary sensors, high resolution surface currents, high resolution SST, improved SSS etc.). Therefore numerical codes should be prepared to achieve smallest target effective resolution in the kilometric range. This objective requires R&D effort on numerical schemes and on adaptation of multi-scale and downscaling capabilities, interfaces with river hydrology, wave and sea-ice modelling components (as well as assimilation interfaces, to be treated jointly with topic 2 here below). In addition and consistently with the kilometric target, it will be necessary to develop new strategies and new algorithms to solve the model equations efficiently on next generation computing systems. This should result into improvements of code performance on most intensive HPC applications, which is crucial to sustain operational production.

Related Earth Observation activities

Societal Challenge 2

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

Societal Challenge 5

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

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

Related Earth Observation activities

'SC2' + 'SC5' WP 2016/2017	
	2016/2017
Societal Challenge 2: Blue Growth – demonstrating an ocean of opportunities (H2020-BG-2016-2017)	Indicative budget (M€)
BG-9-2016: **An integrated Arctic observing system (RIA)**	**15.0**
BG-12-2016: **Towards an integrated Mediterranean Sea Observing System (RIA)**	**8.0**
Societal Challenge 2: Sustainable Food Security – resilient agri-food chains (H2020-SFS-2016-2017)	Indicative budget (M€)
SFS-43-2017: **Earth Observation services for the monitoring of agricultural production in Africa (RIA)**	**10.0**
Societal Challenge 5: Earth Observation (H2020-SC5-2016-2017)	Indicative budget (M€)
SC5-18-2017 **- Novel in-situ observation systems (RIA)**	**15.0**
SC5-19-2017 - **Coordination of citizens' observatories initiatives (CSA)**	**4.6***
SC5-20-2016 - **European data hub of the GEOSS information system (RIA)**	**10.0**
Total EO related in SC2 and SC5 (2016/2017)	**58.0**

* *This ammount corresponds to three topics, among which SC5-19-2017 (not included in the total).*

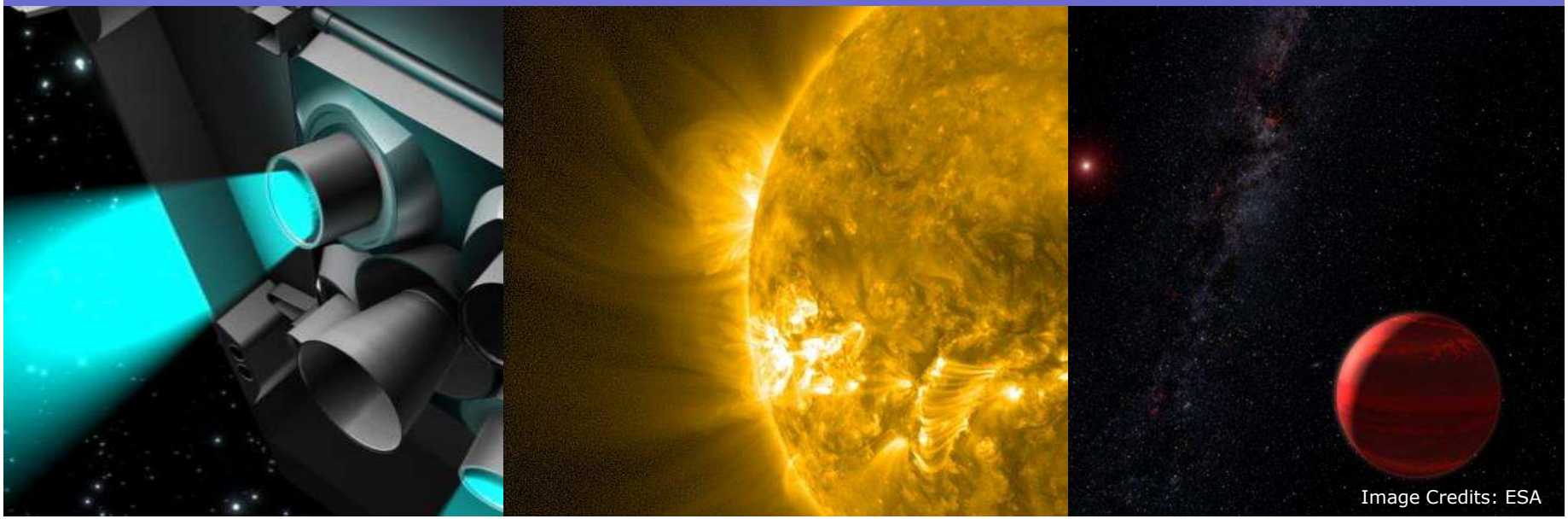
Earth observation calls for proposals: summary

'Space' 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**
Sub-total EO-2016/2017	21.85	19.5
COMPET-2-2017: **Competitiveness in Earth observation mission technologies**		**7.0**
Total EO related 'Space' (2016/2017)	**21.85**	**26.5**

European Commission

2016 call topics

Competitiveness of the European Space Sector Technology and Science



Indicative budget: **65.85 M€**

Deadline: 3 March 2016

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*

Reccomended project size
Indicative budget
Type of action

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.

COMPET-1-2016 – Guidance document

Excerpt from Critical Space Technologies (actions 2015/2017)

esa

EUROPEAN DEFENCE AGENCY

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

esa

EUROPEAN DEFENCE AGENCY

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), > 8 for current generation
Target TRL	8 (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 THEMIS project, planned PICTURE project.
Date of Entry / Last Date of Change	1.9.2014

Page 11

COMPET-1-2016 – Guidance document

Excerpt from Critical Space Technologies (actions 2015/2017)

U14 – Active discrete power components

Description and needed Action	Development and qualification of active components (like diodes) assuring unrestricted availability of space qualified high reliability components in Europe – CMOS MOSFET transistors – GaN diodes & transistors – Power functions: POL, PWM, ICL, drivers (MOS) The recommendations from European Space Components Co-ordination (ESCC) via CTB will be taken into account.
Target TRL:	6
Estimated Initial TRL	4 (usually)

COMPET-1-2016 – Guidance document

Excerpt from Critical Space Technologies (actions 2015/2017)

U18 – Enhanced performance and space qualified detectors

Description and needed Action	High-performance CMOS image sensors (CIS) continue to be a requirement for future Earth Observation, Science and Astronomy missions with sensitivity from UV to VLWIR. In the infrared, a good base of European manufacturers is available and recent developments in NIR, SWIR and LWIR continue to improve the range of technologies on offer. However, it is clear that further progress is both necessary and possible in terms of improved performances and exploitation of different material systems. Large format arrays in the NIR and SWIR are essential for future missions as are longer wavelength detectors with lower dark currents. In the visible waveband (UV is also included here), CCDs continue to dominate due to their higher electro-optical performances. While this remains the case, it is not possible to fully exploit the inherent advantages on offer from CIS (lower power, faster readout, enhanced radiation tolerance, ease of interfacing…) and it is a high priority goal to meet this challenge. Two approaches are possible: 1. European design house coupled with non-European foundry 2. European design house coupled to European foundry Option 1 is likely to provide the best performance in the shorter term, but is only partial non-dependence and consequently subject to more external influences. Option 2 implies full European non-dependence and potentially better control over the processes. However, the European foundry landscape is currently changing and developments need to be targeted and controlled. This said, it is still considered a high priority to develop and support a stable, European CIS supply chain.
Estimated Initial TRL:	2-5
Target TRL	8

COMPET-1-2016 – Guidance document

Excerpt from Critical Space Technologies (actions 2015/2017)

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)

COMPET-1-2016 – Guidance document

Excerpt from Critical Space Technologies (actions 2015/2017)

U20 – Very high performance microprocessors

Description and needed Action	Next Generation MicroProcessor (NGMP) is a 4 core LEON4 based microprocessor targeting the 1 GIPS (giga-instruction-per-second) performance range (http://microelectronics.esa.int/ngmp/). The development strongly relies on the 65 nm DSM developments (DSM libs, high pin count flip-chip packages) Functional (non rad-hard) prototypes are available, and the implementation on rad-hard 65 nm (DSM) technology is currently in progress (2014-2015). Needed actions are validation and qualification activities, e.g. via flight model development and user experience. For future generations of microprocessors, beyond the 65 nm, the development of more advanced DSM technologies will be necessary.
Estimated Initial TRL:	4
Target TRL	➢ 6

COMPET-1-2016 – Guidance document

Excerpt from Critical Space Technologies (actions 2015/2017)

U22 – ASICS: Deep Sub-Micron (DSM)

Description and needed Action	ESCC qualification of the 65 nm technology and first products, extended test vehicles and packaging aspects. In the 65 nm library it is necessary to include elements oriented to the development of Mixed Signal Multiprocessors System-on-Chip (MPSoC), such as Fast and Slow DACs and ADCs for data acquisition and housekeeping as well as analogue multiplexers or Network on Chip (NoC) modules.
Estimated Initial TRL:	5
Target TRL	≥ 6

COMPET-1-2016 – Guidance document

Excerpt from Critical Space Technologies (actions 2015/2017)

N27 – RF components

Description and needed Action	In any space mission high sophisticated semiconductor components for telecommunication such as PLLs, prescalers, power and low noise amplifiers are vital for reliable communication. Although there are very promising attempts in R&D for such components in Europe, almost all components are ordered from overseas. European industry and research facilities have the technological know-how and potential to supply the space community with components having equivalent or even better performance in comparison to its "overseas competitors" but still need R&D to come to market readiness of space qualified components.
Estimated Initial TRL	4
Target TRL	6

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…

Reccomended project size
Indicative budget
Type of action

2 to 4 M€

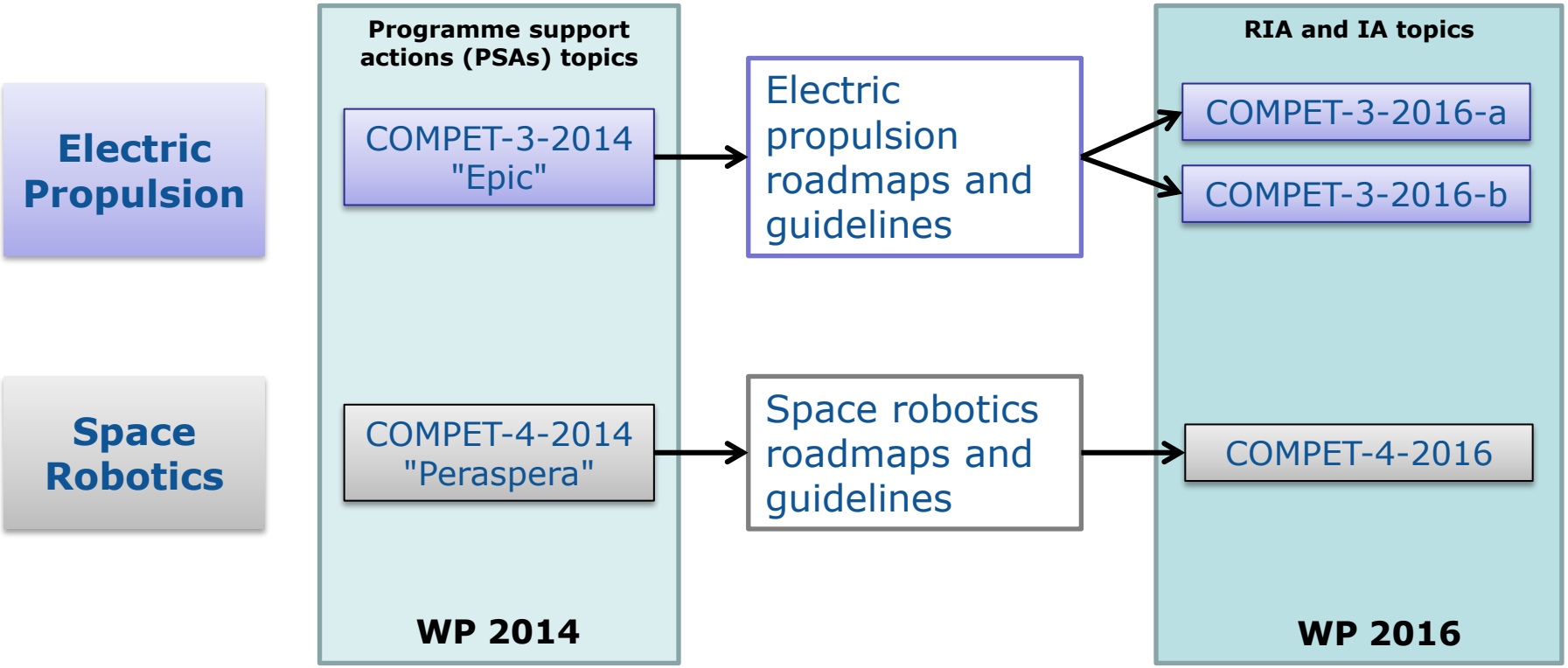
7 M€

Research and Innovation Actions

Proposals that demonstrate technologies targeting TRL 6 are welcome, … [and] *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…

Strategic Research clusters



Reccomended project size
Indicative budget
Type of action

COMPET-3-2016-a

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-3-2016-b

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

Competitiveness of European Space Sector

European Commission

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

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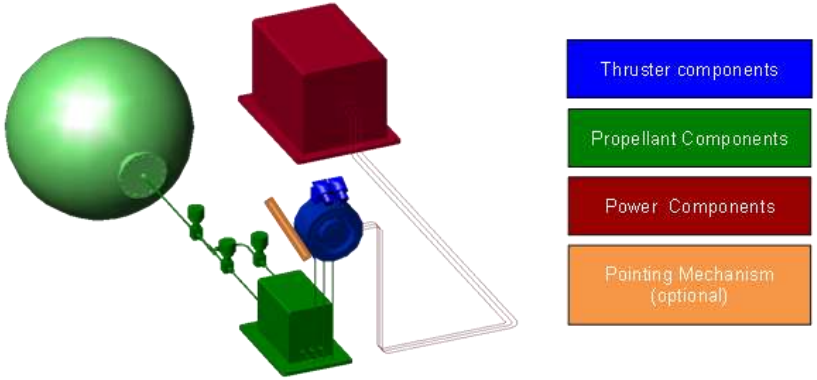
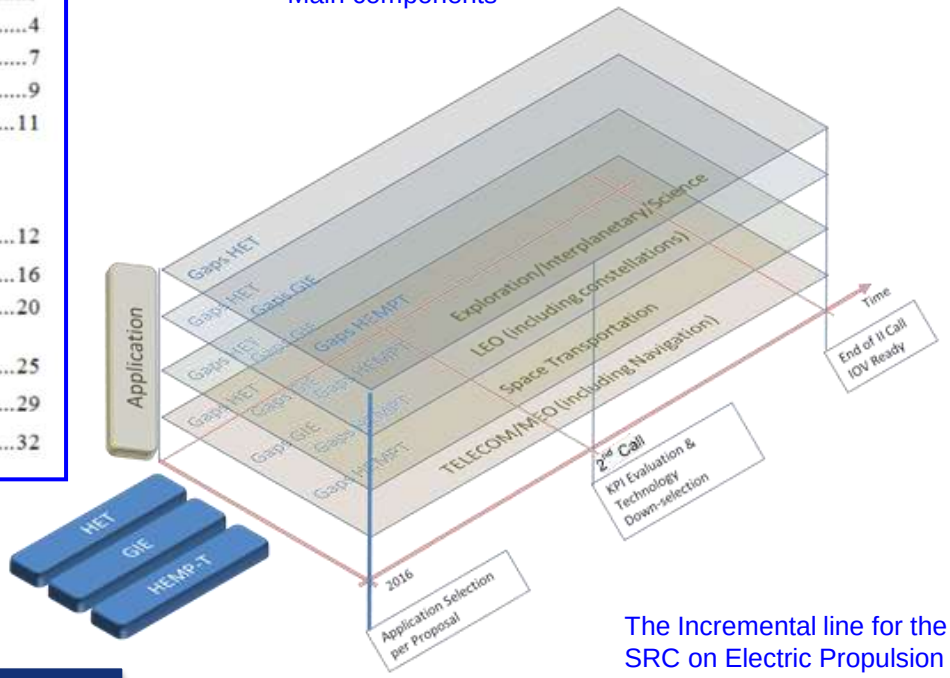
- A2 - Gridded Ion Engines-based EPS (GIE): Project activities 20
- A3 - Highly Efficient Multistage Plasma Thruster-based EPS (HEMPT): Project activities 25

B - DISRUPTIVE LINE 29

ACRONYMS & ABBREVIATIONS 32



Electric Propulsion System
Main components



The Incremental line for the SRC on Electric Propulsion

COMPET-4-2016

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*

Reccomended project size
Indicative budget
Type of action

Building blocks
a) - e): 3 to 3.5 M€
f): 1 M€

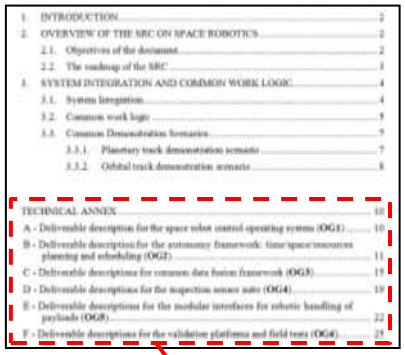
18 M€

Research and Innovation Actions

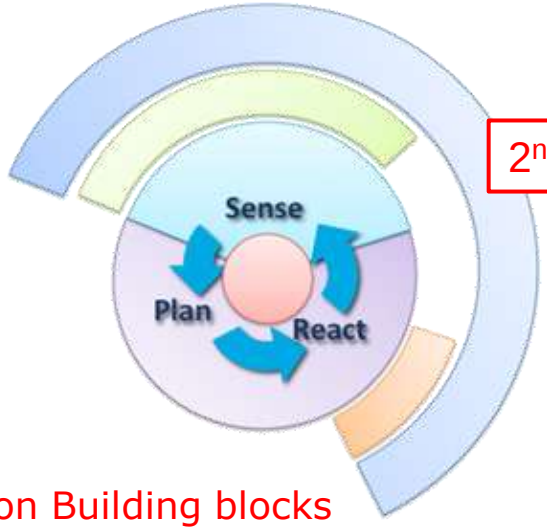
Competitiveness of European Space Sector

European Commission

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

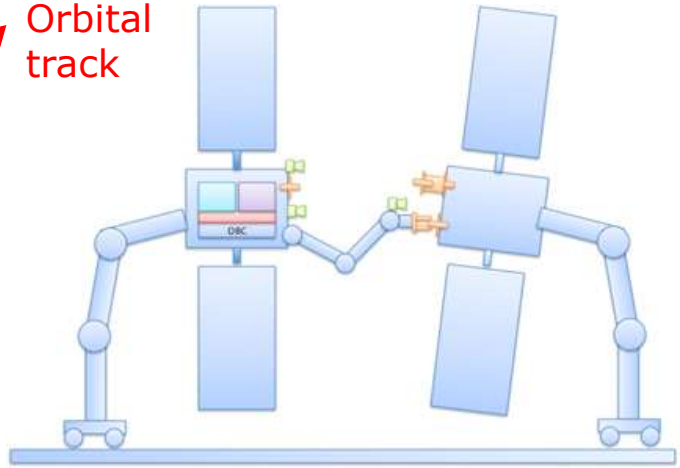


Call 2016

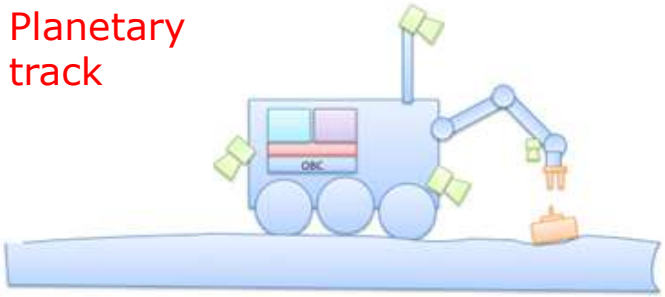


2nd Call

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

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.

Reccomended project size
Indicative budget
Type of action

1.5 to 3 M€

3 M€

Research and Innovation Actions

Competitiveness of the European Space Sector –Technology and Science: summary

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	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	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**

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Satellite Navigation – Galileo and EGNOS

2016 Other actions

WP2016, Other Actions

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

- Actions under this area serve to study and develop concepts for new Galileo services as well as for the evolution of the currently defined services. Following themes will be covered:
  - Innovative concepts
  - Public Regulated Service
  - Search and Rescue Service

- All Actions to be launched as Public Procurement
- Indicative timetable: Second quarter 2016
- Publication of Actions announced through the standard e-tendering process, plus notification via email to the H2020 Space Programme Committee members and Space NCPs)

WP2016, Other Actions

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

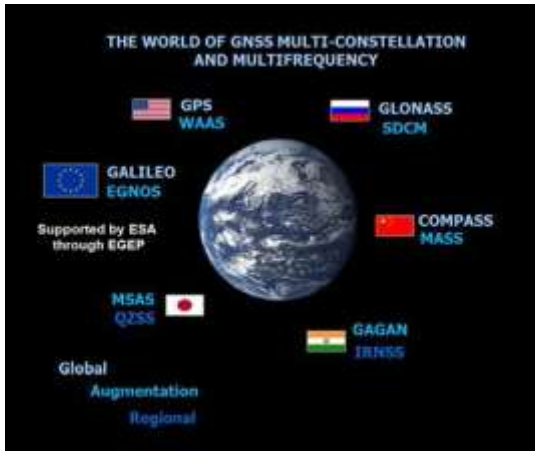
- Actions under this area serve to study and develop of the current EGNOS Services (Open Service, Safety of Life, and EGNOS Data Access Service – EDAS), as well as the development of innovative concepts for new services
- Actions also service to ensure the alignment of EGNOS to international Satellite-based augmentation systems (SBAS) standards

- All Actions to be launched as Public Procurement
- Indicative timetable: Second quarter 2016
- Publication of Actions announced through the standard e-tendering process, plus notification via email to the H2020 Space Programme Committee members and Space NCPs)

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)

Procurement actions to start in 2016 on the basis of the Work Plan for 2015 budget (52 M€)

Satellite Navigation – Galileo and EGNOS: summary

WP 2016	
Other actions	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	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**

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Space Surveillance and Tracking

Image Credits: ESA

2016 Other actions

Space Surveillance and Tracking

http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014D0541&from=EN

27.5.2014 EN Official Journal of the European Union L 158/227

DECISIONS

DECISION No 541/2014/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 16 April 2014

establishing a Framework for Space Surveillance and Tracking Support

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

… Council recalled that space assets have become indispensable for our economy and that their security must be ensured. It underlined the 'need for Europe […] **to develop a European capability for the monitoring and surveillance of its space infrastructure and space debris**, initially based on existing national and European assets…

Space Surveillance and Tracking

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

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

Space Surveillance and Tracking: summary

WP 2016	
Other actions	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	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**

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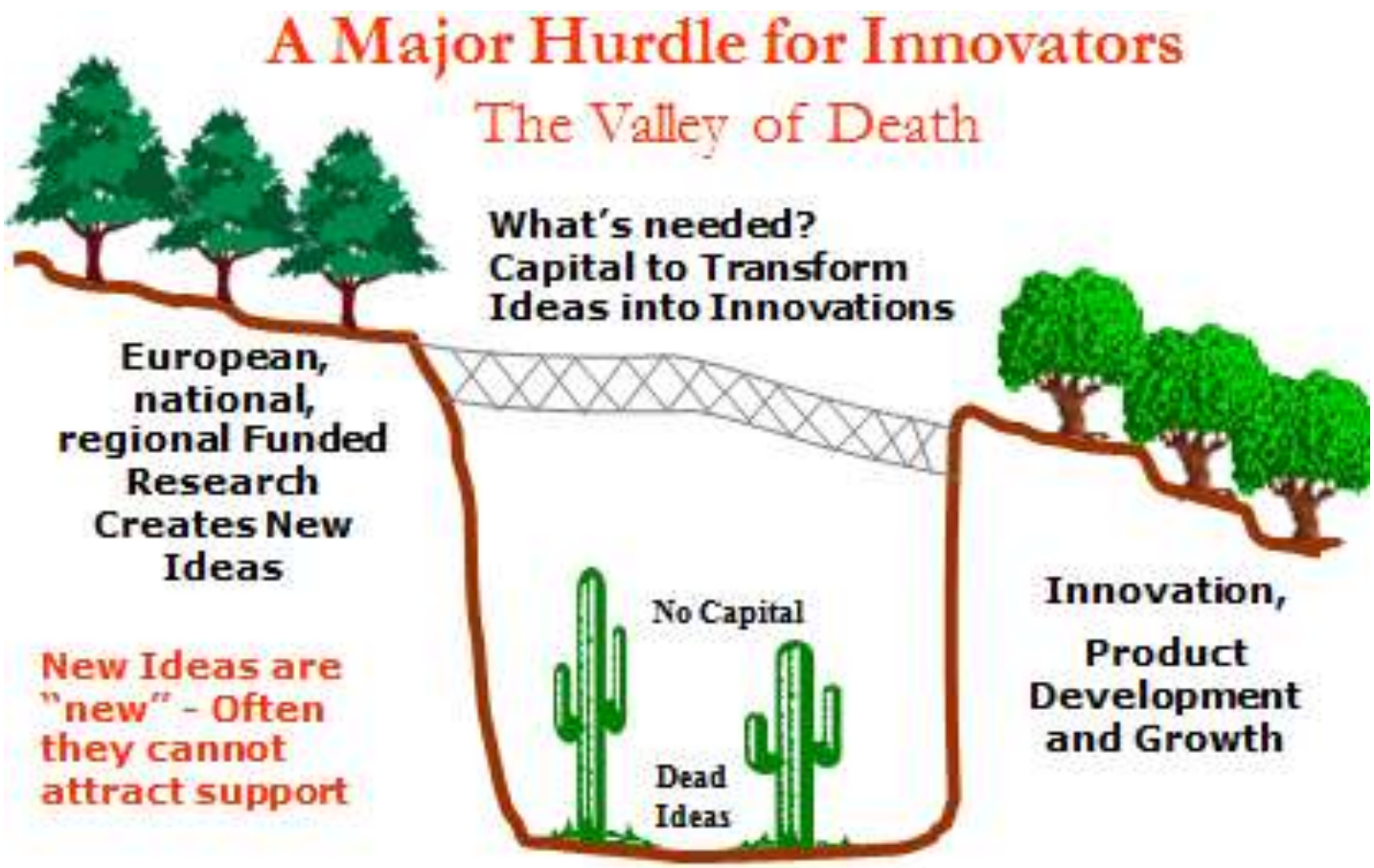
SME Instrument and Fast Track to Innovation

Why the SME Instrument?...
...To get accros the Valley of Death...



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SME Instrument - A recipe for success

It's not about writing a good proposal

It's about **defining a good project**…

…And ultimetly **convincing the evaluators**

SME Instrument target

SME with **innovative ideas** – single company ok

Ambition to **grow** and have a **global/EU** impact

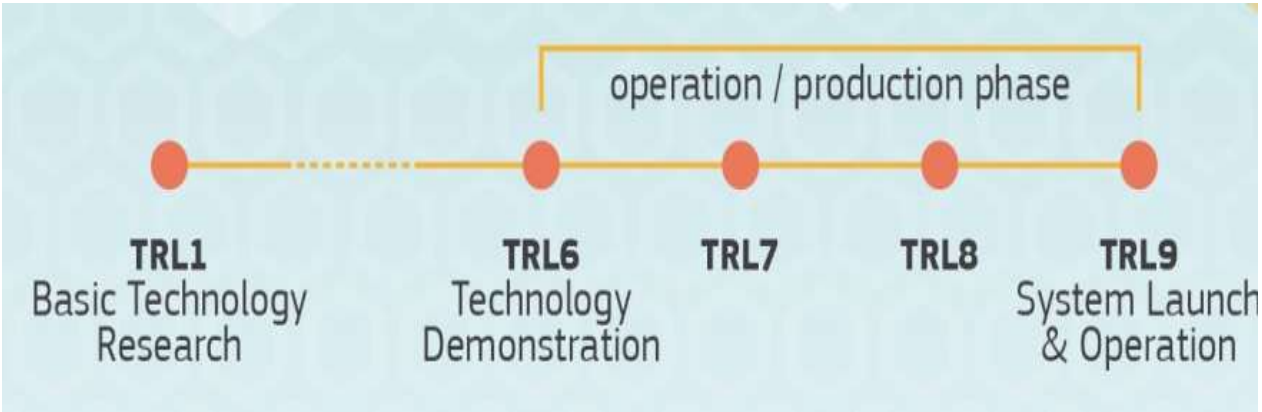
Established SMEs with high growth potential

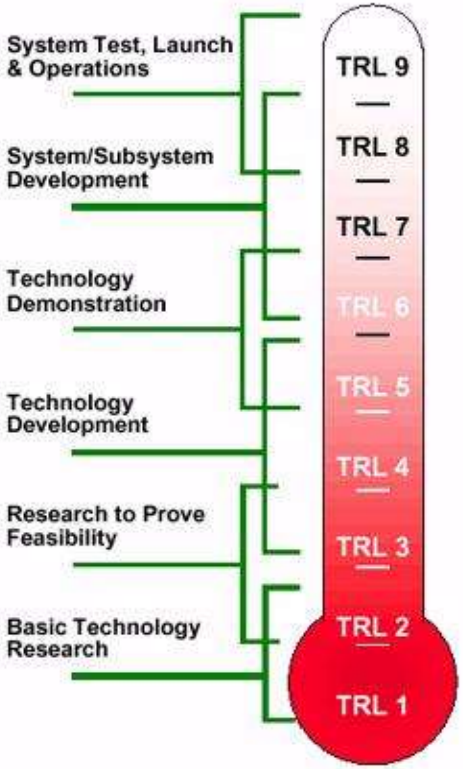
Clear **European dimension**

For profit SMEs of the **EU and associated countries**

SME Instrument target

Technology readiness level 6 or above





SME Instrument phases

PHASE1

Concept & Feasibility Assessment
Idea to concept (6 months)

The SME will draft an initial **business proposal**.

The European Union will provide **€50 000 in funding** and business coaching.

PHASE2

Demonstration, Market Replication, R&D
Concept to Market-Maturity (1-2 years)

The SME will further develop its proposal through **innovation activities**, and draft a more developed **business plan**.

The EU may contribute between **€0.5 million** and **€2.5 million*** and provide business coaching.

PHASE3

Commercialisation
Prepare for Market Launch

The SME will receive extensive support to help polish its concept into a marketable product, and have access to **networking opportunities**.

The EU will not provide funding in this phase.

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
- Applicant can exclude 3 evaluators
- **Short Time to evaluate** :
  - **Ph 1**: Time to evaluate 2 months+1 month time to grant= **3 months**
  - **Ph 2**: Time to evaluate 4 months+2 month time to grant= **6 months**
- No consensus meeting
- Standardised but detailed feedback
- Median rating

Evaluation process

- Remote evaluation
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  - ✓ **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

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Phase 1 - Concept & Feasibility Assessment

- ✓ **€50.000 in EU funding**
- ✓ **Feasibility study**
- ✓ **Initial 10 page business proposal to be drafted**
- ✓ **6 months in duration**

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Phase 2 – Innovation Project

- ✓ Between **€0.5M & €2.5M** of EU funding
- ✓ Develop project through **innovation strategy**
- ✓ Draft a more developed **30 pages business plan**
- ✓ **1-2 years** in duration

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Phase 3 – «Commercialisation»

- ✓ **No stand-alone phase!**
- ✓ **No direct funding**
- ✓ **Business coaching**
- ✓ **Facilitate access to risk finance**
- ✓ **Additional support & networking opportunities**
- ✓ **SMEs "Business Club"**

Space

First lessons learnt

Unsuccessful proposals were

- Too much focused on the project, not on the market opportunity
- Without convicing description of the company
- Without enough information on competing solutions
- Not innovative enough
- Without commercialisation concept (TRL too low)
- Just trying ones' luck

Fast Track to Innovation

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)

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

HIT THE MARKET!

Start your commercial activities

The Market
Market-Maturity to Market Launch

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

Continuous open call until end 2016 → 6 months time-to-grant → 12-24 months for implementation → 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

Space

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

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 – Timeline

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

April 29, 2015 - First intermediary call deadline

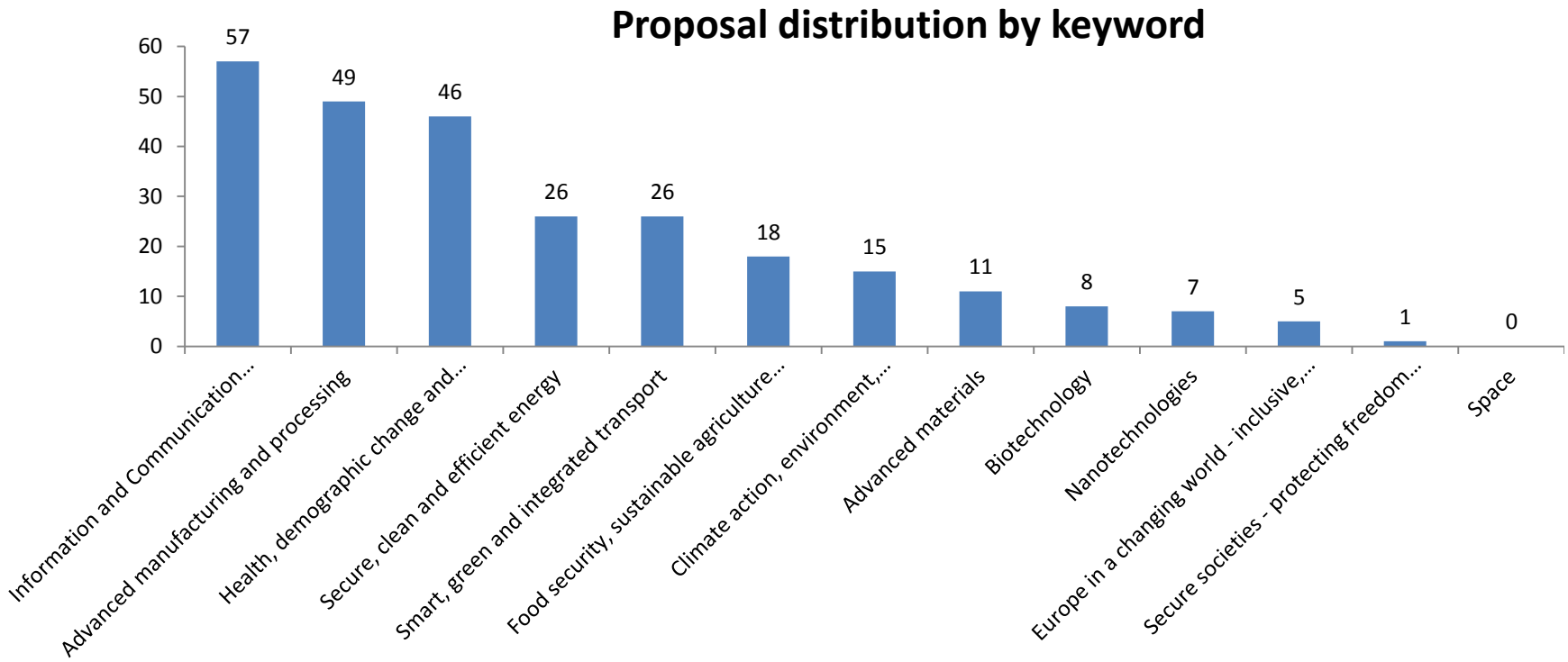
End of August, 2015 → First results from evaluation sent to applicants

September 1, 2015
Second intermediary call deadline

End of October 2015 → First Grants signed

December 1, 2015 Third intermediary call deadline & results of September call known

FTI Pilot – First cut off results



FTI Pilot – Useful Information

- Participant Portal: http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/9096-ftipilot-1-2015.html

- Work Programme: http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/main/h2020-wp1415-fast-track_en.pdf

- Beneficiaries
  https://ec.europa.eu/easme/sites/easme-site/files/FTI-projects-2015_participants%20websites_corrected.pdf

SME Instrument and Fast Track to Innovation: summary

WP 2016/2017		
	2016	**2017**
Call for proposals	Indicative budget (€ million)	Indicative budget (€ million)
SMEInst-04-2016-2017: **Engaging SMEs in space research and development**	**11.37**	**12.60**
Fast Track to Innovation	**3.40**	-

5 – Additional information

WP 2016-2017
Implementation calendar

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

Beyond the deadline…
Example of the evaluation process (2015)

8 April: closure Call

6-10 July: Ethics screening
5 August: Inform applicants

Remote evaluations
11 May – 5 June

Central evaluations
8 June – 3 July

Receipt of proposals

Eligibility check

Allocation of proposals to evaluators

Individual evaluation

Individual Evaluation Reports

(done remotely)

Consensus group

Consensus Report

Panel Review

Panel report

Evaluation Summary Report

Cross-readings

Panel ranked list

Finalisation

Final ranked list

Evaluation results sent to applicants

Initiation Grant Agreement Preparation

8/4/2015 **Time-To-Inform (TTI): 5 months** **8/9/2015**

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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

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Proposals preparation

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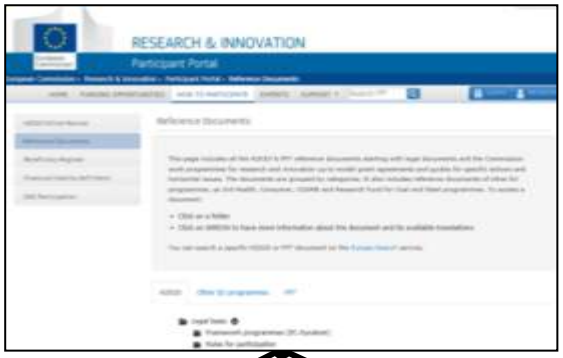
Some useful links

Link to reference documents: http://ec.europa.eu/research/participants/portal/desktop/en/funding/reference_docs.html



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

http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=5235

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

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Self-evaluation form

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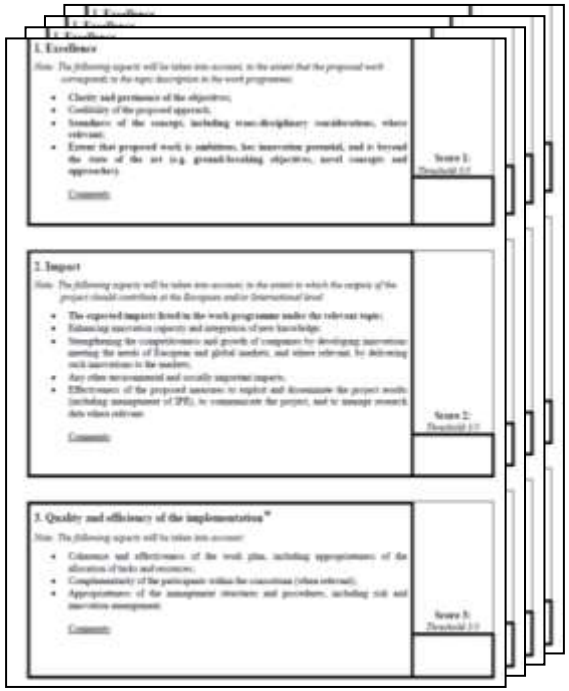
Example for Research and innovation actions



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

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

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Horizon 2020 Space Info days in 2015

Venue	Type of event	Date
FR (Paris)	National info day	17 September 2015
UK (London)	National info day	22 September 2015
PL (Warsaw)	National info day	28-29 September 2015
FR (Toulouse)	National info day	9 October 2015
ES (Madrid)	National info day	20 October 2015
Brussels	Space NCPs meeting	13 October 2015
IT (Rome)	National info day	21-23 October 2015
FR (Paris)	Horizon 2020 Innovation Procurement Event	27, 28 October 2015
PT (Lisbon)	National info day	28 October 2015
GR (Athens)	National info day	2 November 2015
Brussels	H2020 Space Infoday	9-10 November 2015
SE (Stockholm)	National info day	9 December 2015

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Thank you
for your attention

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