HORIZON 2020

SPACE

DG GROW – Internal Market, Industry Entrepreneurship and SMEs

GROW/I1 - Space Policy and Research Unit

Jean-Michel.MONTHILLER@ec.europa.eu

Paris, 11 October 2016

European Union Space Programmes

Multiannual Financial Framework 2014-2020

~ 1 479 M€

opernicus
Europe's eyes on Earth

~ 4 291 M€

GALILEO EGNOS

~ 7 071 M€

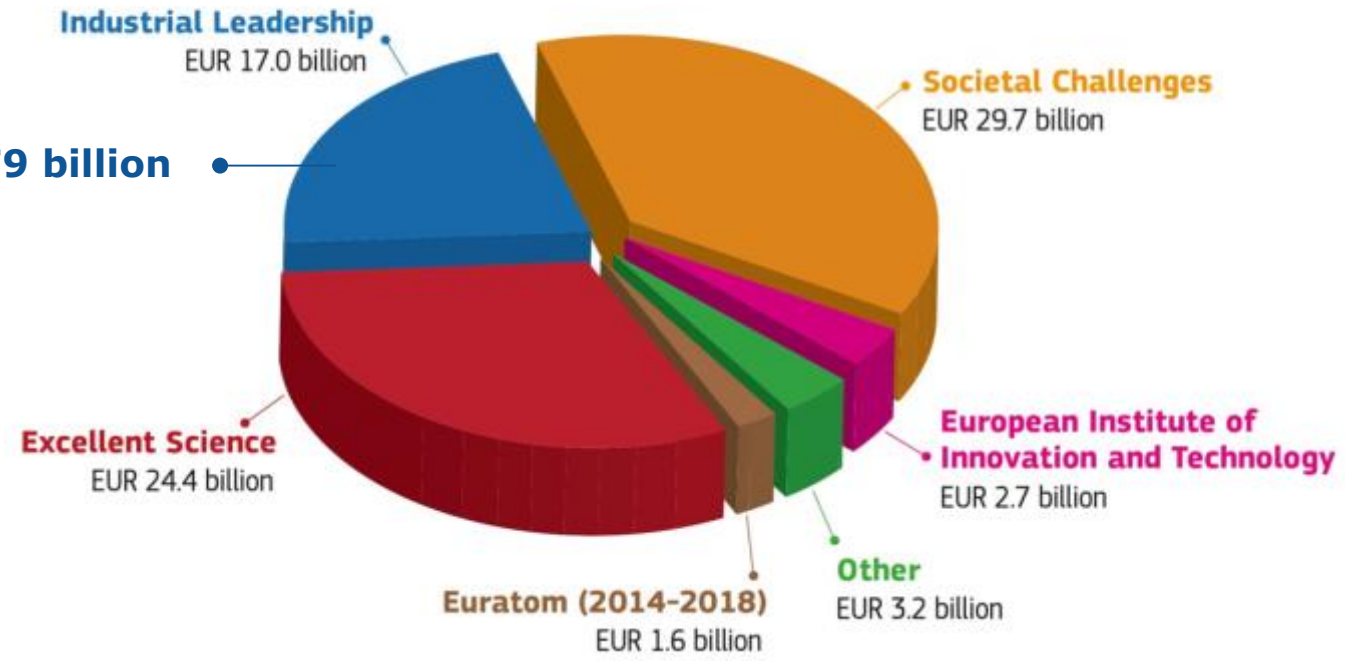
~ 12 841 M€

Space research in Horizon 2020

Space in H2020

HORIZON 2020 BUDGET (in current prices): € 79 billion

LEIT-**Space: € 1.479 billion**



Horizon 2020 Priorities

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

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

Horizon 2020 Space Work Programme 2016 - 2017

Space

WP 2016-2017
Implementation calendar

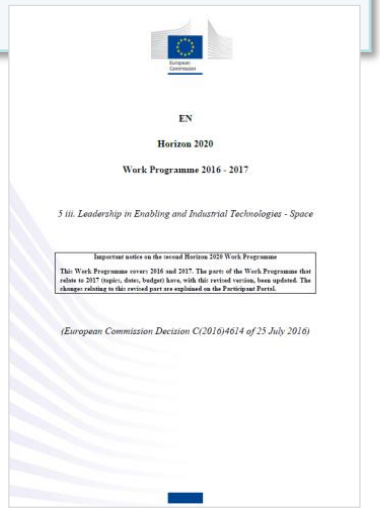
Calls	Opening dates	Deadlines
EO-2016 COMPET-2016	10 November 2015	3 March 2016
GALILEO-2017 EO-2017 COMPET-2017	8 November 2016	1 March 2017

Work Programme (part 05iii LEIT-Space) is available at the H2020 participant portal:

http://ec.europa.eu/research/participants/portal/

The associated **guidance documents** are available at:

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

Work Programme 2016 - 2017

5 iii. Leadership in Enabling and Industrial Technologies - Space

Important notice on the second Horizon 2020 Work Programme

This Work Programme covers 2016 and 2017. The part of the Work Programme that relates to 2017 (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(2016)4614 of 25 July 2016)

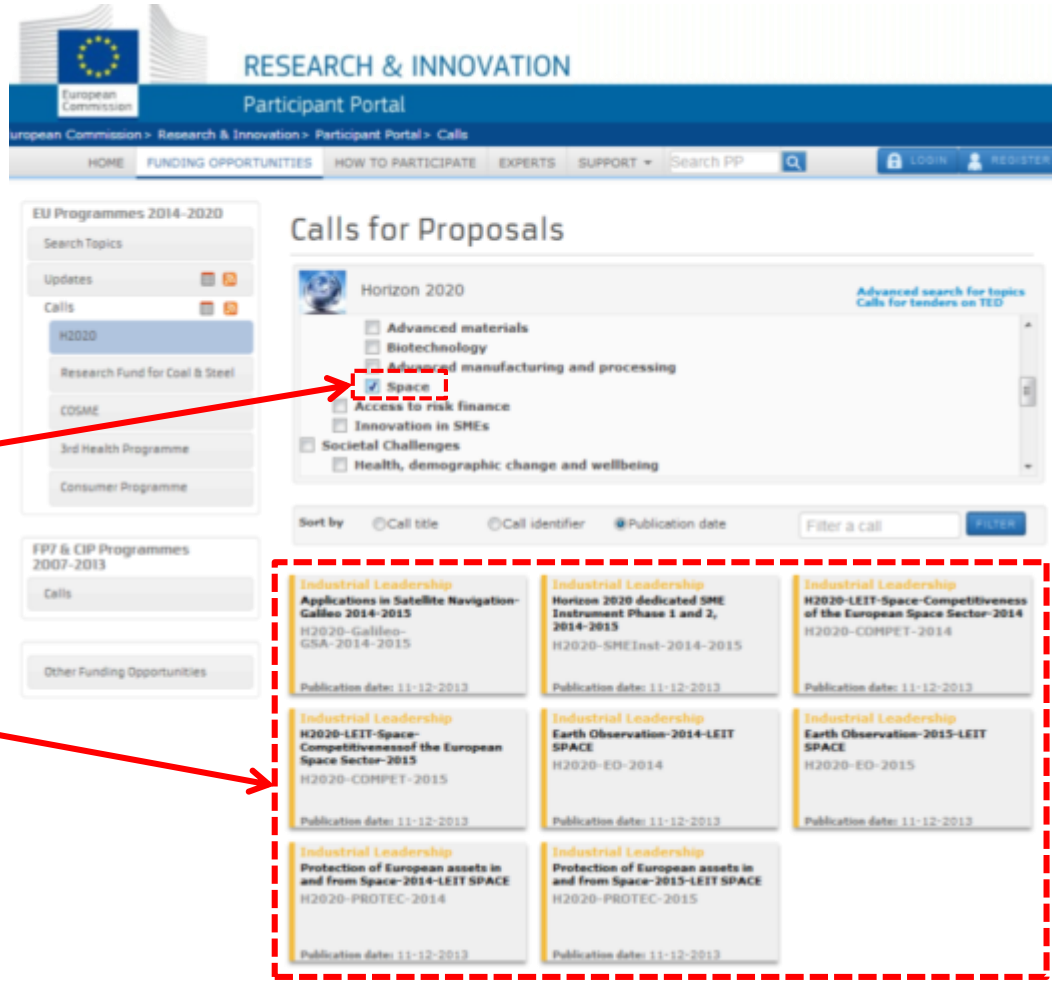
Horizon 2020 Space 2016-2017 'calls'

Horizon 2020 Participants Portal:

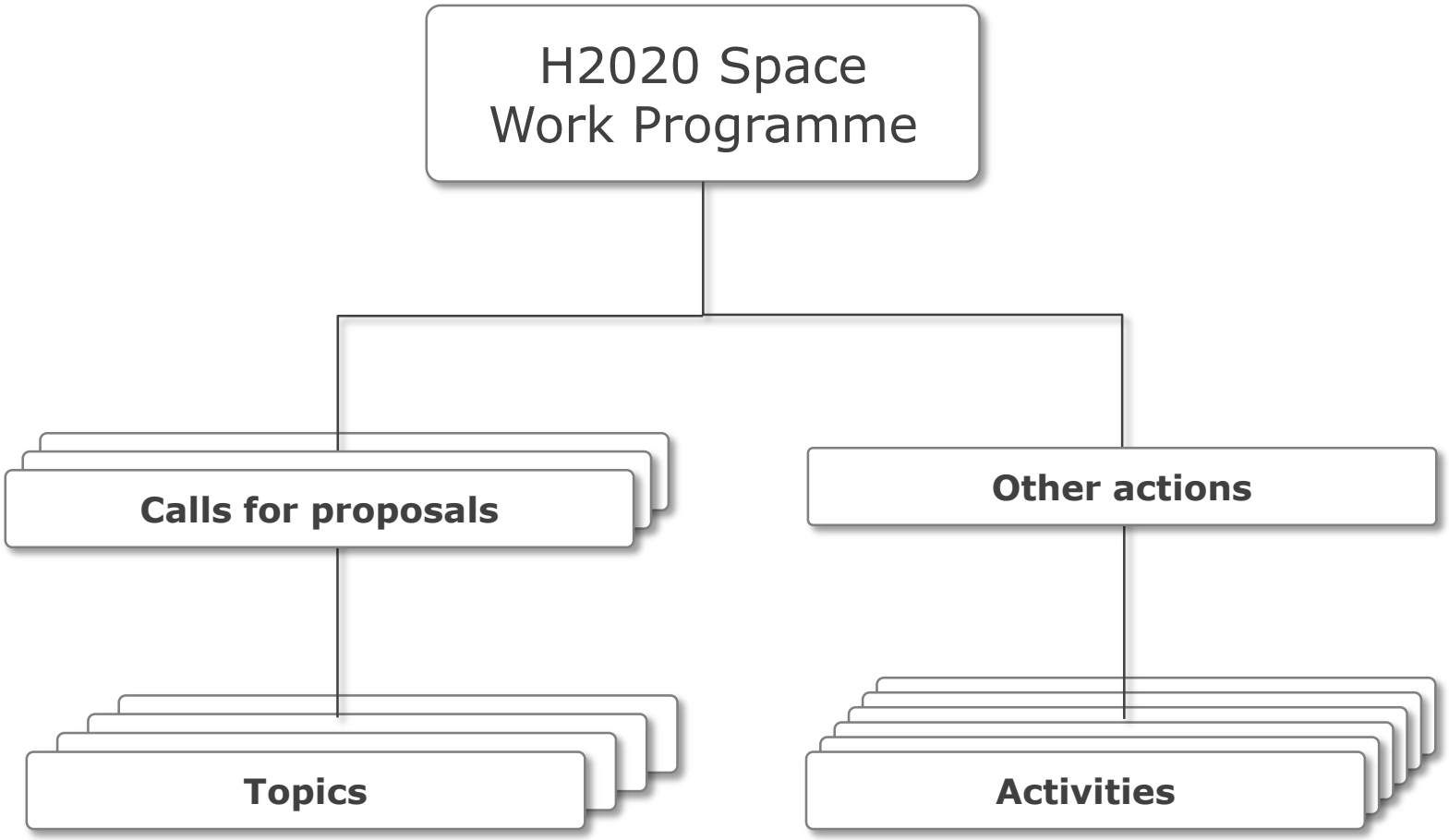
http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/

H2020 Space Work Programme

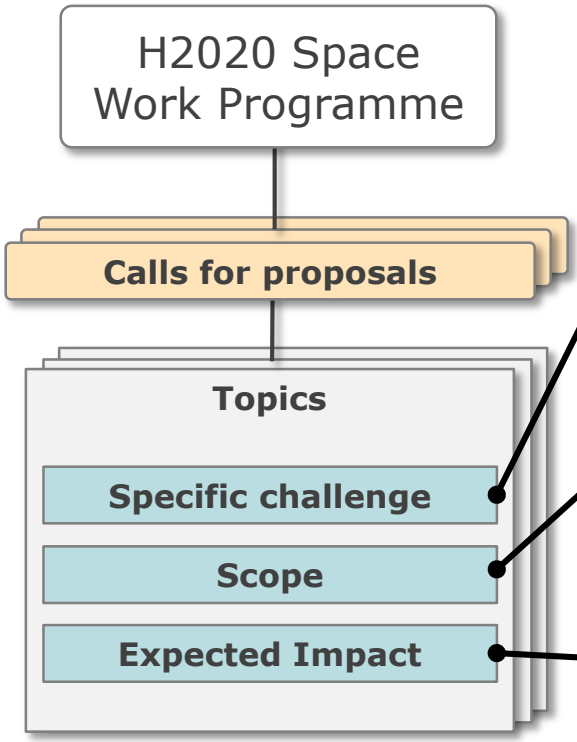
Calls for proposals



Horizon 2020 Space WP structure



WP 2016-17 structure of the 'calls' & 'topics'



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: http://ec.europa.eu/research/participants/data/ref/h2020/other/wp/2016-2017/annexes/h2020-wp1617-annex-ga_en.pdf*

Horizon 2020 Space WP 2017 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
- EO "big data" shift
- Preparation for a European capacity to monitor CO2 anthropogenic emissions

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

Space

EU Agencies involved

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

<u>TASKS include:</u>

Handling of calls and submission of proposals, evaluation process, grant agreement preparation, grant agreements signature, handling submission of reports , reviews, payments, audits…

Horizon 2020 Space WP 2017 update

Main changes to the WP 2017 following adoption by the Commission of updated WP 2016-2017 on 25 July 2016:

Call EO-2017

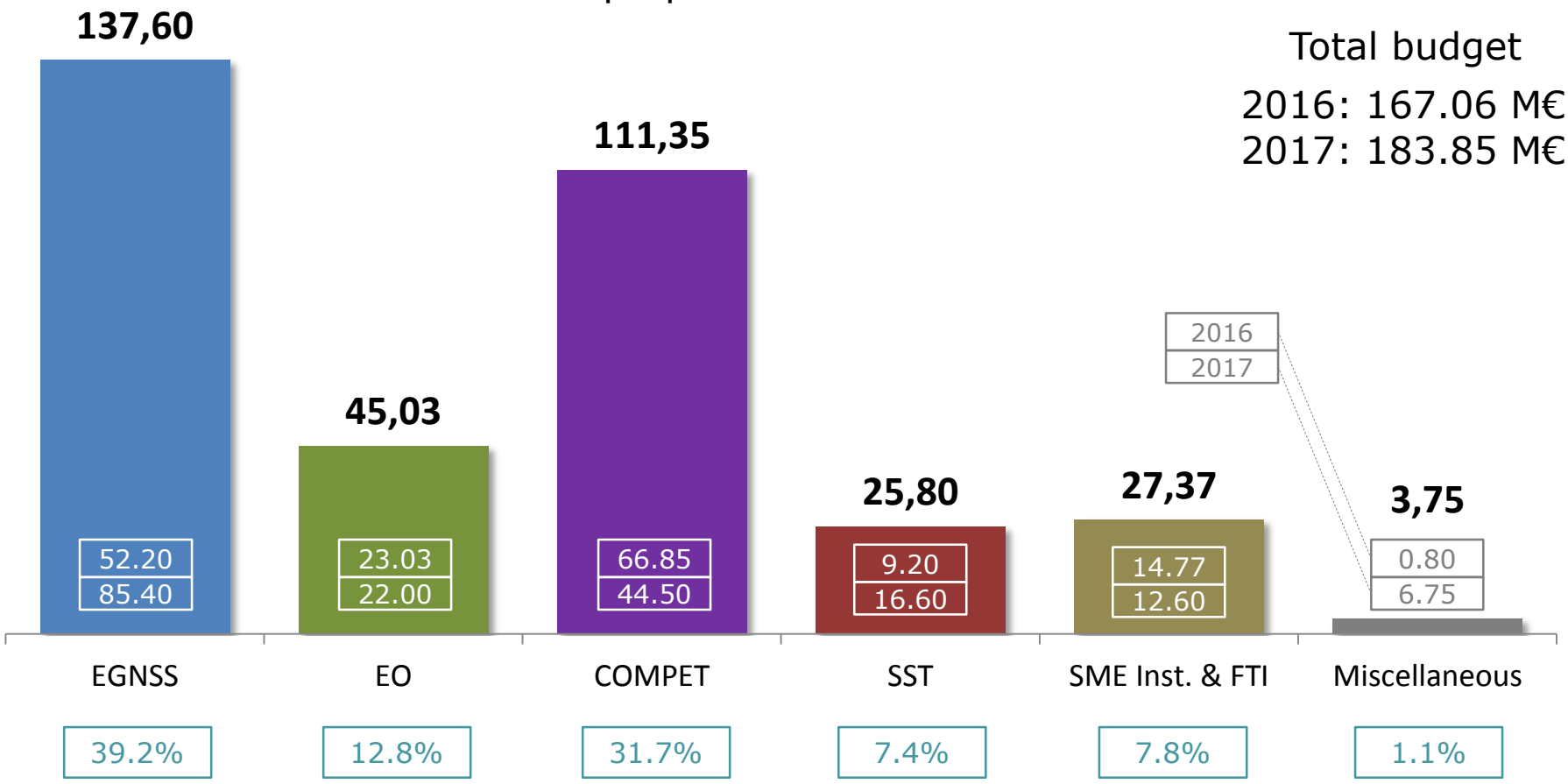
- Minor revision of **EO-1-2017** topic text
- Indicative budget of **EO-2-2017** is now **6.5 M€** (was 7.5M€), topic text revised
- New topic: **EO-3-2017** (CSA with indicative budget 3.5 M€)

Call COMPET-2017

- Minor revision of topic texts affecting **COMPET-2-2017** and **COMPET-3-2017**
- Indicative budget of **COMPET-4-2017** is now **6 M€** (was 5 M€)
- Indicative budget of **COMPET-7-2017** is now **2 M€** (was 1 M€) and expected impact statement updated

WP 2016-2017
Indicative budget

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



Total budget

2016: 167.06 M€
2017: 183.85 M€

H2020 Space building blocks

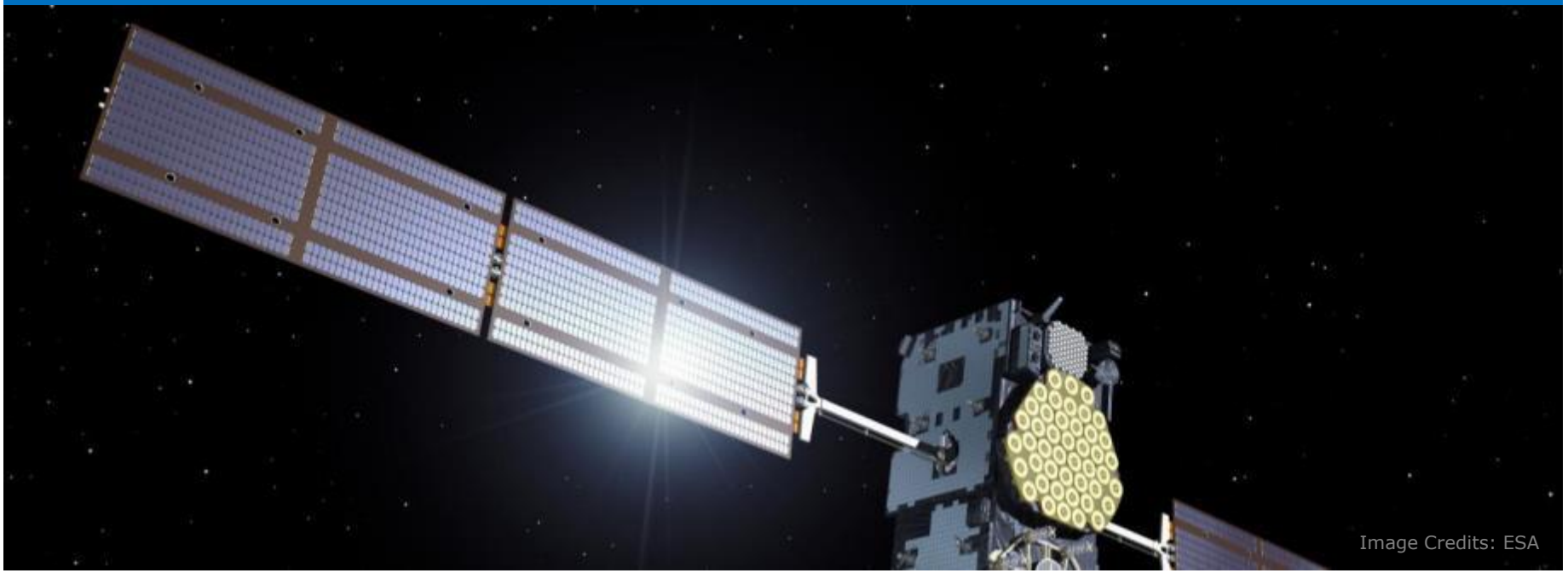
Satellite Navigation (Galileo and EGNOS)	Earth Observation (Copernicus)	Competitiveness of the European Space sector	Protection of the European Space Assets
Applications	Applications	Technologies for European non-dependence and competitiveness	Space Surveilance and Tracking
EGNSS evolution	Data	Independent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

SME Instrument

European Commission

2017 call topics

Satellite Navigation – Galileo and EGNOS



Indicative budget: **33 M€**

Deadline: 1 March 2017

Galileo-1-2017

EGNSS Transport Applications

Proposals should aim at developing new innovative applications, with commercial impact and a clear market uptake perspective.

Proposals may be submitted in any of the following four transport domains:

- Aviation
- Road
- Maritime
- Rail

Reccomended project size
Indicative budget
Type of action

1 to 3 M€
14.5 M€
Innovation Actions

Participation of industry, including SMEs, is encouraged

Galileo-2-2017

EGNSS Mass Market Applications

Proposals should aim at developing new innovative applications, with commercial impact and a clear market uptake perspective.

Some areas which are identified as especially promising for further EGNSS applications development are:

- Mobility as a service and Smart Cities
- Internet of things
- Commercial and social LBS

Reccomended project size
Indicative budget
Type of action

1 to 3 M€
9 M€
Innovation Actions

Participation of industry, including SMEs, is encouraged

Galileo-3-2017

EGNSS Professional Applications

Proposals should aim at developing new innovative applications, building also on the combination of EGNSS with earth observation and Copernicus services, with commercial impact or with satellite communication.

Proposals should have a clear market uptake perspective. Some areas which are identified as especially promising for further EGNSS application development are:

- Agriculture
- Surveying and Mapping
- Timing and Synchronisation
- Other professional applications

Reccomended project size
Indicative budget
Type of action

1 to 3 M€
8 M€
Innovation Actions

Participation of industry, including SMEs, is encouraged

Galileo-4-2017

EGNSS Awareness raising and capacity building

Proposals should aim at capacity building, increasing awareness of EGNSS solutions, providing networking opportunities of centres of excellence and other relevant actors and achieving a critical mass of EGNSS applications success stories, making it an attractive option for private investors in Europe and also globally.

Proposals addressing PRS (Public Regulated Service) related applications are not in the scope of this action.

Reccomended project size
Indicative budget
Type of action

0.5 to 1 M€
1.5 M€
Coordination and support action

WP2017, "Other Actions", Activity 12: 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
  - Commercial Service
  - Signals evolutions

- All Actions to be launched as Public Procurement
- Indicative timetable: Second quarter 2017
- Publication of Actions announced through the standard e-tendering process, plus notification via email to the H2020 Space Programme Committee members and Space NCPs)

WP2017, "Other Actions", Activity 13: 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 2017
- Publication of Actions announced through the standard e-tendering process, plus notification via email to the H2020 Space Programme Committee members and Space NCPs)

WP2017, "Other Actions", Activity 15: GNSS evolution, infrastructure-related R&D activities

Implemented through a **delegation agreement with ESA**:

- R&D actions to be implemented through procurement, grants and prizes in the EU R&D community
  - EGNOS further evolution
  - Galileo 2nd generation phase A/B (system, satellite, payload and ground).
  - GNSS general research and technology.
  - GNSS System Studies and Validation Activities.
  - EGNSS R&D Management.
- ESA Technical activities
- Management, including e.g. monitoring, road mapping, outreach

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	**3.2**
Activity 13 - EGNOS, Mission and Service related R&D activities	**0.7**
Activity 15 – GNSS evolution, infrastructure-related R&D activities	**48.5**

EGNSS: Synergies with other H2020 calls

European Commission

Transport

- **MG-2.3-2016**: New and improved transport concepts in waterborne transport
- **MG-5.2-2017**: Innovative ICT solutions for future logistics operations
- **MG-6.2-2016**: Large-scale demonstration(s) of cooperative ITS
- **ART-01-2017**: ICT infrastructure to enable the transition towards road transport automation
- **ART-02-2016**: Automation pilots for passenger cars

Secure societies – Protecting freedom and security of Europe and its citizens

- **SEC-01-DRS-2016**: Integrated tools for response planning and scenario building
- **SEC-19-BES-2016**: Data fusion for maritime security applications

Information and Communication Technologies

- **ICT-16-2017**: Big data PPP: research addressing main technology challenges of the data economy

Space

(other than Applications in Satellite Navigation Call)

- **COMPET-7-2017**: Technology transfer and business generators
- **SME instrument** SMEInst-04 -2016-2017: Engaging SMEs in space research and development
- **Other actions:**
- Galileo Evolution, Mission and Service related R&D activities
- EGNOS, Mission and Service related R&D activities
- GNSS evolution, infrastructure-related R&D activities

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	

SME Instrument

2017 call topics

Earth observation

Indicative budget: **22 M€**

Deadline: 1 March 2017

EO-1-2017

Downstream applications

Copernicus data and information are expected to unleash unique market opportunities.

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€

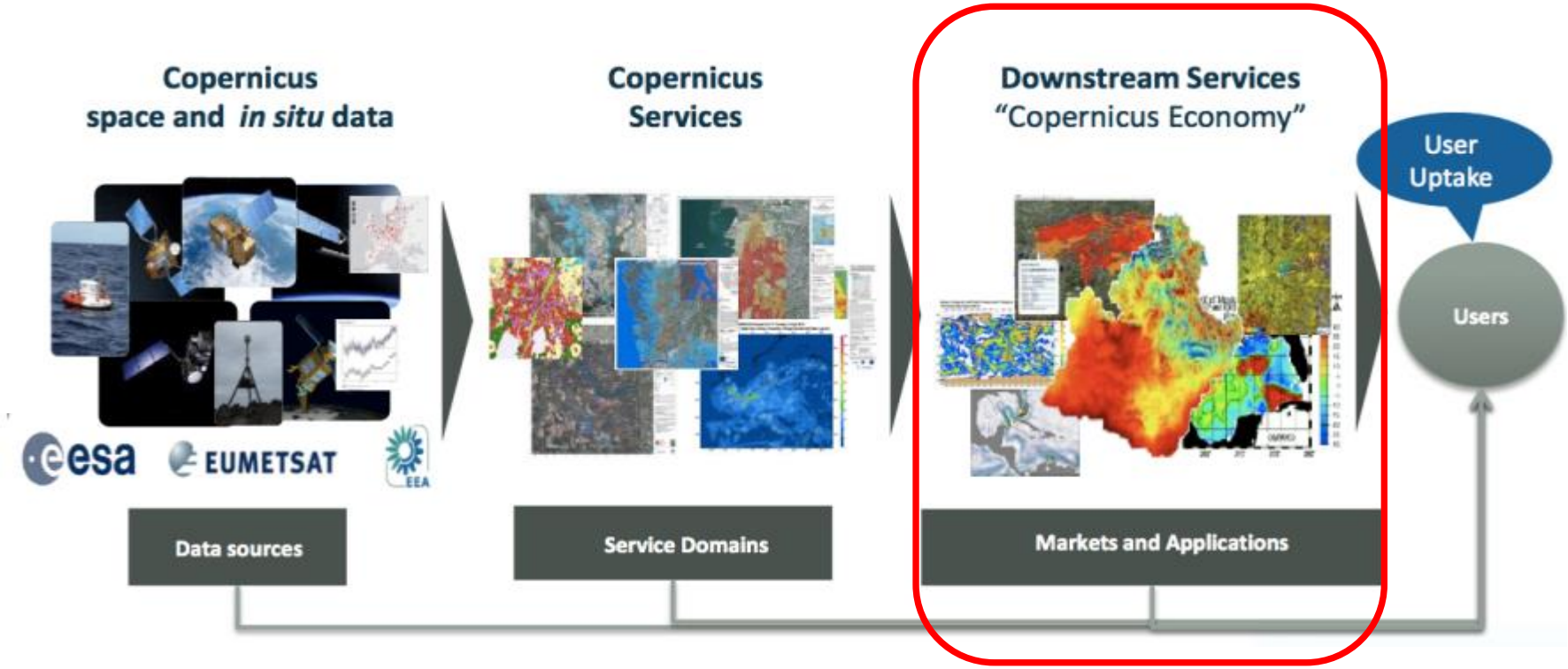
12 M€

Innovation Actions

Participation of industry, including SMEs, is encouraged

EO-1-2017

Copernicus Value Chain



Source: GMV/SpaceTec partners/FDC /NOVELTIS

Important role for H2020 to enable

EO-1-2017

To be kept in mind:

- The focus must be on innovation with a quick path to market
- Demonstrated involvement of new customers
- Integrate EO data into markets, esp. non-space contexts
- Integration of contributors such as Internet of Things (IoT), sensorwebs, UAV (Unmanned Aerial Vehicles) and/or other space and non-space data
- Engagement with existing and emerging content delivery channels e.g. In-Car Information systems, Health Platforms, Renewable Energy, Insurance
- Innovative application environments that e.g. facilitate the handling of EO data in a big data context
- Extract additional benefit from Copernicus/EO and other data by using big data analytics

EO-2-2017

EO Big Data Shift

Effective access to Copernicus data & information is a sine qua non condition.

Technical challenges are:

- Sheer volume of data and information
- Data at higher spatial and temporal resolutions
- New Big Data techniques emerging
- Bring user to data with embedded processing capabilities
- Need for new approach for data curation and dissemination
- Need for an effective and scalable access system
- Need to cover the full data cycle needs

Activities are expected to address the adaptation of big data technologies to Copernicus user scenarios

Activities to include the development of tools

Take into account needs of non-experts, expert users, SME innovative enterprises

Reccomended project size

Indicative budget

Type of action

1 to 2 M€

6.5 M€

Research and Innovation Actions

Participation of industry, including SMEs, is encouraged

EO-2-2017

Copernicus context is to be kept in mind:

- A further guidance document will be released by the Commission in November
- It is important for the projects to focus on solutions and applications that are portable in different big data computing environments (scalable!)
- H2020 projects should be forward looking, beyond what exists at the moment in Copernicus dissemination channels
- Projects should provide an added value by addressing big data platforms holding different types of EO data, amongst which Copernicus is a major source

EO-2-2017

- New tools and applications needed in the context of the exploitation of Copernicus data and information in a big data environment:
  - **Not platform specific**
  - **Modular, and scalable**
  - **Aiming at new functions**

    Facilitating third party front office deployment and use

    Providing innovative tools for intermediary/end users
  - **Demonstrator**
  - **Business model service-based rather than software licensing based (open source licensing much favoured to ease deployment on platforms)**

EO-3-2017

Preparation for a European capacity to monitor CO_2 anthropogenic emissions

To bring together the **key European stakeholders and competent entities** to advance a coordinated preparation of a mature European capacity.

Encompasses coordination of ongoing efforts (e.g. H2020, national and ESA studies)

Includes identification of research and infrastructural gaps.

Action is designed to support the COM-ESA process of task force activities to:

- Lay the mature foundation for an independent space borne observation capacity for CO2
- Lay the foundation for the operational integration of all European capacities as a subsequent step

Reccomended project size

Indicative budget

Type of action

1 project

3.5 M€

Coordination and Support Action

EO-3-2017

CSA to establish the basis for an integrated end-to-end system design, that relies on existing remote-sensing, in situ and modelling capabilities

- Reconcile top-down and bottom-up estimates
- Establish a library of simulations for emissions and atmospheric transport
- Quantify uncertainty trade-offs in fossil fuel emissions
- Establish a basis for attributing CO2 emissions from in-situ measurements

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**	**4.18**	**-**
EO-3-2016: **Evolution of Copernicus services**	**9.00**	**-**
EO-2-2017: **EO Big Data Shift**	-	**6.5**
EO-3-2017: **Preparation for a European capacity to monitor CO2 anthropogenic emissions**		**3.5**
Sub-total EO-2016/2017	23.03	22.0
COMPET-2-2017: **Competitiveness in Earth observation mission technologies**		**7.0**
Total EO related 'Space' (2016/2017)	**23.03**	**29.0**

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

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

H2020 Space building blocks

European Commission

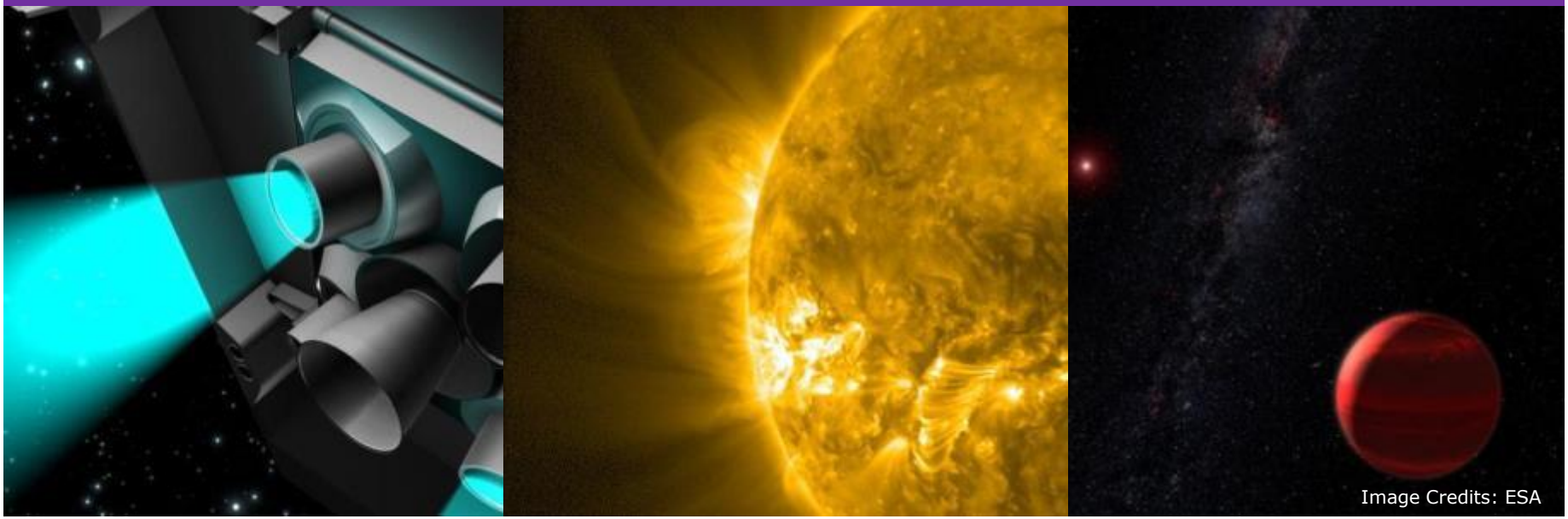
Satellite Navigation (Galileo and EGNOS)	Earth Observation (Copernicus)	Competitiveness of the European Space sector	Protection of the European Space Assets
Applications	Applications	Technologies for European non-dependence and competitiveness	Space Surveilance and Tracking
EGNSS evolution	Data	Independent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

SME Instrument

European Commission

2017 call topics

Competitiveness of the European Space Sector Technology and Science



Indicative budget: **43.5M€**

Deadline: 1 March 2017

Space

COMPET-1-2017

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*

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

➢ Technology transfer with non-space

➢ Proposals should address commercial opportunities => ensure sustainability of supply chains!

➢ Address how to access the commercial markets

* Consult guidance documents in the Commission's website

Recommended project size

Indicative budget

Type of action

2 to 5 M€

15 M€

Research and Innovation action

Participation of industry, including SMEs, is encouraged

Foster links between academia and industry; technology transfer

COMPET-2-2017

Competitiveness in Earth observation mission technologies

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

Proposals should address and demonstrate significant improvements in such areas as miniaturisation, power reduction, efficiency, versatility, and/or increased functionality and should demonstrate complementarity to activities already funded by Member States and the European Space Agency.

- Emerging market for innovative missions relying on small and very small systems (constellations, formation flying and fractionated instruments)
- Significant improvements compared to existing state-of-the-art

Recommended project size
Indicative budget
Type of action

2 to 3 M€

7 M€

Research and Innovation action

Participation of industry, including SMEs, is encouraged

Foster links between academia and industry; technology transfer

COMPET-3-2017

High speed data chain

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

These activities shall address the future challenge of high data rates transmission and significant improvements in data throughput.

- On-board data processing, compression, storage
- Inter-satellite links; different orbits (beyond EDRS)
- Ground segment solution to handle higher data rates
- Link between innovative ground segment architectures and Near-real time (NRT) and Quasi-real time (QRT) data
- Support to standardisation

Recommended project size
Indicative budget
Type of action

5 to 7 M€
(Full data chain or coherent part of it…)
2 to 3 M€
(NRT/QRT)
10 M€
Research and Innovation action

Participation of industry, including SMEs, is encouraged

Foster links between academia and industry

COMPET-4-2017

Scientific data exploitation

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

- Correlation and combination of data delivered by European space missions, international missions and ground-based observations
- Activities shall add scientific value through analysis of the data, leading to scientific publications and higher level data products
- Enhance and broaden international research partnerships

Recommended project size
Indicative budget
Type of action

1.5 M€
6 M€
Research and Innovation action

International cooperation is encouraged

COMPET-5-2017

Space Weather

Exploratory work studying space weather with a view to enhancing the understanding of space weather and its impact.

Proposals can cover the full range of space weather phenomena from the solar cycle, flares and coronal mass ejections to the effects of the solar wind in the near-earth environment and the evolution in between.

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

- Analysis of new viable impact mitigation strategies and demonstrate how these add value compared to existing mitigation strategies

Recommended project size
Indicative budget
Type of action

1 to 1.5 M€
3 M€
Research and Innovation action

International cooperation is encouraged

COMPET-6-2017

Space portal

One-stop-shop user-friendly and visually appealing knowledge oriented project (single space web portal) for space research in Europe: archive and outreach tool.

The call has two main incremental goals:

1. Implementation of an effective space web portal for Europe, able to point to relevant resources as required and depending on the type of queries.
2. Provide a repository of all relevant information regarding FP6, FP7, Horizon 2020 funded space projects (including public deliverables, data, software tools where possible).

➢ Present a realistic plan for sustained operation of the portal after the end of the EU-funded project

Recommended project size
Indicative budget
Type of action

0.5 M€
0.5 M€
Coordination and support action

COMPET-7-2017

Technology transfer and business generators

Contribute to access public funding opportunities, such as the SME instrument of the European Union, as well as potentially other funding opportunities from Member States, ESA and regional authorities.

This activity will not support the establishment of additional BICs, but should assist entrepreneurs and other innovation agents overcoming financial, administrative and networking barriers to innovation.

- Provide additional support to entrepreneurs in technology transfer and commercial exploitation, access to finance and networking
- Encourage take up of applications of space data and services developed in the context of EGNSS and Copernicus
- Complementarity to initiatives of ESA BICs and the EEN

Reccomended project size
Indicative budget
Type of action

2 M€
2 M€
Coordination and support action

WP 2017 "Other Actions": 11 - Horizon prize for low cost access to space

Affordable, **sustainable** and **innovative design-to-cost European solution** of **launch systems dedicated** to the deployment of **nano- and micro-satellites in LEO orbit**, with a **launcher performance of payloads up to 500 kg.** The aim is to improve **cost-effectiveness and launch flexibility**.

The launch system **should become operational as soon as possible** and be **economically viable** when **considering mid-term** (i.e. the year 2025) **commercial nano- and micro-satellite launch market predictions**.

The prize will be awarded, **after closure of the contest**, to a **solution** that best addresses the following cumulative **award criteria**:

- **Technical achievements** (prototype demonstrated in an operational environment)
- **Economic viability** (business plan for sustained operations)

WP 2017 "Other Actions": 11 - Horizon prize for low cost access to space

Award prize: 4 M€ (from the 2020 budget)

Eligibility criteria: Any legal entity or groups of legal entities from MS and associated countries to H2020

Indicative Timetable:

Stages	Indicative date
Opening of the contest (public campaign)	1st quarter of 2017
Deadline for submission of applications	4th quarter of 2019
Evaluation and solutions demonstration	1st quarter of 2020
Award of the prize	2nd quarter of 2020

Competitiveness of European Space Sector

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**	**6.0**
COMPET-5-2017: **Space Weather**	**3.0**
COMPET-5-2017: **Space portal**	**0.5**
COMPET-6-2017: **Technology transfer and business generators**	**2.0**
Total COMPET-2017	**43.5**
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**

H2020 Space 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	

SME Instrument

European Commission

Space Surveillance and Tracking

Image Credits: ESA

2017 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 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 17**)

These activities are funded exclusively by H2020/space

Space Surveillance and Tracking

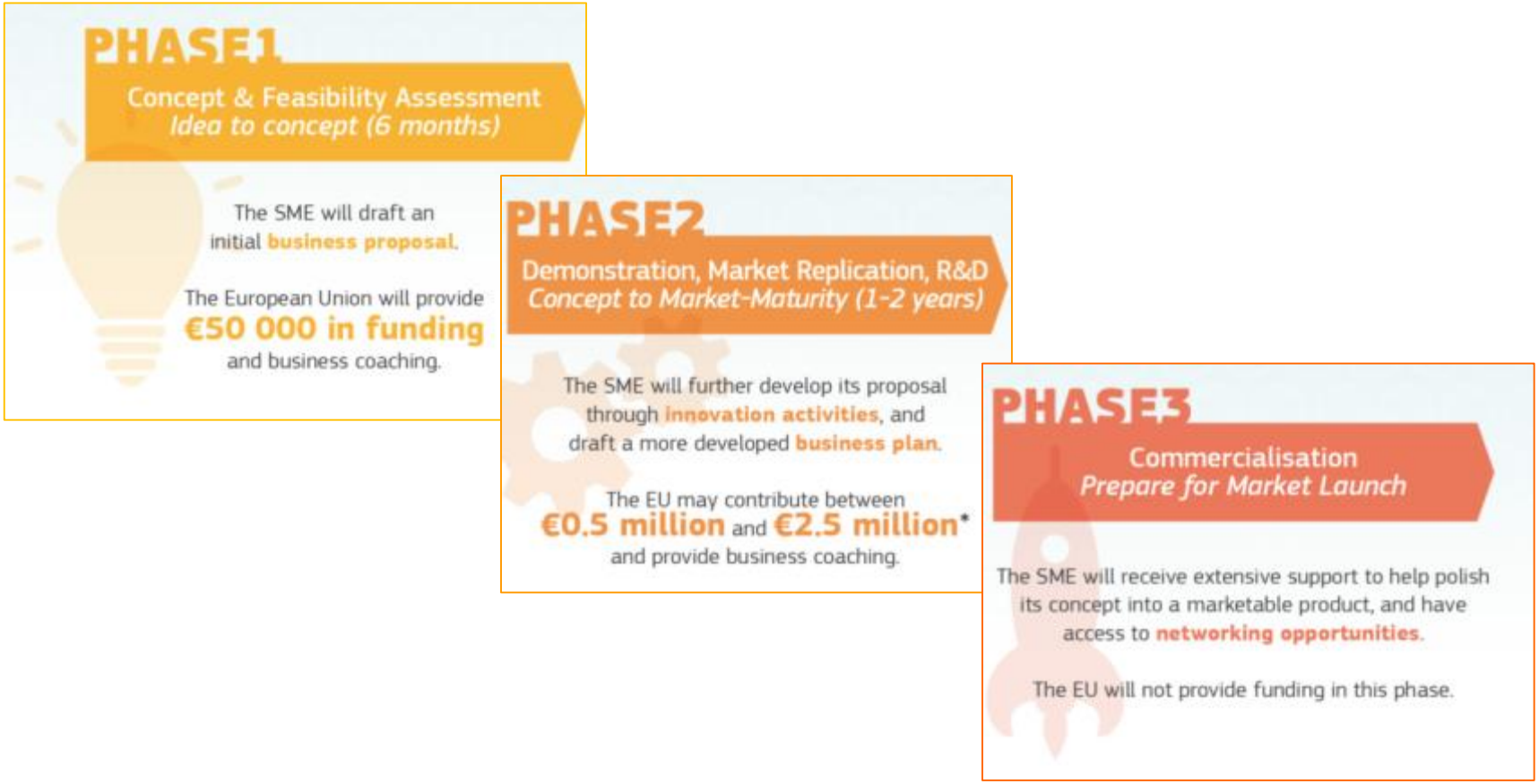
Space Surveillance and Tracking: summary

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**	**15.0**

SME Instrument and Fast Track to Innovation

SME Instrument phases



SME Instrument

Phase 1 - Concept & Feasibility Assessment

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

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

SME Instrument

Phase 3 – «Commercialisation»

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

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**	-

European Commission

HORIZON 2020

Thank you for your attention

Space research and guidance documents
http://ec.europa.eu/growth/sectors/space/research/horizon-2020/

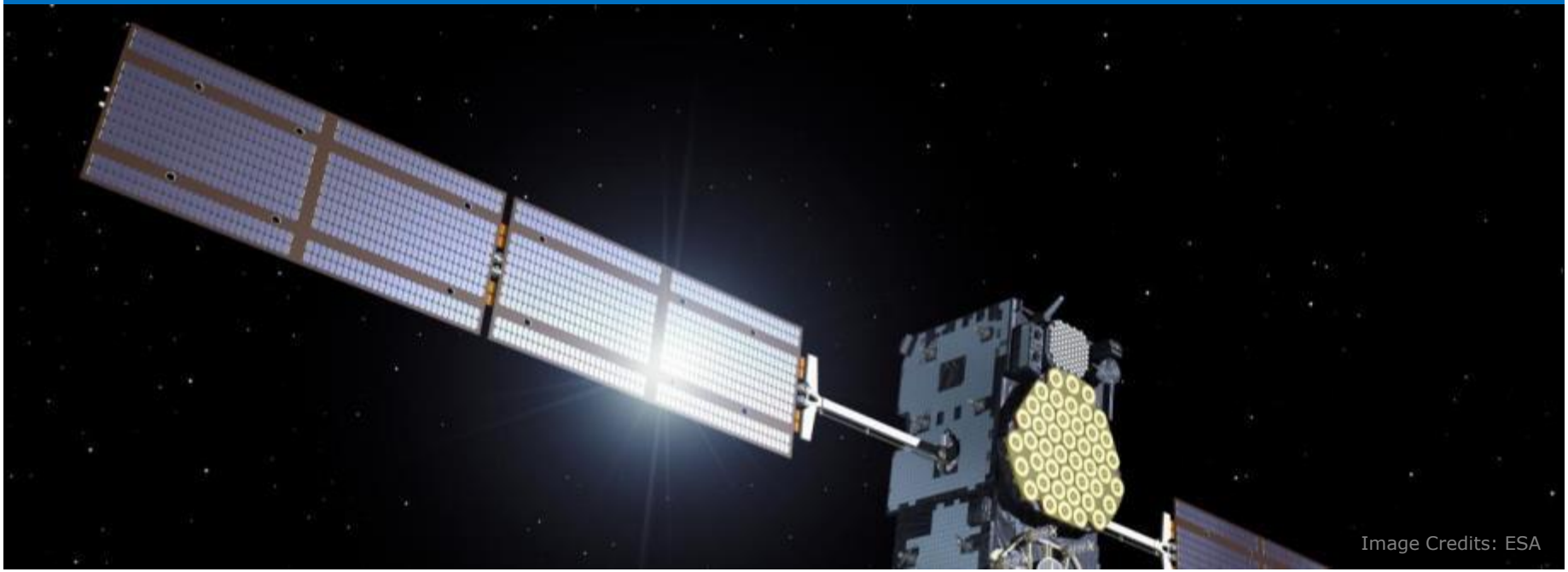
Published work programme 2016-2017
http://ec.europa.eu/research/participants/portal/

http://ec.europa.eu/research/participants/data/ref/h2020/wp/2016_2017/main/h2020-wp1617-leit-space_en.pdf

Additional information

H2020 Space
WP 2014-2015

Satellite Navigation – EGNSS

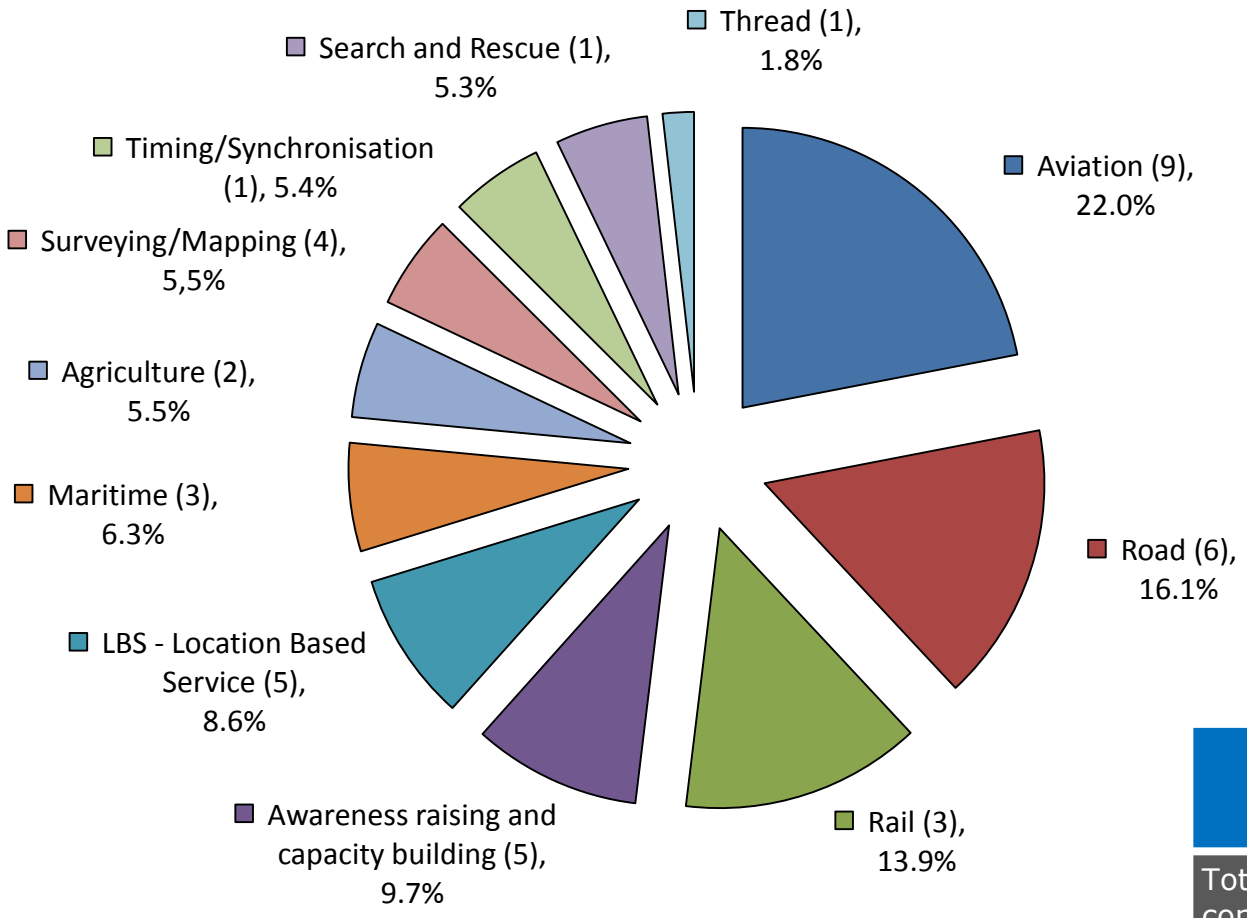


Calls for proposals and other actions

EGNSS Applications

Funded projects distributed by market segment

(number of projects), %EU contribution



EGNSS applications Calls for proposals Galileo 2014-2015	
Total EU contribution (M€):	65.1

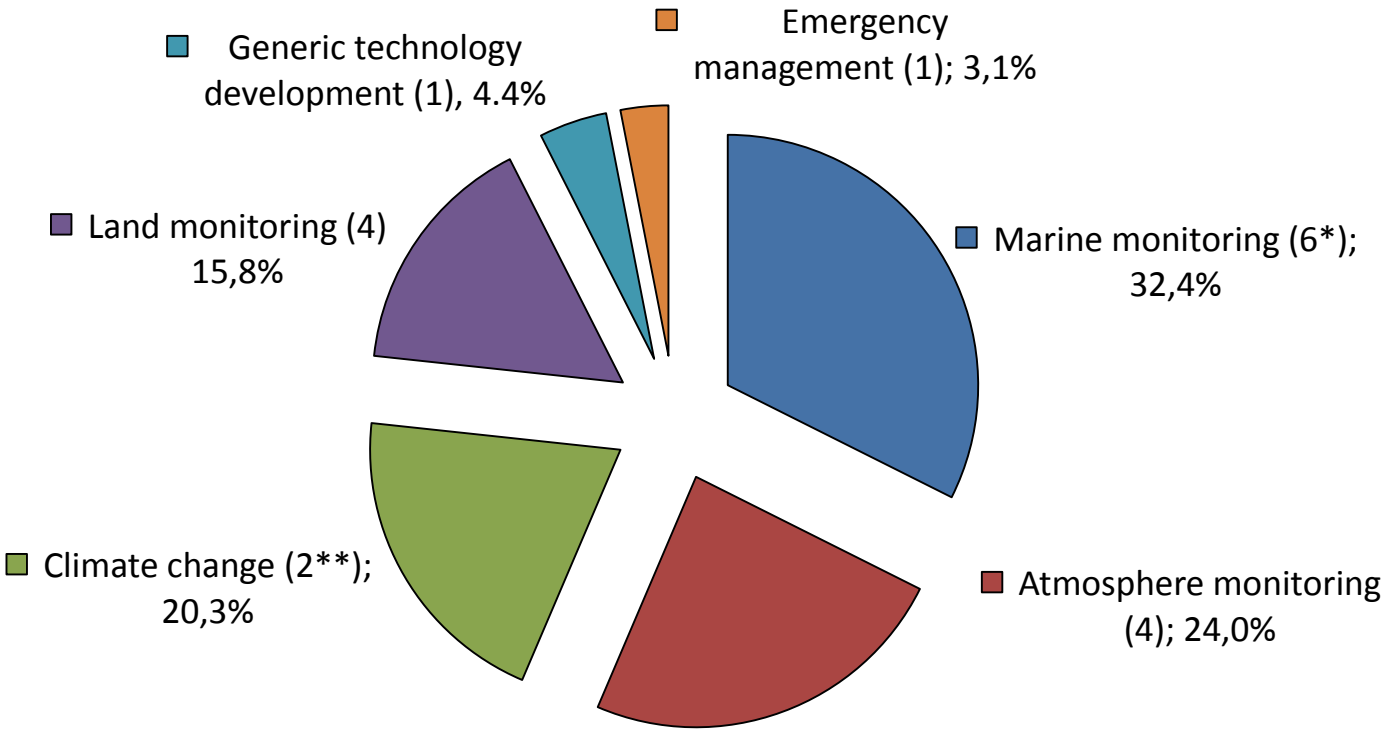
Space

Earth observation

Calls for proposals and other actions

Funded projects distributed by Copernicus Service

(number of projects), %EU contribution



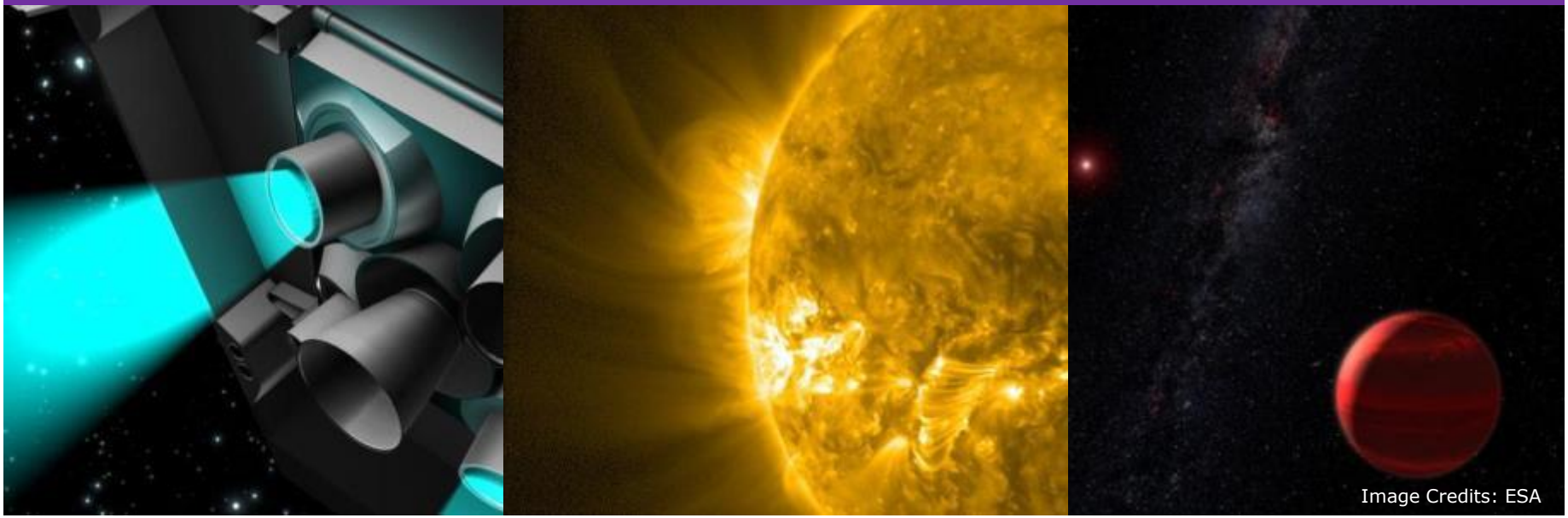
Notes:

* One of the projects is also related to "Land monitoring"

** One of the projects is also related to "Atmosphere monitoring"

EO-2014/2015 Calls for proposals	
Total EU contribution (M€):	**56.9**

Competitiveness of the European Space Sector Technology and Science

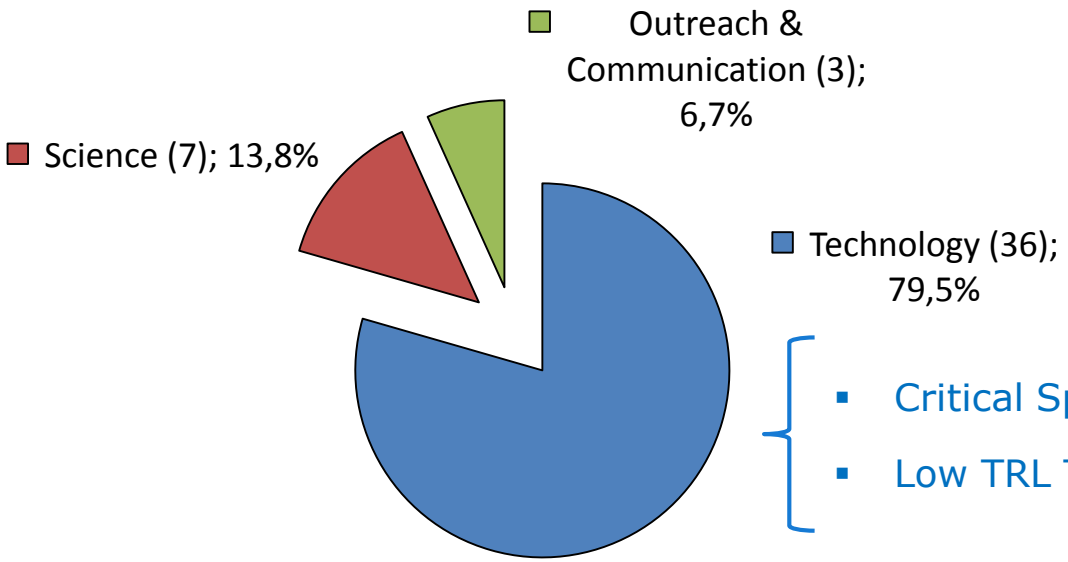


Calls for proposals

Space

Funded projects distributed by programmatic domain

(number of projects), %EU contribution



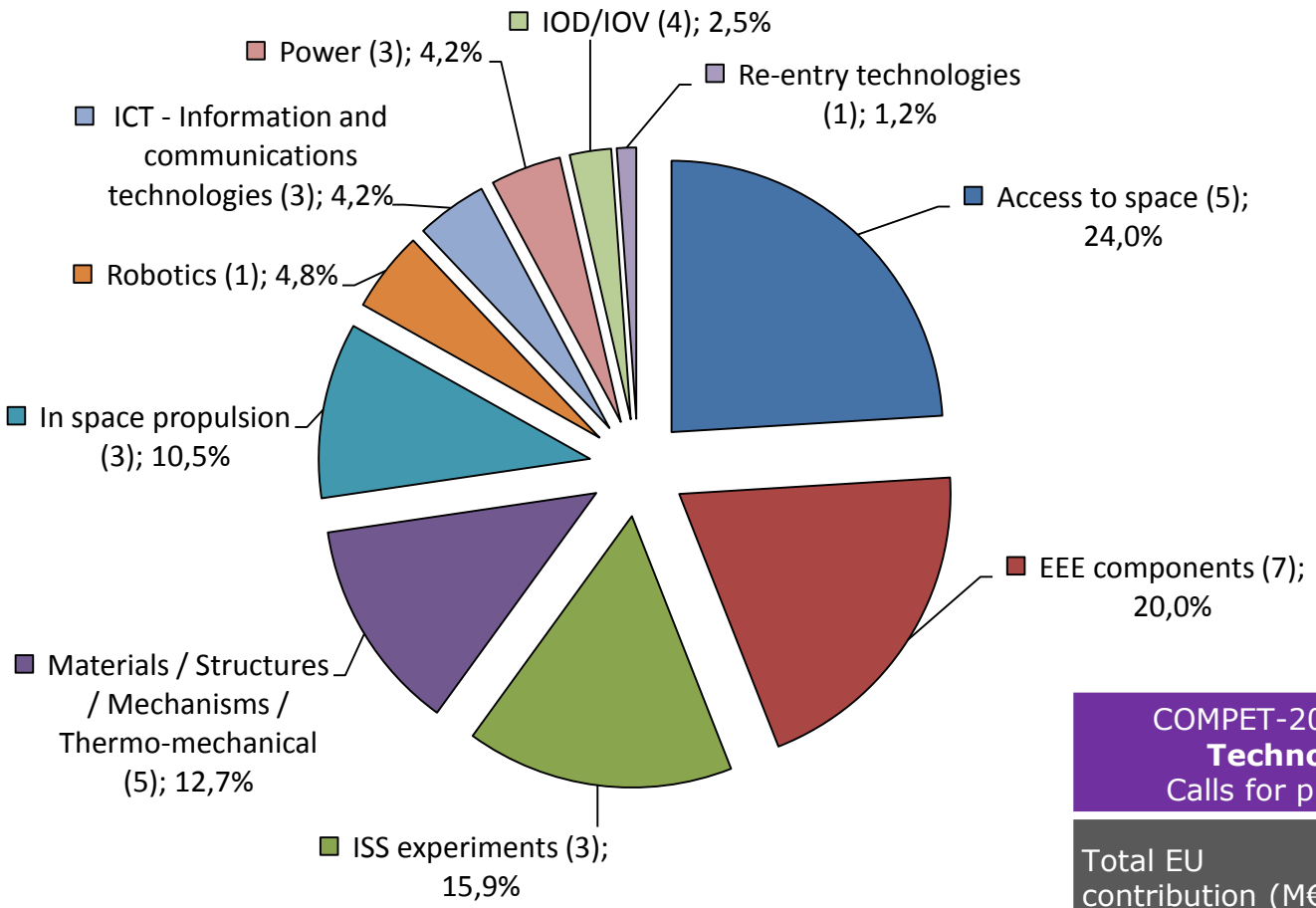
- Critical Space Technologies (6), 28.3%
- Low TRL Technologies (13), 18.1%

COMPET-2014/2015 Calls for proposals	
Total EU contribution (M€):	**90.1**

Technology

Funded technology projects distributed by thematic area

(number of projects), %EU contribution

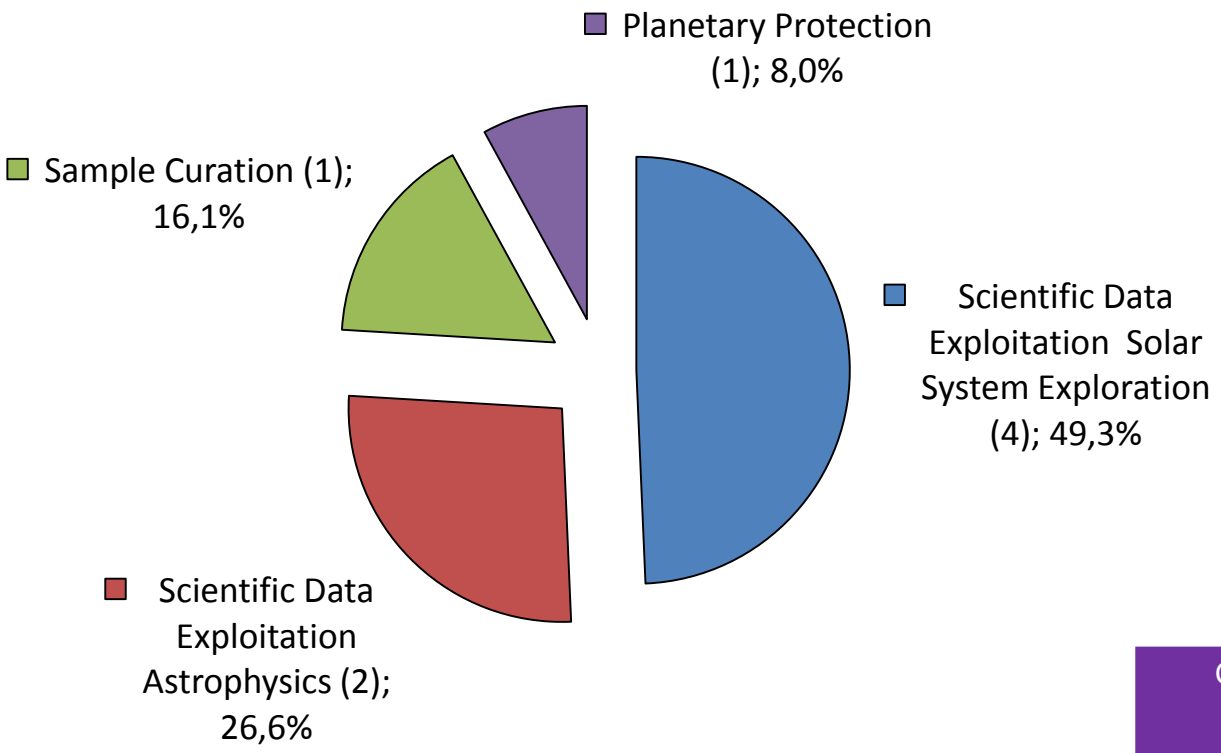


COMPET-2014/2015 **Technology** Calls for proposals	
Total EU contribution (M€):	**71.6**

Science

Funded science projects distributed by thematic area

(number of projects), %EU contribution



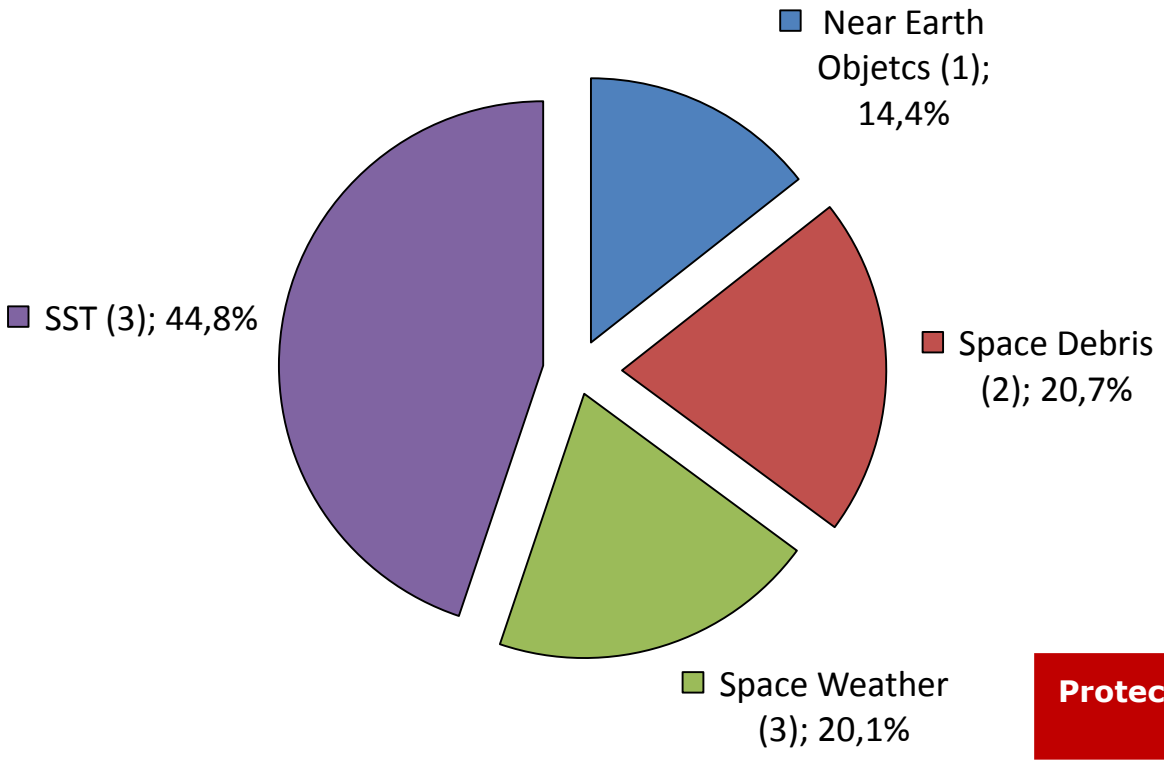
COMPET-2014/2015 **Science** Calls for proposals	
Total EU contribution (M€):	**12.43**

Protection of European assets in and from space

Calls for proposals and other actions

Funded projects distributed by thematic area

(number of projects), %EU contribution



Protection of European assets in and from space	
Total EU contribution (M€):	**29.30**

European Commission

SME Instrument

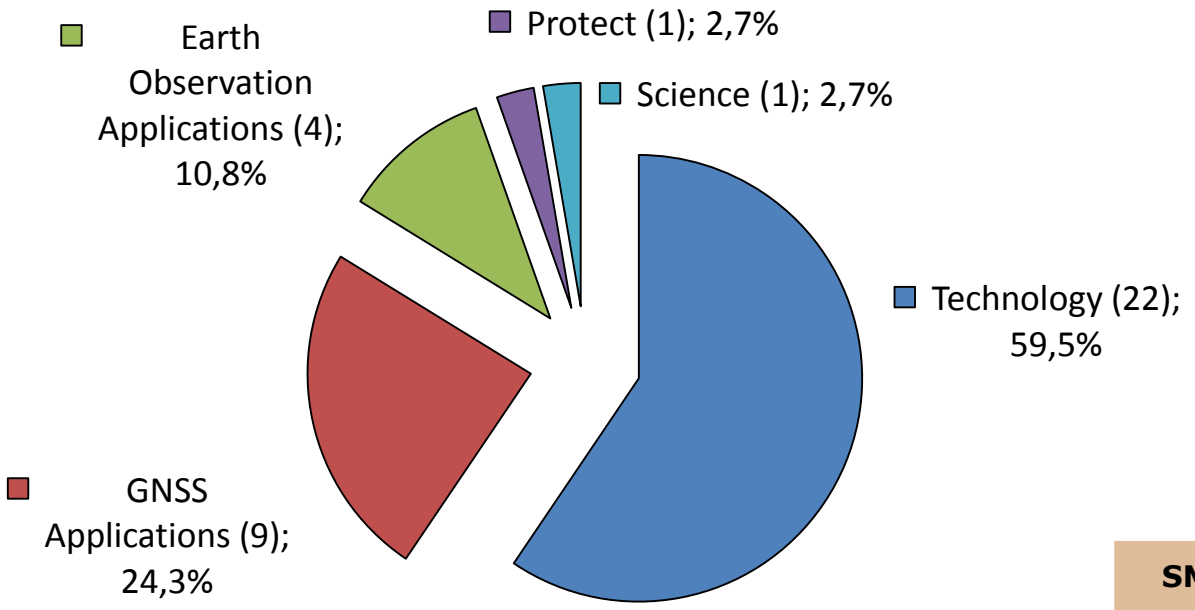
Space

SME Instrument 2014-2015 Phase 1

Phase 1 – business plans and feasibility studies (50,000 €)

Funded projects distributed by thematic area

(number of projects), %EU contribution



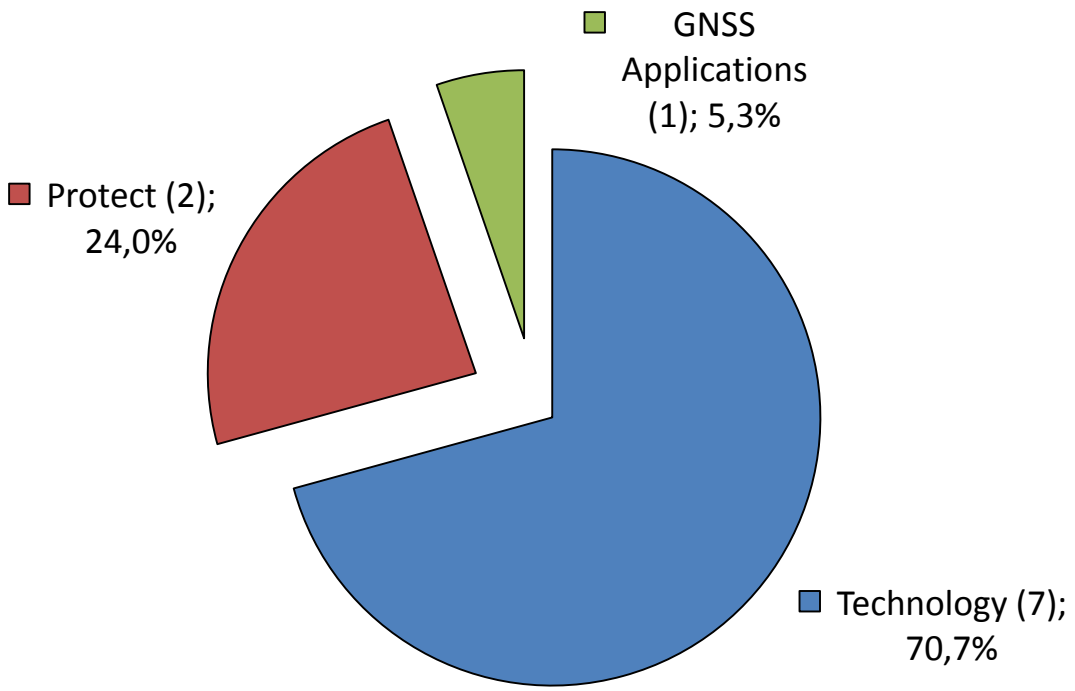
SME Instr. 2014-2015 Phase 1	
Total EU contribution (M€):	**1.85**

SME Instrument 2014-2015 Phase 2

Phase 2 – Innovation actions

Funded projects distributed by thematic area

(number of projects), %EU contribution



SME Instr. 2014-2015 Phase 2	
Total EU contribution (M€):	**13.2**

Space