

H2020 Theme Oriented Training on the SPACE Programme

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H2020 Space Specific Program

- 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](#).

The following applies for all calls with an opening date on or after 26/07/2016

Grant beneficiaries under this work programme part will engage in research **data sharing by default**, as stipulated under Article 29.3 of the Horizon 2020 Model Grant Agreement (including the creation of a Data Management Plan). Participants may however opt out of these arrangements, both before and after the signature of the grant agreement. More information can be found under General Annex L of the work programme.

Where appropriate, beneficiaries are invited to follow the **GEOSS Data Sharing Principles** and to register in GEOSS the geospatial data, metadata and information generated as foreground of the project. Further contact and information on GEOSS can be found from www.earthobservations.org.



Type 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.

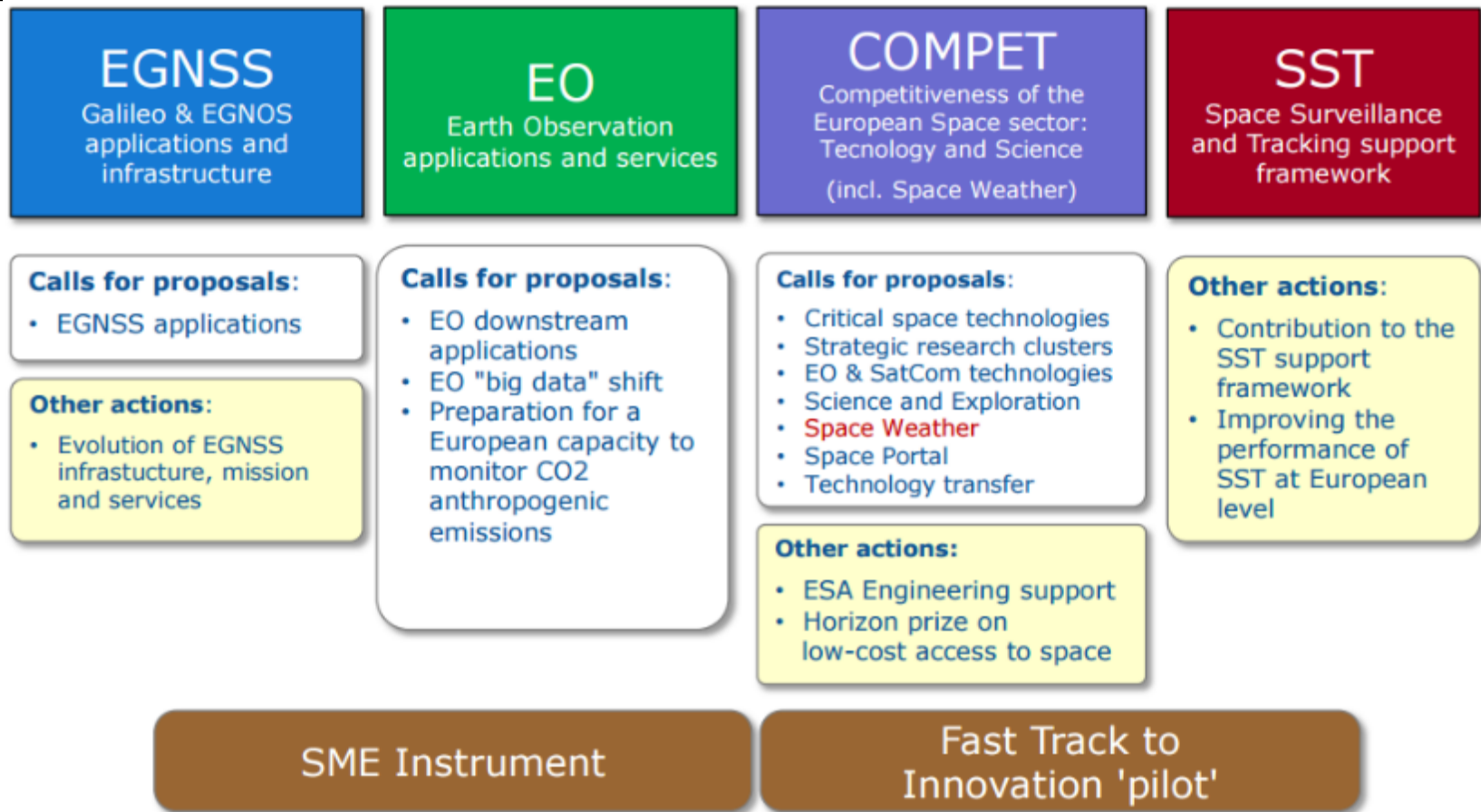
• **Innovation actions (Funding rate: 70% - exception: 100% for non-profit legal entities)**: Projects aiming to produce plans, arrangements or designs for a new or improved product, design, process or service by possibly including large-scale product validation and market replication.

• **Coordination and support actions (Funding rate: 100%)**: Projects consisting of accompanying/complementary 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](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

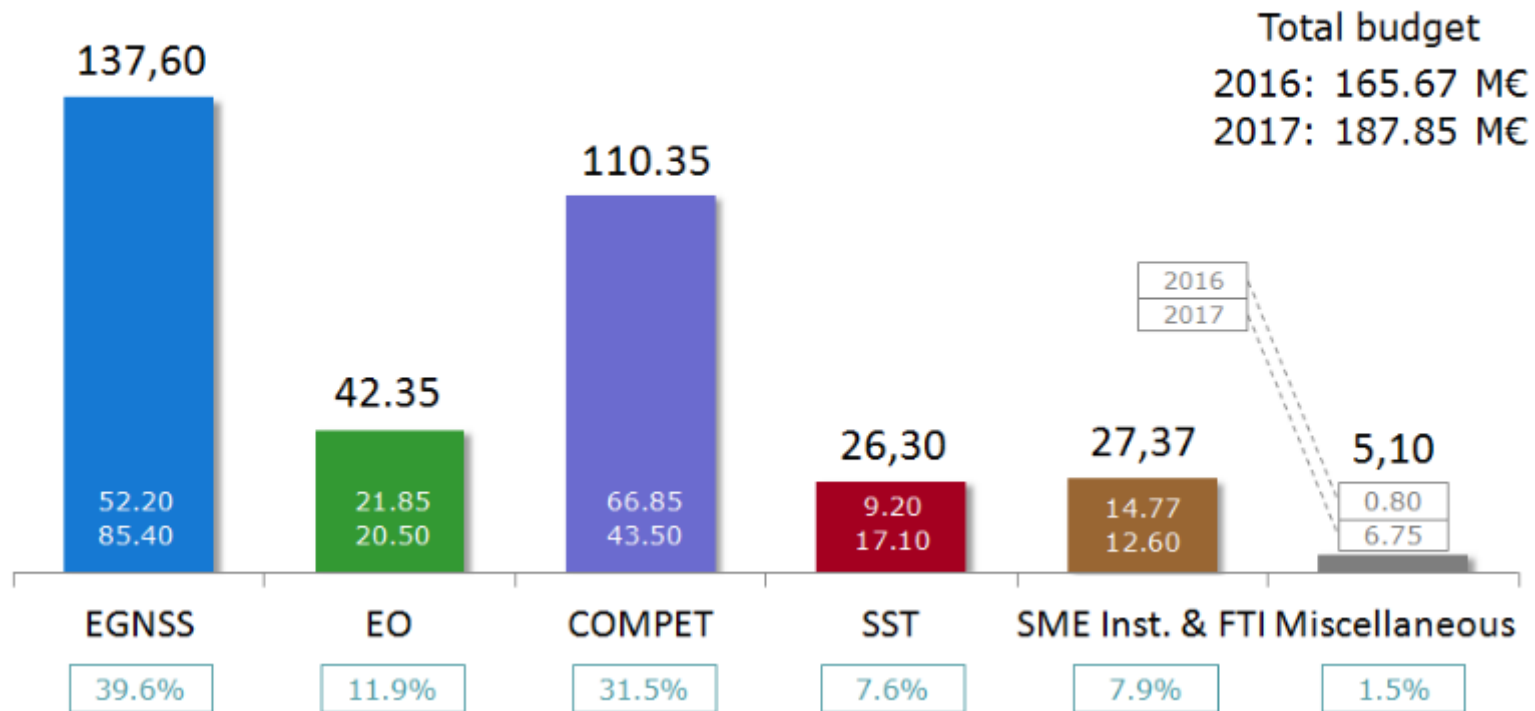


EGNSS: European Global Navigation Satellite System
 EO: Earth Observation Technology
 COMPET: Competitiveness of European Space
 SST: Space Surveillance and Tracking System



WP 2016-2017 Indicative budget

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



Galileo-1-2017, Galileo-2-2017, Galileo-3-2017 and Galileo-4-2017

Action	Call	Budget (M€)
IA	EGNSS Transport Applications	14.5
IA	EGNSS Mass Market Applications	9
IA	EGNSS Professional Applications	8
CSA	EGNSS Awareness raising and capacity building	1.5
TOTAL		33



Satellite Navigation Galileo and EGNOS

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**

The use of the available Galileo initial services and test beds

List of Galileo test infrastructure is available: http://gnss-test-portal.eu/tools/list_all_in_category/3



GALILEO-1-2017 EGNSS Transport Applications-Scope

Innovation activities within this topic should build on:

- Exploitation of the distinguishing features of **EGNOS and Galileo signals** and operational advantages in downstream applications;
- Implementation of EGNSS based pilot projects and **end-to-end solutions**, ready for use by the private or public sector;
- Standards, certification, legal and societal acceptance, which will foster **EGNSS adoption**; and
- Exploitation of synergies with other positioning and navigation systems and techniques, with focus in valorising EGNOS and Galileo in the frame of multi-constellation and multi-frequency environment.











GALILEO-1-2017 EGNSS Transport Applications-Expected Impact

• Activities should promote innovation in order to **maximise the potential of the EGNSS and its adoption in transport**. They should build on specific features and differentiators of Galileo and EGNOS, **demonstrating the advantage of their use** in transport. The applications shall contribute to the modern, efficient and user-friendly transport system. The activities should be complemented with a systems' approach, **taking care of infrastructure and regulatory requirements, coordination of multiple actors and pilot projects to encourage market take-up**.

•The proposals shall have a clear intention and rationale to **commercialise the products and services** developed, including a business plan.

Galileo-1-2017 EGNSS Transport Applications

TURKEY ⁱⁿ HORIZON 2020
 2014-2020 PROGRAMME

Aviation	Road	Maritime	Rail
Advanced navigation 	Autonomous vehicles 	Vessel navigation & Traffic Management 	Train signalling/control 
CNS and ATS 	eCall 	Port operations 	Passenger information 
Unmanned vehicles 	Connected Cars 	Fisheries 	Asset management 
Search and rescue 	Digital tacograph 	Search and Rescue 	Multimodal logistics 

*Synergy and complementarity with ongoing initiatives, e.g. SESAR, Shift2Rail
 PRS (Public Regulated Service) applications are out of scope*




 Project Indicative funding: 1 to 3 million €

Satellite Navigation Galileo and EGNOS

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**



Galileo-2-2017 EGNSS Mass Market Applications

EGNSS will contribute to better performance in LBS (Location Based Services)

Mass market applications

Internet of Things



Smart cities



Emergency services



Commercial LBS



- Foster the adoption of EGNOS and Galileo in mass markets.
- Applications that will make best use of EGNSS innovative features such as better multipath resistance, authentication...
- Foster competitiveness of the European GNSS industry in the area of mobile applications, with special focus on SMEs
- Maximise public benefits by supporting the development of applications that will address major societal challenges.

PRS (Public Regulated Service) applications are out of scope
Project Indicative funding: 1 to 3 million €

LBS: Location based services

Galileo-2-2017 EGNSS Mass Market Application-Expected Impact

Activities should aim at developing highly innovative and adaptive applications taking advantage of the Galileo and EGNOS added value. The proposal shall have a **clear intention to commercialise the products and services developed, including a business plan.** The consumer chipset and devices manufacturers (e.g. for smartphones and tablets) are mainly produced in non-European countries and the expected impact of this topic is **to foster the competitiveness of European GNSS** application providers that build innovation on these chipsets and devices, contributing to increase the overall EU competitiveness in the mass market. In addition, considering that the EU has a good market share of machine to machine chipset and module providers, the expected impact is also to foster applications building on this capacity.



Satellite Navigation Galileo and EGNOS

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

*Recommened project size
Indicative budget Type of
action*

1 to 3 M€

8 M€

**Innovation
Actions**

Galileo-3-2017 EGNSS Professional Applications

EGNSS differentiators are already acknowledged in professional segments

Professional applications

Agriculture



- Machine guidance
- Precision farming
- Field boundary measurements

Surveying and mapping



- Land survey
- Cadastre and geodesy
- Advanced constructions techniques

Timing and Other professional applications



- Timing and synchronisation for power grids
- Timing and synchro for finance
- Earth observation with GNSS

PRS (Public Regulated Service) applications are out of scope
Project Indicative funding: 1 to 3 million €

Galileo-3-2017 EGNSS Professional Applications-Expected Impact

Activities should aim at developing highly innovative applications taking advantage of Galileo and EGNOS aiming at **decreasing the barriers to access such professional applications, in term of price of the solution and easiness to use, increasing the number of users and explore new innovative use of GNSS**. Specifically for agriculture the expected impact is also to improve the productivity and decrease the environmental impact. For timing and synchronisation applications, the expected impact is **to contribute to cope with emerging network synchronisation needs in terms of accuracy and robustness**, while contributing to improve EU dependency from other GNSS.

Satellite Navigation Galileo and EGNOS

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.

*Recommened project size
Indicative budget Type of
action*

0.5 to 1 M€

1.5 M€

**Coordination
and support
action**

Expected Impact: The main aim of this topic is to support building of industrial relationships by gathering private and public institutions around services offered by EGNSS and related applications. This topic should support the competitiveness of EU industry by identifying strategic partners and by developing market opportunities. The support to incentive schemes should foster the emergence of new downstream applications based on either Galileo and/or EGNOS and therefore to support the EU GNSS industry.



Galileo-4-2017 EGNSS Awareness raising and capacity building



- Support building of **industrial relationships** by gathering private and public institutions around services offered by EGNSS and related applications
- Support the **competitiveness of EU industry** by identifying strategic partners and by developing market opportunities
- Support to **incentive schemes** should foster the emergence of new downstream applications based on either Galileo and/or EGNOS and therefore to support the EU GNSS industry

*PRS (Public Regulated Service) related activities are out of scope
Project Indicative funding: 0.5 to 1 million €*

Satellite Navigation Galileo and EGNOS

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)

Indicative budget: EUR 3.20 million from the 2017 budget (indicative number of contracts: 3-7)

Satellite Navigation Galileo and EGNOS

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)

Indicative budget: EUR 0.70 million from the 2017 budget (indicative number of contracts: 1-3)

Satellite Navigation Galileo and EGNOS

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



Indicative budget: EUR 48.50 million from the 2017 budget

Satellite Navigation Galileo and EGNOS



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

2017 call topics

Earth observation



Deadline: 1 March 2017

The Earth Observation (EO)

The Earth Observation (EO) call aims to accompany the investments made in Copernicus and the Earth observation and monitoring programme. Proposals that promote the development of innovative products and services based on remote sensing, geo-positioning or other types of satellite enabled data as well as proposals that focus on the evolution of Copernicus are expected in this call.

Objectives of COPERNICUS

"The Union Earth observation and monitoring programme"

Monitor the environment

Protect people and assets

Increase general knowledge on the state of the Planet

Improve environmental policy effectiveness

Facilitate adaptation to climate change

Foster downstream applications in a number of fields

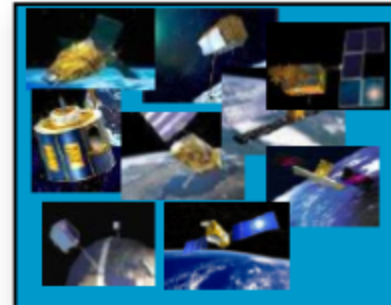
Help managing emergency and security related situations

Copernicus Architecture



Sentinels

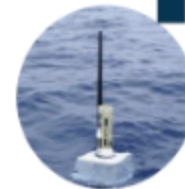
6 services use Earth Observation data to deliver ...



Contributing missions



...added-value products



in-situ

Copernicus Data Access

Access to Copernicus Sentinel data and service information is provided to users on a free, full and open basis. For other satellites data, the DataWareHouse document 2.0 is available at <http://www.copernicus.eu/main/library/technical-documents/> and licensing details can be consulted at http://gmesdata.esa.int/web/gsc/dap_document as well as http://gmesdata.esa.int/web/gsc/terms_and_conditions.

Earth Observation

EO-1-2017

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€

11 M€

**Innovation
Actions**



EO-1-2017 Downstream Applications Expected Impact

• Establish **sustainable supply chains** for innovative EO value added products and services **with demonstrated commercial value with targeted client communities**. Complete integration, based on international standards, into the customer's existing business processes and processing chains, as well as **the economic viability of the application is to be demonstrated**;

• Enhance the European industry's potential to take advantage of market opportunities and establish leadership in the field, and to **boost business activity**;

• **Lead to new or improved products**, processes or services on the market, by industry including SMEs, which are capable of generating, after the end of public funding, turnover and thus create new jobs.



Earth Observation

EO-2-2017

EO Big Data Shift

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

Activities should include the development of tools ... should address any relevant aspect of the data lifecycle which can solve EO big data challenges ...(e.g. collection, processing including online processing, quality control, documentation, dissemination, cataloguing, preservation, usage tracking, integration) and usage activities (e.g. discovery, analysis (including visual), product generation, user feedback, tagging, knowledge extraction, decision making)...

Participation of industry, in particular SMEs, is encouraged.

*Recommened project size
Indicative budget Type of
action*

5.5 M€

**Research and
Innovation
Actions**

Topic updated

EO-2-2017 EO Big Data Shift-Scope

•Big Data, activities shall bridge the gap between Earth observation and information technology sectors taking into account the user needs for EO Big Data and aiming at developing innovative solutions taking into account the needs of 1) **non-expert users like policy makers** involved in societal challenges, 2) **experts** involved, and 3) **small and medium innovative enterprises**. Activities shall be complementary to activities enabled by the **ICT and research** infrastructures work programmes which address generic challenges in the area of data mining, open linked data, web ontology, digital earth.

•**For example e-infrastructure for Research:** Network (GÉANT), processing (PRACE), data network, Federation of research infrastructure with single sign on (eduGAIN).

EO-2-2017 EO Big Data Shift-Expected Impact

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

Earth Observation

EO-3-2017

Preparation for a European capacity to monitor CO₂ anthropogenic emissions

Activities will encompass the coordination of ongoing efforts, include mutual identification of research and infrastructural gaps, and facilitate a cooperation of further research and development to be undertaken to reach sufficiently mature capacities for an operational integration as a subsequent step. The areas needing attention are:

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

*Reccomended project size
Indicative budget Type of
action*

4 M€

**Coordination
and support
action**

New Topic

EO-3-2017 Expected Impact

The proposal is expected to lay the mature foundation for an independent space-borne observation capacity for CO₂ in the context of Europe's Climate Change challenges. Coordination and networking efforts are expected to lay the foundation for the operational integration of all relevant European capacities as a subsequent step.

More specifically, the results are to:

Make a significant contribution to addressing the unresolved issue of ground-based versus space **derived estimates of CO₂ fluxes**.

Generate a large **database of CO₂** sources, sinks and atmospheric transport processes to help dimensioning the various elements to develop an operational EU anthropogenic **CO₂ emission monitoring** capacity.

Establish a set of **requirements regarding the accuracy** as well as spatial and temporal resolutions for anthropogenic CO₂ emissions estimates, such that the policymakers can be provided with reliable CO₂ emission trends to evaluate the **impact of NDC**-nationally determined contributions.

Shape the appropriate dimension and distribution of a surface network **to separate biogenic from anthropogenic CO₂ emissions**.

EO-1-2017, EO-2-2017 ve EO-3-2017



Action	Call Topic	Budget (Meuro)
IA	Downstream applications	11
RIA	EO Big Data Shift	5.5
CSA	Preparation for a European capacity to monitor CO2 antropogenic emissions	4
TOTAL		20.5

Related Earth Observation activities

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

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

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

- SC5-18-2017 - Novel in-situ observation systems
- SC5-19-2017 - Coordination of citizens' observatories initiatives

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

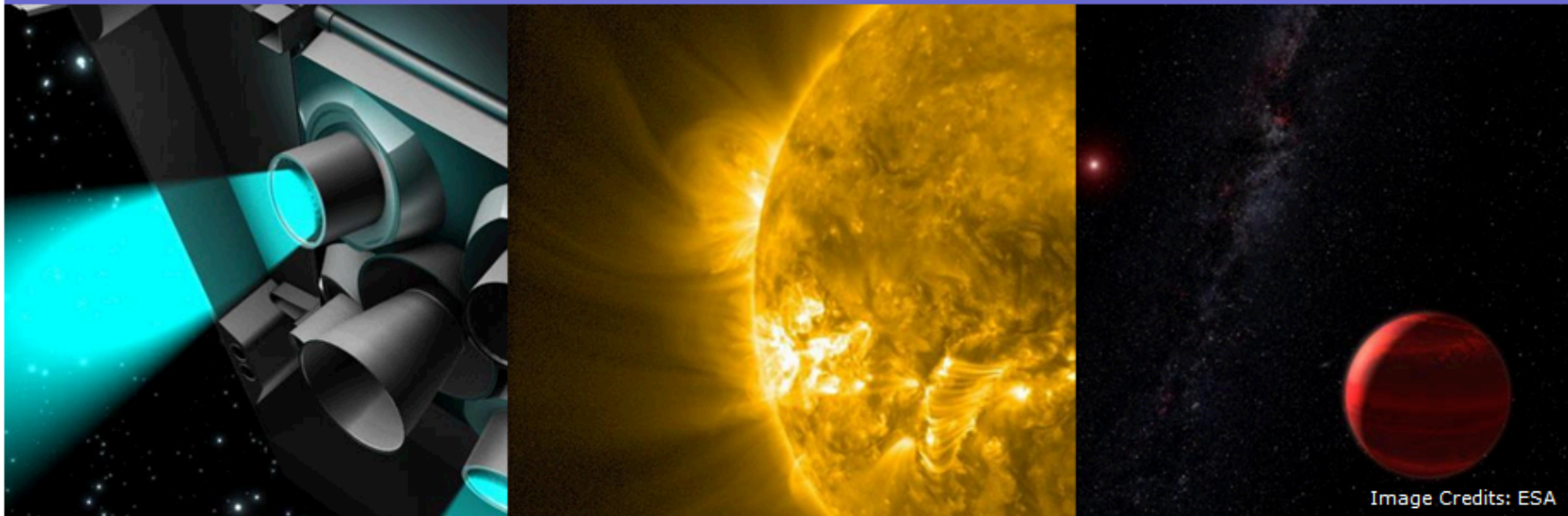
- COMPET-2-2017: Competitiveness in Earth observation mission technologies

SME Instrument (H2020-SMEInst-2016-2017)

- 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

2017 call topics

Competitiveness of the European Space Sector Technology and Science



Deadline: 1 March 2017

The Competitiveness of European Space Sector

Technology and Science (COMPET) call aims to contribute to the safeguarding and further development of a competitive and entrepreneurial space industry (including SMEs) and the strengthening of European non-dependence in space systems. Proposals aiming to miniaturise systems/subsystems, development of instrumentation or generic technologies for different science and application areas are expected in this call.



COMPET-1-2017, COMPET-2-2017, COMPET-3-2017,COMPET-4-2017, COMPET-5-2017, COMPET-6-2017 ve COMPET-7-2017

Action	Call Topic	Budget (M €)
RIA	Technologies for European non-dependence and competitiveness*	15
RIA	Competitiveness in Earth observation mission technologies	7
RIA	High speed data chain	10
RIA	Scientific data exploitation	6
RIA	Space Weather	4
CSA	Space portal	0.5
CSA	Technology transfer and business generators	2
TOTAL		44.5



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.

*Recommened project size
Indicative budget Type of
action*

2 to 5 M€

15 M€

**Research and
Innovation
action**

[More info on the
Participant Portal](#)

Detail of Critical Technologies address:

Excerpt from "Critical Space Technologies for European Strategic Non-Dependence – Actions for 2015/2017" (

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



COMPET-1-2017 Expected Impact

- Reduce the dependence on critical technologies and capabilities from outside Europe for future space applications, as identified in the list of Actions for 2015/2017 as part of the Joint EC-ESA-EDA task force **on Critical Technologies**;
- Develop, or regain in the mid-term, the **European capacity to operate independently in space**, e.g. by developing in a timely manner **reliable and affordable space technologies** that in some cases may already exist outside Europe or in European terrestrial applications;
- Enhance the **technical capabilities** and overall **competitiveness** of European space industry satellite vendors on the **worldwide market**;
- Open **new competition opportunities** for European manufacturers by reducing the dependency on export restricted technologies that are of strategic importance to future European space efforts;
- Enable the European industry to get **non-restricted access to high performance technologies** that will allow increasing its competitiveness and expertise in the space domain;
- Improve the overall European space technology landscape and **complement the activities of European and national space programmes**;
- Greater industrial relevance of research actions and output as demonstrated by **deeper involvement of industry, including SMEs**, and stronger take-up of research results;
- Fostering links **between academia and industry**, accelerating and broadening technology transfer.



COMPET-2-2017

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.

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.

*Recommened project size
Indicative budget Type of
action*

2 to 3 M€

7 M€

**Research and
Innovation
action**

[More info on the
Participant Portal](#)



COMPET-2-2017 Technology Domain

- Proposals that develop technologies targeting **TRL 6, or lower TRLs**, are welcome.
- Optical technologies for high precision sensing**, including high stability structures, stable and lightweight mirrors, large focal planes, adaptive optics and wave front error (WFE) control techniques.
- Detector technology** and complete detection chain enhancement in the domains of **CMOS and Infrared for Earth observations** in orbit aiming at higher spatial or spectral resolution and performance.
- Sensors and mission concepts** delivering high accuracy parameters for emission measurements, particularly of climate change determining **Greenhouse gases** such as CO₂ and methane. High performance miniaturised optical and SAR sensors for Earth observation in support of the hydrological cycle modelling and prediction, and accurate weather forecast.
- Active antennas for radar** - exploring lower (P and S) and higher (X and Ka) frequency ranges - Transmit/Receive Modules (TRMs), digital beam-forming and waveform generation, large deployable reflectors.
- Sensors, actuators and control technologies **for high precision Attitude and Orbital Control Systems (AOCS)**, in particular for small satellites, and Guidance, Navigation and Control (GNC).
- Technologies to advance in **fractionated systems and formation flying** for Earth Observation.



COMPET-2-2017 Expected Impact

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

COMPET-3-2017

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.

*Recommened project size
Indicative budget Type of
action*

2 to 3 M€

10 M€

**Research and
Innovation
action**

[More info on the
Participant Portal](#)



COMPET-3-2017 Scope

- **Re-configurable high data rate links** including high frequency RF bands and optical communications: direct and interoperable links between LEO satellites and links to Earth and mobile or aerial platforms (including X band, Ka band and optical), or direct links between GEO satellites and Earth or mobile or aerial platforms, and inter-satellite links (beyond the specifications of the European Data Relay System – EDRS and its evolution in support to Copernicus).

- **On-board data processing**, implementation of complex data algorithms (e.g. by means of programmable Digital Signal Processors – DSPs).

- **On-board data compression systems** to improve on-board data storage (memory modules for new memory devices).

- **High data rate image (optical and/or radar) and video processing**, such as lossless compression, image enhancement techniques or on-board SAR image generation.

- **Improved on-board data storage** ensuring efficiency and reliability (management of memory modules for new memory devices).

- Anticipate how the ground segment will cope with **higher data rates** to improve the overall data throughput. In particular to address the required evolution of technologies, architectures, products, end-user expectations, including the challenges associated with optical ground stations for data uplink and downlink.

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

COMPET-3-2017 Expected Impact

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

COMPET-4-2017

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.

Expected Impact: A **higher number of scientific publications** based on Europe's space data, high-level data products made available through appropriate archives, and tools developed for the advanced processing of data. Proposals are also expected to **add value to existing activities on European and international levels**, and to enhance and broaden research partnerships.

*Recommened project size
Indicative budget Type of
action*

1.5 M€

6 M€

**Research and
Innovation
action**

[More info on the
Participant Portal](#)



COMPET-5-2017

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.

Expected Impact: Proposals are expected to improve the **understanding of Space Weather phenomena and their impact on space systems** and terrestrial infrastructure, and are also expected to analyse **viable mitigation strategies**, and to demonstrate how these add value compared to existing mitigation strategies.

*Recommened project size
Indicative budget Type of
action*

1 to 1.5 M€

3 M€

**Research and
Innovation
action**

[More info on the
Participant Portal](#)

COMPET-6-2017

COMPET-6-2017

Space portal

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).

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

*Recommened project size
Indicative budget Type of
action*

0.5 M€

0.5 M€

**Coordination and
support action**

[More info on the
Participant Portal](#)



COMPET-7-2017

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.

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

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

Recommened project size
Indicative budget
Type of action

2 M€

2 M€

**Coordination
and support
action**

[More info on the
Participant Portal](#)



Other Action 11 - Horizon prize for low cost access to space

The **launch system** shall provide **affordable, sustainable and innovative design-to-cost solutions** towards **complete launch systems dedicated** to the delivery of **nano- and micro-satellites**, with a **launcher performance of payloads up to 500 kg to LEO orbit****, **operational as soon as possible** and **economically viable** when **considering mid-term** (i.e. the year 2025) **commercial nano- and micro- satellite launch market predictions**.

**Performance expressed for a 600 km LEO orbit

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

- **Technical achievements**
- **Economic viability**

Recommended project size
Indicative budget
Type of action

4 M€

**Inducement
prize**

[More info on the
Participant Portal](#)

Space Surveillance and Tracking



2017 Other actions

Space Surveillance and Tracking(SST)

<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(SST)

Two strands of SST activities funded by Horizon 2020:

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

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

H2020 PROPOSAL EVALUATION CRITERIAS

- Calls are challenge-based, and therefore more open to **innovative proposals**

- Calls are less prescriptive - they do not outline the expected solutions to the problem, nor the approach to be taken to solve it
- Calls/topics descriptions allow plenty of scope for applicants to propose innovative solutions of their own choice

- There is a **greater emphasis on impact**, in particular through each call or topic impact statements

- Applicants are asked to explain how their work will contribute to bringing about the described impacts
- During the evaluation, you are asked to assess this potential contribution

- There is more emphasis on innovation

- Horizon 2020 supports all stages in the research and innovation chain including non-technological and social innovation and activities closer to the market

- Proposals may **bring together different disciplines**, sectors and actors to tackle specific challenges

- e.g. scientists, industry, SMEs, societal partners, end-users...



H2020 PROPOSAL EVALUATION CRITERIAS

- A balanced approach to research and innovation
 - not only limited to the development of new products and services on the basis of scientific and technological breakthroughs
 - but also incorporating aspects such as the use of existing technologies in novel applications and continuous improvements
- Activities closer to the market emphasise the widest possible use of knowledge generated by the supported activities up to the commercial exploitation of that knowledge
- There is a particular emphasis on activities operating close to the end-users and the market, such as demonstration, piloting or proof-of-concept
 - can also include support to social innovation, and support to demand side approaches (standardisation, innovation procurement, user-centred measures ...) to help accelerate the deployment and diffusion of innovative products and services into the market

Operational Capacity

To identify manifestly inadequate partners.

Operational Capacity must be assessed on the basis of the information provided in the proposal such as CV, relevant publications or achievements.

Experts may seek further information from public or otherwise available sources.

Operational Capacity

The following supporting documents will be required to determine the operational capacity:

- CV or description of the profiles of participants.
- List of up to five relevant publications (including widely-used datasets or software).
- A list of up to five relevant previous projects or activities.
- Description of significant infrastructure or any major items of technical equipment.

Research and innovation action (RIA)

Action consisting of activities aiming at establishing new knowledge and/or exploring the feasibility of a new or improved technology, product, process, service or solution.

- For this purpose they may include basic and applied research, technology development and integration, testing and validation on a small-scale prototype in a laboratory or simulated environment
- Projects may contain closely connected but limited demonstration or pilot activities aiming to show technical feasibility in a near to operational environment

Innovation Action (IA)

Action primarily consisting of activities directly aiming at producing plans and arrangements or designs for new, altered or improved products, processes or services.

For this purpose they may include prototyping, testing, demonstrating, piloting, large-scale but limited research and development activities.

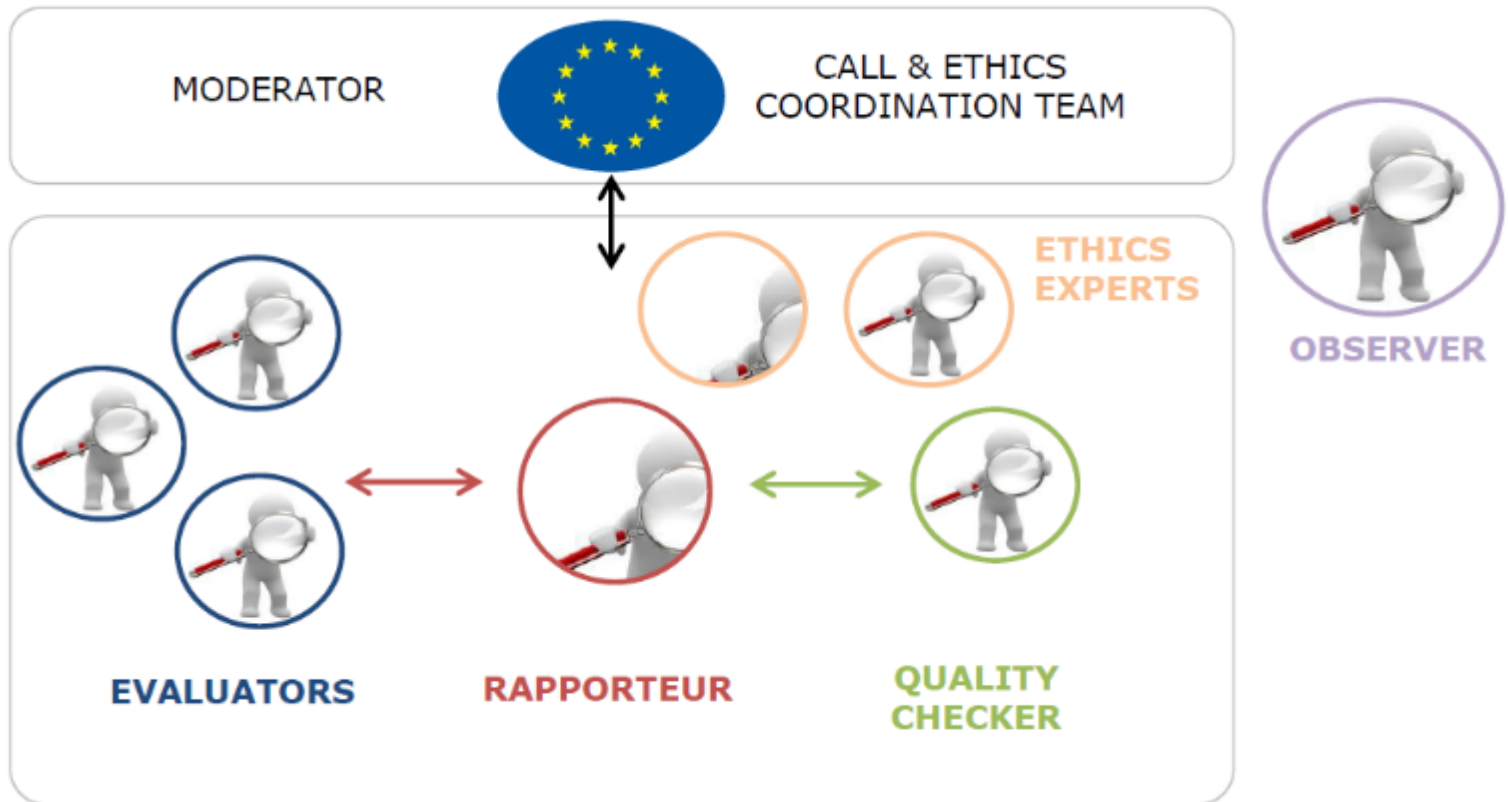
Coordination & Support Action

- Actions consisting primarily of accompanying measures such as

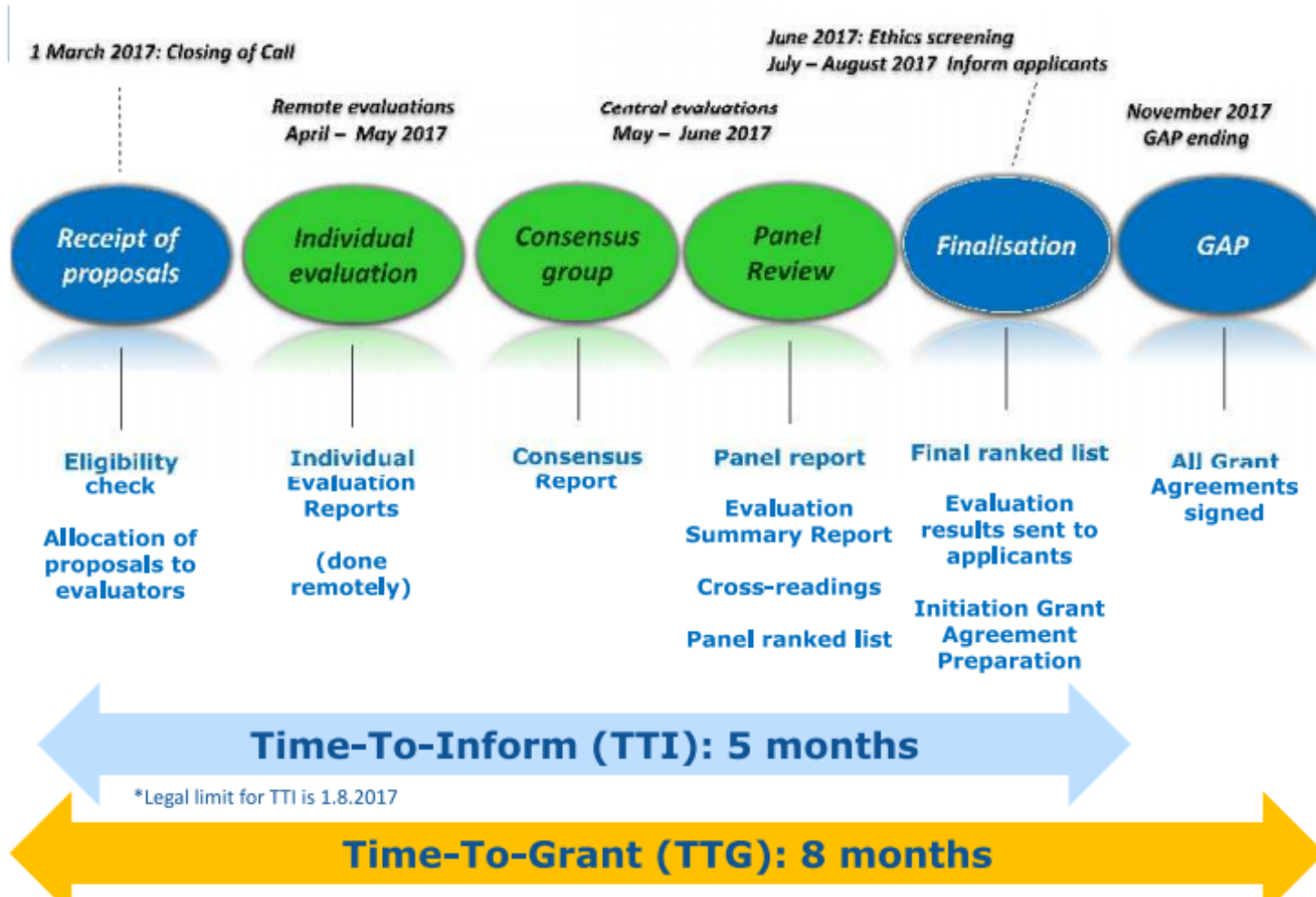
- standardisation, dissemination, awareness-raising and communication, networking, coordination or support services, policy dialogues and mutual learning exercises and studies, including design studies for new infrastructure, and
- may also include complementary activities of strategic planning, networking and coordination between programmes in different countries



The main actors in the evaluation process



H2020 Space calls 2017 evaluation planning



Scores

0 – The proposal fails to address the criterion or cannot be assessed due to missing or incomplete information

1 – Poor. The criterion is inadequately addressed or there are serious inherent weaknesses.

2 – Fair. The proposal broadly addresses the criterion, but there are significant weaknesses.

3 – Good. The proposal addresses the criterion well, but a number of shortcomings are present.

4 – Very Good. The proposal addresses the criterion very well, but a small number of shortcomings are present.

5 – Excellent. The proposal successfully addresses all relevant aspects of the criterion. Any shortcomings are minor.

Evaluation: Selection criteria

Excellence

Extent that proposed work corresponds to the topic description in the work programme

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

Evaluation: Selection criteria

Impact

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

Evaluation: Selection criteria



Excellence

- Extent that proposed work corresponds to the topic description in the work programme
- Clarity and pertinence of the objectives
- Soundness of the concept, and credibility of the proposed methodology
- Quality of the proposed coordination and/or support measures

Impact

- The expected impacts listed in the work programme under the relevant topic
- Quality of proposed measures to:
 - Exploit and disseminate project results (including IPR, manage data research where relevant);
 - Communicate the project activities to different target audiences

Implementation

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

SAME AS RIA / IA

No Recommendation

The evaluators must **NOT** make any recommendations as in H2020 there is no negotiation procedure. The Commission/REA can no longer request applicants to address and correct shortcomings. Bear in mind that any proposal with scores above the thresholds and for which there is sufficient budget will be selected and funded as submitted.

Funded Project Example 1 (TR partner ITU)



SPICES

Project reference: 640161

Funded under: [H2020-EU.2.1.6. - INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Space](#)

Space-borne observations for detecting and forecasting sea ice cover extremes

From 2015-06-01 to 2018-05-31, ongoing project

Project details

Total cost: EUR 2 995 678,75	Topic(s): EO-1-2014 - New Ideas for Earth-relevant space applications
EU contribution: EUR 2 995 678	Call for proposal: H2020-EO-2014 See other projects for this call
Coordinated in: Finland	Funding scheme: RIA - Research and Innovation action

Objective

The main objective of this proposal is to develop new methods to retrieve sea ice parameters from existing (and imminent) satellite sensors to provide enhanced products for polar operators and prediction systems, specifically addressing extreme and unexpected conditions. Automatic remote sensing products traditionally provide general information on sea ice conditions such as ice extent and concentration. However, for ice charting, tactical navigation and management of off-shore activities much more important is to know and avoid hazardous sea ice conditions. In general, sea ice hazards are related to sea ice thickness. More often than not polar ships and off-shore platforms are only operating during summer seasons and certain regions. This is because they are designed to resist typical forces of induced by pack ice, but they are not designed to resist the extreme sea ice conditions.

Ongoing climate warming has manifested as shrinking and thinning of pack ice in the Arctic. This is a primary driver for the increasing shipping, oil and gas explorations and mining activities in the Arctic. However, severe sea ice conditions still exist and in consequence many locations are impossible for ship based operations. Moreover, year-to-year variability of sea ice is very large and hazardous multiyear ice (MYI) floes sometimes appear also in typically seasonally ice free regions.



Funded Project Example 2(TR partner ODTU)

HORIZON
2020

MyOcean FO

Project reference: 633085

Funded under: [H2020-EU.2.1.6. - INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Space](#)

Pre-Operational Marine Service Continuity in Transition towards Copernicus

From 2014-10-01 to 2015-05-31, closed project

Project details

Total cost: EUR 6 000 000,04	Topic(s): SPACE - SPACE
EU contribution: EUR 6 000 000	Call for proposal: H2020-Adhoc-2014-20 See other projects for this call
Coordinated in: France	Funding scheme: CSA - Coordination and support action

Objective

The main objective of the MyOcean Follow On project will be to operate a rigorous, robust and sustainable Ocean Monitoring and Forecasting component of the pre-operational Copernicus Marine Service delivering ocean physical state and ecosystem information to intermediate and downstream users in the areas of marine safety, marine resources, marine and coastal environment and weather, climate and seasonal forecasting. This is highly consistent with the objective of the HORIZON 2020 Work Programme 2014-2015 establishing the need for interim continuity of the pre-operational services developed by MyOcean 2 before the fully operational services of Copernicus.

The project proposes to sustain the current pre-operational marine activities until March 2015 in order to avoid any interruption in the critical handover phase between pre-operational and fully operational services. In effect, any significant interruption in these services could potentially jeopardize several important high-level policy objectives and undermine other related scientific activities.

In the period from October 2014 to March 2015, MyOcean-FO will ensure a controlled continuation and extension of the services already implemented in MyOcean and MyOcean2 FP7 projects that have advanced the pre-operational marine service capabilities. To enable the move to full operations, MyOcean-FO is targeting the prototype operations, and developing the management and coordination to continue the provision of Copernicus Marine service products and the link with independent R&D activities.

MyOcean-FO will produce and deliver services based upon the common-denominator ocean state variables that are required to help meet the needs for information for environmental and civil security policy making, assessment and implementation.

MyOcean-FO is also expected to have a significant impact on the emergence of a technically robust and sustainable Copernicus Service



Funded Project Example 3(TR partner TUBITAK)



COSMOS2020

Project reference: 640163

Funded under:

[H2020-EU.2.1.6.1. - Enabling European competitiveness, non-dependence and innovation of the European space sector](#)

Cooperation Of Space NCPs as a Means to Optimise Services under Horizon 2020

From 2015-01-01 to 2017-12-31, ongoing project

Project details

Total cost:

EUR 2 186 400

EU contribution:

EUR 2 071 615

Coordinated in:

Germany

Topic(s):

[COMPET-11-2014 - Transnational and international cooperation among NCPs](#)

Call for proposal:

H2020-COMPET-2014 [See other projects for this call](#)

Funding scheme:

CSA - Coordination and support action

Objective

National Contact Points (NCPs) for Space provide support on Space funding under EU Framework programmes. In 2007 under FP7 the EU started funding an NCP Space network which was named COSMOS. This enabled the NCPs to benefit from each other's experience and thus raise the level of the overall quality of their services. Additional services were established like a joint website and news service providing information about Space and EU Framework Programme related topics. Furthermore they organised international information days in support of the European Commission with emphasis on bringing potential project partners together. Last but not least they implemented a country independent helpdesk for EU framework Space research related questions. While the project partners are core of the network the full group comprises the other Space NCPs from EU member states and Associated Countries as well as Space contact points in international partner countries, mainly from Space faring nations.

Within COSMOS2020 the network activities are continued under Horizon 2020. Capacity building, information services, project partner search support and more activities will once again reinforce the cooperation of the NCPs and raise the overall quality level of services. This is even more important since their role as only official support entity was decided for Horizon 2020.



TURKEY MINISTRY OF TRANSPORT, MARITIME AFFAIRS AND COMMUNICATION



BEYOND

Project reference: 641607

Funded under: [H2020-EU.2. - PRIORITY 'Industrial leadership'](#)

[H2020-EU.2.1.6. - INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Space](#)

Building EGNSS capacity On EU Neighbouring multimodal Domains.

From 2015-04-01 to 2017-03-31, ongoing project

Project details

Total cost:

EUR 1 933 136,25

EU contribution:

EUR 1 931 885,75

Coordinated in:

France

Topic(s):

[GALILEO-4-2014 - EGNSS awareness raising, capacity building and/or promotion activities, inside or outside of the European Union.](#)

Call for proposal:

H2020-Galileo-2014-1 [See other projects for this call](#)

Funding scheme:

CSA - Coordination and support action

Objective

The overall project concept consists of building capacity in the field of multi-modal applications, focussed mainly on aviation using EGNSS in different Eastern European and Mediterranean countries. These countries are located at boundaries of the EGNOS SOL coverage area with limited EGNSS experience; the projects will promote the development of multi-modal applications, building on the lessons learnt in previous European R&D activities.

With relation to the call's objectives, the goal of BEYOND is threefold:

- Promoting the use of EGNSS outside the EU in neighbouring countries and stimulating investments in EGNSS
- Preparing these countries for an optimal adoption of EGNSS and thus contributing to the increase in knowledge of EGNSS outside the EU
- Supporting networking between EU and non-EU players, from industry, institutions, research, academia, higher education and creating a basis for cooperation and business opportunities in EU neighbours; for aviation and other fields



Funded Project Example 3(TR partner TUBITAK)



InDrive

Project reference: 687366

Funded under: [H2020-EU.2. - PRIORITY 'Industrial leadership'](#)

[H2020-EU.2.1.6. - INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Space](#)

Automotive EGSS Receiver for High Integrity Applications on the Drive

From 2016-01-01 to 2017-12-31, ongoing project

Project details

Total cost: EUR 2 921 125	Topic(s): GALILEO-1-2015 - EGSS applications
EU contribution: EUR 2 435 312	Call for proposal: H2020-Galileo-2015-1 See other projects for this call
Coordinated in: Italy	Funding scheme: IA - Innovation action

Objective

The main objective of this project is to develop and demonstrate innovative close-to-market applications, which are heavily relying on accurate and high integrity satellite navigation. To achieve the full potential of advanced satellite positioning, an integrated solution starting from low-level signal processing to high-level data fusion will be proposed to get a continuous probabilistic positioning of high integrity.

INDRIVE will demonstrate the future use of mass-market GNSS, targeting automotive applications with high demands for integrity by creating a framework that specifies the requirements for data acquisition, signal tracking and data fusion in order to guarantee the proper handling of positioning data. This approach introduces an innovative integrity framework, allowing the applications to comply with their specified false alarm rates.

INDRIVE will target several applications in the area of Advanced Driver Assistance Systems (ADAS) and future Intelligent Transportation Systems (ITS) based on different positioning requirements. Both connected and non connected vehicles will be considered.



Funded Project Example-COMPET

Title: Plastic Components for Advanced Microwave Equipment of New Generation SatCom PAYloads

Project details

Total cost:

EUR 1036876,89

EU contribution:

EUR 1036626,89

Coordinated by:

THALES ALENIA SPACE FRANCE

Subprogramme :

COMPET-06-2014 - Bottom-up space technologies at low TRL

Call for proposal :

H2020-COMPET-2014 - Competitiveness of the European Space Sector: Technology and Science

Funding scheme :

RIA

Objective:

Plastic packaging solutions are foreseen as a good candidate to drastically reduce the cost of microwave equipment for future telecom satellite payloads. The objective of PAMPA project is to develop a plastic component technology, from the supply of the packaged microwave component with a reliability level compatible with space constraints up to its assembly on board using SMT (Surface Mount Technology) process. In order to demonstrate the potential of such technology, a flexible, digitally controlled microwave chain, representative of the need for new generation telecom satellite payloads, will be implemented on printed circuit board. Such technologies are particularly appealing for flexible microwave equipment, as the ASIC (Application Specific Integrated Circuit) and the microwave components can be assembled on board using the same SMT process. Furthermore, the use of a multilayer printed circuit board for the microwave chain is convenient for the implementation of dense DC routing of the command signals. To achieve the objective, the consortium gathers a manufacturer of satellite equipment, a Monolithic Microwave Integrated Circuit (MMIC) foundry, an industrial specialized in SMT manufacturing process and an academic partner with valuable knowledge in reliability of microelectronics packaging. It should be outlined that the MMIC foundry involved in the project is a dual foundry as it provides both plastic packaged components for the Automotive market in QFN (Quad-Flat No-leads) housings and bare MMIC with a Space grade quality. The main challenge will be to successfully spin-in a plastic technology coming from another harsh environment market that has drastic cost concerns, the Automotive, to the Space domain.

EXAMPLE PROJECT-R2RAM



R2RAM

Project reference: 640073

Funded under:

[H2020-EU.2.1.6.1. - Enabling European competitiveness, non-dependence and innovation of the European space sector](#)

Radiation Hard Resistive Random-Access Memory

From 2015-01-01 to 2016-12-31, ongoing project

Project details

Total cost:

EUR 1 039 362,5

EU contribution:

EUR 1 039 362,5

Coordinated in:

Germany

Topic(s):

[COMPET-06-2014 - Bottom-up space technologies at low TRL](#)

Call for proposal:

H2020-COMPET-2014 [See other projects for this call](#)

Funding scheme:

RIA - Research and Innovation action

Objective

The project aims to realize a strong methodology for the development and design of a radiation hard non-volatile memory technology by using standard CMOS silicon processing. Since standard silicon memories, such as flash memories tend to fail under irradiation, a new approach is envisaged: the development of a specific memory technology, so called resistive random-access memory (RRAM), which is able to sustain heavy ions and other charged particles. The switching effect of RRAM devices is caused by chemical Redox-reactions, therefore, radiation effects like total ionizing dose and single event effects don't affect the switching mechanism.

Semiconductor memories, among rad hard integrated circuit scenario, are one of the most critical topics for space applications. Actually both volatile and nonvolatile memories, excluding few exceptions, are integrated using standard processes and standard architectures. This means that the final device is typically at least Rad tolerant and not Rad Hard and failure during mission is avoided using Error Correcting Code techniques including redundancy at the board level. The basic goal of the project is to give a methodology for the development of a new rad-hard nonvolatile RRAM memory with high-performance features like good retention, re-programmability and cycling, and realize a prototype (1Mbit RRAM memory) in order to validate the approach.



EXAMPLE PROJECT-REACT

REACT

Project Reference: 640241

Funded under: H2020-COMPET-2014 - Competitiveness of the European Space Sector: Technology and Science

Title: REsettable Hold-Down and Release ACTuator

Project details

Total cost:

EUR 2731451,25

EU contribution:

EUR 2731451

Coordinated by:

ARQUIMEA INGENIERIA S.L

Subprogramme :

COMPET-01-2014 - Technologies for European non-dependence and competitiveness

Call for proposal :

H2020-COMPET-2014 - Competitiveness of the European Space Sector: Technology and Science

Funding scheme :

RIA



EXAMPLE PROJECT-REACT

Objective:

Unrestricted access to Space low shock non-explosive actuators has been identified as an urgent action by the European Commission, the European Space Agency and the European Defence Agency. Project REACT proposal is oriented to permit the unrestricted access of Europe to the technology of high reliable non-explosive actuators based on SMA (Shape Memory Alloy) technology.

The REACT (REsettable Hold-Down and Release ACTuator) device is a new Hold Down and Release Actuator (HDRA) for space applications that have been developed as an improved alternative to currently available devices.

Specifically, the proposed project is focused on develop low shock resettable Hold Down and Release actuators and qualify them integrated in real space final user space applications that require this release devices, such as big structures deployment, space science payload subsystems deployment, launchers subsystems deployment and small satellites subsystems deployment.

The TRL (Technology Readiness Level) expected to be obtained once the project concluded shall be 8.

REACT project is aimed to optimize and evolve standard REACT devices designs recently qualified up to TRL6 in order to match the requirements of specific applications demanded by the space market and generate a competitive range of products. The product optimized for space market applications will be able to replace and improve the performance of currently available US components in different areas of application (launchers, science, telecom and Earth Observation applications).

REACT project contemplates to develop new SMA material manufacturing techniques and new SMA alloys that fit the specific requirements of the final users also involved in the project. In addition, research and improve the actuator tribology will be a technical objective to be addressed during the project development.

Finally it is addressed a complete qualification campaign in order to upgrade to TRL8 the REACT models.

Agence exécutive pour la recherche/Uitvoerend Agentschap Onderzoek, B-1049 Bruxelles/Brussel, BELGIQUE/BELGIË

EXAMPLE PROJECT-REACT

Coordinator:

Legal name	Country
ARQUIMEA INGENIERIA S.L	Spain

Participants:

Legal name	Country
AVS ADDED VALUE INDUSTRIAL ENGINEERING SOLUTIONS SLU	Spain
EADS CASA Espacio	Spain
ESR TECHNOLOGY LIMITED	United Kingdom
SPACETECH GMBH	Germany
Surrey Satellite Technology Limited	United Kingdom
UNIVERSIDAD DEL PAIS VASCO/ EUSKAL HERRIKO UNIBERTSITATEA	Spain

EXAMPLE PROJECT-URBANFLUXES

URBANFLUXES

Project Reference: 637519

Funded under: H2020-EO-2014 - Earth Observation

Title: URban ANthropogenic heat FLUX from Earth observation Satellites

Project details

Total cost:

EUR 2687446,25

EU contribution:

EUR 2346193

Coordinated by:

FOUNDATION FOR RESEARCH AND TECHNOLOGY
HELLAS

Subprogramme :

EO-1-2014 - New ideas for Earth-relevant space
applications

Call for proposal :

H2020-EO-2014 - Earth Observation

Funding scheme :

RIA

Objective:

The main goal of the proposed project URBANFLUXES (URban ANthropogenic heat FLUX from Earth observation Satellites) is to investigate the potential of Earth Observation (EO) to retrieve anthropogenic heat fluxes. The main research question addresses whether EO is able to provide reliable estimates of anthropogenic heat flux spatiotemporal distribution, at local and city scales. URBANFLUXES will investigate the potential of EO to retrieve the anthropogenic heat flux, as a key component in the urban energy budget and by developing a method capable of deriving it from space. The objective is to develop a method that could be used operationally in the near future, when observations with adequate temporal resolution become available. URBANFLUXES EO-based approach will be easily transferable to any urban area and capable of providing anthropogenic heat flux benchmark data for different applications, including climate models to assess the implication of the anthropogenic heat on the Earth system; building energy models to characterize buildings-to-atmosphere/soil/water heat exchange pathways; and decision support systems for urban sustainable planning and mapping of emissions related to energy consumption. URBANFLUXES is therefore expected to prepare the ground for further innovative exploitation of European space data in scientific activities (Earth system modelling and climate change studies in cities) and future and emerging applications (sustainable urban planning) by exploiting the improved data quality, coverage and revisit times of the Copernicus Sentinels data. The Copernicus observations have the potential to reveal novel scientific insights, related to monitoring the anthropogenic heat flux in cities, at both local and regional scales, generating new EO opportunities. The URBANFLUXES products will therefore support both sustainable planning strategies to improve the quality of life in cities and Earth system models to provide more robust climate simulations.

LESSONS LEARNT

Successful proposal-some hints

Be focused and concrete:

- ✓ Build on **fairly mature application** or business concepts and fill the gap
- ✓ Think to **bring the products / services on the market** at the end of the project

Build on market understanding and business expertise:

- ✓ Ideally, coordinator with good expertise in the specific market
- ✓ Demonstrable **capability to commercialise** the products and services developed

Demonstrate a clear motivation to commercialise the products and services:

- ✓ Market **entry plan** (marketing strategy & business plan)
- ✓ Previous achievements in the specific market

Focus on practical impact:

- ✓ Maximise the use of the **available signals**
- ✓ Prefer **trials and large scale demonstration**, involving final users in their real life procedures
- ✓ Produce **practical tools useful for the GNSS developer community**

Select applications where EGNOS and Galileo differentiators are key for the product/service success

Standard admissibility criteria

1. **Submitted in the electronic submission system before the deadline**
2. **Complete** (requested administrative forms + proposal description + supporting documents)
3. **Readable, accessible and printable**
4. **Respecting page limit** (RIA/IA: 70 pages; CSA:50 pages)
 - Outside the limit:
 - **participating organisations** (operational capacity check)
 - CV or profile description of staff carrying out the work
 - A list of up to 5 publications and/or other research or innovation products
 - A list of up to 5 relevant previous projects/activities
 - Relevant available infrastructure/equipment description
 - Description of additional third parties contributing to the work
 - **ethics self assessment, data management plan** (open access to peer-reviewed scientific publications)

Proposal evaluation basic principles

- Excellence, transparency, fairness and impartiality and efficiency and speed
- Done **by independent experts** selected by REA/GSA/EASME from Experts database on Participant Portal
 - Balance in terms of
 1. Skills, experience and knowledge
 2. Other factors
 - geographical diversity
 - gender
 - where appropriate, the private and public sectors
 - an appropriate turnover from year to year
 - **No conflict of interest !**

Proposal scoring

Excellence: 4,0
"The objectives"

Impact: 4,5
"The innovation capacity...."

Quality and efficiency of the implementation: 3,5
"The management"

1. Per criterion: Assessment, comments, justifications

→ Σ 12,0 out of 15,0

- Evaluation scores are awarded per criterion, scale from 0 to 5, half point scores may be given
- Maximum score: 15
- **Individual criteria threshold: 3**
- **Total score threshold: 10**

Who can be an expert

You have a chance of being selected as an expert if you:

- have **high-level of expertise** in the relevant fields of research and innovation
- can be available for **occasional, short-term** assignments.

Experts, as peer reviewers, assist in the:

- **evaluation** of proposals
- **monitoring** of actions

Registration is open to experts of any nationality including those outside of the EU and Associated Countries!

In addition, experts assist in the :

- preparation, implementation or evaluation of programmes and design of policies.

Who can be an expert

- **Place of work**
All or part of the evaluation and monitoring may be carried out at the evaluator's home or place of work (remote evaluation), or at the Commission's/Agency's offices in Brussels or Luxembourg, depending on the type of work to be done.
- **Conflicts of interest**
The Commission will not appoint any expert for proposals or projects if there is a vested interest that could influence the way he/she evaluates them.
- **Confidentiality**
If the expert is going to be handling **classified information**, he/she will need security clearance before he/she can sign a contract.
- **Remuneration**
The expert shall receive EUR 450 for each full day worked. All travel and subsistence costs will be refunded.

Registration as an expert

- **To register**, go to the [Experts' page](#) on the Participant Portal. To access the registration forms, you'll need an *ECAS account*, which you can set-up on the same website if you don't yet have one.
- Once you've done this, you can log in to your account any time and view, update or complete your profile in the My Expert Area.
- Click on the "Register as an expert" button. To create your profile, you'll need to specify:
 - which programmes you're interested in
 - personal details, knowledge of languages, education and training
 - area of expertise
 - professional experience (employment, past involvement in EU research programmes, publications or other achievements...)

Some Additional Points

Most of the experts mother tongue is not English, so proposals sentences should not be too long and complicated.

Proposals should answer all expected impacts in the WP by supporting visual descriptions, tables and etc to make it clearly understandable.

Before submission, an other person out of the project team may read the proposal and make comments about its clearness of descriptions.

Start to prepare your proposal in advance. Get in close collobaration with your Space National Contact Point !

Never give up, continue to submit proposal.

Of course you need good luck also. I wish good luck for all...

THANK YOU FOR YOUR ATTENTION !
**We are looking forward your proposal ideas
and funded projects.**