

→ CRITICAL INFRASTRUCTURES

Beatrice Barresi
beatrice.barresi@esa.int

business.esa.int

@ESAbusinessapps

European Space Agency

→ AGENDA

- ESA overview
- What ESA Business Applications offers
- Overview on the study “**Services to support resilient & sustainable Critical Infrastructure**”
- Eligibility
- Open Questions & Answers session

Purpose of ESA

“To provide for and promote, for exclusively peaceful purposes, cooperation among European states in **space research and technology and their space applications.**”

Article 2 of ESA Convention



ESA: facts & figure

- Over 50 years of experience
- 22 Member States
- Eight facilities in Europe, about 2300 staff
- 5.75 billion Euro budget (2017)
- Over 80 satellites designed, tested and operated in flight



→ FUEL FOR YOUR BUSINESS

Could you be leveraging Space technology and data for the benefit of life on Earth?



→ THE POWER OF SPACE



Satellite Navigation

- Global Positioning
- Navigation
- Timing



Satellite Communication

- Communication on the move
- Deployable connectivity
- Unprecedented speeds



Earth Observation

- Digital Mapping
- Global coverage
- Hi-res imagery
- Weather forecasting



Spaceflight Technologies

- Technologies developed for weightless environment which can be used also on Earth



Space Weather

- Management of solar effects
- Impact on communication network
- Impact on power grids

→ YOUR BUSINESS POWERED BY SPACE



We have **€195m**
available for funding

And we have invested...



€190M in over



500 European Businesses



→ OUR OFFER TO YOU

We'll work together to make your idea commercially viable, with:



Zero-Equity
Funding
(€60k-€2M+)



Tailored Project
Management
Support



Access to
Our Network
& Partners



Use of the
ESA Brand for
Credibility



Zero-equity funding & support for

→ **CRITICAL INFRASTRUCTURES**
POWERED BY SPACE



→ KEY ELEMENTS



Zero-equity funding & support for

→ **CRITICAL INFRASTRUCTURES**

POWERED BY SPACE

Title: Services to support resilient & sustainable Critical Infrastructure

Scope: Identify and analyse technically and economically sustainable space-based services for **reducing the vulnerability of Critical Infrastructure and for making such infrastructure more “green”**

Budget: 250 K Euro (fully funded by ESA)

Duration: 9 months

Procurement: Several parallel contracts possible

Dates: Tender will open mid-March 2018 and it will stay open for 8/10 weeks

→ EXAMPLE OF SERVICES

RESILIENT

- Monitoring of the critical infrastructure from environmental/climate-related events (e.g. flooding, earthquake) and from consequences of human actions.
- Monitoring the structural integrity of the asset itself
- Implementation of cybersecurity
- Logistic and maintenance inspection

SUSTAINABLE

- Reduce the impact on the environment
- Support the development of a new infrastructure
- Support the replacement (upgrade) of an existing infrastructure

and many more



→ ENABLERS FROM SPACE



- **Satellite Earth Observation (SatEO)**

- provide an enhanced operational picture to end users, via data collected by remote sensing satellites in med/high resolution
- provide wide coverage for monitoring large assets
- change assessment through the analysis of optical and radar time-series images



- **Satellite navigation (SatNav)**

- trace and tracking service which are fundamental to know where people and assets are located
- for geo-localising in-situ samples

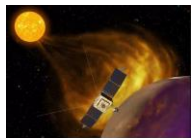


- **Satellite Communications (SatCom)**

- increase communication network robustness and communication resilience
- back-up solution in case of network failures or cyber-attacks targeting terrestrial communication

- **Space Weather**

- magnetic storm can cause radiation and geomagnetic spikes which impact on Earth can impact the operation of electricity grids, pipelines, railway signalling, etc.



→ ...MORE TECHNOLOGIES



- Big Data analytics
- Megaconstellations for communication network
- 5G
- IoT
- Crowdsourcing



→ ESA ENGAGED USERS



EUROPEAN UNION
SATELLITE CENTRE
Analysis for decision making

Monitoring of Critical Infrastructure SatCen is particularly interested in monitoring critical infrastructure which are critical for the security of Europe (e.g. transportation networks, power plants and industrial sites). SatCen deems as crucial the integration, interoperability and fusion of different types of data (e.g. remote sensing, social media data).



Protection of critical infrastructure from cyber threats: UNICRI interest is mainly on enhancing the information safety of the critical infrastructure meaning to protect the information assets (data and systems) from unauthorized access, unauthorized modification or the denial of access



Organization for Security and
Co-operation in Europe

Reduce vulnerability of energy related infrastructure: OSCE welcomes any initiative which objective is to make energy networks more resilient to malicious cyber-attacks and to geophysical (earthquakes) and climate-related disasters (floods, droughts, landslides).

SatCen, UNICRI and OSCE have agreed to support the ESA study and provide user requirements and guidance for the services of their interest.

→ MAIN OBJECTIVES



→ Identify, define and assess technically and economically potentially sustainable services

→ Identify and reduce technical and commercial risks related to the implementation of these services

→ Consolidate user /customers requirements and engage with relevant customers and other stakeholders for further involvement

→ Propose recommendations and define a roadmap for service(s) implementation and demonstration, and prepare a potential follow-on demonstration project.

→ **STUDY LOGIC**



Technical Phase 1: Viability Assessment

Task 1

Stakeholders Analysis and Preliminary Sustainability Assessment

Task 2

Technical Feasibility Assessment

Task 3

Commercial Viability Assessment

Technical Phase 2: Implementation Plan

upon ESA decision based on business case presented at Business Case Review

Task 4

Preparation for Service Implementation

Kick-Off

T₀

Progress Meeting 1

T₀ + 3 months

Business Case Review

T₀ + 6 months

Final Review

T₀ + 9 months

Time



→ MAIN REQUIREMENTS

→ Contractor team should be interested in developing and commercialising considered services and have relevant capabilities. Involvement of potential service provider in the project team is required.

→ Customer/user-driven study (user involvement required)

User letter(s) of interest to be provided in the proposal

ESA will be responsible for the liaison between the Contractor and SatCen, UNICRI and OSCE.

→ Any category of CI (e.g. energy installations and networks, food and agriculture, financial services, waste and wastewater systems, government facilities, dams, ports, transportation systems, information technology,) is eligible for this activity

→ •Study focused on a reduced number of services (max.3)

→ Involvement of at least one space asset

→ FUNDING ELIGIBILITY

- Open to any organisation, residing in any of those states that subscribed to the ARTES IAP programme (to date: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxemburg, The Netherlands, Norway, Poland, Portugal, Romania, Sweden, Switzerland and the United Kingdom)
- **Letter of Authorisation from bidding team's national delegation(s) is needed and must be submitted as part of the Bidder's proposal. Without this letter, the proposal is not eligible.**
- **The contacts of the National Delegations can be found at <https://business.esa.int/national-delegations>**



→ HOW TO APPLY

- The Call for Proposals will be issued on **EMITS** (<http://emits.sso.esa.int/emits/owa/emits.main>) in the section **Open Invitations To Tender** under the number 9189
- The proposal submissions shall make use of the new **ESA-STAR** system which will allow the **submission of proposals electronically**
- Companies shall register beforehand by completing the **online questionnaire** on the “ESA-STAR registration” website (<https://esastar-emr.sso.esa.int/>)
 - For general information about how to do it, see the “esa-star” Registration User Manual http://esamultimedia.esa.int/docs/business_with_esa/CG-EM-ORR-S-16_End_User_Manual_v1.2.pdf
- Follow updates in EMITS and ESA business application website <https://business.esa.int/> & subscribe to the newsletter!

A large circular graphic with a black background and a dashed white border. At the center is a realistic image of the Earth. Surrounding the Earth are several semi-circular segments containing different images: a bar chart, a person running, a person in a pink shirt, a coastal landscape, a port with shipping containers, and agricultural fields. Three blue banners are overlaid on the graphic.

→ THANK YOU

[BUSINESS.ESA.INT/CRITICAL-INFRASTRUCTURE](https://business.esa.int/critical-infrastructure)

Beatrice Barresi
Beatrice.Barresi@esa.int