

ARTES 4.0 Generic Programme Line Business Applications - Space Solutions

“Space for Infrastructure – Digital”

THEMATIC CALL FOR PROPOSALS

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Table of ACRONYMS

AI	Artificial Intelligence
APQ	Activity Pitch Questionnaire
AoF	Authorisation of Funding
ARTES	Advanced Research in Telecommunications Systems
BASS	Business Applications and Space Solutions
DG	Director General
ESA	European Space Agency
FP	Full Proposal
IoT	Internet of Things
ML	Machine Learning
OP	Outline Proposal
OSIP	Open Space Innovation Platform
SME	Small and Medium sized Enterprise

1. OVERVIEW

This document presents an overview of the “Space for Infrastructure”, under the 6th thematic area “Digital”, thematic call for proposals issued under the ARTES BASS, 5G and 4S programme lines. The call offers the opportunity to companies to bring forward their business propositions, which shall leverage on space and advanced digital technologies for delivering sustainable solutions.

2. BACKGROUND AND RATIONALE

Infrastructure underpins both national economies and citizens’ quality of life. It consists of the physical infrastructure needed, for example, to power homes and businesses, to supply the water that people need, but also includes the digital infrastructure needed to efficiently manage the transport of goods, exchange ideas, and stay in touch with family members and friends. Infrastructure networks account for a substantial proportion of both government and private sector investment, and given its scale, it is critical that such investment is deployed effectively.

Digital infrastructure refers to technologies that provide the foundation for an organisation's information technology and operations by bringing together physical and virtual technologies such as compute, storage, network, applications, and IaaS, PaaS and SaaS platforms. Examples of digital infrastructure include telecom networks, cloud computing and data centres. According to recent reports from Global Market Insights (GMI), digital infrastructure is projected to grow from \$90 billion USD in 2020 to \$120 billion USD in 2027. The demand for future generation services and devices, such as 5G and smart technologies, is expected to exceed \$50 billion USD over the next five years. Digital infrastructure and rapid connectivity bring new opportunities. Satellite-based communications have a critical role to play in increasing connectivity to improve access to the online world as well as to enhance network resilience backing up the terrestrial infrastructure. Cybersecurity techniques and solutions should also be updated to reflect the substantial advancements in attacker capabilities, which can jeopardise availability of essential digital services (e.g. health, energy).

3. OBJECTIVES OF THE CALL

The objectives of this specific subtheme are to:

- Support the infrastructure sector by stimulating the emergence of innovative space applications and services with high market potential, addressing the typical phases of infrastructure projects including planning, construction, operation and decommissioning/repurposing.
- Improve efficiency in the selected domains within the infrastructure sector through allowing lower costs, better capacity management, increased output while reducing environmental footprint.
- Increase the resilience of the infrastructure with more accurate resilience models and reducing the impact of disruptive events.

4. SPACE ASSETS

Satellite technology and data have a significant part to play in the development of potential services. This section lists (and applications are not limited to) the following examples.

Satellite Communications is becoming a key part of digital services with many new communications solutions now integrating LEO, GEO, and hybrid networks into their communication architectures. This has enabled advancements in areas such as high-speed global internet and 5g applications. However, these communication systems need to be secure and reliable. Downstream solutions which use satellite communications need to be provided in a cyber-secure environment so that threats to digital infrastructure can be mitigated against. In addition, satellite communications can be used for redundant communication channels when terrestrial communications is disabled, i.e. in an emergency situation. By using satellite communications as a backup, digital services can be continued in the light of a massive cyber-attack against digital infrastructure assets.

Satellite navigation and timing services (GNSS) provides both a timing and navigation service. From a timing perspective, GNSS provides highly accurate time synchronization, which is crucial for the operation of various digital infrastructures. This includes telecommunications networks (like 5G), power grids, financial systems, and broadcasting networks reliant on digital infrastructure. Accurate timing ensures that these systems can operate efficiently and coordinate effectively. Synchronisation services are especially important for time-critical solutions or in situations in which digital infrastructure suffers a disruption. Geo-fencing, through a positioning service, of physical digital infrastructure assets is essential to ensure networks physically protected and prevent the digital infrastructure becoming physically damaged.

Inherently, Satellite Earth Observation (SatEO) services use digital infrastructure for large amounts of data storage, processing and dissemination. However, SatEO can possibly enable the following applications:

- Regional level environmental monitoring: events such as earthquakes and landslips can cause damage to fiber-optic and wired networks. SatEO can be used to show areas in which maintenance would be required or provide insights into showing low-risk areas in which new fiber-optic cables could be laid;
- Planning of new networks;
- Disaster Management: In the event of a disaster, SatEO can be used for supporting emergency response efforts. This mitigates the impact that disasters can have on key communication networks.

5. SCOPE OF THE CALL

The proposals under this Call for Proposal shall address the digital infrastructure domain with innovative user-driven integrated downstream services which rely on advanced technologies and space data.

The Bidder shall involve in the project representatives from user communities, which shall

take part in the pilot (if applicable).

The Bidder shall either address the use cases included in the Annexes (available on the website¹) or address other use cases and requirements related to digital infrastructure provided by other customers / users directly involved by the Bidder. In the latter case, support of those potential customers shall be evidenced in letters of interest to be attached to the Outline Proposal.

The service provider shall be identified and possibly be part of the bidding team to ensure the commercial operational roll-out of the proposed service following completion of the project.

This thematic call for proposals covers two types of activities:

1. **Feasibility Studies**, which provide the preparatory framework to identify, analyse and define new potentially sustainable services.

The applications and/or services covered by the proposed Feasibility Studies have to:

- Be customer/user driven and present a strong sustainability potential.
- Propose a service demonstrating the benefits of the utilisation of integrated space assets .
- Include a viability analysis .
- Aim to evolve the targeted applications and services to marketability and operational roll-out, potentially through a Demonstration Project after successful completion of the feasibility study.
- Address at least one of the thematic areas described in section 3 or other(s) defined by the Bidder.
- The Bidder shall either address the use cases of one or more stakeholders involved by ESA and included in the annexes or address other use cases and requirements related to digital infrastructure provided by other customers / users directly involved by the Bidder. In the latter case, support of those potential customers shall be evidenced in letters of interest to be attached to the Outline Proposal.

2. **Demonstration Projects**, dedicated to the implementation and demonstration of pre-operational services.

The applications and/or services covered by the proposed Demonstration Projects have to:

- Be customer/user driven (including user involvement and active participation in the project).
- Propose a service demonstrating the benefits from the utilisation of space assets with clear potential to become sustainable.
- Address at least one amongst the thematic areas described in section 3, covering one or more of the mentioned applications or other(s) defined by the Bidder.

¹ <https://business.esa.int/funding/call-for-proposals-non-competitive/space-for-infrastructure-digital-infrastructure>

- Provide a measurable socio-economic impact.
- The Bidder shall involve in the project representatives from users communities, which shall take part in the pilot.
- The Bidder shall either address the use cases of one or more stakeholders involved by ESA and included in Annex A or address other use cases and requirements related to digital infrastructure provided by other customers / users directly involved by the Bidder. In the latter case, support of those potential customers shall be evidenced in letters of interest to be attached to the Outline Proposal.

6. PROCUREMENT APPROACH

The proposals submitted in reply to the call shall be implemented in the context of ESA BASS, 5G and 4S programme lines of ARTES in coordination with National Delegations.

The Bidder shall submit first an Activity Pitch Questionnaire, and following evaluation, may be invited to submit the Outline and Full Proposal. The Activity Pitch Questionnaire (APQ) template provided by ESA shall be used. This is considered as entry point for companies to submit their idea, providing a simplified and single point of access to the ESA ARTES framework.

The price of activities carried out in a given State are charged against the contribution of that State in the programme. A letter of Authorisation of Funding (AoF) from the relevant National Delegation is therefore required as part of the Full Proposal. The Bidder is however advised to inform the relevant National Delegation(s) when submitting the Pitch. The coordinates of the National Delegates can be found here: <https://artes.esa.int/national-delegations>.

The Agency will admit for evaluation only (Outline and Full) proposals from a bidding team composed of a company and/or organisation - be it as Prime or Subcontractor - residing in any of those states that subscribe to the Programme under which you wish to submit your proposal:

- I. **for the ARTES 4.0 BASS Generic Programme Line - Component A:** Business Applications. To date, Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Lithuania, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Slovenia, Sweden, Switzerland and the United Kingdom have subscribed.
- II. **for the ARTES 4.0 5G Strategic Programme Line:** Austria, Belgium, Finland, Germany, Greece, Hungary, Ireland, Italy, Luxemburg, Netherlands, Norway, Portugal, Romania, Spain, Sweden, Switzerland, the United Kingdom and Canada have subscribed.
- III. **for the ARTES 4.0 4S Strategic Programme Line:** Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxemburg, The Netherlands, Norway, Poland, Portugal, Romania, Spain, Switzerland, the United Kingdom and Canada have subscribed.

7. PROCESS AND SCHEDULE

It is planned for the call for proposals to be opened on 22nd November 2024 until the 28th February 2025, 13:00 CET.

7.1. Timeline and Procedure

Bidders can respond to this thematic call by submission of a short Activity Pitch Questionnaire within the above timeframe.

The Call is planned to be implemented according to the following stepwise approach:

In **Step 1**, the interested Bidders are requested to submit their proposal(s) based on a short Activity Pitch Questionnaire (APQ) template made available by ESA that can be downloaded from the Thematic Call website. The pitch should provide the initial idea of what the Bidder would like to propose, elaborated on the basis of the thematic areas and either the use cases proposed by ESA's partners or others selected by the Bidder. If the Bidder has the relevant information available to them, they may consider completing the supplementary questions (AP5) in the APQ template as part of the APQ+, which may allow to skip Step 3 below, at ESA's discretion.

The bidder should select 'Thematic Call (under 1-10494)' and 'Space for Infrastructure - Digital' under the drop-down options on the introductory page of the APQ template (also indicating if they intend to address an optional use-case or not). Should the bidder wish to cooperate with any of the listed partners in the annexes, they shall give to the Agency the authorisation to distribute the activity pitch questionnaire to these stakeholders by explicitly stating it in the Activity Pitch Questionnaire. Subject to such authorisation, the Agency will follow up distributing the APQ to the bidder's authorised stakeholder(s) and liaise with them to facilitate interactions with the Bidder.

The Bidder shall not contact any of the stakeholders listed in the annexes on the webpage.

The Bidder shall NOT involve any of the stakeholders mentioned in the annexes in the bidding consortium neither as subcontractor nor as external service (including consultancy).

The completed Activity Pitch Questionnaire (APQ) shall be uploaded using the online web submitter, ESA's Open Space Innovation Platform (OSIP) in the channel named ["APQ for ARTES Downstream Business Applications"](#)

Multiple Pitches can be submitted.

It is strongly recommended that the interested Bidder liaises with the relevant ESA Member States Delegates from the beginning.

Following an assessment of the Pitch by ESA, ESA will provide feedback to the company, aiming to provide a reply within 10 working days following the deadline for submission of the Pitch.

It is recognised that some interactions with the Bidder may be required and ESA may therefore consult with the Bidder and may offer support in providing further clarifications,

aimed at better shaping the subsequent proposal(s) which form the subsequent steps. Dialogue sessions may be organised individually with potential partners prior to Step 3. ESA might also consult, when necessary, with the relevant National Delegation(s) for orientation and will provide key information (e.g. title, cost, price, subcontractor) to the relevant National Delegation(s).

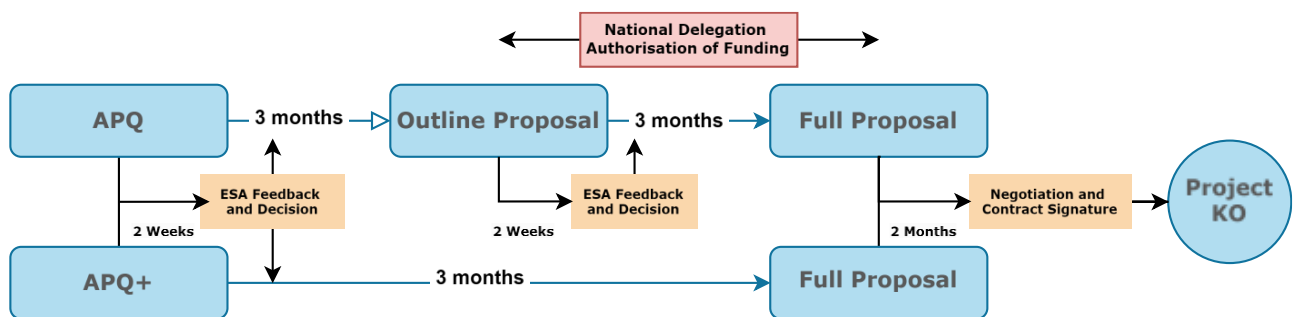
Subject to a positive evaluation of the Pitch and the Bidder having informed the National Delegation(s), the Bidder will be notified by ESA and invited to submit an Outline Proposal. Note that the APQ+ can act as a substitute for the Outline Proposal, thus if having adequately answered the additional questions included in the APQ+, the Bidder may be able to skip Step 3.

In **Step 2**, the Bidder will submit the Outline Proposal, based on a template provided by ESA, with letter(s) of interest from users/stakeholders. The Outline Proposal expands upon the Pitch with a more extensive level of detail. The Bidder will be allowed 3 months from the APQ submission deadline to submission of their Outline Proposal. The Outline Proposal will be submitted on the OSIP platform under the channel [“Outline Proposal for ARTES Downstream Business Applications – Feasibility Studies/Demonstration Projects”](#).

Subject to a positive assessment of the Outline Proposal from ESA and in-principle support from the National Delegations, the Bidder will be invited to submit a Full Proposal on ESA-STAR in accordance with BASS programme line. The Bidder will be allowed 3 months from submission of their Outline Proposal to submit their Full Proposal on ESA-STAR.

In **Step 3**, the Bidder will submit a Full Proposal with the Authorisation of Funding (AoF) from the relevant National Delegation(s). Following a positive assessment by ESA the proposed activity will be approved for implementation.

A summary of the process is shown below.



NB: Indicative Timelines are the Maximum Durations

Figure 1 Summary of the Application Process

7.2. Evaluation Criteria

The evaluation process is non-competitive, as each proposal will be assessed individually on its own merits, according to the evaluation criteria applicable for [CALL FOR PROPOSALS FOR DOWNSTREAM APPLICATIONS IN ARTES 4.0](#) (esa star ref.: 1-10494).

More information for the assessment of the APQ and outline proposal stages can be found on the OSIP page [“APQ for ARTES Downstream Business Applications”](#).

More information on the evaluation criteria for the final proposals can be found within the document “Appendix 1 to AO/1-10494/20/NL/CLP (Issue 2.2)” which can be found on ESA-STAR and the [activity webpage](#).

8. GENERAL CONDITIONS

The submissions and all correspondence relating to it shall be in English.

The tender shall not contain any Classified Information, whether in the Pitch, Outline Proposal or in the Full Proposal.

To avoid any confusion with Classified security markings, the unclassified protective marking used by the Tenderer in the proposal shall not contain the terms: "Restricted", "Confidential", or "Secret".

However, should the Tenderer consider necessary to include Classified Information in the tender, the Tenderer shall inform beforehand the ESA Security Officer.

The Tenderers are informed that Classified Information can be shared with ESA only in compliance with the Project Security Instruction (PSI) duly established by the Agency beforehand and subject to the approval by the ESA Member States.

The Agency will treat commercially sensitive or proprietary information confidentially and solely for the purpose of the assessment of the response.

Expenses incurred in the preparation and dispatch of the response to the announcement will not be reimbursed. This includes any expenses connected with a potential dialogue phase.

The announcement does not bind the Agency in any way to place a contract. The Agency reserves the right to issue amendments to the announcement.