SPARK 4 Tech Open Call

CONDITIONS TO TENDER AND MANAGEMENT REQUIREMENTS

INTRODUCTION

The SPARK 4 Tech Open Call is launched by Instituto Pedro Nunes (IPN) and the Commercialisation Department of the European Space Agency (ESA), with the support of the Portuguese Space Agency (Portugal Space) and Autoridade Nacional de Comunicações (ANACOM).

The general objective of the call is to promote the use of space technologies from ESA Member States and Associate States, involving Portuguese industry, within non-space applications. The call aims to finance Technology Transfer Proof of Concepts in order to prove the relevance of a technology/know-how for another technology field as well as reduce the technical risk and confirm the market opportunity. Through this SPARK 4 Tech Open Call, the ESA Space Solutions Portugal invites bidders to submit proposals for feasibility studies regarding the transfer of a space technology into a non-space application.

SPARK 4 Tech is exclusively for the Technology Transfer Feasibility Study activities. Technology transfer refers to the use / exploitation of a space heritage technology into a new ground application domain.

ESA Space Solutions Portugal and the Portuguese Delegation at ESA (Portugal Space) encourage applications addressing relevant problems, needs or opportunities regarding the following preferential thematic areas:

A. "Blue Worlds" – socio-economic development of the Atlantic namely, bay and estuarine areas including coastal ecosystems and processes, sustainable food production, maritime infrastructure, safety and security, low-cost sensors and information systems;
B. Sustainable development;
C. Safe and secure communications, optical communications and 5G;
D. Space Safety.

This statement does not limit in any possible way the range of non-space markets or geographies of application of the Applications submitted.

The specific objectives of the call are:

(1) to determine the economic viability and technical feasibility of integrated service(s) and the associated system(s) able to meet the needs and conditions of relevant customers, users and other stakeholders;
(2) to secure the buy-in and involvement of important customers, users and other stakeholders; and
(3) to prepare the implementation of sustainable service(s).

To meet its goals, this call supports the generation of new or the improvement of existing user-driven applications and services that employ a technology with proven space heritage, from hardware, software, know-how, processes, methodologies or systems developed or adapted for space applications. Exploitation of

satellite borne data, GNSS signals and satellite communication capacity are not considered as space heritage technologies in the context of technology transfer. These ideas will be implemented as projects with a **maximum duration of 6 months** where the funding granted is limited to **50.000 Euro** per project on a co-funding basis of **50%** (e.g., a project with total cost of 100.000 Euro may be granted a maximum of 50.000 Euro).

The purpose of this document is to present the conditions to bid for the SPARK 4 Tech Open Call and to present the Management Requirements to be considered by the bidder.

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CONDITIONS TO TENDER

1. Participation in the Tender

Bidders are invited to submit their projects considering the launch and evaluation dates and the eligibility requirements below announced in the call.

Bidders are requested to include personal data as part of their proposal as described in the "Proposal Template", as well as when a contract is placed for financial reporting, regarding proposed Key Personnel and contact details.

IPN is subject to Personal Data Protection Framework and has in place a Data Protection and Privacy Policy, ensuring a high level of protection of personal data and preserving the safety, dignity and privacy of the individuals concerned (Data Subjects).

IPN will process the personal data provided in the open call for the sole purpose of evaluating the tender, inserting required data in the Contract – should the tender be successful, and for financial reporting purposes.

For this effect, IPN will require to the bidder´s representative a prior consent for the processing of any personal data necessarily involved in the proposal submission.

Moreover, for the approved proposals, IPN will further require additional consent for other data processing activities linked with the same proposal, prior to the relevant contract signature.

Eligibility Requirements:

Domain of activity
Bidders shall fulfil **at least one** of the following requirements:
a) Space or non-space companies (including SMEs);
b) Academic and research organizations.

Legal requirements
In order to be eligible for contract award, bidders must fulfil **all** the requirements below:
a) To be a legal entity (a public law company / a private law company / an association / a foundation) registered under the laws of Portugal;
b) To be headquartered in Portugal;
c) To be fully compliant with Portuguese tax and social security obligations;
d) To observe the remaining requirements stated in this document;
e) When acting in collaboration with other national or foreign entities, the Bidder is the sole contractor and will be fully responsible for managing the grant.

Eligible costs

In order to be eligible, besides observing the dispositions in "Annex B - Cost eligibility limits and conditions", all project costs must be:

- Necessary to the execution of the project;
- Incurred by the beneficiary and recorded in its accounts;
- Incurred during the contract term;
- Indicated in the cost planning in the proposal;
- Without VAT, interest owned, or duties.

Expenses incurred in the preparation and dispatch of the proposal will not be reimbursed.

2. Presentation and Submission

General Standards of Presentation

- The Proposal Template and all correspondence relating to it shall be in the English language.
- The Cover Letter and the Executive Summary shall not exceed 1 page each.
- Sections A, B and C of the Proposal shall not exceed 15 pages in total.
- All sections shall be filled in and the proposal shall have enough substance to perform the evaluation.
- Bidders shall avoid duplication of past, ongoing, and intended ESA activities. Such duplication may lead to non-admissibility of the proposal.
- Bidders can submit only one proposal, per campaign. In case more proposals will be submitted, the last one(s) will not be admitted for evaluation.

Formal conditions, commitments, undertakings

The SPARK 4 Tech call is open in 2022. Projects may be submitted at any given time of the year but there will be one Evaluation Campaigns per year. The submission and evaluation dates are set in the Invitation to Tender.

In the Cover Letter the bidder shall explicitly state compliance with and acceptance of the SPARK 4 Tech Conditions to Tender and Management Requirements and Draft Contract.

Space heritage

A space heritage technology can be hardware, software, know-how, processes, methodologies or systems developed or adapted for space applications.

Exploitation of satellite borne data, GNSS signals and satellite communication capacity are not considered as space heritage technologies in the context of technology transfer.

When the technology was not originally developed for space, but adapted and qualified to the space conditions, there should be clear benefits/added value which the adaptation for the space field brings to the proposed new application (e.g.: size and weight reduction, reliability, performance improvement, etc.).

Added-value is understood as benefit(s) in relation to meeting the requirements in the new application domain, when compared to commercially available solutions and underlying technologies.

The space heritage technology shall significantly contribute to achieving the value proposition in the new application domain.

Conditions relating to the Technology Transfer

Market representative end-users shall be involved for specifying the use case scenario, describing and validating the problem they are facing, for generating user requirements, and for assessing and validating the technical solution & value proposition. End users shall be understood as stakeholders who are candidates to operationally use the solution. The end-user organization is referred to as "receiver".

The receiver shall be independent (e.g., organizationally and financially) from the donor organization which owns the technology to be transferred.

Intellectual Property Rights (IPR)

i) **Bidders' IPR:** SPARK 4 Tech bidders will hold full and unconditional IPR on any proprietary assets to be used in their project. The project submission does not grant to IPN, ESA, Portugal Space, and/or ANACOM any Intellectual Property Right, license, or option on any technology contained in the said project.
ii) **Proprietary Assets:** In case a bidder intends to explore, perform, develop and/or by any means use proprietary assets in his/her SPARK 4 Tech project, the entity is obliged to submit and annex with the Proposal Template a formal written document (e.g., agreement, license, comfort letter) signed by the legal representative of the assets owner expressly granting the right to explore, perform, develop and/or by any means use those assets. The lack of that document leads to the rejection of the project.
iii) **Freedom to Operate**: The bidder is the sole responsible, on its behalf and on behalf of its Subcontractor(s), for fulfilling the requirements concerning IPR Freedom to operate.

Dispatch and receipt conditions

All Proposals shall be submitted to IPN in .pdf format only and in a single e-mail to the address space@ipn.pt and until the closing date and time announced at the Invitation Letter. An acknowledgement of receipt will be sent by e-mail to each bidder.

3. Content of the Project Submission Form

The content required for the Project Submission is detailed in a dedicated document and shall comprise the following elements:

A. Cover Letter,
B. Executive Summary,
C. Proposal.

4. Tender Evaluation Process

Tender Opening Board

The Tender Opening Board (TOB) is carried out by IPN and ESA and assesses the admissibility of the project and checks all formal requirements, ensuring the project does not show *prima facie* evidence of a major non-

compliance with the call requirements that would impair the fairness or secrecy of the competition. Specifically, the TOB will assess:

i. Cover Letter,
ii. Executive summary,
iii. Compliance with Eligibility Requirements,
iv. Compliance with Presentation and Submission.

When formal requirements are not met, the project will be rejected. The outcome of the admissibility check will be communicated to the bidder by e-mail.

A project is only admitted for evaluation by the Tender Evaluation Board (TEB) if all formal requirements are met.

Tender Evaluation Board

When the project is compliant with the formal requirements, the bidder will be invited to present his/her ideas to Tender Evaluation Board (TEB) and to participate in the related Q&A session on the Evaluation Date set in the Invitation to Tender.

The Tender Evaluation Board (TEB) is responsible for the evaluation of Proposals based on defined evaluation criteria. The TEB is composed of ESA, Portugal Space, ANACOM, IPN and, if the case may be, non-voting experts. The information provided at the Proposal Template will be dealt with in confidence.

Evaluation Criteria

The Proposal evaluation is based on the way the criteria below have been addressed both in the Project Submission Form and during the bidder's presentation to the TEB.

No.	*Criteria*	*Weight Factor*
1	**Suitability of space heritage technology**: space connection, relevance in relation to problem, maturity, feasibility for the transfer.	**20%**
2	**Market opportunity**: Validated problem and value proposition, product / market fit, market potential.	**30%**
3	**Quality of the proposal**: clarity, completeness; suitability of implementation approach; adequacy of involved resources (personnel, facilities, end-user representative) for the execution of the work.	**40%**
4	**Quality of the management plan and financial proposal**: compliance with the administrative tender conditions of the Announcement of Opportunity and acceptance of the draft contract.	**10%**

All bidders will be notified by e-mail about the TEB decision within 30 calendar days after the Evaluation Date. Winning projects will be awarded a contract, subject to negotiation and TEB recommendations acceptance.

The period between the notification of the TEB decision and the placement of the contract is in principle no longer than 30 days.

Preferential Clause

ESA Space Solutions Portugal and Portugal Space, following the decision of the National Delegation, may give preference in the placing of the contract to bidders which addressed the preferential thematic areas, in the case they have obtained an overall weighted positive and accepted mark, and they are equally ranked with other proposal.

5. Budget and non-refundable grant

The total available budget for the implementation of the SPARK 4 Tech Open Call is up to 100.000 Euro. The available grant per winning project is up to 50.000 Euro.

All projects should consider a co-funding basis of up to 50% of the total project cost (e.g.: for a total project cost of 100.000 Euro, the maximum grant is 50.000 Euro; if the total project cost is above 100.000 Euro, the maximum grant remains 50.000 Euro). At all times, the TEB has the prerogative to approve projects considering a co-funding rate below 50%. IPN is the sole responsible for the payment of grants to the winning entities.

MANAGEMENT REQUIREMENTS

1. Scope of work and project logic

Within the activities to be developed under a SPARK 4 Tech project, the bidder shall propose to perform the preparatory work and establish the key documents for the development of an application/service involving telecommunication/data satellites or other space assets in order to fulfil the requirements of the relevant user community.

The programme of work of the project shall be composed by commercial and technical activities and, if economic viability and technical feasibility are proven, it shall involve the preparation of an implementation approach and of a pilot service.

The project shall be organised in a way that supports the generation of the deliverables defined in section ”3. Documents and items to be produced/delivered”.

2. Contractual milestones and review meetings

The contract term is fixed to a maximum of 6 months, during which the project must be executed and all deliverables submitted.

The following table represents the sequence of events to be taken into account in establishing the logical organisation of the work for SPARK 4 Tech projects.

Contractual Milestones are the Kick-Off Meeting, the Mid-Term Review and the Final Review. Progress Meetings (if needed) are not foreseen as physical meetings but via tele/videoconference; additional meetings may be requested either by IPN or the Contractor; each of these meetings will take place in Portugal and will be attended by representatives of the project team, IPN, and possibly ESA, PT Space and ANACOM.

The documentation supporting each meeting shall be delivered to IPN ten (10) working days before the meeting takes place.

Milestone	Month	Meetings	Purpose of the meeting
Kick-Off	0	Kick-off	Clarification of outstanding issues; Overview of milestones, payment plan and deliverables.
Mid-Term	3	Mid-Term	Presentation by the Contractor and review of the progress of the work, including the status of due deliverables and the financial execution.
Final	6	Final	Final presentation by the Contractor and review of the progress of the work, including the status of due deliverables and the financial execution.

3. Documents and items to be produced/delivered

Contractors shall follow the structure of deliverables presented here and detailed in Annex A.
A single document containing the due deliverables shall be provided at mid-term and final project stages.

	Due by	
Deliverables	**Mid-Term**	**Final**
D1.1. Technology Description	✔	✔
D1.2. Technical Data Package	Draft only	✔
D2.1. Service/System Definition	Draft only	✔
D2.2. Technical Feasibility Analysis	Draft only	✔
D3.1. Executive Summary Report	Draft only	✔
D3.2. Business Plan	Draft only	✔
D3.3. Viability Analysis	Draft only	✔
D3.4. Socio Economic Impact Analysis	Draft only	✔
If applicable:		
D4.1. Proof of Concept		✔

4. Management

Project Manager

The Contractor shall implement effective and economical management for the project. The nominated Project Manager shall be responsible for the management and execution of the work and for the coordination and control of the work within the consortium (when applicable). The Project Manager will be the official point of contact with IPN during the execution of the work, and shall be identified in the Cover Letter.

Project Name/Acronym

The Contractor shall give the project a name. It is required to select a name not already used within the community of the former or existing Business Applications projects, and to indicate the project name and acronym in the Cover Letter.

Access

During the course of the Contract IPN and ESA shall be afforded free access to any plan, procedure, specification or other documentation relevant to the programme of work.

5. Reporting

Minutes of Meetings (MoM)

Formal written MoM attended by IPN shall normally be agreed and made available by the Contractor within the next five (5) calendar days of the meeting. The MoM shall clearly identify all agreements made including agreed action items.

Mid-Term Report

The Contractor shall deliver, not later than ten (10) working days before the Mid-Term Review Meeting, the Mid-Term Report, on which IPN will provide comments at the Mid-Term Review Meeting. The Mid-Term Report shall be self-standing, not requiring to be read in conjunction with other documents issued within the project. It shall present the status of all deliverables agreed and include an attached .pdf with the deliverables due at that time. Within one week after the Mid-Term Review Meeting the finalised version of the Mid-Term Report shall be delivered in one single document in .pdf format.

Final Report and public Executive Summary

The Contractor shall deliver, not later than ten (10) working days before the Final Review Meeting, a Draft Final Report, on which IPN will provide comments at the Final Review Meeting. The Final Report is to be written in a concise form and shall describe the major accomplishments of the project in an introductory part, and have attached all the deliverables due. It shall be self-standing, not requiring to be read in conjunction with other documents issued within the project. For the purpose of disseminating IPN and ESA activities, a public Executive Summary of the project, not containing proprietary information, shall be provided at this stage. Within one week after the Final Review Meeting the finalised version of the Final Report and the public Executive Summary shall be delivered in single documents in .pdf format.

Problem Notification

The Contractor shall immediately notify IPN of any problem likely to have a major effect on the time schedule of the work, or to have significantly impact the scope of the work to be performed (due to e.g., procurement problems, unavailability of facilities or resources, etc.), or to require any budget changes (e.g., allocation of budget from one cost category to another; impossibility to spend the total grant amount).

ANNEX A – DETAILS ON DELIVERABLES

Within the activities to be developed under a SPARK 4 Tech project, the Contractor shall propose to perform the preparatory work and establish the key documents for the development of application/service involving a space technology transfer to terrestrial applications. The following deliverables shall be provided:

D1.1 Technology Description (suggested length: 4 pages)
The contents of this section *shall* include:

- Name of the technology;
- Abstract (less than 3 lines including keywords, plus illustrative picture);
- Space origin (what problem it does solve in space, when/what it was developed for);
- Description of the technology (what functions it performs, its key features and capabilities);
- Innovation and advantages (innovative aspects, its advantages with respect to alternative technologies);
- TRL (Identify with justification the current level of maturity of the technology (TRL) for space applications);
- IPR (in case relevant – are background IPRs needed? Has an invention been protected by patent, etc.).

D1.2. Technical Data Package (suggested length: 1 pages)
The contents of this section *shall* include:

- Presentation and justification of the role of the space asset(s) which are subject for integration.

D2.1. Service/System Definition (suggested length: 4 pages)
The contents of this section *shall* include:

- Definition of the service concepts towards paying customers, users and other relevant stakeholders aligned with the needs and KPI identified, and taking into account any performance, quality and mode of delivery, integration with and interfaces to operational processes and procedures.
- Definition of the end-to-end service value chain, including key resources, key activities and key partners involved, their roles, and the interactions amongst them, and taking into account existing tools and services of paying customers, users and other relevant stakeholders to interface with.
- Definition of the system architectures providing the defined service concepts, taking into account any existing infrastructure of paying customers and other relevant stakeholders.
- Visualisation of the system architecture in terms of main building blocks and interfaces to external systems and services identifying key technologies required and their maturity status (existing, commercial-off-the-shelf, to be developed, market readiness, etc.).

Suggested aid: a high-level block diagram with your system/service showing the key attributes and key building blocks and the main interfaces (internal and external).

D2.2. Technical Feasibility Analysis (suggested length: 2 page)

The contents of this section *shall* include:

- Justification of the final service concept and its underlying system and validation of the service concept with the engaged customers, users and other relevant stakeholders.
- Identification of critical elements and risks related to development, implementation, and operation of the service and system from a developer perspective as well as from the perspective of paying customers, users and other relevant stakeholders, and presentation of mitigation strategies and measures.
- Assessment of the overall technical feasibility of the proposed service and system concept.

D3.1 Business Model(s) (suggested length: 1 page)

The contents of this section *shall* include:

- Definition of business model(s) based on the value proposition(s) and service concept(s) addressing as a minimum customer relationship, paths to market, key resources, key activities, key partnerships, revenue streams and cost structure.
- Presentation of the validation activities of the business assumptions with the engaged customers, users and other relevant stakeholders.

D3.2 Business Plan (suggested length: 4 pages)

The contents of this section *shall* include:

- Presentation of the quantitative market analysis for the envisaged services including the size and attractiveness of the market/customer segment(s).
- Presentation of the competitive environment and of the main competitors including information on their services and value propositions.
- Presentation of the financial plan and financial projections for development and sales, including key financial indicators such as CAPEX, OPEX, Break Even Point, Net Present Value, financial projections for the next 5 years.
- A discussion of your market penetration projections (i.e., percentage of market share, etc.), including key assumptions. This part should be put in relation with the competitive positioning described in point 4 and stakeholders' benefits described.
- Presentation of the team, competences and capabilities required to implement and deliver the service. In case of missing competences and capabilities, presentation of the intended strategy to acquire them.

D3.3 Viability Analysis (suggested length: 3 pages)

The contents of this section *shall* include:

- Identification of critical elements and aspects related to the business model(s) and business plan and their robustness, by addressing aspects such as market barriers, cost/benefit ratios, competitive positioning, key differentiators, growth potential, etc., and presentation of mitigation strategies and measures.
- Identification of critical elements and aspects related to non-economic aspects (e.g., liability, regulation, public acceptability, etc.) and presentation of mitigation strategies and measures.
- Assessment of the overall commercial viability of the proposed service and system concept.

D3.4 Socio Economic Impact Analysis (suggested length: 2 pages)

The contents of this section *shall* include:

- Assessment of the potential socio-economic impact of resulting operational services regarding expected revenues, job creation across the value chain, export opportunities, establishment of new markets, investment leverage, and societal benefits.

D4.1. Proof of concept (suggested length: 1-2 pages)

The contents of this section shall include:

- Definition of the most critical technical, operational, commercial elements which shall be validated within the PoC, including hypotheses, validation methods, and quantifiable success criteria.
- Presentation of the PoC outline, including objectives for the PoC, scope, schedule, approach, necessary training and communication material, and involvement of the customers, users and other relevant stakeholders (where necessary).
- Presentation of the results, including assessment of the outcome on the most critical elements and validation of the results with the involved customers, users and other relevant stakeholders (where necessary).

ANNEX B – COST ELIGIBILITY LIMITS AND CONDITIONS

1. Direct Costs

The project may consider the following direct costs:

a) Staff costs, calculated considering an hourly rate and monthly cost according to the following formulas:

$$Cost_{hour} = \frac{Base\ Salary * N\ months}{1.720\ hours}, \qquad Cost_{person-month} = \frac{BS * N\ months}{11} * persons\_month$$

where:
Base Salary = monthly base salary and social security charges, when applicable
N = number of months annually paid (N ≤ 14)
Person-month = time dedicated to the project calculated in Full Time Equivalent (FTE)
$Cost_{person\text{-}month}$ = monthly remuneration amount, considering 100% dedication for 1 month

b) Subcontracting costs, considering a maximum cost of 95 Euros/hour per person;

c) Access to data sources;

d) Travelling, Subsistence and Accommodation costs
The following costs incurred are eligible:
- Train and plane costs in Economy Class, up to 700 Euro travelling in Europe and up to 1600 Euro travelling outside Europe;
- Taxi costs;
- Car rental and/or car mileage;
- Accommodation up to 250 Euro per person per night;
- Subsistence costs up to 100 Euro per person per day.

Information regarding all Travelling, Subsistence and Accommodation costs must be provided in the Mid-Term and Final Reports, and shall include the objectives of the occasion (event, meeting, etc.), contacts made and results.

e) Equipment;

f) Awareness creation costs (concept notes, data sheets, flyers, etc.).

2. Indirect Costs

Indirect costs are all those eligible costs which cannot be identified by the participant as being directly attributed to the project. They may not include any direct costs. A specific flat rate of 10% of the staff costs is to be used to calculate the indirect costs.

ANNEX C – TECHNOLOGY DOMAIN COVERING THE TECHNOLOGY DESCRIPTION

TD #	Technical Domain Description
1	On-Board Data Systems
2	Space System Software
3	Spacecraft Electrical Power
4	Space Environments & Effects
5	Space System Control
6	RF Payload and Systems
7	Electromagnetic Technologies & Techniques
8	System Design & Verification
9	Mission Operation & Ground Data systems
10	Flight Dynamics & GNSS
11	Space Debris
12	Ground Station System & Networks
13	Automation, Telepresence & Robotics
14	Life & Physical Sciences
15	Mechanisms & Tribology
16	Optics
17	Optoelectronics
18	Aerothermodynamics
19	Propulsion
20	Structures & Pyrotechnics
21	Thermal
22	Environmental Control Life Support (ECLS) & In Situ Resource Utilisation (ISRU)
23	EEE Components and quality
24	Materials and Processes
25	Quality, Dependability and Safety
26	Other