Future EO Industrial Competitiveness
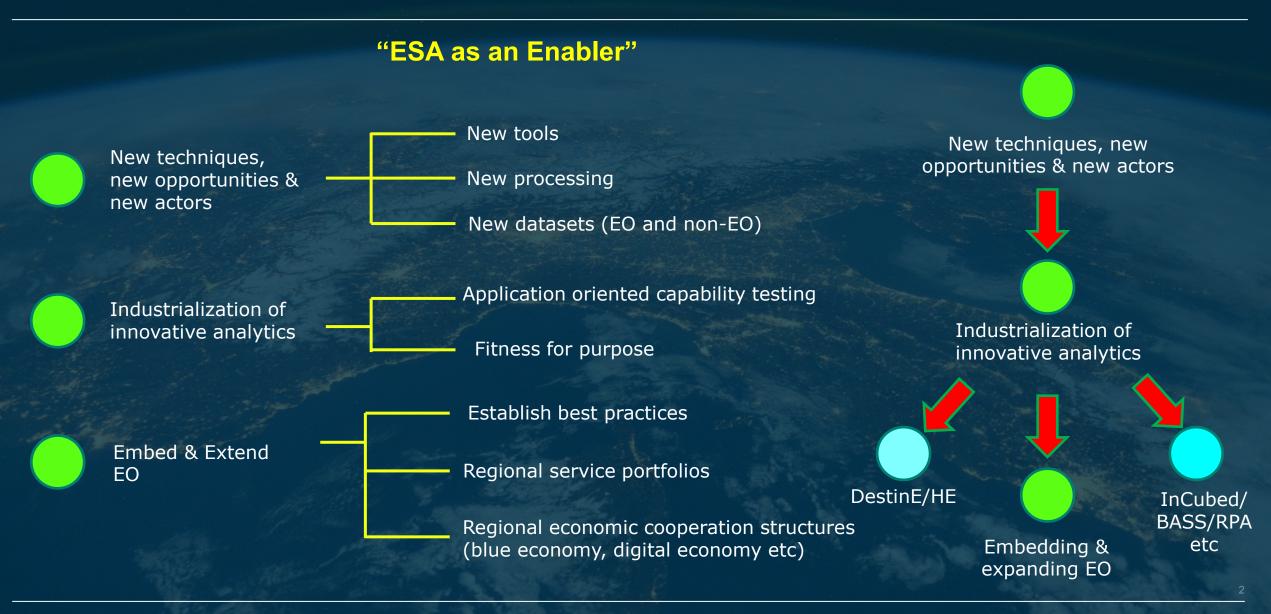
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Industrial Competitiveness Overview

"ESA as an Enabler"

New techniques, new opportunities & new actors
- New tools
- New processing
- New datasets (EO and non-EO)

Industrialization of innovative analytics
- Application oriented capability testing
- Fitness for purpose

Embed & Extend EO
- Establish best practices
- Regional service portfolios
- Regional economic cooperation structures (blue economy, digital economy etc)

New techniques, new opportunities & new actors

↓

Industrialization of innovative analytics

DestinE/HE

Embedding & expanding EO

InCubed/BASS/RPA etc

New techniques, opportunities & actors

New Techniques and Processing Methods (5-6 Parallel contracts) – prototype and verify new algorithms and processing methods for:

- already available EO datasets

- Sentinel Expansion class datasets.

This includes actual testing within 3 application examples. Priority areas to be addressed include:

- Optical/IR video processing methods including neuromorphic processing, low contrast feature extraction, low light level enhancement, automated feature recognision, off-nadir feature recognisiton,SWIR based automated feature extraction

- New methods for long wavelength SAR, VideoSAR analytics, including neuromorphic processing, feature characterization based on radar shadow behaviour, sub-sperture coherence characteirzation

- AI methods for spectral-spatial signature fusion in HS data

- MIR/TIR and HS super-resolution enhancement

- Opportunity for industry defined activity lines

- ITT release date April/May 2024

Industrialization of Innovative Analytics 1

- **Industrialization of Innovative AI methods:**
  - development and verification of innovative new AI based EO data processing and analysis methods, including clearly defined use case based assessment against requirements specified by cooperating stakeholders. Examples include Graph-AI based methods, integration of EO and HPC Earth system process emulators, causul AI based inference methods etc
  - Opportunity for industry defined activity area also
  - ITT release date May 2024
  - 3-4 contracts

- **New methods for economic activity analysis:**
  - Development and verification of methods to integrate EO derived information, transponder information, IoT sensor network data and telecoms network information to support enhanced characterization of economic activities, eg multi-sensor fusion for characterization of steel, cement and aluminium production activities, manufacturing activities (vehicle production, chemical production), construction activity levels etc
  - Opportunity for industry defined activity area also
  - ITT release date Q3/Q4 2024
  - 2-3 contracts

Industrialization of Innovative Analytics 2

Augmenting industrial services for Green Transition

- Overall framework for rapid implementation of industrial focussed portfiolios of information services addressing priority Green Transition sectors (eg transport, energy, health, manufacturing, resource management)

- Develop and verify state of the art methods integrating AI based data processing and multi-dataset fusion as well as methods for effective integration of EO and non-EO (eg mobile network data, IoT sensor network data etc) datasets

- Establish basis for follow-on commercialization actions

Implementation Approach

- Overall frame contract to be awarded through Open Competitive ITT in Q2/Q3

- Specific service portfolios to be implemented as subcontracts on the basis of stakeholder consultations

Planned funding and timing

- 500kEuro per block – multiple blocks to be integrated within the overall frame contract

- Frame contract ITT Q3 2024

Embed and Expand EO

- **EO Veracity Proof of Concept Verification (**1 contract):

- Elaboration of priority issues to be addressed and verification of possible analysis methods to support verification of end-to-end information generation processes to generate credible, relevant and trustworthy information - ITT planned for Q3/Q4 2024

- **Embedding EO services within International Agencies** (2-3 contracts) This will target developments for entities having operational budgets available to procure new services. Focus is novel applications where EO is a relatively small element within the overall analysis to be conducted and where analysis products require extensive fusion of multiple data streams and complex /customized processing – ITT release planned for Q4 2024

- **Enhanced Methods for EO and Unstructured Data Information Fusion** (1 contract) develop and test methods for using EO derived information to rapidly verify and augment information from social media, commercial media and open source public sector institutions - ITT release planned for Q3 2024

Workshops

29-31 May 2024 – SUREDOS   https://suredos24.esa.int/

12-13 June 2024 – Environmental Crimes   https://envcrimes2024.esa.int/

16-18 September 2024 - URBIS 24   https://urbis24.esa.int/

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EO Science for Society Permanently Open Call for Proposals

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Permanently Open Call overview

Background

- Open call mechanism requested by Member States to accelerate Future EO capacity to address new ideas from industry/science communities

Objectives

- Rapid verification of innovative proofs of concept
- Scope covers entire activity spectrum for Future EO block 4 – ie EO exploitation

Implementation Approach

- Proposal template submitted according to regular deadlines
- TEB review against standard ITT criteria including innovation/impact WRT state of the art

Experience to date for lessons learned

- ~ 800 proposals to date, ~ 200 contracts placed so average success rate ~ 1 in 4
- Consistently high quality of new proposals each batch means many good proposals not being selected
- Success rate for new actors basically the same as for experienced bidders
- Significant success rate for resubmitted proposals
- Rethinking of domain specific requirements (in particular user engagement)
- Need for rapid communication and debriefing with unsuccessful bidders

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FutureEO segment 2 EO4 Society Open Call

Scope of new Call:

- All elements of Block 4

- Core of activity is innovative EO data exploitation

Implementation

- New implementation approach with two types of activity possible:

  - Conventional innovative project as for previous calls

  - Smaller, more rapid actions (eg earlier levels of maturity)

- 3 Submission batches per year but possibility to select increased number of proposals per batch – next submission deadlines are 30 May 2024 and 30 September 2024

- Certain batches may include priority foci per batch to complement generic block 4 scope (eg new sensor availability, response to time limited issues etc)

- Rapid communication to unsuccessful bidders and improved debriefing (but limit on number of resubmissions)

Financial aspects:

- Conventional projects – max value 200k Euro

- Rapid verification and testing – max value is 100k Euro

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Open Call - Up-front considerations

Is your proposed development really a small, "quick and dirty" verification that a new methodology could work and could be the basis for significant follow-on activity (either inside or outside of ESA)?

Things that may not be in scope:

- Theoretical assessments (the scope is activities leading to short term EO data exploitation)
- Commercial demonstrations with new customers (InCubed, BASS etc may be better suited to this)
- A larger scale development where the ESA funds cover only a small part of the overall development costs (POC is for trying out new stuff that then leads to larger scale activity)
- Development of applications or science based exclusively on non satellite data
- A development where the core issues do not relate to EO data

Submitting a proposal – just complete a template

What do you want to develop & what for?

What are the technical steps to be executed?

What will the development do?

What are the target requirements to meet?

What is the innovation you propose?

What are the technical problems and what will you do about them?

Why should we do this activity?

3) SECTION 3: IMPLEMENTATION AND MANAGEMENT (3,25 pages)

3.1 Scientific/technical implementation steps (750 words)

3.2 Work Breakdown Structure ("WBS") (only for the regular innovative activities) (250 words)

3.3 Work Package Description ("WPD") (only for the regular innovative activities) (250 words per WP)

3.4 Allocation effort of the key personnel of the proposed activity (250 words)

Name Key Person	Organization	Project Role	Key expertise	Effort dedicated to the Project (Total working hours and percentage)

3.5 Gantt chart (250 words)

- *[Insert a Gantt chart schedule for the proposed activity, covering from the start of the*

Note that there is no need for a letter of support from your national delegation

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General issues to take into account

Very general issues

- Your proposal is evaluated by technical experts, not venture capitalists or technology journalists
- We can only assess what is written in the proposal – we are not allowed to bring in external information into an assessment
- There is no constraint on the number of proposals you can submit

More specific considerations

- It is very important to demonstrate the innovative content of the proposal and your capacity to address the underlying technical issues, risks etc and that risk mitigation actions are credible, feasibile and appropriate
- Do not use ChatGPT
- Keep the scope focussed on the fundamental technical issues to be addressed – everything else can be addressed later under other activities

Overall considerations

Proposal should address an innovative development

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A truly innovative proposal will contain inherent technical issues that will have to be resolved

Proposal should contain a clear list of these technical problems to be addressed and what is the proposed approach for addressing them

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Description of technical steps should demonstrate credible developments to address the identified problems

Typical issues on the starting point

Lack of explicit technical content in the proposal

Proposal content
- we have a user
- we want to develop a prototype application

→

WP1 User Requirement ~~Collection~~

WP2 ~~Application/Service~~ **capability specification**

~~Application/Service~~ **capability development**

Does not enable a technical assessment of the proposal

Proposal content
- we want to develop a prototype application
- We will use a ML based processing method

→

WP N Literature Review and identify model approach

WP N+1 Implement M...

...

Does not enable a technical assessment of training data, validation, method etc

Recurring issues in technical methodologies

Use of AI to generate the required information:

- AI is not magic and does not enable magic to happen or laws of physics to be ignored
- Models need training data and training
- Are you using the best model for generating the required information? If so demonstrate this in the proposal

Steps to be executed

- Do not just list the steps
- Make sure the critical activities are described to a level of detail that lets us verify that this is a credible approach

Verification and validation

- What test areas are to be used for verification and why? To what extent will they enable a sufficiently comprehensive verification
- How is the process for generating derived information to be validated? What validation data are to be used and how is their adequacy to be assessed?

Input data

- Are the datasets you plan to use fit for purpose? If s, demonstrate this to the proposal reviewers
- Are detection/measurement reliability and update times adequate for detecting changes of interest?
- If you are using costly commercial data in the initial project, is this viable as a long term solution?

Different types of stakeholder involvement

Better than nothing but not much help

Demonstrates reason for engagement and commitment to proposed activity

Not much help (at least without a translation)

And Finally.....

Please make sure of the following (at least twice):

- The cover letter contains a validity period, a firm fixed price (which you state is the firm fixed price) and a signature of the relevant person in your organization. Also proposed contract duration and domain under which proposal is submitted

- Allocations to each partner and associated geographic return are clear

- All relevant codes are included

- The proposal contains a firm fixed price

- All PSS forms are signed by the relevant person in each partner entity

Contractual conditions - Our job is to build industrial competitiveness (your competitiveness) and not swindle you out of IPR. Please make sure your lawyers understand this before letting them loose on objecting to contractual conditions etc.

Please remember to press the submit button on ESA-STAR otherwise we cannot access your proposal

And, for the 34 215th time…. **No you do not need to provide a letter of support from your national delegation**