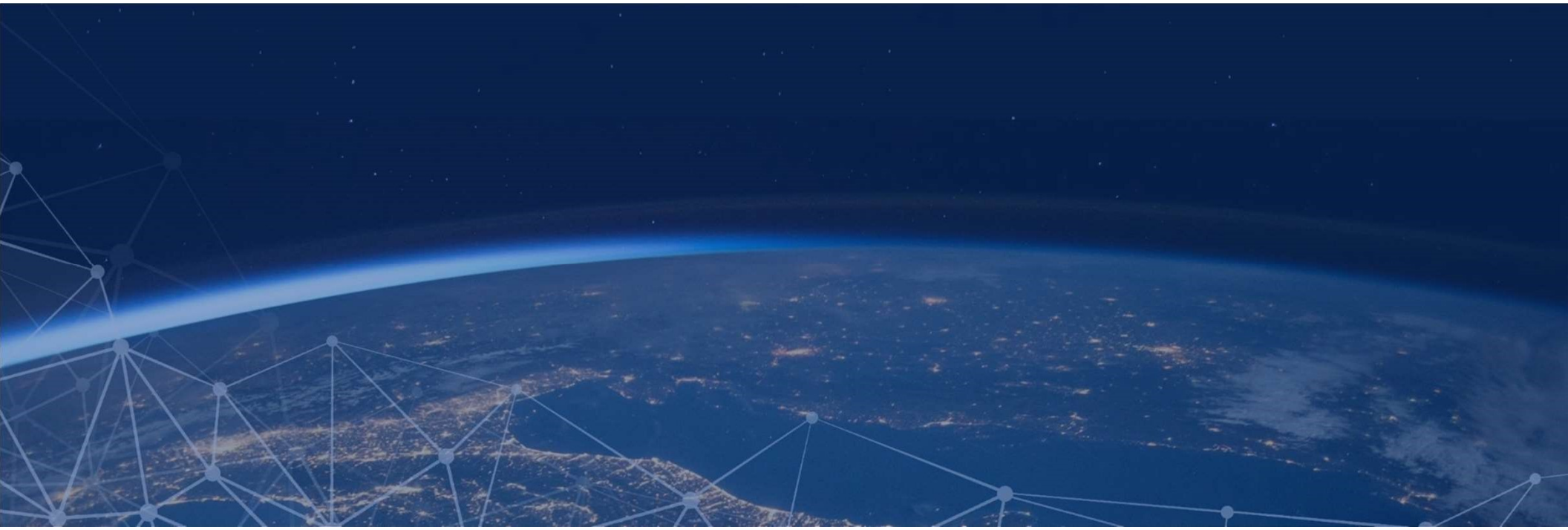

Introduction of the new Fundamental Elements calls

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Fundamental Elements 2 main drivers

New development of receivers, antennas and enabling users technology main drivers:

Continue to be **driven by user needs** and **oriented for a commercial use**:
- ✓ Priorities on specific segments driven by market needs, consultation with Users, with MS, with Industry/Academia
- ✓ Clear-cut from prototype receiver developments needed to leverage new services

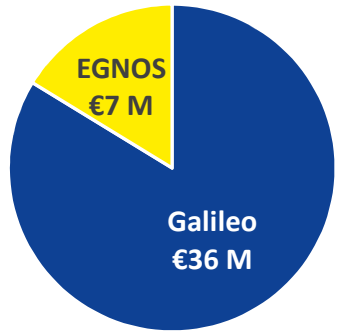
Operational **implementation of current differentiators**:
- ✓ E.g. OS-NMA and HAS, multi frequency

Prepare for commercial implementation of **new differentiators**:
- ✓ Early Warning Service, CAS, ARAIM, …

Develop **emerging, disruptive technologies** (e.g. leveraging ML/AI, etc.)

Explore **synergies with other space systems** on user technology:
- ✓ E.g. Copernicus, SatCom

Allocated FE2 budget
€43* million
2021-2027



* Indicative budget

Info on the 2022 Fundamental Elements grant plan are available in EUSPA website under opportunities→grants→2022 grants plan

OSNMA implementation for consumer solutions

Open for submission

Deadline: 15/09/22

Up to **2 projects** to be awarded
Maximum budget: **1.0M€**

Objectives

- Consolidate **a specific OSNMA concept** of use compatible with the target **consumer grade use case**
- Design, development and testing of **a consumer grade and battery sustained receiver/terminal enabled with OSNMA capability**

Foreseen results

- Development of a **receiver/terminal optimizing the OSNMA** implementation for **consumer grade solutions** on the basis of ad-hoc trade-off analyses
- Assessment of the performance in laboratory and in the field, with the aim to characterise the **benefits of OSNMA for the target use cases**

OSNMA implementation for consumer solutions (1)

Background information

- Galileo plans to provide a navigation message authentication feature over its Open Service. From the Galileo standpoint, the "Open Service Navigation Message Authentication" (OSNMA) is defined as the ability of the system to guarantee to the users that they are utilising navigation data from the Galileo satellites and not from any other, potentially malicious, source
- The OSNMA Public Observation Test Phase started in early 2021, whereas the Service Phase is envisaged to start in 2023

Potential applications of OSNMA in consumer solutions

- Several applications are expected to benefit from the use of authentication
- These applications are considered candidate use cases for Galileo authentication features, including but not limited to the OSNMA
  - OSNMA is one important contributor to the overall security of such applications. It is, however, anticipated that in most use cases OSNMA will be used in synergy with other receiver based or external techniques, in order to reduce the likelihood of success of a spoofing attack and therefore increase the overall security at PNT level
- The following applications have been identified within the consumer solutions area, for which OSNMA appears most relevant and likely to be rapidly adopted: *games and augmented reality, sports, mobile payments and E-commerce, navigation, mapping and GIS, mHealth, Geo-marketing and advertising, enterprise applications, social networking and personal tracking*
  - OSNMA could also be used in wider scope of tracking solutions, including asset tracking and management

OSNMA implementation for consumer solutions (2)

Main objectives

Call for Proposals aims to implement OSNMA capability in close-to-market (i.e. TRL 7) consumer grade receiver/terminal that is highly power constrained, and therefore designed to minimise the battery drain

Furthermore, the applicants are requested to reach this objective by:

- Consolidating a specific OSNMA concept of use* compatible with the target consumer/mass market grade use case/application.
- Designing, development and testing of a consumer/mass market grade and battery-sustained receiver/terminal enabled with OSNMA capability**.
- Assessment and validation of the performance of such receiver/terminal in an operational scenario.

**If innovative OSNMA concept of use is proposed, then it has to be validated by target users and provided in the requirements document*

***Regarding the development approach, in duly justified cases the call is open to several options for OSNMA implementation:*

- *- Firmware implementation, and/or software implementation, and/or hardware implementation in a GNSS receiver/terminal*
- *In case the applicant is not including hardware development in the proposal, it shall provide a detailed justification of why firmware/software implementation approach was selected.*

OSNMA implementation for consumer solutions (3)

Selected activities of the CfP

- **If that is considered relevant for the application's expected threats**, the GNSS low-end power-restrained consumer grade receiver/terminal **shall exploit the unpredictability of the OSNMA protocol to build anti-replay protection**
- Dissemination activities of the achievements of the project during the course of the project and to relevant stakeholders
- Definition of a business plan describing the strategy to exploit the results, including the market uptake strategy in the selected application`s segment
- **The final demonstration** shall aim to highlight the benefits of employing OSNMA in the overall solution and shall demonstrate the solution`s suitability and benefits for the target users

Other points to consider

- see what is requested as part of proposal and what during the project duration, when writing the proposal, see also the award criteria
- see what is defined as core tasks (i.e. activities that cannot be subcontracted)
- If needed, use the request for clarifications (deadline 29 July 2022)

OSNMA implementation for consumer solutions (4)

Form of funding and programme

- Grant, Up to 70% funding of the eligible total costs

Intended duration of the activity

- 2 years

Award schedule

- Allocated budget for the Call for Proposal: € 1,000,000
- Indicative number of projects to be granted: up to 2 (two) projects, depending on the quality of the proposals received

Signature of the Grant agreements

- Q1 2023

Important dates

- publication: 24 June, deadline: 15 September

https://www.euspa.europa.eu/osnma-implementation-consumer-solutions

HAS implementation in Agriculture & Geomatics

Up to **2 projects** to be awarded
Maximum budget: **2.5M€**

Objectives

- Support the implementation of **professional GNSS receiver with full support of HAS** in relevant agriculture and geomatics applications
- Validate the **target performance of HAS** initial and full services (Phase 1 and Phase 2)

Foreseen results

- **Commercial receiver/terminal optimizing the implementation of HAS** in professional markets
- Assessment of the performance in laboratory and in the field, with the aim to characterise the **benefits of HAS for the target use cases**

New SAR beacons for maritime

Up to **3 projects** to be awarded
Maximum budget: **4.0M€**

Objectives

- Design, development and testing the **new Galileo SAR beacons** with remote activation capability implemented and/or with activated beacon detection capability implemented
- Support the **definition of appropriate protocols and tests for RBA (Remote Beacon Activation)** within the different standardization and certification bodies depending on the use case, including conformity procedures (e.g., standardisation and certification)

Foreseen results

- **Commercial beacons optimizing the RBA implementation for maritime** users for SSAS, EPIRBs and PLBs
- Assessment of the performance in laboratory and in the field, with the aim to characterise the **benefits of RBA for the target use cases**

Early Warning Service (EWS) Galileo devices

Up to **2 projects** to be awarded
Maximum budget: **1.0M€**

Objectives

- To design, develop and test **Galileo enabled devices** (e.g., smartphones, smartwatches, specialised equipment for outdoors activities and other sport wearables, dedicated receivers for buildings and dedicated receivers for cars and vessels) for the **reception of Emergency Warnings based on Galileo EWS**
- Support the **definition of appropriate protocols and tests for EWS** within the different standardisation and certification bodies depending on the use case, including conformity procedures (e.g., standardisation and certification)

Foreseen results

- **Prototype receiver/device optimising implementation of Galileo EWS** in target use cases
- Assessment of the performance in laboratory and in the field, with the aim to characterise the **cost and benefits of EWS for the target use cases**

Connectivity

Up to **4 projects** to be awarded
Maximum budget: **3.0M€**

Objectives

- Optimisation of Galileo use in connected devices, focusing on innovative concepts using **cloud processing, hybridisation of GNSS with 5G* and other dedicated networks** as well as implementation of new Galileo features proposed for low power tracking
- Development of chipsets and receivers as well as hybrid solutions to address specific challenges of **low power tracking in connected devices**

Foreseen results

- **Commercial receiver/terminal** or hybrid solution optimising the **Galileo use in low power tracking use cases**

*Complementarity with the action HE-ESA-005 "*Engineering support and development of unified GNSS and 5G/6G testbed for enhanced PNT"* in the ESA work Plan 2021 will be analised.

Artificial Intelligence, Machine Learning

Up to **3 projects** to be awarded
Maximum budget: **3.0M€**

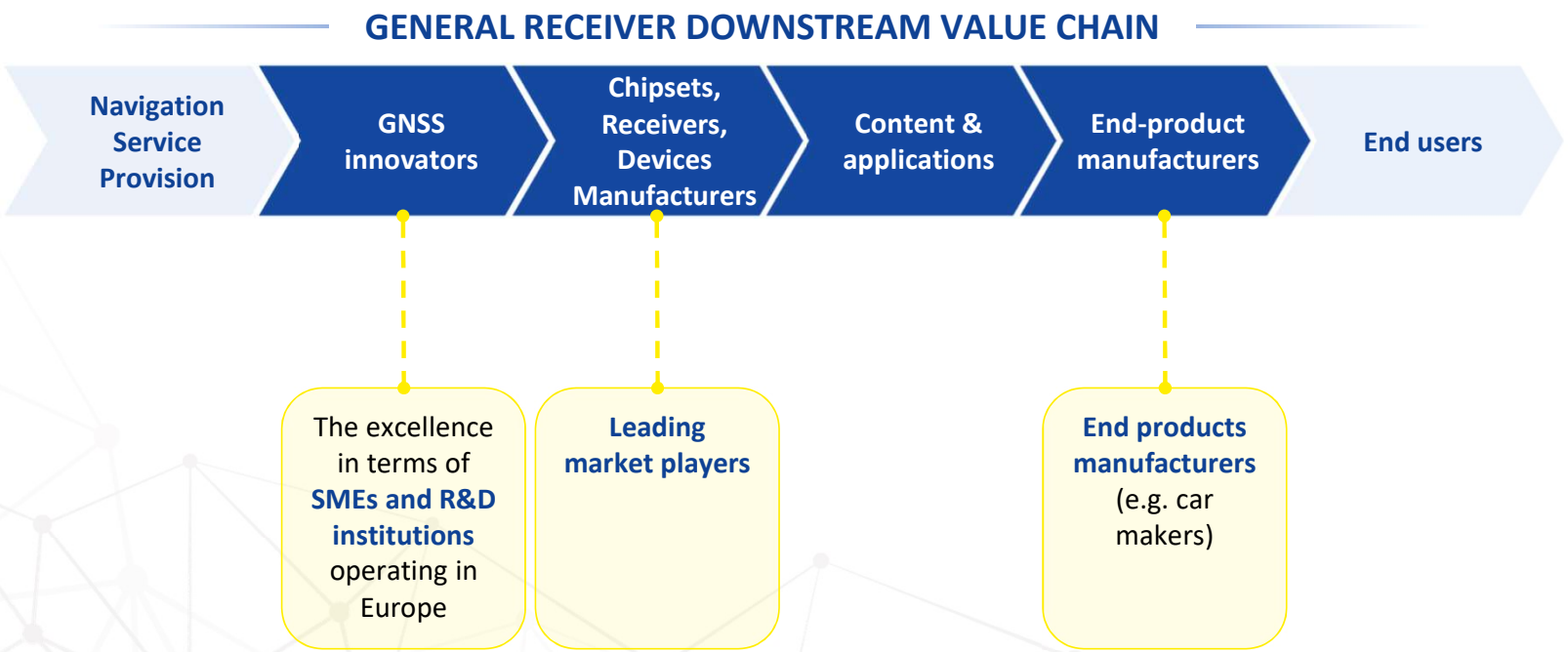
Objectives

- Design and development of elements which can support the **deployment of AI for improving EGNSS services** such as graphics processing units (GPUs), field-programmable gate arrays (FPGAs) and application-specific integrated circuits (ASICs) and/or techniques for the multipath mitigation
- Development of **enhanced PNT and cost-effective standalone solutions** taking advantage of **EGNSS data combined with AI/ML techniques**

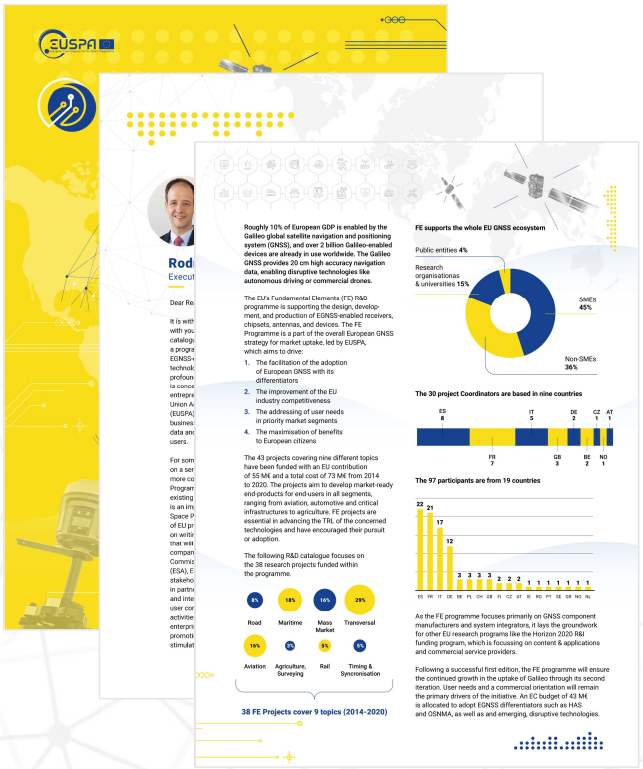
Foreseen results

- Technology **development of prototype AI chipsets in tandem with cloud-native AI/ML orchestration** solutions, aimed to empower the next generation of receivers and antennas and improve EGNSS services
- Assessment of the **performance in laboratory and in operational environment**, with the aim to demonstrate **feasibility** and characterise the **cost and benefits of AI chipsets**

How to build an ideal FE consortium

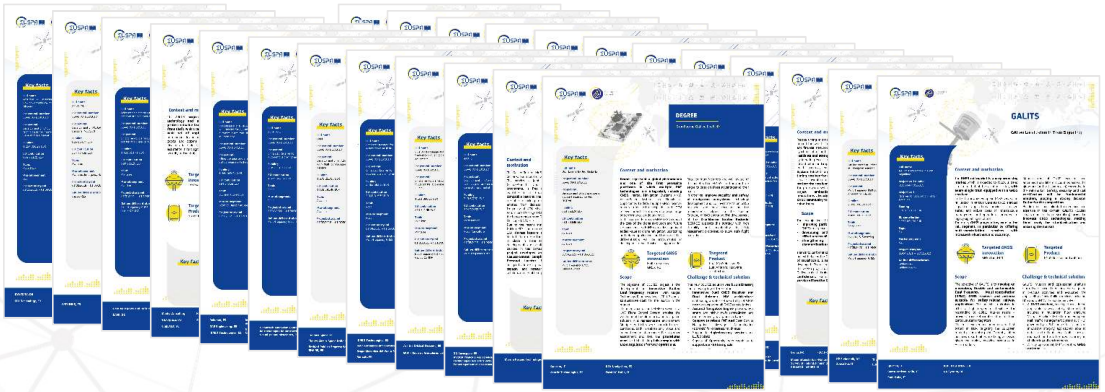


The upcoming R&I catalogue



The **FE R&I Catalogue** is coming soon!

- Portfolio-level statistics
- Scope and objectives of the 38 FE R&I projects
- Beneficiaries and key facts



EUSPA Horizon Europe call of 2022
(HORIZON-EUSPA-2022-SPACE)

Type of action	Topic	Indicative budget (€M)	Funding rate
IA	EGNSS applications for Smart mobility	9.5	70% (except for non-profit legal entities, where a rate of 100% applies)
PCP	Public sector as Galileo and/or Copernicus user	5.2	100%
IA	Copernicus downstream applications and the European Data Economy	9.6	70% (except for non-profit legal entities, where a rate of 100% applies)
RIA	Large-scale Copernicus data uptake with AI and HPC	9.6	100%
RIA	Designing space-based downstream applications with international partners	5.1	100%
RIA	GOVSATCOM Service developments and demonstrations	9.1	100%
Total budget		48.1	

Opening: 27 October 2022
Deadline: 16 February 2023

Innovation action (IA)
Activities to produce plans and arrangements or **designs for new**, altered **or improved products**, processes or services.

Research and innovation action (RIA)
Activities to **establish new knowledge** or to **explore the feasibility** of a new or improved technology, product, process, service or solution.

Pre-commercial procurement actions (PCP)
Activities that aim to help a buyers' group to **strengthen the public procurement** of research, development, validation and, possibly, the first deployment of new solutions

* dates are tentative and subject to change

Any questions?

Linking space to user needs

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