**Survey to the industry**

Survey addressed to the industry on the following topics:

|  |  |
| --- | --- |
| * Proposal for R&D | (HE WP 2024) |
| * SSA commercial sensors |  |
| * Public/commercial services |  |
| * Concept of a SST marketplace |  |

## Introduction

The European Union actively participates to the global coordination to make space activities more sustainable through the activities of the European Union Space Surveillance and Tracking cooperation (EU SST), established in 2014 and operational since July 2016. Composed of 15 Member States of the European Union, and relying on EUSPA as front desk, the EU SST Partnership coordinates the development of space surveillance and tracking capabilities and provides public services in collision avoidance, re-entry and fragmentation analysis, relying on Member States capabilities and on European industry and start-ups.

EU SST has a long-term strategy to foster innovation and competitiveness of the European industry and start-ups by supporting the consolidation of a commercial ecosystem around SSA, strengthening strategic autonomy in Europe.

In this direction, EU SST has set up, together with the European Commission, the European Union Industry and Start-Forum on Space Traffic Management (EISF). This forum was established on 26 April 2022 and six editions have already been held since this date. The EISF allows pragmatic and transparent dialogue between EU SST and industry and start-ups, and is focused on reinforcing the link between EU SST and the European industrial SSA ecosystem.

To this end, and ahead of the next EISF, we would like to address the following survey to gather feedback from the industry on the following 4 areas: (i) proposals for R&D activities EU SST could launch in the framework of Horizon Europe WP 2024, (ii) SSA commercial sensors, (iii) public / commercial services, and (iv) concept of a SST marketplace.

This survey has been circulated on the 27 September 2024 and will allow the industry to revert during a one-month period (i.e. 27 October 2024). **The survey will therefore be closed on 27 October 2024.**

The information provided by the respondents of this survey will only be disclosed to the European Commission; it will be anonymized and then transferred to the Heads of Expert Teams of EU SST for analysis and integration in the program’s future orientations.

## Company information

|  |  |
| --- | --- |
| Company name |  |
| **Date of creation** |  |
| **Name of CEO, CFO, CTO** |  |
| **Type of company (Start-Up, SE, ME, LE)[[1]](#footnote-2)** |  |
| **Number of employees** |  |
| **Location of headquarters** |  |
| **Location of offices around the world** |  |
| **Value chain** | Manufacturer  Satellite integrator  Satellite operator  Data provider  Service provider  Other |
| **Contact for this survey (name, surname, email, position)** |  |

## Proposals for R&D activities

*The information to be collected under section “1. Proposals for R&D activities” will be used for the preparation of the proposal to be submitted for the upcoming Horizon Europe (HEurope) grants in the context of the WP 2024[[2]](#footnote-3) .* ***The target date for EU SST to submit such proposal to the European Commission is the 31 January 2025. The grant will be awarded to EU SST and the calls to industry will be published from Q3 –Q4 2025.***

EU SST coordinates research and development (R&D) activities covering the entire operational value chain, taking into account national R&D programs and involving academia as well as the European commercial SSA ecosystem. HEurope contributes to this endeavor with dedicated calls focusing in research and innovation activities with low TRL[[3]](#footnote-4) (up to TRL 6 at the end of the contract).

With this in mind, we would like to seek your contribution in order to collect some recommendations for technical R&D activities covered by the 4 following areas of HEurope programme that could be conducted as from mid-2025 or 2026 (TOP1, TOP2, TOP3, TOP5).

* 1. **Range of R&D areas stemming from HEurope areas programme WP 2023-2024**

The tables belows contain the list of possible activities as per listed in the Annex 7 of HEurope Work Programme 2023-2024 adopted by the EU Horizon Europe Programme Committee.

* + 1. **New & Improved EU SST Missions and Services (HEurope TOP1)**

You may find below some examples of new missions and services (non-exhaustive list) that could be developed in the scope of R&D activities. Please rate them from 1 to 3 depending of the level of interest you have (1: low interest, 2: medium interest, and 3: high interest), and feel free to provide us with expectations/recommandations on activities to be supported, ROM budgets and approaches to pursue for these incoming calls.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Identify and define new missions and services | Level of interest (low, medium, high) | | Expected budget per activity | Expectations and comments |
| Debris mitigation |  |  | |  |
| Debris remediation |  |  | |  |
| Potential hazardous objects identification |  |  | |  |
| Potential synergies with other EU Space Programme components (e.g. current and future Galileo services; Data authentication mechanism; timing service; High Accuracy Service, etc.) |  |  | |  |
| Inter-orbit RFI anticipation |  |  | |  |
| Post-manoeuvre analysis |  |  | |  |
| Support to EOL operation |  |  | |  |
| Others |  |  | |  |

* + 1. **SST & STM system architecture and evolutions (HEurope TOP2)**

You may find below some range of activities (non-exhaustive list) that could be developed in the scope of R&D activities. Please rate them from 1 to 3 depending on the level of interest you have (1: low interest, 2: medium interest, and 3: high interest), and feel free to provide us with expectations/recommandations on activities to be supported, ROM budgets and approaches to pursue for these incoming calls.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Range of activities | Level of interest (low, medium, high) | | Expected budget per activity | | Expectations and comments |
| Architecture engineering |  |  | |  | |
| Performance criteria |  |  | |  | |
| Simulation tools |  |  | |  | |
| Support to spacecraft manoeuvres, interference management, collision avoidance automation |  |  | |  | |
| Space object life cycle and risk assessment |  |  | |  | |
| Post-manoeuvre analysis |  |  | |  | |
| Object identification, navigation aids and servicing interfaces |  |  | |  | |
|  |  |  | |  | |
| Others |  |  | |  | |

* + 1. **Space-based SST (mission, system and sensors network) (HEurope TOP3)**

You may find below some range of activities (non-exhaustive list) that could be developed in the scope of R&D activities. Please rate them from 1 to 3 depending of the level of interest you have (1: low interest, 2: medium interest, and 3: high interest), and feel free to provide us with expectations/recommandations on activities to be supported, ROM of budgets and approaches to pursue for these incoming calls.

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| --- | --- | --- | --- |
| Range of activities | Level of interest  (low, medium,  High) | Expected budget per activity | Expectations and comments |
| Study on various mission configurations (e.g. orbit regime, orbit plan) and payload definition to maximize the number of catalogued objects and associated accuracy) |  |  |  |
| Study coordination strategies and techniques among satellites of SBSS missions and terrestrial SST systems |  |  |  |
| Develop or improve existing algorithms to evolve from detection to cataloguing |  |  |  |
| Explore use of non-dedicated sensors or hosted payloads in non-dedicated missions |  |  |  |
| Assess security issues related to the link between SBSS and ground-based EU SST networks |  |  |  |
| Others |  |  |  |

* + 1. **SST Networking, Security & Data sharing (HEurope TOP5)**

You may find below some range of activities (non-exhaustive list) that could be developed in the scope of R&D activities. Please rate them from 1 to 3 depending on the level of interest you have (1: low interest, 2: medium interest, and 3: high interest), and feel free to provide us with expectations/recommandations on activities to be supported, ROM of budgets and approaches to pursue for these incoming calls.

|  |  |  |  |
| --- | --- | --- | --- |
| Range of activities | Level of interest  (low, medium, high) | Expected budget per activity | Expectations and comments |
| Update operation centres to improve current services (CA, FG, RE) adapted to future user needs and the space environment |  |  |  |
| Update operation centres to new missions and services (e.g. debris mitigation, debris remediation) |  |  |  |
| Adapt European SST network to a more efficient coordinated scheduling and tasking of resources and assets |  |  |  |
| Develop new data sharing and fusion strategies and techniques adapted to both ground and space-based SST assets |  |  |  |
| Develop threat analysis and counter-measures to protect EU SST infrastructure |  |  |  |
| Adapt EU SST operation centres for increasing security and resiliency |  |  |  |
| Others |  |  |  |

* 1. **Additional R&D activities (not covered under 1.1 above) that could be considered in HE work programme 2023 - 2024**

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1. **SSA commercial sensors**

*The information to be collected under section “2. SSA commercial sensors” will contribute to the reflection on the budget envelope of the next EU Multiannual Financial Framework (MFF) for the period 2028-2034.*

*Before the end of the year EU SST will request industry inputs to refine the given envelope by precising technologies development and market positioning of commercial sensors. Such information will also contribute to run the architecture studies and performance simulations of the sensors network.*

* 1. **Projected European budget for commercial SSA**

In EU SST we have a long-term strategy to foster innovation and competitiveness of the European industry and start-ups by supporting the consolidation of a commercial ecosystem around SSA, strengthening strategic autonomy in Europe.

This strategy is supported today by the allocation of a first EU budget of 18 M€ for 3 years (2023-2026) dedicated to the acquisition of commercial data and of an EU budget of 30 M€ dedicated to the development of commercial sensors for 3 years (2023-2026).

*Based on your experience, and knowledge of the market, what would be the ideal projected budget for the acquisition of commercial data in EU SST between 2028 and 2034 (7 years)?*

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*Based on your experience, and knowledge of the market, what would be the ideal projected budget in EU SST for the development of commercial sensors between 2028 and 2034 (7 years)?*

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## Public/ commercial services

*The information to be collected under section “3. Public/commercial services” will be used for the preparation of the upcoming calls managed by EU SST supporting EU industry capacities on services. As a contextualization element, please kindly be informed that a similar survey[[4]](#footnote-5) has also been launched in May 2024 (survey closed since June 2024) by EUSPA and that we are coordinating together on this topic.*

The goal of SST public services is to ensure a minimum level of safety in space and to contribute to the long-term sustainability of outer space activities. In pursuing this goal, EU SST relies as much as possible on European industry and start-ups, and aims to encourage, promote, and support the development of an ecosystem of lucrative, advanced, more accurate and tailor-made commercial services, which may rely on and be provided on top of the public services that EU SST provides.

In this context, during the 6th edition of the EISF held in June 2024, a list of the public services has been presented to the ecosystem of industry and start-ups with clear perimeters of the public services from EU SST. Presentation was shared and feedback requested.

EU SST is requesting in which areas of the public services your company would be interested to contribute to the EU SST system in the frame of the next Space Regulation Grants starting from mid-2026 to mid2028.

By public services, it shall be understood to be referring to the public services in collision avoidance, reentry, and fragmentation analysis provided free of charge by EU SST to ensure a minimum level of spaceflight safety and sustainability. By commercial services, it shall be understood to be referring to the services provided by commercial SSA industry and start-ups ecosystem on top of the public services provided by EU SST, or any other advanced commercial services in support of spaceflight safety and sustainability.

* 1. **Table of inputs used for public services**

Inputs are used for the performance of public services. You may advise us on whether or not your company has the capabilities to contributes to the production of such inputs by ticking boxes under the table below.

|  |  |  |
| --- | --- | --- |
|  | Has your company capabilities to contribute? | Comments |
| **Inputs used for public services:** |  |  |
|  |  |  |
| **1. Sensor data** |  |  |
| Commercial data | Yes  No |  |
| **2. Database/ data repository** | Yes  No |  |
|  |  |  |
| **4. Commercial ephemerides** |  |  |
| 1. Commercial Ephemerides for : (i) Registered User Spacecraft incl. Maneuver Plans; (ii) Non-Registered User Spacecraft ; (iii) Space debris | Yes  No |  |
|  |  |  |
| **5. Auxiliary Information** |  |  |
| 1. Space weather information | Yes  No |  |
| 1. Planetary Ephemerides, Constants, Orientation Information | Yes  No |  |
|  |  |  |
| **6. Catalogue of space objects** | Yes  No |  |

* 1. **Contribution to EU SST public services**

You may find below a table of services for which you may tick boxes depending on whether or not your company is interested in contributing to the provision of these services.

|  |  |  |
| --- | --- | --- |
|  | Is your company interested in contributing? | Comments |
| 1. **SSA information as a service** |  |  |
| 1. Contact information   Sharing information platform (contact information, satellite attributes, O/O ephemerides with planned manoeuvers, catalog of space objects) | Yes  No |  |
| 2. Satellite attributes | Yes  No |  |
| 3. O/O ephemerides with planned maneuvers | Yes  No |  |
|  |  |  |
| 1. **In-Orbit Collision Avoidance service:** |  |  |
| 1. Routine catalog and O/O ephemerides screening and CDM production | Yes  No |  |
| 1. Risk Assessment and Detection and Notification of High Interest Events/Emergency Events | Yes  No |  |
| 1. Additional tracking on the secondary and/or primary objects | Yes  No |  |
| 1. Basic CAM Options for selection by O/O[[5]](#footnote-6) | Yes  No |  |
| 1. Candidate CAM Screening | Yes  No |  |
| 1. For selected HIE/ Emergency Events, dialogue with O/O | Yes  No |  |
|  |  |  |
| 1. **Reentry Monitoring Service** | Yes  No |  |
|  |  |  |
| 1. **Fragmentation Notification and Analysis Service** | Yes  No |  |

* 1. **Potential future public services under consideration or commercial services**

EU SST is considering several potential future public services, please list your interest and opinion if these services shall be delivered as part of the public services of EU SST or shall be fully commercial.

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| Potential Future Services Under Consideration | Do you consider as a public service or a commercial service? | Comments/recommendations |
| 1. **Candidate Maneuver Screening** | Public  Commercial |  |
| 1. **Spacecraft Anomaly Reporting** | Public  Commercial |  |
| 1. **Launch Collision Avoidance service** | Public  Commercial |  |
| 1. **Improved O/O Ephemerides** | Public  Commercial |  |
| 1. **Space Weather Information and Atmospheric Drag Model** | Public  Commercial |  |
| 1. **Traffic Coordination Platform as a Service** | Public  Commercial |  |
| 1. **Others** | Public  Commercial |  |

* 1. **Potential upcoming commercial services (WP HE 2025)**

EU SST may consider launching calls on commercial services in the future. A draft list of preliminary/complementary commercial services is provided here, please mark those ones that you’ll be interested that EU SST could potentially launch R&D activities to foster this service inside HE WP 2025 grant.

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| --- | --- | --- | --- |
| Public services | Definition | Are you interested | Comments |
| 1. **Anomaly support** | Anomaly Support offline: deeper analysis on a given event / anomaly (e.g. request of light curve, attitude information,...) | Yes  No |  |
| 1. **User’s suport (on call)** | Examples: - Improved reactivity compared to public service - Anomaly Support :   - near real time: course of actions + sensor tasking in case of anomaly (e.g. loss of TM/TC link) - Anything which is not described in section 2 | Yes  No |  |
| 1. **Ad hoc maneuver support** | CAM recommendation considering all O/O system constraints (planned passes, payload, S/C platform constraints,...) | Yes  No |  |
| 1. **Additional tracking in priority** | O/O can request additional tracking to commercial companies if EUSST tracking does not suit their needs in a given situation | Yes  No |  |
| 1. **Forecasting of consequences of a potential collision** | Simulation of the various impacts that a potential collision would have on a given O/O, and on the whole space objects populations Should be used in the design phase: selection of orbits, effect of the S/C attitude & shape on the aggregated PoC during the S/C lifetime… | Yes  No |  |
| 1. **Callibration of O/O ephemerides** | If biases are identified in its ephemeris, O/O should take actions to improve them and have them calibrated. | Yes  No |  |

*Please list all potential commercial services that could be developed on top of public services and that could be supported through EU SST-launched R&D activities.*

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*EU SST buys data and makes data fusion to optimize efficiency. Nevertheless, commercial ephemerides could be in some cases provided to EU SST. Do you have an interest in providing commercial ephemerides to EU SST?*

*Yes – please explain what could be the added value for EU SST*

*No*

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## Concept of a SST marketplace

*The information to be collected under section “4.Concept of marketplace” will be used for the preparation of WP 2025 on commercial services. This section of the survey aims to gather high-level information on the concept of marketplace in order to refine the questions in the dedicated survey on marketplace to be prepared at a later stage by AEE. As a contextualisation element, please kindly be informed that the survey circulated by EUSPA in May 2024 also included a section on the marketplace and that EU SST is working along with EUSPA on this topic.*

Through previous EISF meetings, the concept of a marketplace has been brought forward by industry and start-ups. As we begin our reflection on the potential nature of such a marketplace, the actors involved in its making and its operations, we can draw inspiration from existing examples – such as the Unified Data Library operated in the framework of the Joint Commercial Operations, as well as the future U.S. Global Data Marketplace of the Office of Space Commerce, an online transaction system established by the Department of Defense in partnership with BlueStaq. The concept of a marketplace is also discussed under the EU Space Programm (Copernicus, Galileo) with the concept of a space data hub.

As we are still in a preliminary phase trying to identify which benefits a marketplace could bring to the European ecosystem, we would like to seek your contribution by responding to the below questions.

* 1. *Do you think there is a need for a marketplace in Europe?*

*Yes – see below questions*

*No*

*If the answer is ‘”yes”, please answer to the following questions:*

* 1. *Is there a need for a marketplace dedicated to SSA only in Europe or a global marketplace (in Europe) on space data/services including an SSA component?*

*Dedicated SSA marketplace*

*Non-dedicated SSA marketplace including an SSA segment*

* 1. *How do you envision the SST/STM marketplae in EU?*

*As a showroom, to offer your services and then being redirected to external websites/contacts*

*As an end-to-end platform, to offer your services and make the transaction through the platform itself*

*Both as a showroom and a complete purchasing platform, depending on the specifics*

* 1. *What is for you the definition of such marketplace and what could be its main functions?*

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|  |

* 1. *Please complete the table below with the needs that could be addressed by such marketplace on the customer side and on the service provider side:*

|  |  |
| --- | --- |
| Customer needs | Service provider needs |
|  |  |

* 1. *Who should operate such marketplace?*

*Private sector*

*EU SST*

*Others, please specify:*

* 1. *Do you consider that EU SST could play the role of supporting R&D activities to develop such marketplace?*

*Yes – see below*

*No*

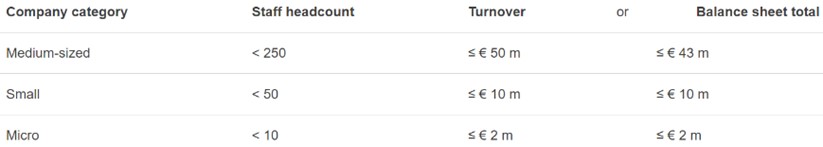
*If yes, what would be the ideal projected budget for the industry to launch a marketplace?*

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**Annex I: TRL levels definition**

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| TRL | Definition |
| TRL9 | Actual system “flight proven” though successful mission operations. |
| TRL8 | Actual system completed and “flight qualified” through test and demonstration. |
| TRL7 | System prototype demonstration in a space environment. |
| TRL6 | System/Subsystem model or prototype demonstration in a relevant environment (ground or space). |
| TRL5 | Component and/or breadboard validation in relevant environment. |
| TRL4 | Component and/or breadboard validation in laboratory environment. |
| TRL3 | Analysis and experimental critical function and/or characteristic proof-of-concept. |
| TRL2 | Technology concept and/or application formulated. |
| TRL1 | Basic principles observed and reported. |

1. suggestion for SME (as defined in the EU recommendation 2003/36)

   And for ME :

   Mid capitalization companies are defined as those with between 500 and 1499 employees and a turnover of more than 100 million EUR. [↑](#footnote-ref-2)
2. <https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2023-2024/wp-7-digital-industry-and-space_horizon-2023-2024_en.pdf> [↑](#footnote-ref-3)
3. See Annex I for the TRL levels definition [↑](#footnote-ref-4)
4. Link: [EUSurvey - Survey (europa.eu)](https://ec.europa.eu/eusurvey/runner/UserConsultationOnPotentialServices) [↑](#footnote-ref-5)
5. [↑](#footnote-ref-6)