SOPRANO

Socially-Acceptable and Trustworthy Human-Robot Teaming for Agile Industries

Project Number 101120990

SOPRANO Open Call

Annex 1.1: Guidelines for Applicants

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DOCUMENT CONTROL

Version	Status	Date
1.0	First version	12 March 2025
2.0	Final version for publication	13 March 2025

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ACRONYMS

KPIs	Key Performance Indicators
MH-MR	Multi-human multi-robot
OC	Open Call
OCOC	Open Call Operational Committee

1. INTRODUCTION

This document provides the full information regarding the SOPRANO Open Call for Proposals, also referred to as SOPRANO OC.

All associated Annexes must also be read before starting the application process and submitting a proposal.

2. CONTEXT

Manufacturing, construction, and agriculture are foundational pillars of the European economy, contributing significantly to its growth and prosperity. Novel intelligent robotic capabilities that can operate alongside humans and adapt to dynamic environments are essential for accelerating these sectors' digital transformation and for ensuring that they remain competitive.

However, current robotic systems often fall short of these requirements. They tend to lack the necessary versatility and flexibility to automate specific tasks, struggle to collaborate safely with humans in open and changing settings, and cannot be easily or cost-effectively adapted to process modifications.

3. THE SOPRANO PROJECT

The SOPRANO project, short for *Socially-Acceptable and Trustworthy Human-Robot Teaming for Agile Industries*, is an Innovation Action funded by the European Union's Horizon Europe research and innovation program under grant agreement No. 101120990.

SOPRANO focuses on human-robot collaboration and intelligent multi-agent systems. The goal is to design the next generation of manufacturing floors, construction sites, and agri-food production facilities, where humans and intelligent machines work together seamlessly. The project aims to expand collaboration from single human-robot pairings to a synergistic network of multiple interconnected robotic systems with diverse physical and cognitive abilities, collaborating on various tasks alongside human workers and other agents.

3.1. Team

The SOPRANO consortium is composed of 19 partners from 9 different countries, collaborating for 40 months. It includes leading European robotics R&D organizations with expertise in multi-human multi-robot systems, as well as industrial robotics users and providers and service organizations that support innovations within the European robotics community (see the Project Partners table above for more details).

3.2. Ambition and Detailed Objectives

The mission of SOPRANO is to revolutionize agile industries by enabling seamless collaboration between multiple humans and multiple robots (MH-MR), thereby enhancing efficiency, reliability, and adaptability in dynamic work environments.

To achieve this, SOPRANO will:

- **Develop advanced human-centric robotic capabilities**: Enhance robots to operate seamlessly in dynamic highly uncertain indoor and outdoor industrial environments. SOPRANO will focus on:
  - location awareness and autonomous navigation,
  - detection of objects with challenging properties,
  - grasping and manipulation of objects,
  - collaborative sensing, perception of human actions, and
  - human-centric action planning for effective human-robot collaborations and synchronization.
- **Ensure trustworthy and dependable AI-based multi-human multi-robot collaboration:** Implement robust safety and security protocols to maintain reliable teaming between multiple humans and robots, effectively managing uncertainties and ensuring dependability during safety-critical tasks. SOPRANO will focus on**:**
  - techniques for safety monitoring, diagnosis, AI planning and reasoning,
  - model-driven simulation-based approaches to assess quality aspects,
  - a human-digital twin integrating the human resource in the system design and operation for dynamic and accurate multi-human multi-robot monitoring.
- **Provide modular and reconfigurable tools:** Create flexible, easy-to-use tools and model-based frameworks that allow rapid programming and configuration of new tasks and products, supporting optimization, intelligent resource scheduling, adaptability and ease of use in diverse and changing operating environments. SOPRANO will focus on:
  - robot programming,
  - easy configuration of AI-supported tools in ML Operations via high-level abstractions to dynamically adapt to product changes,
  - model-based development of reconfigurable control architectures supporting modification of control policies at run time,
  - open standards-based cloud platforms and federated cloud-edge service orchestration for Industrial IoT ecosystems with auto-organisation of tasks and resources.
- **Realize next-generation MH-MR teams in agile industries:** Demonstrate and validate SOPRANO's technological advancements through novel use cases in manufacturing, construction, and agriculture, fostering adaptable, flexible, and efficient multi-human multi-robot teams that meet the evolving demands of modern industries. SOPRANO aims to contribute to the challenges in dynamic operating environments in agile industries:
  - Improve context awareness for robot actions in environments with high degree of uncertainty;

- Develop real-time task planning and allocation, ensuring dynamic and efficient task distribution among humans and robots, balanced workloads and improved ergonomic outcomes for human workers;

- Implement robust monitoring and re-planning mechanisms to enhance run-time dependability and resilience in human-robot collaborations and adaptation to unforeseen events;

- Develop digital twin technologies to model and represent the functions, structures, and behaviours of integrated human-robot teams using real-time data, thus facilitating better supervision and control.

Work in SOPRANO integrates interdisciplinary research, combining expertise from collaborative robotics, AI, computer vision, and human-centric design to build a comprehensive MH-MR collaboration framework that meets the evolving needs of modern industries.

3.3. The SOPRANO Technologies

SOPRANO is working to deliver the following key technologies to support the design, testing, deployment and monitoring of MH-MR applications:

- Pervasive scene perception with real-time environment monitoring of multiple sensors;
- Detection/localization of challenging objects exploiting visual and tactile cues during robot actions;
- Human digital twins supporting virtual simulation for complex scenarios integrating human resources;
- Time-aware MH-MR orchestration for collaboration at global team and local human-robot level;
- Human-robot interaction model encompassing socio-cognitive prerequisites for effective interactions;
- Suite of advanced development and deployment tools for MH-MR applications;
- Suite of ML quality assessment tools for testing ML models for MH-MR applications;
- Simulation-based testing tools for MH-MR applications able to interface with different robotic simulators.

3.4. Industrial Use-Cases

The project technologies are being validated through demonstrator implementations of the MH-MR technologies by representatives from three key industrial sectors.

3.4.1 Construction Robotics - Residential Building Renovation

KUKA has developed a flexible and multifunctional robotic platform that can support the automation of renovation processes via the partially and fully automated execution of activities such as measuring existing rooms, bricklaying, drilling holes, milling slots, plastering, spreading plasterboards, and stuccoing. The robot can also support the fitting of new electrical installations in buildings. The robot may collaborate with workers to support completing tasks usually undertaken by workers.

The challenge is on one end to position the robot itself in space or on a floor with high precision based on an initial map of the environment that is constantly updated to reflect the changes performed. After registering the position, the exact position of the stone and the travel path of the robot have to be calculated to place the stone with the robot gripper and to determine the positions of the next stones depending on the length of the existing stones. On the other end, in terms of human-robot collaboration, the robot is allocated several tasks that precede or follow those executed by humans. Apart from spatial awareness, the robot must be equipped with temporal awareness for those tasks and subtasks executed by the human worker to optimize task completion. The third challenge is the detection of obstacles by the crawler-based robot system, improved context awareness and more effective path planning. SOPRANO will be supporting advances in the capabilities of KUKA's construction robotic platform, achieving higher levels of responsiveness and intelligibility when the robots work as a team alongside workers.

3.4.2 Automotive Manufacturing Robotics - Vehicle Door Disassembly

Centro Ricerche FIAT SCPA exploits an MH-MR team in a door assembly line with seven workstations to support the assembling of gaskets, carriers, rear view mirrors, glasses, screws and door panels. One mobile robot and one mobile Cobot by KUKA will support different operations in the assembly process to collaborate with the human workers in their tasks of assembling or procuring components or in the quality checks at the end of the cycle execution. The robots will support the manipulation of a large set of tools and/or components with different shapes and weights within the assembly line, overcoming the limited repertoire. SOPRANO's target is to deliver a framework that supports the peer-based synergy between multiple robots and multiple workers.

3.4.3 Smart Agri-Foods Robotics - Symbiotic Farming

E-TERRY is a startup from Erfurt, Germany, specializing in symbiotic farming. E-TERRY develops an autonomous agricultural robot that advances sustainable agriculture on a large scale. The robotic platform is a highly agile carrier system, variable in height and track width, which can adapt to various growth stages and crops. It can be enhanced with different tools and sensors to cover diverse operations in the field. During harvesting operations, the E-TERRY's robot supports the transportation of full crates. Once positioned in the field, the robot is assigned its responsibility area and tasks (e.g., via a mobile application). Since the hands of workers are usually not free during harvesting, the E-TERRY robot must recognize the harvesters as a second control option and follow them autonomously. When arriving at the responsibility area, the robot uses on-board sensors to recognize the position of the harvesters in the row, travelling at a low speed and adjusting its height to that of the workers making loading possible with reduced effort.

Delivering a solution that can adapt safely to the complexity and unpredictability of the environment while also considering the characteristics of individual workers (e.g., height, pose) remains a major challenge. Furthermore, when several E-TERRYs are active in the field simultaneously, their runtime monitoring and dynamic task assignment is mandatory to guarantee the minimum travel time and distance. Finally, the robotic platform is typically deployed in diverse and harsh environments which necessitate fast repose to repurposing changes in requirements and the target environment. E-TERRY will apply the SOPRANO technologies to support further the advancement of its robotic platform as a cost-efficient, flexible, reliable and trustworthy carrier system suitable for harsh and diverse environments.

4. CALL FOR PROPOSALS

4.1. Open Call Objectives

In this Open Call, SOPRANO will invest a total of 1,880,000.00 EUR, which will be aimed at:

- Recruiting SMEs/startups to exploit the SOPRANO technologies to develop new demonstrators or enhance an existing demonstrator supporting MH-MR scenarios in industrial settings, thus validating the project technologies in industrial sectors beyond those directly addressed by the consortium partners.
- Engaging new use cases from different industrial sectors to test and validate the SOPRANO technologies through specific integration paths, to collect a broader set of industrial requirements for the project technologies that ensures their wide applicability to European robotic solution developers, and to further quantify the added value and benefits both for businesses and humans involved in the supported MH-MR interactions.
- Boosting the SOPRANO technologies' dissemination and exploitation.

The implementation of the demonstrator must be an industry relevant prototype of a robotics solution, which is created using the project technologies and addresses the chosen MH-MR application scenario. The demonstrator might consist of existing technologies and systems of the SME(s)/startup(s) and the SOPRANO technologies to a varying ratio. It should support the transition from research to product development and should demonstrate the SOPRANO technology's potential for commercial use.

The SOPRANO consortium will welcome applications from innovative SMEs/Startups with various company profiles. The applicants will typically be one of the following types of actors:

- Robotic Equipment Vendors
- Robotic Systems Developers
- Robotics Systems Integrators
- Industrial Robotic Application Providers

4.2. SOPRANO Open Call Design

Table 1: SOPRANO Open Call characteristics

For whom?	**Innovative SMEs/startups in the robotic field** Robotic Equipment Vendors Robotic Systems Developers Robotics Systems Integrators Industrial Robotic Application Providers **Single applicants or consortiums of up to 3 SMEs/startups**
What? Target and goal	For robotics SMEs/startups to develop demonstrators supporting a MH-MR scenario (1) within one of the desired industrial sectors or within a sector justified by the applicant, by (2) integrating and using at least one of the SOPRANO components. Goal: Demonstrate, test and validate the SOPRANO technologies when exploited within SME and Startup solutions in additional robotics use cases involving human-robot collaboration
Expected outcome	Industry relevant prototype of a robotics solution addressing the applicant's MH-MR application scenario, which is created using the project technologies. The applicants may engage in co-development of the components if needed for their use case.

Number of funded projects	At least 9 proposals will be funded. A 10th proposal may be funded with a grant limited to the available budget, which is 1,880,000 EUR.
Form of financial support	Lump sum
How long? Duration of the funded projects	16 months
How much? Maximum budget per application; Size of the grant and co-financing ratio	The maximum budget per application is 200,000 EUR. The financial support to SMEs will cover only 70% of the project budget (i.e. the maximum grant is 140,000 EUR). SMEs are expected to co-finance 30% of the project budget. The financial support for startups is 100% of the project budget and no co-financing is expected.

4.2.1. Open Call Timeline

Table 2: Timeline of the SOPRANO Open Call

Start of submissions to the SOPRANO Open Call	13 March 2025, 12:00 pm CET
Deadline for submission (SOPRANO Open Call closes)	14 May 2025, 17:00 CEST
Evaluation phase	Until mid-June 2025
Signing of Sub-Grant Agreements with selected applicants	Until mid-July 2025
SOPRANO Open Call program - implementation of funded projects	From mid-July 2025 until mid-November 2026

4.2.2. SOPRANO components to be used in the demonstrators

At least one of the SOPRANO components shown in Table 3 below should be integrated and used in the demonstrator proposal. Applicants should make sure to consult Annex 1.2 – Technical Description in order to understand the technical aspects of the component.

Table 3: Components that can be integrated by third parties in the framework of the Open Call

Component ID	Component name	Date when the component will be released
SC01	Visual Spatial Mapping [VLM]	Mid-2025
SC02	Object Perception [OBP]	Mid-2025
SC03	Non-Visual Localization [NVL]	Mid-2025
SC04	Human Monitoring [HMO]	Mid-2025
SC05	Mapping of High-level Plan to Robotic Capabilities [MRC]	Mid-2025 - early prototype
SC06	MH-MR Task Allocation [CTA]	Autumn 2025
SC07	Safety Tools [DSA & RSA]	Mid-2025 - DSA End-2025 - RSA

SC08	Scalable Simulation-Based Testing [SBT]	Mid-2025 - SBT prototype with scalable architecture End-2025 - SBT component enhanced with predictor
SC09	Human - Digital Twin [HDT]	End-2025
SC11	AI Trustworthiness [AIT]	Mid-2025 - explainability-driven testing module and runtime uncertainty estimation module End-2025 - enhanced AIT component with data augmentation module
SC12	Context Extraction Module [CEM]	Mid-2025
SC13	MH-MR Architecting Tools [MAT]	Mid-2025
SC14	MLOps Orchestrator [MLO]	Mid-2025 - early prototype
SC15	AI Model Optimizer [AIO]	Mid-2025 - initial release
SC16	Robotic Capabilities Implementation [RCI]	Mid-2025 - some capabilities (Object handling, Object manipulation) End-2025 - most capabilities (collaborative handover, unscrewing)
SC17	Advanced Visualizations [AVT]	Mid-2025 - initial release

The SOPRANO component **SC10 Responsible AI & Ethics (RAI)** will be mandatory for all selected applicants (see Section 4.12.2. Requirements for each phase - crosscutting requirements).

The maximum number of proposals to be selected per component (exploited alone or in a bundle) is 2. However, if there are multiple components without proposals, the Stage 1 ranking will be based on total score, regardless of the component (see Section 4.7. Step 4. Stage 1 Ranking of the Proposals).

4.2.3. Industrial Sectors

Table 4: Industrial sectors eligible in the SOPRANO Open Call

Preferred Industrial Sectors	**Open Sector**
Electronics	*Have you not found the right sector for your demonstrator?* Submit a proposal in a sector of your own choice (**) *** The sector must align with the SOPRANO objectives and must be one where human-robot interactions can be demonstrated to bring added value. The applicant should specify and justify the choice of sector in the proposal.*
Logistics	
Healthcare	
Packaging	
Metal/Machining	
Plastic/moulding	

SOPRANO is aiming at supporting demonstrator projects in a diverse set of industrial sectors in order to enable testing and validation of the SOPRANO technologies in different

environments and to ensure the components' wide applicability to European robotic solution developers in various economic sectors.

To that end, Stage 2 ranking may give preference to proposals from sectors that are underrepresented in the list of highest-ranking applicants (for more details, see Section 4.7 Step 5. Panel Consensus - Stage 2 Ranking and Final Selection).

4.2.4. Funded activities

The activities shown in Table 5 below should be planned and elaborated in each proposal submitted to the SOPRANO Open Call.

Table 5: Compulsory activities in SOPRANO Open Call proposals

Activity	**Phase**
Specification of the application scenario and associated use cases	Phase 1 – Design Duration: 3 months Jul - October 2025
Specification of additional requirements needed to support the proposed application scenario, and the measures on the basis of which the impact of the SOPRANO technologies will be evaluated	
Deployment of the SOPRANO technologies in the applicant's existing robotic systems development environment	Phase 2 – Implementation Duration: 10 months Oct 2025 - Aug 2026
Human-robot interaction analysis and modelling	
Demonstrator implementation in the form of an industry relevant prototype of a robotics solution addressing the proposed application scenario	
Evaluation and feedback by providing a comprehensive assessment of the impact of the SOPRANO technologies as per the quantified measures specified in Activity 2. *The activity involves participation of 2 persons in at least one physical meeting in the SOPRANO project*.	Phase 3 – Validation & Exploitation Duration: 3 months Aug - Nov 2026
Max budget	**€200,000.00**

4.2.5. Budget of the proposals

The maximum budget per proposal is 200,000 EUR. An example of budget distribution among the compulsory activities is shown in Table 6 below. It should serve as a guide for an optimal use of the budget. However, applicants will be asked to propose their own distribution which may be different. The extent to which the proposed distribution is reasonable and justified will be subject to evaluation.

Table 6: Proposed budget distribution per activity in SOPRANO Open Call proposals

Activity	**Example of budget per activity**
Specification of the application scenario and associated use cases	€12,500.00
Specification of additional requirements needed to support the proposed application scenario, and the measures on the basis of which the impact of the SOPRANO technologies will be evaluated	€25,000.00
Deployment of the SOPRANO technologies in the applicant's existing robotic systems development environment	€12,500.00

Human-robot interaction analysis and modelling	€25,000.00
Demonstrator implementation in the form of an industry relevant prototype of a robotics solution addressing the proposed application scenario	€87,500.00
Evaluation and feedback by providing a comprehensive assessment of the impact of the SOPRANO technologies as per the quantified measures specified in Activity 2. *The activity involves participation of 2 persons in at least one physical meeting in the SOPRANO project.*	€37,500.00
Max budget	**€200,000.00**
Max grant for SMEs (lump sum) 30% co-financing needs to be planned.	**€140,000.00**
Max grant for startups (lump sum)	**€200,000.00**

The applicant will be asked to present the budget of the proposal. The amount of the SOPRANO grant will be determined based on whether the applicant(s) qualify as startups (see Section 4.4.3. SME Eligibility and Startup Eligibility).

4.2.6. Requirements

Table 7: Requirements for the SOPRANO Open Call proposals

Requirement	Details
Use of Robot Operating System	ROS 2 (mandatory)
Types of robots	Pickers, Lifting, Pipetting Other types eligible if the applicant can convincingly demonstrate that the adaptation and integration efforts will be manageable within the 16-month program duration
Sensor types	Applicants should consult Annex 1.2. Technical Description. Additional types are eligible if the applicant can convincingly demonstrate that the adaptation and integration efforts will be manageable within the 16-month program duration
Technologies	AI-driven, Digital Twins, model-based. Additional ones are eligible if the applicant can convincingly demonstrate that the adaptation and integration efforts will be manageable within the 16-month program duration
TRL	Minimum starting TRL 5. Final TRL 7
Source code availability	The created software can be provided either as open-source code, or as proprietary code
Standards	Not mandatory. Depending on the domain it can be a specific industry standard
Programming language(s)	Applicants should consult Annex 1.2 Technical Description.
Ethics	• The applicants will perform a standard ethics self-assessment (included in Annex 2.1: Proposal Template). For awarded projects, SOPRANO will apply relevant evaluation and compliance frameworks for AI.

	• Disclosure regarding dual use or possible misuse. The applicant must disclose the capabilities of all co-developed components or software.
Security and safety	• Protection of personal data • Disclose the possible and known risks and vulnerabilities concerning cybersecurity of any developed software or components • For human-robot interactions, disclose, plan and implement security measures for the safety of workers
Data management	Provide information about how data will be collected, generated and/or processed
IPR co-creation	In the case where the applicant produces software, data, know-how or information in cooperation with other partners, the applicant cannot become the sole operator for this use-case. In the sub-grant agreement, applicants shall identify their Background for the sub-project and should also, where relevant, inform the SOPRANO consortium that access to specific Background is subject to legal restrictions or limits.
Ideal candidate	An organization with an interest in exploiting the SOPRANO technologies in practice and integrating them to its standard processes.
Resources provided by SOPRANO	• SOPRANO components • Assigned contact person(s) from SOPRANO (administrative support) • Assigned technical person(s) from SOPRANO (implementation support) • Integration and validation support • Dissemination of achievements
Expected final outcome	The final outcome should be the demonstrated use of the SOPRANO modules in the selected industrial sector in the form of an industry relevant prototype at TRL 7 (system prototype demonstrated in a relevant environment). This should be supported by an evaluation report and an exploitation plan.
KPIs	KPI01: Successful deployment of the use case in the selected industrial sector - an industry relevant prototype (Target value: >= 1) KPI02: N of SOPRANO components implemented in the use case application (Target value: >= 1) KPI03: N of different scenarios for validation specified for the use case application (should be used to test the developments and improvements provided by the SOPRANO technologies) (Target value: >= 3) KPI04: Number of different quantifiable evaluation measures (with target values relevant to the identified validation scenarios) defined and evaluated in the demonstrator use case (Target value: >= 5) KPI05: Applicant-defined indicators, specific to the proposed project but pertaining more broadly to the demonstration and validation of the SOPRANO technologies (Target value: >= 3) KPI06: Applicant-defined KPI regarding the number of users that will be included in the final User Engagement Study (suggested/indicative value: 10)

Examples of evaluation scenarios developed in the SOPRANO project's internal use cases.

The following examples are use-case-specific and should only be taken as examples of possible validation scenarios and evaluation measures. Applicants are encouraged to determine

validation scenarios and evaluation measures (with targets to be achieved) specific and tailored to their own use case, solution and industrial sector.

Use case	Examples of validation scenarios	Examples of evaluation measures
Residential Building Renovation	Localization, Navigation, Obstacle detection, Human interaction, Data handling	Localization in Test area, Accuracy in recognition of room dimensions and layout, Accuracy of assigned agent actions, Autonomous navigation without collision (duration), Achieving target location with distance tolerances with respect to objects, Positional and angular localization errors during navigation, Object detection and localization success rate (percentage), Obstacle detection during navigation, Detecting Humans in the room and their location (accuracy), Time reduction in the reconfiguration scenarios that can be implemented, etc.
Vehicle Door Disassembly	Safety, Reconfiguration, Productivity, Multi-Robot interactions, Multi-Human interactions	Positional and angular localization errors, Object detection and localization success rate (percentage), Accuracy of assigned agent actions, Reduction in safety-critical incidents/near misses with MH-MRs (percentage), Cost and time reduction for reconfigurations due to requirements change, Time reduction for ML model retraining, validation and serving, Average time improvement in completing different tasks with robot support, Improvement in worker satisfaction in performing their tasks with robot support
Symbiotic Farming	Harvesting mode, Unloading mode, Hand gestures, Following mode	GNSS-based localization in the field (outdoors), Object detection and localization success rate in the field, Accuracy of assigned agent actions, Achieving target location at loading point, Detecting humans on the field and giving their respective location, Detecting human posture (success rate), Keeping safe distance to humans (accuracy), Obstacle detection (success rate), Time reduction in the validation of safety scenarios, Robustness test of more scenarios than current practice.

4.3. Confidentiality

Any information regarding the proposal will be treated in a strictly confidential manner.

4.4. Eligibility Criteria

All applicants will have to abide by all general requirements described in this section to be considered eligible for the SOPRANO OC. The eligibility check verifies that:

- Submissions are made only through the SOPRANO application form on the F6S platform, within the defined deadline (https://www.f6s.com/soprano-open-call/apply)
- Applicants are legal entities established in a country eligible to participate in the Horizon Europe program, as indicated in Section 4.4.5 Eligible Countries. In the case of consortium applications, each of the consortium members should comply with this requirement.

- The application as well as the requested documents are to be provided only in the English language.
- The proposal description is submitted according to the Guidelines for Applicants and the provided templates.
- In the case of consortium applications, a maximum of 3 entities make up the consortium.
- The budget of the proposal does not exceed the maximum.
- The application is complete and includes the requested administrative data and any obligatory supporting documents specified in the Open Call.
- A proposal is only considered eligible if its content corresponds specifically to the requirements of the exploited components and the selected industrial domain, including any specific eligibility conditions set out in the relevant parts of the Open Call documentation.

Applications that do not comply with those criteria will be considered ineligible and will not be evaluated.

4.4.1. Deadline

Only proposals submitted before the deadline will be accepted. After the OC closure, no additions or changes to the received proposals will be considered.

Submission to the SOPRANO Open Call is open between 13 March 2025, 12:00 pm CET (Brussels time) and 14 May 2025, 17:00 CEST (Brussels time). The hour of the submission deadline is not flexible; the online form will be automatically disabled at 17:00 CET. To avoid missing the deadline, the applicants are strongly encouraged to submit the proposal as soon as possible.

4.4.2. Type of Beneficiary (Applicant)

SOPRANO will fund third-party projects submitted by:

- Single applicants (must be robotics SMEs or startups)
- Consortiums of 2 or 3 entities, all of which must be robotics SMEs or startups.

All entities (whether single applicants or part of a consortium) must be:

- Innovative SME/Startup robotics technologies/services company
- A SME according to the EU definition (see Section 4.4.3 SME Eligibility and Startup Eligibility)
- An entity from an eligible country (see Section 4.4.5 Eligible Countries)
- An entity that is able to prove their financial stability and capacity
- An entity that is established at least one year before the submission of the application.

4.4.3. SME Eligibility and Startup Eligibility

A SME will be considered as such if it complies with the European Commission Recommendation 2003/361/EC and the SME Qualification Guide. In summary, a company is an SME eligible in this Open Call if it meets both of the following criteria:

- Headcount in Annual Work Unit less than 250.

- Annual turnover less or equal to €50 million EUR or annual balance sheet total less or equal to €43 million EUR.

An applicant that is not an autonomous SMEs but is instead a partner enterprise is required to add a proportion of its partners' staff headcount and financial data to its own when determining its eligibility for SME status and checking if it respects the thresholds mentioned in the definition.

An applicant that is not an autonomous SMEs but is instead a linked enterprise is required to add 100% of the linked enterprises' staff headcount and financial data to its own when determining its eligibility for SME status and checking if it respects the thresholds mentioned in the definition.

For a concise and user-friendly definition of what is a partner enterprise and a linked enterprise, and a description of the correct way of checking eligibility for SME status, please consult the SME Qualification Guide.

SMEs that do not yet have a balance sheet and profit and loss account can also be considered eligible given that they fulfil the criteria (a) and (b) at submission time and that they are established at least one year before the date of submission of the application. In this case, the financial data that shall be used to determine SME status shall be derived from a reliable estimate made over the financial year.

The SOPRANO Open Call will regard as an **eligible startup** an SME that meets all the requirements below:

- Is established at least 1 year but not more than 5 years before the date of submission of the application.
- Has headcount in Annual Work Unit less than 50.
- Annual turnover less or equal to €50 million EUR or annual balance sheet total less or equal to €43 million EUR.

Additional conditions apply for SME/startup eligibility:

- The applying SME(s)/startup(s) should not:
  - Have convictions for fraudulent behaviour, other financial irregularities, or unethical or illegal business practices.
  - Have been declared bankrupt or have initiated bankruptcy procedures.
  - Be under liquidation or an enterprise under difficulty according to the Commission Regulation No 651/2014, art. 2.18
  - Be excluded from the possibility of obtaining EU funding under the provisions of both national and EU law, or by a decision of both national or EU authority
- Proposals must ensure that there is no risk of double funding. The fundamental principle underpinning the rules for public expenditure in the EU states that no costs for the same activity can be funded twice from the EU budget, as defined in Article 111 of Council Regulation (EC, Euratom) No 1605/2002 of 25 June 2002 on the Financial Regulation.

4.4.4. Consortium Eligibility

Consortia are eligible if they consist of 2 or 3 eligible SMEs/startups. Consortia including members that are not SMEs or do not fully meet all eligibility criteria will automatically be regarded as ineligible. To be treated as a consortium of startups, the consortium must include only applicants that qualify as startups according to the definition above.

4.4.5. Eligible Countries

Entities legally established in any of the following countries (hereafter collectively identified as the "Eligible Countries") are eligible:

- The Member States of the European Union (EU), including their outermost regions.
- The Overseas Countries and Territories (OCT) linked to the Member States.
- Horizon Europe associated countries (Association to Horizon Europe is governed by the Horizon Europe Regulation 2021/695): according to the updated list published by the EC (https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/list-3rd-country-participation_horizon-euratom_en.pdf)

The UK applicants are not eligible under the conditions set by the EC for Horizon Europe participation at the time of the deadline of the OC.

4.5. Proposal Submission: How to Apply?

4.5.1. General Instructions

Proposals must be submitted electronically, using the SOPRANO Online Submission Service accessible via the F6S platform at: https://www.f6s.com/soprano-open-call/apply. The applicants are required to register a profile at F6S to submit a proposal.

The templates of the documents needed for application submission are available at: https://www.soprano-project.org/open-call. These are:

- Annex 1.2 Technical Description: the document contains important technical information about the SOPRANO components.
- Annex 2.1 Proposal Template: the document contains the description of the proposed project. It must be filled in, converted to PDF format and uploaded as part of the application form on the F6S platform. Falling to submit this document, uploading another document not using the provided template, modifying the template or otherwise failing to submit the document properly will result in the proposal being considered ineligible.
- Annex 2.2 Proposal Budget Template: the document contains the detailed budget of the proposed project and must be uploaded - in Excel or equivalent format - as part of the application form on the F6S platform. Falling to submit this document, uploading another document not using the provided template, modifying the template or otherwise failing to submit the document properly will result in the proposal being considered ineligible
- Annex 2.3 Application Form at F6S: The form template is for reference only. The application form should be filled online directly at the F6S platform.

The templates of the documents that must be submitted only by the selected applicants are available at https://www.soprano-project.org/open-call. These are:

- Annex 3.1 Declaration of Honour or Annex 3.2: Consortium Declaration of Honour: templates of the declaration of no conflict of interest and that all conditions related to the SOPRANO Open Call are accepted by the applying entity(ies). The signed and stamped declaration must be submitted upon acceptance of the proposal for funding.
- Annex 4 SME Declaration: the signed and stamped declaration must be submitted upon acceptance of the proposal for funding (check Section 4.4.3 SME Eligibility and Startup Eligibility).
- Annex 5 Declaration of Financial Stability. Upon acceptance of the proposal for funding, the signed and stamped declaration must be submitted by a) a single applicant or b) the consortium lead.
- Annex 6 Sub-grant Agreement Template.
- Annex 7 Bank account information.

Applying to an Open Call takes time and dedication and we would like to make sure that you understand the crucial rules:

- Be on time: Make sure you submit your proposal on the F6S platform before the deadline: 14 May 2025, 17:00 CEST. Upon correct submission, the system will send you a submission confirmation email (please check your Spam folder as well). Proposals submitted by any other means are ineligible. It is strongly recommended that you not wait till the last moment of submission. Failure of the proposal to arrive in time for any reason, including communications delays or network issues, is not acceptable and will automatically lead to rejection of the submission. The time of receipt of the proposal as recorded by the submission system will be definitive.
- The project proposals must strictly adhere to the F6S application form and the proposal templates, which define sections, required annexes, and the overall length. Participants are requested to carefully read and follow the instructions in the form. All required sections in the application form must be answered and all the required annexes must be filled in and uploaded correctly. Additional material, which has not been specifically requested, will not be considered in the evaluation of the proposals and may cause the applicant to be removed from the evaluation process.
- The F6S platform allows you to work flexibly on the content and saves the progress of your work automatically. All members of your team can access and contribute to the application form.
- Documentation format: Any requested document must be submitted electronically, as a single document, and in the required format. If PDF format is required, the documents must be submitted without restrictions for printing.
- After submission of the application, editing or adding information is not possible. An applicant that discovers an error in the proposal sufficiently early before the deadline may request the SOPRANO OC team to reopen the proposal and enable resubmission by sending an email to open-call@soprano-project.org, titled: RESUBMISSION REQUEST. Requests sent less than 48 hours before the Open Call deadline will not be considered.

4.5.2. Multiple Submissions

Up to two applications per entity (and its affiliated or linked enterprises) can be evaluated. In case an entity and its affiliated or linked enterprises have submitted or participate in more than

2 proposals, only the last two proposals (as per the timestamp of submission on the F6S platform) will be evaluated.

The SOPRANO OC is competitive and multiple applications are generally not recommended. **Any entity (and its affiliated or linked enterprises), applying solely or as part of a consortium, may only be funded for one project.** In case an entity and its affiliated or linked enterprises have submitted or participate in two evaluated proposals in this OC and both proposals have been shortlisted for funding, only the proposal with the higher score will be accepted for funding.

Note that the regular functioning of the F6S platform limits the user to one application submission in each OC. An F6S user that wishes to submit more than one application should request support from the F6S support team support@f6s.com at least 10 days prior to the OC deadline.

4.5.3. Language

English is the official language in the SOPRANO Open Call. Submitted proposals written in any other language will not be evaluated. English is also the only official language during the whole execution of the SOPRANO program. It is mandatory that all submitted reports and deliverables are in the English language. Reports and deliverables submitted in any other language will not proceed for review and will not be accepted.

4.6. Conflict of Interest

IMPORTANT: To avoid conflict of interest, applications will not be accepted from persons or organizations who are partners in the SOPRANO consortium or who are formally linked in any way to partners of the consortium. Please check the list of partners at https://www.soprano-project.org/.

Applicants should not have any actual or/and potential conflict of interest with the SOPRANO selection process and during the whole project. The awarded proposals will be required during the contracting phase to declare that they know of no such potential conflicts of interest by submitting Annex 3.1 Declaration of Honour or Annex 3.2 Consortium Declaration of Honour.

All suspected cases of conflict of interest will be assessed case by case. In particular, applicants must take all measures to prevent any situation where the impartial and objective implementation of the project is compromised for reasons involving economic interest, political or national affinity, family or emotional ties or any other shared interest (‘conflict of interest’).

4.7. Evaluation Process

Step 1. Eligibility Check

Eligibility to participate in the funding program is assessed by the SOPRANO team only for proposals submitted on the F6S platform by the set deadline. The initial check is done as Step 1 of the SOPRANO evaluation, but a proposal may be declared ineligible or inadmissible at any stage.

The eligibility check will include:

- Verification that all entities involved in the proposal are legal entities registered in an eligible country.

- Verification that all entities involved in the proposal are SMEs according to the applicable definition.
- Verification that the same entity is not involved in more than 2 other proposals. If this is the case, only the last two proposals, as per the timestamp of submission, will be considered.
- Verification that the consortium application has a minimum of 1 and a maximum of 3 partners (if relevant).
- Verification that the proposal budget does not exceed the maximum allowed budget.
- Verification that the correctly completed Proposal Template and Proposal Budget Template are submitted.
- Verification that all required sections of the proposal are completed. Proposals that lack actual and adequate content in a required section may be removed from the evaluation process.
- Verification that the whole proposal is written in English. If a required section is submitted in another language, the proposal may be removed from the evaluation process.
- Verification of the originality of the proposal.
- Verification that all entities meet the eligibility requirements for European Commission funding under Horizon Europe regulations.
- Verification that there is no conflict of interest for any of the entities involved in the proposal.
- Verification that the proposal is sufficiently aligned with the SOPRANO Open Call. Proposals that are unrelated to the SOPRANO technologies or are otherwise outside of the scope of the OC will not be evaluated and will be rejected. The degree of alignment with the SOPRANO project will be further evaluated in the next stages of the evaluation process.

The applicants that are not eligible or have submitted non-eligible proposals will be informed via email. No further feedback will be provided at this point.

Step 2. Evaluation of the Eligible Proposals

Eligible proposals will advance to the evaluation phase. Each proposal will be assigned to two expert evaluators with suitable expertise from within the SOPRANO consortium. All evaluations will be conducted remotely. At this stage the evaluators will work independently of each other. They are required to be impartial and objective, and to uphold the highest standards of integrity. At the end of the process, each evaluator will provide a signed Individual Evaluation Report detailing their assessment based on the established evaluation criteria.

All evaluators must confirm the absence of any conflicts of interest and are bound by the confidentiality rules and agreements applicable for all partners in the SOPRANO consortium. Any known conflicts must be immediately reported to the SOPRANO Open Call team.

Evaluation criteria

Evaluators will perform the assessments on the basis of the evaluation criteria shown in Table 8 below.

Table 8: SOPRANO Open Call evaluation criteria

Criterion	Sub-criteria	Threshold
Excellence	▪ Ambition: a) the extent to which the proposal is aligned with SOPRANO project objectives and the SOPRANO technologies and contributes to the SOPRANO project scope, b) the European dimension, c) novelty of the approach; going beyond the state-of-the-art in robotic systems and human-robot collaboration ▪ Innovation ▪ Feasibility and quality of the approach and the work plan	3/5
Impact	▪ Relevance, feasibility and ambition of the outcomes and KPIs ▪ Market potential of the solution ▪ Commercial strategy and scalability ▪ Environmental and social impact	3/5
Implementation	▪ Quality of the team, including management and leadership skills, technical skills, business skills ▪ Quality and effectiveness of the resources assigned to task implementation, demonstrator implementation and evaluation. In the case of SMEs, there will be a 30% self-financing of activities by each SME partner.	3/5

Scoring

The score on each criterion will be on the scale from 0 to 5:

- **0 = Fail**: The proposal fails to address the criterion or cannot be evaluated due to missing or incomplete information.
- **1 = Poor**: The criterion is inadequately addressed, or there are serious weaknesses.
- **2 = Fair**: The proposal broadly addresses the criterion, but there are significant weaknesses.
- **3 = Good**: The proposal addresses the criterion well, but a few shortcomings are identified.
- **4 = Very Good**: The proposal addresses the criterion very well, with only minor shortcomings.
- **5 = Excellent**: The proposal successfully addresses all relevant aspects of the criterion; any identified shortcomings are negligible.

Decimal scores, up to the second decimal point, are allowed.

The evaluators will document their assessments of the assigned proposals in Individual Evaluation Reports. The two Individual Evaluation Reports for each proposal will be compared and, in the absence of significant divergence between the scores of the two evaluators, the final score per criterion will be calculated as the average of the two evaluators' scores. The total score of the proposal will be the sum of the average scores of all individual criteria (the three criteria have equal weight in the final score).

In the case of significant divergence between the scores of the two evaluations on any of the criteria, the proposal will proceed to Step 3 of the evaluation process, namely the consensus evaluation (see Section 4.7).

Step 3. Consensus Evaluation

If the higher score exceeds the lower score with more than 30%, the scores of the evaluators will be considered significantly divergent. If this happens in any of the criteria, the two evaluators will reach consensus and will agree on scores for each criterion that are not significantly divergent. After the consensus, the total scores will be calculated in the same manner as in Step 2.

Step 4. Stage 1 Ranking of the Proposals

At the beginning of this stage, the SOPRANO consortium reserves the right to invite some of the applicants to an online interview if there is doubt about any aspect of the proposal. If such an interview is held, the scores on each criterion will be determined by the SOPRANO interview board and will supersede any scores received in the previous evaluation steps. These scores will be considered final.

Once all the proposals have final scores per criterion and final total scores, a ranking list will be generated.

The threshold score in each of the three criteria will be 3, and the **overall threshold for the whole proposal will be 10**. Proposals scoring below 3 in any individual criterion or below an average total of 10 points will be rejected and will not be included in the Stage 1 ranking.

Proposals that pass the thresholds will be included in the Stage 1 ranking, which will follow these rules:

- **Rule 1**: Proposals will be ranked according to their overall score.
- **Rule 2**: If proposals have the same overall score, priority will be given to those that better align with the SOPRANO scope (Criterion 1: Excellence).
- **Rule 3**: If a tie remains after applying Rule 2, priority will be given to proposals with higher impact and market potential (Criterion 2: Impact).
- **Rule 4**: If proposals are still tied, preference will be given to teams with a higher number of female development personnel.
- **Rule 5**: If a tie persists after applying Rule 4, priority will be given to proposals requesting lower funding.

In the unlikely event that proposals remain tied after all the above rules have been applied, the SOPRANO consortium will break the tie during the next step of the evaluation, namely the panel consensus.

Step 5. Panel Consensus - Stage 2 Ranking and Final Selection

The OCOC will meet for a final review of the evaluation process, a panel discussion and consensus on the final ranking.

At this stage, the OCOC - working on the basis of consensus - may give preference to applicants from underrepresented sectors over shortlisted proposals that are in a sector already covered by 2 shortlisted proposals with a higher score. The OCOC will ensure that the final

adjustment for sectoral diversity will not jeopardize the overall quality of the Open Call demonstrators. Preference for proposals in underrepresented sectors will not be given in cases when these proposals are of significantly lower quality than the shortlisted proposals in the overrepresented sectors.

4.8. Communication of the SOPRANO Open Call Results

4.8.1. Evaluation Summary Report

The Open Call team will summarize the anonymised results of the evaluation in a single Evaluation Summary Report (ESR) for each proposal. The ESR will be sent to the applicant to the email address indicated in the application form as the preferred contact for this application. In the case that the delivery of this email fails due to wrongly written or non-existent email address provided by the applicant, the Open Call team has no obligation to search for alternative communication channels to deliver the ESR.

4.8.2. Redress process

Within 5 working days after receiving an individual Evaluation Summary Report considering the application as not applicable for funding (non-eligible or below the selection threshold), the applicant may submit a request for redress if s/he believes the results of the eligibility check have not been correctly applied, or if s/he feels that there has been a shortcoming in the way his/her proposal has been evaluated that may have affected the final decision on whether to receive funding. Requests must:

- Be related to the evaluation process or eligibility check.
- Clearly describe the complaint.
- Be received within the time limit (5 working days) from the reception of a rejection letter or an Evaluation Summary Report. Requests for redress will be treated as confidential and must be sent to the SOPRANO OC official email address only: open-call@soprano-project.org.
- Be sent by the legal representative of the SME's that has submitted the application.

The OCOC will examine the received appeals, ensuring a coherent interpretation of such requests, and the equal treatment of all applicants. If there is clear evidence of a shortcoming that could have affected the eventual funding decision, it is possible that all or part of the proposal will be re-evaluated.

Please note:

- This procedure is concerned only with the evaluation and/or eligibility checking process and will not call into question the expertise of the evaluators.
- A re-evaluation will only be carried out if there is evidence of a shortcoming that affects the final decision on whether to fund the proposal or not. This means, for example, that a problem relating to one evaluation criterion will not lead to a re-evaluation if the application has failed anyway on other criteria.
- The evaluation score following any re-evaluation will be regarded as definitive. It may be lower than the original score.
- Only one redress request per application will be considered.

- In case a proposal under the redress procedure is re-evaluated and the new evaluation score is higher, it will be compared with the lowest ranking of the funded proposals. The comparison will use the ranking rules and procedures as expressed in the sections on evaluation above. In case the proposal under the redress procedure ranks higher, it will be funded.

4.9. Data Protection during Evaluation & Selection

To process and evaluate applications, the SOPRANO consortium will need to collect personal and industrial data. F6S Network Ireland Limited (F6S) will act as Data Controller for data submitted through the F6S platform for these purposes. Please see our privacy policy here. A Data Protection Officer (DPO) has been appointed by F6S generally, to ensure compliance with data protection regulations, such as the General Data Protection Regulation (GDPR), and that personal data is collected, processed, and stored in a secure manner. The F6S platform's system design and operational procedures ensure that data is managed in compliance with the General Data Protection Regulation (EU) 2016/679 (GDPR). Each applicant will have to accept the F6S terms to ensure compliance. Please refer to https://www.f6s.com/privacy-policy to review the F6S platform's privacy policy and data security policy. Apart from the F6S platform, data will also be stored in the F6S Google Drive. Please note that the SOPRANO consortium must retain generated data until five years after the balance of the SOPRANO project is paid or longer if there are on-going procedures (such as audits, investigations or litigation). In this case, the data must be kept until the end.

4.10. Origin of Funds

The selected SMEs will sign a Sub-grant Agreement with the SOPRANO coordinator (on behalf of the SOPRANO consortium). As will be indicated in the Sub-grant Agreement, this relation between the SOPRANO beneficiaries and the European Commission through the SOPRANO project carries a set of obligations of the SOPRANO Open Call beneficiaries to the European Commission. It is the task of the SOPRANO Consortium partners to inform about them, and the SOPRANO beneficiaries to accomplish them. The funds attached to the Sub-grant Agreement come directly from the funds of the European project SOPRANO, and the SOPRANO consortium is managing the funds according to Grant Agreement No. 101120990 signed with the European Commission.

4.11. Contracting

At the end of the evaluation, the top-ranked proposals will be selected, up to the available budget for this Open Call. The other proposals will remain on a reserve list in case one of the selected proposals fails to sign the sub-grant agreement.

4.11.1. Contract preparation

The SOPRANO coordinator will start the contract preparation in collaboration with the selected single applicant or the lead partner of the selected consortium. Contract preparation will involve administrative and financial checks (and potentially technical or ethical/security negotiations) based on the evaluators' comments. On a case-by-case basis, an online meeting may be needed for clarification.

The objective of the contract preparation is to ensure that the applicant (single SME or a consortium) fulfils the legal requirements for entering the SOPRANO Open Call program (see Table 9 - Requirements for contract preparation). The following will be covered:

- Inclusion of the comments (if any) provided in the proposal ESR into the Sub-grant agreement (Contract).
- Validation of the legal documents of the applicant and any consortium members.

Note: the contract as provided to the sub-grantee is final and may not be changed, including the addition or removal of any articles or other content. All documentation that requires a signature (e.g. Declaration of Honour, SME Declaration(s), Bank Account, and sub-grant agreement must be signed by the legal representative of the organization by hand (e.g. with the same signature as on the identity card) or with a valid electronic digital signature. SOPRANO reserves the right to request one or the other types of signatures for specific documentation.

Table 9: Requirements for contract preparation

Legal requirement	Description
Proof of legal existence	Company register, official journal or other official document per country showing the name of the organization, the legal address and registration number and a copy of a document proving VAT registration (in case the VAT number does not show on the registration extract or its equivalent)
Proof that each single applicant and each consortium member are SMEs	*1. Proof of SME condition* ▪ The beneficiary must submit Annex 4 SME Declaration, signed by the legal representative (with a valid e-signature or by hand) and stamped. The declaration must provide information about the headcount (AWU), balance, profit & loss accounts of the latest closed financial year and indication of any relation, upstream and downstream, to any linked or partner enterprise. In the event the beneficiary has declared that it is not an autonomous SME (e.g. linked enterprise or a partner enterprise), the balance sheets and profit and loss accounts (with annexes) for the last financial year for upstream and downstream organizations are required. ▪ If the applicant has been fully validated as an SME on the Beneficiary Register Participant Portal, the PIC number must be provided. *2. Supporting documents* In cases where either the number of employees or the ownership is not clearly identified: any other supporting documents that demonstrate headcount and ownership such as payroll details, annual reports, national regional, association records, etc.
Declaration of Honour (Annex 3.1) *or* Consortium Declaration of Honour (Annex 3.2)	Signed declaration that all conditions related to the SOPRANO Open Call are accepted by the applying entity(s).
Bank account information (Annex 7)	The account where the funds will be transferred will be indicated via a specific form signed by the entity and the bank owners. The holder of the account will be the entity.
Declaration of Financial Stability (Annex 5)	The Declaration of Financial Stability needs to be signed by the Legal Representative of the single applicant or the consortium leader. By signing this declaration, the lead partner in the consortium assumes responsibility for the financial implementation of the SOPRANO proposal.
Sub-grant agreement (Annex 6)	Signed between the SOPRANO consortium, represented by its coordinator (ATB), and the beneficiary. The sub-grant agreement will also include the comments (if any) in the proposal's ESR to the work plan.

4.11.2. Contract signature

At the end of the contracting phase, the sub-grantee funding agreement will be signed between the SOPRANO Consortium represented by its coordinator (ATB), and the selected beneficiary, represented by its leader (if consortium). The contract should be signed by the Legal Representative of the applicant (or the consortium leader). In case of applying consortia, the consortium leader and the other consortium partners are responsible to conclude an agreement that shall cover the rights and obligations between them.

4.12. The SOPRANO Open Call Program

4.12.1. Structure of the Program

Table 10: Structure of the SOPRANO Open Call Program

Phase name	Duration (months)	Activity	Means of verification	Funding (*) % of the grant
Contracting and preparation	1 month Jun - Jul 2025	▪ Finalization of contracting ▪ Administrative preparations ▪ Kick-off meeting	Signed contractual documents Presence at kick-off meeting	10% pre-financing
Design	3 months Jul - Oct 2025	▪ Specification of the application scenario and use cases ▪ Specification of additional requirements needed to support the proposed application scenario, and the measures based on which impact will be evaluated	Assigned deliverable(s)	20% following a successful review and submission of the assigned deliverables (*)
Implementation	10 months Oct 2025 - Aug 2026	▪ Deployment of the SOPRANO technologies in the applicant's robotic systems development environment ▪ Human-robot interaction analysis and modelling ▪ Demonstrator implementation ▪ Industry relevant prototype of a robotics solution addressing the proposed application scenario	Assigned deliverable(s)	40% following a successful review and submission of the assigned deliverables (*)
Validation and Exploitation	3 months Aug 2026 - Nov 2026	Evaluation and feedback by providing a comprehensive assessment of the impact of the SOPRANO technologies	Assigned deliverable(s)	15% following a successful review and submission of the assigned deliverables (*)
Closure		Final approval of the SOPRANO deliverables, following the final review and payment of the balance	Participation in SOPRANO review meeting or another dissemination event	15% following the receipt of the final balance payment in the SOPRANO project

(*) Associated with a positive assessment of the required deliverable(s) and KPIs.

4.12.2. Requirements for each phase

Table 11: Summary of requirements for each phase of the SOPRANO Open Call Program

Minimum deliverables required (M-month, D-deliverable)	**Phase 1 (M3)** D1. Requirements, Specification, Design and Implementation plan (detailed roadmap for SOPRANO components integration and deployment of the demonstrator) D2. Performance Report (End of Phase 1) *Phase 1 Review*	**Phase 2 (M13)** D3. Demonstration of an industry relevant prototype (MVP) D4. Video demonstrating the use-case D5. Technical and Performance Report, including the collection of relevant data (End of Phase 2). *Phase 2 Review*	**Phase 3 (M16)** D6. Evaluation report (Gathering the assessment of the use case regarding the technical, economical, ecological and sociological impact of the solution; review of the achieved KPIs). D7. User engagement study D8. Exploitation Plan D9. Final Performance Report Participation in at least one SOPRANO meeting (in-person event) - 2 persons from the team *Phase 3 Review*
KPIs	KPI01: Successful deployment of the use case in the selected industrial sector - an industry relevant prototype (Target value: >= 1) KPI02: N of SOPRANO components implemented in the use case application (Target value: >= 1) KPI03: N of different scenarios for validation specified for the use case application (should be used to test the developments and improvements provided by the SOPRANO technologies) (Target value: >= 3) KPI04: Number of different quantifiable evaluation measures (with target values relevant to the identified validation scenarios) defined and evaluated in the demonstrator use case (Target value: >= 5) KPI05: Applicant-defined indicators, specific to the proposed project but pertaining more broadly to the demonstration and validation of the SOPRANO technologies (Target value: >= 3) KPI06: Applicant-defined KPI regarding the number of users that will be included in the final User Engagement Study (suggested/indicative value: 10)		

Requirements for Phase 1 (Design)

Within this phase, which has a duration of 3 months, the Beneficiary(ies) must set the implementation plan, including key requirements and roadmap for the development and deployment of the demonstrator within the selected industrial sector. The implementation plan shall be aligned with the integration of SOPRANO and the fulfilment of the project's objectives.

The Design phase should include the following:

- Description of how the project will be carried out.
- List of detailed milestones, deliverables and KPIs to achieve (metrics and target values for how the success will be determined).

- Description of the technologies that will be used.
- POC illustrating the use case and the technology they will bring.
- Development of requirements
- Development of specifications
- User stories, if applicable.

At the end of the Phase 1, the Beneficiary(ies) will have to deliver the assigned deliverable as a means of verification of work performed. It must include a publishable summary of the results obtained at this stage. A specific report can be requested by the SOPRANO team.

Requirements for Phase 2 (Implementation)

Phase 2 lasts 10 months. Projects will perform their development and deployment, based on the implementation plan developed in Phase 1. The Beneficiary(ies) should consider the following:

- Development and showcasing of an MVP.
- Video demonstrating the prototype.
- Provision of a Technical and Performance Report, including the collection of relevant data.
- Provision of additional deliverables and proof of achieved KPIs as per the requirements and implementation plan of the applicant.

Reports provided must include a publishable summary of the results obtained at this stage. A specific report can be requested by the SOPRANO team.

Requirements for Phase 3 (Validation and Exploitation)

Phase 3 lasts 3 months. This phase is critical to leverage the results of the previous phases. The aim is to validate the demonstrator and foster the exploitation of project results. Within this phase, projects must focus on the validation, assessment, and exploitation of results/achievements. The assessment and exploitation should include the following:

- System prototype demonstration in an operational environment (TRL7).
- Evaluation report
- Deliverables and KPIs required by the SOPRANO program and those KPIs set by the applicant in the proposal.
- Materials for communication & dissemination.
- Proposal for an exploitation plan.
- Report of a user study to assess the demonstrator, with as many users as the applicant has indicated in the proposal (applicant-defined KPI). Participants should accept to conduct user studies and publish the results in scientific conferences/journals.

At the end of Phase 3, the Beneficiary(ies) will have to deliver the assigned deliverables as a means of verification of work performed. A publishable summary of the project's results and feedback to the obligatory Impact Assessment that will be run by the Open Call management should also be provided. A specific report can be requested by the SOPRANO team.

Crosscutting requirements (all Phases)

SOPRANO will apply relevant evaluation and compliance frameworks for AI through the **Responsible AI & Ethics component** (SC09).

The responsible use of AI will be monitored and evaluated through an ethical readiness evaluation tool that ensures that best ethics-by-design practices are followed, including privacy protection, and compliance with the upcoming European regulation on AI. The main functionality of the evaluation is to provide a comprehensive assessment of the ethical readiness of SOPRANO components from design to deployment. This assessment encompasses a modular structure (to ensure that only relevant indicators are evaluated) and a wide range of indicators based on EU frameworks - ALTAI principles, GDPR, AI Act. The tool and the broader evaluation process seeks to ensure that SOPRANO creates solutions that are not only technologically advanced but also socially responsible and aligned with European values.

The ethical evaluation tool is designed with a structured and modular approach. It employs a set of indicators derived from existing guidelines and regulations, adapted to the specific terminology and context of robotics. These indicators cover the main aspects of ethical AI development, such as transparency, accountability, fairness, and human oversight. The evaluation process involves a collaborative dialogue between technical experts and ethics experts, ensuring that the assessment is targeted and well understood by both sides. The tool also includes a scoring engine that enables tracking of ethical readiness over time, allowing for continuous improvement.

From a technical perspective, the ethics evaluation tool operates as a software platform that can be deployed locally or on the web. It takes as input the answers to indicators. Indicators are formulated as yes/no questions, and answers are discussed between an ethics expert and the technical owner before submitting. The evaluation dynamically adapts to previous answers, so that only relevant indicators are displayed. Finally, the set of indicators are scored and visualized. In addition to the score and the answers log, the two experts involved in the evaluation draft a narrative summary with the most important issues discovered and recommendations for further development. The evaluation is iterative and repeated to track progress over time.

4.12.3. Resources and Tailored Support Provided Within the SOPRANO Program

Financial support

The SOPRANO grant is provided in the form of a lump-sum - a fixed amount of money that can be used by the beneficiary(ies) for the implementation of the sub-granted project. Since the granting of a lump sum does not foresee the delivery of detailed financial reporting and timesheets, the use of the project budget will be controlled by monitoring and evaluating the actual implementation of the funded activities, the results and outputs produced, the submitted deliverables and reports, and the achieved impact.

Applicants will receive the awarded grant in several instalments, subject to a positive assessment of the required deliverable(s) and KPIs. The payment schedule is given in Section 4.12.1 Structure of the Program.

Implementation support

The SOPRANO Open Call program will implement a three-tier support model for the sub-granted projects. For the duration of the program each Beneficiary will have an immediate

contact person (Tier 1 Support) to whom all issues will be addressed. As needed, Tier 1 Support will escalate implementation and technical issues to Tier 2 Support persons (providing general technical support) and Tier 3 Support persons (providing specialized technical support). The SOPRANO consortium may appoint more than one Tier 1, Tier 2 and Tier 3 Support persons to a sub-granted project.

The Tier 1 Support will liaise with the other support tiers and the sub-granted project's team to ensure successful implementation – monitors the implementation and KPIs, escalates issues, collects the deliverables and reports from the beneficiary and shares them with the other support tiers for evaluation, organizes the reviews at the end of each program phase, reports to the SOPRANO coordination about the implementation progress and liaises with the other SOPRANO partners if this is necessary in order to address the needs of the sub-granted project. The Tier 1 support can organize regular check-ins for the awarded project and will decide whether Tier 2 and Tier 3 support should also be present.

Tier 2 and Tier 3 support persons will be individuals from the SOPRANO consortium with expertise in the topics and solutions being addressed within the project. They will be responsible for providing technical support (general and specialized), providing feedback, motivating, and evaluating the Beneficiary. They will facilitate the successful implementation of the sub-granted project's work plan, deliverables and reports, KPIs and results.

The SOPRANO consortium may organize, as needed, technical workshops and Ask Me Anything sessions to support the beneficiaries.

All three tiers of support will be involved in Phase 1, Phase 2 and Phase 3 reviews. Tier 2 and Tier 3 support persons will provide a technical evaluation of the deliverables and the reports submitted by the Beneficiary.

4.13. Responsibilities of the Beneficiaries

Selected third parties in SOPRANO are indirect beneficiaries of EC funding. They are responsible for the appropriate use of these funds and must ensure compliance with all obligations under the Horizon Europe framework. This includes adhering to any specific requirements set forth by the EC and the SOPRANO consortium.

4.13.1. Data protection and confidentiality

Beneficiaries are required to keep confidential any data, documents, or other materials (in any format) identified as confidential at the time of contract signing, both during the implementation of activities funded by the SOPRANO Open Call and for four years after their completion. This confidential information must not be disclosed to third parties without obtaining prior written consent from the SOPRANO consortium.

Beneficiaries are permitted to share confidential information with members of the SOPRANO consortium and selected reviewers, provided these are bound by appropriate non-disclosure agreements (NDAs).

4.13.2. Promoting action and giving visibility to the EU funding

The selected Beneficiary(ies) must promote their program activities, the SOPRANO project, and its results by providing targeted information to various stakeholders, including the media and the public, in a strategic and effective manner that highlights the financial support of the EC. Detailed requirements will be specified in Annex 6 Sub-Grant Agreement.

Any publicity produced by the selected beneficiaries about the project, in any form or medium, must clearly state that it reflects only the author's views. It should also indicate that neither the European Commission (EC) nor the SOPRANO project is responsible for any use that may be made of the information contained therein.

The EC and the SOPRANO consortium are authorized to publish, in any form and on any medium, the following information:

- The names of the selected project members.
- Contact addresses of the selected projects.
- The general purpose of the projects.
- The amount of the financial contribution foreseen for the projects; after the final payment, the amount of the financial contribution received.
- The geographic location of the activities carried out.
- The list of dissemination activities and/or patent applications relating to the project results.
- The details, references, and abstracts of scientific publications related to the project results, and, if funded within SOPRANO, the published version or the final manuscript accepted for publication.
- The publishable reports submitted to SOPRANO.
- Any pictures or audio-visual or web material provided to SOPRANO within the framework of the project.

4.14. Intellectual Property Rights

When participating in the SOPRANO project, successful applicants may be involved, depending on the nature of the proposal, in a co-creation process with the current partners of the SOPRANO consortium. In the case where the applicant(s) produce software, data, know-how or information independently of any other partner, the applicant(s) will remain the sole owners of their respective IPR. In the case of co-creation with SOPRANO consortium partners, an IPR co-ownership may be negotiated if the results will be established through the joint efforts of multiple parties.

Each Beneficiary shall bear sole responsibility for ensuring that its acts within the project do not infringe third party property rights. Therefore, there is no obligation to conduct research with regard to the property rights of third parties.

In Annex 6 Sub-Grant Agreement the Beneficiary(ies) shall identify their Background for the Project and should also, where relevant, inform the SOPRANO consortium that access to specific Background is subject to legal restrictions or limits.

During implementation, access rights to results of the project and Background needed for the performance of the own work of a party under the project shall be granted on a royalty-free basis, unless otherwise agreed for Background in Annex 6.

For exploitation, access rights to results if needed for exploitation of a party's own results shall be granted on fair and reasonable conditions and upon prior written agreement.

The SOPRANO Consortium itself will not retain an equity stake in any applicant's company, nor will it retain any IPR. However, the SOPRANO Consortium will be granted the right to make internal use of any IPR that the applicants produce as part of their SOPRANO Open Call activities.

SOPRANO and the European Commission may ask participants who have received funding to present their work as part of public relations and networking events to showcase the benefits of the SOPRANO project.

4.15. Checklist

- Does your planned work fit with the Call for Proposals? Check that your proposed work does indeed address the SOPRANO Open Call objectives.
- Is your proposal eligible? The eligibility criteria are given in Section 4.4 Eligibility Criteria. Any proposal not meeting the eligibility requirements will be considered ineligible and will not be evaluated.
- Budgetary limits. Check that you comply with any budgetary limits as expressed in Section 4.12.1. Structure of the Program.
- Is your proposal complete? Have you completed all mandatory questions?
- Does your proposal provide the requested information? Proposals should be precise and concise, and must answer to requested information, which is designed to correspond to the applied evaluation. Omitting requested information will almost certainly lead to lower scores and possible rejection.
- Have you maximized your chances? Edit your proposal and strengthen or eliminate weak points.
- Have you submitted your proposal before the deadline? Failure of the proposal to arrive in time for any reason, including network communications delays, is not acceptable as an extenuating circumstance. The time of receipt of the application as recorded by the submission system will be definitive.
- Have you provided the necessary annexes? Are the PDF file containing the correctly completed Annex 2.1 Proposal Template and the Excel (or equivalent) file containing the correctly completed Annex 2.2 Proposal Budget Template uploaded as part of the application filled in on the F6S page?
- Do you need further advice and support? Communicate with the SOPRANO team in case of doubts.

Contact

The SOPRANO Consortium serves the following support:

- Open Call Documents and summary of the Open Call requirements: https://www.soprano-project.org/open-call
- For questions not answered in the documentation or other unforeseen communication needs, please contact the Help Desk: open-call@soprano-project.org
- F6S Online discussion board for SOPRANO: https://www.f6s.com/soprano-open-call/discuss
- F6S support team: support@f6s.com.