

TALOS

Guide for Applicants

TALOS Open Call

Submission of applications starts:
Submission deadline:

September 30, 2024
December 3, 2024 at 15:00 Brussels Time



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Table of acronyms

AGV	Autonomous ground vehicle
APV	Agri-photovoltaic pilot site
AUV	Autonomous underwater vehicle
FPV	Floating photovoltaic pilot site
LPV	Land-based photovoltaic pilot site
AgriPV	Agrivoltaics
AI	Artificial intelligence
API	Application Programming Interface
IoT	Internet of Things
O&M	Operation & Maintenance
OC	Open Call
PV	Photovoltaic
ROS	Robot operating system
UAV	Unmanned Aerial Vehicle
UGV	Unmanned Ground Vehicle

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1. Basic Info about TALOS

TALOS (roboTics and Artificial intelligence Living labs improving Operations in PV Scenarios) is a HORIZON EUROPE project co-funded by the European Commission. It is coordinated by CNET CENTRE FOR NEW ENERGY TECHNOLOGIES SA (EDP), with the participation of [13 partners](#) from 7 countries.

TALOS aims to transform photovoltaic (PV) energy and agriculture sectors by leveraging advanced robotics and Artificial Intelligence (AI). By integrating and implementing specialised solutions, the project enhances safety and efficiency in the operation and maintenance tasks of PV plants. Robotic automation aims to reduce dangerous, monotonous and dirty conditions while promoting human-robot collaboration.

TALOS will develop Robotics, AI and Data solutions tailored for 3 distinct PV energy scenarios: land-based, floating, and agriPV. These are the project objectives:






- 1** Showcase advanced robotics in monitoring, operation, and maintenance. 
- 2** Optimise collaboration between humans and robots. 
- 3** Enhance PV plant availability, reliability, and performance. 
- 4** Tackle robotics challenges in the energy-food nexus within the expanding AgriPV application sector. 
- 5** Provide environmental benefits through GHG emission reduction, water savings, and resource optimization. 

Figure 1 - TALOS Objectives

TALOS will launch an Open Call, with a total budget of EUR 1,800,000 to select from 9 to 13 SMEs and/or Startups acting as Technology Providers, to develop Robotic, AI, and Data solutions to address the Challenges of the 3 Pilot Scenarios as described in the section 3.2. of this Guide for Applicants.

Where can you find key information regarding this Open Call?

- This **Guide for Applicants** is the main document including the most important requirements that must be met by applicants.
- [Frequently Asked Questions](#) (FAQ) where you can find more information about our Open Call.
- TALOS application system: <https://talos-oc.fundingbox.com/> .
- If you have any technical problems or doubts when filling in the online Application Form at FundingBox, tell us directly at: TALOS.help@fundingbox.com, or post your questions in the Connected World Helpdesk in [Discord](#). [Here](#) you can find out how to access the Community.

2. What do we offer?

The TALOS Open Call will select from 9 to 13 individual Startups and/or SMEs, to develop robotics, AI, and data solutions. Applicants have to focus on addressing one of the Challenges that TALOS Consortium has defined for the 3 Pilot Scenarios (described in Section 3.2).

The initial idea is to select, at least, 3 projects per Pilot Scenario, but finally, it would depend on the quality of the proposals received and the alignment with Challenges as described in Section 3.2.

The maximum grant amount depend on the type of applicants (more details about the payment arrangements and funding rate can be found in [Section 5 of this GfA](#)):

- Startups will be covered for 100% of their eligible costs, up to EUR 200,000.
- SMEs that are not Startups can receive 70% of their eligible costs, up to EUR 140,000, with the remaining 30% required to be self-funded.

The total budget for this Open Call is EUR 1,800,000.

Beneficiaries from the TALOS Open Call will join the Support Programme lasting up to 9 months, which includes the following stages:

Stage no.	Name	Duration	Max. funding for Startups	Max . funding for SMEs that are not Startups
Stage 1	Individual Mentoring Plan (IMP), Definition & Virtual Prototype	1 month	12,000 €	8,400 €
Stage 2	Solutions Development	3 months	66,000 €	46,200 €
Stage 3	Solutions Integration & Demonstration	5 months	122,000 €	85,400 €

During the 3 Stages of the Support Programme, Technical Partners from the TALOS Consortium will provide technical support with expertise in engineering integration, testing and validation to support the selected beneficiaries in demonstrating the added value of their solutions to address the Challenges of the Pilot Scenarios. A technical support plan will be developed (and included in IMP) to support each Beneficiary and follow-up the Beneficiaries' Projects development, according to their necessities and TALOS Partners capabilities.

3. Eligibility Criteria

To participate in the TALOS Support Programme you have to meet all the criteria described in Section 3 of this Guide, positively pass our evaluation process described in Section 4 of this Guide for Applicants, and finally sign the Sub-Grant Agreement with the TALOS Consortium.

The projects that do not comply with all the criteria described in this section will be excluded. We will check the eligibility criteria during the whole evaluation process.

3.1. Who are we looking for?

We are looking for an individual Startup¹ or SME² legally registered as a company at the moment of the application submission to this Open Call in any of the following countries:

- [The Member States of the European Union](#)³ and its Overseas Countries and Territories (OCT)
- [Associated Countries \(AC\) to Horizon Europe](#)⁴.

The applicants who are subject to [EU restrictive measures](#) under Article 29 of the Treaty on the European Union (TEU) and Article 215 of the Treaty on the Functioning of the EU (TFEU)⁵ are not eligible to participate in this Open Call.

The TALOS Consortium partners, their affiliated entities, employees or permanent collaborators CANNOT be involved in the grantees' projects. They are not eligible to act as applicants in the TALOS Open Call.

¹ Startup refers to a tech-oriented SME. It should employ less than 10 people (but more than 2 full time equivalent staff) that has operated for less than three years and has attracted more than €50k early stage private sector investment or has demonstrable sales growth over 50% pa.

² An SME will be considered as such if it complies with the European Commission's Recommendation 2003/361/EC. As a summary, the criteria defining an SME are:

- Headcount in Annual Work Unit (AWU) less than 250;
- Annual turnover less or equal to €50 million OR annual balance sheet total less or equal to €43 million.

Note that the figures of partners and linked enterprises should also be considered as stated in the SME user guide. For detailed information check EU recommendation:

https://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition_en

³ Following the Council Implementing Decision (EU) 2022/2506, as of 16th December 2022, no legal commitments can be signed with Hungarian public interest trusts established under Hungarian Act IX of 2021 or any entity they maintain. Affected entities may continue to apply to calls for proposals. However, in case the Council measures are not lifted, such entities are not eligible to participate in the TALOS Open Call.

⁴ AC as of 27.09.2024: Albania, Armenia, Bosnia and Herzegovina, Canada, Faroe Islands, Georgia, Iceland, Israel, Kosovo, Moldova, Montenegro, North Macedonia, Norway, Serbia, Türkiye, Tunisia, United Kingdom, Ukraine, for the most up-to-date list please see first part of this [document](#).

⁵ Please note that the EU Official Journal contains the official list and, in case of conflict, its content prevails over that of the EU Sanctions Map.

3.2. What types of activities can be funded?

The activities that qualify for financial support under TALOS Open Call are the development of Robotics, AI and Data Solutions in order to address one of the Challenges defined for the 3 Pilot Scenarios by the TALOS Consortium.

These Robotics, AI and Data solutions have to be in compliance with TALOS Platform integration requirements as described per Challenge in [Annex 1 of this GfA](#).

The activities inside the TALOS Project are expected to start at a Technological Readiness Level (TRL)⁶ of 3-5 and to achieve a TRL 6-7. You can also check the [FAQ document](#) for a detailed explanation about TRL.

⁶ TRL - Technology Readiness Level - Technology Readiness Levels (TRLs) are indicators of the maturity level of particular technologies. This measurement system provides a common understanding of technology status and addresses the entire innovation chain. There are nine technology readiness levels; TRL 1 being the lowest and TRL 9 the highest. In our project, we refer to Annex B of the [General Annexes for Horizon Europe Work Programme 2021-2022](#) for a full description of TRLs.

TALOS Consortium has defined the following Challenges for each of the Pilot Scenarios:

	Challenge name	Pilots			
		Floating PV		Land-based PV	AgriPV
		Alqueva, PT	Alto Rabagão, PT	Ávila, ES	Randwijk, NL
1.	BVLOS aerial inspection	•	•	•	•
2.	Autonomous inspection flight for electroluminescence imaging and analysis	•	•	•	•
3.	Fire detection and deterrent system	•	•	•	•
4.	Deep learning based bird deterrent system	•			
5.	Autonomous detection of defects in underwater high-voltage cables	•	•		
6.	Inspection & maintenance of platform anchorages and/or mooring lines using AUVs	•	•		
7.	Prevention of algae growth and biofouling	•	•		
8.	Remote environmental quality control	•			
9.	XR tools for O&M teams	•	•	•	
10.	Pre-cleaning and soiling prevention coatings for PV panels	•	•	•	

11.	Autonomous detection of defects in underground high-voltage cables			•	
12.	Biodiversity (flora and fauna) identification and monitoring			•	
13.	Soil analysis using UAVs or AGVs:soil study			•	•
14.	Terrain analysis using UAVs or AGVs: topological study			•	•
15.	Inspection of the back sheet of the PV panels			•	•
16.	AI-based microclimate monitoring and recommendation system				•
17.	Autonomous agricultural practices for pear orchards				•
18.	Cleaning of the PV panels above the fruit trees				•
19.	Open innovation topic	•	•	•	•

* Challenge order does not mean any specific ranking or order of preference.

You can address only one of the Challenges per proposal. You can submit a maximum of 3 proposals, but only the one with the highest score can be funded by TALOS.

Your project should have a clear European Dimension, meaning fostering projects that generate a substantial positive impact for European citizens and contributing to sustainable development, Green Deal or other European policies

3.3. Ground Rules

When applying to TALOS Open Call, please note that:

- **Be on time and use our system:** Make sure you submit your proposal through the TALOS Open Call microsite (<https://talos-oc.fundingbox.com/>) before the deadline of December 3, 2024 at 15:00 Brussels Time. If you submit the form correctly, the system will send you a confirmation of your submission. Get in touch with us if it is not the case. Note that we will not be evaluating any proposal sent after the deadline and submitted outside the dedicated form.
- **English Language:** your proposal must be written in English in all mandatory parts to be eligible. Only parts written in English will be evaluated. If the mandatory parts of the proposal are in any other language, the entire proposal will be rejected. If only non-mandatory parts of a proposal are submitted in a language different from English, those parts will not be evaluated, but the proposal is still eligible.
- **Choose only one challenge:** Your project should directly address one of the challenges for the Pilots Scenarios defined by the TALOS Consortium in section 3.2. of this Guide for Applicants. It means that you can address only 1 challenge per proposal. Applicants can submit a maximum of 3 different proposals, but each proposal needs to focus on a different challenge offered by TALOS. The objectives of the proposal must fit within the scope of the project as it is described in section 3.2 of this Guide for Applicants.
- **Every question deserves your attention:** all mandatory sections - generally marked with an asterisk - of your proposal must be completed . The data provided should be actual, true, and complete and should allow assessment of the proposal. Additional material not specifically requested in the online application form will not be considered for the evaluation.
- **Be exhaustive:** You have to verify the completeness of the form, as it won't be possible to add any further information after the deadline. After the proposal is submitted, you will be able to modify the form until December 3rd 2024 at 15:00 Brussels Time. Be aware that it will not be possible to update any information or modify your proposals after the deadline.
- **Multiple submissions:** Though applicants could submit multiple applications to different Challenges, neither team members nor any legal entities can be funded twice by TALOS. In the case that more than one proposal from the same applicant will be among the selected projects, only the one with more points will be funded. Applicants are permitted to submit a maximum of 3 proposals, with the condition

that each proposal addresses a distinct Challenge offered by TALOS. This means, if you submit one, distinct, proposal for each Challenge, you can submit up to 3 proposals in total. If more than one proposal to the same Challenge is submitted by the same applicant, only the last proposal which has been submitted in order of time will be evaluated.

- **Healthy finances and a clean sheet are a must:** we don't accept entities that are under liquidation or are an enterprise under difficulty⁷ according to the Commission Regulation No 651/2014, art. 2.18, or that are 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. We also don't accept entities that are meeting national regulations regarding bankruptcy.
- **Conflicts of interest:** we will take into consideration the existence of a potential conflict of interest between you and one or more TALOS Consortium partners. The Consortium partners, their affiliated entities, employees, persons treated as personnel (ex. working under B2B contracts), board members and permanent collaborators cannot take part in the TALOS programme. All cases of potential conflict of interest will be assessed case by case.
- **It is your proposal:** your project should be based on your original work, or, if the project is not based on your original work, your right to use the Intellectual Property Rights (IPR) must be clearly defined (you must have a licence agreement or the IPR must be transferred to you from somebody who created the work). In particular, any work related to the implementation of the project described in the application may not violate the IPR of third parties, and the IPR of the application project may not be the subject of a dispute or proceedings for infringement of third-party IPR.

⁷ An enterprise will be considered an undertaking in difficulty if more than half of the capital has disappeared. This refers to the loss of "subscribed share capital". If profit and loss reserves deficit more than 50% of share capital, there is a potential problem with the company. (Article 2, item 18 point a) and b))

(a) In the case of a limited liability company (other than an SME that has been in existence for less than three years [...]), where more than half of its subscribed share capital has disappeared as a result of accumulated losses. This is the case when the deduction of accumulated losses from reserves (and all other elements generally considered as part of the own funds of the company) leads to a negative cumulative amount that exceeds half of the subscribed share capital. For the purposes of this provision, 'limited liability company' refers in particular to the types of company mentioned in Annex I of Directive 2013/34/EU (1) and 'share capital' includes, where relevant, any share premium.

(b) In the case of a company where at least some members have unlimited liability for the debt of the company (other than an SME that has been in existence for less than three years [...]), where more than half of its capital as shown in the company accounts has disappeared as a result of accumulated losses. For the purposes of this provision, 'a company where at least some members have unlimited liability for the debt of the company refers in particular to the types of company mentioned in Annex II of Directive 2013/34/EU.

Please note that, if your SME exists for less than three years, you won't be considered as undertaking any difficulties.

- Acceptance of the Open Call rules: to apply for this Open Call you have to accept its rules and regulations detailed in this Guide for Applicants.

TALOS intends to undertake a series of dissemination/information activities in relation to this Open Call. They will be announced at the [TALOS Open Call Microsite](#) and [Discord Community](#).

3.4. Ideal Project

In order to present a detailed description for an ideal project solution, 4 different challenges were chosen as an examples:

- BVLOS aerial inspection
- Inspection & Maintenance of platform anchorage and mooring lines using an underwater robot
- Autonomous agricultural practices for pear orchards (APV)
- Biodiversity identification and monitoring (flora and fauna)

1. BVLOS aerial inspection (GPV/FPV/APV)

As the PV plants are becoming larger and larger, the need for inspection drones to cover vast areas is increasing. Beyond Visual Line of Sight (BVLOS) aerial inspection is an advanced method of using drones to inspect these large new areas or other hard-to-reach places without the need for the operator to maintain visual contact with the drone.

Within TALOS, the beneficiary of the Open Call develops a BVLOS solution which is a drone-in-the-box system capable of performing multiple mission plans without human intervention.

The drone solution captures high-resolution thermographic, RGB and LiDAR images for the early identification of issues such soiling, damage, or temperature irregularities in PV panels.

The BVLOS drone solution meets the following technical requirements:

- **Flight endurance:** The solution has a flight endurance that enables it to perform the single-flight inspection of a 2 MWp PV plant. Depending on the specific characteristics of the site, a flight endurance of 60 minutes should allow the drone to respect this requirement.
- **Thermographic imaging:** The solution detects early-stage failures such as hotspots thanks to high-resolution cameras
- **RGB imaging:** The solution quickly identifies defects such as cracks, soiling, or bird droppings.

- **LiDAR imaging:** The solution performs a detailed 3D mapping of the site to get useful topography data.
- **Reliable communication system:** The solution maintains a stable and continuous connection with the ground control station throughout the entire flight.

And the following requirements are desirable:

- **Real-time imagery data transmission:** The solution delivers in real-time the captured thermographic, RGB images and LiDAR point clouds , thanks to a high communication bandwidth.
- **Communication with the TALOS platform**

The beneficiary guarantees that BVLOS operations have the required waivers or approvals and that the drone is not used in exclusion zones which are designated areas where drone operations are prohibited.

The beneficiary collaborates with the TALOS consortium for the implementation of the solution in accordance with the TALOS platform (TALOS software architecture).

To validate the solution, flight tests will be performed in sandboxing areas located in, at least, one of our TALOS pilot sites. If needed, these tests can also be performed in other equivalent and relevant pilot sites.

2. Inspection & Maintenance of platform anchorage and mooring lines using an underwater robot (FPV)

Anchorage and mooring lines are responsible for maintaining the stability of the floating PV platform, ensuring that it remains in the correct position and orientation, and can withstand environmental conditions such as wind, waves, and currents. Regular inspection and maintenance of these underwater components are crucial for early detection of corrosion, abrasion, deformation, defects in the tension of mooring lines, or any other potential issues that could compromise the stability of the platform.

Within TALOS, the beneficiary of the Open Call designs an Autonomous Underwater Vehicle (AUVs) to perform such underwater inspection and maintenance. This solution is capable of operating visual inspections, tension monitoring and cleaning of the anchorage and mooring lines.

The autonomous operations involve the use of advanced AI algorithms for path planning, obstacle avoidance, and decision-making.

Given the harsh underwater environment, the AUV solution is robust, reliable and designed to withstand the conditions it will be operating in.

Environmental implications of AUV operations are contemplated with careful consideration by the beneficiary. The AUV doesn't perturb marine biodiversity.

The proposed system respects the following technical requirements:

- **Depth:** The solution operates up to 100m of depth.
- **Underwater endurance:** The solution is tethered with a backup battery component to autonomously complete the inspection and maintenance tasks and/or has the ability to return to the surface.
- **Manipulator arms:** The solution is equipped with manipulator arms or other tools that allow it to perform maintenance tasks, such as cleaning or removing debris.
- **RGB resolution:** The solution is able to identify visible signs of wear, corrosion, or damage.
- **Multibeam sonar:** The solution is equipped with a multibeam sonar to provide a high level of detail and create a detailed 3D model of underwater structures.
- **Navigation and positioning:** The AUV uses a combination of key technologies (Inertial Navigation Systems (INS), Doppler Velocity Logs (DVL), Acoustic Positioning Systems, etc...) to achieve robust and accurate navigation and positioning, which is critical in the harsh underwater environment.

Another requirement is desirable:

- Communication with the TALOS platform

The beneficiary closely collaborates with the TALOS consortium for the implementation of the solution in accordance with the TALOS platform (TALOS software architecture).

To validate the solution, underwater tests will be performed in the TALOS floating demonstrators of Alqueva and Alto Rabagão. If needed, these tests can also be performed in other equivalent and relevant pilot sites.

3. Autonomous agricultural practices for pear orchards (APV)

AgriPV practices combine photovoltaic energy production with agricultural activities, optimizing land-use and providing shading benefits to the crops. The challenge is to find the right balance between electricity generation and crop yields. However, to enable this dual land-use, Agri-PV systems have special structural components which limit the standardisation of O&M practices.

Within TALOS, the beneficiaries of the Open Call develop Autonomous Ground Vehicles (AGVs) to address this issue of O&M practices standardisation in Agri PV. Their solutions are designed to manage and optimize agricultural practices without human intervention.

For the pear-orchard demonstrator of Randwijk, beneficiaries of the Open Call propose the development of automated robotic solutions, able to perform one (or more) of these agricultural practices:

- **Pruning:** Process of selectively cutting certain parts of a pear tree, such as branches, buds, or roots, to improve the plant's structure, promote healthy growth, and increase pear production. For young pear trees, pruning is more focused on establishing a good structure.

- Frequency: As a general guideline, pear trees are often pruned once a year in late winter or early spring before the new growth starts but when the pear tree is not in a dormant state.
- Thinning: Process of selectively removing pears in a densely populated area to allow the remaining ones to grow better, by reducing competition for light, water, and nutrients. A common guideline is to leave about 6-8 inches of space between each remaining pear.
 - Frequency: As a general guideline, pear trees are often thinned once a year in late spring or early summer after the natural pear drop has occurred and when the pears are about the size of a marble.
- Spraying: Process of applying liquids such as pesticides, herbicides, or fungicides to pear crops to protect them from pests and diseases.
 - Frequency: As a general guideline, spraying often starts in early spring, before the buds open, to control diseases such as scab or fire blight. Additional sprays may be applied at intervals throughout the growing season, typically every 10 to 14 days, to control pests such as aphids, mites, or codling moths.
- Fertilising: Process of applying fertilisers to pear crops to provide necessary nutrients for their growth.
 - Frequency: As a general guideline, pear trees are often fertilized once a year, typically in early spring before the new growth starts. This helps to provide the trees with the nutrients they need for the growing season.
- Harvesting: Process of collecting the ripe pears from the orchard at the end of their growing season.
 - Frequency: Pears are harvested once a year, generally in late summer. The exact timing can depend on the specific variety of pear and the local climate conditions.

For all these agricultural practices, advanced sensors combined with AI algorithms allow the robots to make the optimal decision at the right time. For the harvesting task example, the robot detects the ripeness of the pears thanks to the AI analysis of high-quality sensing data and then collects the pears without damaging them with gentle grippers.

The beneficiaries closely collaborate with the farmers of the pear orchard, as well as with the TALOS consortium for the implementation of the solutions in accordance with the good agricultural practices and the TALOS platform (TALOS software architecture).

To validate the solutions, tests will be performed in the TALOS pear-orchard demonstrator of Randwijk. If needed, these tests can also be performed in other equivalent and relevant pilot sites.

4. Biodiversity identification and monitoring (flora and fauna)

Land-based PV plants are located in natural environments where flora and fauna can thrive. Managing the ecological diversity of these sites to mitigate their environmental impacts is primordial.

Within TALOS, the beneficiary of the Open Call supplies an AI service for biodiversity identification and monitoring. This solution is assessed for its environmental impact, with the models, documentation, training set, and application published back on the AIoD (AI on Demand) platform.

This AI service includes:

- **Identification of species:** The service identifies different species of plants, animals, and insects to understand the biodiversity of the area around the PV plant.
- **Real-time alerts:**
 - The service sends an alert to the O&M team if there are significant changes in the local biodiversity, such as the sudden disappearance of a species.
 - The service sends an alert to the O&M team to be aware there is an animal intrusion and to avoid on-site robots to run over it.
 - The service sends an alert to the O&M team so that the robot mower does not cut the protected plants, or the plants identified as not cuttable.

And other desirable requirements are:

- **Predictive Analysis:** The service predicts future changes in biodiversity based on current trends, environmental factors, and migration patterns.
- **Communication with the TALOS platform**

The data used for the AI analysis is collected from monitoring stations installed by a public environmental agency. The beneficiary collaborates with this agency to validate and enhance the AI models, extending its service offering with more value-added capabilities for tracking changes in flora and fauna.

The beneficiary has also to closely collaborate with the TALOS consortium for the implementation of the solutions in accordance with the TALOS platform (TALOS software architecture).

To validate the solutions, tests will be performed in the TALOS land-based PV pilot site of Villacastín. If needed, these tests can also be performed in other equivalent and relevant pilot sites.

4. How will we evaluate your proposal?

Our evaluation process is transparent, fair and equal to all our participants with a clearly defined complaint procedure (see section [Complaints](#)).

We will evaluate your project in several phases indicated in the Figure below. We encourage you to put in the effort to present your project in the best possible way, offering as much detail as you can. This will assist us in evaluating your application and identifying how your proposal aligns with the overall scope of TALOS.

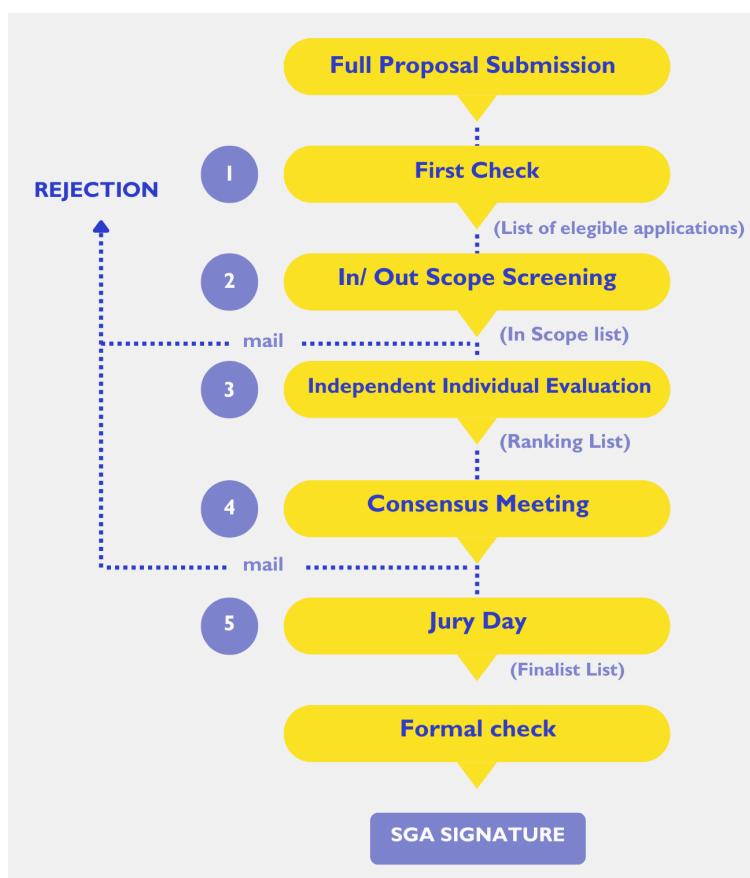


Figure 2 - TALOS Selection Process

4.1. STEP 1: First Check

After the closure of the Open Call, we will review the proposal to ensure it meets the conditions outlined in Section 3. This assessment will be based on the statements provided in your proposal.

At this stage, the eligibility criteria are checked against the Declaration of Honour or self-declarations included in the application form, and they will be continuously verified throughout the evaluation process, including the final formal check.

The projects that do not comply with these criteria will be rejected. As a result of the checking, a 'List of Eligible Applications' will be produced.

4.2. STEP 2: In/Out Scope Screening

In case of a large number of applications, or special needs of the TALOS project, the Selection Committee might decide to apply the In/Out Scope Screening.

The In/Out Scope Screening will be done by the Selection Committee members.

The overall summary/general objectives of all proposals included in the 'List of Eligible Applications' will be reviewed to evaluate the following aspects:

- **Scope.** The objectives of the proposal must fit within the scope of the TALOS project as described in the Guide for Applicants (GfA). In particular, the proposal should directly address one of the challenges proposed in [Section 3.2 of this GfA](#);
- **European Dimension.** The project should have a European dimension as described in [Section 3.2 of this GfA](#).

The Selection Committee will assess if your proposal complies with the aspects above on a YES/NO basis and will provide reasoning in the cases where no compliance evidence is found.

Each proposal will be reviewed by one partner from the Selection Committee and, once reviewed, the Selection Committee will review the ones proposed to be excluded, generating an 'In Scope List'.

Proposals that do not comply with all the requirements described above will be excluded. The ones complying with all of them will move on to the independent individual evaluation phase. We will inform the applicants about the results of the eligibility check and in/out scope screening.

4.3. STEP 3: Independent Individual Evaluation

In this phase, each proposal will be evaluated by 3 independent experts, appointed according to the specific characteristics of the applicants from the pool of External Experts and Partners' Experts (2 External Experts and 1 Partners' Expert per proposal)

The External Experts must be independent from the applicants and cannot be Consortium partners employees, permanent collaborators, nor board members. The Partners' Experts have to be independent from the applicants and cannot be members of the TALOS Selection Committee.

The projects will be evaluated within the following awarding criteria:

(1). EXCELLENCE will evaluate:

- **Ambition:** You have to demonstrate how the proposed project contributes to the project scope, has a European dimension and is beyond the State of the Art, and how it will help overcome the selected challenge. You have to describe the innovative approach behind the project.
- **Innovation:** You should provide information about the level of innovation within the market and about the degree of differentiation that the project will bring to the PV Pilot Scenarios developed within TALOS Project.
- **Soundness of the approach and credibility of the proposed methodology for covering the challenge.**
- **Gender dimension:** You have to demonstrate how the gender dimension has been integrated into the research and innovation content of the project.

(2). IMPACT will analyse:

- **Market opportunity:** You have to demonstrate a clear idea of what you want to do and the market potential of the new/improved product. Additionally, the applicants have to highlight the impact that the project will have on their overall company strategy and growth prospects.
- **Competition:** You have to describe and analyse the degree of competition of the product/service and to explain how your proposal is disruptive and breaks into the market, and how the products/services can be clearly differentiated from the competition.
- **Commercial Strategy and Scalability:** You are required to demonstrate the level of scalability potential of the new/improved product, showcasing its ability to be commercially viable and effectively address a structural problem in a specific sector/process/etc.
- **Environmental, society and European competitiveness:** You have to demonstrate the project's contribution towards environmental, social and competitiveness/economic impacts to contribute to sustainable development, Green Deal and other European policies.

(3). IMPLEMENTATION will consider:

- **Team:** You have to demonstrate your team management and leadership qualities, your ability to take a concept from ideas to market, your capacity to carry through your ideas and your understanding of the dynamics of the market. The team should be a cross-functional team, with a strong background and skills base and caring about its gender balance.
- **Resources:** You need to demonstrate the quality and effectiveness of the resources assigned in order to achieve the objectives proposed. Startups will be funded 100% of their eligible costs, but in the case of SMEs the compromise of 30% self-financing of activities should be secured by each beneficiary.

The evaluators will score each award criterion on a scale from 0 to 5:

- 0 = Proposal fails to address the criterion or cannot be assessed due to missing or incomplete information.
- 1 = Poor – criterion is inadequately addressed or there are serious inherent weaknesses.
- 2 = Fair – proposal broadly addresses the criterion, but there are significant weaknesses.
- 3 = Good – proposal addresses the criterion well, but a number of shortcomings are present.
- 4 = Very good – proposal addresses the criterion very well, but a small number of shortcomings are present.
- 5 = Excellent – proposal successfully addresses all relevant aspects of the criterion. Any shortcomings are minor.

Each evaluator will produce an Individual Evaluation Report. Once the Individual Evaluation Reports are submitted, the final score for each individual criterion will be calculated as the average of the scores provided by each evaluator. The final score of each application will be calculated as the sum of the scores for each individual criterion.

The threshold for individual criteria will be 3 out of 5 points. The total maximum score is 15 points. The overall threshold, applying to the sum of the three individual scores, is 10 points.

Evaluation Panel Meeting

After carrying out the Independent Individual Evaluation, in special cases, experts who have evaluated the proposals will join an Evaluation Panel Meeting, to agree on a common position, including comments and scores for the evaluated proposals with a significant divergence between the evaluators' scoring. In case no consensus is reached

between the evaluators, there will be a voting and a minority report explaining the point of disagreement will be produced.

Once we have an initial ranking, ties (if any) will be solved using the following criteria in order of priority:

- The highest score in the Excellence Section,
- Gender balance among the personnel responsible for carrying out the project activities,
- The highest score in the Implementation Section.

As a result of the Independent Individual Evaluation, a 'Ranking List per Pilot Scenario' will be produced. All proposals that reach the threshold or are scored above the threshold, will pass to the next phase.

Please note that we need time to process all the proposals in this phase, an extended period can be anticipated prior to receiving a response

4.4. STEP 4: Consensus Meeting

Following the Experts evaluation ranking list, the TALOS Selection Committee (composed by 8 partners from TALOS Consortium) , with the support of 3 External Experts who participated in the Independent Evaluation, will decide, at this stage, the 'List of Jury Day's participants', which includes the proposals to be invited to Jury Day. The Experts take part in an advisory capacity (i.e. with a voice but without a vote).

The decision will be based on the 'Ranking List per Pilot Scenario' obtained as a result of the previous step.

Whilst normally the highest ranked proposals will be selected, the Selection Committee might have fair reasons for objecting to a specific proposal. This reasons could include the alignment with TALOS goals and scope, the ability to achieve the highest impact possible, commercial competition, as well as the existence of significant ethical concerns or a potential conflict of interest. In this case, the choice may pass to the next-ranked proposal, and the rejected proposal Applicant will receive feedback about the reasons for the rejection

The goal of this step is to select around 20 proposals to be invited to Jury Day, including, at least, the highest-ranked proposal per Pilot Scenarios (provided that it reached all the thresholds and met all of the requirements). The exact number of proposals selected will be decided based on the overall quality of the proposals. All decisions are taken by the Selection Committee by a minimum of 2/3 majority votes.

After the Consensus Meeting, we will communicate the results to the applicants and invite the selected ones to pitch their project on the Jury Day.

4.5. STEP 5: Jury Day

If your proposal has been selected following the Consensus Meeting, you will be invited to an online Jury Day, where you will have the opportunity to pitch your project in front of the TALOS Selection Committee.

After the Jury Day, the TALOS Selection Committee (and the members of the Advisory Board, whose role is to provide advice, they do not have voting rights) will undertake the final evaluation and select the finalists taking into account the following awarding criteria:

- High potential impact on the project's goals;
- Vision and attitude of the Team;
- Positive impact on the applicant's processes.

The Selection Committee will decide by minimum $\frac{2}{3}$ of majority votes the 'Provisional List of FSTP recipients' and 'Reserve List'.

The goal is to select, at least, 3 projects per Pilot Scenario, but the exact number of proposals approved will be decided based on the overall quality of the proposals.

In case the number of proposals approved is lower than expected, Selection Committee may decide either to select a lower number of beneficiaries or to extend the selection process by inviting applicants (over threshold) from the next places on the ranking lists, obtained as result of Independent Individual Evaluation, and organise an additional online pitching session.

TALOS Jury day will be happening around the first/second weeks of February 2025, the final date will be published in the TALOS OC website as soon as it is scheduled.

After the Jury Day, we will communicate the results to the applicants.

4.6. Formal Check, Sub-Grant Agreement Preparation and Signature

Before the start of the TALOS Support Programme, it is required to sign the [Sub-Grant Agreement](#) with the TALOS Consortium.

Before signing the Sub-Grant Agreement, you should provide documents regarding your formal status. The TALOS Consortium will verify them to prove your eligibility.

To confirm your formal status, we may ask you for (not an exhaustive list): company's registration document, the legal representation (optionally POA), tax ID number;

ownership structure⁸, financial statements; document/s confirming the staff headcount, Bank Identification form, other documents in case of doubts raised during the checks.

Be extremely vigilant with respect to:

- The nature of the documents we request. If the documents you provide us with do not prove your eligibility, your participation will end here.
- The deadlines that will be given to provide the documents. If the requested documents are not delivered on time, without a clear and reasonable justification, the applicant will be excluded from further formal assessment. Another applicant from the Reserve list will then be selected.

The selected proposals will also undergo an ethics assessment performed by 2 TALOS partners specialised in ethics plus one external ethics Expert. An 'Ethics Summary Report' will be produced and, when applicable, specific requirements will be included in the Individual Mentoring Plan.

⁸ If the ownership structure is not clear from the registration documents, additional documents confirming the ownership structure, e.g. statute, company deed, founding act, share register, in a joint-stock company - list of the company's shareholders; etc, may be requested.

5. Our Support Programme and Payment Arrangements

Once your eligibility has been confirmed following the formal check and the Sub-Grant Agreement signed, you will be an official beneficiary of the TALOS programme.

Support Programme

The Support Programme will last up to 9 months and it is planned to start in April 2025. During this period beneficiaries will be working on the solutions development. The TALOS experts will support beneficiaries in integrating and testing the solution, and provide technical mentoring.

At the beginning of the Support Programme, the beneficiaries will be invited to participate in a Welcome Event (please note that participation in the Welcome Event is mandatory for at least one beneficiary representative) where they will be matched with TALOS mentors.

The first step of the Support Program will be the definition of each beneficiary's Individual Mentoring Plan (IMP). This document, once created and validated, will become an Annex to the Sub-Grant Agreement and will establish the budget planned for the execution of the project (eligible costs should be considered according Horizon Europe Programme Rules), the Key Performance Indicators (KPIs) that each project should achieve and the Deliverables that will be taken into account when evaluating the projects' performance during the following stages:

Stage 1. Individual Mentoring Plan Definition & Virtual Prototype (1 month)

Stage 2. Solutions Development (3 months)

Stage 3. Solutions Integration & Demonstration (5 months)

Selected beneficiaries will receive a fixed lump sum of up to EUR 200,000 (100% eligible costs) if the beneficiary entity is a Startup or a fixed lump sum of up to EUR 140,000 (70% eligible cost) if the beneficiary entity is an SME that is not a Startup .

The lump sum is a simplified method of settling expenses in projects financed with Horizon Europe funds. It means that the beneficiary is not required to present strictly defined accounting documents to prove the costs incurred (e.g. invoices), but is obliged to demonstrate the implementation of the project is in line with the milestones set for it. Simply speaking, we will carefully assess your progress and the quality of your work during Interim Reviews, not your accountancy. The milestones (deliverables, KPIs and ethical

recommendations) will be defined in the 'Individual Mentoring Plan' elaborated at the beginning of the programme.

The lump sum does not release you from the obligation to collect documentation to confirm the costs under fiscal regulations.

Payments arrangements

Grant will be paid in the following scheme

Payment Milestones	Deliverable	Payment Milestone	% Total Grant
Stage 1. Individual Mentoring Plan Definition & Virtual Prototype	IMP & Virtual Prototype	M1	6%
Stage 2. Solutions Development	Solutions Developed	M4	33%
Stage 3. Solutions Integration & Demonstration	Solutions Integration & Demonstration Report	M9	61%
Total	-	9 months	100%

Payment of the given tranche depends on the proper and timely execution of the work planned in the 'Individual Mentoring Plan'. The Selection Committee will evaluate your progress on a regular basis. For more details check the [SGA template](#).

Milestones Review

Your performance during the Support Programme will be reviewed by the Technical Partners (with the support of Ethics Partners in the case of third-party projects where specific requirements on ethics have been included as deliverable in the Individual Mentoring Plan) at the Milestone Review (established every time a payment is due), according to the following criteria:

- Deliverable quality (30%).
- Technical performance indicators (60%).
- Deadline Compliance (10%).

Each criterion will be scored from 0 to 10 and, based on the weight of each criterion, the final score will be calculated. The threshold to continue in the programme is 7 points.

According to this final score, beneficiaries over the threshold (7 points) will successfully receive the corresponding part of the grant and continue the programme. The

beneficiaries who haven't reached the threshold (7 points) will be invited to leave the programme without receiving the corresponding payments. The Selection Committee will review and validate the evaluations, putting special attention to the 'under threshold' cases, if any, by taking into consideration all possible objective reasons for underperformance (i.e. external factors which might have influenced the beneficiaries' performance).

TALOS Selection Committee might also assess the necessity of an extension of the Programme to achieve the objectives and grant it to the beneficiaries if necessary. The final decision about possible extension is at the sole discretion of the TALOS Selection Committee and depends on a case-by-case assessment. Further details regarding possible extensions will be included in the Sub-Grant Agreement template.

The TALOS Selection Committee will make the final decision, and approve the payments or invite beneficiary projects which have not reached the threshold to leave the programme.

6. Contact us

How can we help you?

If you have any questions regarding our application process, feel free to contact us and email us at the following address: TALOS.help@fundingbox.com, or post your questions in the TALOS Helpdesk in [Discord](#). [Here](#) you can find out how to access the Community.

In case of any technical issues or problems, please include the following information in your message:

- Your username, phone number and email address;
- Details of the specific problem (e.g. error messages you encountered, bug description, i.e. if a dropdown list isn't working, etc.);
- Screenshots of the problem.

If, after receiving the results of the eligibility check phase, you consider that a mistake has been made, resulting in the rejection of your application, you have the right to send us a complaint. You can email us in English at: TALOS.help@fundingbox.com including the following information:

- Your contact details (including email address);
- The subject of the complaint;
- Information and evidence regarding the alleged mistake.

You have 3 calendar days to submit your complaint, starting from the day after the communication was sent. We will review your complaint within 7 calendar days of its reception. If we need more time to assess your complaint, we will inform you about the extension by email. We will not review anonymous complaints as well as complaints with incomplete information.

Please take into account that the evaluation is run by experts in the relevant field, and we do not interfere with their assessment. Therefore, we will not evaluate complaints related to the results of the evaluation other than those related to procedural or technical mistakes.

7. Last but not least – final provisions

Any matters not covered by this Guide will be governed by Polish law and rules related to the Horizon Europe Programme and general rules of EU grants.

Please take into account that we make our best effort to keep all provided data confidential. However, for the avoidance of doubt, you are solely responsible to indicate your confidential information as such.

Your IPR will remain your property.

For the selected grantees, the Sub-Grant agreement will include the set of obligations towards the European Commission (for example: promoting the project and giving visibility to the EU funding, maintaining confidentiality, understanding potential controls by the EC/ECA, EPPO and OLAF).

The TALOS Consortium might cancel the call at any time, change its provisions or extend it. In such a case we will inform all applicants about such change. Signature of the Sub-Grant agreement is an initial condition to establish any obligations among applicants and any Consortium partners (with respect to the obligation of confidentiality of the application).

Did not find what you were looking for? You may check our [‘Frequently Asked Questions’](#) section. You can also [contact us](#) and we will happily answer all your questions.

8. Extra hints before submitting your proposal

A proposal takes time and effort and we know it. Here are a few crucial points you should read before submitting your proposal.

- Is your project in line with what TALOS is looking for? You are not sure? You can consult this [section 3.1](#) as well as the [TALOS project website](#).
- Did you present your project in a way that will convince evaluators? Not sure if you did? Go back to [this section](#).
- Is your project fulfilling all eligibility requirements described in the Guide? Check again [this section](#).
- Are you sure you are able to cope with our process of the Sub-Grant agreement signature and payment arrangements for selected proposals? You may want to go over [this section](#).
- Did you check our Sub-Grant agreement template? You didn't? [Check it here](#).
- Do you need extra help? [Contact us](#).

Good luck!

ANNEX 1: Open Call Challenges Requisites

The following table presents a brief description and corresponding mandatory and preferential requisites for each challenge.

#	Challenge name	Brief description	Requisites	
			Mandatory	Preferential
1	BVLOS aerial inspection (all pilot sites)	Beyond Visual Line of Sight (BVLOS) aerial inspection is an advanced method of using drones to inspect large PV plants or other hard-to-reach areas without the need for the operator to maintain visual contact with the drone.	<ul style="list-style-type: none"> • Must execute a flight mission • Must not enter an exclusion flight zone • Maintain reliable communication links and real-time drone data transmission • Capacity to integrate with the TALOS Platform • Validation of the proposed solution in a pilot site (i.e., equivalent to the respective TALOS pilot site) 	<ul style="list-style-type: none"> • Advanced real-time inspection (e.g., EL, IR, AI diagnosis tool, vegetation growth detection, overdried vegetation, veg. shadowing on PV panel) • Real-time imagery data capture transmission • Flight endurance above 50 minutes • Communication with TALOS Platform • Validation in sandboxing areas located in one (or more) TALOS pilot sites
2	Autonomous inspection for flight for electroluminescence imaging and analysis (all pilot sites)	UAV performing automated scans across designated sites to detect and analyse defects in photovoltaic panels using electroluminescence imaging techniques.	<ul style="list-style-type: none"> • Conduct EL imaging during nighttime • Drone with high-resolution cameras • Ability to diagnose and interpret the EL inspection • Capacity to integrate with the TALOS Platform • Validation of the proposed solution in a pilot site (i.e., equivalent to the respective TALOS pilot site) 	<ul style="list-style-type: none"> • Conduct EL imaging during daylight • Automated approach of current injection in PV plants or usage of a passive luminescence technique • Advanced AI image processing software • Communication with TALOS Platform

				<ul style="list-style-type: none"> • Validation in sandboxing areas located in one (or more) TALOS pilot sites
3	Fire detection and deterrent system (all pilot sites)	System using integrated sensors to identify potential fires within a PV plant, ensuring rapid detection to minimize damage and operational disruptions.	<ul style="list-style-type: none"> • Fire detection system (based on sensors, imagery, and/or SCADA data) • Remote monitoring and control • Integrated alarm system • Capacity to integrate with the TALOS Platform • Validation of the proposed solution in a pilot site (i.e., equivalent to the respective TALOS pilot site) 	<ul style="list-style-type: none"> • Automated fire suppression system • Communication with TALOS Platform • Validation in one (or more) TALOS pilot sites
4	Deep learning-based bird deterrent system (FPV)	System using advanced algorithms to detect and deter birds from nesting or interfering with solar panels.	<ul style="list-style-type: none"> • Advanced AI bird recognition algorithms • The deterrent system must repel the birds from the PV plant(s) • The innovative solutions must not harm the birds • Capacity to integrate with the TALOS Platform • Validation of the proposed solution in a pilot site (i.e., equivalent to the respective TALOS pilot site) 	<ul style="list-style-type: none"> • Communication with TALOS Platform • Validation in one of the FPV TALOS pilot sites
5	Autonomous detection of defects in underwater power cables (medium to high voltage) using AUVs (FPV)	AUVs to ensure efficient maintenance and reliability of electrical infrastructure in marine environments.	<ul style="list-style-type: none"> • Ability to identify defects in underwater power cables • Maintain reliable communication links and real-time data transmission • Minimum operating depth of 100m • Underwater mission endurance above 30 minutes • Must not affect the underwater ecosystem 	<ul style="list-style-type: none"> • Detailed visual inspections • Ability to diagnose faults via different inspections and NDT methods • Communication with TALOS Platform • Validation in one of the FPV TALOS pilot sites

			<ul style="list-style-type: none"> • Capacity to integrate with the TALOS Platform • Validation of the proposed solution in a pilot site (i.e., equivalent to the respective TALOS pilot site) 	
6	Inspection & maintenance of platform anchorages and/or mooring lines using AUVs (FPV)	AUVs operating inspection and maintenance of platform anchorages and mooring lines in harsh underwater environments (less than 100m depth) without human intervention	<ul style="list-style-type: none"> • Ability to inspect anchorages and mooring lines using an AUV and/or use different NDT techniques • 3D mapping of the anchorage and mooring lines • Maintain reliable communication links and real-time data transmission • Minimum operating depth of 100m • Underwater mission endurance above 30 minutes • Must not affect the underwater ecosystem • Capacity to integrate with the TALOS Platform • Validation of the proposed solution in a pilot site (i.e., equivalent to the respective TALOS pilot site) 	<ul style="list-style-type: none"> • Autonomous cleaning of the anchorage and mooring lines • Advanced AI algorithms for anchorage and mooring line defect identification • Communication with TALOS Platform • Validation in one of the FPV TALOS pilot sites
7	Prevention of algae growth and biofouling (FPV)	System implementing proactive measures to inhibit the accumulation of marine organisms on floating PV platforms	<ul style="list-style-type: none"> • Design solutions to prevent algae growth and biofouling • Identify and measure the presence of algae and biofouling • Must not affect the underwater ecosystem • Validation of the proposed solution in a pilot site (i.e., equivalent to the respective TALOS pilot site) 	<ul style="list-style-type: none"> • Integration of potential sensor data with TALOS Platform • Validation in one of the FPV TALOS pilot sites
8	Remote environmental quality control (FPV)	System monitoring water quality parameters to ensure	<ul style="list-style-type: none"> • Perform water quality measurements at 2 different locations (under the floating 	<ul style="list-style-type: none"> • Provide other marine life statistics at 2 different locations (near the floating

		compliance with environmental regulations and provide marine fauna indicators	<p>platform and in a control zone far from the floating platform) of:</p> <ul style="list-style-type: none"> ○ Temperature ○ pH ○ Dissolved Oxygen ○ Nutrient levels ○ Etc... <ul style="list-style-type: none"> ● Creation of a forecast model for algae growth and biofouling ● Perform fish counting at 2 different locations (near the floating platform and in a control zone far from the floating platform) ● Must not affect the underwater ecosystem ● Validation of the proposed solution in a pilot site (i.e., equivalent to the respective TALOS pilot site) 	<p>platform and in a control zone far from the floating platform)</p> <ul style="list-style-type: none"> ● Capacity to differentiate fish species ● Integration of sensor with TALOS Platform ● Validation in one of the FPV TALOS pilot sites
9	XR tools for O&M teams (FPV and LPV)	XR (extended reality) tools to facilitate monitoring, remote assistance, and collaboration of the O&M teams while providing real-time guidance to on-site technicians	<ul style="list-style-type: none"> ● Capacity to integrate and communicate with the TALOS Platform ● Validation in one (or more) TALOS pilot sites ● Virtual representation of the PV plant ● Access to real-time data from the TALOS platform (PV plants and robots) ● AR features for real-time data visualization from the PV plant, including alerts and robot mission progress 	<ul style="list-style-type: none"> ● VR for remote operation of robotized O&M tasks ● MR features for robot mission triggering within the pilot site
10	Pre-cleaning and soiling prevention coatings for PV panels (all pilot sites)	Soiling prevention coatings to reduce the accumulation of dirt	<ul style="list-style-type: none"> ● Coatings must: <ul style="list-style-type: none"> ○ be compatible with PV panels (non-corrosive) ○ be durable (>=6 months) 	<ul style="list-style-type: none"> ● Monitoring of the coating application

		and debris on the surface of the PV panels	<ul style="list-style-type: none"> ○ be environmentally friendly (biodegradable) ○ have no impact on solar energy production ○ be easy to apply ● Validation in one (or more) TALOS pilot sites 	
11	Autonomous detection of defects in underground (medium to high voltage) cables (LPV)	Detection of defects in underground high-voltage cables in land-based PV without manual intervention	<ul style="list-style-type: none"> ● Advanced AI algorithms and/or new techniques for cable defect identification ● Validation in the LPV TALOS pilot site 	<ul style="list-style-type: none"> ● Route mapping of the underground cables ● Capacity to integrate and communicate with the TALOS Platform
12	Biodiversity (flora and fauna) identification and monitoring (LPV)	Management of the ecological biodiversity of the land-based PV site with flora and fauna identification and monitoring systems	<ul style="list-style-type: none"> ● Identification of the protected plant species ● Identification of the animal species ● Alert system for animal intrusion ● Capacity to integrate with the TALOS Platform ● Validation in the LPV TALOS pilot site 	<ul style="list-style-type: none"> ● Comprehensive baseline database of existing biodiversity ● Communication with TALOS Platform
13	Soil analysis using UAVs or AGVs: soil study (LPV and APV)	UAV or AGV to perform soil studies to obtain its characteristics for robot mobility decision-making	<ul style="list-style-type: none"> ● Chemical and/or visual analysis of the soil's characteristics ● Recommendation engine for safe robot operation ● Capacity to integrate with the TALOS Platform ● Validation in one (or more) TALOS pilot sites 	<ul style="list-style-type: none"> ● Advanced AI algorithms to analyse soil data ● Sample collection of soil to analyse its characteristics ● Communication with TALOS Platform
14	Terrain analysis using UAVs or AGVs:	UAV or AGV to perform terrain analysis and topological	<ul style="list-style-type: none"> ● Visual analysis of the terrain ● Recommendation engine for safe robot operation 	<ul style="list-style-type: none"> ● Advanced AI algorithms to analyse terrain data ● Communication with TALOS Platform

	topological study (LPV and APV)	studies for robot mobility decision-making	<ul style="list-style-type: none"> • Detection of terrain changes (obstacles, landslides, etc.) with LIDAR capture system • Capacity to integrate with the TALOS Platform • Validation in one (or more) TALOS pilot sites 	
15	Inspection of the back sheet of the PV panels (LPV and APV)	AGV to inspect the status of the electrical wiring connections in the back of the PV panels	<ul style="list-style-type: none"> • Status identification of the electrical wiring connections of the PV panels • Visual and/or thermal inspection of the back sheet of the PV panels • Capacity to integrate and communicate with the TALOS Platform • Validation in one (or more) TALOS pilot sites 	<ul style="list-style-type: none"> • Identification of loose cables and/or hanging elements • Autonomous identification of the defects of the PV panels
16	AI-based microclimate monitoring and recommendation system (APV)	AI-based microclimate system to improve crop productivity by delivering real-time farming recommendations and optimizing water usage	<ul style="list-style-type: none"> • AI algorithms for crop data analysis • Smart water management system for optimization of crop irrigation • Recommendation engine for farming activities • Capacity to integrate with the TALOS Platform • Validation of the proposed solution in a pilot site (i.e., equivalent to the respective TALOS pilot site) 	<ul style="list-style-type: none"> • Construction of structures for rainwater collection • Reuse of water for other applications (e.g., panel cleaning) • Communication with TALOS Platform • Validation in the APV TALOS pilot site
17	Autonomous agricultural practices for pear orchards (APV)	AGVs to perform pruning, thinning, spraying, fertilizing, or harvesting, without human intervention	<ul style="list-style-type: none"> • AI algorithms for the identification of action areas for agricultural practices (pruning, thinning, spraying, fertilizing or harvesting) • Task-dedicated UGVs for one or more agricultural practices 	<ul style="list-style-type: none"> • Communication with the TALOS Platform • Validation in the APV TALOS pilot site

			<ul style="list-style-type: none"> • Capacity to integrate with the TALOS Platform • Validation of the proposed solution in a pilot site (i.e., equivalent to the respective TALOS pilot site) 	
18	Cleaning of the PV panels above the fruit trees (APV)	Perform the cleaning of PV panels above the fruit trees using an autonomous system (e.g., AUV)	<ul style="list-style-type: none"> • Cleaning of the PV panels • Must not damage the crops • Must not damage the soil beneath and around the panels • Capacity to integrate with the TALOS Platform • Validation in the APV TALOS pilot site 	<ul style="list-style-type: none"> • Water management system of the cleaning system for crop irrigation • Communication with the TALOS Platform
19	Open innovation topic	Other innovative solutions within Robotics, AI and/or Data topics applied to O&M tasks in PV plants	<ul style="list-style-type: none"> • A clear advancement over the state-of-the-art and/or intent to increase for TRL 6-7 	<ul style="list-style-type: none"> • Capacity to integrate with the TALOS Platform and/or Communication with TALOS Platform • Validation of the proposed solution in a pilot site (i.e., equivalent to the respective TALOS pilot site) and/or validation in one (or more) TALOS pilot sites

ANNEX 2: TALOS platform minimal technical requirements

TALOS platform supports the integration of diverse data sources, devices and robots, as well as algorithms that process that information and output actions or reports based on it, from various partners, facilitating collaboration with other computing environments and the exchange of data, analysis and reports between partners.

Annex 2 includes the main minimal technical requirements to be fulfilled by those tools and solutions which will collaborate with the TALOS platform and its corresponding modules.

1.1 Requirements for Digital Solutions/Tools

	Minimal requirements for Digital Solutions/Tools
Input connection	<p>Requirement: The external tool must support a REST-based API to receive uploading data requests.</p> <p>Description: The tool should be able to handle HTTP requests (POST, GET, etc.) and process incoming data as specified by the platform's API documentation.</p>
Output connection	<p>Requirement: The external tool must support a REST-based API to return the operation result.</p> <p>Description: The tool should be capable of sending HTTP responses, including status codes and data payloads, as specified by the platform's API documentation.</p>

<p>Software Requirements</p>	<p>Compatibility with the following development languages:</p> <ul style="list-style-type: none"> • Java: The tool should be developed or at least interoperable with Java applications. • Maven: The tool should support Maven as a build automation tool for Java projects. • Quarkus: The tool should be compatible with Quarkus, a Kubernetes-native Java framework tailored for GraalVM and OpenJDK HotSpot. • Knative: The tool should be compatible with Knative, a Kubernetes-based platform to deploy and manage serverless workloads.
<p>Hardware Requirements</p>	<p>External tools collaborating with TALOS platform should be capable of running on hardware that supports the above software requirements and protocols. This typically includes modern multi-core processors, sufficient RAM (8GB or more), and appropriate storage (SSD preferred) to handle data processing and API calls.</p>
<p>Communication Protocols</p>	<p>Requirement: The external tool must support TCP and UDP communication protocols.</p> <p>Description: The tool should be able to establish and manage connections using TCP (for reliable communication) and UDP (for faster, but less reliable communication), ensuring compatibility with the platform's networking requirements.</p>

1.2 Requirements for robots and IoT tools

	Minimal requirements for Robots and IoT tools
Hardware	<p>Hardware specifications must ensure adequate performance for the tasks of the robots:</p> <p>Robots:</p> <ul style="list-style-type: none"> ● Processor Architecture: Must use ARM or x86 processors. ● RAM: A minimum of 16 GB of RAM. ● Processor: At least 8 cores to handle computationally intensive tasks
Output connection	<p>Devices must have the capability to send and receive data using various communication protocols and connection methods:</p> <ul style="list-style-type: none"> ● HTTP Requests: For data exchange via standard HTTP requests. ● MQTT: A lightweight messaging protocol ideal for IoT devices. ● WebSockets: For real-time bidirectional communication. ● Socket.IO: A library that enables real-time, bidirectional communication over WebSockets and other technologies. ● AMQP (Advanced Message Queuing Protocol): For asynchronous and secure messaging between systems. ● 4G/5G Connectivity: Devices must be able to connect to 4G or 5G mobile networks, either through an external communication module or integrated into the device.
Software Requirements	<p>Software compatibility varies between robots and IoT devices:</p> <p>Robots:</p> <ul style="list-style-type: none"> ● Docker: Must be capable of running Docker containers for isolated application deployment. ● Operating System: Must operate on a Linux-based system, preferably Ubuntu. ● ROS/ROS2 Gateway: Must be compatible with ROS (Robot Operating System) or ROS2 for package management and communication.

	<p>IoT Devices:</p> <ul style="list-style-type: none"> ● HTTP: Ability to make and respond to HTTP requests. ● MQTT: Must support publishing and subscribing to MQTT topics for information exchange.
Communication Protocols	<p>Communications must be secure and utilize appropriate protocols for data transport:</p> <ul style="list-style-type: none"> ● TCP/UDP: Devices must support secure communications using the following protocols: ● HTTPS: HTTP over SSL/TLS for secure web communications. ● MQTT: Telemetry protocol over TCP for IoT devices. ● AMQP: Advanced Message Queuing Protocol for distributed systems. ● WSS (WebSockets Secure): WebSockets over SSL/TLS for secure real-time connections.
Media Protocols	<p>For real-time transmission of video and data, the following capabilities are required:</p> <p>Robots:</p> <ul style="list-style-type: none"> ● WebRTC: Must support WebRTC for real-time transmission of video and data. ● Video Formats: Compatibility with H264: HTTP, RTSP (Real-Time Streaming Protocol), V4L2 (Video for Linux 2) ● Bandwidth: A minimum connection bandwidth of 20 Mbps with latency under 20 ms is required to ensure transmission quality.
Security and Data	<ul style="list-style-type: none"> ● Lease Management and Concurrency: Robots and IoT devices must implement mechanisms to manage concurrent access and lease resources to ensure operational integrity. ● Connection Maintenance: It is recommended to implement mechanisms to keep connections alive (keep-alive) and manage reconnections in case of network failures. ● Software Updates: Devices must support remote software updates to ensure the incorporation of improvements and security patches. ● Data Security: Implement security measures such as encryption of data in transit and at rest, and authentication and authorization for accessing services and resources.