ARTES 4.0 Generic Programme Line Business Applications - Space Solutions
ACTIVITY DESCRIPTION

“Space for Underwater Radiated Noise Management”

THEMATIC CALL FOR PROPOSALS

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Table of Acronyms

Acronym	Definition
5G	Fifth Generation Mobile Network
4S	Space Systems for Safety and Security
AIS	Automatic Identification System
APQ	Activity Pitch Questionnaire
AoF	Authorisation of Funding
ARTES	Advanced Research in Telecommunications Systems
BASS	Business Applications - Space Solutions
CfP	Call for Proposal
DAS	Distributed Acoustic Sensing
EBP	Experience Building Phase
EIA	Environmental Impact Assessment
ESG	Environmental, Social and corporate Governance
ESI	Environmental Ship Index
ESA	European Space Agency
EU	European Union
FP	Full Proposal
GNSS	Global Navigation Satellite Systems
IMO	International Maritime Organisation
MMO	Marine Management Organisation
MPA	Marine Protected Area
MSFD	Marine Strategy Framework Directive
OP	Outline Proposal
OSIP	Open Space Innovation Platform
EO	Earth Observation

Acronym	Definition
SFDR	Sustainable Finance Disclosure Regulation
UNOC	United Nations Ocean Conference
URN	Underwater Radiated Noise
WAPS	Wind Assisted Propulsion Systems

1. OVERVIEW

This document provides an overview of the "Space for Underwater Radiated Noise Management" thematic call for proposals under the ARTES BASS, 5G and 4S programme lines. It invites companies to submit business ideas that develop space-based services aimed at enhancing underwater radiated noise management.

2. BACKGROUND AND RATIONALE

Underwater Radiated Noise (URN) has emerged as a major and growing environmental pressure in marine ecosystems[1], largely driven by human activities such as commercial shipping and offshore operations. Among these, vessel traffic is the most significant source of continuous, low-frequency noise, with estimates indicating that 91% of Europe's seas are exposed to ongoing shipping noise (Figure 1) and 10% to high shipping density. Impulsive noise from activities such as seismic surveys or construction is more spatially limited, affecting around 8% of European marine areas[2].

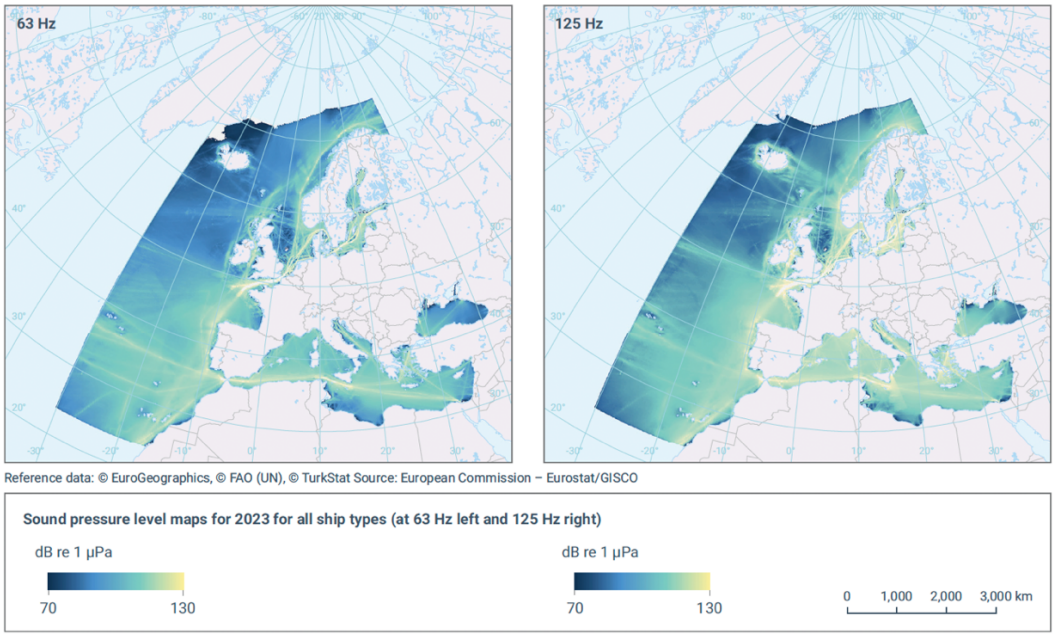

Figure 1: Sound pressure level maps for 2023 for all ships. Source: NAVISON, EMSA 2024[3]

Although shipping is widely regarded as the most efficient mode of transporting goods, the rapid growth in fleet size, shipping density, and voyage distances has contributed to a steady

[1] Shipton, M., Obradović, J., Ferreira, F. et al. A Database of Underwater Radiated Noise from Small Vessels in the Coastal Area. Sci Data 12, 289 (2025). https://doi.org/10.1038/s41597-025-04584-x

[2] https://www.eea.europa.eu/en/european-zero-pollution-dashboards/indicators/underwater-noise-pollution-in-europes-seas

[3] EMSA, 2024a, *NAVISON Final Report: Calculation and analysis of shipping sound maps for all European seas from 2016 to 2050,* European Maritime Safety Agency (https://emsa.europa.eu/publications/reports/item/5253-navison.html), accessed 4 October 2024.

increase in URN levels[4]. Importantly, smaller recreational vessels and ferries, often overlooked, are increasingly recognised as significant contributors to noise pollution, especially in shallow coastal waters[5]. The dominant source of URN from vessels is broadband propeller cavitation, with machinery noise also contributing significantly, particularly from main propulsion systems[6]. In addition to vessel noise, other human activities, such as seismic surveys, multibeam echosounders, side-scan sonars, fish finders, and naval active sonars, add a wide range of frequencies to marine soundscapes. Coastal and offshore construction activities, including pile-driven, dredging, and the operation of dynamic positioning systems on drilling platforms also produce substantial low-frequency noise. Even small-recreational activities contribute to this pervasive anthrophony[7]. In parallel, the rapid expansion of offshore wind energy introduces new sources of continuous operational noise[8] - mainly in the low- to mid-frequency range (<1 kHz) - originating from turbine gearboxes, generators, transformers, and subsea cables. While generally lower in intensity than construction noise, the cumulative impact of turbine arrays, particularly in regions with high wind farm density or overlapping shipping routes, is increasingly relevant for marine environmental assessments. Human activities have also altered natural soundscapes by reducing biophony through the depletion of vocalising marine animals and by changing geophony through climate-related habitat degradation and sea ice loss. Climate change further modifies ocean acoustics by warming and stratifying the water column, affecting sound speed and propagation, and by lowering ocean pH, which reduces sound absorption and contributes to a noisier ocean, especially at low frequencies[9]. This persistent noise pollution, while invisible, can have far-reaching consequences, disrupting communication, navigation, and behaviour in marine species, and threatening the stability of entire ecosystems. Addressing underwater noise pollution is therefore an essential component of a sustainable maritime future, and the focus of this call.

Despite its significant ecological impact, URN has historically received less attention than other forms of marine pollution[10]. However, growing evidence of its harmful effects on marine life, from invertebrates to large marine mammals, is now prompting a shift. Studies across multiple disciplines have linked exposure to underwater noise can disrupt key biological processes, such as foraging, communication, reproduction, and navigation, in a wide range of marine species. Responses have been observed across all major groups of marine life, including mammals, fish, and invertebrates, and commonly manifest as behavioural changes (such as altered swimming or diving patterns), communication masking and physiological stress. Masking occurs when man-made noise overlaps with the frequency ranges marine animals use to communicate or detect predators and prey, leading to reduced communication space

[4] Vakili, S., White, P., Turnock, S. 2025. Advancing a sustainable maritime future: Integrating energy efficiency and underwater radiated noise reduction strategies in commercial shipping. Marine Pollution Bulletin, Vol. 215, 117835

[5] Smith, T.A., Rigby, J., 2022. Underwater radiated noise from marine vessels: A review of noise reduction methods and technology. Ocean Engineering, Vol. 266, 112863

[6] EMSA, 2025. European Maritime Transport Environmental Report 2025. doi:10.2800/3162144

[7] C. M. Duarte et al. The soundscape of the Anthropocene ocean. Science 371, eaba4658 (2021). DOI: 10.1126/science.aba4658

[8] Marmo, Brett & Risch, Denise & van Geel, Nienke & Favill, Guy. (2024). Underwater sound produced by operational floating wind turbines.

[9] C. M. Duarte et al. The soundscape of the Anthropocene ocean. Science 371, eaba4658 (2021). DOI: 10.1126/science.aba4658

[10] EMSA, 2025. European Maritime Transport Environmental Report 2025. doi:10.2800/3162144

and higher risks[11]. These effects are particularly pronounced in sound-dependent animals like cetaceans and sea turtles and some fish species, especially in areas with high maritime traffic[12]. While most studies to date focus on short-term effects, there is limited understanding of the long-term or population-level consequences of chronic exposure to continuous noise. Moreover, knowledge of noise exposure thresholds, dose-response relationships, and species-specific sensitivities remains incomplete, which complicates risk assessments and management[13]. Current evidence is often based on easily accessible or manageable species, with scarce data on threatened or vulnerable species. There is also a lack of research on the cumulative impacts of multiple noise sources and on the effectiveness of mitigation measures, which hampers policy development[14]. This creates significant challenges for fully assessing the scope of URN impacts, especially given the variability in vessel types and noise characteristics[15]. In the absence of coordinated industry efforts, the overall contribution of URN, especially from commercial and smaller vessels, is expected to continue rising over the coming decades[16].

Given the transboundary nature of URN, addressing this issue requires coordinated action across international, regional, and national levels[17]. Institutions such as the International Maritime Organization (IMO) and the European Union (EU), alongside national governments and regional agreements, are increasingly working to monitor, regulate, and mitigate noise emissions from shipping and other offshore activities. The International Maritime Organization (IMO) has led global efforts by issuing voluntary guidelines aimed at reducing URN from ships. These were first released in 2014 and recently revised to include a more integrated approach that considers vessel design, operational changes, maintenance, and routing. The updated guidelines reflect a growing recognition of the link between URN and other maritime concerns such as climate goals, biofouling, and vessel safety. To further support implementation, the IMO's Sub-Committee on Ship Design and Construction has adopted an action plan for reducing noise pollution from shipping, reaffirmed during MEPC 82.

At the European level, the Marine Strategy Framework Directive (MSFD) remains the primary binding regulation addressing underwater noise. Under Descriptor 11, the MSFD obliges EU member states to assess and manage human-generated underwater noise, and has introduced threshold values and methodologies of assessment for impulsive and continuous underwater sound, both with the goal of achieving “good environmental status.” The arrival of the European Green Deal has further emphasized the urgency of tackling URN, spurring additional research and policy development. Regional Sea Conventions such as OSPAR and

[11] C. M. Duarte et al. The soundscape of the Anthropocene ocean. Science 371, eaba4658 (2021). DOI: 10.1126/science.aba4658

[12] Shipton, M., Obradović, J., Ferreira, F. et al. A Database of Underwater Radiated Noise from Small Vessels in the Coastal Area. Sci Data 12, 289 (2025). https://doi.org/10.1038/s41597-025-04584-x

[13] C. M. Duarte et al. The soundscape of the Anthropocene ocean. Science 371, eaba4658 (2021). DOI: 10.1126/science.aba4658

[14] C. M. Duarte et al. The soundscape of the Anthropocene ocean. Science 371, eaba4658 (2021). DOI: 10.1126/science.aba4658

[15] EMSA, 2025. European Maritime Transport Environmental Report 2025. doi:10.2800/3162144

[16] Smith, T.A., Rigby, J., 2022. Underwater radiated noise from marine vessels: A review of noise reduction methods and technology. Ocean Engineering, Vol. 266, 112863

[17] Vakili, S., White, P., Turnock, S. 2025. Advancing a sustainable maritime future: Integrating energy efficiency and underwater radiated noise reduction strategies in commercial shipping. Marine Pollution Bulletin, Vol. 215, 117835

HELCOM have been instrumental in advancing these efforts, providing platforms for cooperation and supporting technical work through dedicated expert groups. In the UK, the Marine and Coastal Access Act, alongside the Marine Management Organisation (MMO), also addresses the impact of underwater noise, particularly through licensing processes for offshore activities.

Beyond regulatory frameworks, other measures are also being explored. Ports such as Vancouver have implemented incentive schemes offering reduced fees for quieter vessels, and classification societies have introduced “Quiet Ship” notations to recognize ships with lower noise emissions. Despite these efforts, adoption remains limited due to challenges in standardizing measurement techniques and a lack of comprehensive data, especially for vessels that do not carry automatic identification systems, such as recreational craft or vessels of opportunity. Additionally, while internal ship noise is well-regulated, external radiated noise lacks consistent international standards. Current efforts aim to expand existing frameworks like ISO 17208 and ANSI/ASA standards to include shallow water measurements and refine classification procedures across ship types.

URN is not yet formally regulated under instruments like the IMO’s MARPOL Convention; however, regulatory momentum is clearly growing. At the United Nations Ocean Conference (UNOC-3) held from 9 to 13 June in Nice, the IMO emphasised the urgent need to address and reduce URN and the organisation reaffirmed the commitment through the revised guidelines and the ongoing Experience Building Phase (EBP), which call for coordinated engagement and shared responsibility from both public and private sectors. A significant milestone was the signing of the High Ambition Coalition for a Quiet Ocean by 37 Member States, including Panama, Canada and the 27 EU countries, demonstrating political will to assess and mitigate URN on global scale. This shift creates a timely opportunity for industry to develop and implement commercially viable solutions that respond to evolving policy and market expectations. As data standardisation improves and noise-related requirements gain traction, there is increasing space for sustainable business models built around services such as monitoring, modelling, and mitigation, positioning industry players to lead in shaping a low-noise, environmentally responsible maritime sector aligned with the future economy.

3. OBJECTIVES OF THE CALL

The objective of this call for proposals is to support the development and deployment of innovative services for the monitoring and management of underwater radiated noise (URN). While still an emerging discipline, URN management is gaining commercial relevance across multiple sectors, with space-based solutions expected to play a key enabling role, particularly in light of increasing international commitments. These services are intended to support a wide range of stakeholders, including shipping companies, maritime operators, environmental organisations and other actors committed to ocean health and sustainable maritime practices. The initial areas of interest include, but are not limited to, the following:

Quiet Maritime Environment

- **Quiet ship design, voluntary certification and compliance:** Efforts to reduce URN are increasingly shaping ship design and construction, with voluntary certifications playing a pivotal role. Classification societies develop regulations that vessels must

comply with not only during construction but throughout their operational life. This includes rigorous inspections of design plans, on-site checks during shipbuilding, and ongoing assessments to ensure adherence to noise and environmental standards. It is important to clearly distinguish between existing vessels and new builds: new ships can integrate noise reduction measures directly from the design phase, whereas existing ships often require retrofit solutions that must consider operational limitations and cost-efficiency.

While underwater noise regulations remain largely voluntary and there is no globally mandatory standard yet, voluntary notations classes encourage early adoption by offering reputational benefits and facilitating access to ports that operate green incentive schemes. These certifications are becoming essential for operating in environmentally sensitive marine areas.

To reduce noise emissions, shipbuilders and naval architects employ a range of design and retrofit measures. These include optimizing propeller shapes and hull forms to minimize cavitation, installing resilient mounts to reduce machinery vibration, using noise-dampening materials, and integrating Wind Assisted Propulsion Systems (WAPS) to decrease engine loads. However, underwater noise measurement remains costly and complex, compounded by variations in bathymetry and measurement methodologies that create uncertainty. Harmonizing acoustic measurement protocols and establishing recognized certification criteria are critical to incentivizing broader compliance. In this context, space-based services, including independent acoustic verification and enhanced compliance monitoring, can play a growing role in supporting certification processes.

Quiet ship operation: Minimising URN from vessels requires a combination of operational best practices and informed decision-making. Key strategies include optimising speed and routing to avoid cavitation, operating at reduced speeds in sensitive marine areas, optimising the use of WAPS, using quiet operational modes where available, and leveraging autonomy to avoid abrupt manoeuvres. This “small steps” approach allows shipowners to enhance their vessels’ acoustic performance progressively, without imposing sudden cost or operational burdens.

A critical enabler for this approach is access to a vessel’s baseline noise profile. While standards exist for noise measurement, the accuracy and relevance of these baselines depend heavily on environmental context and vessel-specific factors. Establishing a reliable acoustic baseline, under defined conditions and at specific locations, enables shipowners to identify tailored mitigation measures and monitor their impact over time.

Standardised assessment frameworks and benchmarking further support this process by allowing vessel operators to quantify and compare acoustic emissions. This, in turn, guides decisions on routing, speed, and the application of quiet operational modes. A shared repository of performance data can foster industry-wide learning and accelerate adoption.

Space-enabled solutions can play a vital supporting role across all these elements: from improving environmental awareness and baseline assessments, to enabling the monitoring, analysis, and exchange of performance data. By underpinning each stage of quiet ship operation, space assets help align acoustic impact reduction with broader operational and regulatory goals.

- **Quiet port initiatives:** Ports are increasingly recognising the importance of URN mitigation as part of broader environmental and stakeholder engagement strategies. Programmes such as the Port of Vancouver’s ECHO initiative and Port Prince Ruppert,

both in Canada, offer incentives for slower ship speeds, quieter routing, and seasonal transit changes to protect vulnerable marine species. Such initiatives contribute to biodiversity conservation, enhance social licence to operate, and can ease environmental permitting. Additionally, they offer commercial advantages through green branding, Environmental, Social and corporate Governance (ESG) alignment, and stronger partnerships with local and national stakeholders.

As gatekeepers of maritime access and influence points for thousands of vessels annually, ports have a pivotal role in accelerating the uptake of URN reduction practices. Their leadership is critical in establishing expectations, incentivising change, and shaping global norms. In addition to Canada's financial incentive schemes, European frameworks such as Green Marine Europe are advancing environmental performance labelling, and from January 2026, the Environmental Ship Index (ESI) will include URN indicators, used by ports like Rotterdam to offer preferential rates for lower-emission vessels.

To support this transition, space-enabled solutions can assist ports in monitoring ship behaviour, assessing compliance with voluntary programs, and better understanding local environmental conditions.

Environmental Services

- **URN in ESG and Digital Maritime Analytics:** As investors and regulators demand more comprehensive environmental performance reporting, URN is emerging as a valuable metric within ESG frameworks. Digital platforms and maritime analytics providers are beginning to integrate underwater noise data into fleet-level sustainability dashboards, enabling benchmarking, risk evaluation, and disclosure aligned with frameworks such as the EU Taxonomy and Sustainable Finance Disclosure Regulation (SFDR). This creates a new commercial opportunity for data-driven ESG services in the maritime sector, linking biodiversity impacts with financial and regulatory decision-making.
- **URN monitoring:** Monitoring and managing URN is becoming increasingly urgent as both continuous sources (e.g. marine traffic) and impulsive activities (e.g. offshore construction) intensify. Yet existing monitoring systems are often fragmented, particularly in coastal zones where many vessels operate without Automatic Identification Systems (AIS) and acoustic coverage remains sparse. These gaps create significant blind spots in understanding cumulative acoustic pressure on sensitive marine ecosystems and hinder effective environmental management. Besides, there is a need to provide precise qualification of ambient noise in coastal areas, with often unavailable high-resolution and accurate historical meteorological and oceanographic data.

  As environmental regulations tighten and expectations rise under frameworks such as the EU MSFD, there is growing demand for reliable URN data to support baseline assessments, regulatory compliance, and permitting processes. Space-enabled solutions can help bridge current data and monitoring gaps by complementing in-situ systems with satellite-derived insights, enhancing coverage, contextual understanding, and decision-making in noise-sensitive areas.
- **Risk mapping of URN impacts:** Assessing the ecological impact of URN remains a major challenge due to the lack of reliable data on species presence, behaviour, and habitat use across space and time. Without this biological baseline, it is not possible to

define or apply thresholds of tolerable noise exposure, especially data-poor regions and coastal ecosystems. This uncertainty is compounded by the lack of vessel movement data, particularly for coastal pleasure craft and recreational vessels. Without this biological baseline, it is not possible to define or apply thresholds of tolerable noise exposure. As a result, relevant stakeholders responsible for managing marine noise impacts often cannot confidently assess when and where marine species may be at risk, despite increasing regulatory and public pressure to protect vulnerable ecosystems.
This uncertainty is particularly acute in data-poor regions, where cumulative risk assessments and effective mitigation planning are most difficult to implement. In response, there is growing demand for tools and datasets that can enhance ecological insight and support precautionary, spatially explicit decision-making. In this context, space-enabled solutions can support this effort by providing large-scale environmental insights, helping to identify important habitats, and offering a broader view of vessel activity and noise-related pressures. By improving understanding of how marine species interact with their environment over time and space, satellite-derived data can strengthen risk assessments and support more informed decisions to reduce the impact of underwater noise.

- **Monitoring shipping and URN impact on Marine Protected Areas:** There is increasing attention on the impacts of URN within Marine Protected Areas (MPAs), particularly in light of new conservation targets and expanding protection zones. Despite notable national efforts, such as the Pelagos Sanctuary (France, Monaco, Italy) and the Cetacean Migration Corridor in Spain, URN monitoring remains fragmented and limited in scope. Currently, monitoring efforts are often small in scale and mostly localized. Passenger ferries, in particular, operate intensively between Mediterranean islands and coastal cities, often passing through or near MPAs. While there are currently no binding international requirements for URN emissions from ferries, regulatory pressure is increasing. Ferry operators may soon face stricter expectations to assess and reduce their acoustic footprint, especially in ecologically sensitive zones. Many MPAs implement spatial zoning that restricts or regulates ferry access to sensitive habitats, often through speed limits, timing restrictions, or exclusion zones. While complete bans on ferries are uncommon due to their essential transport role, these measures create opportunities for operational planning and noise mitigation services that help ferry operators comply with spatial regulations while minimizing acoustic impacts. As new and more ambitious MPA designations take shape, there is a timely opportunity to provide tools and services to assess and mitigate URN impacts within these zones. At the 2025 UNOC-3 in Nice, Samoa, French Polynesia, Colombia, Tanzania, Spain, and São Tomé and Príncipe announced new MPAs, while Greece declared two new marine parks. These developments reflect a growing global commitment to marine conservation, often overlapping with busy maritime routes, and are driving demand for services that help ferry operators and authorities manage underwater noise sustainably. Space-enabled solutions can support this transition by contributing to the monitoring of vessel activity, environmental conditions, and compliance with spatial regulations, providing valuable data for both operators and MPA managers to reduce acoustic impacts effectively.

Subsea Activity Noise Management

- **Construction noise mitigation :** Offshore renewable energy developers face significant challenges from URN generated during construction activities, especially pile driving, dredging, and cable installation. This has created a growing market for noise mitigation technologies such as bubble curtains, noise-dampened foundation designs, and acoustic deterrent devices to temporarily displace marine species. Companies offering these technologies are benefitting from the global expansion of offshore wind and the parallel rise in marine biodiversity protections. Integration of space-based tools can enhance planning and compliance monitoring throughout project lifecycles.
- **Continuous machinery noise :** Once operational, offshore infrastructure such as wind turbines, substations, and associated support vessels emit continuous low-frequency URN from machinery like generators, gearboxes, and cooling systems. While less intense than construction noise, this continuous exposure can interfere with marine species' communication, navigation, and feeding behaviour over longer periods. This is particularly concerning in biologically sensitive areas and migration corridors. Effective monitoring of these chronic sources of noise is becoming increasingly important for environmental compliance and public trust. Space-based data can support habitat sensitivity mapping and inform decisions on turbine placement and operational scheduling to minimize ecological impact.

4. SPACE ASSETS AND DIGITAL TECNOLOGIES

Direct detection of underwater radiated noise (URN) is not possible from space. However, several space-based assets provide valuable proxy data that can significantly enhance the understanding, monitoring, and mitigation of underwater noise emissions. These include, but are not limited to, the following:

- **Satellite Communications:** AIS data relayed via satellites enables near-global tracking of vessel movements, supporting the modelling and correlation of noise emissions with specific traffic patterns. When integrated with in-situ acoustic sensors or Distributed Acoustic Sensing (DAS) systems, AIS data can enhance both real-time and retrospective analyses of underwater noise.
- **Satellite Earth Observation (EO):** EO data can support environmental characterisation, including bathymetry, sea surface temperature, and chlorophyll concentration, all of which influence the propagation of sound underwater. This characterisation is fundamental not only for maritime traffic modelling, but also for the Environmental Impact Assessments (EIAs) for offshore developments. EO systems also contribute to monitoring vessel activity in sensitive or protected areas, assisting enforcement and conservation efforts.
- **Satellite Positioning and Timing:** Global Navigation Satellite Systems (GNSS) underpin the positioning accuracy of AIS data, which is crucial for reliable noise modelling. Additionally, GNSS data can be used to implement geofencing of ecologically sensitive zones, enabling the enforcement of dynamic noise reduction measures or vessel exclusion policies.

5. SCOPE OF THE CALL

The proposals submitted under this Call for Proposal (CfP) shall target innovative and user-driven services which rely on advanced digital and space-based technologies. The proposals shall leverage target opportunities in the agricultural sector related to environmental sustainability, efficiency, and regulatory compliance.

The Bidder has two options for addressing use-cases in their proposal: either address the optional use-cases included in the Annexes (available on the website), or address other use-cases and requirements related to the Call by involving other customers or users directly. If choosing the latter, the Bidder must provide letters of interest from these potential customers as evidence of their support, which should be attached to the Outline Proposal (the second step in the application process). Both options will be considered equally in the evaluation process

The service provider shall be identified and be part of the bidding team to ensure the commercial operational roll-out of the proposed service following completion of a demonstration project.

This Call for Proposal covers two types of activities:

1. **Feasibility Studies** which provide the preparatory framework to identify, analyse and define new potentially sustainable services.

   The applications and/or services covered by the proposed Feasibility Studies must:

   - **Be customer - and user-driven:** proposals should demonstrate a clear understanding of user needs and present a strong potential for sustainability.
   - **Leverage integrated space assets:** propose a service demonstrating the benefits of the utilisation of integrated space assets.
   - **Include a plan to test business hypotheses:** a plan should be included that details how the user desirability, technical feasibility, and commercial viability of the service will be tested.
   - **Target marketed readiness:** Aim to evolve the targeted applications and services to marketability and operational roll-out, potentially through a Demonstration Project after successful completion of the Feasibility Study

2. **Demonstration Projects** dedicated to the implementation and demonstration of pre-operational services.

   The applications and/or services covered by the proposed Demonstration Projects must:

   - **Be customer- and user-driven**: Active user involvement is essential throughout the project, including their participation in defining requirements,

validating results, and contributing to the pilot activities.

- **Showcase the value of space assets**: Proposals must clearly demonstrate how the utilisation of space technologies provides a distinct advantage, with a strong potential for long-term sustainability.
- **Deliver measurable socio-economic benefits**: The project should quantify its impact, highlighting improvements in efficiency, sustainability, or other key outcomes that align with user and societal needs.
- **Ensure user participation**: Representatives from the target user communities must actively engage in the project, including participation in the pilot phases to ensure alignment with their requirements and expectations.

The goal of Demonstration Projects is to validate pre-operational services in a real-world environment, paving the way for scaling and operational deployment.

To apply to a demonstration project, the Bidder is required to have addressed the key technical and business risks associated with the proposed project, and to have established a solid business plan including clear support from prospective customers.

6. PROCUREMENT APPROACH

The proposals submitted in reply to the call shall be implemented in the context of ARTES 4.0 Generic Programme Line “Business Applications – Space Solutions”, “Space Systems for Safety and Security” (4S) and “Space for 5G/6G and Sustainable Connectivity” Strategic Programme Lines in coordination with National Delegations.

The Bidder shall submit first an Activity Pitch Questionnaire, and following evaluation, may be invited to submit the Outline and Full Proposal. The Activity Pitch Questionnaire (APQ) template provided by ESA shall be used. This is considered as entry point for companies to submit their idea, providing a simplified and single point of access to the ESA ARTES framework.

The price of activities carried out in a given State are charged against the contribution of that State in the programme. A letter of Authorisation of Funding (AoF) from the relevant National Delegation is therefore required as part of the Full Proposal. The Bidder is however advised to inform the relevant National Delegation(s) when submitting the Pitch. The contact information of the National Delegates can be found here:
https://artes.esa.int/national-delegations.

The Agency will admit for evaluation only (Outline and Full) proposals from a bidding team composed of a company and/or organisations (be it Prime or Subcontractor) residing in any of those states that subscribe to the Programme under which you wish you submit your proposal:

I) **for the ARTES 4.0 BASS Generic Programme Line:** Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Lithuania,

Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Slovenia, Sweden, Switzerland and the United Kingdom.

II) **for the ARTES 4.0 Space for 5G/6G and Sustainable Connectivity Strategic Programme Line:** Austria, Belgium, Finland, Germany, Greece, Hungary, Ireland, Italy, Luxemburg, the Netherlands, Norway, Portugal, Romania, Spain, Sweden, Switzerland, the United Kingdom and Canada.

III) **for the ARTES 4.0 Space Systems for Safety and Security (4S) Strategic Programme Line:** Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxemburg, Norway, Portugal, Romania, Spain, Switzerland, the United Kingdom and Canada.

7. PROCESS AND SCHEDULE

The call for proposals is scheduled to open on **01 September 2025** and will remain open until **17 October 2025**, 13:00 CEST.

7.1 Timeline and procedure

The Bidder shall submit first an **Activity Pitch Questionnaire,** and following evaluation, may be invited to submit the **Outline Proposal** and subsequent **Full Proposal.** The Activity Pitch Questionnaire (APQ) template provided by ESA shall be used, which is considered as entry point for companies to submit their idea. The details of the APQ can be found here: Open Space Innovation Platform - OSIP - Channel: APQ for ARTES Downstream Business Applications

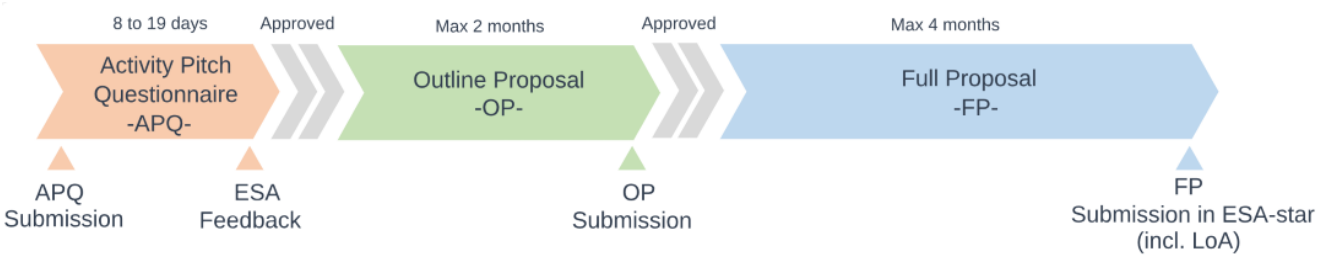

Figure 11: Application steps

This Call is planned to be implemented according to the following stepwise approach.

Step 1: APQ Submission

In Step 1, the interested Bidders are requested to submit their proposal(s) based on a short Activity Pitch Questionnaire (APQ) template made available by ESA that can be downloaded from the Thematic Call website. The pitch should provide the initial idea of what the Bidder would like to propose, elaborated on the basis of the thematic areas and either the use cases proposed by ESA's partners or others selected by the Bidder. If the Bidder has the relevant information available to them, they may consider completing the supplementary questions

(AP5) in the APQ template as part of the APQ+, which may allow to skip Step 3 below, at ESA's discretion.

Should the bidder wish to cooperate with any of the listed partners in the annexes, they shall give to the Agency the authorisation to distribute the activity pitch questionnaire to these stakeholders by explicitly stating it in the Activity Pitch Questionnaire. Subject to such authorisation, the Agency will follow up distributing the APQ to the bidder's authorised stakeholder(s) and liaise with them to facilitate interactions with the Bidder.
The completed Activity Pitch Questionnaire (APQ) shall uploaded using the online web submitter, ESA's open space innovation platform (OSIP) in the channel named "APQ for ARTES Downstream Business Applications".

Multiple Pitches with different ideas can be submitted.

It is strongly recommended that the interested Bidder liaises from the beginning with the relevant ESA Member States Delegates.

APQ Evaluation

Following an assessment of the pitch by ESA, ESA will provide feedback to the company, aiming to provide a reply within 10 working days following the deadline for submission of the pitch.

It is recognised that some interactions with the Bidder may be required, and ESA may therefore consult with the Bidder and may offer support in providing further clarifications, aimed at better shaping the Outline Proposal(s). Dialogue sessions may be organised individually with potential partners prior to Step 3.

ESA might also consult, when necessary, with the relevant National Delegation(s) for orientation and will provide key information (e.g. title, cost, price, subcontractor) to the relevant National Delegation(s).

Subject to a positive evaluation of the pitch and the Bidder having informed the National Delegation(s), the Bidder will be notified by ESA and invited to submit an Outline Proposal. Note that the APQ+ can act as a substitute for the Outline Proposal, thus if having adequately answered the additional questions included in the APQ+, the Bidder may be able to skip Step 3.

Step 2: Outline Proposal Submission

In Step 2, the Bidder will submit the Outline Proposal, based on a template provided by ESA, with letter(s) of interest from users/stakeholders. The Outline Proposal expands upon the pitch with a more extensive level of details. The Bidder will be allowed 2 months from ESA's approval of the APQ to the submission of their Outline Proposal. The outline proposal shall be submitted on the OSIP platform under the channel "Outline Proposal for ARTES Downstream Business Applications – Feasibility Studies/Demonstration Projects".

Step 3: Full Proposal Submission

In Step 3, subject to a positive assessment from ESA and in-principle support from the National Delegations, the Bidder will be invited to submit a Full Proposal on ESA-STAR in accordance with BASS programme line. The Bidder will be allowed 4 months from submission of their Outline Proposal to submit their Full Proposal on ESA-STAR.

A letter of Authorisation of Funding (AoF) from the relevant ESA National Delegation is required as part of the Full Proposal. The Bidder is however advised to inform the relevant National Delegation(s) when submitting the Pitch. The details of the National Delegates can be found here: https://artes.esa.int/national-delegations.

After the Bidder have submitted a Full Proposal with the Authorisation of Funding (AoF) from the relevant National Delegation(s) and following a positive assessment by ESA, the proposed activity will be approved for implementation.

7.2 Evaluation Criteria

More information for the assessment of the APQ (**Step 1**) and outline proposal (**Step 2**) stages can be found on the OSIP page "APQ for ARTES Downstream Business Applications".

More information on the evaluation criteria for the final proposals (**Step 3**) can be found within the document "Appendix 1 to AO/1-10494/20/NL/CLP (Issue 2.2) " which can be found on ESA-STAR at the following link under "Tender conditions".

The evaluation process is non-competitive, as each proposal will be assessed individually on its own merits, according to the evaluation criteria applicable for CALL FOR PROPOSALS FOR DOWNSTREAM APPLICATIONS IN ARTES 4.0 (esa star ref.: 1-10494).

8. GENERAL CONDITIONS

The submissions and all correspondence relating to it shall be in English.

The tender shall not contain any Classified Information, whether in the APQ, Outline Proposal or in the Full Proposal. To avoid any confusion with Classified security markings, the unclassified protective marking used by the Tenderer in the proposal shall not contain the terms: "Restricted", "Confidential", or "Secret".

However, should the Tenderer consider necessary to include Classified Information in the tender, the Tenderer shall inform beforehand the ESA Security Officer.

The Tenderers are informed that Classified Information can be shared with ESA only in compliance with the Project Security Instruction (PSI) duly established by the Agency beforehand and subject to the approval by the ESA Member States.

The Agency will treat commercially sensitive or proprietary information confidentially and solely for the purpose of the assessment of the response.

Expenses incurred in the preparation and dispatch of the response to the announcement will not be reimbursed. This includes any expenses connected with a potential dialogue phase.
The announcement does not bind the Agency in any way to place a contract. The Agency reserves the right to issue amendments to the announcement.