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The Baltic Marine Watchdog Challenge

1 About Vinnova and challenges

Vinnova is Sweden's innovation agency [[Länk: https://www.vinnova.se/en/](https://www.vinnova.se/en/)]. We enhance Sweden's and Europe's competitive edge and capacity for innovation by paving the way for sustainable growth. Our funding creates opportunities and platforms for collaboration that enable innovation and systemic shifts. To succeed, we promote those who think in new and unconventional ways.

Our challenges are designed to finance teams developing, testing, and demonstrating bold new solutions. Each challenge is built around a clearly defined societal need that lacks a solution. The challenges define what needs to be achieved, while leaving the approach open to participating teams.

Several teams participate and develop solutions in parallel. The challenge takes place in stages. Progression between stages is based on demonstrated results, where participating teams show which solutions have what it takes to be a breakthrough innovation.

Our goals are:

- To invest in bold ideas that address societal needs that might otherwise go unmet.
- To accelerate innovation and the development of breakthrough technology.
- To create conditions for new fields of technology and for companies to emerge, scale and become globally competitive.

2 What is the Baltic Marine Watchdog Challenge?

Recent incidents involving sabotage or accidental damage to Critical Underwater Infrastructure (CUI) are directly challenging civil security frameworks and strategies. Currently, there is a critical capability gap, where no cost-effective, scalable, or autonomous civilian systems exist. There is a growing need for solutions that can operate in degraded marine environments and dense maritime traffic to successfully detect, identify, track, and document suspicious surface and underwater activities.

To achieve full attribution, such systems must be capable of monitoring and documenting a wide range of unauthorised, and possibly illegal, activities. This includes being able to address physical threats to infrastructure, such as anchor dragging, and other unauthorised surface or underwater activities. They must also be able to monitor environmental offences, including oil spills and hazardous waste leaks.

The difficulty in attributing these suspicious sub-threshold actions places severe strain on authorities and private corporations who are responsible for safeguarding such infrastructure. To counter these threats, new scalable, autonomous, and selective approaches are required to interpret, document, deter, and de-escalate suspicious activities. Future systems must also be able to adapt to unexpected threats and deploy situationally appropriate countermeasures, ranging from non-escalatory interception to comprehensive documentation that can support the subsequent investigation, verification and attribution of unauthorised activities.

3 Objectives

The aim of the Baltic Marine Watchdog Challenge is to develop, demonstrate, and validate fully autonomous systems for maritime surveillance, vessel tracking, documentation, and monitoring relevant to safe navigation, environmental protection, maritime situational awareness, and critical infrastructure protection in demanding operational conditions. These systems must be able to autonomously patrol a defined sea area, identify and track vessels or other objects of interest, detect relevant anomalies, and maintain safe manoeuvring in real time.

The challenge addresses a market and capability gap in integrated autonomous maritime systems. While individual technologies for unmanned platforms, sensors, navigation, energy systems and data analysis are developing rapidly, there remains a need for solutions that can combine persistent, energy-efficient autonomous operation with sensor fusion and decision-support functionality. Such solutions should contribute to broader maritime situational awareness, support faster and better-informed operational decisions, and generate trustworthy documentation that may support subsequent assessment, verification and, where appropriate, attribution in complex Baltic Sea conditions. Where applicable, the solution may also support operator decisions on whether to continue observation, issue visible or audible signalling, or notify relevant authorities, while maintaining human oversight, safety, and accountability.

We seek adaptive solutions that have maritime situational awareness, can autonomously classify and track objects and activities of interest, exchange relevant information, and operate effectively under adverse weather, darkness, dense maritime traffic, electronic interference, and GNSS-degraded conditions. The challenge progresses from controlled demonstrations to realistic field trials and ultimately to operational validation in complex multi-threat scenarios.

Solutions must integrate autonomous sensing, decision-making, endurance, documentation, and navigation into a complete end-to-end capability. This includes multimodal sensor fusion, combining several technologies for surface and underwater awareness together with transparent decision logic, robust data transmission and seamless integration of detection, tracking, documentation and response-support functions.

Human override capabilities must always be available, and solutions must prioritise safety, accountability, operational resilience, and sustainability throughout all stages of the challenge.

System requirements

- **Autonomy:** The system must be fully autonomous. Time from incident to detection (alert to the demonstration operator), and to correct decision to track, will be measured.
- **Monitoring and data exchange:** The system must be monitored from a land-based central command.
- **Deterrence:** An audible and visual alarm that is perceptible to the object identified as an anomaly.
- **Documentation:** Suspicious activities must be documented through time-stamped and geo-referenced data and securely transmitted or stored for subsequent analysis and decision support. The documentation should support subsequent assessment, verification, and, where appropriate, attribution by authorised operators.

Regulatory requirements

- **Regulations:** The system must comply with relevant regulations for unmanned vessels and with a remote kill switch installed.
- **Data transmission and structure:** The system should comply, as far as possible, with the relevant parts of STANAG 4817 and the Federated Mission Network (FMN) framework.

Operational context

- **Area of operation:** The Baltic Sea, littoral waters. The anomalies to be detected will be within a defined area.
- **Environmental conditions:** South Baltic Sea, year-round (24/7), ice-free, but with fog, darkness, and common sea states.
- **Target vessel profile:** Maximum speed is 5 knots.
- **Jamming/spoofing:** Intermittent GNSS-contested environment.

Stage 1: Patrol a defined area of dense maritime traffic and follow a specified surface target

How can autonomous Maritime Situational Awareness (MSA) systems perform in defined monitoring and tracking scenarios under degraded environmental and operational conditions?

In this first demonstration phase, the autonomous system will present its core capabilities under controlled conditions in the Baltic Sea (littoral waters) by tracking a specified surface target within a defined area of maritime traffic. The focus is on endurance (operational duration is not defined), navigation, collision avoidance, detection, time to decision, tracking and data transmission.

Mission

- **Target engagement:** Detect and track a specified surface target within the defined Baltic Sea area.
- **Anomaly evaluation and documentation:** Assess, log and document a simulated suspicious activity in real time. Time from incident to detection (alert to the demonstration operator), and to correct decision to track will be measured.
- **Persistence and mission availability:** Demonstrate sustained operation during the mission while maintaining navigation, sensing, communication, and safety functions.

Stage 2: Patrol a defined area of dense maritime traffic and follow a suspicious surface or underwater target

How can autonomous Maritime Situational Awareness (MSA) systems react to unannounced suspicious surface and underwater activities under degraded environmental and operational conditions?

In this second demonstration phase, the autonomous system must operate in an escalated and less predictable mission scenario. The focus shifts to handling unannounced threat profiles, advanced multi-target collision avoidance, and the detection and tracking of both surface and underwater environmental or security threats. The system should provide information that supports rapid decision-making, including whether to continue observation, issue signalling, or notify relevant authorities.

Mission

- **Target engagement:** Automatically detect, identify, and track an unannounced, unknown suspicious target operating either on the surface or underwater.
- **Anomaly detection and documentation:** Real-time detection and documentation of suspicious activity, simulated by unknown activities or objects. Time from incident to detection (alert to the demonstration operator), and to correct decision to track will be measured.

Safety features

The basic prerequisite for demonstration is the safe autonomous operation of the system. It must not pose a danger to people, the environment, property, or other autonomous systems at the site. Every vessel must have safety measures to eliminate the risk of a run-away. A safety risk assessment plan must be in place before the start of operation. In addition, a kill switch that causes the vessel to lose propulsion must be implemented.

Regulations regarding the intermediate and closing events will be communicated to participants in advance.

4 The process

The challenge comprises two stages, each with defined milestones that need to be achieved. It will run for a total period of 10 months.

Teams interested in participating in the challenge are asked to send in a submission online.

Table 1: The process in short

- **Submission period:** 8 October – 2 December 2026. Call for submissions opens; information webinar; submission deadline.
- **Initial selection:** December 2026 – January 2027. Evaluation; invitation to pitch; pitch event; selection meeting; contracts signed.
- **Stage 1:** February – June 2027 . Stage start; testing days; interim demonstration and evaluation; selection for Stage 2.
- **Stage 2:** June – November 2027. Stage start; testing days; final demonstration.
- **End of challenge:** 30 November 2027. Challenge closure.

Submissions that meet the eligibility requirements are assessed by Vinnova and appointed experts against the challenge evaluation criteria. Based on this evaluation, teams will be invited to participate in a pitch event.

A jury of recognised experts will support Vinnova at the pitch event and in the evaluation of submissions. A selection meeting follows, at which the jury recommends up to twelve teams that will be invited to participate in Stage 1. Contracts will be sent out for signing a few days after the selection meeting.

Participating teams are financially compensated for performing research and development services as specified in their submission. In addition to financial support, Vinnova also offers teams various forms of coaching, as well as test days where Vinnova provides the framework conditions for teams to test and validate their technology in practice. The dates and location for the test days will be communicated to teams in good time before the event.

An interim evaluation will take place at the end of Stage 1 to assess whether each team has achieved the defined milestones. This includes a practical demonstration in which the system will present its core capabilities under controlled conditions in the Baltic Sea (littoral waters) by tracking a specified surface target within a defined area of dense maritime traffic.

Participation in the interim evaluation is mandatory. If a team does not attend the demonstration, Vinnova reserves the right to reclaim funds from this stage of the challenge.

Based on the interim evaluation, the jury assesses the progress of each team and selects up to nine teams for the second stage of the challenge.

A final public demonstration event will take place at the end of Stage 2, in November 2027. The exact date will be communicated in good time prior to the event. In realistic, demanding environments, each team must demonstrate that their system can effectively operate under escalated and less predictable conditions, including the management of unannounced threat profiles, advanced multi-target collision avoidance, and the detection and tracking of both surface and underwater environmental and security threats.

Participation in the final demonstration, including practical validation, is mandatory. If a team does not attend the demonstration, Vinnova reserves the right to reclaim funds from this stage of the challenge.

Vinnova reserves the right to change dates. Participants will be informed of date changes in good time.

5 Who is eligible to apply?

We are looking for teams of people with the right ambition, technical expertise, and business drive, whether you are a few individuals with a shared vision or an established team ready to scale.

Only legal entities are eligible to apply, such as universities, research institutes, established companies and start-ups. Individuals or sole proprietorships cannot apply by themselves but are welcome to participate in a team in which a legal entity sends in the submission.

Research teams should aim to incorporate a company into the team and demonstrate a commitment to building a self-sustaining business in the future.

Applicants are eligible to apply if they are headquartered in the European Union, the European Free Trade Association (EFTA) or the United Kingdom. Individual team members or collaboration partners may be based outside of these regions.

For incorporated companies, a key requirement is that the company is headquartered in, and has at least 50% of its equity held within the European Union, the European Free Trade Association (EFTA), or the United Kingdom.

Applicants are not eligible to apply if they:

- Have been convicted by a final judgment of any criminal offence,
- Are in a situation of financial difficulties,

- Have not fulfilled their obligations relating to the payment of taxes and social security contributions, or
- Are subject, directly or indirectly, to applicable sanctions.

For further details on what this encompasses, see the [Declaration of Honour \[Länk: https://www.vinnova.se/globalassets/utlysningar/2025-03966/omgangar/declaration-on-honour.docx1553911.docx?cb=20261006162803\]](https://www.vinnova.se/globalassets/utlysningar/2025-03966/omgangar/declaration-on-honour.docx1553911.docx?cb=20261006162803) form.

Applicants must ensure that their contribution to the challenge is not already financed by other public funding.

6 How does my team benefit?

Participating teams are financially compensated for their research and development activities relating to the challenge.

Vinnova provides financing over two stages in the form of an individually fixed price based on each team's cost estimates. The total budget and price caps per stage are set out below and should be completed before publication.

- Total maximum financing per team: **€520,000**.
- Stage 1 price cap per team: **€170,000**.
- Stage 2 price cap per team: **€350,000**.

Vinnova uses the pre-commercial procurement instrument for financing the challenge, see [Participation Agreement \[Länk: https://www.vinnova.se/globalassets/utlysningar/2025-03966/omgangar/participation-agreement.pdf1553910.pdf?cb=20261006162804\]](https://www.vinnova.se/globalassets/utlysningar/2025-03966/omgangar/participation-agreement.pdf1553910.pdf?cb=20261006162804).

To help teams reach their full potential, Vinnova provides various forms of support throughout the entire challenge period, including provision of testing opportunities. Vinnova also facilitates access to new cooperation partners and experts.

Vinnova expects successful candidates to be open to collaboration to build successful teams.

7 How does the submission process work?

Teams are invited to complete our online submission form to apply for this challenge.

All claims in the submission must be substantiated by scientific data. If no data is available for certain points, we still ask for an estimate (declared as such).

The “[Declaration of Honour \[Länk: https://www.vinnova.se/globalassets/utlysningar/2025-03966/omgangar/declaration-on-honour.docx1553911.docx?cb=20261006162803\]](https://www.vinnova.se/globalassets/utlysningar/2025-03966/omgangar/declaration-on-honour.docx1553911.docx?cb=20261006162803)” form must be completed and sent in along with the submission. It is mandatory to fill out the form to participate in this challenge.

8 How are teams selected?

Teams are selected in a two-step process:

- The first step is an evaluation of written submissions. This decides which teams are invited to the pitch event.
- The second step is the selection of teams that are invited to participate in the first challenge stage.

Vinnova is supported in the selection of teams by a group of recognised experts who are appointed based on their expertise in the field.

The submissions that are compliant with the eligibility requirements and complete are distributed among the experts. They are evaluated in competition with each other regarding:

- Their potential to become a breakthrough innovation (Approach).
- The effectiveness of the proposed work plan (Implementation).
- The team's ability to execute that plan (Team).
- The team's economic strategy (Economy).

Approach, Implementation and Team categories are given equal weight in the evaluation. The category of Economy is decisive if two submissions are evaluated equally based on the other categories.

After applying the criteria, an overall portfolio perspective may be taken into account for team selection. If so, the portfolio perspective "type and variation of solution/s" will be used.

After the evaluation of submissions, chosen teams are invited to a pitch in front of a jury. The jury then selects which teams participate in the challenge.

See below for a list of the sub-criteria that will be used in the evaluation and in the selection meeting.

Table 2: Evaluation criteria

Approach

- Does the approach suggest that the challenge can be solved?
- To what degree does the approach suggest that standardised threat scenarios can be detected?
- How effectively does the system autonomously respond to unforeseeable events in an operational context, including scalability and performance under simultaneous and dynamic threats, abrupt changes of direction, time-to-intercept, and robustness against false targets?
- How hardware-independent and platform-agnostic is the approach with respect to accessibility of technology and system (for example off-the-shelf, availability, origin)?

- To what extent can the technology be transferred to other applications?
- In what ways does the approach differ significantly from existing solutions?
- Does the approach take inclusive gender equality perspectives into account?

Implementation

- To what extent is the work plan based on realistic assumptions and a structured timeline?
- To what degree are the financial plan and the planned steps plausible and consistent?
- Can core functions be demonstrated under realistic conditions up to the interim and final demo?
- Are necessary work packages, external partners or subcontractors meaningfully integrated?
- Are the total costs in proportion to the scope of services offered?
- What is the scaling strategy for technology transfer beyond the challenge?

Team

- To what extent does the team have relevant expertise, for example in robotics, autonomous systems, sensor fusion, real-time processing, the maritime domain?
- To what degree does the team have relevant experience within the areas of use, for example research in the maritime domain, surface or seabed mapping, marine autonomous operations?
- What experience does the team have in commercialisation?
- Is the team gender-balanced or actively promoting gender balance?

Economy

- How will the costs per unit develop in the case of widespread use or series production? Is it economically viable and realistically achievable?
- Is there a viable plan for further development or follow-up financing?

9 Timeline

Submission period

- Call for submissions opens, 8 October 2026
- Information webinar, 11 November 2026
- Submission deadline, 2.00 pm CET on 2 December 2026

Initial selection of teams

- Evaluation
- Invitation to pitch event, 16 – 18 December 2026
- Pitch event, 14 – 15 January 2027
- Selection meeting
- Signing of contracts, 18 – 29 January 2027

Stage 1

- Start of Stage 1, 1 February 2027
- Testing days
- Interim demonstration and evaluation
- Selection of teams to move forward to Stage 2

Stage 2:

- Start of Stage 2, 28 June 2027
- Testing days
- Final demonstration

End of challenge

- 30 November 2027

10 Confidentiality and processing of personal data

- All documents received by a public authority, or prepared and stored there, are public documents.

Information relating to received submissions must not be made accessible to anyone other than the respective applicant before the expiry of the submission period. Information about the submissions will only be passed on to the jury, reviewers, challenge coaches, and potential collaboration partners. These persons are also bound to secrecy. This follows from the absolute confidentiality of tenders pursuant to Chapter 19, Section 3 of the Swedish Public Access to Information and Secrecy Act and also applies when pre-commercial procurement (PCP) is used as a method.

- What does this mean in practice?

No external access during the submission period. Information indicating that a submission is received, the identity of the applicant, the content of the submission, or the price may not be disclosed to anyone other than the applicant concerned before all submissions are made public, a contract award decision is taken, or the matter is otherwise concluded. This is what is meant by “absolute” tender confidentiality.

- After a contract award decision has been made, the following applies:

When the selected challenge teams are publicly announced, all public documents can be requested. However, the fact that a document is public does not mean that all information

contained in it is public. We may be required to keep confidential information concerning a private party's business or operational circumstances, inventions or research results where there are specific reasons to assume that disclosure would cause harm to that party.

- What are business and operating conditions?

This may include, for example, the use of property or services, operating guidelines, market research, market planning, negotiations and other business events, information about budgets and salaries, and other information on an individual's activities.

When assessing confidentiality, we take full account of the applicant's own opinion on what information should be considered confidential, and thus not to be released.

By making a submission, teams agree to these terms.

- Processing of personal data

For information about how we process your personal data, including what data we collect, why we process it, and how it is used, please read the [Processing of Personal Data \[Länk: <https://www.vinnova.se/globalassets/utlysningar/2025-03966/omgangar/processing-of-personal-data.pdf1553912.pdf?cb=20261006162803>\]](https://www.vinnova.se/globalassets/utlysningar/2025-03966/omgangar/processing-of-personal-data.pdf1553912.pdf?cb=20261006162803) document.