Project idea form - small projects

Version 2.1

Registration no. (filled in by MA/JS only) _____

Project Idea Form

Date of submission   05/06/2025

1. Project idea identification

Project idea name	BALTIC-SHIELD – Cross-Border Platform for Critical Infrastructure Resilience, Renewable Energy Integration, and Resilient GNSS in the Baltic Sea Region
Short name of the project	BALTIC-SHIELD
Previous calls	yes ◯ no ◉
Seed money support	yes ◯ no ◉

2. Programme priority

1. Innovative societies

3. Programme objective

1.1. Resilient economies and communities

4. Potential lead applicant

Name of the organisation (original)	Stowarzyszenie Instytut Bezpieczeństwa i Rozwoju Infrastruktury Krytycznej
Name of the organisation (English)	Critical Infrastructure Security & Development Institute Association
Website	www.ibrik.org.pl
Country	PL

Type of Partner	NGO
	Non-governmental organisations, such as Greenpeace, WWF, etc.

Contact person 1	
Name	Michał Ditrich
Email	michal.ditrich@ibrik.pl
Phone	+48696046493
Contact person 2	
Name	Sebastian Kowalczyk
Email	sebastian.kowalczyk@ibrik.pl
Phone	+48505205528

Which organisation(s) in the planned partnership take part in a project within the Interreg Baltic Sea Region Programme for the first time? Please list the respective partners. IBRIK (PL) Fraunhofer FKIE (DE) Eurowind Energy A/S

5.1 Specific challenge to be adressed

GNSS jamming and spoofing have emerged as a top-tier threat for distributed renewables across the Baltic Sea Region. Dozens of incidents over the past two years show that a jammer of only a few watts can force wind turbines into safe-mode or push PV inverters off-grid, cutting daily output by 8-12 %, delaying debt repayment and dropping technical availability below PPA thresholds. Rural RES SMEs cannot afford commercial detection suites (€35-40 k/site) and critical-infrastructure operators lack a harmonised response protocol. Without hard evidence, municipalities cannot enact radio-quiet zones and citizens cannot hold offenders accountable. GNSS-SHIELD delivers an open ecosystem: an SDR sensor costing < €2 k, a virtual radar that correlates blade echoes, an AI engine predicting loss-of-lock, and—critically—mobile radar units owned by Eurowind Energy that can be deployed within two hours to triangulate a jammer. A cross-border network of sensors and radars, maintained by seven research-industrial partners, fills the gap between military-grade gear and hobbyist dongles, making GNSS resilience affordable for every renewable-energy site.

5.2 Focus of the call

Our application is fully aligned with Priority 1 "Innovative societies", specifically Objective 1.1 "Resilient economies and communities" of the Interreg Baltic Sea Region Programme. The project is designed to support the cohesive development of small places, rural areas, and communities facing significant social and economic challenges in the Baltic Sea region.

Rural and peripheral municipalities are often the most vulnerable to disruptions in energy supply and digital infrastructure due to limited resources and technical capacity. By deploying affordable SDR sensors, a mobile radar fleet, and a live public "GNSS blackout map," the project provides these areas with equal access to state-of-the-art tools for critical infrastructure protection. An open-access dashboard and e-learning course ensure that local authorities, farmers, and community groups can use and benefit from advanced solutions, empowering local leadership and capacity-building.

Through cross-border collaboration and knowledge transfer, the project ensures that innovation and resilience are not limited to urban centers but are extended to peripheral and rural regions where they are most needed. Pilots implemented in rural settings in Poland, Germany, and Denmark provide scalable and replicable models, supporting local development, energy transition, and social cohesion. In this way, the project directly contributes to Priority 1 and Objective 1.1 by strengthening the resilience and fabric of small communities

6. Transnational relevance

A GNSS outage does not stop at a border; a 10 W jammer can black out signals for 30 km, disrupting cross-border power trade, aviation services and vessel tracking. Yet the six countries in our consortium (PL, DE, DK, SE, LT, FI) use different alarm thresholds, signal-strength units and notification channels. Lacking a common rulebook, operators cannot run joint drills and regulators cannot recognise each other's cyber-security certificates for wind farms. GNSS-SHIELD fixes this gap by delivering:

- a BSR-GNSS-JSON standard for interference messages (developed by Gdańsk Tech + Fraunhofer FKIE);

- a federated signature server that stores jamming "fingerprints" (RISE + LEI);

- a "Blue-Radar" procedure that dispatches one of Eurowind's mobile radars to whichever country reports an incident;

- a joint on-/offline training programme endorsed by national regulators.

Such a package cannot emerge from single-nation projects: no country owns enough data, a roll-out-ready mobile radar or mutual trust in unilateral certificates. The transnational network therefore raises the whole macro-region's resilience and cuts the risk of cascading grid failures.

7. Specific aims to be adressed

Building trust that could lead to further cooperation initiatives

All raw sensor streams are public; SMS alarms reach the operator, the county officer and the village head at the same second. Once per quarter an Open Radar Day rotates between pilots, letting residents watch Eurowind's mobile radar pinpoint a live jammer demo. Transparent telemetry plus a physical demo slashes "mystery-interference" complaints and paves the way for further joint ventures such as an eLoran backup layer.

Initiating and keeping networks that are important for the BSR

We launch the Baltic GNSS Resilience Hub: a GitLab repo (hardware, firmware, AI), a moderated mailing list run by DTU and a travelling annual hackathon. Targets by month 24: ≥ 50 organisations, ≥ 250 active users, ≥ 300 verified interference signatures. By meshing with WindEurope and the Sea-Radar Cluster, the Hub will live on via member fees and university cloud hosting.

Bringing the Programme closer to the citizens

A container-based "GNSS-ZERO Zone" tours five countries, showing a mini-radar, a rescue drone and a jammer simulator. TikTok/YouTube clips (#FindTheJammer) aim for 100 k views and carry Interreg branding. High-school teams join an AR treasure hunt to locate the hidden transmitter, learning first-hand why GNSS safety matters to renewables.

Allowing a swift response to unpredictable and urgent challenges

Edge-AI in each sensor flags spoofing within three seconds; if Eurowind's mobile radar confirms, SCADA auto-switches turbines to IMU + eLoran fallback (< 5 s) and a by-law template for a radio-quiet zone is emailed to the mayor. Every country rehearses the "vessel-jammer" scenario during an inter-agency drill: KPI = 90 % sensors trigger < 10 s, regulator reaction < 1 h.

8. Target groups

GNSS-SHIELD mobilises five inter-locking stakeholder groups that together create a satellite-safety ecosystem for renewable energy.

RES operators & SMEs – owners of wind- and PV-farms, O&M companies, SCADA integrators. They feel jamming first-hand; they install sensors, receive AI alerts and embed fallback logic. The open-hardware licence cuts GNSS-protection cost by ~70 % versus proprietary gear.

Local & regional authorities – municipalities, counties, regional energy offices. They manage land-use, road access for mobile radars and public-warning systems. The "GNSS Blackout" dashboard lets them draw protection zones around airports, ports and new turbine clusters within minutes.

Sectoral agencies – energy regulators, telecom authorities, critical-infrastructure inspectorates. The signature hub becomes their evidence base in administrative cases and feeds NIS-2 as well as the new EU Resilience Regulation.

Rural communities & NGOs – residents living near renewable installations. They crowd-report "dead

zones" via the project app and, on Open Radar Day, see triangulation results in person. Community involvement legitimises additional turbine capacity.

Business clusters & industry associations – national RES federations, chambers of commerce, IoT clusters. They spread the open kit to hundreds of member firms and will drive the GNSS Hub's long-term upkeep.

Tight feedback loops between these groups ensure that sensor data turn into operational fixes, legal acts and public education, strengthening every link in the renewable-energy value chain.

	Please use the drop-down list to define up to five target groups that you will involve through your project's activities.	Please define a field of responsibility or an economic sector of the selected target group	Specify the countries and regions that the representatives of this target group come from.
1.	Local public authority	Rural and coastal municipalities responsible for spatial planning, emergency management and permitting of RES sites.	Poland, Germany, Denmark, Sweden, Lithuania, Finland
2.	Small and medium enterprise	Wind/PV farm operators, O&M service SMEs, SCADA integrators for renewable-energy assets.	Poland, Germany, Denmark, Sweden, Lithuania
3.	Sectoral agency	Energy & telecom regulators and critical-infrastructure inspectorates overseeing GNSS resilience and NIS-2 compliance.	PL – URE/UKE, DE – BNetzA, DK – DUR, SE – PTS, LT – NERC
4.	Interest group	Rural resident, farmer and fisher associations affected by GNSS outages and renewable-energy deployment.	Areas around pilot farms in PL, DE, DK, SE, LT

5. Business support organisation	National & regional RES industry associations and IoT clusters distributing the open-hardware toolkit and training.	Polish PWEA, German BVKW, Nordic Energy Cluster, Baltic Energy Forum

9. Contribution to the EU Strategy for the Baltic Sea Region

Please indicate if your project idea has the potential to contribute to the implementation of the Action Plan of the EU Strategy for the Baltic Sea Region (https://eusbsr.eu/implementation/).

yes ◉ no ○

Please select which policy area(s) of the EUSBSR your project idea contributes to most.

PA Safe
PA Energy
PA Secure

The MA/JS may share your project idea form with the respective policy area coordinator(s) of the EUSBSR. You can find contacts of PACs at the EUSBSR website (https://eusbsr.eu/contact-us/).

☐ If you disagree, please tick here.

10. Partnership

he consortium unites seven entities from six BSR states, covering the entire pathway from basic research to commercial roll-out and regulation.

IBRIK (PL) – lead; national GNSS-incident database; ran three Interreg projects (€ 4.1 m).

Gdańsk Tech / WETI (PL) – 25 peer-reviewed SDR/GNSS papers; two ESA/NCBiR grants (€ 3 m); designs AI & SDR v2 board.

Fraunhofer FKIE (DE) – 60 ICS experts; led H2020 GNSS4C (€ 5.6 m); provides cyber forensics.

DTU Wind & Energy (DK) – operator of WindScanner 3D LiDAR, 40 PhDs on digital twins; models production loss from jamming.

RISE (SE) – installed 12 GNSS triangulation stations for ABB Grid; hosts the signature repository.

Lithuanian Energy Institute (LT) – hosts the HVDC-Visaginas testbed; runs cross-border drills and eLoran integration.

Eurowind Energy A/S (DK/DE/PL) – 1.4 GW in operation; owns three truck-mounted mobile radars that are the project's show-piece demonstrators. It embeds fallback logic in live SCADA and crafts a "Radar-as-a-Service" business model.

Complementarity: Gdańsk Tech + FKIE → detection tech; DTU + LEI → modelling & drills; RISE → signature hub; Eurowind → industrial showcase; IBRIK → policy hand-over. No role overlaps; every thematic gap is filled. An Estonian Maritime Administration (AIS) and Finland's VTT (eLoran backup) are slated to join the Hub in year 2.

11. Workplan

WP-A Design (M1-M4)
IBRIK finalises consortium contracts, the HSE plan and the risk matrix. Gdańsk Tech + DTU freeze the SDR v2 spec (RF board + cloverleaf antenna) and draft the BSR-GNSS-JSON standard. Eurowind publishes a relocation timetable for its three mobile radars and nominates ten demo farms.

WP-B Prototype (M5-M8)
Gdańsk Tech assembles 30 lab sensors; RISE calibrates antennas; FKIE builds a 200-signature library. DTU releases AI engine v0 (1-D CNN, target ≥ 90 % sensitivity). IBRIK posts the open BOM and DIY guide (CC-BY-SA).

WP-C National deployment (M9-M12)
Forty-five sensors (15 per country) and three passive radars are installed and tied into SCADA. Eurowind showcases a mobile radar at each farm, proving "setup < 2 h, bearing error < 3°". Operator Academy #1 trains 30 technicians.

WP-D Operation & AI (M13-M18)
DTU trains a federated LSTM on 50 M pts/sensor/month. Eurowind enables auto-switch to IMU + eLoran (< 5 s). Gdańsk Tech rolls out firmware OTA v2. FKIE runs a red-team spoofing test; KPI: zero critical false positives.

WP-E Cross-border exercise (M19-M21)
LEI stages a "vessel-jammer" drill (LT→PL→SE) with coast-guard and port operators. Eurowind's mobile radar plus RISE passive nodes localise the source in < 10 min; regulators issue a TETRA alert. IBRIK records metrics: 90 % sensors trigger < 10 s; municipal response < 1 h.

WP-F Evaluation & scale-up (M22-M24)
RISE releases open-hardware v3 (CERN-OHL-S) and a Docker image of the AI engine. IBRIK publishes the "BSR GNSS Code of Practice" and hands it to EUSBSR PA Energy & PA Security. The 2027 Baltic GNSS Hackathon (online) attracts 100 coders and spawns 15 forks. Eurowind presents a subscription-based Radar-as-a-Service (< €1 k/month/farm).

Key outputs
• Open SDR v2 (TRL 7, cost < €2 k)
• 300+ validated jamming signatures
• INSPIRE-compliant "GNSS Blackout" dashboard & API
• Two MOOCs (EN/PL/DE/DK)
• > 30 % production-loss reduction at pilot farms
• "Blue-Radar" procedure: mobile unit deployable in 2 h

12. Planned budget

ERDF budget (planned expenditure of partners from the EU)	EUR 500,000.00
Norwegian budget (planned expenditure of partners from Norway)	*EUR XXX*
Total budget (including preparatory costs)	**EUR 500,000.00**

13. Project consultation

Please indicate if you wish to have a consultation (online meeting) with the MA/JS to discuss your project idea

yes ⦿　no ○

14. Questions to the MA/JS

Questions related to the content of the planned project	*(max.1.000 characters incl. spaces)*
Questions related to budgeting and expenditure	(max.1.000 characters incl. spaces)
Any other questions	*(max. 1.000 characters incl. spaces)*

15. Additional information

(max. 1.000 characters incl. spaces)

Your account in BAMOS+

Please remember that to officially submit your application you need to access our electronic data exchange system BAMOS+. More information about the process of applying for your account in BAMOS+ you will find here:
https://interreg-baltic.eu/gateway/bamos-account