Project idea form - small projects

Version 2.1

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

Project Idea Form

Date of submission *dd/mm/yyyy*

1. Project idea identification

Project idea name	Trans-Baltic Network for High-Temperature Geothermal Heat-Pump Toolkit Development for Municipalities
Short name of the project	HEAT+
Previous calls	yes ○ no ◉
Seed money support	yes ○ no ◉

2. Programme priority

	3. Climate-neutral societies

3. Programme objective

	3.2. Energy transition

4. Potential lead applicant

Name of the organisation (original)	Instytut Maszyn Przepływowych Polskiej Akademii Nauk
Name of the organisation (English)	Institute of Fluid-Flow Machinery Polish Academy of Science
Website	www.imp.gda.pl
Country	PL

Type of Partner	Higher education and research institution

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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.

At the current stage, none of the listed partners are new to the Interreg Baltic Sea Region Programme. However, new partners are being actively sought to participate in the project, in line with the programme's aim of building trust and widening networks.

5.1 Specific challenge to be adressed

Small and mid-sized towns in the Baltic Sea Region still distribute heat through legacy 90 °C district-heating loops fed by ageing coal-, oil- or gas-fired boilers. Shallow and medium-depth aquifers in these areas frequently offer water of c. 50 °C, yet this resource remains untapped because municipalities lack the competences, software and bankable concepts needed to upgrade that heat to the 100 °C required by their networks.

Key bottlenecks are:

Insufficient geo-data resolution — local actors do not know where 45–60 °C horizons lie or how sustainable abstraction rates should be calculated.

Design gap for >100 °C heat-pump systems — commercially available high-temperature heat pumps (HTHP, 90–120 °C) are new to the Baltic market; planners lack sizing rules, integration schemes and business models adapted to small load centres.

Investment risk — without proven reference designs, public financiers judge such projects too experimental, while private investors are deterred by unfamiliar technology.

As a result, many municipalities postpone decarbonisation or switch to biomass that locks them into future CO_2 prices and supply insecurity. The Programme's objective 3.2 "Energy transition" explicitly calls for solutions that decarbonise heating; failing to close the knowledge and confidence gap around 50 °C geothermal plus HTHP would leave rural communities behind in the Green Deal and perpetuate fuel-poverty-driven outmigration.

5.2 Focus of the call

HTGeoHeat-UP delivers the knowledge infrastructure that lets small places turn moderate-temperature geothermal wells into high-temperature, drop-in replacements for fossil boilers:

Modular Toolkit — open-source design rules, CAPEX/OPEX calculators and tender templates for 50 → 100 °C HTHP retrofit blocks sized 1–5 MW.

Roadmap Builder — an online wizard that guides municipal engineers from resource mapping to financing in ≤ 12 months.

Virtual Mock-Up — a cloud-based digital twin (using real geo-datasets from PL & FI) where users can test layouts and operating scenarios without drilling a single borehole.

These products help peripheral towns create realistic investment pipelines, slash planning costs and offer citizens cleaner, cheaper heat. By focusing resources, skills and data on communities "experiencing challenges significant to the social and economic fabric", the project squarely meets the call's demand for cohesive development under Priority 3 — Climate-neutral societies while complementing Priority 1 goals on innovation capacity.

6. Transnational relevance

Delivering 100 °C heat from ~50 °C geothermal wells is a complex, multi-disciplinary task that no single small municipality, or even one country, can master on its own. The partnership deliberately combines four institutes whose core competences complement, rather than duplicate, each other and whose past Interreg records prove they can translate science into actionable tools.

GTK – Geological Survey of Finland supplies the subsurface intelligence. GTK created the national 3-D geological framework of Finland and public shallow-geothermal potential maps covering depth-to-300 m layers; its workflows for resource estimation and sustainable abstraction are among the most advanced in Europe. Transferring these open-data standards to Poland, Sweden and Denmark will give rural planners outside Finland the first fit-for-purpose resource baseline they ever had.

IMP-PAN – Institute of Fluid-Flow Machinery (PL) leads Interreg DecarbonDHS and hosts decades of

R&D on energy-conversion machinery; its researchers already optimise district-heating retrofits for coal-to-renewable switches. In HTGeoHeat-UP IMP-PAN converts GTK's geo-data into thermo-hydraulic and techno-economic sizing rules for high-temperature heat-pump (HTHP) cascades, filling the current design gap for 100 °C output.

RISE – Research Institutes of Sweden authored the LowTEMP training package and runs the ICE datacentre test bed for low-temperature excess-heat recovery. RISE therefore turns raw engineering know-how into hands-on e-learning, webinars and procurement templates that Baltic municipalities can immediately use.

DTU – Technical University of Denmark coordinates HEAT 4.0, the flagship digital-twin platform (HEATman) that couples AI optimisation with district-heating operations. DTU adapts this engine to the higher supply temperatures and intermittent well output typical for 50 → 100 °C geothermal-HTHP systems, giving end users a real-time "virtual mock-up" before they spend a euro on drilling.

Pooling

7. Specific aims to be adressed

Building trust that could lead to further cooperation initiatives

"Baltic Geothermal Clinic" matches every newcomer municipality with an experienced "buddy" city or research institute. Together they run two confidential design-review sessions, share raw geodata and jointly solve first-year teething problems. The safe peer-to-peer setting nurtures personal relationships, reduces the fear of failure and proves that the technology works in comparable contexts. Once trust is established, partners sign a light MoU that automatically qualifies them for future joint proposals (Interreg regular, LIFE, Horizon Europe), turning today's pilot contacts into a standing community of practice.

Initiating and keeping networks that are important for the BSR

The project launches the HTHP Baltic Network—an open, low-bureaucracy forum linking municipalities, drilling & heat-pump SMEs, OEMs, geological surveys and universities. A Slack workspace, quarterly online "clinics," one annual in-person camp and a Git-based repository for open-source design files keep interaction lively. Governance is laid out in a two-page charter: any Baltic entity can join by endorsing shared data standards. This light structure sustains knowledge exchange and aggregate purchasing power long after the project ends, providing the region with a permanent focal point for 50→100 °C geothermal know-how.

Bringing the Programme closer to the citizens

A travelling pop-up exhibition—built from modular boxes that fit into a small van—parks for one week on each demo town's market square and in school gyms. Visitors operate a physical scale model of a 50 °C well and its high-temperature pump, compare tariff scenarios on a touch screen, and leave their heating-bill data on sticky notes that feed a live infographics wall. Local media stream interviews with residents who co-designed the system. By making the technology hands-on and personal, the exhibition turns an EU-funded toolbox into a relatable story, visibly branding Interreg as a driver of tangible change.

Allowing a swift response to unpredictable and urgent challenges

The Toolkit contains three pre-configured “emergency swap-out packages” (0.5 MW, 1 MW, 3 MW) with template technical specs, cost curves and EU-compliant tender clauses. If a rural boiler fails mid-winter, the municipality can issue a call for bids within 30 days, select from framework-contract suppliers and plug the module into the existing 90 °C loop using containerised heat-pump skids. A built-in financial model shows payback under volatile energy prices, helping councils make decisions under pressure while safeguarding heat security for vulnerable citizens.

8. Target groups

Decarbonising 90 °C district-heating loops in small Baltic towns requires a tightly knit value-chain: public authorities that own the grids, utilities that run them, SMEs that drill wells and integrate high-temperature heat pumps, knowledge institutions that validate designs, and citizen/NGO actors that secure social acceptance. The project therefore involves five target groups that ① are directly hit by rising fossil-fuel prices and climate policy, ② possess the legal mandate or technical skills to act, and ③ have a clear stake in using the Toolkit outputs. Each group will co-create at least one work-package deliverable: local authorities draft investment roadmaps; utilities test the digital-twin mock-up; SMEs refine procurement lots; universities embed training modules into curricula; NGOs mobilise residents for participatory tariff design. Geographical spread—Poland, Finland, Sweden, Denmark plus associated Baltic states—ensures solutions work across diverse geological and regulatory settings, while joint workshops forge relationships that outlive the grant period.

	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.	Infrastructure and public service provider	District-heating utilities run the pipes, metering and customer service that will adopt the high-temperature heat-pump modules.	Poland, Finland
2.	Local public authority	Municipalities (< 20 000 inh.) own the 90 °C grids, grant permits and lead citizen engagement.	PL, FI, SE, DK rural municipalities

3. Small and medium enterprise	Drilling firms, HVAC integrators and software start-ups supply wells, 100 °C heat-pump skids and digital twins, ensuring market uptake.	PL, FI, SE, DK + EE, LV, LT
4. Higher education and research institution	Universities, VET centres and R&D labs provide subsurface modelling, thermal-system design and training materials embedded into curricula.	PL, FI, SE, DK
5. Regional public authority	County-level energy & climate departments coordinate multiple small towns, integrate geothermal plans into regional SECAPs and can aggregate funding.	PL, FI, SE, DK

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 Bio-economy
PA Energy
PA Innovation

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

Heat+ unites four core centres of excellence that together cover the full innovation chain required to turn 50 °C geothermal resources into 100 °C heat-pump solutions for small municipal networks.

Institute of Fluid-Flow Machinery, Polish Academy of Sciences (IMP-PAN, PL – Lead)
• 25 + years of research on thermal-energy conversion, coordinator of several Interreg and Horizon projects on district-heating decarbonisation.
• Leads project management, techno-economic optimisation and integration of the Toolkit components.

Geological Survey of Finland (GTK, FI)
• Developer of Finland's national 3-D shallow-geology model and open geothermal potential maps.
• Adapts its data standards and resource-assessment workflows to partner regions; trains planners in sustainable abstraction rates.

Research Institutes of Sweden (RISE, SE)
• Author of the LowTEMP training package and operator of the ICE data centre low-temperature test bed.
• Translates engineering outputs into e-learning modules, procurement templates and capacity-building events.

Technical University of Denmark (DTU, DK)
• Coordinator of the HEAT 4.0 digital-twin platform for district-heating optimisation.
• Customises the AI twin for 50 → 100 °C heat-pump systems and hosts the cloud-based Mock-Up Lab.

The consortium merges GTK's unrivalled geoscience, IMP-PAN's conversion engineering, RISE's user-oriented training expertise and DTU's digital-twin competence—capabilities that do not coexist in any single country. Geographical distribution (PL, FI, SE, DK) ensures that methods work across crystalline bedrock, sedimentary basins and mixed heat-market regulations.

Partners to be added (negotiations under way)

Two rural municipalities (one PL, one FI) and their district-heating utilities – to supply real datasets, chair user panels and road-test the Toolkit.

A regional energy agency (SE or LV) – to embed outputs into SECAP processes and aggregate small-town investment pipelines.

1–2 SME integrators of high-temperature heat-pump skids – to validate technical specifications and guarantee market readiness.

This balanced partnership of public research, local authorities, utilities and industry delivers both scientific rigour and direct implementation pathways.

11. Workplan

IMP-PAN manages contracts, risk and gender mainstreaming. A lean steering group with municipal observers meets quarterly; an external Advisory Board provides independent reviews at M6 & M18.

Outputs: Project handbook, risk log, two external reviews.

WP2 – Geo-data Harmonisation
GTK leads the transfer of its 3-D geological framework to selected Polish and Danish counties. Local drill-logs are ingested, meta-data harmonised and made Open Data.

Outputs: Harmonised shallow-geothermal database (Open License), guideline on sustainable abstraction for 45–60 °C horizons.

Target-group involvement: Regional geological surveys contribute archives; SMEs supply recent borehole data.

WP3 – High-Temperature Heat-Pump Toolkit
IMP-PAN, with SME integrators, converts WP2 data into sizing algorithms, CAPEX/OPEX calculators and three modular reference designs (0.5 MW, 1 MW, 3 MW) for 100 °C output. RISE crafts procurement templates and an e-learning curriculum (6 micro-modules, BSR languages).

Outputs: Open-source Toolkit (software + manuals); MOOC hosted on RISE's platform.

Target groups: Utilities and local planning departments beta-test the calculators; VET centres embed the MOOC into curricula.

WP4 – Virtual Mock-Up Lab
DTU adapts its HEATman digital-twin engine to model geothermal-HTHP cascades, including transient well performance, demand response and tariff scenarios. The cloud-based Lab lets any town upload its network data and virtually "try before buying."

Outputs: Cloud twin with three demo cases (SE, PL, FI); user guide; AI optimisation API.

Target groups: Utilities run stress-tests; SMEs validate control strategies; regional authorities use results for SECAPs.

WP5 – Uptake, Networking & Policy
RISE and IMP-PAN jointly launch the HTHP Baltic Network: Slack workspace, quarterly clinics, annual camp. A travelling pop-up exhibition tours eight rural centres, accompanied by citizen workshops on tariff design. Policy briefs translate lessons into actionable recommendations for PA Energy and national ministries.

Outputs: Network charter & membership list, exhibition kit, two policy briefs, replication roadmap for 20 towns.

Target groups: Local/ regional authorities sign MoUs for future cooperation; NGOs mobilise residents; ESCOs attend investor round-tables.

Expected use of outcomes

Municipalities & utilities: run the Toolkit and twin to draft investment-grade project dossiers in ≤ 12 months.

SMEs: quote directly against standardised tender lots, cutting bid costs.

Educational bodies: certify 50 technicians per year via the MOOC.

Policy makers: adopt abstraction guidelines and financial-risk metrics in support schemes.

Through digital tools, targeted training and a permanent Baltic network, the project delivers a scalable path for rural towns to unlock moderate-temperature geothermal resources and meet 2030 climate goals without costly trial-and-error pilots.

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

"The project is designed for maximum replicability and post-funding sustainability. All deliverables, including engineering and agronomic results, will be made available in Germany, Polish, and Swedish, with plans for further translations upon scaling. We are actively seeking additional partners and municipalities interested in piloting the system beyond the initial demonstration phase."

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