

# EU Interreg project: Baltic Sea Underground Innovation Network (BSUIN)

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*Working together to improve the utilization level and the capacity for innovation of the underground laboratories in the Baltic Sea region.*



# Contents of the presentation

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# Rationale for forming the Baltic Sea Underground Innovation Network

**Background:** Underground Laboratories (ULs) have usually been constructed for mining, underground storing, tunnels for transportation or research. The underground facilities have been built for a specific use and are generally closed after ending the operation.

**Possibilities:** Laboratories, in ULs provide unique opportunities for using the underground research infrastructure for technical development with focus on innovation. By developing the service concepts, the underground laboratories can incubate new businesses and provide unique test and R&D environments for established companies.

**Suggestion:** In order to facilitate new and innovative use of underground facilities in the Baltic region the formation of a Baltic Sea Underground Innovation Network (BSUIN) was suggested.



# Baltic Sea Underground Innovation Network

## The BSUIN creates:

- a) Coordination network for sharing expertise and best practises between the ULs
- b) Community of commercial users of the Baltic Sea ULs to guide the development of the services and facilities of underground research infrastructures.
- c) Service design for strengthening the capacity for Innovation and new business incubation
- d) Joint marketing activities for the ULs and their users
- e) Sharing of the procedures for technical characterization, administrative and safety routines between the ULs
- f) Broaden the underground research and technical development possibilities and increase the selection of experimental and demonstration locations





# The Baltic Sea Underground Innovation network

# BSUIN fact box

- Interreg Baltic Sea Region project
  - Capacity for Innovation the thematic area is priority for research infrastructure
- Project duration  
Oct 1<sup>st</sup> 2017 – Sep 30<sup>th</sup> 2020
- 13 full partners and 18 associated organizations
- Total of 15 activities, project management and communication in five work packages
- Lead partner: University of Oulu, Kerttu Saalasti Institute





# Baltic Sea Underground Innovation Network Laboratories

## BSUIN partner laboratories ●

- Callio Lab, Pyhäsalmi mine, Finland
- Äspö Hard Rock Laboratory, Oskarshamn, Sweden
- TU-Freiberg's Research and Education mine "Reiche Zeche", Germany
- Conceptual Lab development coordinated by KGHM Cuprum R&D centre, Poland
- Ruskeala, Russia
- Underground Laboratory of Khlopin Institute, Russia

## BSUIN Associated Underground Laboratories ●

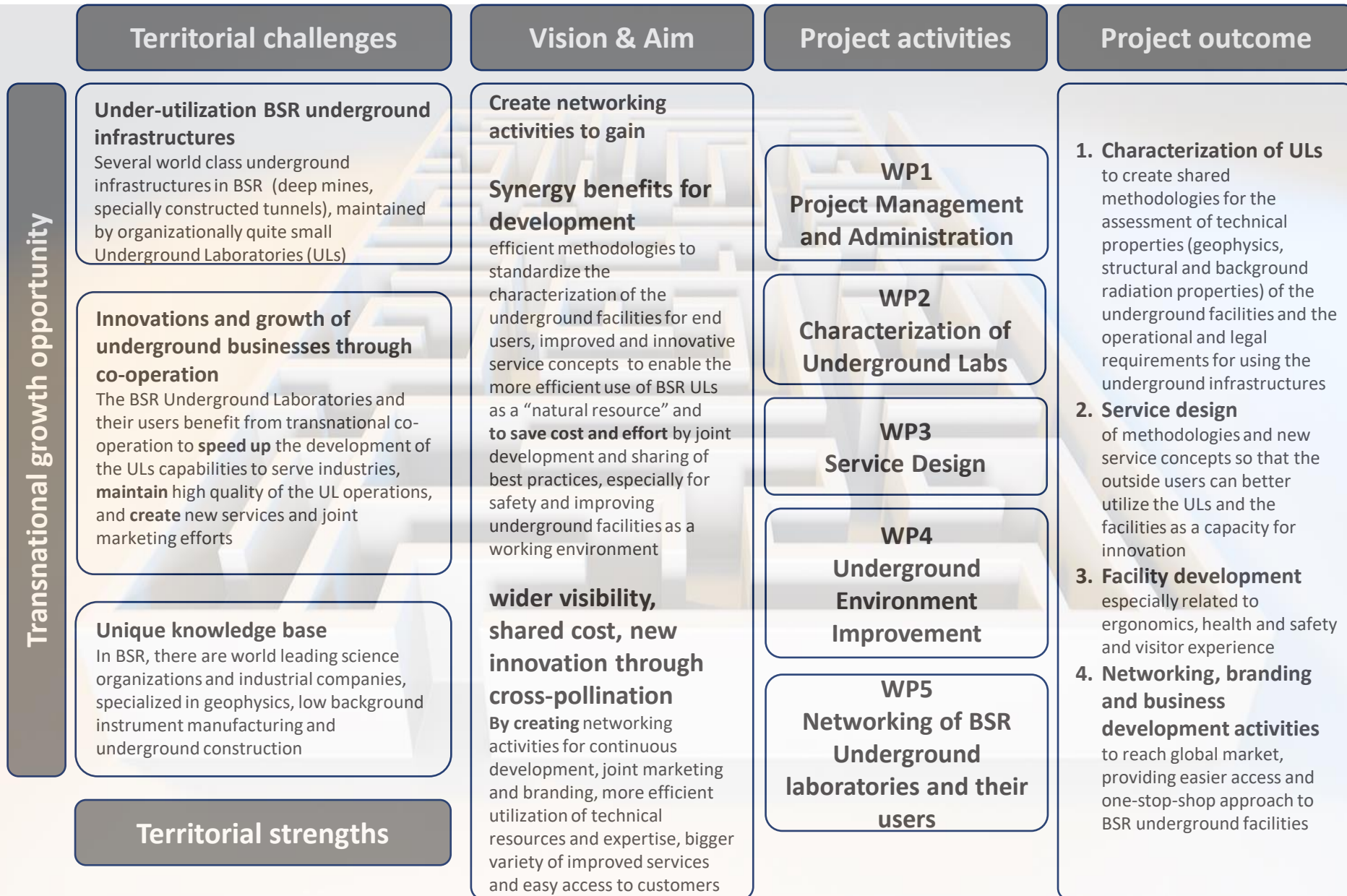
- Experimental mine Barbara, Poland
- Hagerbach Test Gallery, Switzerland



# Associated organizations



# Why the BSUIN project is needed





# Why the BSUIN project is needed

## Territorial challenges

### Under-utilization BSR underground infrastructures

Several world class underground infrastructures in BSR (deep mines, specially constructed tunnels), maintained by organizationally quite small Underground Laboratories (ULs)

### Innovations and growth of underground businesses through co-operation

The BSR Underground Laboratories and their users benefit from transnational co-operation to **speed up** the development of the ULs capabilities to serve industries, **maintain** high quality of the UL operations, and **create** new services and joint marketing efforts.

### Unique knowledge base

In BSR, there are world leading science organizations and industrial companies, specialized in, geophysics, low background instrument manufacturing and underground construction

## Territorial strengths

## Vision & Aim

### Create networking activities to gain

#### Synergy benefits for development

efficient methodologies to standardize the characterization of the underground facilities for end users, improved and innovative service concepts to enable the more efficient use of BSR ULs as a “natural resource” and **to save cost and effort** by joint development and sharing of best practices, especially for safety and improving underground facilities as a working environment

#### Wider visibility, shared cost, new innovation through cross-pollination

**By creating** networking activities for continuous development, joint marketing and branding, more efficient utilization of technical resources and expertise, bigger variety of improved services and easy access to customers

# BSUIN Outcomes

## Project activities

## Project Outcomes

**WP1**  
Project Management

**WP2**  
Characterization of  
Underground Labs

**WP3**  
Service Design

**WP4**  
Underground  
Environment

**WP5**  
Networking of BSR  
ULs

- 1. Characterization of ULs:** Each of the underground laboratories is unique in their geological, technical, managerial, service and legislative settings. Set of methodologies to characterize and to compare the ULs have been created.
- 2. Service design:** The key services, partners and current market segments have been identified. New service concepts have been created so that the outside users can better utilize the ULs and the facilities as a capacity for innovation
- 3. Facility development:** As the key characteristics of each UL have been evaluated, placed on the same evaluation terms, the suggestions for facility development especially related to working environment, health and safety and visitor experience has been introduced.
- 4. Networking, branding and business development activities:** One of the key items identified is the narrow customer segments and wider marketing of the ULs. The Innovation platform has been created to provide easier access and one-stop-shop approach to BSR underground facilities

# Co-creation provides resources, new opportunities and enhances innovations!

Shared measurement equipment and systems  
e.g. Gamma-spectrometer and analysis resources, site mapping

Standards for technical characterization  
e.g. Site Description Model

Collaboration projects

Joint marketing  
e.g. Fairs and conferences, publications, LinkedIn, Facebook, Twitter, bsuin.eu

Multi-disciplinary knowledge base  
e.g. Geological, geophysical, structural

Events and conferences  
e.g. Organizing joint-events on underground science, education and technology: BSUIN roadshows

Open innovation platform  
UL characterisation, innovation and service design information for the clients to choose the optimal ULs for their needs.



# From BSUIN to EUL:

## *European Underground Laboratories association*



Underground  
laboratories

Implementing  
a project

Research  
and innovation

ABOUT EUL NEWS & EVENTS CONTACT ↗

The BSUIN consortium is preparing to carry on the well-progressed work as the European Underground Laboratories association.

More in the following presentations

EUL, or European Underground Laboratories Association, is a registered non-profit association to promote science, research, technical development, innovation, education and various events at member underground laboratories.

About EUL

in Made in InVision

Interreg  
Baltic Sea Region



BSUIN



# The Underground Laboratories

# Callio Lab, Finland

- **Status:** Operational
- **Location:** Callio Lab is located at 1 444m deep Pyhäsalmi Mine in Finland. Mine is owned by FQML Ltd. Underground mining ending in 6/2021. Callio – Mine for Business operates the re-use facilities.
- **Rock type(s):** granite bedrock surrounding massive volcanogenic sulfide deposit.
- **Activities:** Research, tourism, agriculture RDI/Testing, Underground Rescue, Feasibility studies on energy storage
- **Future:** Callio Lab facilitates several types of actors, incl. research institutions and companies.





# Ruskeala Mining Park, Russia

- **Status:** Operational
- **Location:** Ruskeala Mining Park is located in the Russian Karelia. The depth of the cave system is 36m.
- **Rock type(s):** The dominant crystalline rock type is marble.
- **Activities:** Main activities are around tourism. Geological and –physical, and also water chemical measurements are on-going
- **Future:** Mining heritage centre with underground sites for geological and – physical studies



# Äspö Hard Rock Laboratory, Sweden

- **Status:** Operational
- **Location:** The Äspö Hard Rock Laboratory (Äspö HRL) is located in Oskarshamn Sweden and is owned by SKB. The depth is 460m.
- **Rock type(s):** The dominant rock types are Äspö diorite and Ävrö granodiorite.
- **Activities:** Main activities related to methodological and technical development of spent nuclear fuel storage facility. Also environmental, geotechnics, geo-energy, material science and technical development projects.
- **Future:** The aim is to turn the facility over to future research and development stakeholders.



# The underground Low Background Laboratory (LBR) of Khlopin Radium Institute

- **Status:** Operational
- **Location:** The underground Low Background Laboratory (LBR) of Khlopin Radium Institute is located in St. Petersburg at the underground metro lobby of Gostiny Dvor. The laboratory is located at the depth of 58m.
- **Rock type(s):** Dominant is Cambrian Clay.
- **Activities:** Low, radioactive, background measurements with gamma spectrometers
- **Future:** Laboratory is used for scientific and commercial operations.



# Research and Education Mine “Reiche Zeche”, Germany

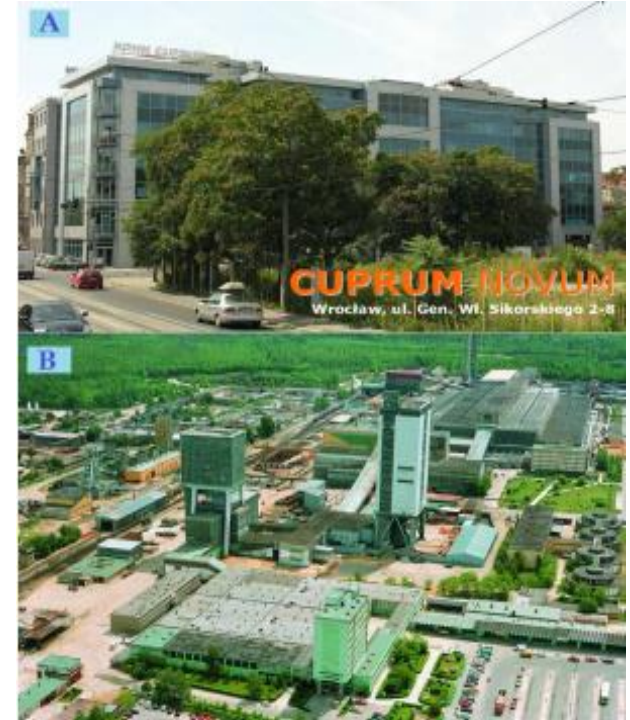
- **Status:** Operational since 1919
- **Location:** Research and Education Mine “Reiche Zeche” is located in Freiberg, Germany and it is run by TUBAF. The Mine is accessible up to a level 230m.
- **Rock type(s):** Lead-zinc deposit.
- **Activities:** Reich Zeche is used by research institutions and industrial partners R&D and testin of new technologies. Additionally multiple Universities use the site to train new mining professionals.
- **Future:** To develop the mine into a European platform for enchancing mining techniques and educations. To build a ramp to develop new fields, rooms and drifts.





# Conceptual Lab development co-ordinated by KGHM Cuprum R&D centre, Poland

- **Status:** Conceptual design phase
- **Location:** The KGHM mines are located 75km NW from the city Wroclaw, Poland. Mines reach 1300 m.
- **Rock type(s):** Salt rock, fine grain sand stone, copper bearing ore
- **Activities:** In existing mine workings trials&pilot panels used to be furnished for research purposes. The mines were constructed mainly for the copper extraction.
- **Future:** Low background laboratory and other research facilities at the salt deposit, macro scale industrial testing at copper deposits



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EUROPEAN UNION  
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## More information

 [Bsuin.eu](http://Bsuin.eu)

