# PoMHaz

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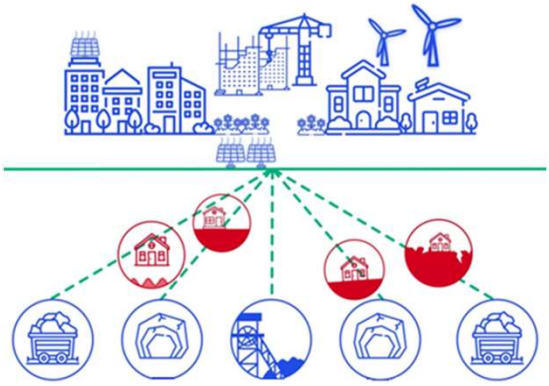
https://www.pomhaz-rfcs.eu/
Project's Video



## About the project

Duration: 3/10/2022 – 2/10/2025

The POMHAZ project, rooted in Europe's transition towards **decarbonization** and the closure of coal and lignite mines, seeks to enhance methodological understanding of **hazard analysis** and **risk assessment**. **Post-mining areas** undergo transition as mines cease operations. So, they are often susceptible to multiple hazards, which may interact or occur simultaneously, referred to as **"multi-hazard"**.

The primary objective of the project is to identify and assess the multi-hazard conditions prevalent in these post-mining areas.

The project aims to calculate the overall *risk*, known as **"multi-risk"**, by integrating *multi-hazard* analysis with socio-economic considerations and assessing the *vulnerability* of post-mining areas and *exposed elements*.

*Risk = Hazard x Vulnerability x Exposure*

Implementing this methodology in real case studies in Europe will enhance the management and land planning of the territories in transition, utilizing decision support systems to mitigate multi-risk.

The project is structured in five work packages:

- WP1: Coordination and dissemination
- WP2: Post-mining hazards and multi hazards assessment methodology
- WP3: Post-mining risk assessment methodology and Decision Support Systems
- WP4: GIS development
- WP5: Application on real case studies

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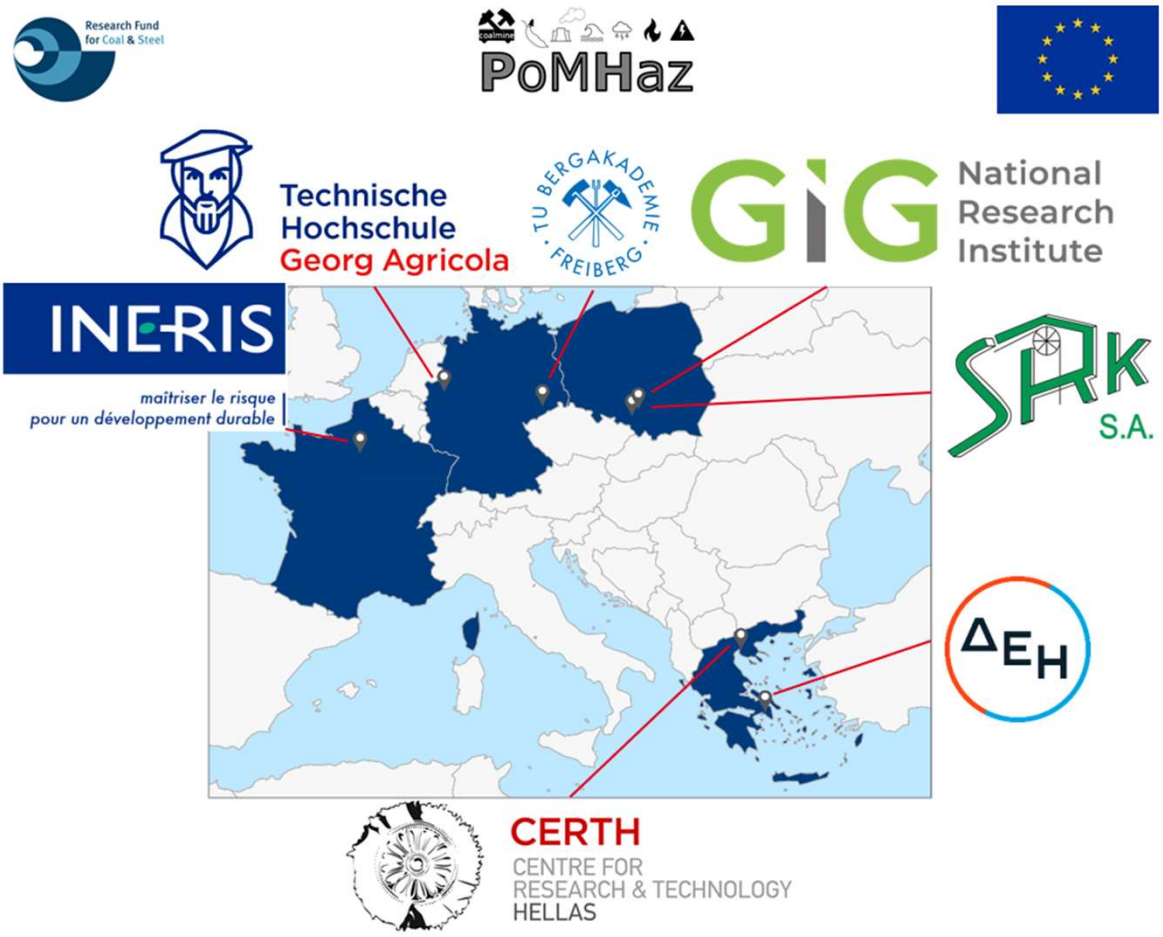
## Partners




- National Institute of Industrial Environment and Risks (Ineris, France)
- Centre for Research and Technology Hellas (CERTH, Greece)
- Public Power Corporation (PPC SA, Greece)
- Central Mining Institute (GIG, Poland)
- Spółka Restrukturyzacji Kopalń S.A. (SRK SA, Poland)
- Technische Hochschule Georg Agricola (DMT-THGA, Germany)
- TU Bergakademie Freiberg (TU BAF, Germany)

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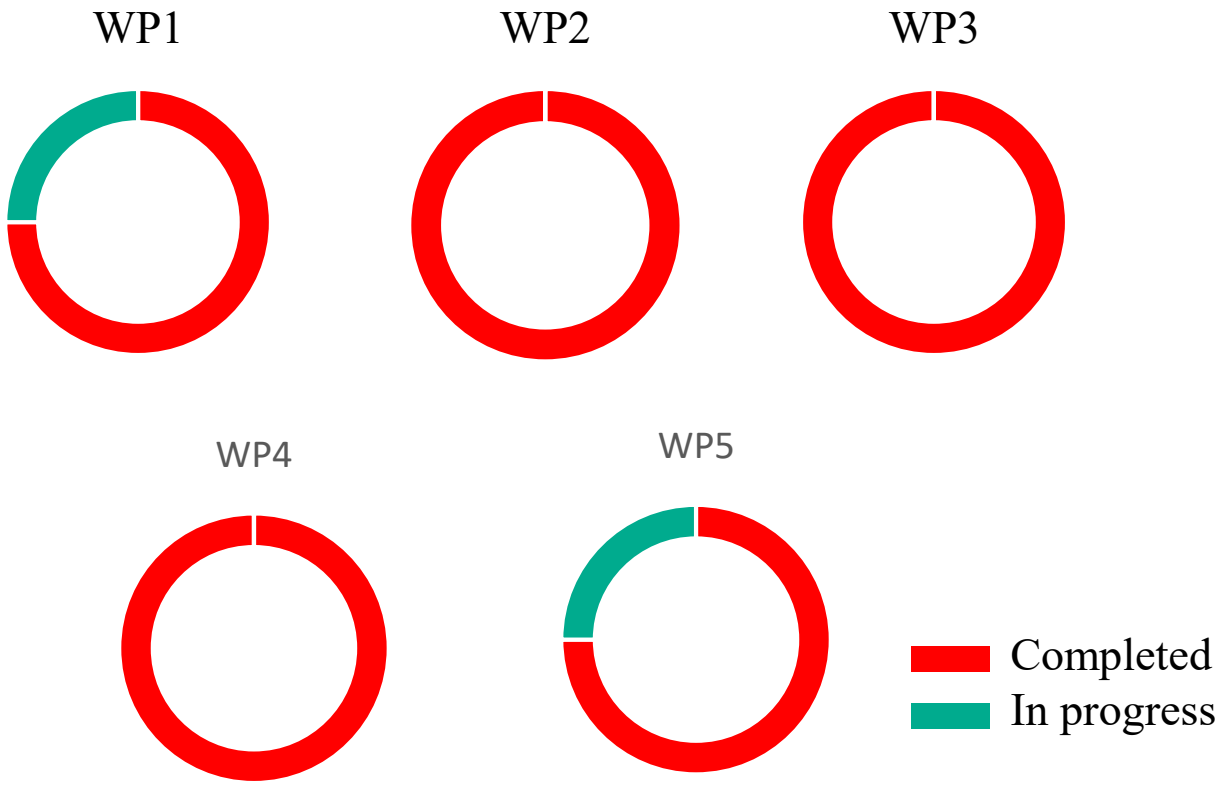
## Work progress

Completed

- Data base of hazards related to closed and abandoned coal and lignite mines in Europe (WP2)
- Information collection of existing tools related to multi-hazard methodologies (WP2)
- Development of a methodology for post-mining hazards interaction identification (WP2)
- Development of the multi-hazard risk assessment methodology and the development of the Decision Support System (DSS) specifications for post-mining areas (WP3)
- Development of GIS and Decision Support System (DSS) (WP4)

In progress

- Application on real case studies in Europe (WP5)

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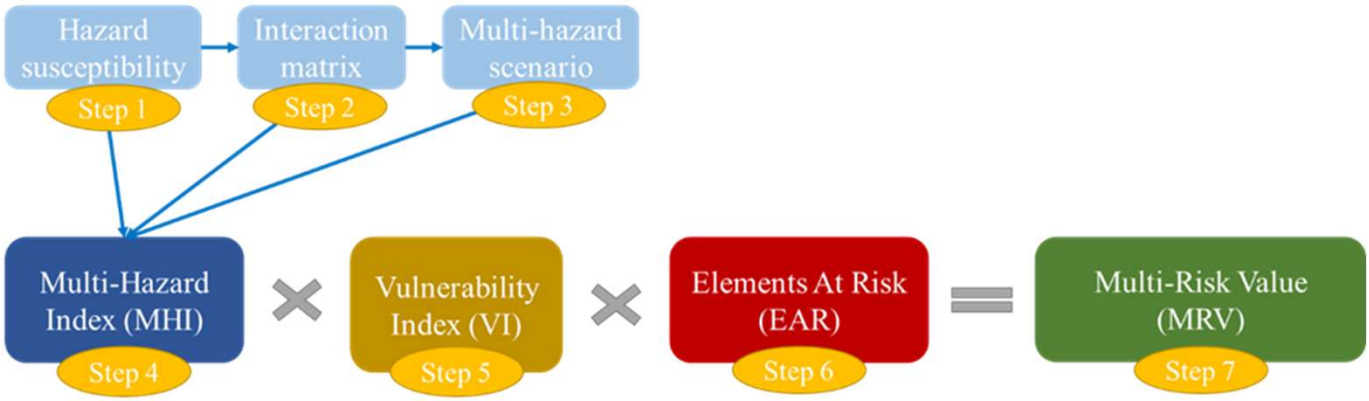
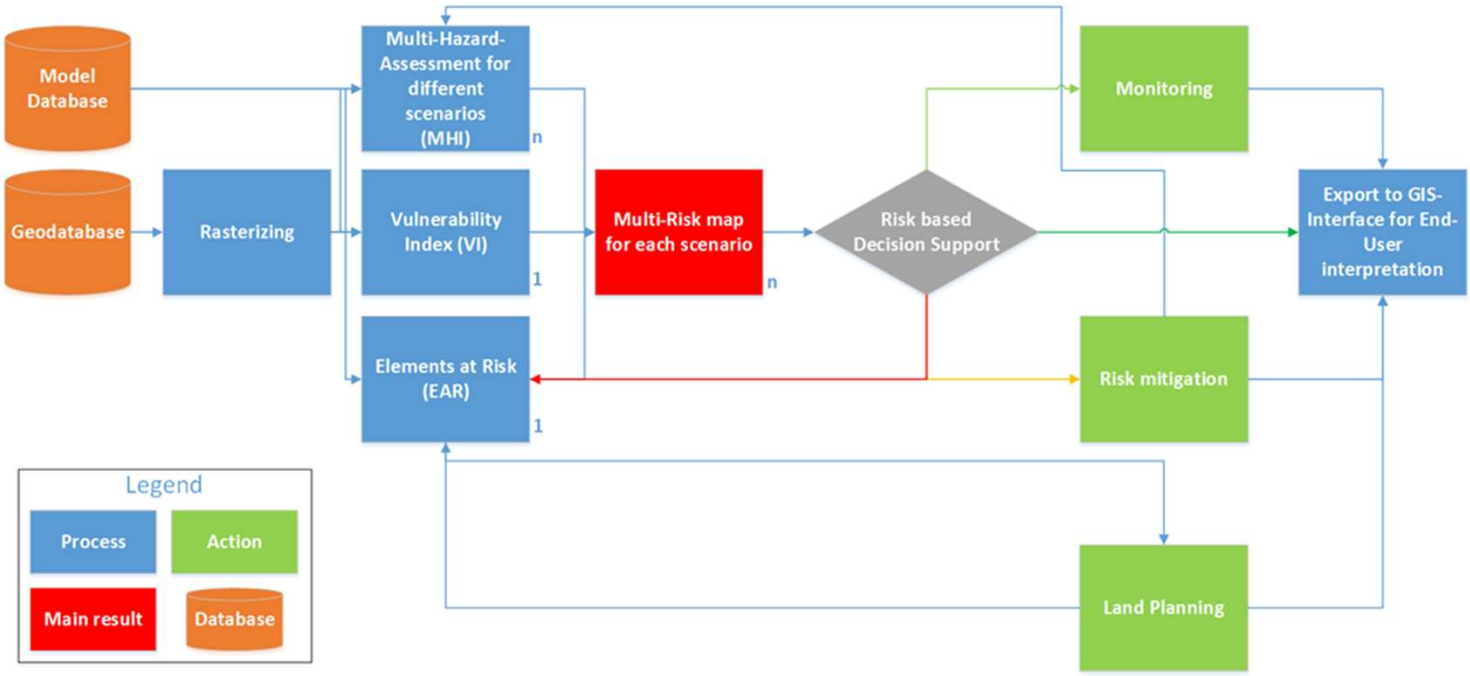
## Work results




The seven main steps of the project's multi-hazard risk assessment methodology, adapted for evaluation in post-mining areas, begin with the susceptibility of each identified hazard (Step 1) and culminating in the final calculation of the multi-risk value (Step 7).




DSS architecture

Multi-Risk calculation process: the pre-processed data is stored in the model and geodatabase, rasterized and then used to calculate the three factors and subsequently the Multi-Risk value for each cell, leading to different causes of action.

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# Dissemination and exploitation (2023-2024)

## Articles

Al Heib, M.M.; Franck, C.; Djizanne, H.; Degas, M. Post-Mining Multi-Hazard Assessment for Sustainable Development. Sustainability 2023, 15, 8139. https://doi.org/10.3390/su15108139

Haske, B.; Al Heib, M.M.; Inojosa, V.; Bouaziz, M. Development of a spatial decision support system for multi risk assessment of interacting post-mining and natural hazards. Sustainability. https://doi: 10.20944/preprints202412.0155.v1

Nalmpant-Sarikaki, D.M.; Theocharis, A.I.; Koukouzas, N.C.; Benardos, A.G.; Zevgolis, I.E. Multi-Risk Assessment in Post-Mining Lignite Areas. Mater. Proc. 2023, 15, 65. https://doi.org/10.3390/materproc2023015065

## International Conferences/Congress/Symposium

European Geosciences Union General Assembly 2023, 19-21 April 2023, Vienna, Austria

2nd International Conference on Raw Materials and Circular Economy" (RawMat2023), 28 Aug. - 2 Sept. 2023, Athens, Greece

15th ISRM International Congress on Challenges in Rock Mechanics and Rock Engineering, 9-14 October 2023, Salzburg, Austria

11th Edition of the International Symposium on Occupational Health and Safety (SESAM 2023), 18-25 October 2023, Bucharest, Romania

Mine Closure 2023, 3-6 October 2023, Reno, United States of America

European Geosciences Union General Assembly 2024, 14-19 April 2024, Austria

4th International Symposium on Applied Geo-Informatics, 9-10 May 2024, Poland

9th Edition of the International Scientific and Technological Conference named „Energy, Environment, Intelligent Use of Minerals: Management and Sustainable Development ", 5 June 2024, Rybnik, Poland

Mine Closure 2024, 26-28 November 2024, Perth, Australia

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# Dissemination and exploitation (2023-2024)

## National Conferences

9th Panhellenic Conference on Geotechnical Engineering, 4-6 October 2023. Athens, Greece. https://thracegroup.com/li/en/events/9th-hellenic-conference-on-geotechnical-engineering-athens-greece-4-6-october-2023/

17th Days of Mining Surveying and Protection of Mining Areas, 11-13 October 2023, Jaworze, Poland

21st Altberbaukolloquium (Post-Mining Conference), 9-10 November 2023, UNESCO World Heritage Site Zollverein Essen, Germany

Surface hazard assessment 25 years after the end of mining exploitation in post-mining areas in Wałbrzych, 14 November 2024, Wałbrzych, Poland

Committee on Geology and Mining of the Silesian Union of Municipalities and Districts, 28 November 2024, Katowice, Poland

## Project workshops / meetings

Kick-off meeting (hybrid): 13 October 2022, Paris, France

Work Progress meeting (online): 8 December 2022

Work Progress meeting (online): 1 February 2023

Work Progress meeting (online): 3 April 2023

Work Progress meeting (online): 21 September 2023

Second meeting (hybrid): 11-12 October 2023, Athens, Greece

Third meeting (hybrid): 11-12 April 2024, Freiberg, Germany

Fourth meeting (hybrid): 08-09 October 2024, Bochum, Germany

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