

GEORISK Project

PROJECT OVERVIEW

2020

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [818232 — GEORISK]



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2 / Partners

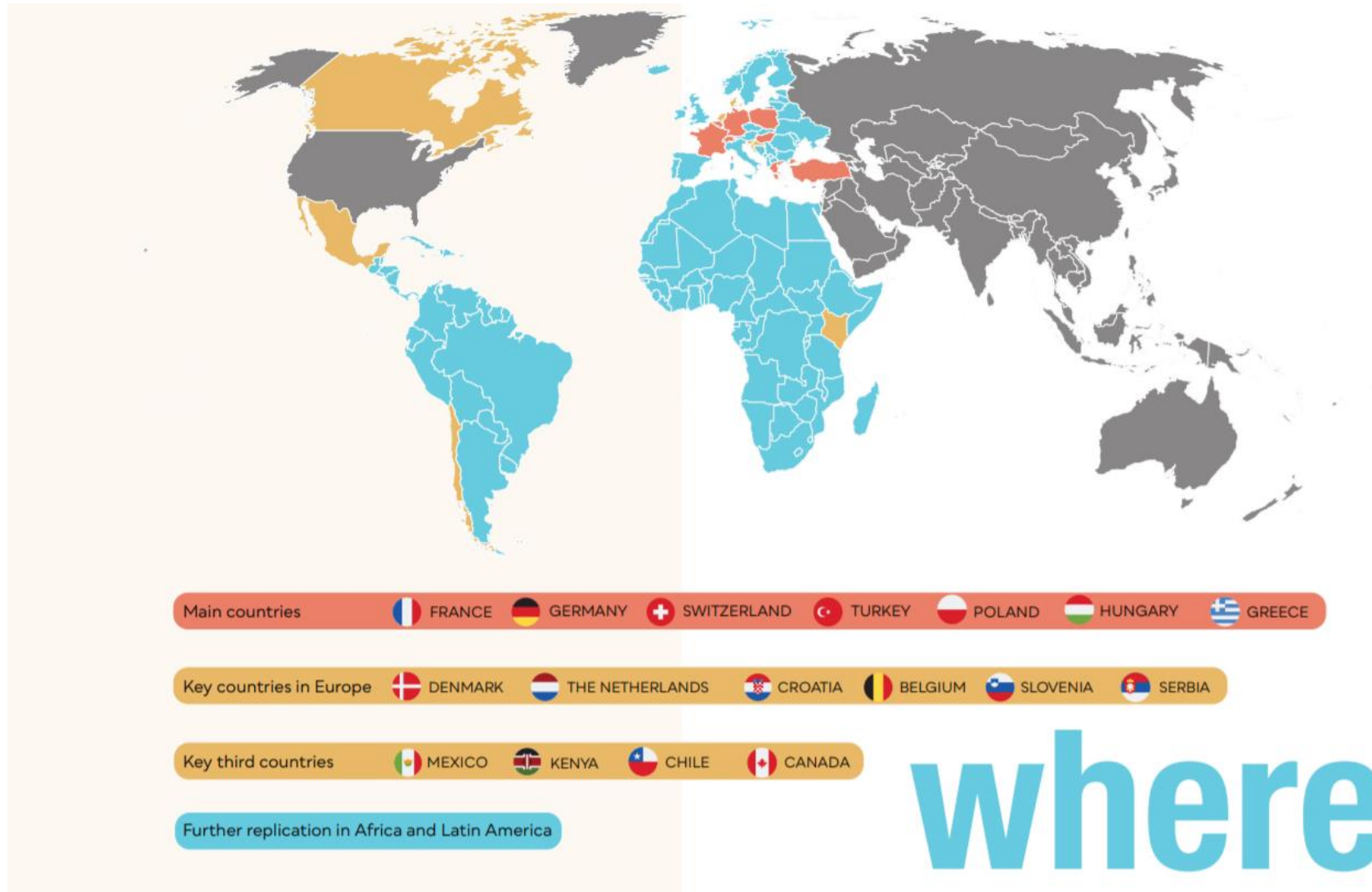


Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

partners



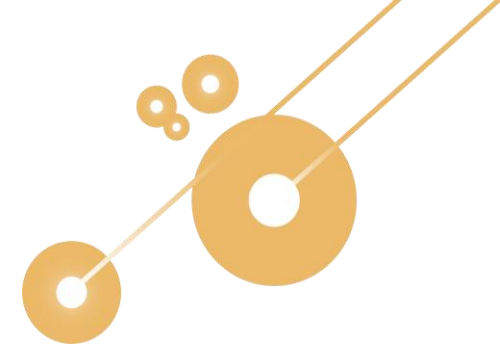
3 / Geographical coverage



where

GEORISK

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RISK ASSESSMENT

1) Context and Identification of potential risks (BRGM)

Geothermal Risks register, a workshop organised in each country > Done

2) Risk Assessment (GEC-CO)

Geothermal Risk Matrix > Done

3) Tools to assess the risks (BRGM)

GEORiskREPORT: Online tool for developers > Online

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GEORISK TOOL

Here is an online version of the risk register that was developed by the partners of the project. It shows the list of all plausible risks faced by developers of deep geothermal projects. Each risk is accompanied by corresponding de-risking measures. This is the starting point for developing a risk management framework adapted to the needs of a particular project by selecting the more appropriate risks from the list.

FILTERS

Categories

- External hazards
- Risks due to uncertainties in the external context
- Risks due to internal deficiencies
- Risks due to subsurface uncertainties
- Technical issues
- Environment risks

Phases

Please select one or several categories AND one or several phases to display the corresponding risks.

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FILTERS

Categories

- External hazards
- Risks due to uncertainties in the external context
- Risks due to internal deficiencies
- Risks due to subsurface uncertainties
- Technical issues
- Environment risks

Phases

- Identification / Exploration
- Drilling / Testing
- Exploitation / Development
- Post-closure

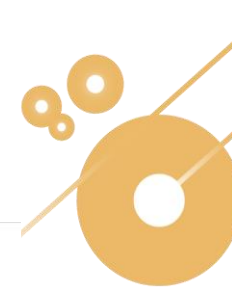
For more details, click [here](#)

Category	Id	Phases				Description
		IE	DT	ED	PC	
Risks due to subsurface uncertainties	D-1		✓			Flow rate lower than expected (reservoir)
	D-2			✓		Flow rate degrades over time
	D-3		✓			Temperature lower than expected (reservoir)
	D-4			✓		Temperature degrades too quickly
	D-5		✓			Pressure lower/higher than expected
	D-6			✓		Pressure is changing during the operation in an unexpected way
	D-7		✓	✓	✓	Fluid chemistry/ gas content / physical properties are different from expected
	D-8			✓		Fluid chemistry/ gas content / physical properties change
	D-9		✓			Target formation is missing in the well
	D-10		✓			Target formation has no/insufficient fluid for commercial production
	D-11		✓			Geological lithology or stratigraphy is different than expected
	D-12		✓	✓	✓	Excessive scaling in the geothermal loop
	D-13		✓	✓	✓	Excessive corrosion in the geothermal loop
	D-14			✓		Particle production ("sanding")
	D-15			✓		Hydraulic connectivity between wells is insufficient for commercial use
	D-16		✓	✓		Re-injection of the fluid is more difficult than expected
	D-17				✓	Degradation of the reservoir (structure, properties, deteriorating whole-scale further commercial utilization)

ONLINE RISK REGISTER

FLOW RATE LOWER THAN EXPECTED (RESERVOIR)

- Category : Risks due to subsurface uncertainties
- Id : D-1
- Phases :
 - Drilling / Testing
- Consequences :
 - Economic / Performance / Acceptability
- Mitigation :
 - Technical :
 - Adaptation of the drillpath to reach multiple targets - Avoid excessive contamination of the well
 - Use of clay-mineral free drilling mud
 - Avoid the use of loss control material during drilling of the production section
 - Avoid the cementing of previous casing string in the production section
 - Try to drill long enough production section for securing the expected yield
 - Use of external casing packer between the loose formation and the productive layer
 - On case of porous reservoir use of underreaming and gravel pack in the production section
 - Design the production section of the well with 8 1/2 " diameter
 - Accurate collection and interpretation of productivity data of wells for securing information for the expected yields
 - Doing new measurements in existing wells for securing information for the expected yield
 - Legal / Policy :
 - Insurance : Dedicated fund

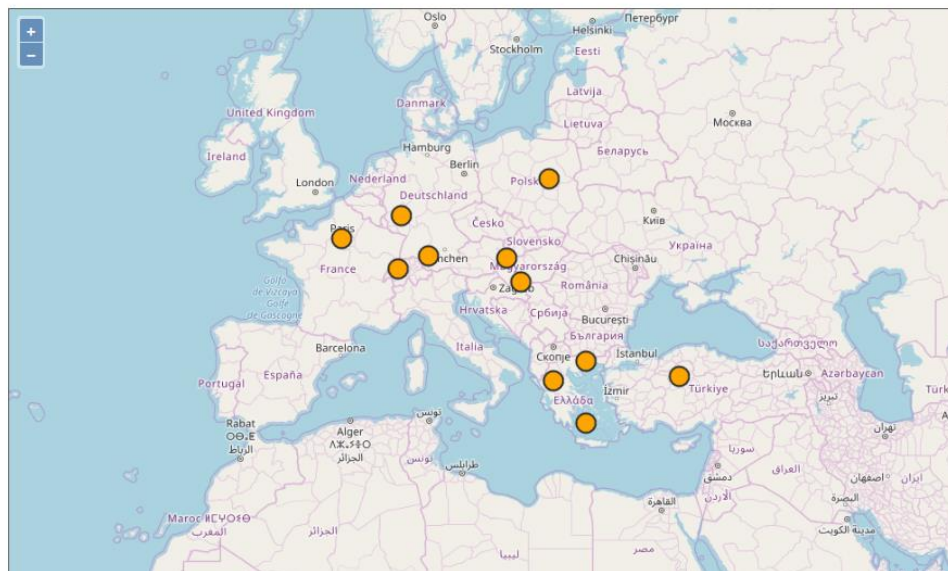


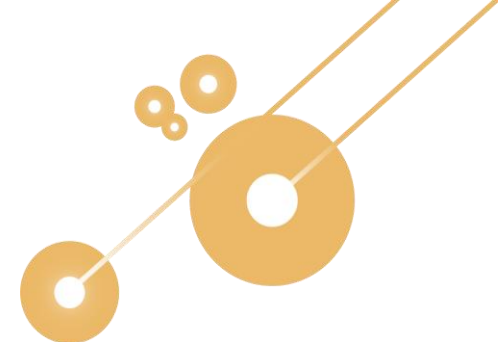
RISK ASSESMENT RESULTS

Several stakeholders from the GEORISK countries have answered a questionnaire in order to assess which risks are more important. In this page you will be able to find the online version of this assessment of risk for each GEORISK country. In addition, you can also download an guided spreadsheet for making a risk assessment dedicated to your project.

RESULTS FROM GEORISK

Click on the region you are interested in or get more info [here](#)





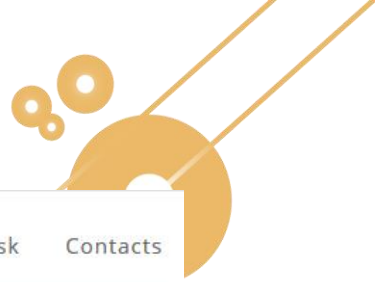
RISK MITIGATION TOOLS

- 1) Existing and innovative financial tools: public and private (GEODEEP)
comparison of the Risk Mitigation Systems > **Published**

- 2) Framework conditions for establishment a new insurance scheme (SFOE)
> **published as a Key deliverable**

- 3) Conditions for a transition in the insurance schemes, according to market maturity (GEC-CO) >
published

- 4) Helpdesk for establishing an insurance scheme (EGEC)
- For public authorities > **published**



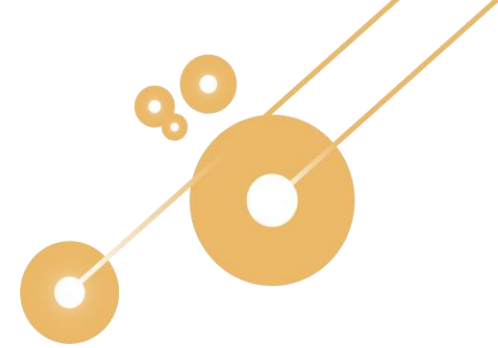
HELPDESK

KEY RESOURCES

[Framework conditions for establishing a risk mitigation scheme](#)

[Risk register](#)

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WP 4: ESTABLISH sustainable RISK MITIGATION SCHEMES IN TARGET COUNTRIES

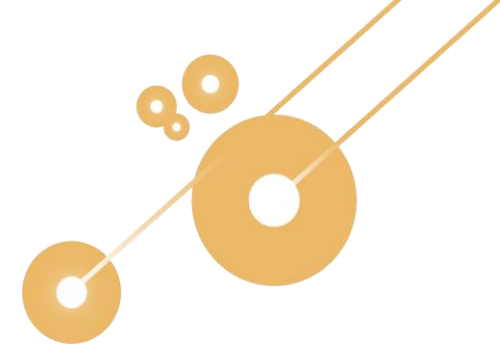
Hungary-Poland-Greece

France-Germany-Switzerland-Turkey

- 1) Create relationship with decision makers (IGSMiE PAN) (10-24) > ongoing
- 2) Support establishment of insurance scheme in target countries (CRES) (months 10-20)
> ongoing
- 3) Assess its establishment, adopt corrective measures (Geoex) (months 18-24) > next

A 10 years operation simulation of the financial model

GEORISK



A 10 years operation simulation of the financial model

Operating simulation: analyses and further calculations in the three focus countries

Ten years operating symulation of the planned Hungarian Geothermal Risk Mitigation Scheme

10 years cash-flow

BASE calculation

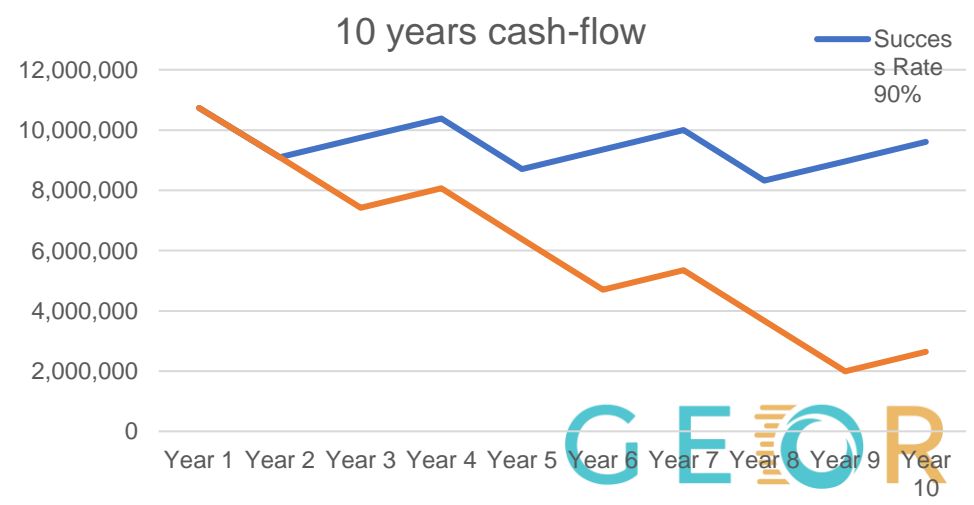
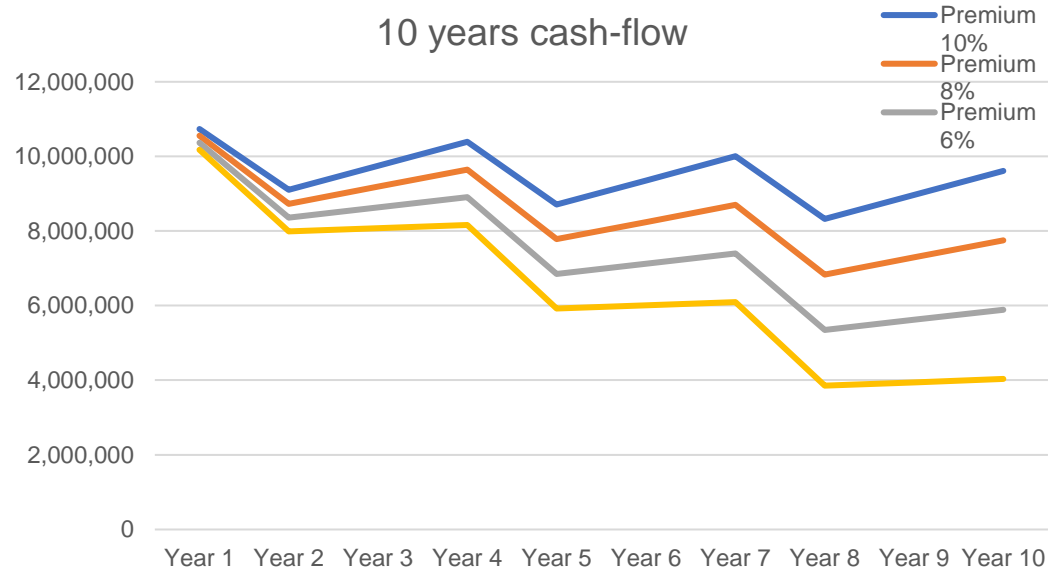
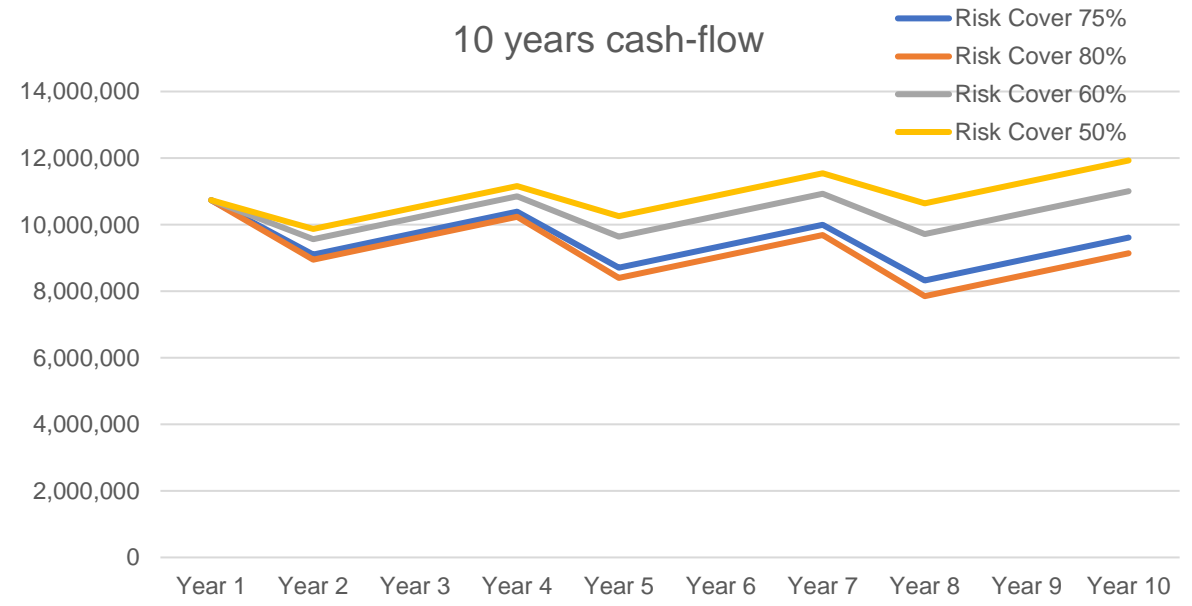
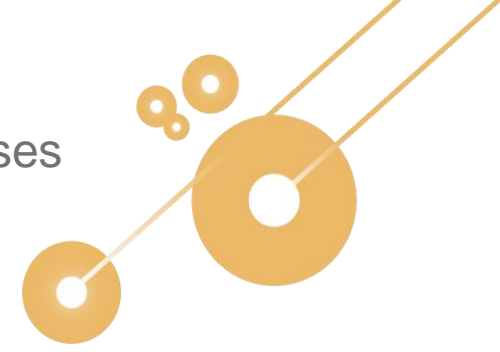
Total Assets	at the end of year, €
Year 1	10.735.000
Year 2	9.100.000
Year 3	9.745.000
Year 4	10.390.000
Year 5	8.710.000
Year 6	9.355.000
Year 7	10.000.000
Year 8	8.320.000
Year 9	8.965.000
Year 10	9.610.000

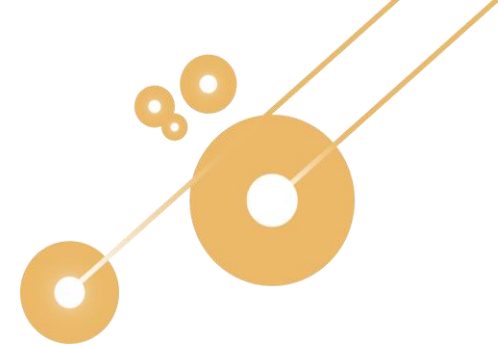


A 10 years operation simulation of the financial model

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Premium, Risk Cover and Success Rate analysis with the Hungarian premises



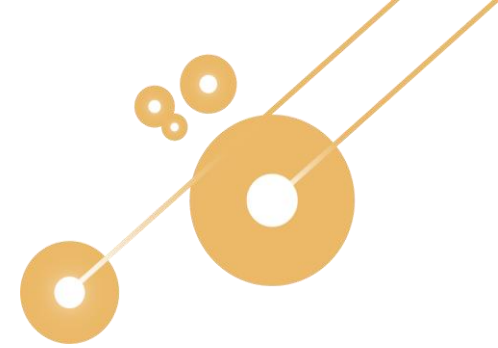


WP 5: REPLICATION AND PROMOTION IN EUROPE & GLOBALLY

- Countries to target in WP5 are
 - in Europe (Denmark, Netherlands, Belgium, Croatia, Serbia, Slovenia)
 - and outside (Chile, Kenya, Canada & Mexico).
- A regional, Pannonian Basin geo-risk insurance scheme is to be evaluated in WP5

> ongoing

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WP 5: REPLICATION AND PROMOTION IN EUROPE & GLOBALLY

Adapt tools, set framework conditions (GEODEEP) > ongoing

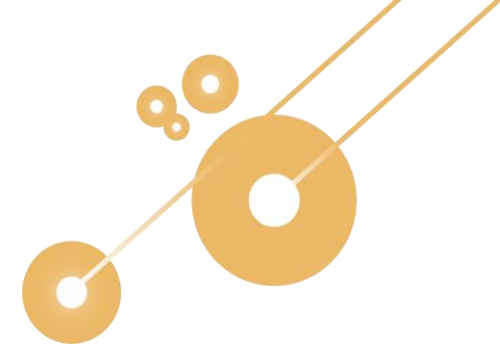
Create liaison with decision makers and international & national stakeholders, present tools (CRES)

one-to-one interviews, webinars, > ongoing

3) Capacity building (TBK)

Organise one workshop in each third countries > next

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WP 5: COMMUNICATION

Publications: Reports, Brochures..

Website

Media campaign

Events

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DEVELOPING GEOTHERMAL PROJECTS BY MITIGATING RISKS WITH FINANCIAL INSTRUMENTS

The GEORISK project works to establish risk insurance all over Europe and in some key target third countries to cover risks associated with the development and the operation of a deep geothermal plant.



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