RINGEN
research infrastructure

# Geothermal Project Litoměřice

## as part of the Czech RE:START strategy

EVROPSKÁ UNIE
Evropské strukturální a investiční fondy
Operační program Výzkum, vývoj a vzdělávání

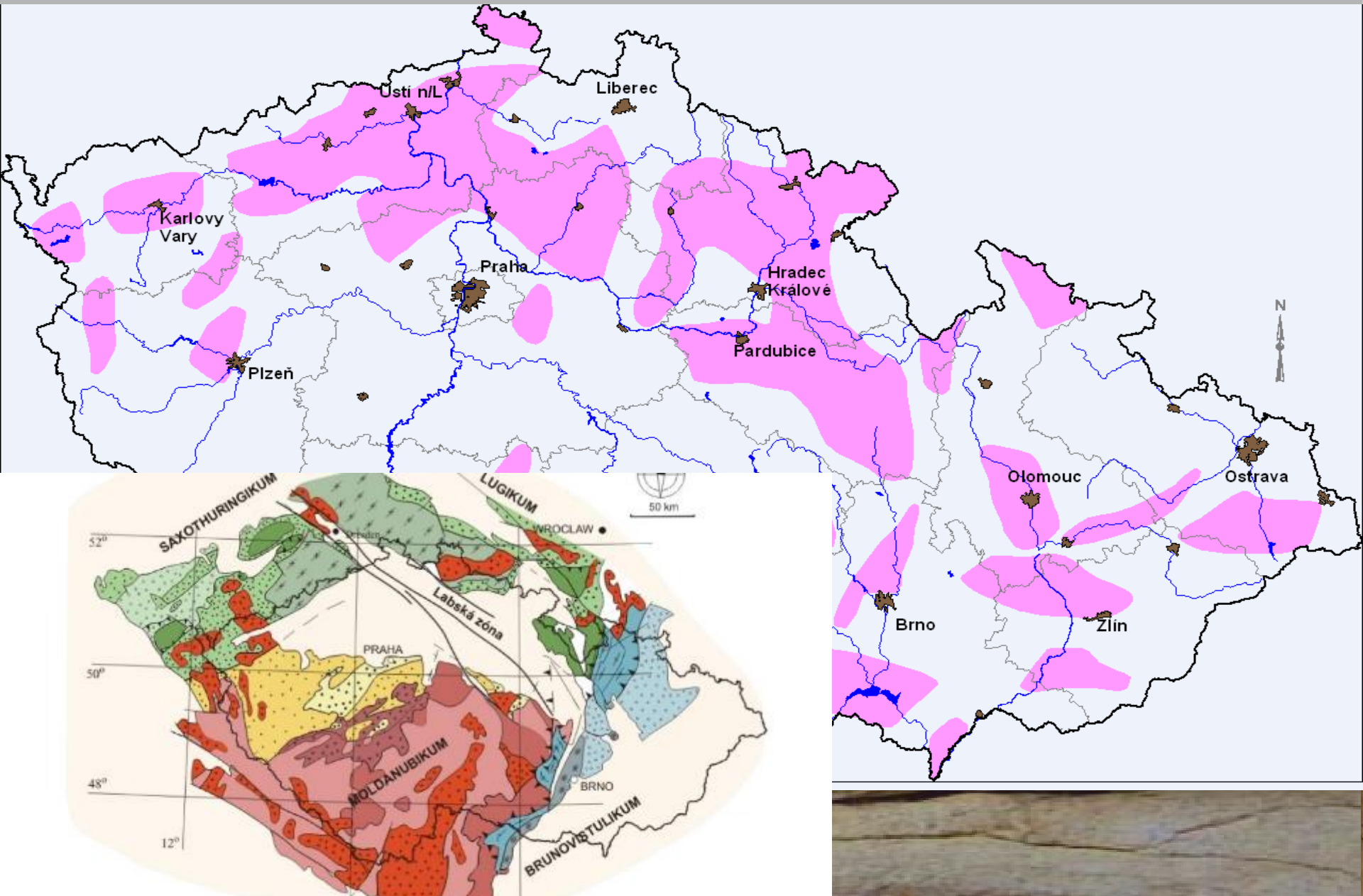
MINISTERSTVO ŠKOLSTVÍ, MLÁDEŽE A TĚLOVÝCHOVY

# I - General overview

- Location
- General conditions for geothermal energy utilization
- Main aspects of the decarbonisation in city of Litoměřice


Locality Litoměřice
- 24 000 inhab.
- Historical listed area
- Natural protected area
N
Czech Republic
POLAND
GERMANY
Liberec
Harrachov
Teplice
Ústí nad Labem
Karlovy Vary
Praha
Hradec Králové
Pardubice
Krnov
Havířov
Ostrava
Pilsen (Plzeň)
Rokycany
CZECH REPUBLIC
Příbram
Olomouc
Frýdek-Místek
Havlíčkův Brod
Prostějov
Tábor
Kroměříž
Telč
Brno
Zlín
Šumava
Uherské Hradiste
České Budějovice
Český Krumlov
SLOVAKIA
AUSTRIA
Vienna (Wien)
Bratislava

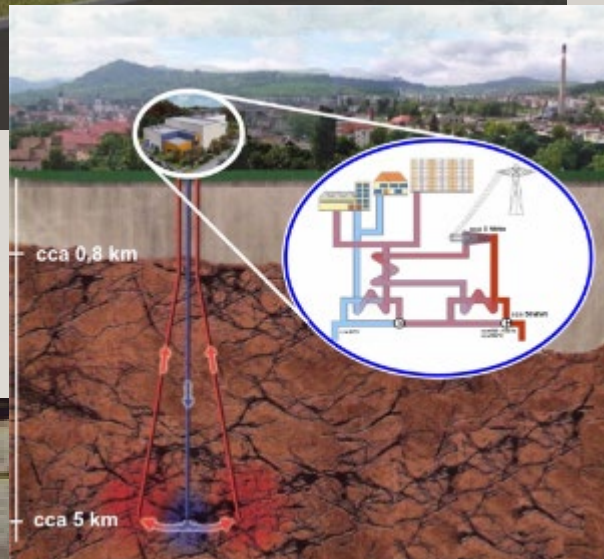
# Suitable geological conditions for EGS/HDR in Czechia – Bohemian Massiv



# Moving towards de-carbonisation



From coal combustion district heating (DHS)
to geothermal energy & more



# II – Timeline & financial aspects

- **Phase Zero:** starting in 2004
- **Continuing from research to application:** 2016-2024
- **Final solution based on RES**: by 2026
- **Total future investment:** 1,35 bil CZK/ € 55 mil. exl. DHS

# First steps – exploratory well 2,1 km (2007-8)

- Confirmation of the heat gradient
- Clarification of the geological profile
- Investment € 4 mil.

# Phase 1 (2016-2019) – geothermal research

## Research Infrastructure RINGEN (est. 2016)

Funding 1**: Operational Programme „OP VVV“ call „Research Infrastructures“**
Funding 2**: Ministry of Education, Youth and Sport (non-investment costs)**

Budget **2016-2019: CZK 131 mil (€5 mil) – in realisation**

**Main goal**:
Create a unique and high-tech centre for research of geothermal energy utilisation in medium to deep (2-5km) metamorphic rock formations for basic, applied and experimental research

**Objectives are to**:

- develop and improve technologies for EGS / HDR heat extraction
- develop and improve methods for seismic monitoring system
- support research and provide services in the area of geothermal energy exploitation and related areas to universities, scientific institutions and the industry
- raise safety and bankability of EGS/HDR geothermal resources by lowering investment risks
- serve as the Czech contribution to the European and worldwide geothermal energy R&D

# RINGEN research centre Litoměřice – constructed in 2018-2019

# RINGEN location

## Former barracks Jiřího z Poděbrad

# Phase 2 – application of EGS & other RES

## Step by step approach – projects testing various RES sources

i. medium depth geothermal wells project (€6,5 mil. result in 04/2019) - experiment

ii. deep geothermal wells (2x 4-5 km) – possible connection to DHS

iii. shallow (200 m) GTE source combined with heat pumps – additional source

iv. analysis of other suitable sources (biomass, biogas etc.) for DHS (ELENA?)

## Timeline: 2019-2024

## Estimated budget: CZK 1,1 bil. (€ 40 mil)

**Funding options:**

- **Czech resources: operational programmes, R&D, RE:START)**
- **EU resources: Horizon 2020**

# Phase 3 – operation of EGS heating plant

**Project following EGS deep wells project (if successful):**

i. financial & economic analysis of long-term operation; risk/legal due diligence
ii. heating plant construction and connection to the DHS
iii. continuing monitoring of heating plant & EGS reservoir operation
iv. further research of potential localities in Czechia/abroad (coal regions)

**Timeline: 2022-2026**

**Estimated budget: CZK 260 mil. (€ 10 mil )**

**Funding options:**

- **Czech resources: operational programmes, R&D, RE-START)**
- **EU resources: Horizon 2020**
- **Other public (city, region) or/and private investors**

# III – Technical & other challenges

- Uknown geothermal source output (0-20 MWth?)
- High upfront investments with high risks
- Private (DHS) versus public (GTE source) ownership
- State aid & other issues (initial high public subsidy level)
- RES availability to feed DHS (suply of 260 TJ, 35 MWth output)
- Transformation from coal to RES by 2026
- Long-term viability of the DHS system supplying 70 % of heat

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# Thank you for your attention!

## more on www.rin-gen.cz

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