

Geothermal UK webinar: Germany update

24 September 2026, 12:00 – 13:30 (London)

Presentations

Pullach – geothermal case study
Geothermal policy update
Exploration risk insurance
City-scale geothermal in Munich

Ralph Baasch, IEP
Stephanie Ostermaier, Rödl
Matthias Tönnis, Munich Re
Neil Farquharson, Erdwerk



Followed by Q&A

Join us!

www.geothermaluk.org

info@geothermaluk.org

Yesterday, Today and Tomorrow

Development of IEP

Dr. Ralph Baasch

Geothermal UK webinar 24.09.2026

The „Treasure“ is located underneath our feet



Looking into the depth of the earth for oil and gas an energy source much more sustainable, cleaner and available 24/7 in many places has been ignored in the past and still hasn't reached everyone's brain – „geothermal“ which is our energy source for heating and cooling. Looking for alternatives to oil and gas in Pullach, a village of 9000 inhabitants south of Munich, we started engaging in geothermal in 2000.

The IEP, a 100% community owned company, was founded in 2002 to do that business. But it took us another 2 years convincing the council and the public before drilling the first 2 wells in 2004/2005 and a third well in 2011, using the first wells now as production wells and the third well as reinjection well.

District Heating Network of Pullach in the beginning



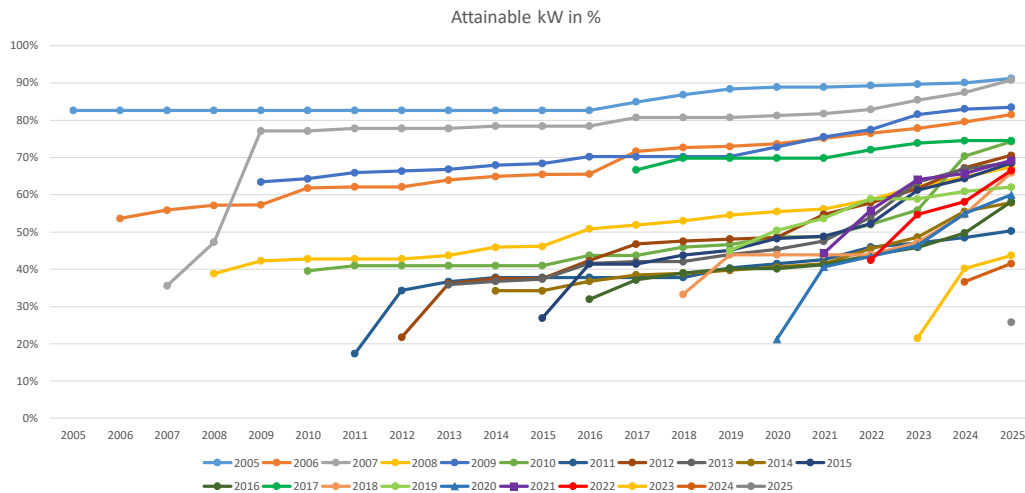
At the beginning the goal for the council was only a small district heating network, marked by the red rectangle, build on community owned property with safe customers like the highschool, the public pool and public housing. Seeing that the system works soon the expansion of the network went on.

District Heating Network of Pullach today



This is the situation today comprising 70km of district heating network. Almost the whole community is developed

Development of construction sections



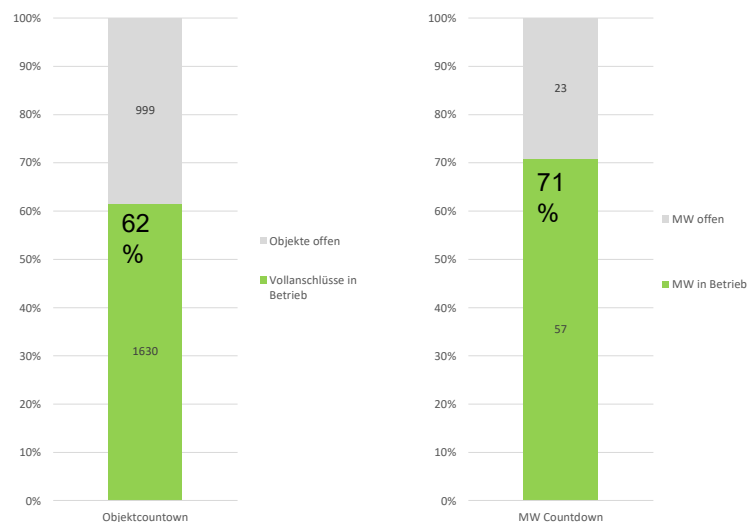
as per Dec. 2025

5

This chart depicts the development of the different construction sections over the years and the attained connected heat load. This chart shows you that in the beginning it is hard work to convince people to change to that new form of energy but over the years we could connect at least 60% of the possible heat load.

If you have an existing network it is much easier, as for the customer it doesn't make any difference which type of energy you use for heating the network. But more important it shows you that the price for the customer is compatible. And it is or better would be also cost effective for us if we didn't continue to do big investments. The annual turnover of the IEP 2025 was round about 9 Mio. Euros.

real estate countdown



+ 3,5 % compared to 2025

+ 4 % compared to 2025

Stand Juni 2026

6

A similar chart about our achievements. The left bar shows the possible real estates to be connected. The right bar, which is more important, shows the possible heat load behind these objects.

Strong demand for renewable district heating



Objekt-Nr: 14136 | Scout-ID: 136299142

Attraktives Baugrundstück in Pullach mit Anschluss für Geothermie

Adresse

82049 Pullach im Isartal, München (Kreis)
Die vollständige Adresse der Immobilie erhalten Sie vom Anbieter.
[Auf Karte zeigen](#)

5.300.000 €
Kaufpreis

Geschätzte
Monatsrate 19.708 €

1.870 m²
Fläche

7

In contrary to the begining a connection to geothermal is not only an asset for real estate dealers, as by now it is a special feature advertising. But also big companies like Linde gas, Sixt car rental and others appreciate the reliability and price stability of our heat supply.

Being proud to be connected



After being connected we give this plate to our customers and many of them put it beside their entrances. Pay attention to the house without chimney, which is not needed any more after being connected and a sign for a cleaner environment.

Heat production season 2025



- Geothermal Th1+ Th2 16 - 17 MW
- Max. district load 27,95 MW (29.12.2025, -5°C, 8:30 AM)
- Max. daily heat production 555,5 MWh (29.12.2025)
- On normal winter days (+/- 0°) 1-2 burner (fossil fuel) necessary
- use of fossil fuel/year 9% (2024), 32% (2025)
- Peak consumption of largest customers: 3 MW, 1.8 MW; 1 MW

2 complete sets of pumps (Baker Hughes und Halliburton) are in stock for redundancy

2,5 MW rented Hotmobil (fuel) available for backup

The heat demand of the southern Munich region is huge

9

Here some technical features of our plant.

Interesting here are two different points:

You may have recognized two slides before that we have connected already 57 MW of heat load, that our geothermal capacity however is only 16-17 MW. How does that fit together? It does because of contemporaneity, i.e. not all customers need the heat at the same time. Following the rule that you may connect about double as much heat load than your capacity, the input for fossil fuels for the peak load is cost effective. As you see we have exceeded that point. The fossil fuel input in 2024 was 9% and 2025 even 32% due to a failure of both pumps in the mid of the winter period. meaning that we have to do something about our system which will be showed later.

Expansion of the Energy plant Pullach North



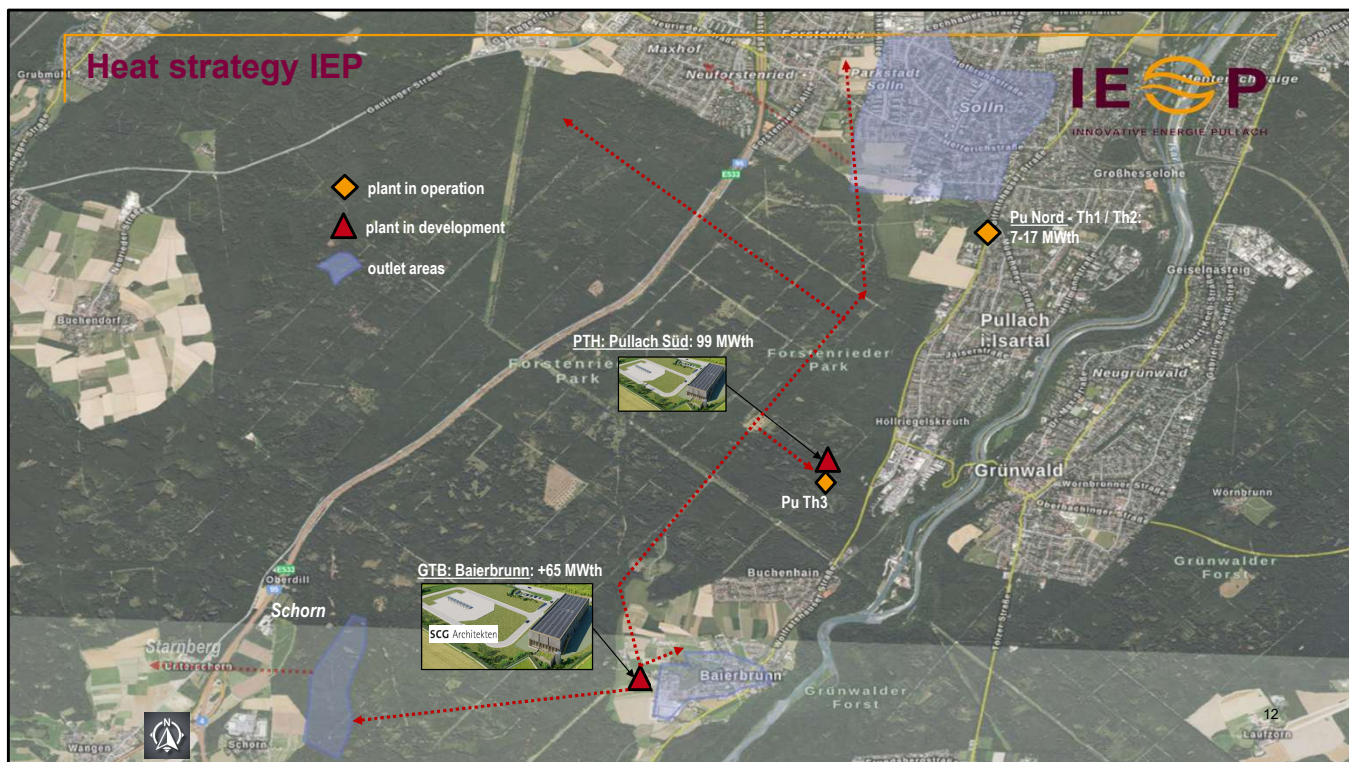
This was our energy station two years ago. At least what was visible above ground containing only the control room. All the other technical equipment like heat exchangers etc. was built under ground. This was a political concession to the neighbours and the fact that twenty years ago the project was also opposed by parts of the public. Knowing how the project would develop this construction was absolutely unreasonable, because technically more difficult to handle and much more expensive.

Expansion of the Energy plant Hans-Keis-Straße



11

This is the building today with the small building being incorporated. The district heating part of the plant is still under ground but the geothermal part is now on the ground floor.



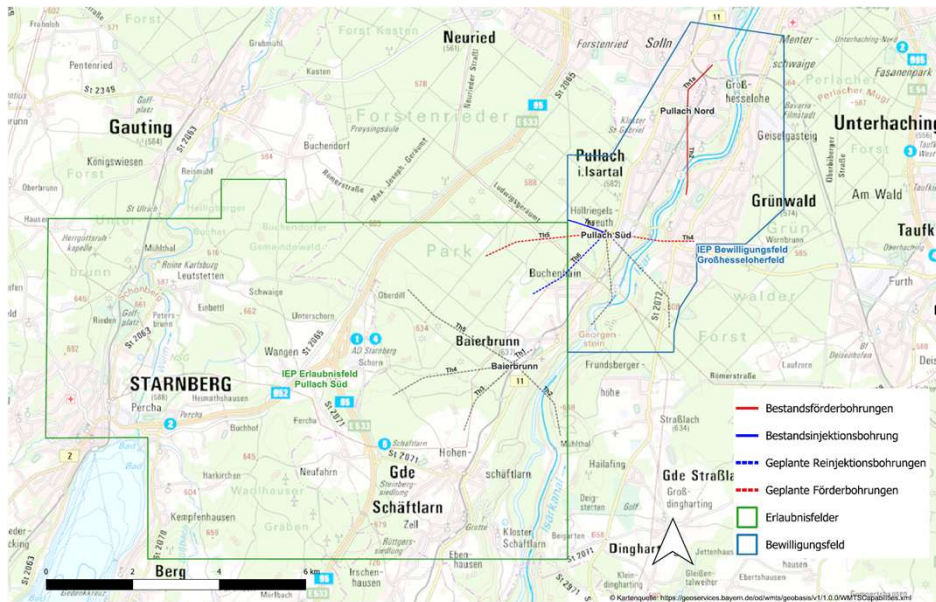
Here you see our current geothermal projects. The existing production wells in the north and the reinjection well in the south where we are developing a new project with 5 more wells with a prospect of 99 MW and further south in the neighbouring community of Baierbrunn are other five wells with 65 MW.

Heat strategy IEP – drill site Pullach South



Here a view on the new drill site in Pullach South. We are almost ready to start. On the right hand side is the building of the new energy plant.

Claim „Pullach South“ approved



Beside our Pullach claim we gained another one „Pullach South“ which allows us to drill from the drill site described before into this new claim and do the project in Baierbrunn

Self-produced electricity by means of wind und PV



Another big project my colleagues are managing at the moment is a wind park with 6 windmills of which 4 belong to the neighbouring communities and 2 two to the IEP. Meaning that in the future we will provide our plants with our own electricity being even more independent and sustainable.



WÄRMEWENDE
durch GEOTHERMIE



INNOVATIVE ENERGIE PULLACH



We know how to do heat rebound!

Deep Geothermal in Germany

From Strategic Priority to Implementation

Stephanie Ostermaier

Consultant

Geothermal project coordination and heat markets

Agenda

1. The Strategic Rationale for Germany's Geothermal Policy

2. From Policy Ambition to a National Framework

3. Creating the Conditions for Market Scale-Up

4. Translating Policy into Project Delivery

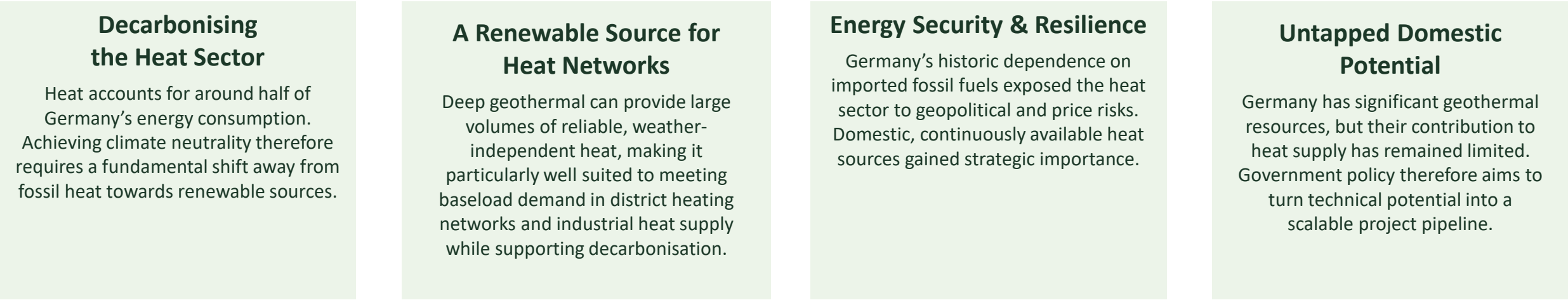
5. Lessons from the German Approach for the UK

1. The Strategic Rationale for Germany's Geothermal Policy

Current market status



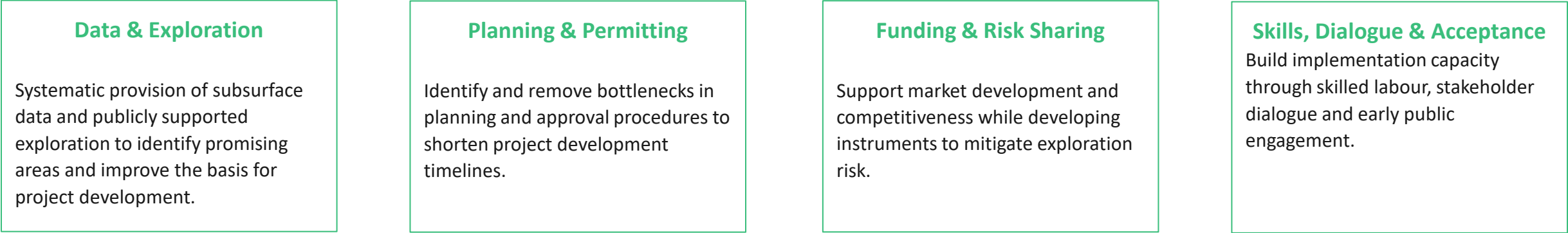
Germany's geothermal policy responds to a broader heat-system challenge: decarbonising heat while securing supply



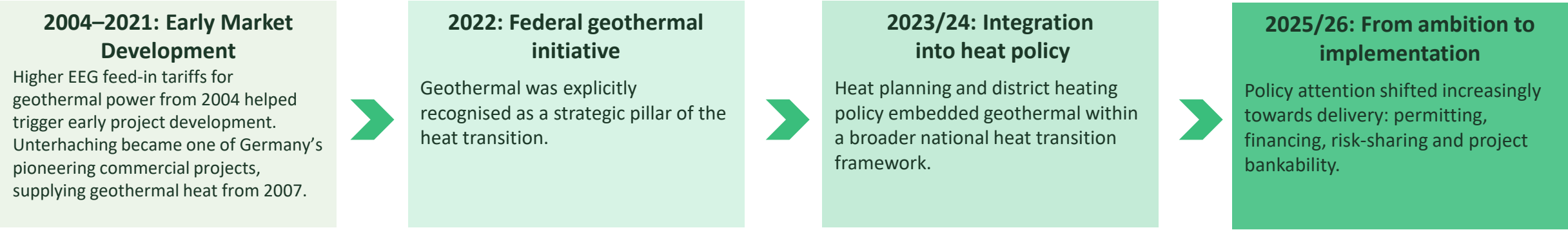
Deep geothermal became a policy priority not as a standalone technology, but as part of Germany's response to the broader heat transition.

2. The Federal Geothermal Initiative

Identified areas of action



From Untapped Potential to a National Policy Agenda



These measures were designed to turn geothermal potential into a scalable project pipeline.

3. What Was Preventing the Market from Scaling?

Market & Revenue Risk

Heat Network Dependency

- Requires sufficient network capacity
- Off-take must be secured long term

Long-Term Revenue Risk

- Payback over decades
- Stable heat sales are critical

Demand Uncertainty

- Customer base must be large enough
- High utilisation is essential

Upfront Investment & Exploration Risk

High Upfront CAPEX

- Major investment before revenues
- Drilling, plant and grid all capital-intensive

Geological Uncertainty

- Temperature and flow confirmed only after drilling
- Significant costs incurred before certainty

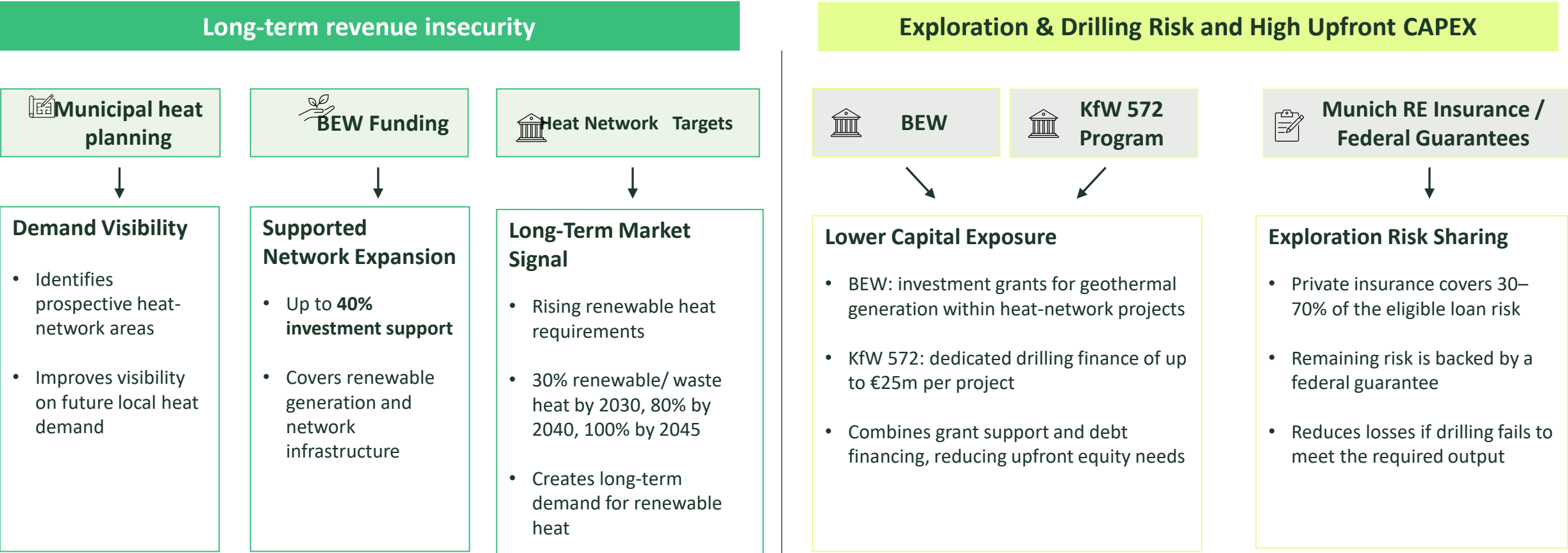
Limited Bankability

- Early-stage debt is difficult to obtain
- Developers carry substantial risk upfront

Interdependent market, financing and geological risks constrained geothermal scale-up.

3. Creating the Conditions for Market Scale-Up

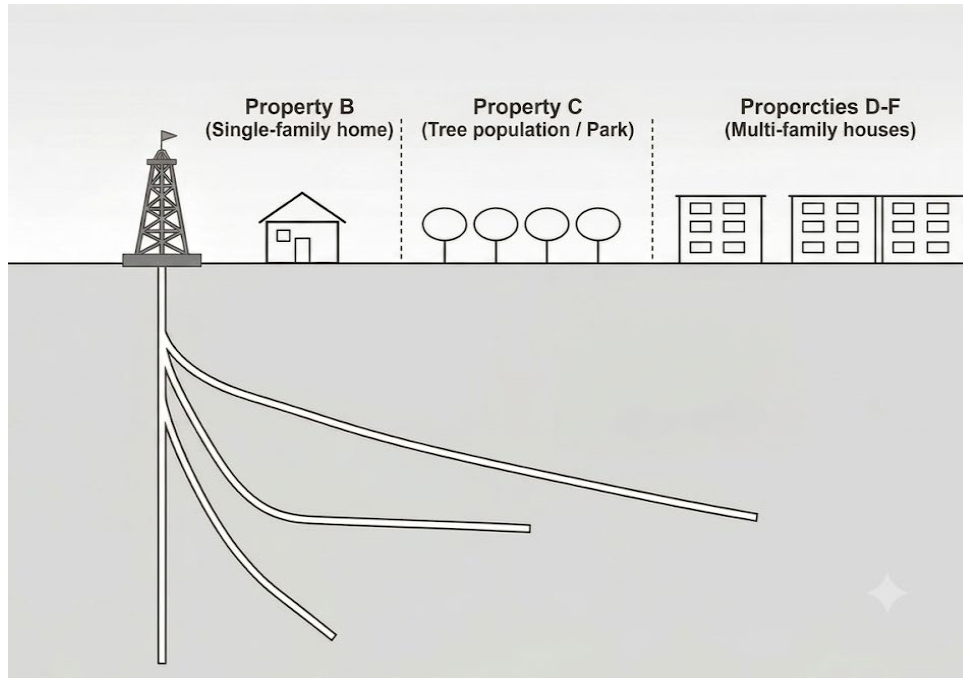
Germany’s response combines heat planning, infrastructure support and risk-sharing across the project development chain.



The German policy framework addresses both market-side and project-side risks rather than relying on a single support instrument.

3. Germany's Federal Mining Act: Legal Certainty

Resource rights: How does Germany create legal certainty for deep geothermal development?



*AI generated image

Problem

Subsurface resources can extend across multiple properties

Surface ownership does not determine rights to deep geothermal resources

Fragmented property-based rights could create uncertainty over resource access after significant upfront investment.



Germany's Federal Mining Act

Solution

Defined, Field-Based Resource Rights

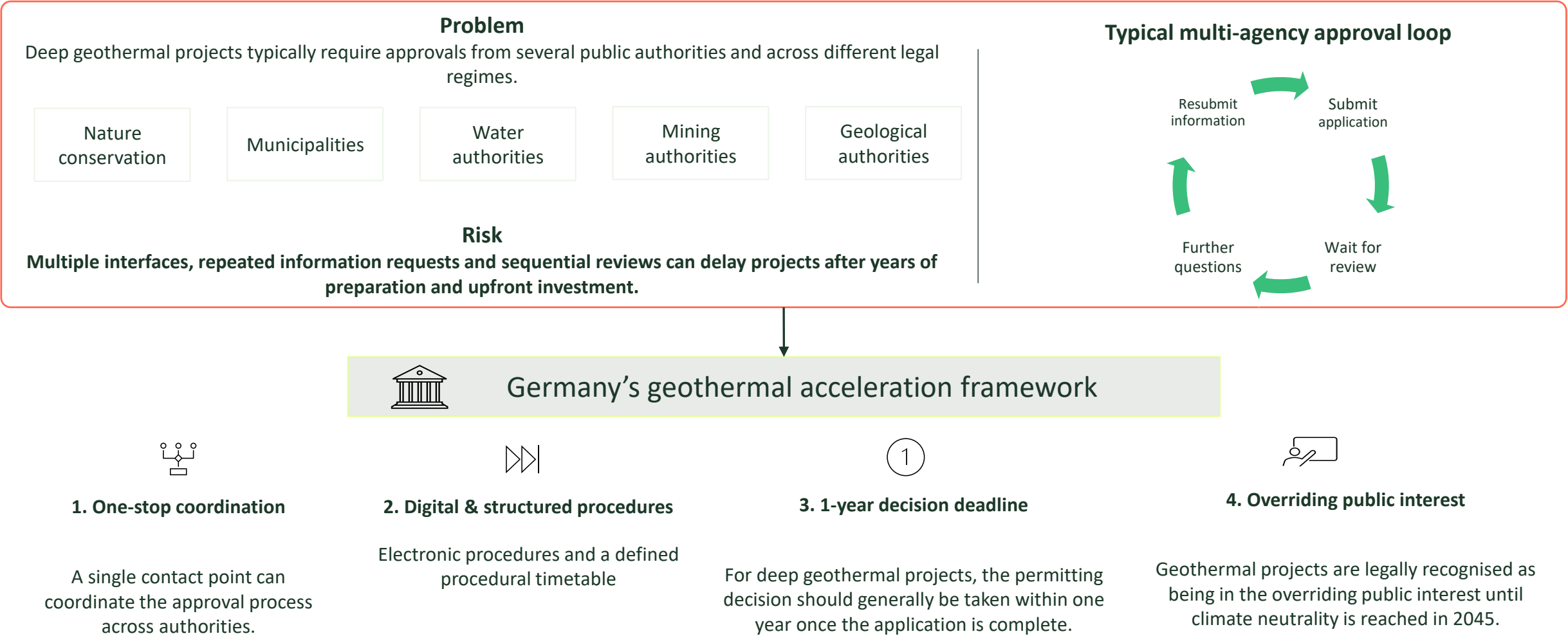
Similar to oil and gas, geothermal resource rights are separate from surface ownership.

- **≥400 m:** geothermal heat is classified as a resource independent of surface ownership under German mining law
- **Exploration permit:** exclusive exploration rights within a defined field
- **Production right:** exclusive right to extract the resource within a defined field

The Federal Mining Act separates geothermal resource rights from surface ownership and provides exclusive exploration and production rights within defined fields.

4. Translating Policy into Project Delivery

Permitting delays: how Germany is trying to shorten approval timelines



5. Lessons from the German Approach for the UK

Five practical lessons from Germany's geothermal policy framework.



1. Geothermal embedded in wider heat policy

Germany treated geothermal not as a standalone technology, but as important part of the wider heat transition and district heating strategy.



2. Long-term demand visibility

Municipal heat planning and binding heat-network targets improve visibility on where renewable heat will be needed and where projects can scale.



3. Multiple de-risking instruments

Germany combines grants, debt finance and exploration-risk mitigation rather than relying on a single support mechanism.



4. Legal and permitting certainty

Clear subsurface resource rights and more coordinated, time-bound approval procedures reduce uncertainty for investors and developers.



5. Coordination across the delivery chain

Scaling geothermal requires alignment between heat generation, heat networks, public authorities and end users, not just support for drilling alone.

Thank you for your attention



Contact



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B.Sc. Governance and Public Policy

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Exploration Risk Insurance in the German Heat Transition

Geothermal UK, September 24th, 2026

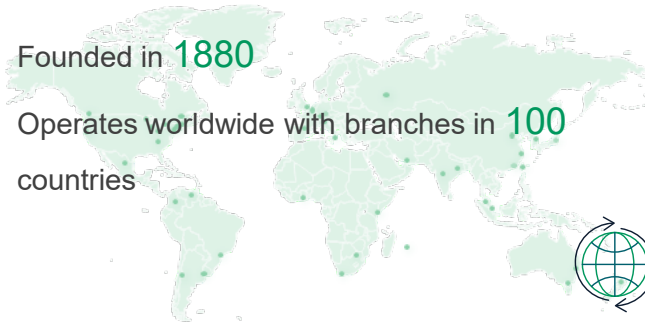
Matthias Tönnis

Topic Lead Geothermal – Green Tech Solutions

Munich RE 

Munich Re is one of the **world's leading Reinsurers** and provides risk transfer solutions.

Among the world's largest
Reinsurers – 4000+
corporate clients in 160+
countries



Insurance Revenue in 2025
€60.4 bn.



ERGO



Primary Insurance Subsidiaries

Consolidated Income
€6.121 bn.
(2025)



Employees
~43.000



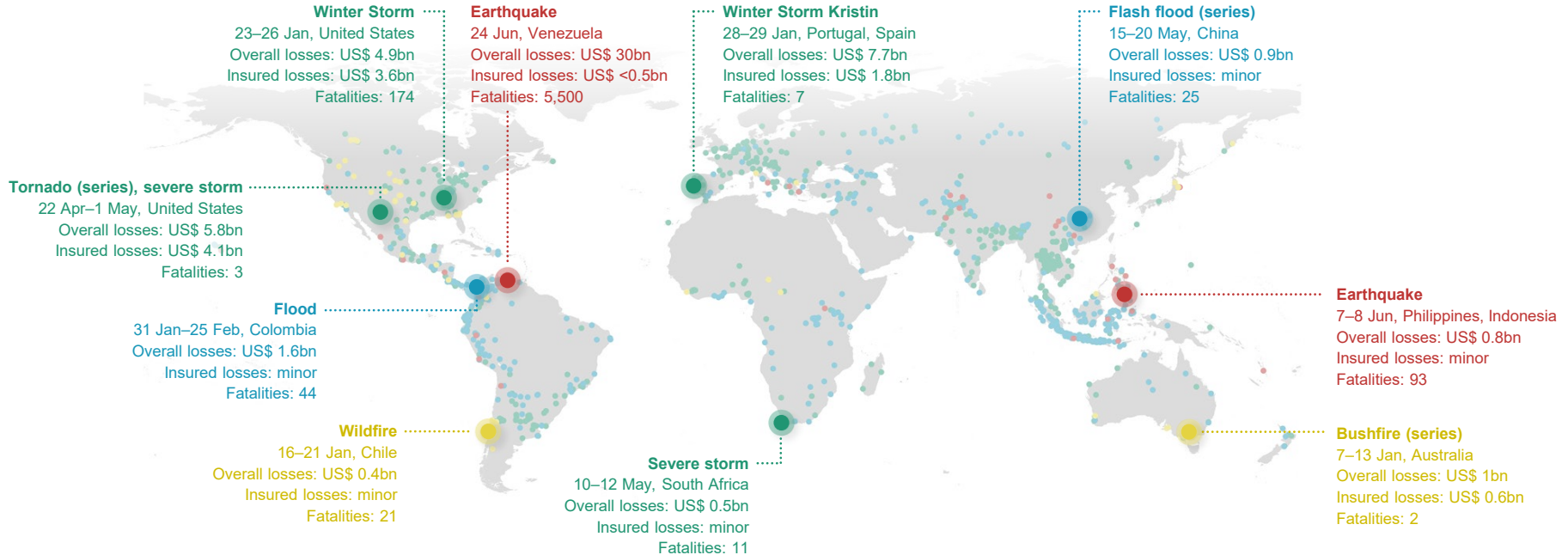
A reliable partner with excellent
ratings

A+, AA und Aa3

(A.M. Best, Fitch, S&P, Moody's)



Munich Re is affected by almost any **natural disaster**.
Severe Earthquake in **Venezuela** caused highest losses in 2026.



Geophysical events

Earthquake, tsunami,
volcanic activity, rockfall



Meteorological events

Tropical storm, extratropical storm,
severe convective storm, local storm



Hydrological events

Flood, mass movement



Climatological events

Extreme cold temperature,
wildfire

Munich Re **Green Tech Solutions** covers the technical risk associated with sustainable technologies

Target groups: Global technology companies, Projects and Investors

Photovoltaics

[PV Warranty Insurance backing your solar investment | Munich Re](#)



2009

Wind power

[Wind farm insurance: on- and off-shore | Munich Re](#)



2009

Energy storage

[Electrical Energy Storage Systems Insurance | Munich Re](#)



2019

Green hydrogen

[Securing the power of Green Hydrogen | Munich Re](#)



2022

E-Mobility

[Enabling the e-mobility transition | Munich Re](#)



2022

Circle Economy

[Bioenergy Plant Performance Insurance | Munich Re](#)



2024

Geothermal

[Geothermal energy - unleash its potential | Munich Re](#)



2024

Outlook

Tax Credit
Insurance
Carbon
Capture
+ Storage

Munich RE 

Performance
Warranty
Insurance



Technical risk covered



Investment-security

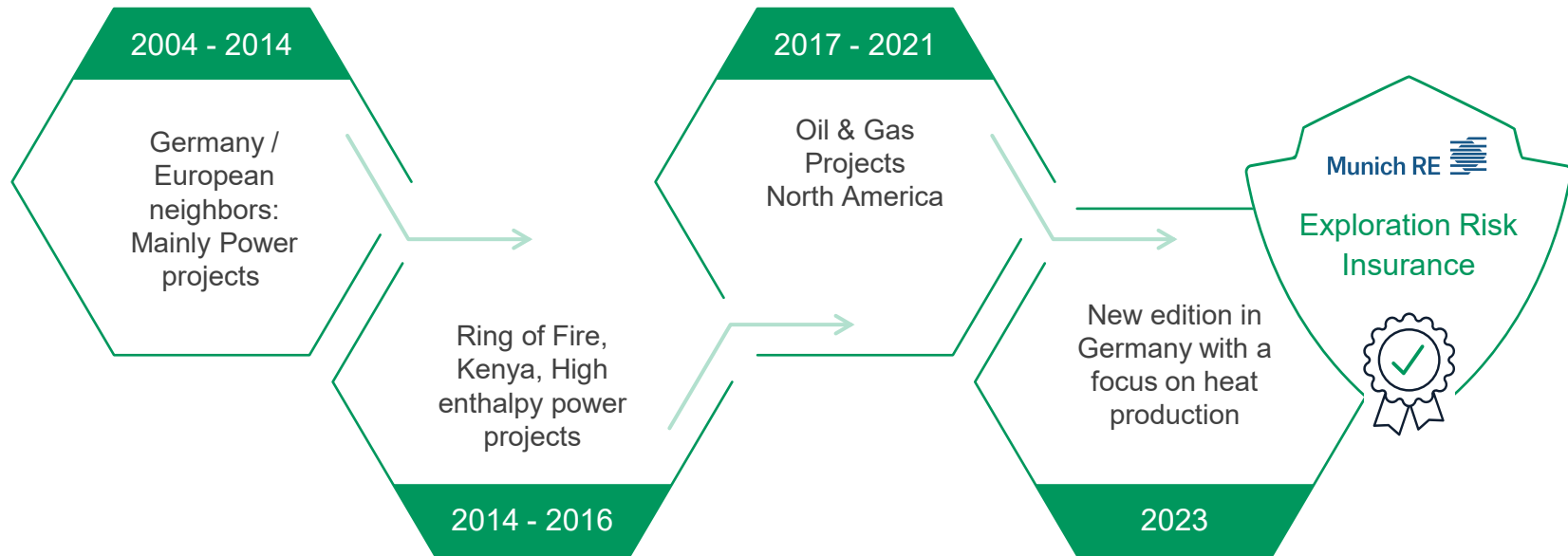
~ 1400
Projects

~ 75 GW
insured

Projects in
~ 90 countries

For 20 years, Munich Re has built up great experience in the area of Exploration Risk Insurance “ERI”

- Technical expertise in geology & exploration
- Continuous development in a complex environment



Geothermal energy as an important component of the **heat transition** will require many new deep wells.

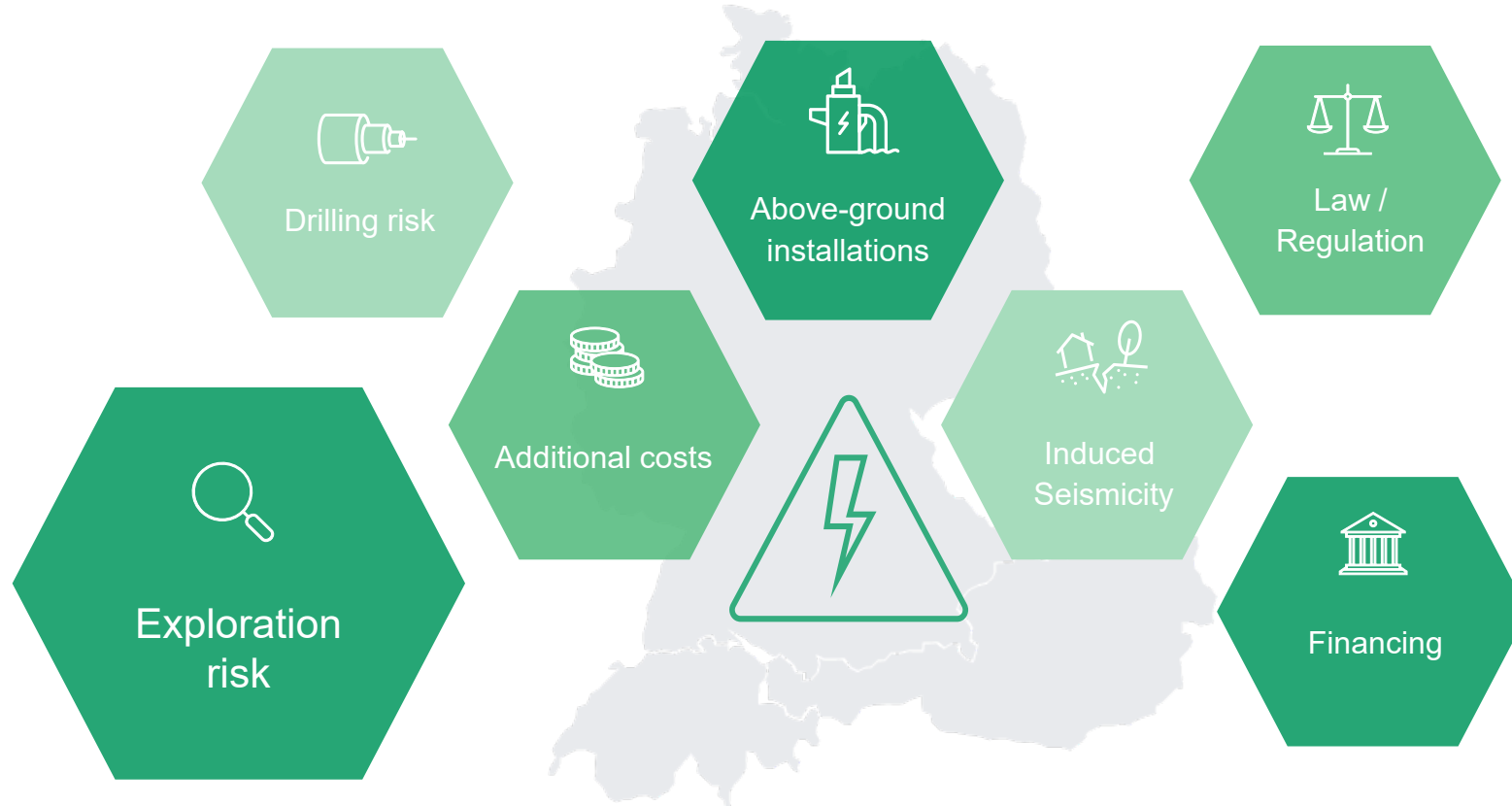


The “Roadmap Deep Geothermal” by
Fraunhofer Institute:

Geothermal shall provide
25% of heating energy
by 2045 (150 TWh/a)

→ up to **2.000** new wells by 2030
and 7.000 to 10.000 by 2045

Geothermal as important component for heat transition:
but - if wells are insufficient, investments are lost

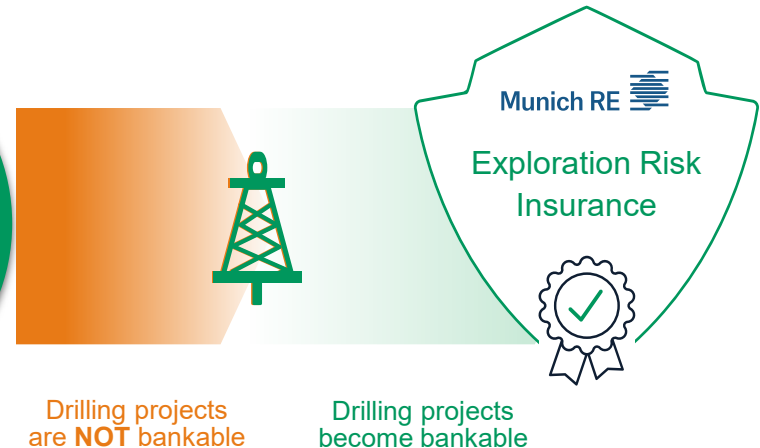
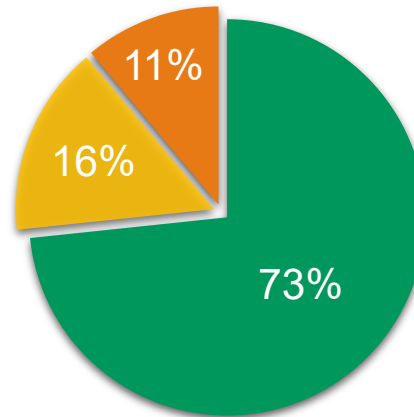


The **Exploration Risk** is the **main risk** for geothermal projects and cannot be avoided, even with thorough preparation.

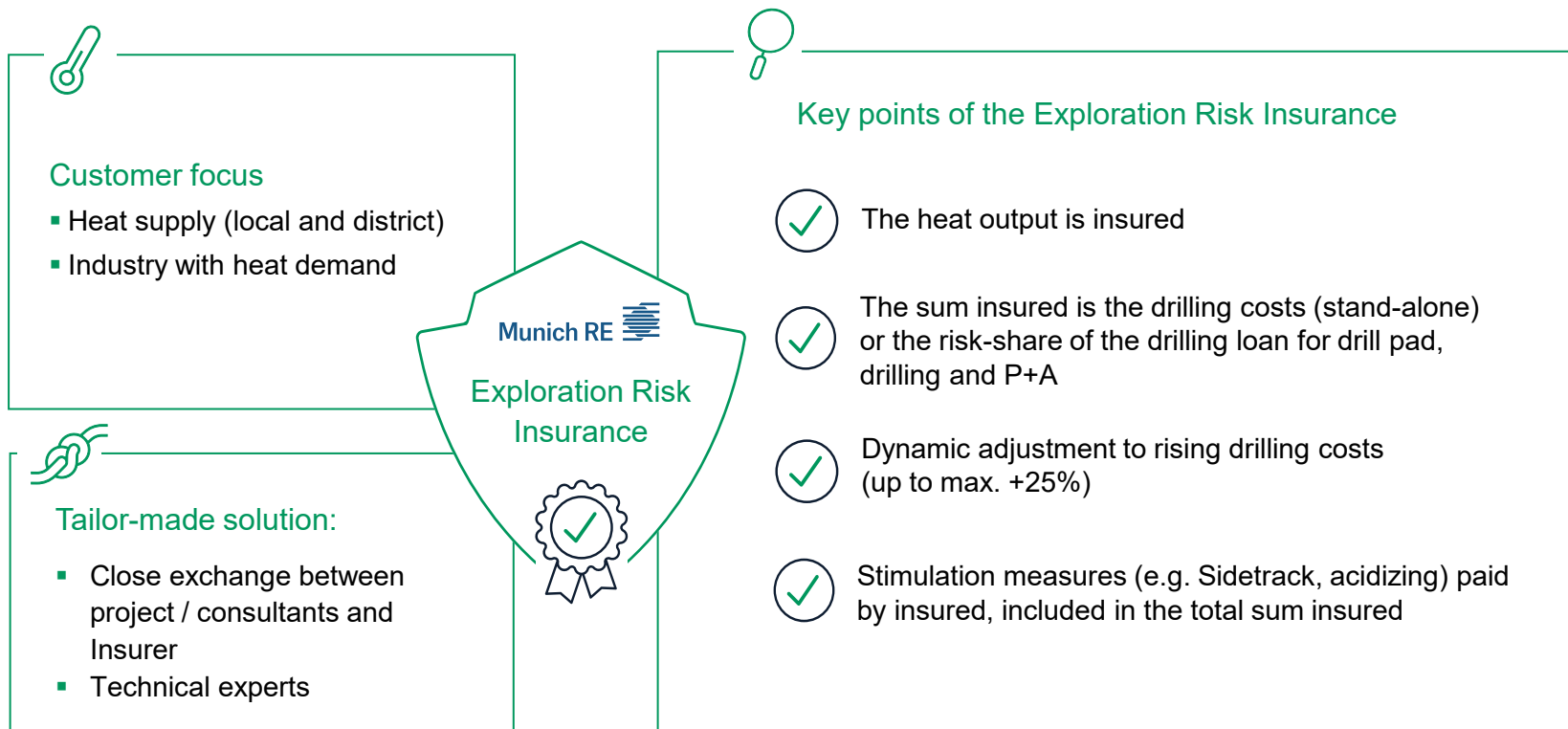


...of **45 Geothermal projects**
in Germany since 1999, realized so far...

- ...without loss (success 1. attempt)
- ...partial loss (+ success after stimulation)
- ...total loss (even after stimulation)



Our **Exploration Risk Insurance** for municipal heat supply and industry is a **tailor-made product**.



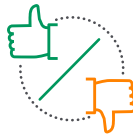
Risk-assessment, project acceptance and thus the **premium** are influenced by several factors.

Premium structure

Target Premium rates

6 - 15%

of the sum insured



Influencing factors

Location

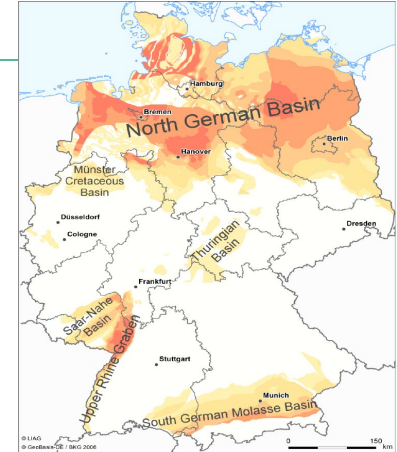
- Molasse
- Upper Rhein Graben
- Northern German Basin
- others

Empirical values

- Exploration (e.g. seismic, other data)
- Other (successful) wells and projects nearby
- Previous wells in the same project
= Extension wells

Parameter

- Expected vs insured value / trigger
- Deductible



Only region for
(partly) commercial
ERI so far:
**Central Bavarian
Molasse**

KfW-Förderkredit Geothermie 572: Public Private Partnership (PPP) and part of The Germany Fund “Deutschlandfonds”



Bundesministerium
für Wirtschaft
und Energie

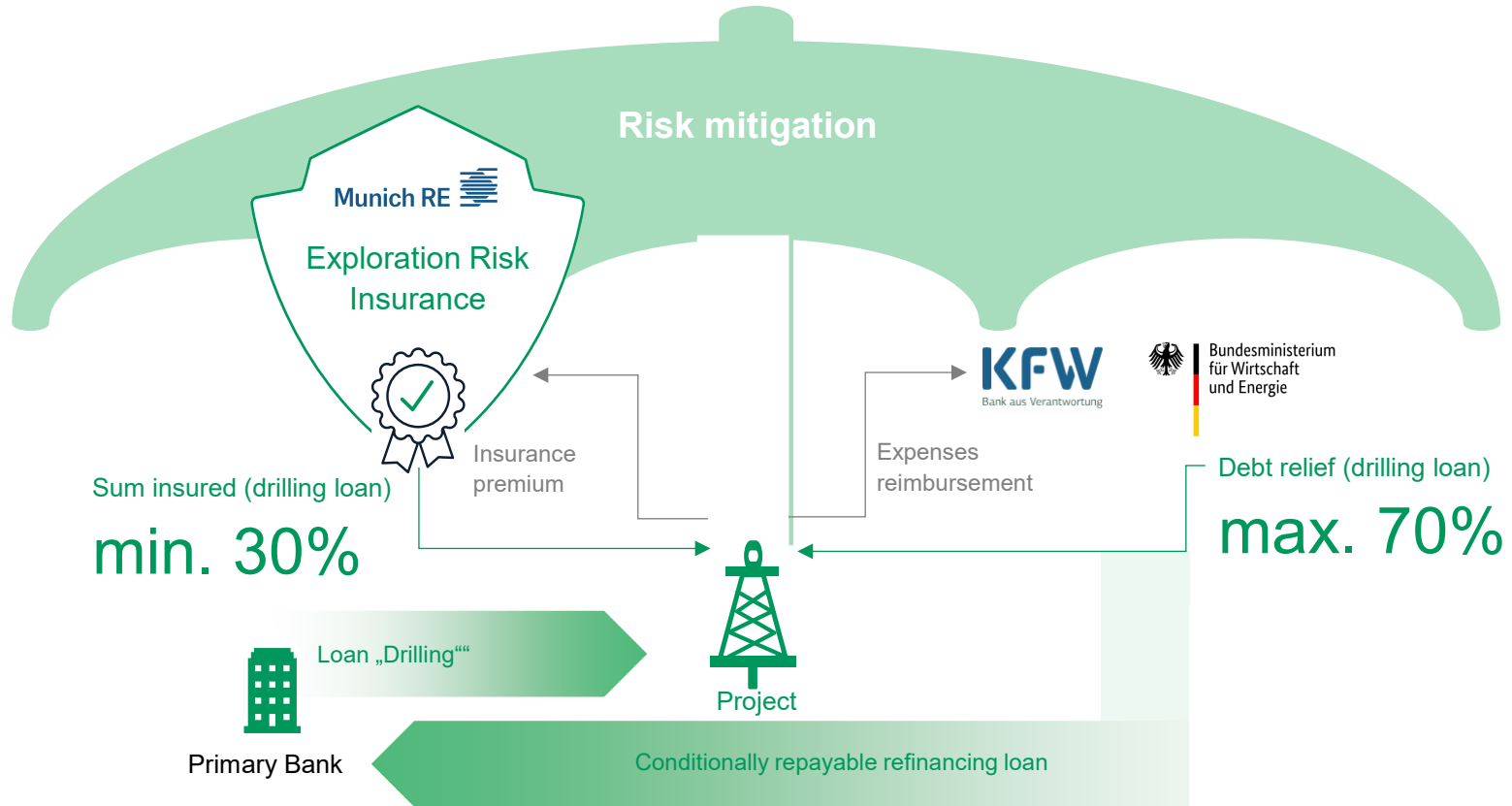
KfW

Bank aus Verantwortung

Munich RE 

Deutschlandfonds
GROW
WITH · GERMANY

The **Drilling Loan** is insured.
It can be **combined** with grants (e.g. BEW II)



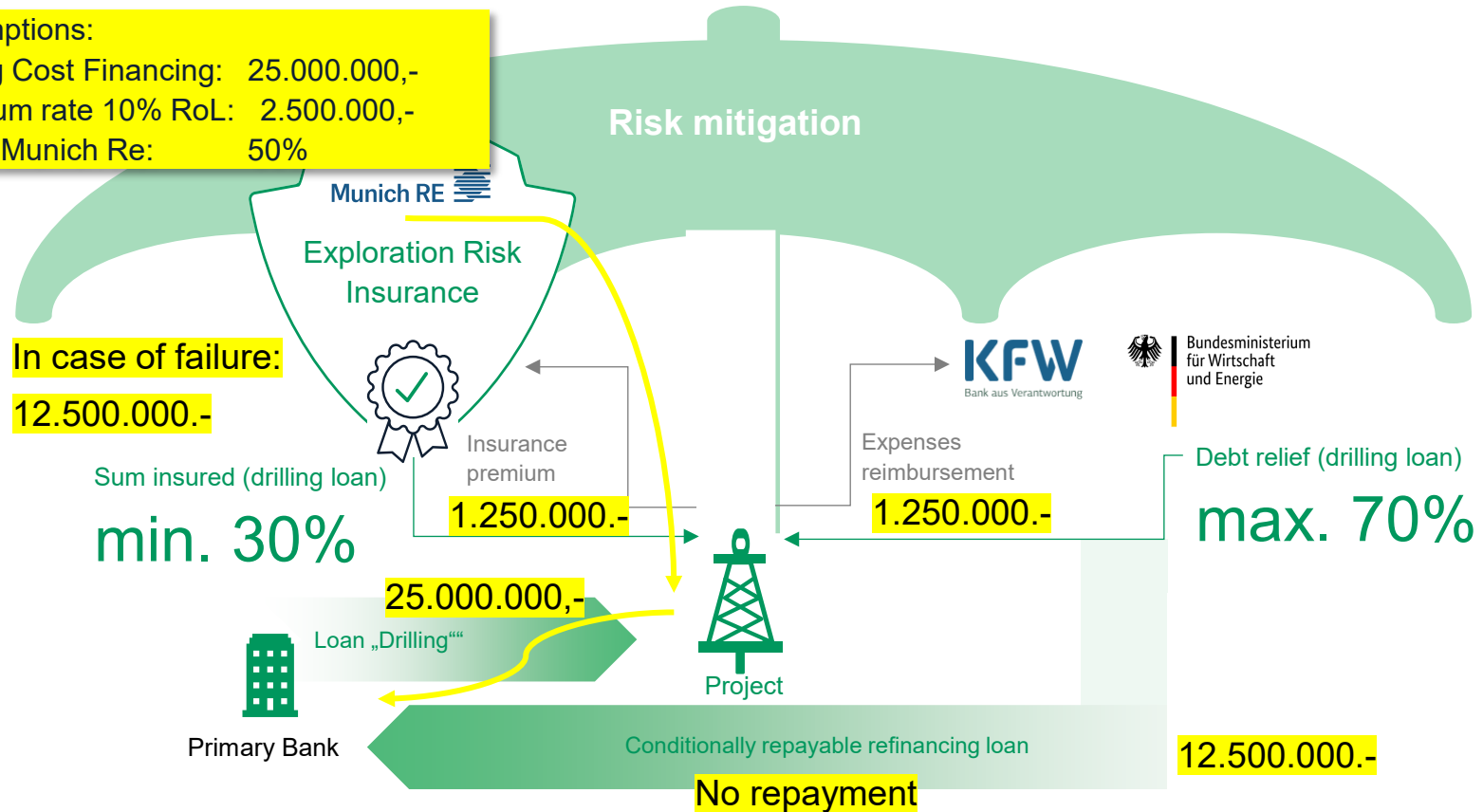
The Drilling Loan is insured.
Example: 25 Mio. Euro loan for drilling

Assumptions:

Drilling Cost Financing: 25.000.000,-

Premium rate 10% RoL: 2.500.000,-

Share Munich Re: 50%



Summary: PPP in Exploration Risk Insurance at a glance: The Drilling Loan



- ✓ **Inexpensive** compared to entirely state-run protection mechanisms
- ✓ “Pari-passu” principle: **no subsidy**, can be combined with additional subsidies
- ✓ Open for all types of geothermal application, as long as heating is primary focus, only precondition: underwriting **accessibility**
- ✓ Can be applied easily to **further countries** and/or regions - also without rather complicated banking structure
- ✓ Next country will follow shortly, with simplified structure: just providing a **governmental guarantee** for the drilling costs

Thank you very much for
your attention!

See more at:



Munich RE 



ERDWERK

starts grounded. delivers beyond.



Geothermal energy in Munich

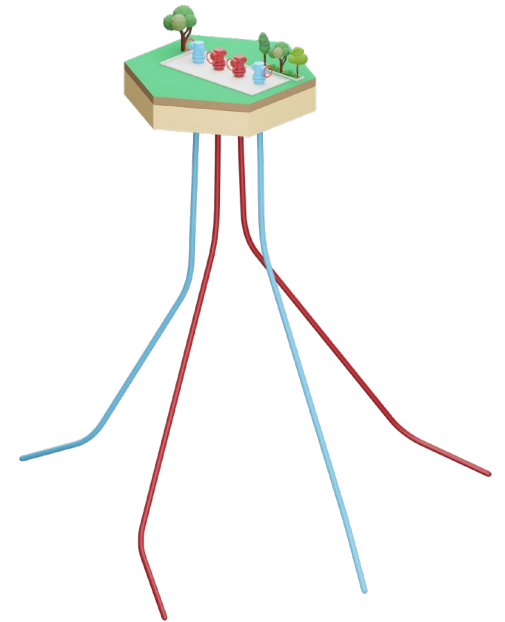
Challenges and opportunities

Neil Farquharson

Senior Geothermal Engineer & CEO
ERDWERK GmbH

Presentation Contents

- ❖ Introduction
- ❖ Geothermal Development in (and around) Munich
- ❖ What is driving the projects?
- ❖ GIGA-M
- ❖ Challenges
- ❖ Can the UK take inspiration?
- ❖ Project Case Studies



Neil Farquharson

- Senior Geothermal Engineer & CEO
- BEng Engineering Geology (Portsmouth)
- MRes Engineering for Climate Change (Southampton)
- Construction, Mining, Infrastructure & Energy
- UK, Australia, Switzerland, Germany, Belgium, EU ...



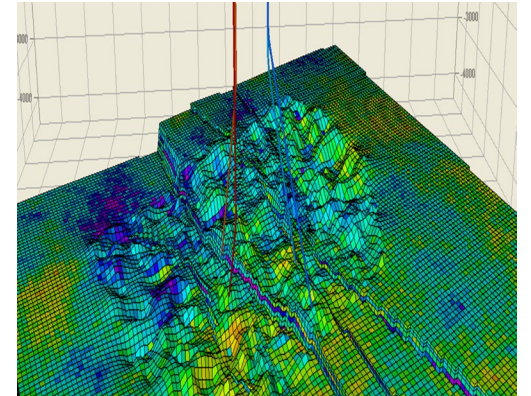
Project
Management

Geology &
Geophysics

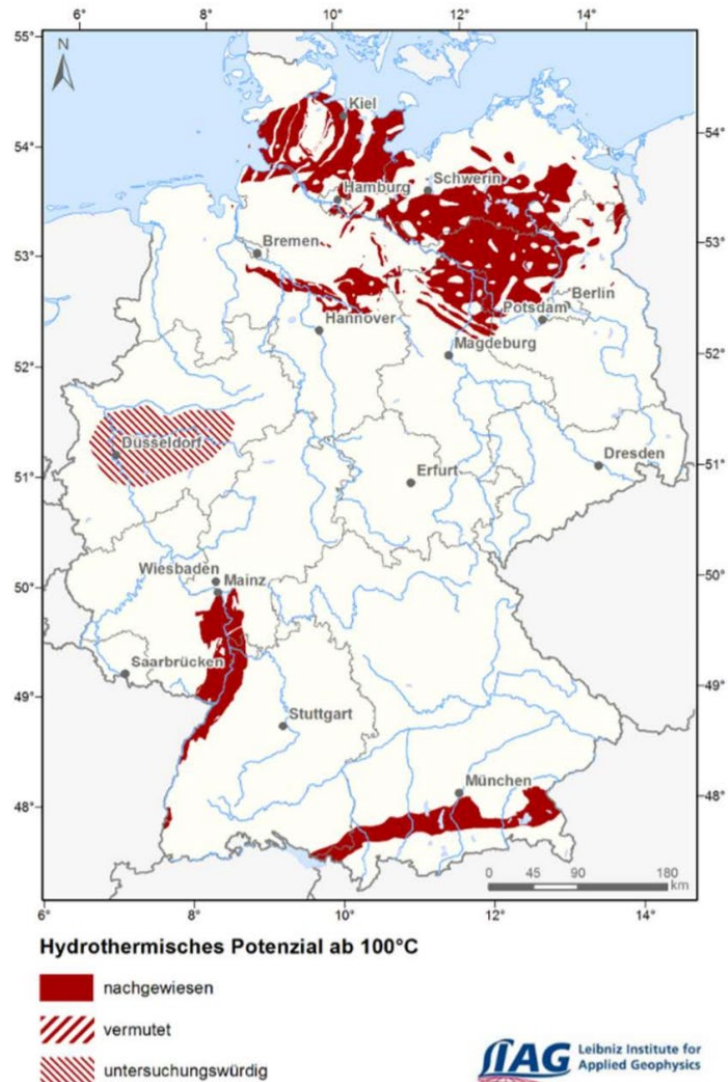
Reservoir
Engineering

Drilling
Engineering

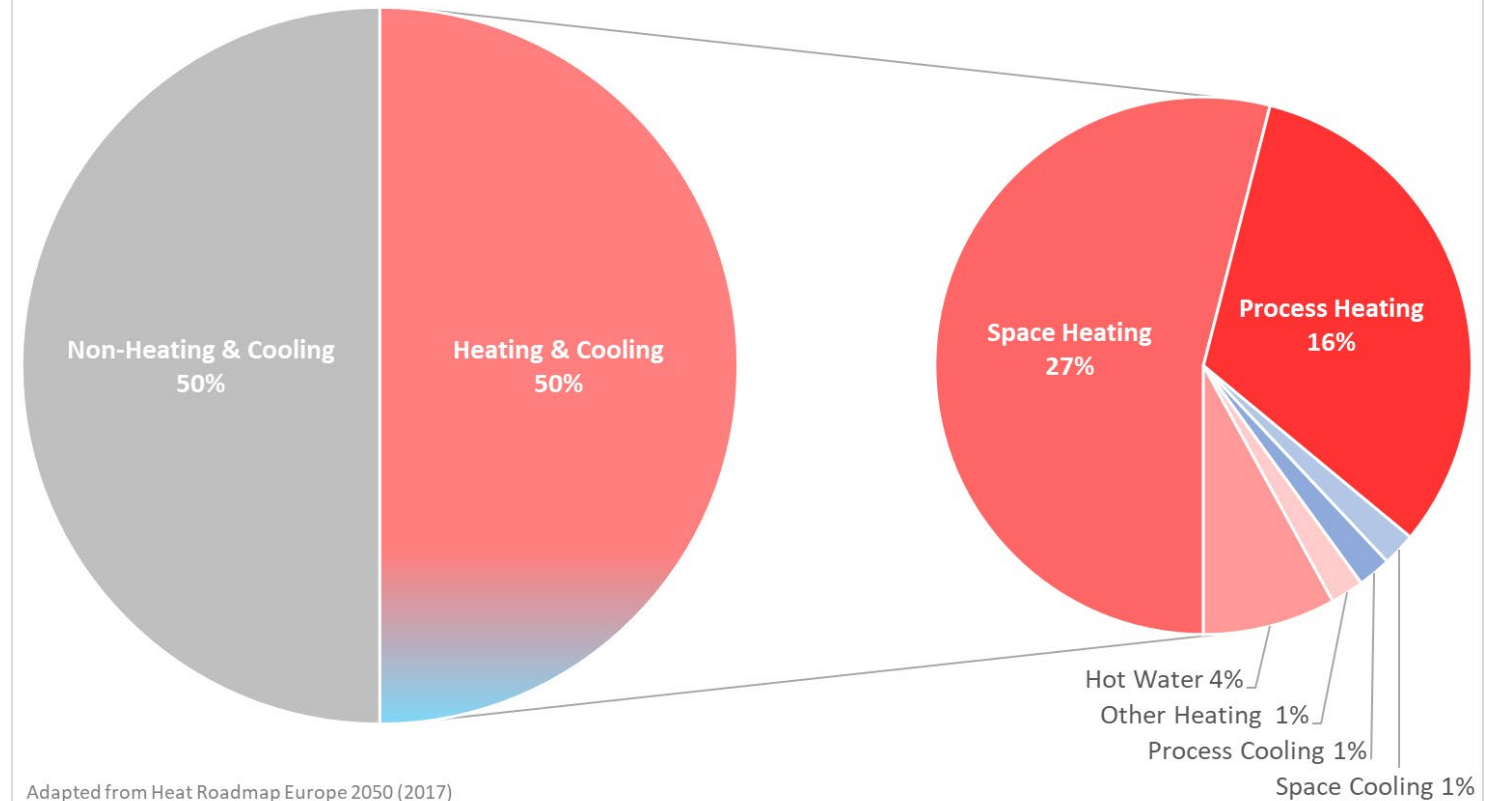
Production
Engineering



Geothermal Development in Germany – Brief Overview



EU28 Energy Demand(2015)
(Household and Industry)



Nutzung der Tiefen Geothermie in Deutschland

(Stand Februar 2026)

Anzahl der Anlagen in Betrieb*: 45 (Strom oder Wärme)

in Betrieb mit Wärmebereitstellung: 43

- davon Anlagen mit ausschließlicher Wärmeerzeugung: 33
- ⚡ davon Anlagen mit kombinierter Bereitstellung von Strom und Wärme: 10

in Betrieb mit Stromerzeugung: 12

- ⚡ davon Anlagen mit ausschließlicher Stromerzeugung: 2
- ⚡ davon Anlagen mit kombinierter Bereitstellung von Strom und Wärme: 10

- installierte Wärmeleistung: 442 MW
- installierte elektrische Leistung: 47 MW
- Bruttostromerzeugung 2024: 216 GWh

Anzahl der Anlagen in Bau*: 18

- in Bau
- ⚡ in Bau mit Stromerzeugung

Anzahl der Anlagen in Planung*: 178

- in Planung (Strom und/oder Wärme)
- * ohne Thermalbäder

Forschungsanlagen: 9

- Forschung

Thermalbäder: 179

- 🔥 Thermalbad / Balneologie
- 🔥 Anzahl Thermalbäder / Balneologie



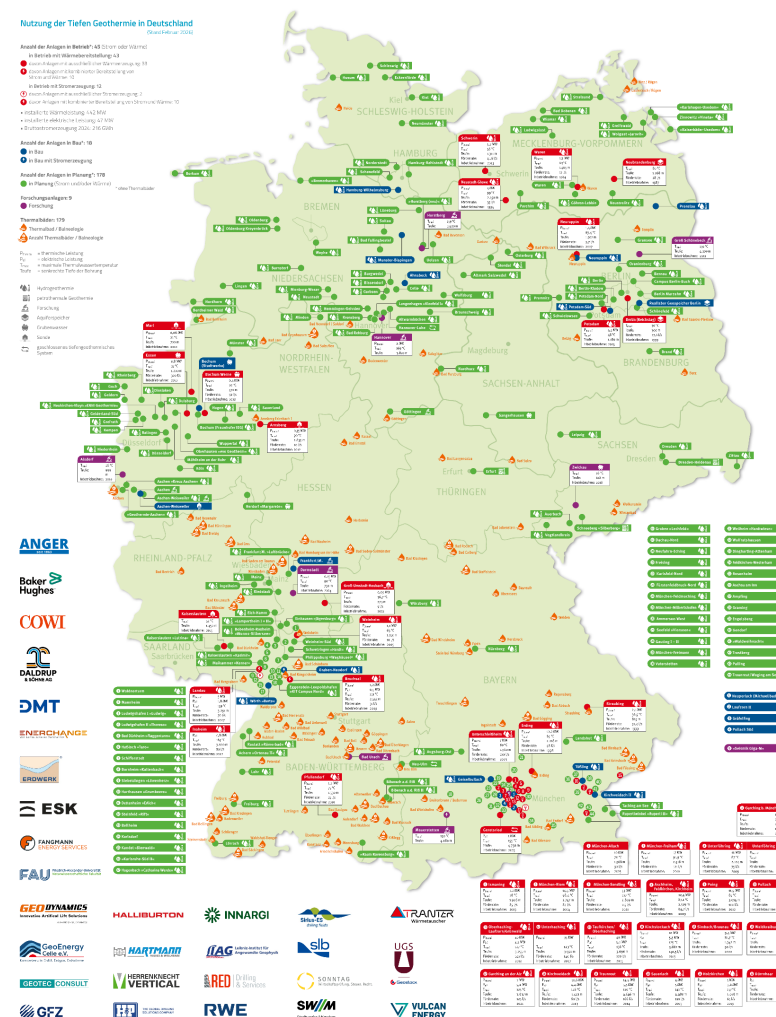
Nutzung der Tiefen Geothermie in Deutschland

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Anzahl der Anlagen in Planung* 178
● in Planung (Strom und/oder Wärme)
Forschungsanlagen: 9
● Forschung
Thermalbäder: 179
🔥 Thermalbad / Balneologie
🔥 Anzahl Thermalbäder / Balneologie

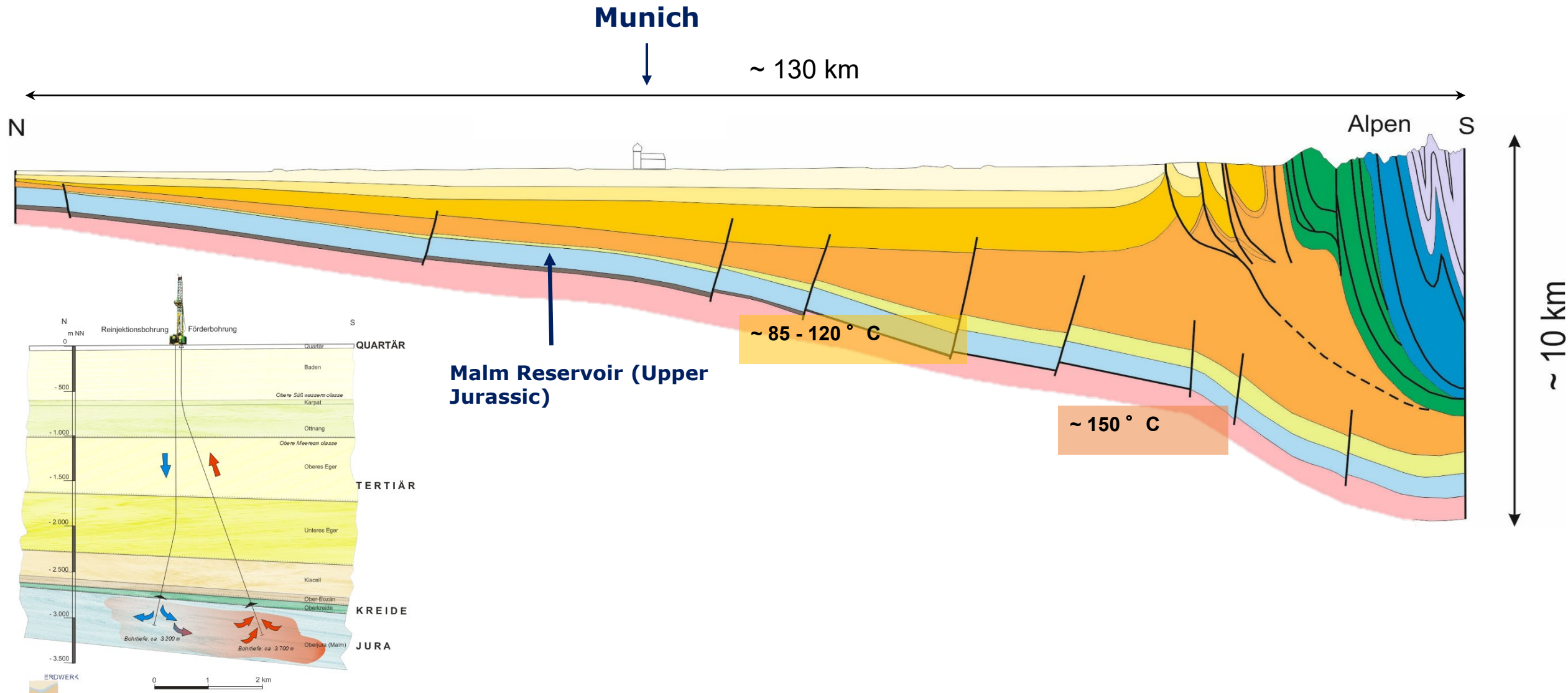
Tiefe Geothermie in Deutschland 2026



Quelle: Bundesverband Geothermie (BVG) / Erdwerk
Stand: Februar 2026
© 2026 Erdwerk GmbH



Geothermal Development in Munich – Brief Overview



Geothermal Development in Munich – Brief Overview (cont.)

Geothermal Concession Fields

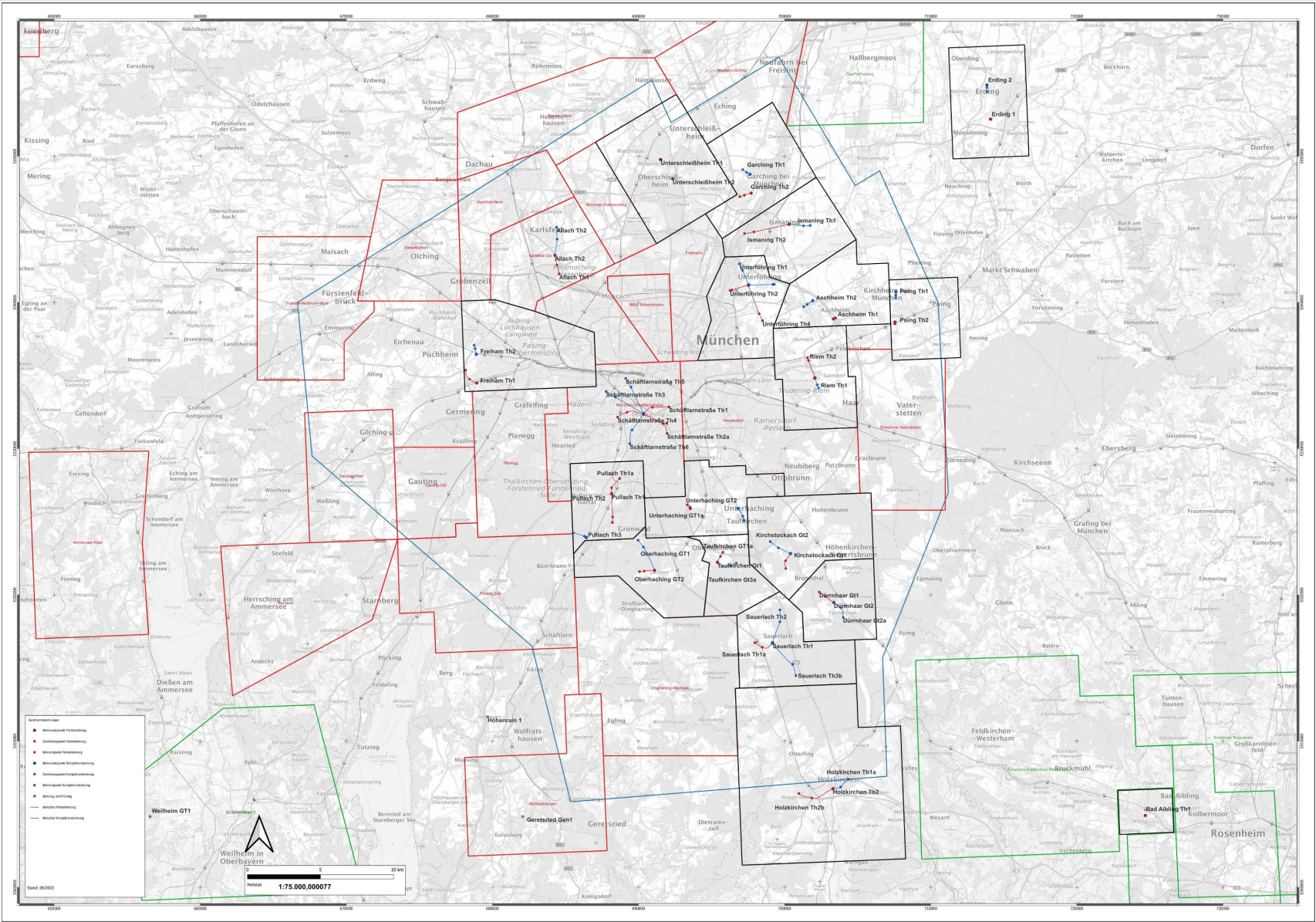
- Production Permit
- Exploration Permit
- Large-Scale Permit

Geothermal Wells

- Production Well
- Injection Well

Development of the Concessions Fields in Bavaria

Year	Concessions
2002	4
2004	>40
2013	>80
heute	ca. 50



North to South

- Reservoir Depth Increase
- Temperature Increases
- Productivity Decreases

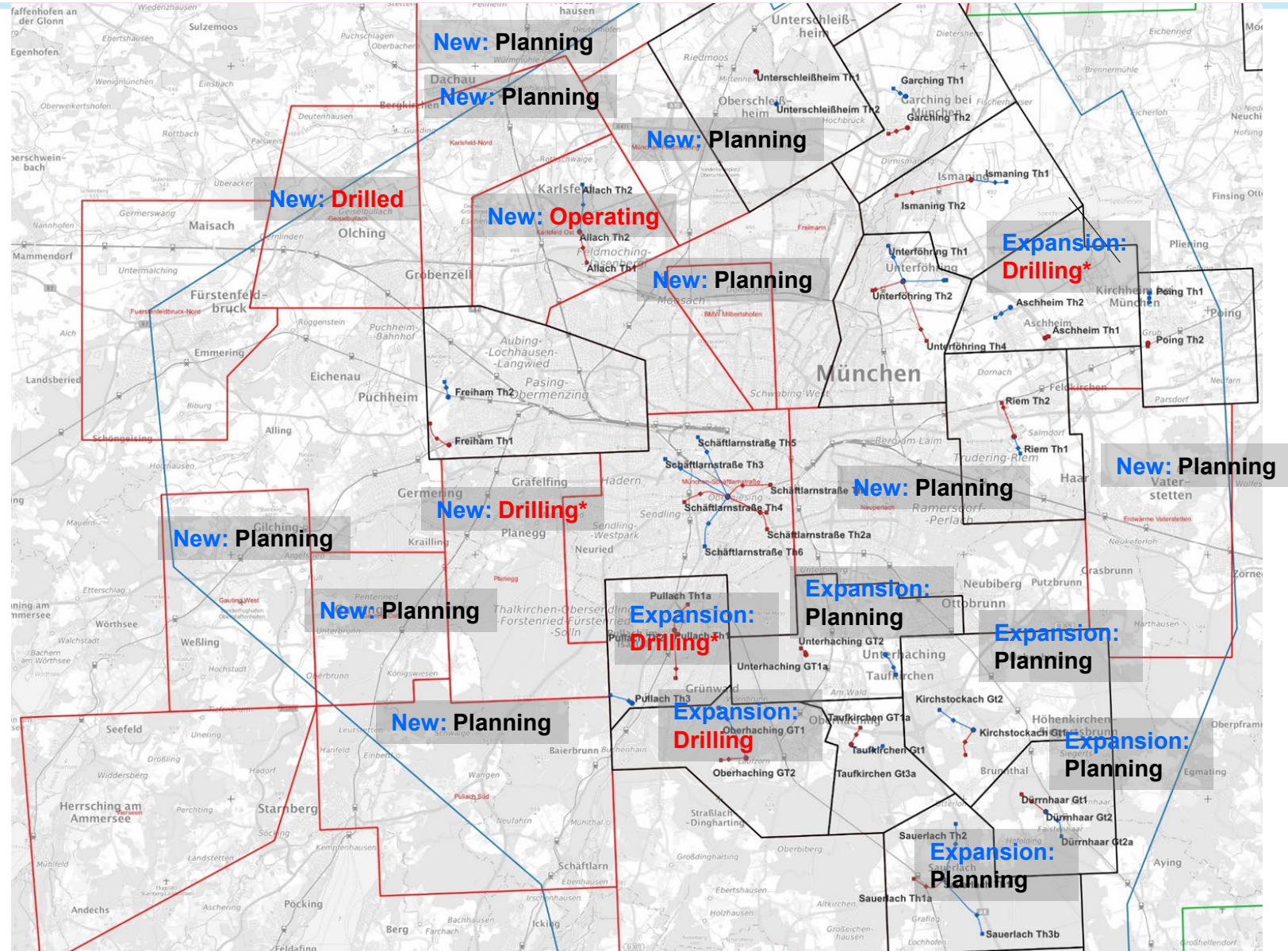
Geothermal Development in Munich – Brief Overview (cont.)

Geothermal Concession Fields

- Production Permit
- Exploration Permit
- Large-Scale Permit
-

Geothermal Wells

- ◆ Production Well
- ◆ Injection Well



What is driving the new wave of projects (and Wells)?

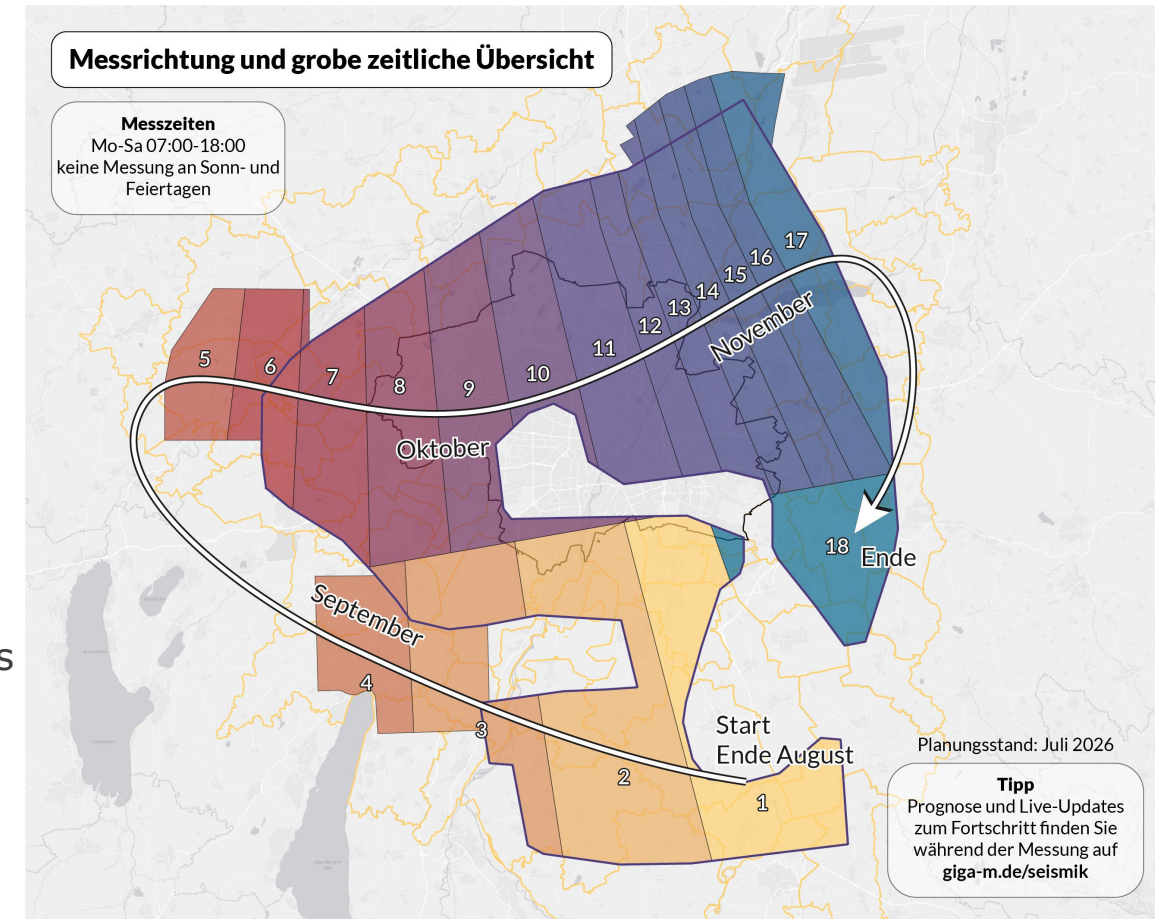
Upscaling	Political Framework	Economic Viability
Regional Exploration, e.g. GIGA-M	National "Federal/Private" exploration insurance	District heating market ready for geothermal (plug and play)
Multiple geothermal doublets	Regional exploration programs	Competitive pricing
Projects start small but allow for expansion	Federal funding for efficient heating networks (BEW)	Rising gas prices

Region-wide analysis of deep geothermal potential, Greater Munich

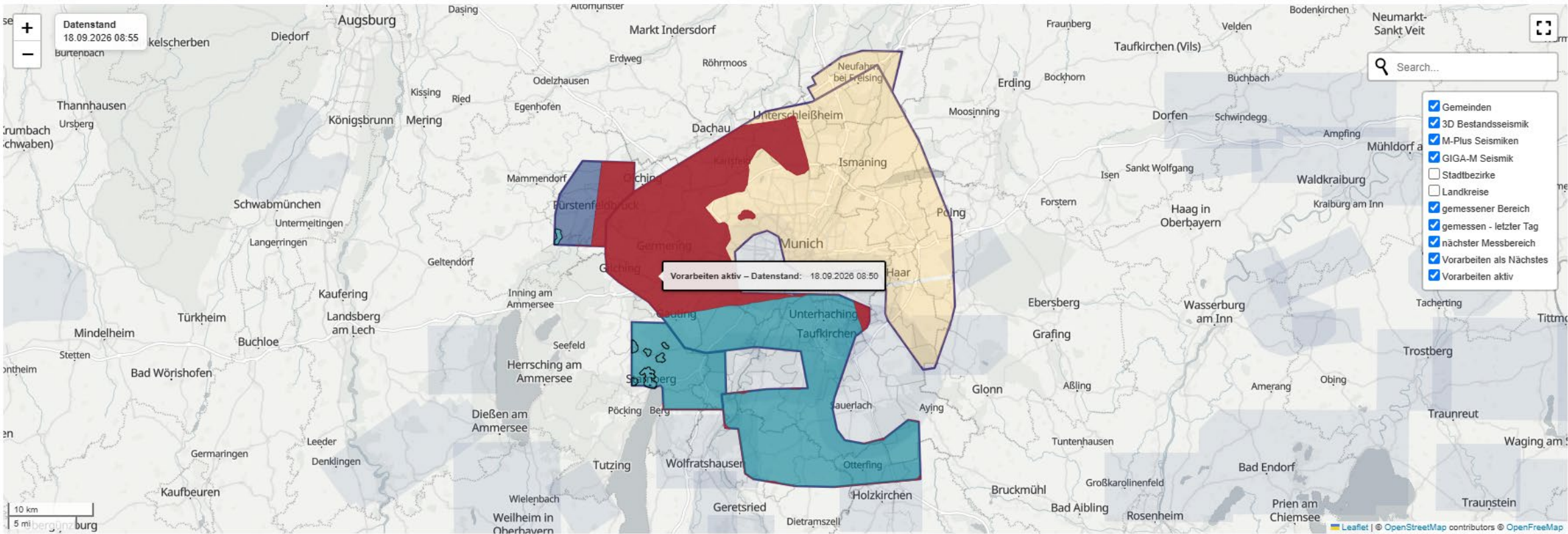
"Making deep geothermal accessible to everyone."

- **Inter-municipal collaboration** — shared framework for siting, economics, law and communication
- **Subsurface exploration** — region-wide seismic survey builds a full 3D model, released free of charge as a common planning basis
- **Extended-reach drilling** — longer horizontal wells access more of the reservoir from a single site
- **Reservoir management** — models how neighbouring plants interact, enabling efficient siting and optimisation

Transferable to other geothermal regions — results shared with all municipalities and authorities.



<https://giga-m.de/>





Exploration risk

Regions with higher exploration risk



Heat offtake

Heat offtake is not always straightforward



Competing heat sources

Some other resources can be too competitive (biomass and waste incinerators)



Local opposition

Some regional opposition

Can the UK take inspiration?

1

National subsidies: making geothermal energy competitive

2

Go after the low-hanging fruit: start smaller and simpler, then upscale

3

Open data availability

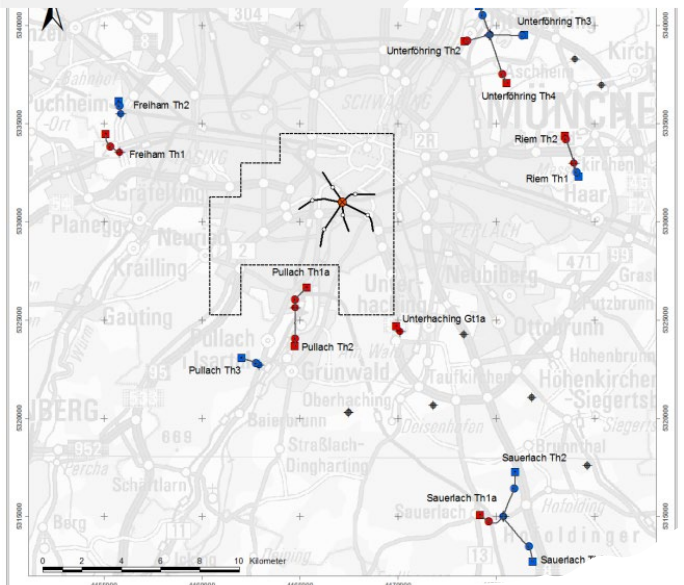
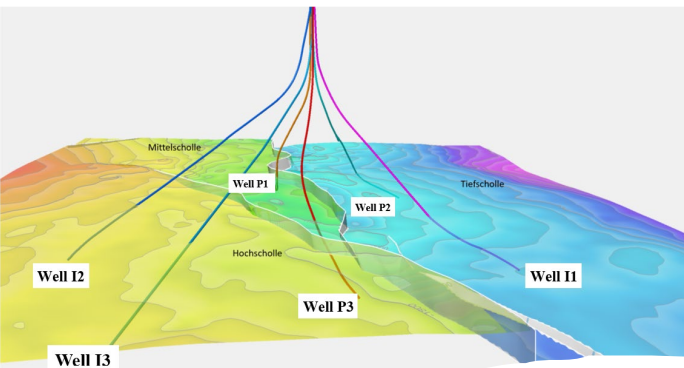
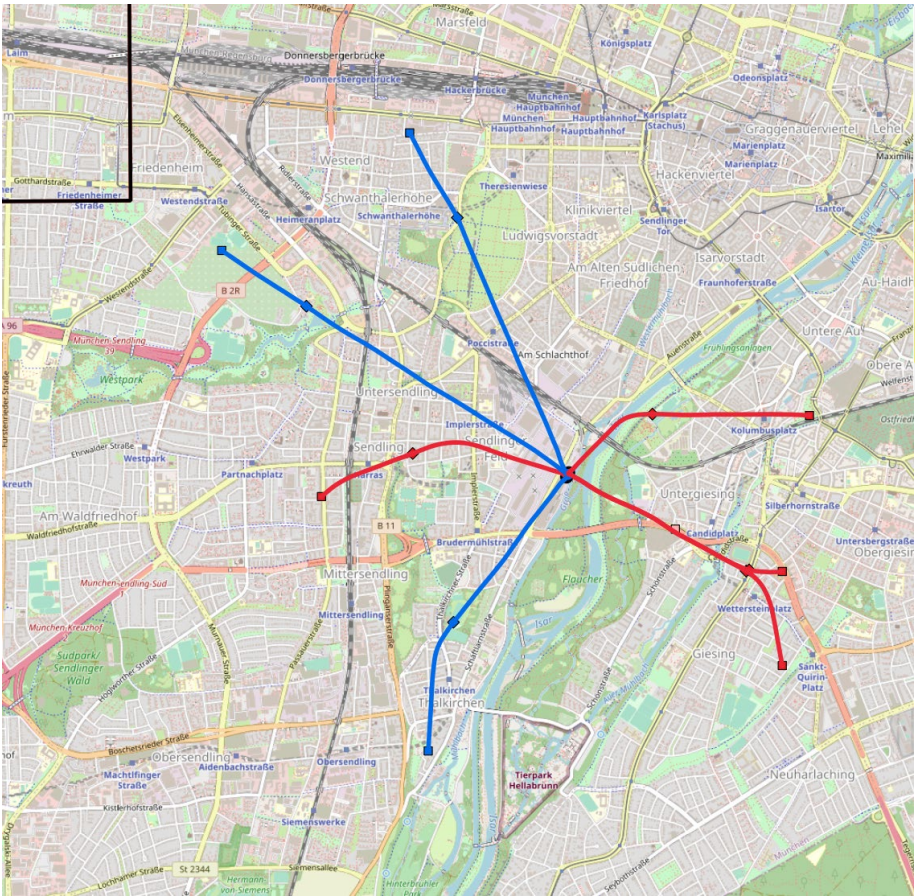
4

Standardised risk and exploration insurance

5

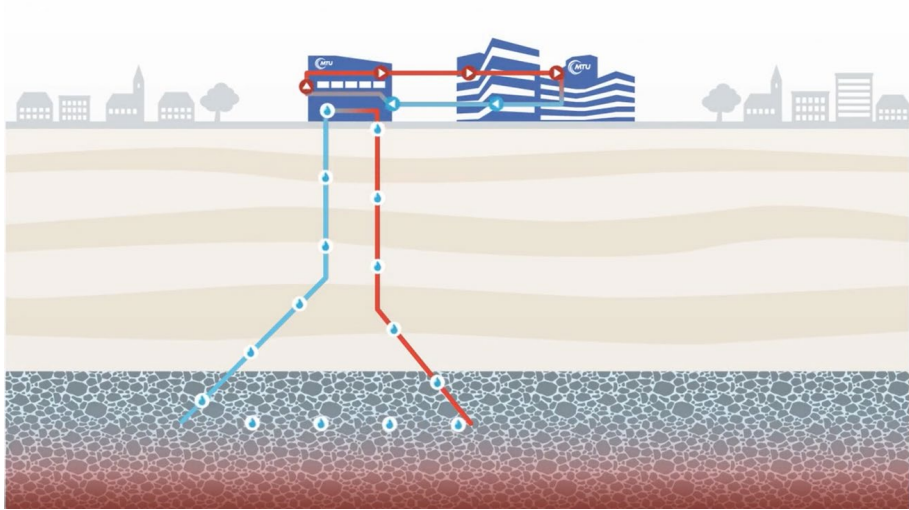
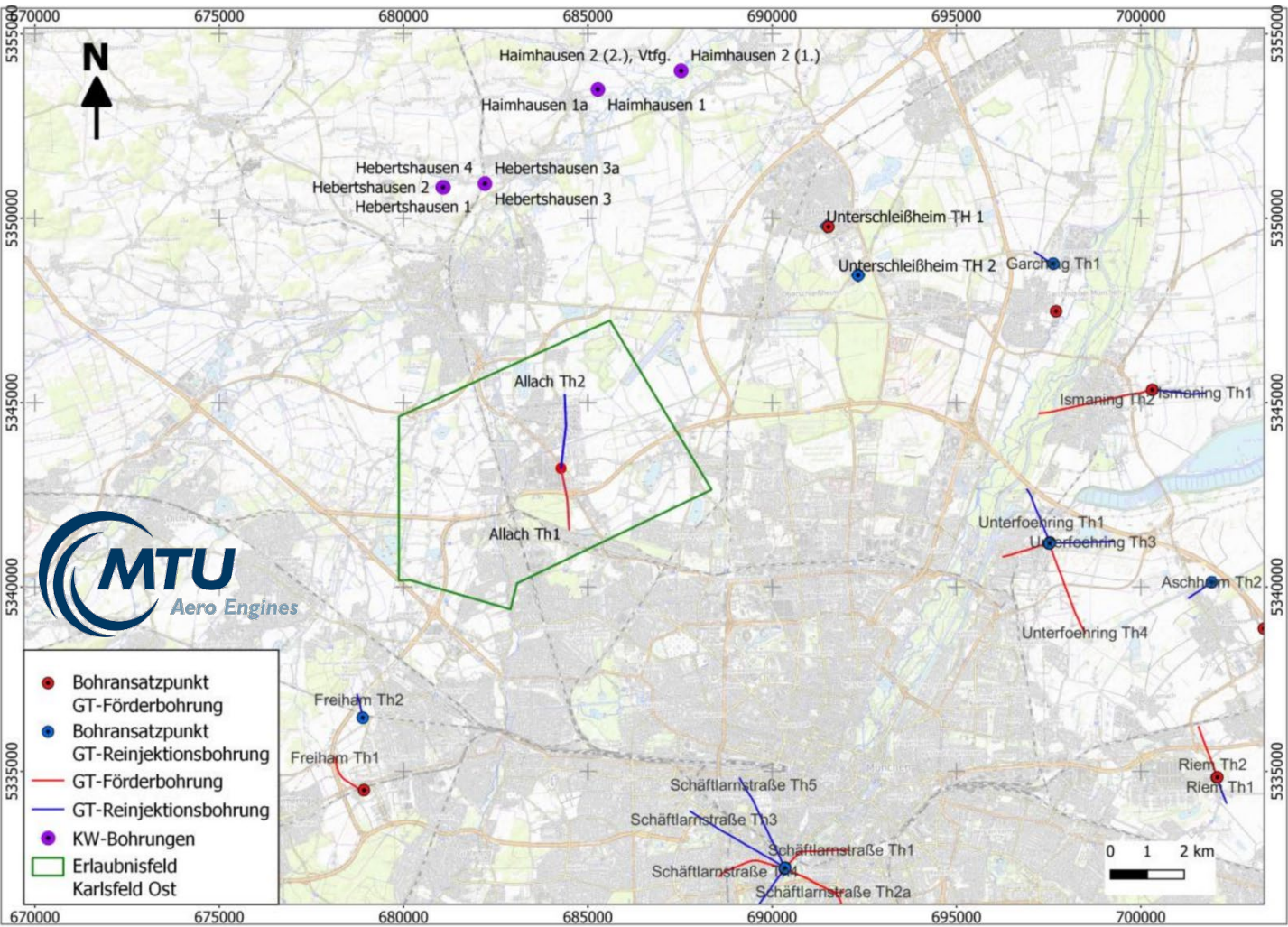
Centralised knowledge and market coordination

Project Case Study: Schäftlarnstraße, Munich



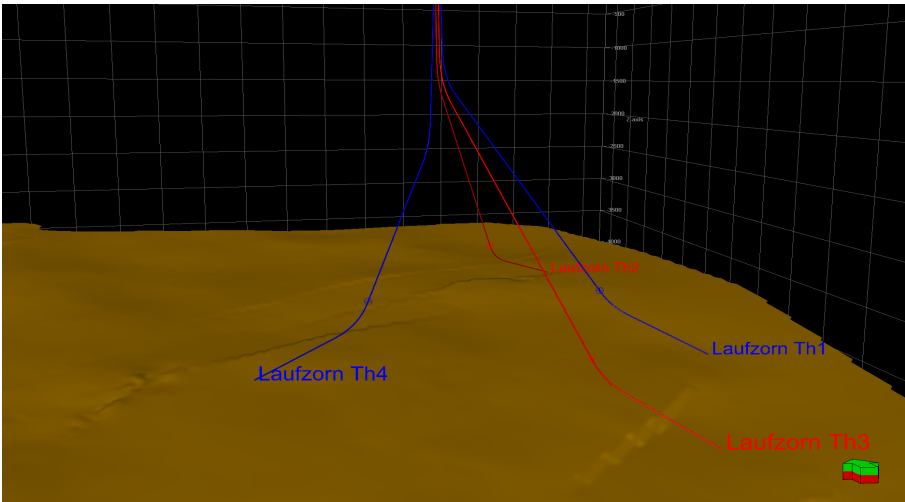
Location:	München-Sendling
Number of Wells	3 x Production Wells, 3 x Injection Wells
Depth (TVD):	3150 m
Temperature:	100 ° C
Production Rate:	100 l/s





Location:	München-Allach
Number of Wells	1 x Production Well, 1 x Injection Well
Depth (TVD):	2200 m
Temperature (expected):	70–75 ° C
Production Rate (expected):	>100 l/s

Project Case Study: Laufzorn II, Oberhaching near Munich



Project Location:	Munich-Oberhaching
Number of Wells:	2 (3) x Production Wells, 2 (3) x Injection Wells
Depth (TVD):	4022 m
Temperature (expected):	125–136 ° C (forecast)
Flow Rate (expected):	75 l/s (forecast)



Q&A

