Geothermal Research in Austria

“Regional geoscientific database for deep geothermal use”

Goethemal spa-, heat supply and electric power generation at Blumau (Styria), © Rogner Thermen GmbH

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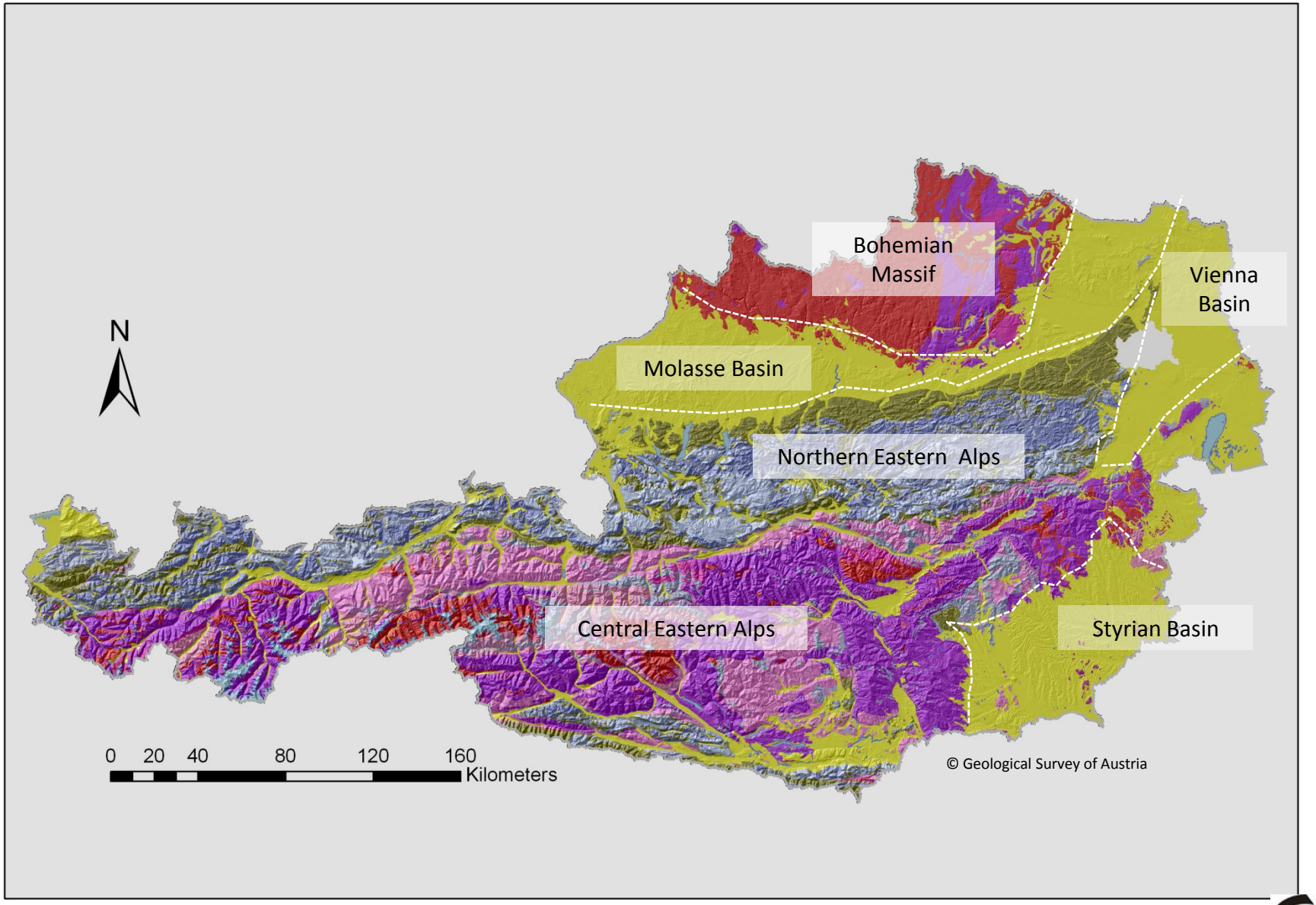
Outline of presentation

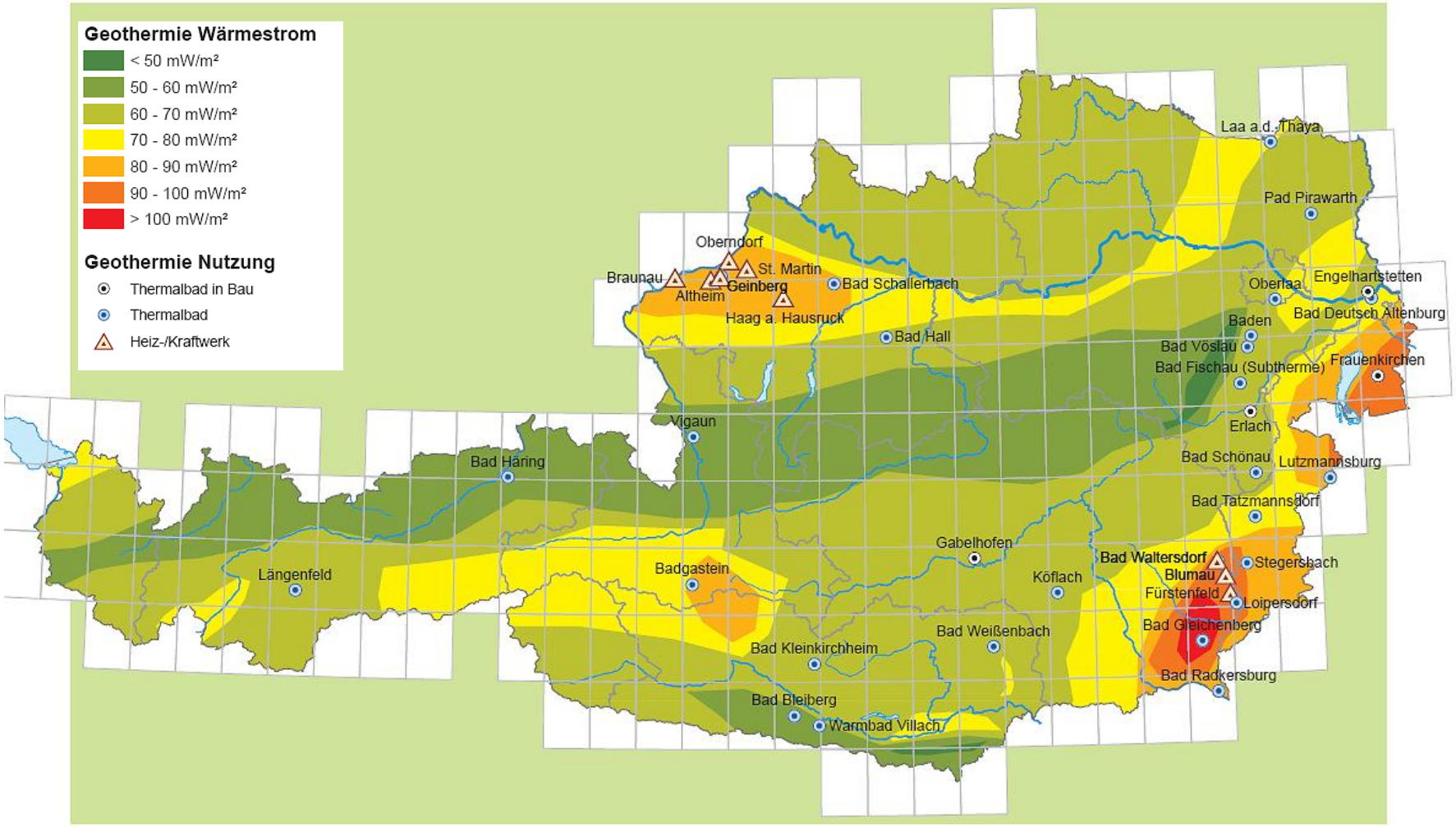
- Introduction
  - Geological and geothermal overview on Austria
  - Data background and state of knowledge until 2004
- Recent research Activities (overview)
  - National studies
  - Transnational studies
- Conclusions and outlook on further activities
  - Current state of knowledge
  - Future strategies

Geological overview



Geothermal overview

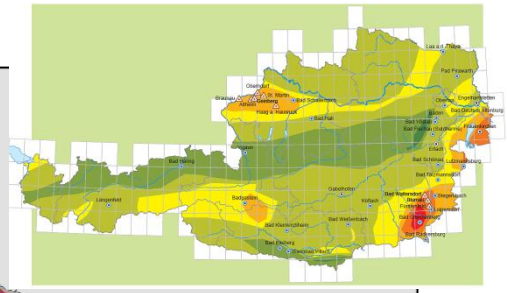
Average Surface Heat Flow Density ~ 70 mW/m², Range: 45 to 130 mW/m²

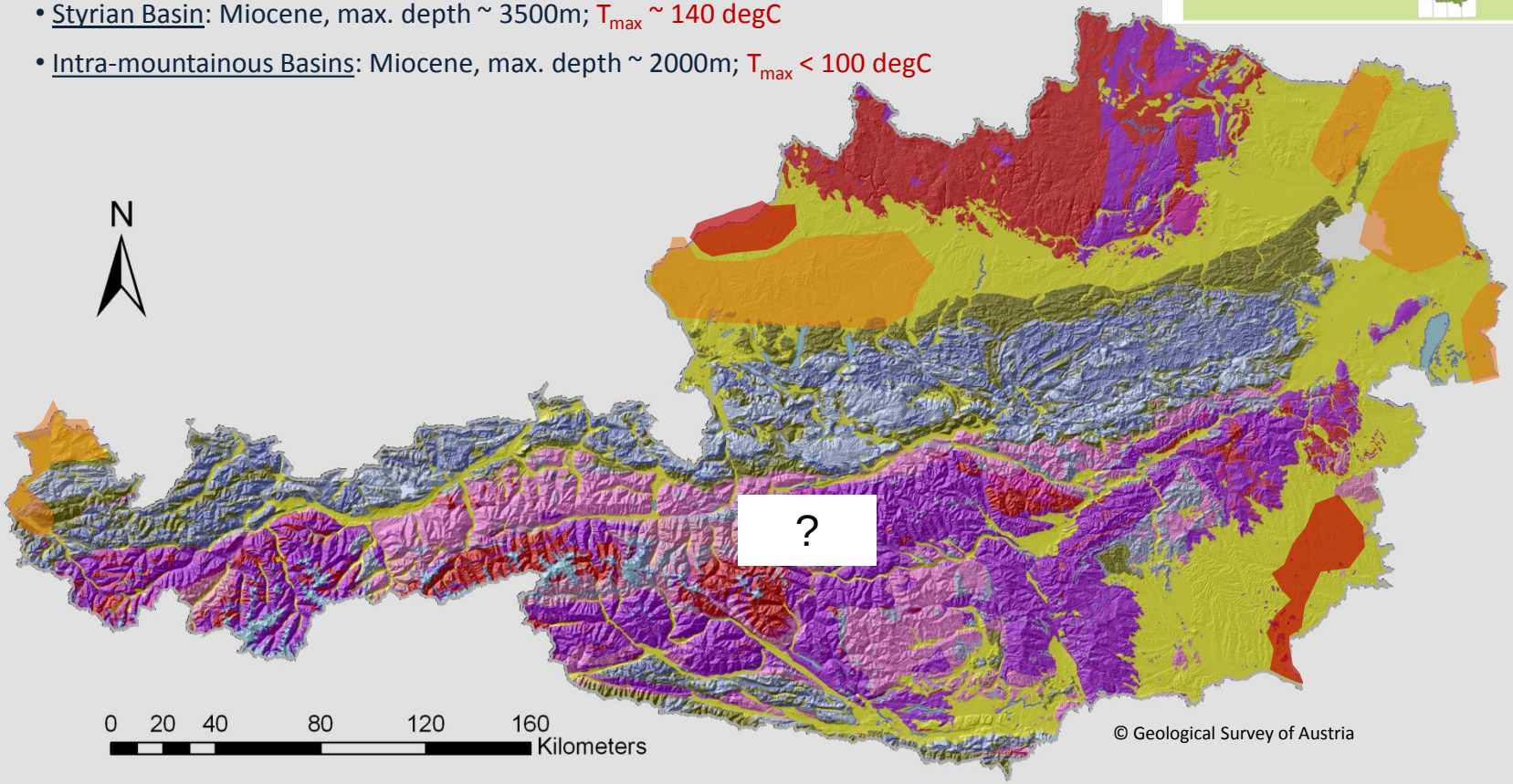


Overview on regions of interest

Basins

- Molasse Basin: Jurassic – Miocene; max. depth ~ 3000m; T_{max} ~ 120 degC
- Vienna Basin: Triassic - Miocene, max. depth ~ 7000m; T_{max} ~ 180 degC
- Styrian Basin: Miocene, max. depth ~ 3500m; T_{max} ~ 140 degC
- Intra-mountainous Basins: Miocene, max. depth ~ 2000m; T_{max} < 100 degC

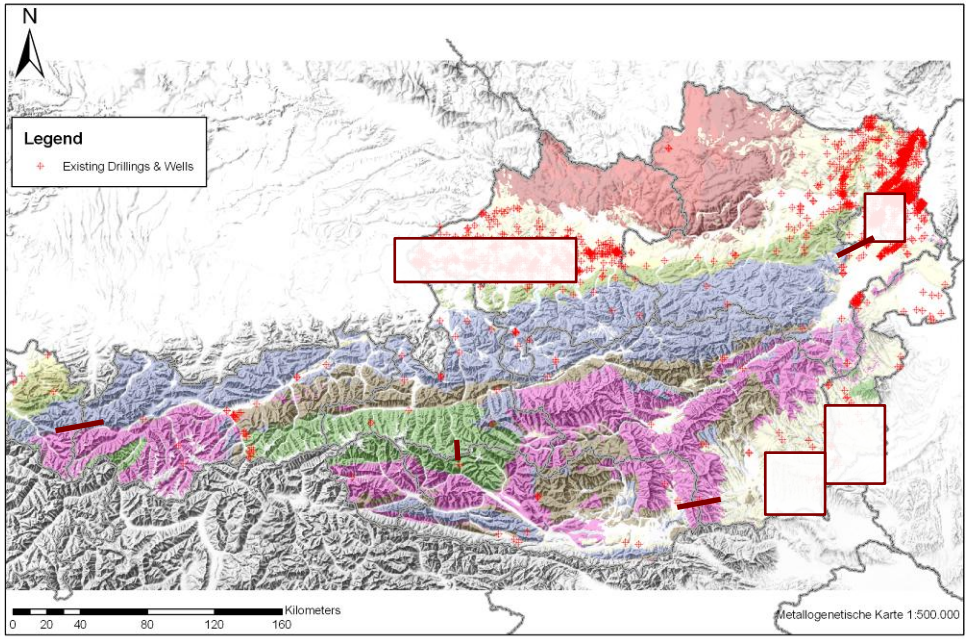




Data background and state of knowledge until 2004

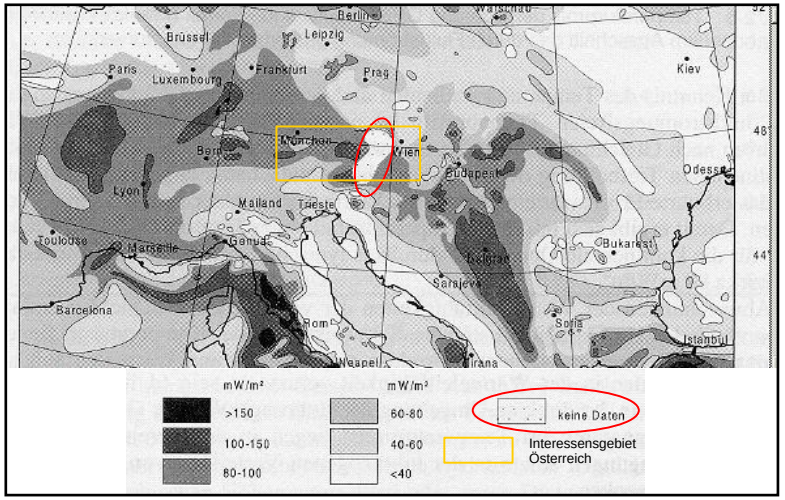
Data background: “Austria is rich in poorly documented wells”

- More than 3500 deep wells
- Restrictive data policy by data-owners
- No comprehensive collection of geothermal data (subsurface temperatures, reservoir parameters)



Geothermal maps and resource estimation

- Geothermal utilization of national interest since late 1970s.
- No supra-regional maps (temperature, HFD)
- Resource estimation was limited to local – regional scale qualitative studies.
- Geothermal utilization mostly based on abandoned hydrocarbon wells.



Source: Th. Kohl, 2002

National studies (abstract)

THERMALP

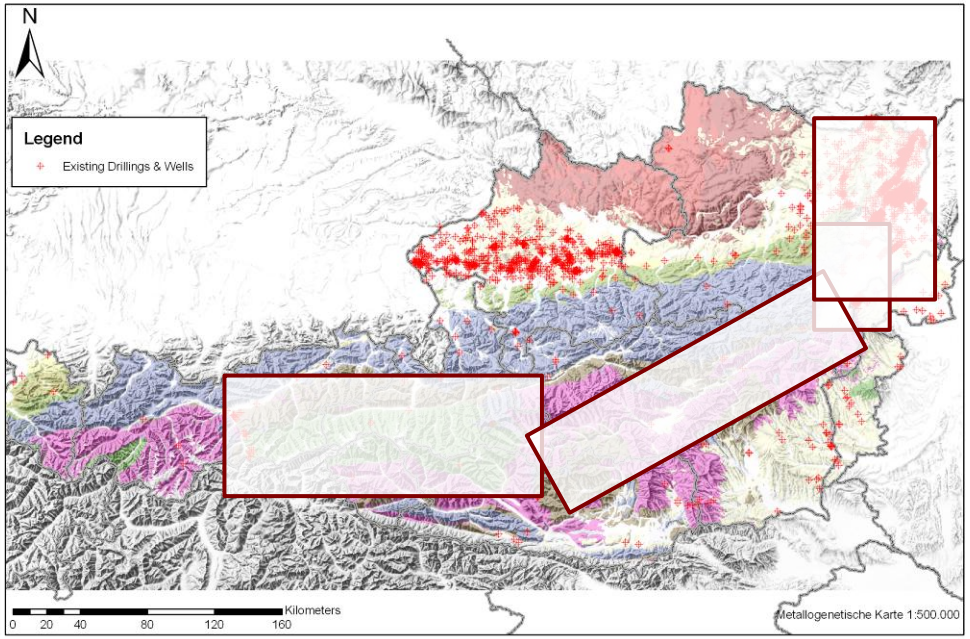
- Since 2004 (GBA)
- Supra-regional collection of geothermal data
- Geothermal model of southern Vienna Basin

THERMTEC

- Since 2008 (GBA)
- Focus on central Alpine region
- Geothermal model of Tauern Window

OMVTHERMAL

- 2008 - 2012 (GBA involvement)
- Re-use of abandoned wells and hydrogeothermal utilization
- Geothermal potential assessment

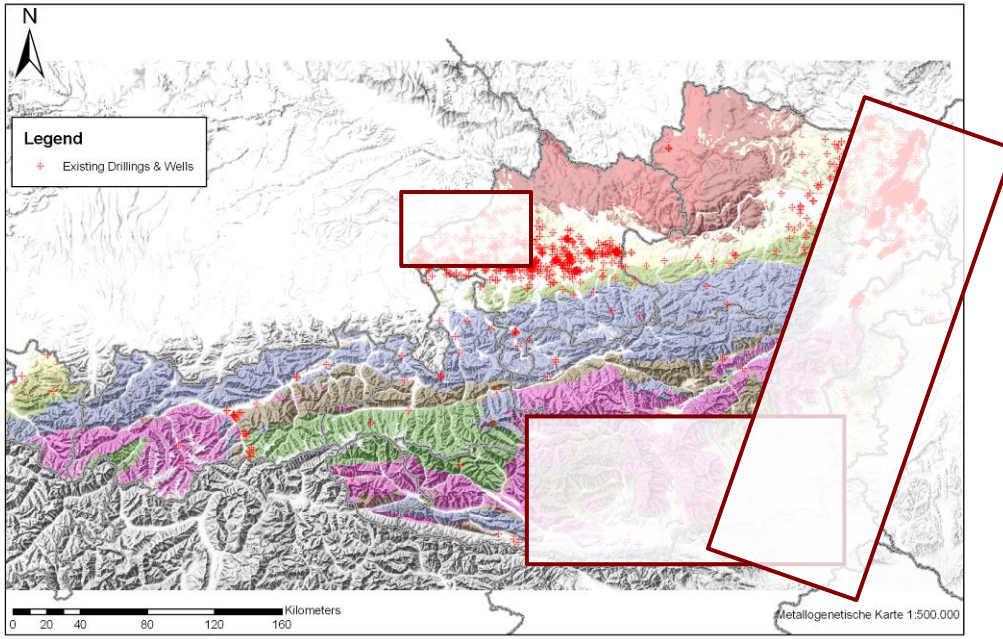


Closed-loop geothermal well „Prottes T11“ near Vienna (thermal capacity ~ 200 kW)
© OMV, 2009

Trans-national studies (abstract)

TRANSTHERMAL

- 2006 - 2008 (GBA, Geo-ZS, JR)
- AUT - SI
- Geothermal maps and qualitative resource assessment

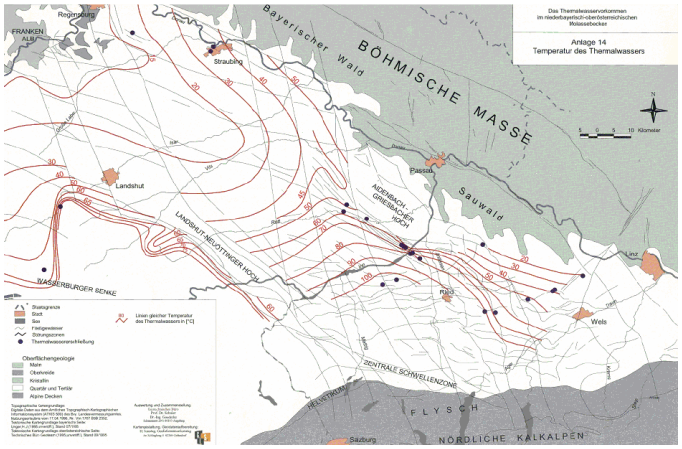


Transenergy

- Since 2010 (GBA, MAFI, GEO-ZS, SGUDS)
- AUT – SI – SK - HU
- Geothermal maps and qualitative resource assessment

Thermal- hydraulic modeling at Molasse basin

- 1996 – 2007
- AUT - GER
- First trans-boundary water management system in Austria
- Hydraulic and thermal 3D model



Actual state of knowledge in Austria

Maps and Models

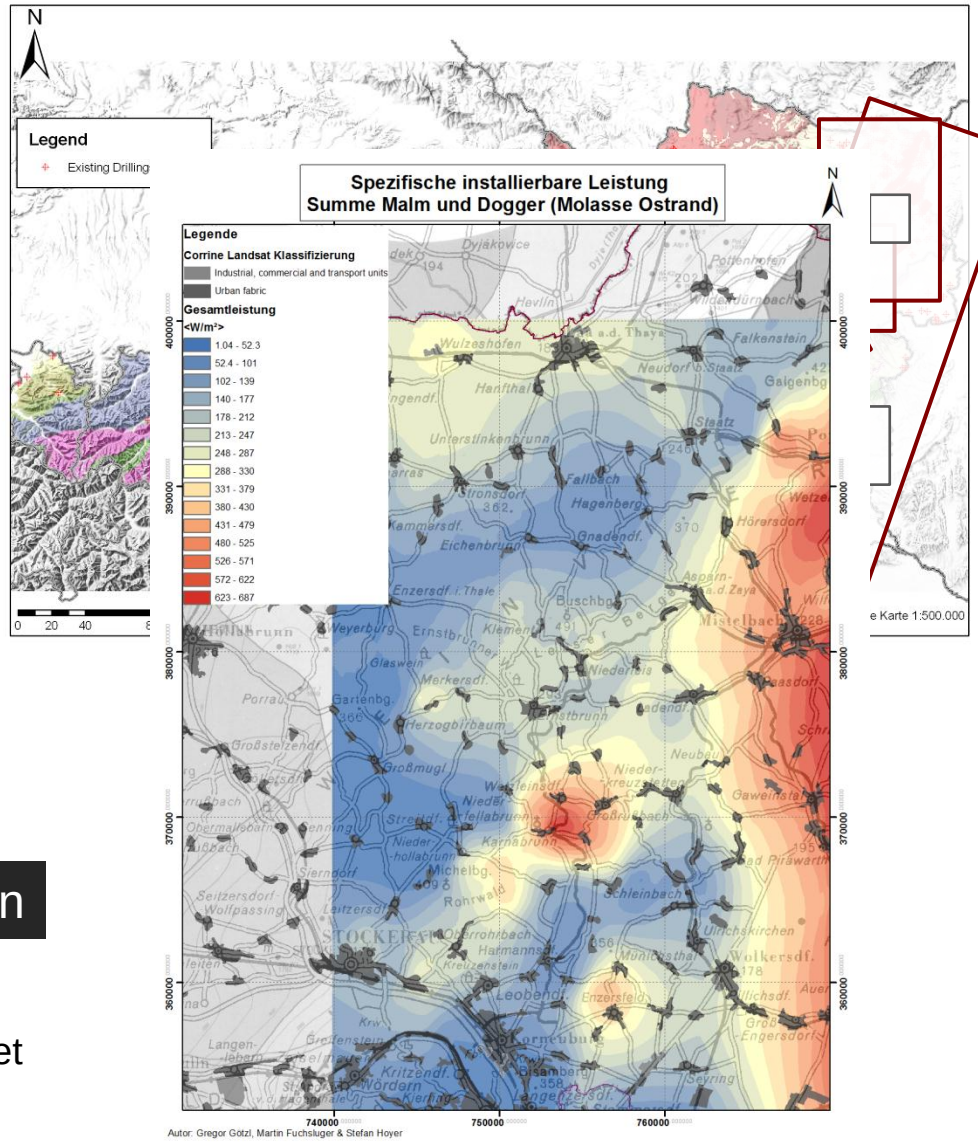
- Studies before 2004
- National studies since 2004
- Trans-national studies since 2004

Data assessment and databases

- Non-public data collection at GBA drawn from individual studies
- Petrophysical measurements since 2004
- Thermal data assessment from deep wells
- Thermal measurements in intra-mountainous regions since 2008

Resource assessment and dissemination

- Resource assessment (HIP) at Vienna Basin
- No national web-based map services installed yet
- TRANSENERGY will provide WMS for eastern part of Austria



Near future scientific strategy at GBA

Data assessment and databases

- Petrophysical measurements and databases
- Thermal processing of hydrocarbon wells
- Generalized public database including a metadata-catalogue

National covering geothermal maps

- All maps should base on 3D models (for adaptivity reasons)
- Starting at scale 1:1.000k, later 1:500k
- HFD, interpreted hydrogeological maps at depths of different isothermal surfaces
- Resource maps (HIP, regionalized heat recovery factor)
- Dissemination via free accessible WMS governed by GBA

Barriers

➢ Geothermal energy is still not seen as a federal energy resource from legal point of view

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