Geothermal resources in Poland

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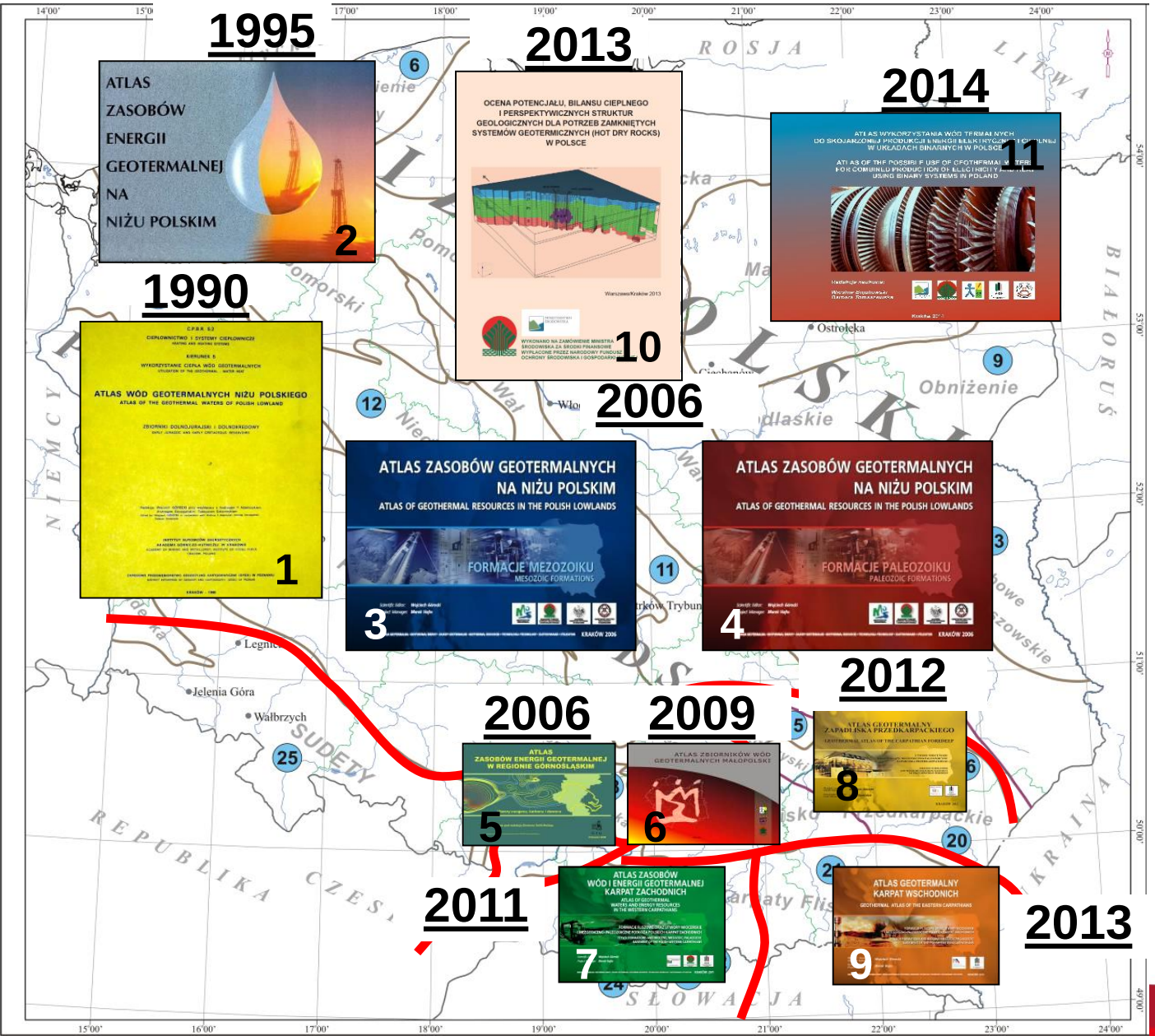
Polish Geothermal Society

Good regional geothermal recognition of Poland

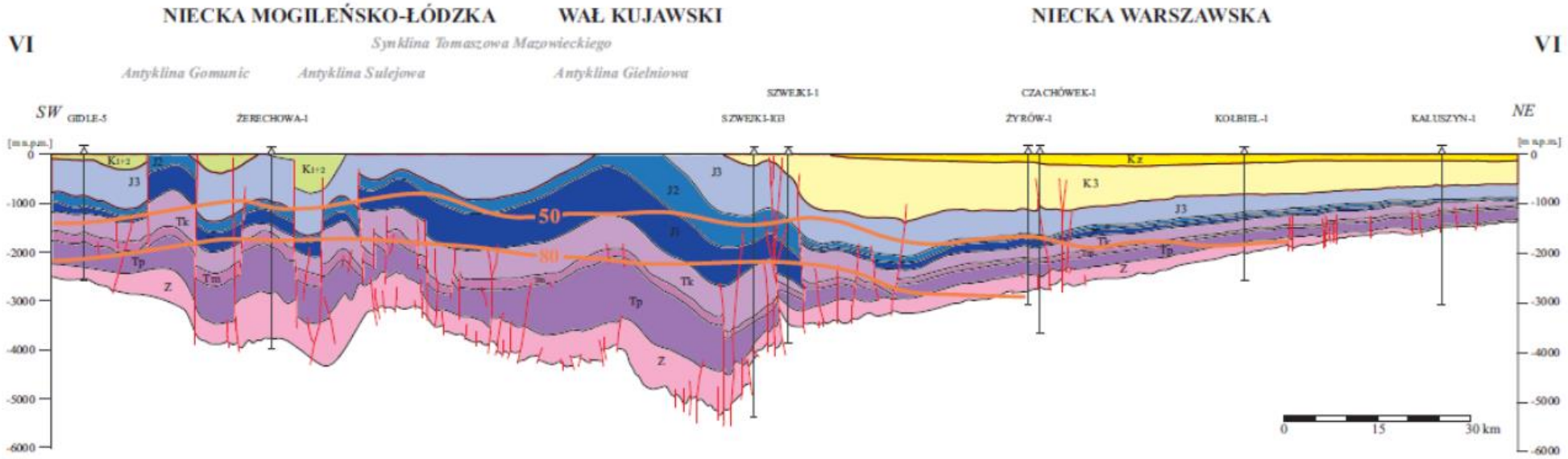
summary in „Geothermal Atlasses” and other works (for over 80% of Polish area)



Scientific and practical aspects

- ✓ evaluation of geothermal resources and potential of their use for different purposes
- ✓ indicating prospective areas for geothermal water and/or energy utilization
- ✓ structural and parametric characteristics of geothermal reservoirs
- ✓ hydrogeological conditions of the geothermal waters occurrence
- ✓ recognizing of the geothermal potential for binary installations (11)
- ✓ recognizing the geothermal potential for Enhanced Geothermal System (10)

Low- temperature geothermal systems

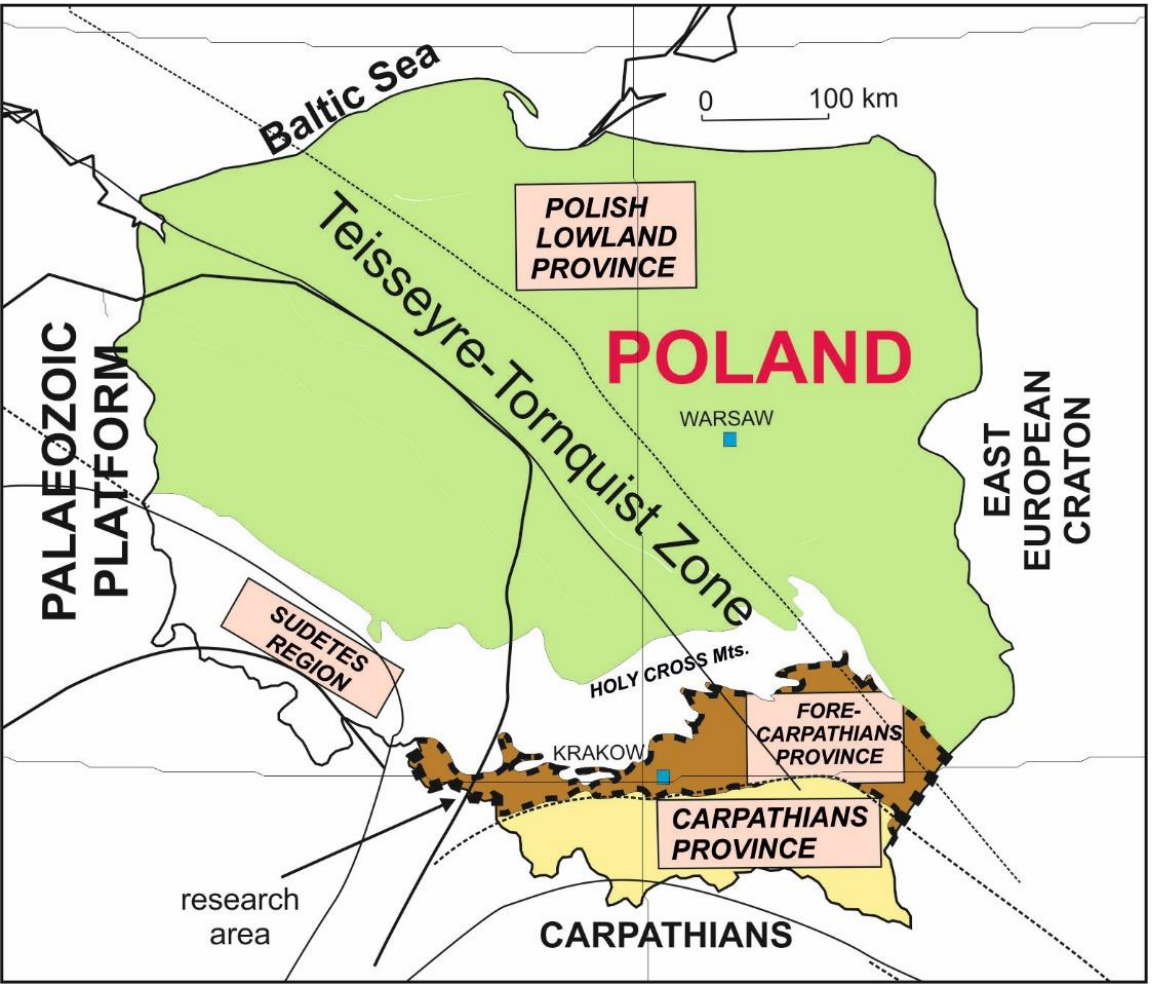


Geological cross-section through Poland
Great share of sedimentary rocks - potential and proven geothermal reservoirs

Domination of sedimentary formations (Mesozoic mostly)

- ✓ Large thickness (to 7-12 km)
- ✓ Significant share of carbonates and sandstones - main reservoir rocks
- ✓ Crystalline rocks – the Precambrian platform (NE-Poland), the Sudetes region (SW-Poland)

Main geothermal parameters



- ✓ Depths of exploited aquifers: 1 – 3.5 km
- ✓ Water temperatures: 20 – 97^{0}C
  (locally >100^{0}C waters found)
- ✓ Water mineralization (TDS): 0.4 -150 g/dm^3
- ✓ Water flow rates/well:
  several m^3/h – 550 m^3/h

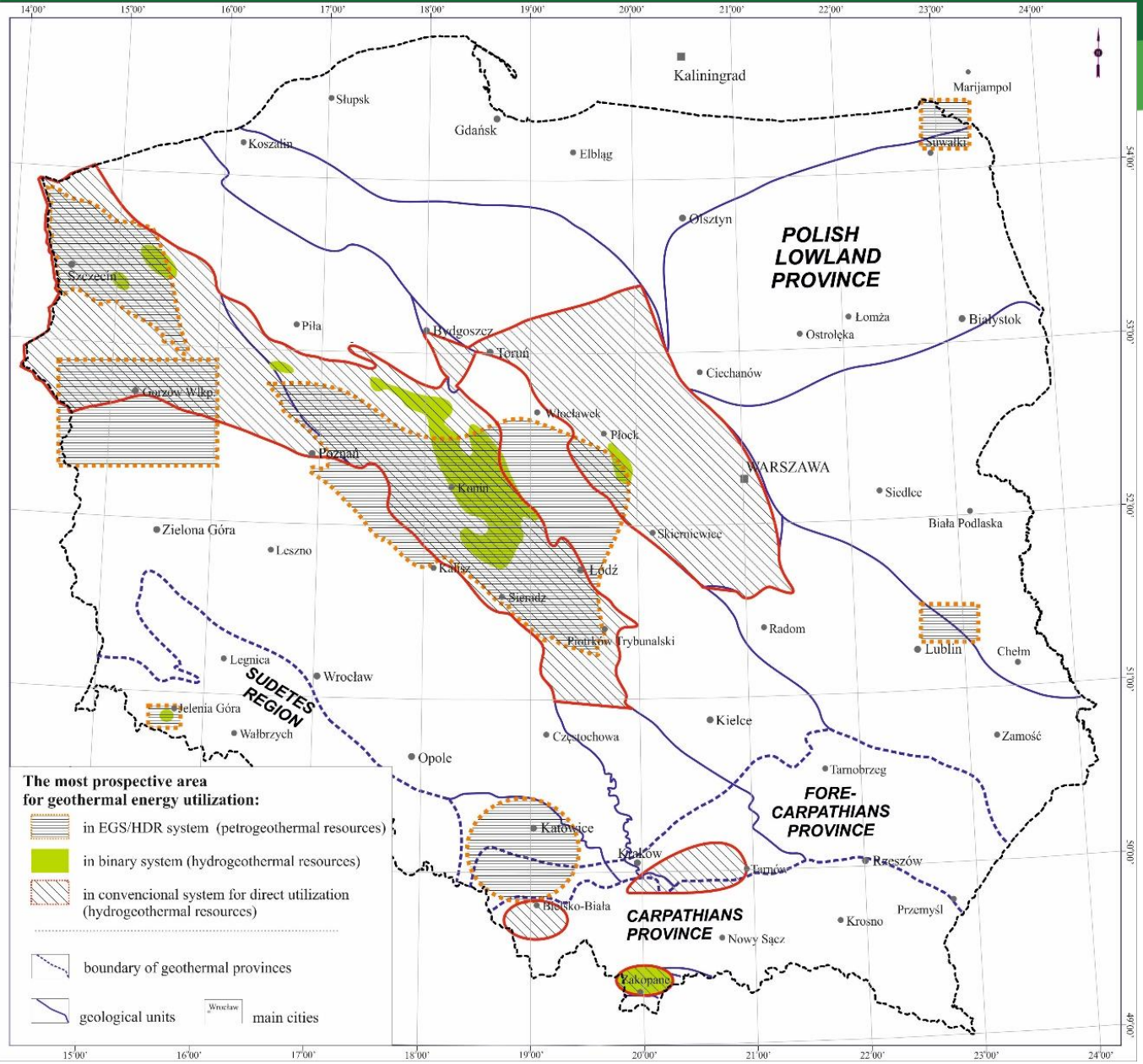
Rich low-enthalpy potential in geothermal provinces

- ✓ The largest in area and the most perspective province in Poland
- ✓ Two geothermal reservoirs have commercial significance:
  - ❑ Lower Cretaceous
  - ❑ Lower Jurassic
- ✓ In many areas of the Polish Lowlands utilization of geothermal waters with relatively high temperatures (even exceeds 100°C) and high capacities (even 300 m^3/h) is real

- ✓ Geothermal reservoirs of Miocene and Mesozoic-Paleozoic basement

- ✓ The only geothermal province in Poland where the occurrence of geothermal water is associated with crystalline rocks
- ✓ Favorable thermal conditions (Cieplice)
- ✓ The current use of waters associated with balneotherapy and recreation

- ✓ The occurrence of thermal water resources and geothermal energy in the Polish part of the Carpathians is associated primarily with the area of **Inner Carpathians** - **the Podhale basin**
- ✓ **Outher Carpathians** due to the complicated geological structure are characterized by diverse of hydrogeothermal conditions – locally use of geothermal waters for recreation and balneotherapy is possible



(based on: Górecki (ed.) et al., 1990 – 2013; Bujakowski, Tomaszewska (eds.), 2014; Wójcicki, Sowiżdżał, Bujakowski (eds.), 2013; Sowiżdżał, 2018)

The most prospective area for geothermal energy utilization in Poland

- ✓ Geothermal waters can be used in a wide range for heating purposes (individual and communal) and others purposes: recreation, balneotherapy, agriculture, aquaculture, ecological food production etc.
- ✓ Locally – binary electricity generation (CHP)
- ✓ Shallow geothermal (heat pumps - a wide range of applications for heating and cooling)

POLAND - GEOTHERMAL CONDITIONS

- ✓ In Poland **low - temperature geothermal resources** occurs
- ✓ The geothermal reservoirs are built of:
  - ❑ sedimentary rocks - mostly Mesozoic sandstones and carbonates
  - ❑ crystalline rocks – the Precambrian platform (NE-Poland), the Sudetes region (SW-Poland)
- ✓ The most prospective aqufiers:
  - ❑ Polish Lowland: Lower Jurassic and Lower Cretaceous aquifers
  - ❑ Podhale: Middle Triassic/Eocene aquifers
- ✓ Hydrogeothermal resources are associated with waters of different temperatures from 20 to over 100°C
- ✓ Petrogeothermal resources - associated with sedimentary, volcanic and crystalline rocks with temperature above 150°C

Project GeoPLASMA-CE

Shallow **Geo**thermal Energy **Pl**anning, **As**sessment and **Ma**pping Strategies in **C**entral **E**urope

Opracowanie zasad planowania, strategii wykorzystania oraz metod oceny i wykonywania map potencjału płytkiej geotermii w Europie Środkowej

www.geoplasma-ce.eu

Funding programme: Interreg CE
Priority axis: Cooperating on low-carbon strategies in CENTRAL EUROPE;

Running time: 07/2016 – 06/2019;
Project partners: 11 (AT, DE, PL, CZ, SK, SI)
6 Geological survey organizations, **1** University (PL), **1** City administration (SI), **1** Interest group (DE), **2** SMEs (DE);
Total budget: EUR 2.9 Mio

Mission and vision of GeoPLASMA-CE:

Foster the use of shallow geothermal energy use in Central Europe by:

- ✓ Transferring and harmonizing knowledge;
- ✓ Connecting experts and stakeholders in Central Europe;
- ✓ Developing state-of the art methods and tools;
- ✓ Demonstrating concepts in pilot areas;
- ✓ Interacting with stakeholders for the inclusion of SGE.

Many thanks for kind attention!

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