
FRAUNHOFER INSTITUTION FOR ENERGY INFRASTRUCTURES & GEOTHERMAL SYSTEMS



GSEU
GEOLOGICAL SERVICE FOR EUROPE

19.10.2023, Bruxelles



We shape the climate-neutral energy systems of the future.

Dr. Isabella Nardini

Manager of International Affairs – Transfer and Strategy

EU Geothermal in action



Representing the energy research community in the EU



Representing the geothermal industry in the EU



The European Technology & Innovation Platform on Geothermal (ETIP-Geothermal) is an open stakeholder group

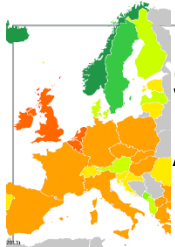
European Energy Research Alliance Joint Programme Geothermal

- representing the energy research community in the EU established in 2010
- 30 Participants, 7 Associate Participants
- to coordinate geothermal energy research across Europe
- approximately 40% of European research capacity

EERA Geothermal provides research to:

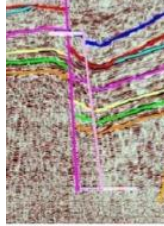
- **expand the type, number and size of geothermal resources** suitable for increasing power and heat generation,
- **improve efficiency, sustainability and flexibility** in production of geothermal resources
- **improve integration** of geothermal heat and power in the energy system

Sub-Programmes



SP1

Assessment of Geothermal Resources



SP2

Exploration of Geothermal Reservoirs



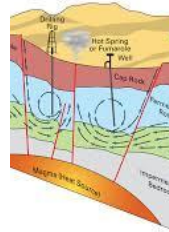
SP3

Engineering of Geothermal Wells and Resources



SP4

Energy Conversion Systems



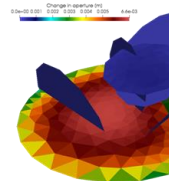
SP5

Operation of Geothermal Systems



SP6

Sustainability, Environment and Regulatory Framework



SP7

Computing and Data Management

- representing the European Geothermal Industry
- non-profit international organization founded in 1998
- more than 120 members from 28 countries:
 - developers
 - equipment manufacturers
 - electricity providers
 - national associations
 - consultants
 - research centres
 - geological surveys
 - public authorities

EGEC represents the entire geothermal sector

European Geothermal Energy Council: Mission and Vision

- To promote the European geothermal industry and enable its development both in Europe and worldwide by :
 - shaping policy
 - driving more R&D
 - improving business condition

Policy, market intelligence and communication, providing a link between the industry and European institutions.



A sound policy framework and financial instruments which allow geothermal energy to compete with traditional sources;



Increased research and development;



The development of the geothermal industry inside and outside of Europe.

- Open stakeholder group recognized by the European Commission as a tool to strengthen cooperation with Stakeholders under the Strategic Energy Technology Plan (SET-Plan), as part of the H2020 programme.
- **ETIP DG & ETIP RHC- become ETIP Geothermal from 2023**

The primary objective is overall cost reduction, including social, environmental, and technological costs.

It brings together representatives from

- industry
- academia/research centres
- sectoral associations



MARKET UPTAKE

The leader of this Working Group is Adele Manzella. For more information about the WG please contact: info@etip-getothermal.eu



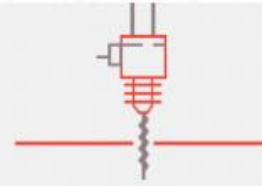
CIRCULARITY & SUSTAINABILITY

The leaders of this Working Group are Joerg Uhde and Sara Montomoli. For more information about the WG please contact: info@etip-getothermal.eu



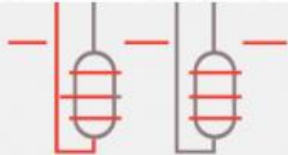
GEO RESOURCES ASSESSMENT

The leaders of this Working Group are Jan-Diederik van Wees and David Bruhn. For more information about the WG please contact: info@etip-getothermal.eu



WELL TECHNOLOGY

The leaders of this Working Group are Miklos Antics and Laurent Escare. For more information about the WG please contact: info@etip-getothermal.eu



POWER SYSTEMS

The leaders of this Working Group are Riccardo Corsi and Marco Baresi. For more information about the WG please contact: info@etip-getothermal.eu



H&C SYSTEMS

The leaders of this Working Group are Thomas Jahrfeld and Luca Guglielmetti. For more information about the WG please contact: info@etip-getothermal.eu



MATERIALS

The leader of this Working Group is Fausto Batini. For more information about the WG please contact: info@etip-getothermal.eu



ENVIRONMENT

The leader of this Working Group is Bodo von During. For more information about the WG please contact: info@etip-getothermal.eu

EGEC MARKET OUTLOOK: First glance of the Market Report 2022

POWER GENERATION

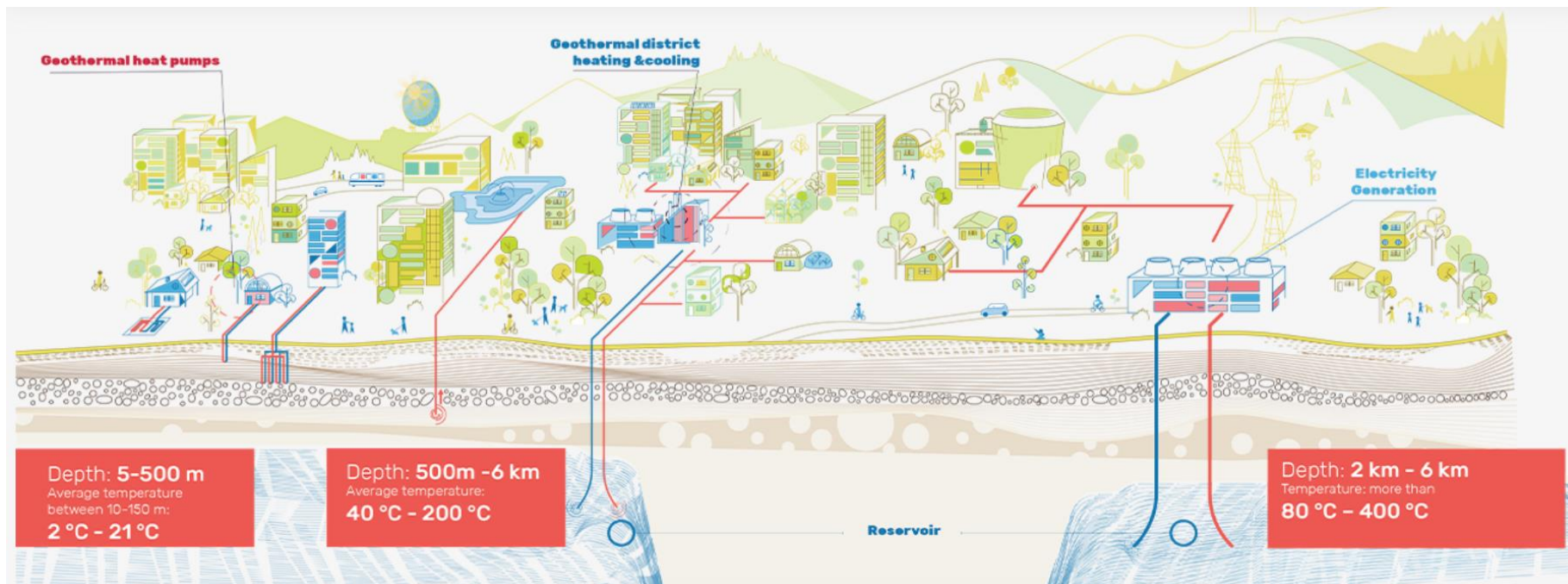
More than 30 wells will be drilled in the next 3-5 years for Geothermal electricity power plants

- 25 plants are under development (construction or extension)
- 100+ projects are investigated

HEATING

More than 100 wells will be drilled for heating projects

- 16 projects are currently (or about to) drilling
- 300+ are developed or investigated



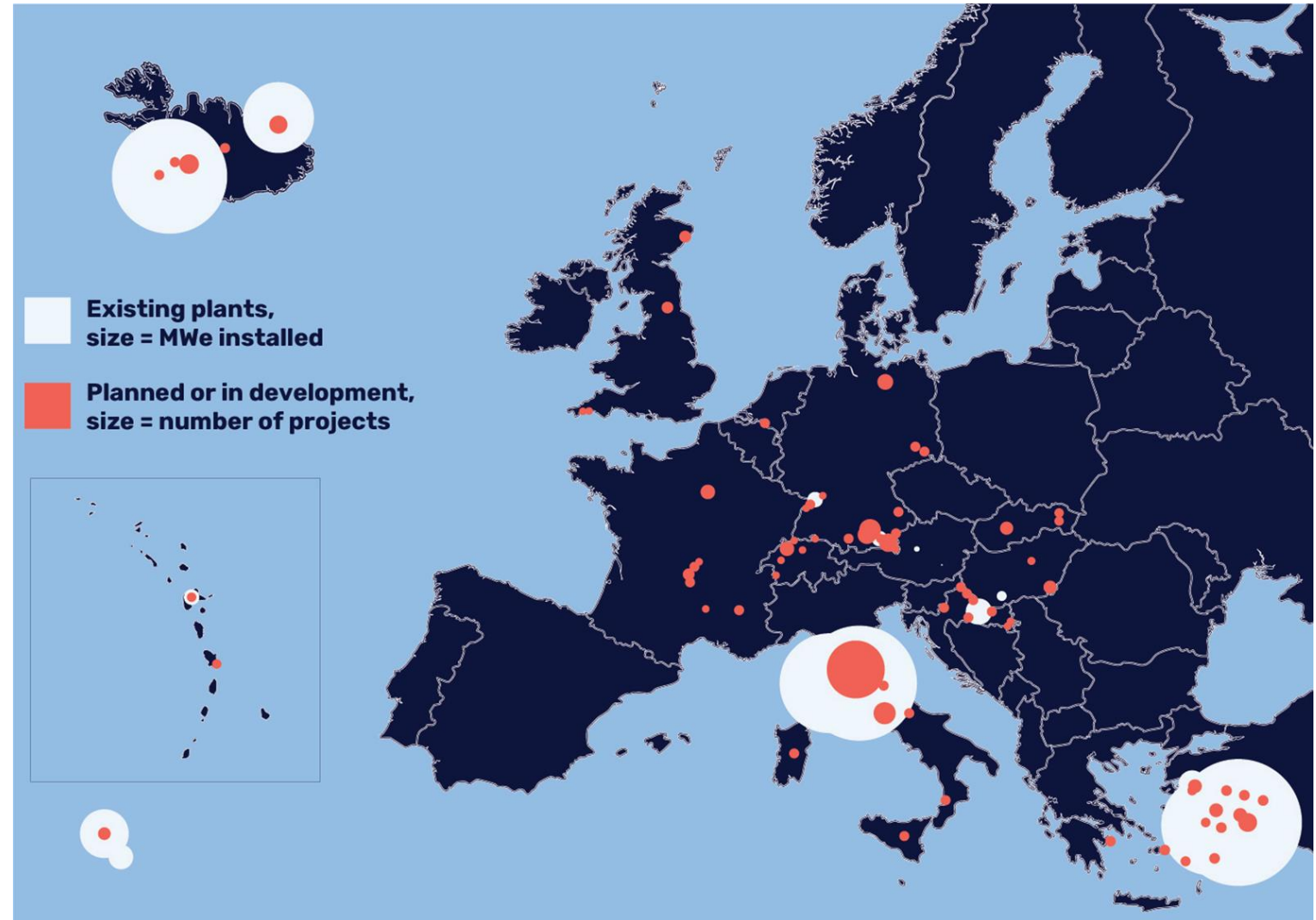
Location of geothermal power plants per region in Europe

POWER GENERATION

More than 30 wells will be drilled in the next 3-5 years **for Geothermal electricity** power plants

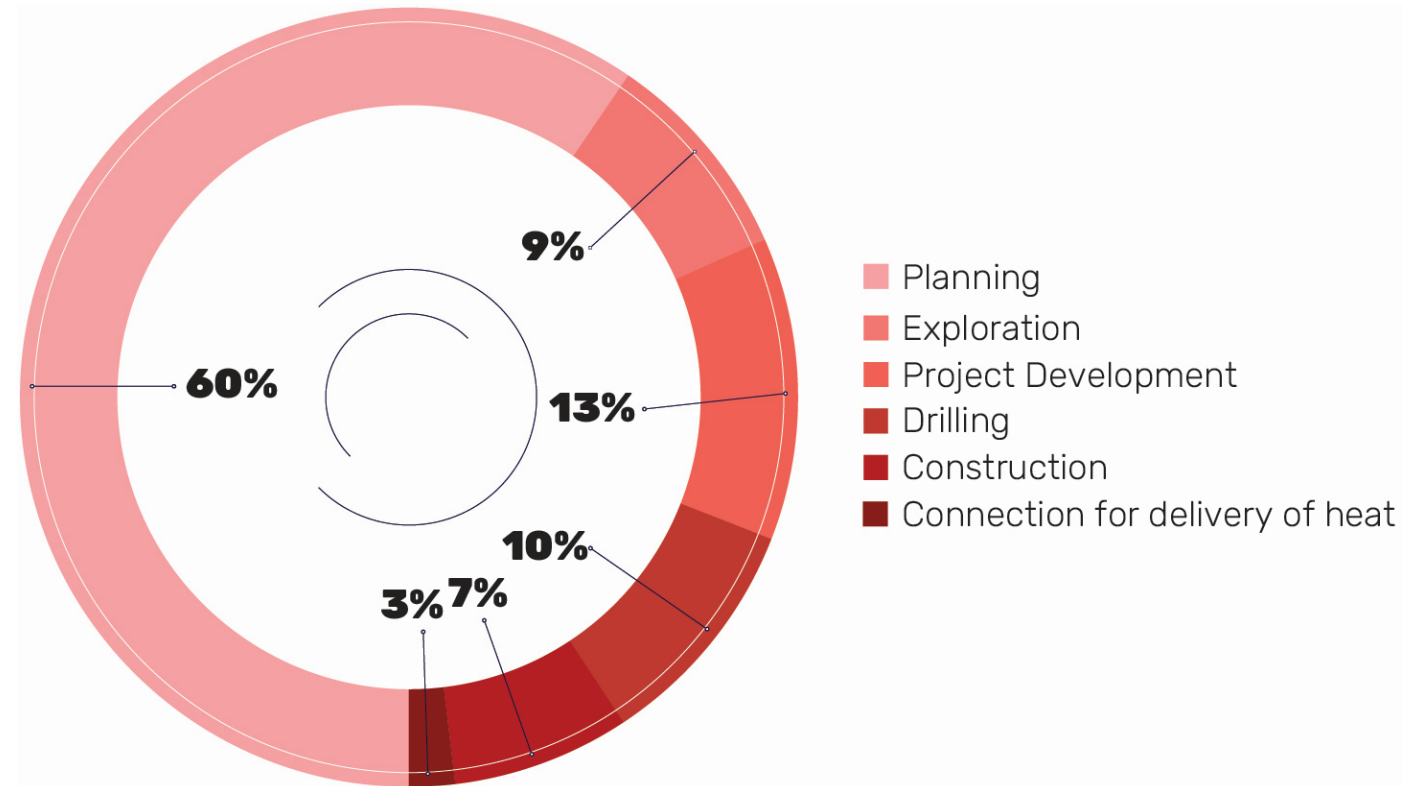
- 25 plants are under development (construction or extension)
- 100+ projects are investigated

The geothermal electricity market is now entering a new development phase, with many plants to be put into operation throughout the next 5 to 7 years.



Geothermal DHC project pipeline

- **316 new projects** under active investigation, which add over 744 MW to the operational 5,608 MW capacity.
- France remains the largest geothermal district heating country in the European Union and second to Iceland across Europe.
- **Germany has the largest pipeline** with 102 projects and is followed by France with 24, the Netherlands with 22, Italy and Poland with 21 respectively.



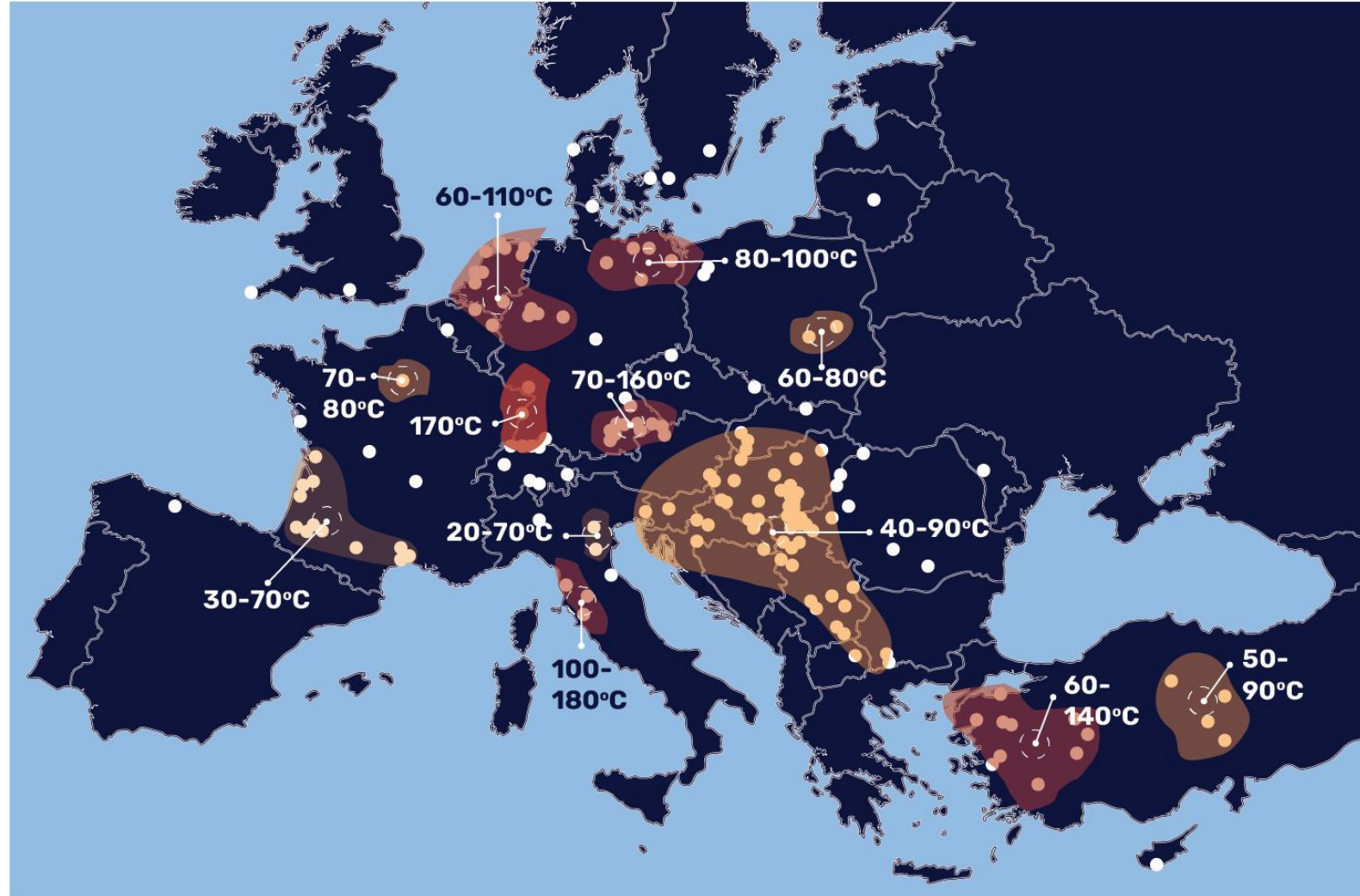
HEATING: Resource and flow rates

HEATING

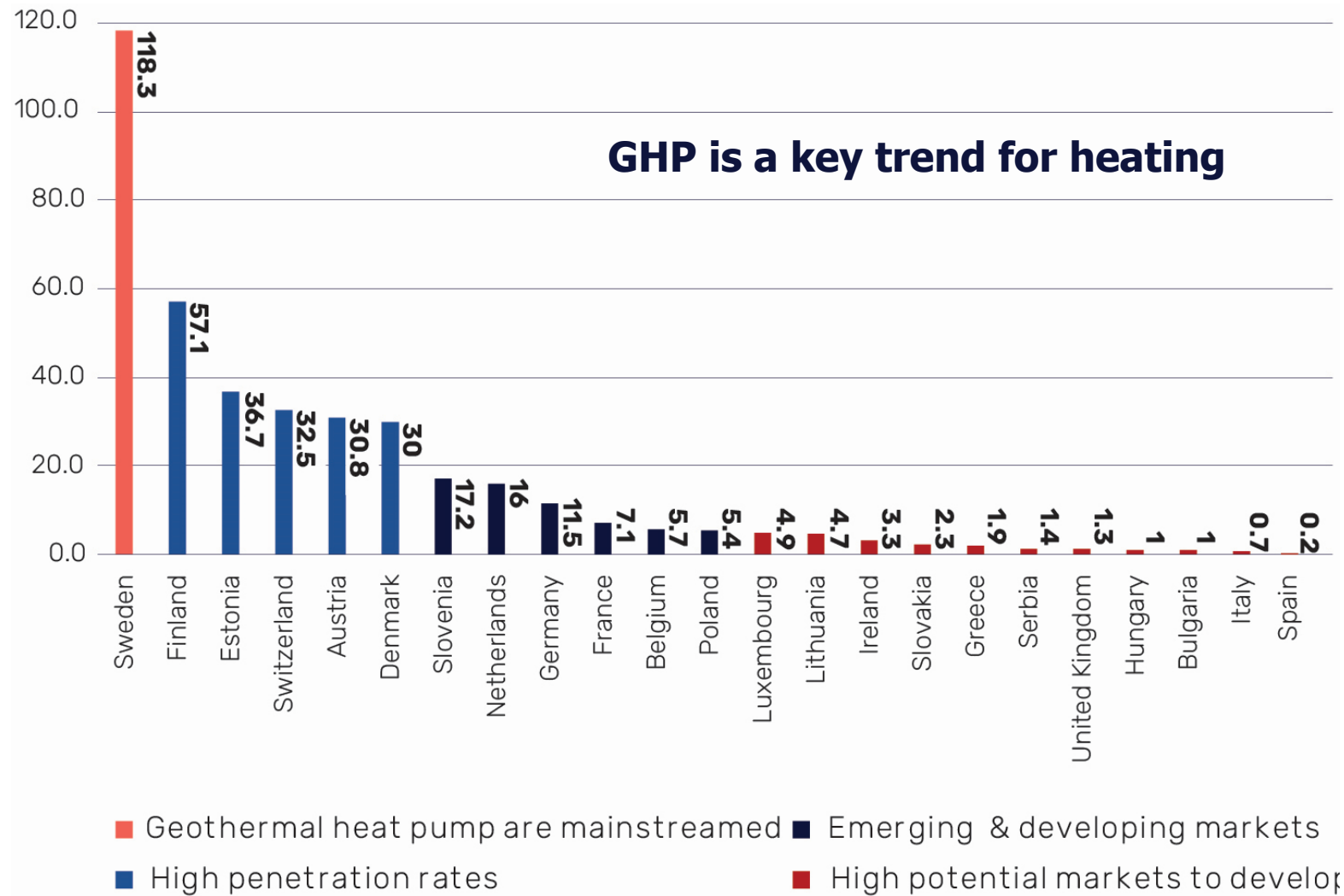
More than 100 wells will be drilled **for heating projects**

- 16 projects are currently (or about to) drilling
- 300+ are developed or investigated – typically doublet
- 17 geothermal heating systems are expected to be commissioned in 2023: 4 in Serbia; 3 in Finland; 2 in the Netherlands and 1 in Austria, Cyprus, Estonia, Hungary, Italy, Portugal, Slovakia and Spain

One of the key trend is the use of large Geothermal Heat Pumps - GHP



Number of geothermal heat pump systems per 1,000 households

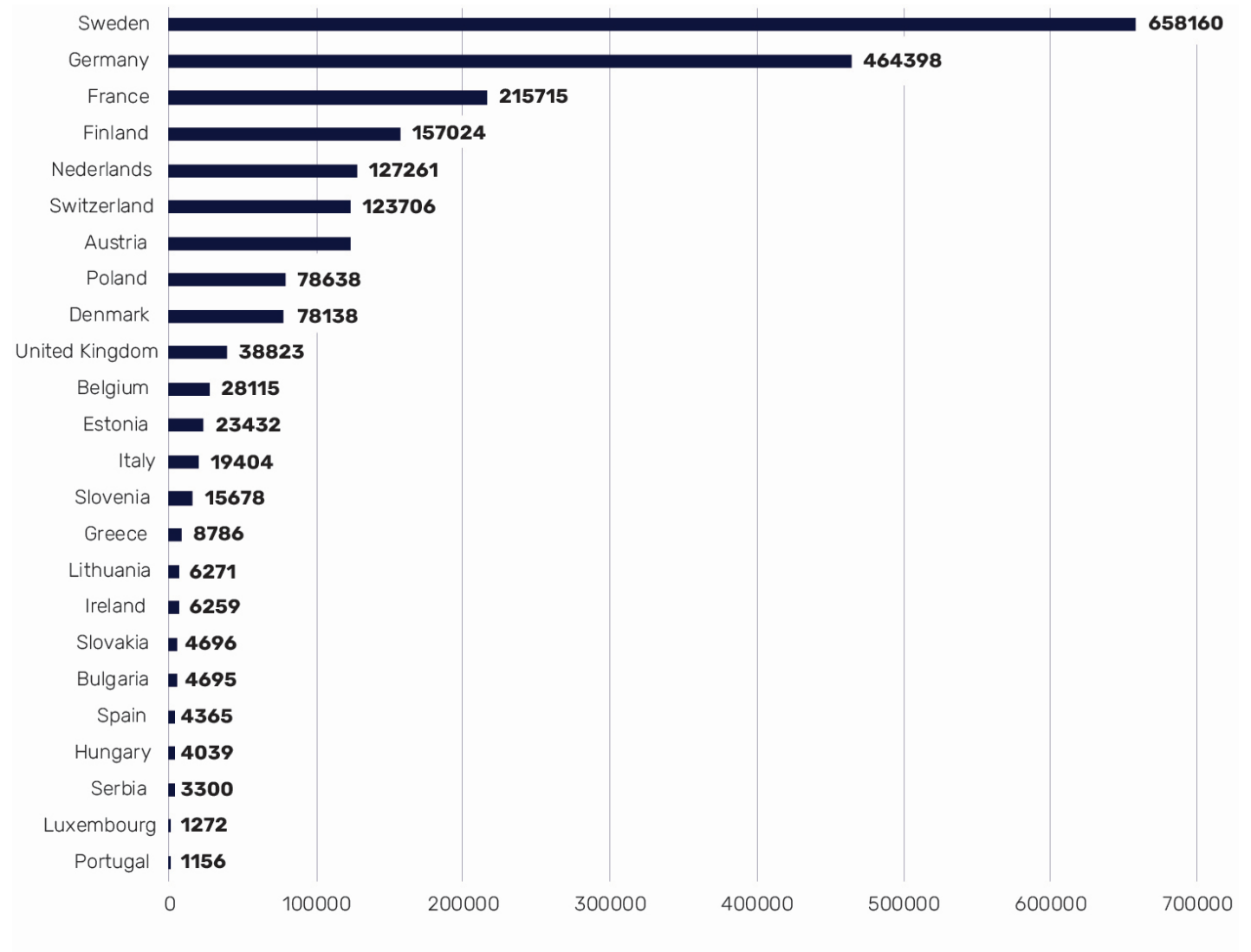


GHP: sales in old and new markets

50% of the stock is in 2 countries...



- Number of GHPs installed (stock) in 2022 in Europe



Facing how to foster the geothermal sector in EU and enter the global market

- Simplify permitting procedures
 - Fast permitting for geothermal heat pump systems
 - National ROADMAPS: launched in Ireland, Germany and Poland
 - Funding schemes/ Risk insurance
 - Social acceptance
 - Capacity building actions: education and training, transfer knowledge
-
- Standardization and harmonization for Pan-European **geological map and 3D models**
 - Pan-European inventories, characterisations and knowledge of **geothermal energy resources**
 - Pan-European inventories, characterisations and knowledge for **underground thermal energy storage** for the system integration
 - Pan European inventories, characterisations of **underground capacities for CCS**
 - Pan-European maps of **brine mines**: economically strategic raw material extraction from geothermal brines (i.e. lithium, boron)

GSEU as a Pillar for EU!

THANK YOU!



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