Geothermal potential in Northern Ireland

Dr Marie Cowan, Director GSNI, Credits to Dr Rob Raine, Energy Geologist GSNI

Department for the Economy
www.economy-ni.gov.uk

GSNI Geological Survey of Northern Ireland
www.bgs.ac.uk/gsni

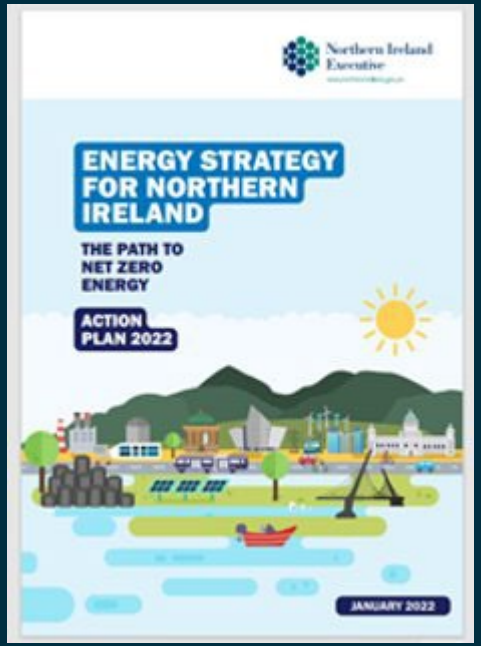
BGS British Geological Survey

Introduction - GSNI

- Staffed by BGS scientists
- Generates information, data, research and provides expertise and advice for decision making and policy
- Works with government departments & councils
- Collaborates with 35 universities
- Close working relationship between the three surveys BGS-GSNI-GSI

Geothermal Journey in NI

- 1981 Larne geothermal borehole
- 2019/2020 Energy Strategy Call for Evidence
- 2020 Build Back Better Geothermal Conference QUB and GSNI
- 2021 Energy Action Plan
- 2021 Geothermal Webinar series GSNI, QUB, GAI, GSI
- 2021 DfE Geothermal Advisory Committee and Report
- 2021 EU PEACE PLUS programme announced. €20M for geothermal. GSI and GSNI preparing bid for 2022 call.
- GSNI scoping work programmes for geothermal demonstrator sites.

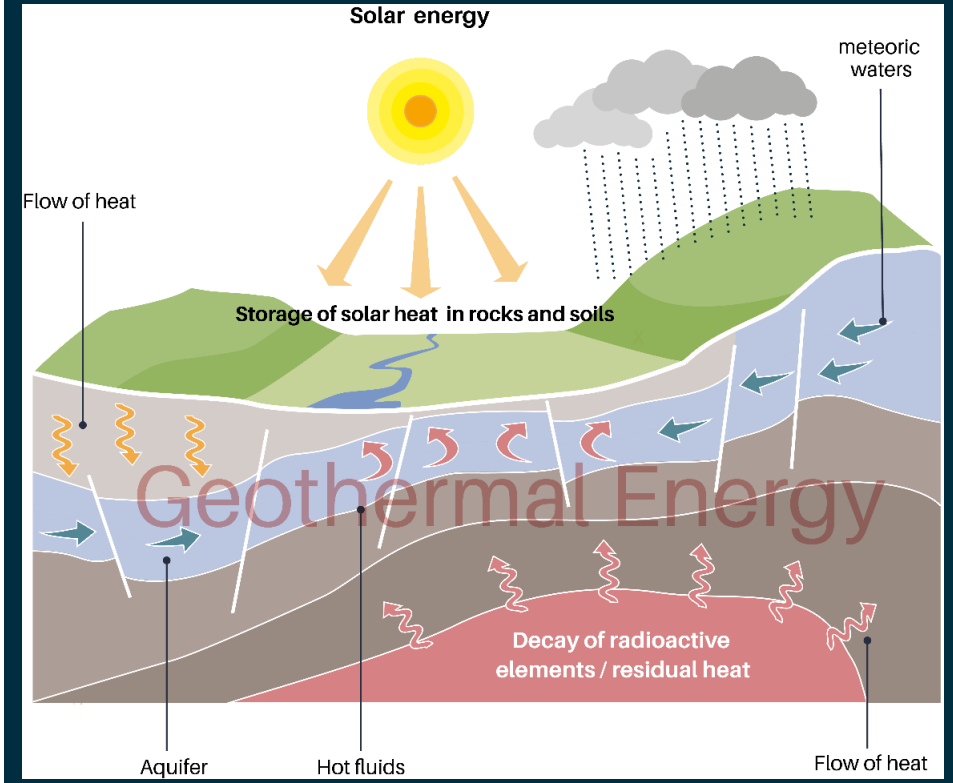


16	Develop and commence delivery of a geothermal demonstrator project	Undertake feasibility studies to inform future decisions on suitable locations for accessing geothermal heat and to better understand the potential role that geothermal energy can play in Northern Ireland's energy mix. This will help catalyse growth in this sector.	DfE (with GSNI)

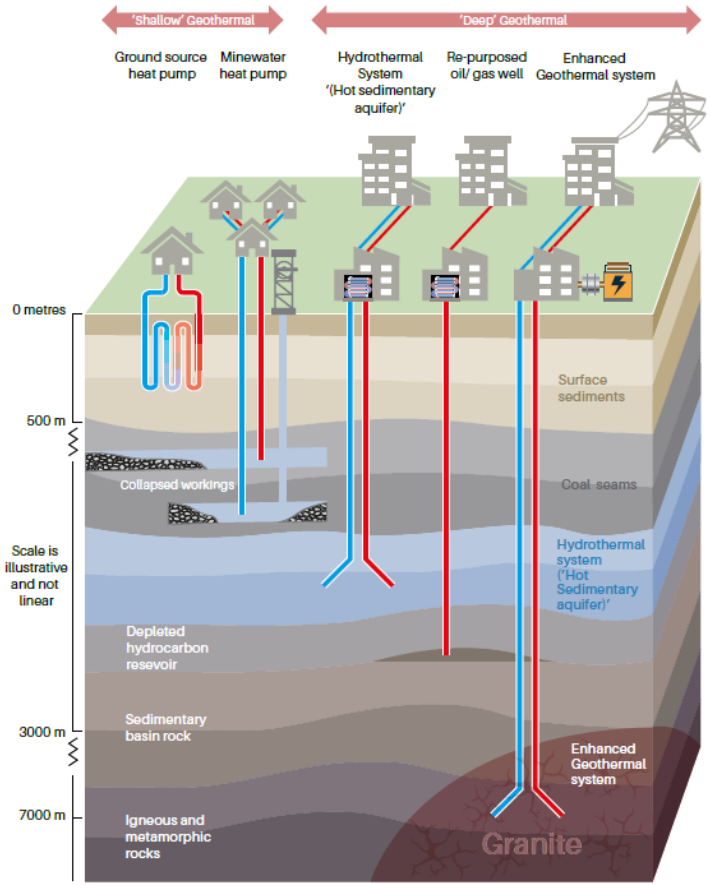
What is Geothermal?

- Energy in the subsurface of the Earth, stored in the form of heat.
- Sustainable and low-carbon energy source.
- Available 24hr/day, 365 days/yr.

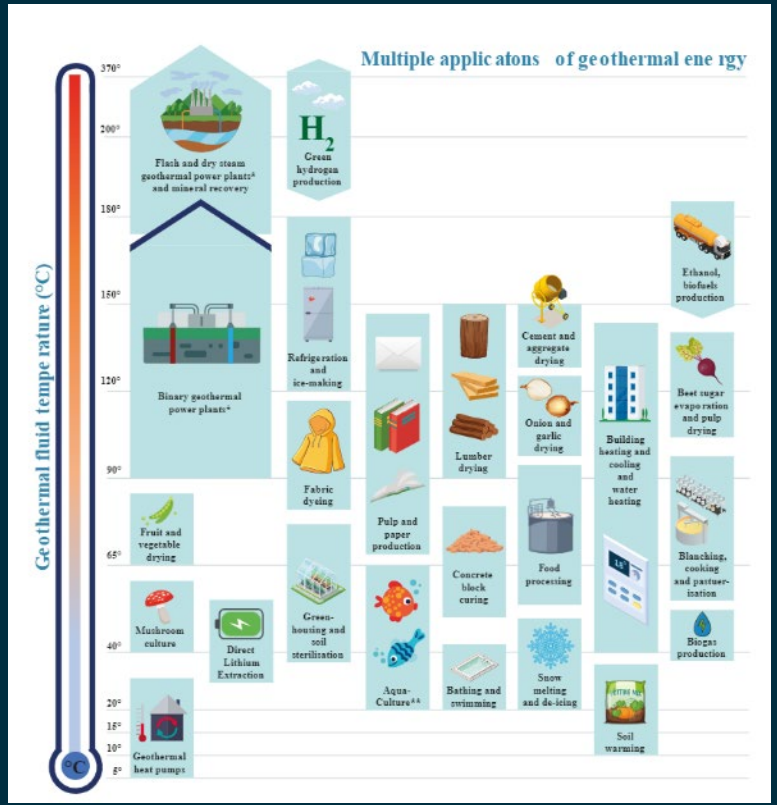
- Used for - heating/cooling, heat storage or power generation if hot enough.
- Divided into ground source/shallow geothermal or deep geothermal.
- Does not fluctuate like other renewables so can provide baseload heat or baseload power.



Abesser et al. 2022

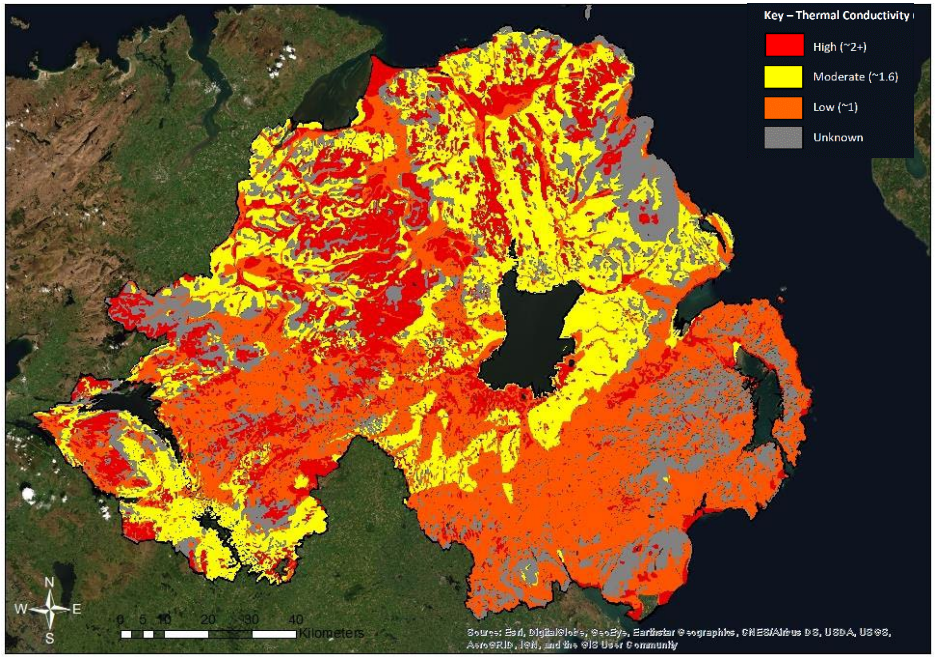


The main types of geothermal resource. (Townsend et al. 2021))

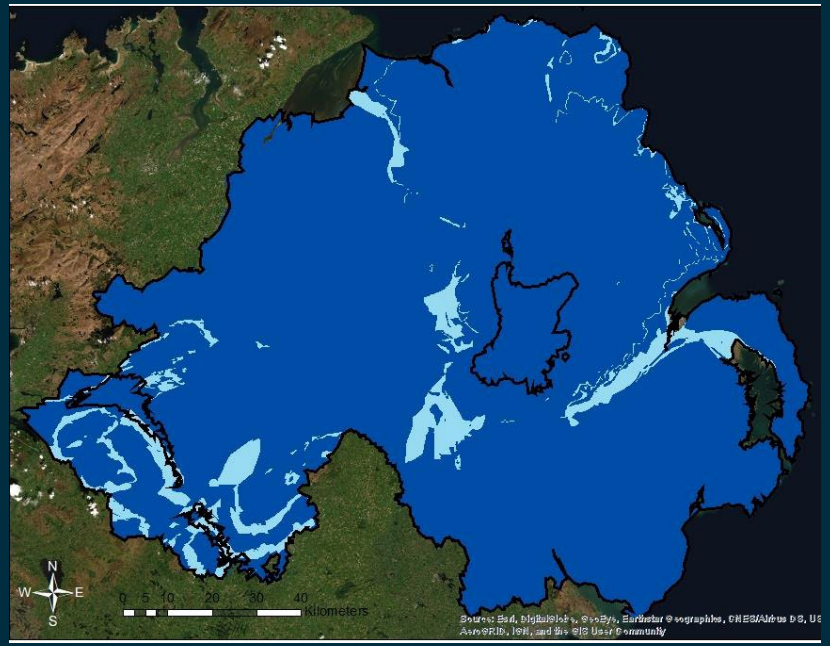


Source https://geothermalengineering.co.uk/what-is-geothermal%E2%80%8B/

Shallow Geothermal

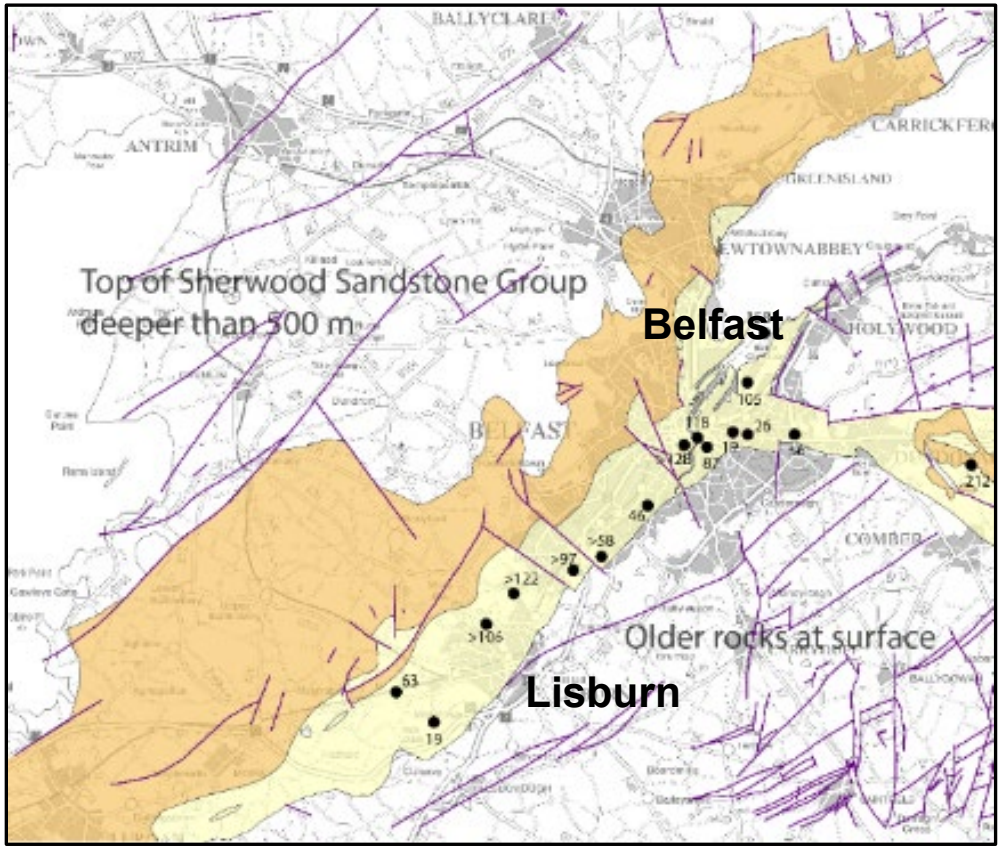


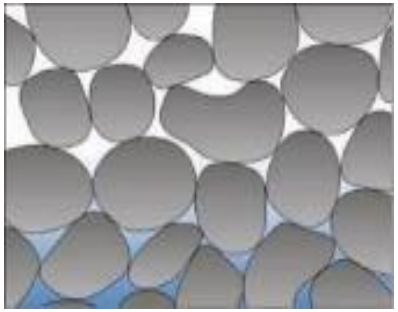
- Shallow sediments with high thermal conductivity across more than half of NI. Beneath this many areas also have high thermal conductivity rock, making them suitable for vertical closed loop.

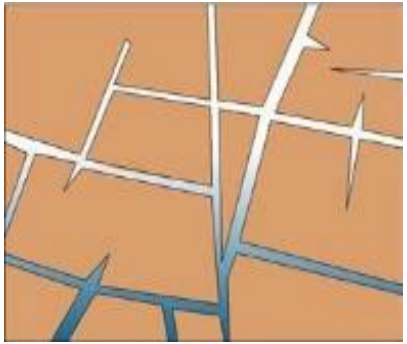


- NI has world class aquifers that have potential for open-loop shallow geothermal

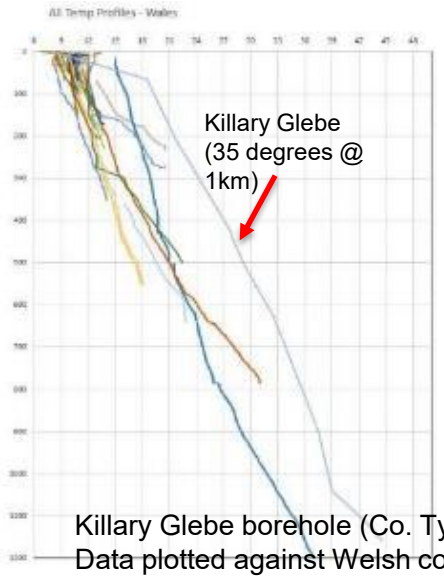
The Sherwood Sandstone Aquifer

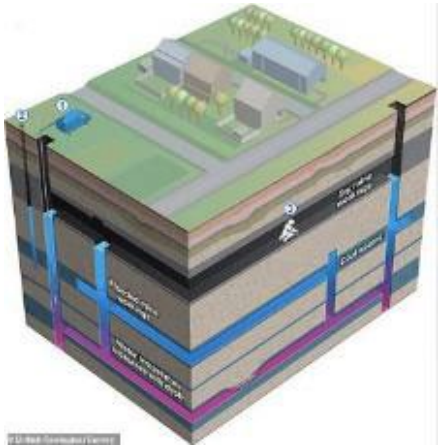


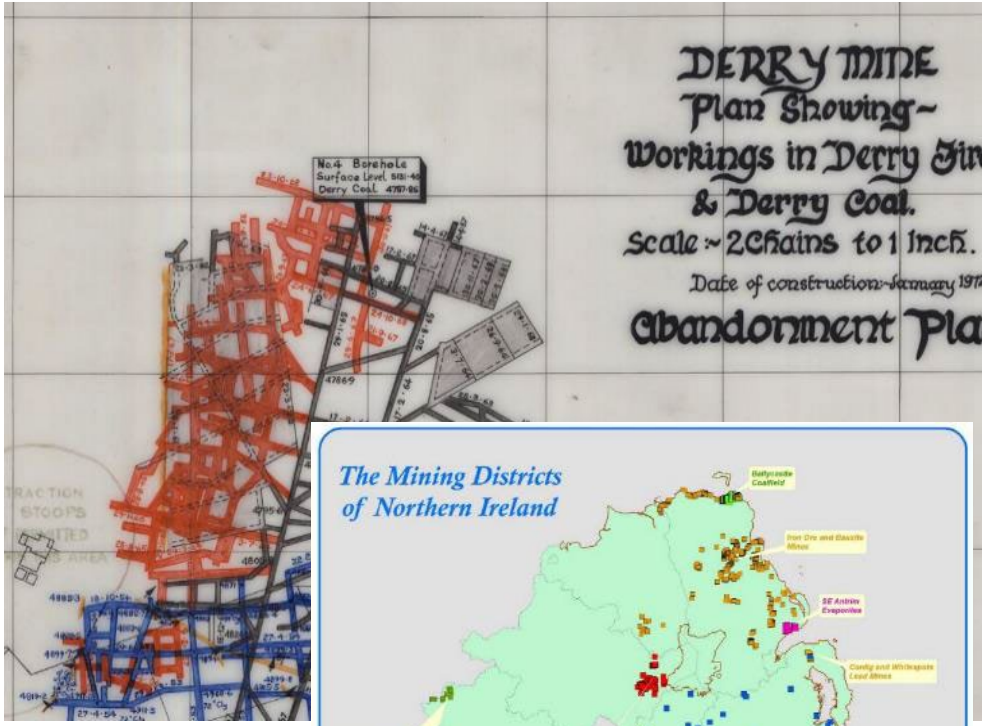


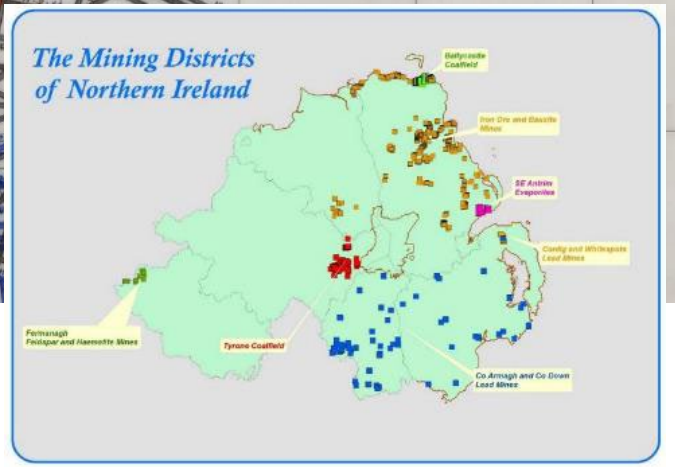


Mine water energy





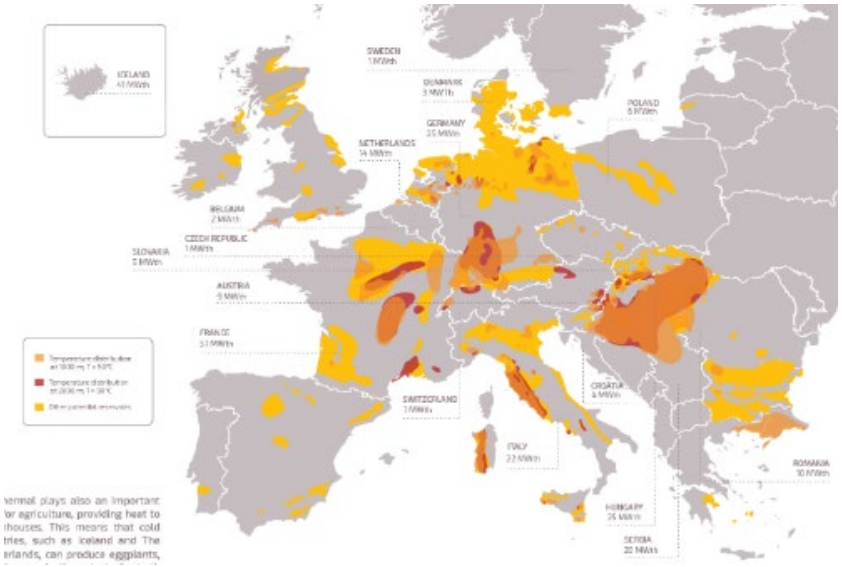




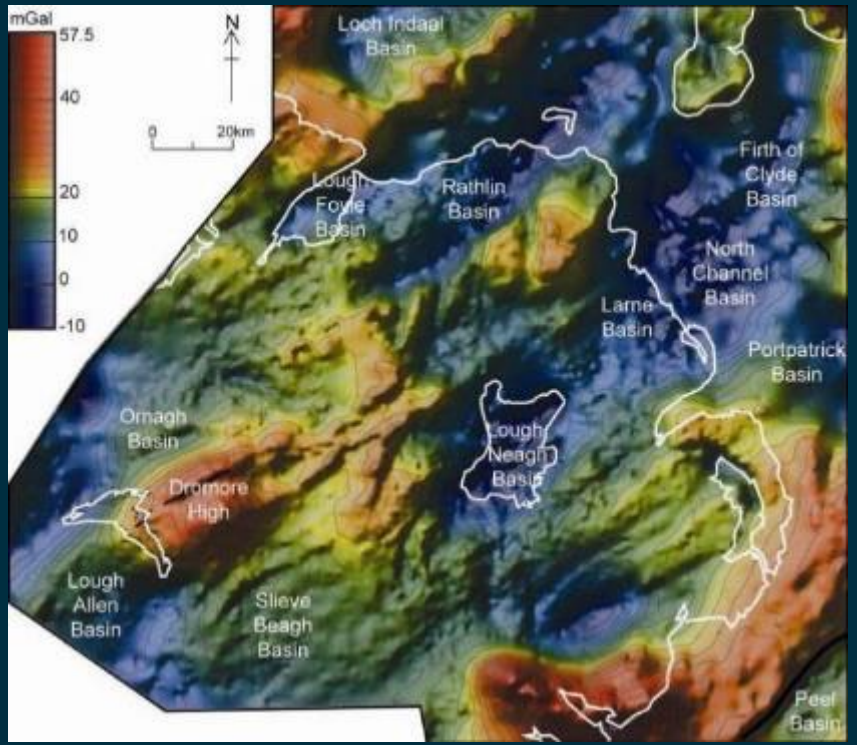
Farr et al. 2020.

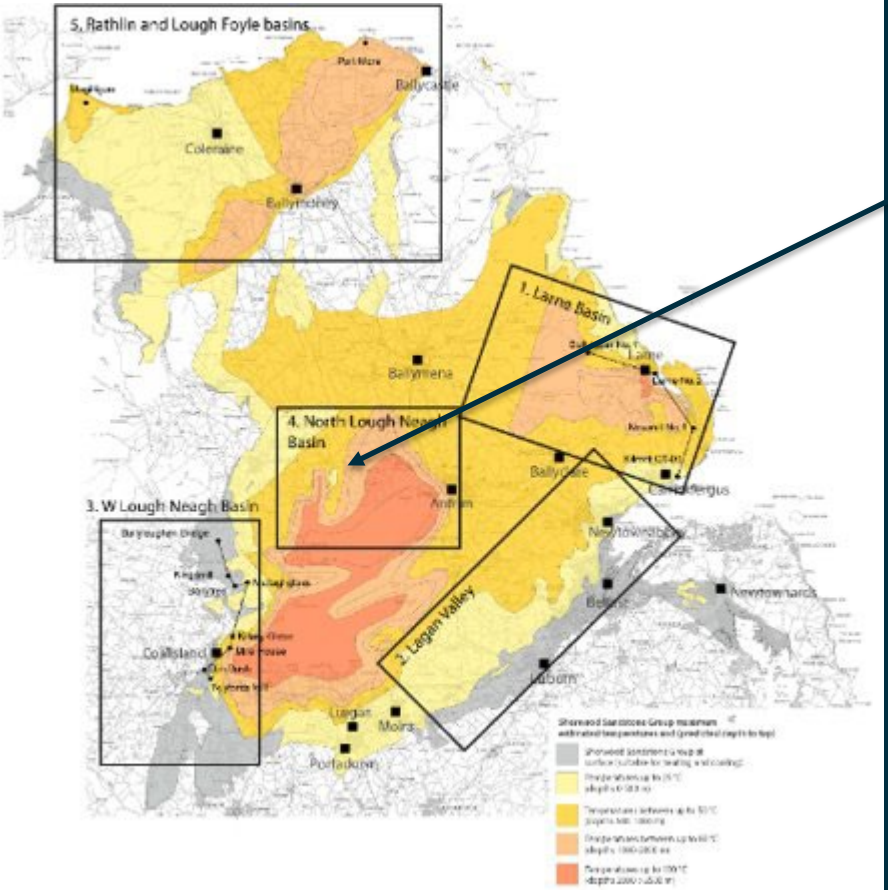
Killary Glebe borehole (Co. Tyrone).
Data plotted against Welsh coalfields by Gareth Farr (CA)

Deep Geothermal



- Europe has several areas with deeply buried sediment called basins. These have potential for hot sedimentary aquifer geothermal.





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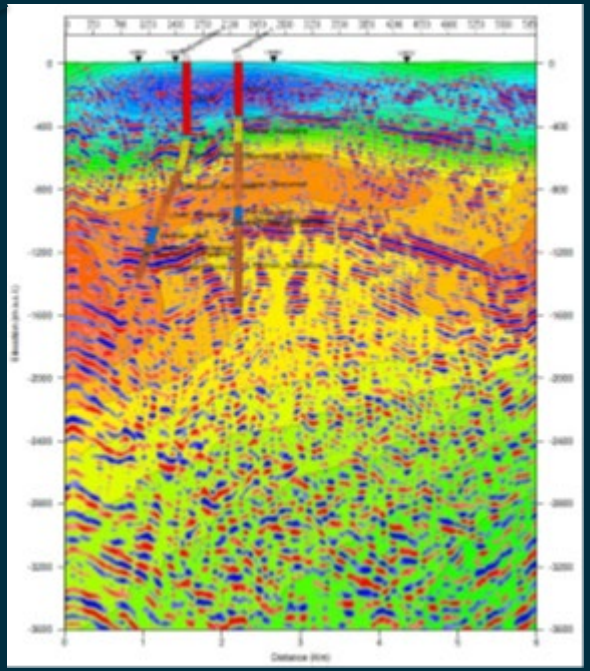
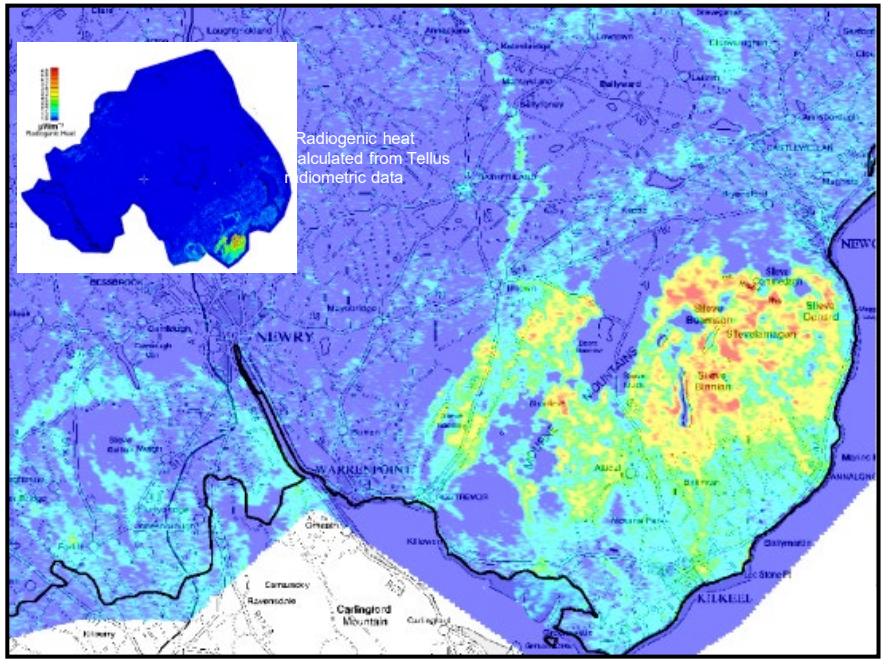


High Heat flow granites



- NI has high heat production granites
- Shallow geothermal potential in Mournes
- Deep geothermal potential if buried granites found elsewhere

http://nora.nerc.ac.uk/id/eprint/531393/

Queen's University Belfast

DEMONSTRATORS

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Thank you

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