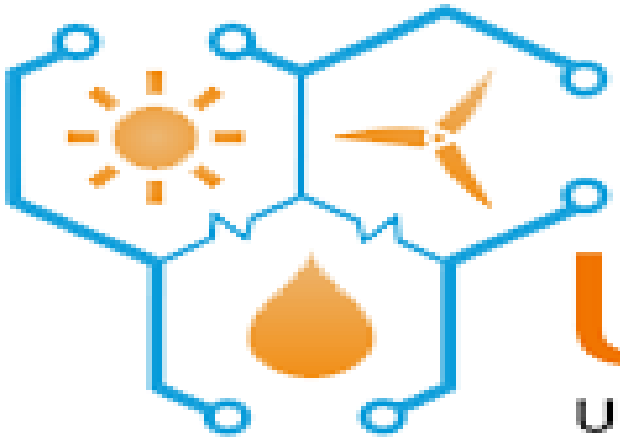
UK Energy Storage Conference
3 Sept. - 5 Sept. 2019
Frederick Douglass Centre,
Newcastle University



UKES2019

UK Energy Storage Conference

4th Sept 2019

Newcastle University

UKES2019
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Subsurface Heat Storage Potential of the UK

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Durham University
Durham Energy Institute

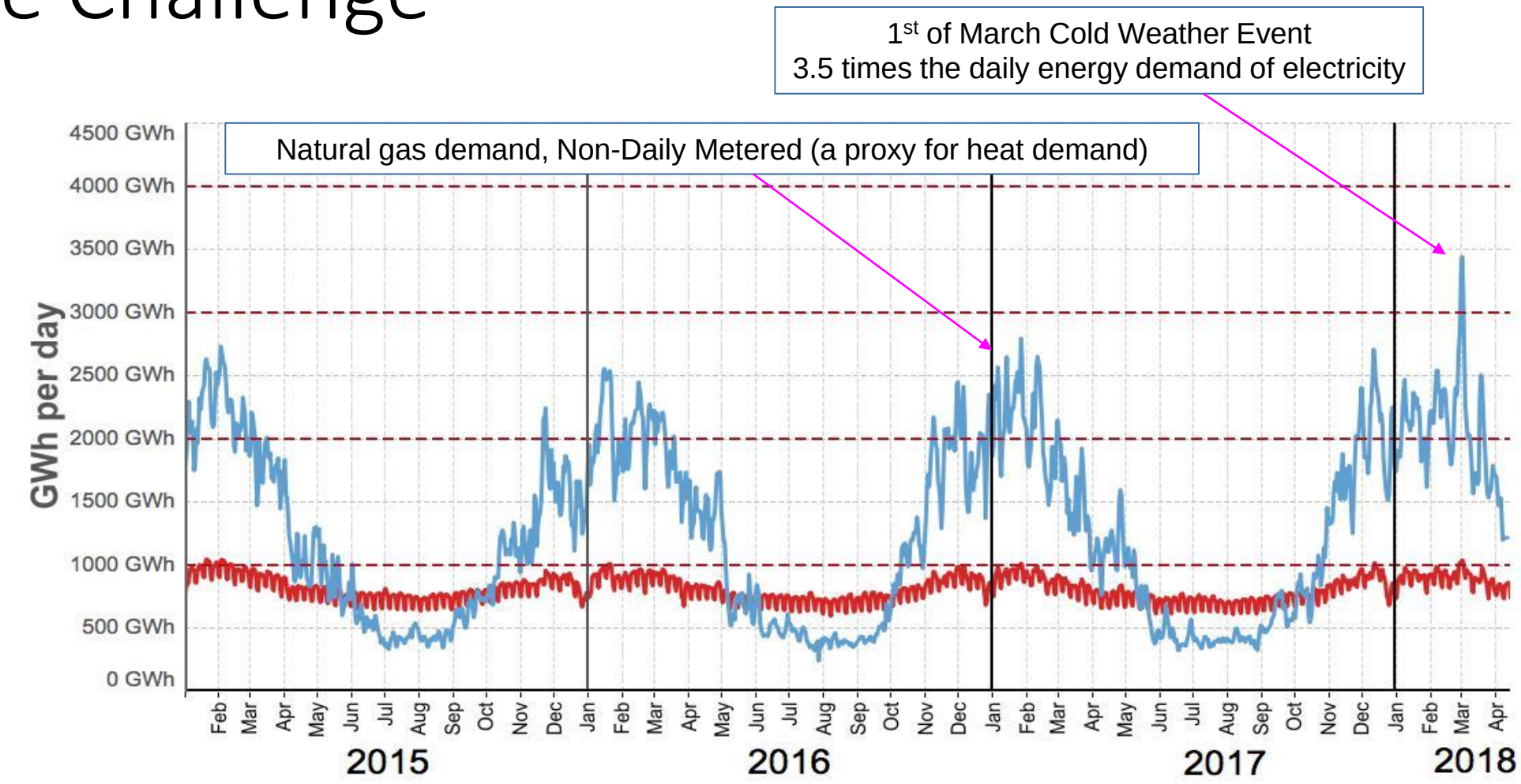
Newcastle University

storengy

The Coal Authority

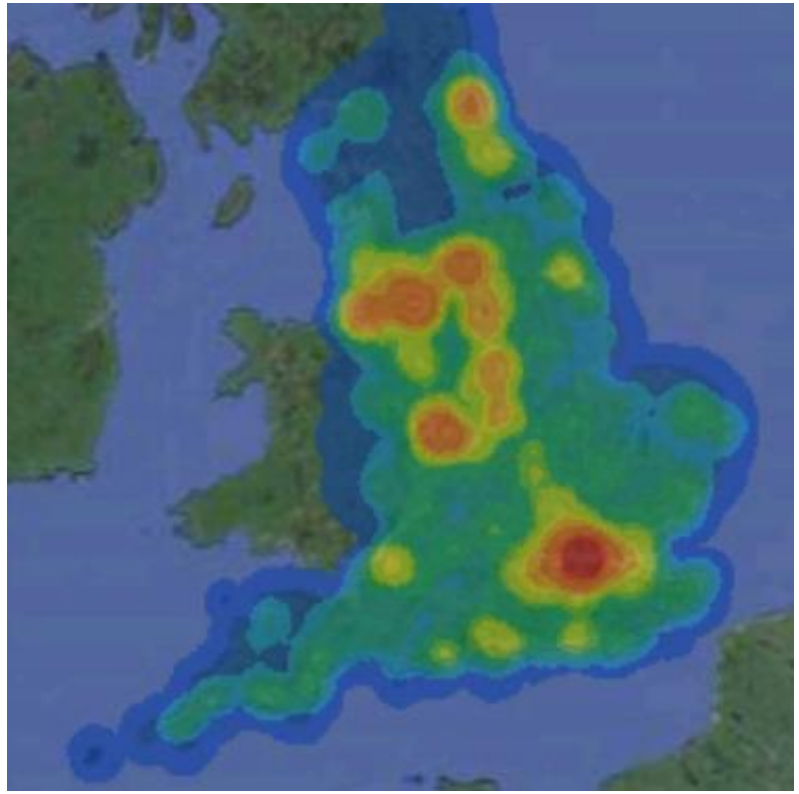
CESI National Centre for Energy Systems Integration

The Challenge



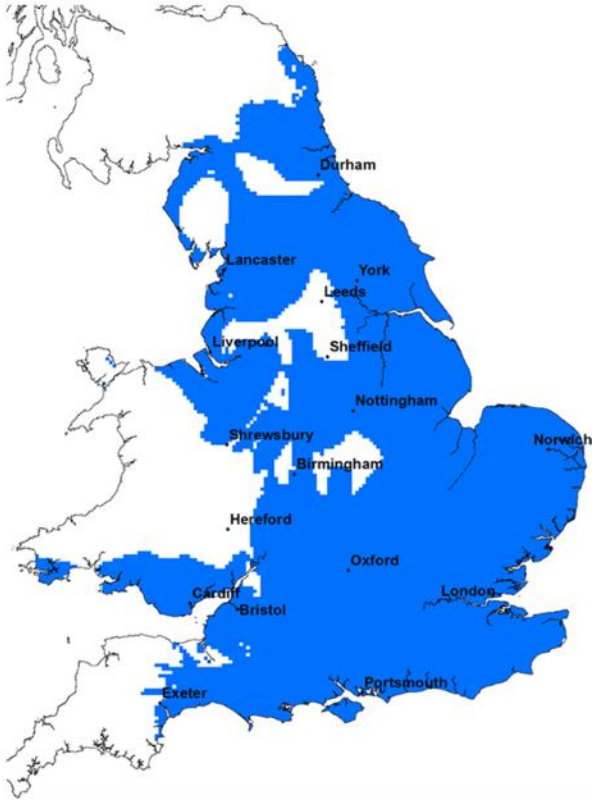
by Dr Grant Wilson grant.wilson@sheffield.ac.uk

Demand and Supply



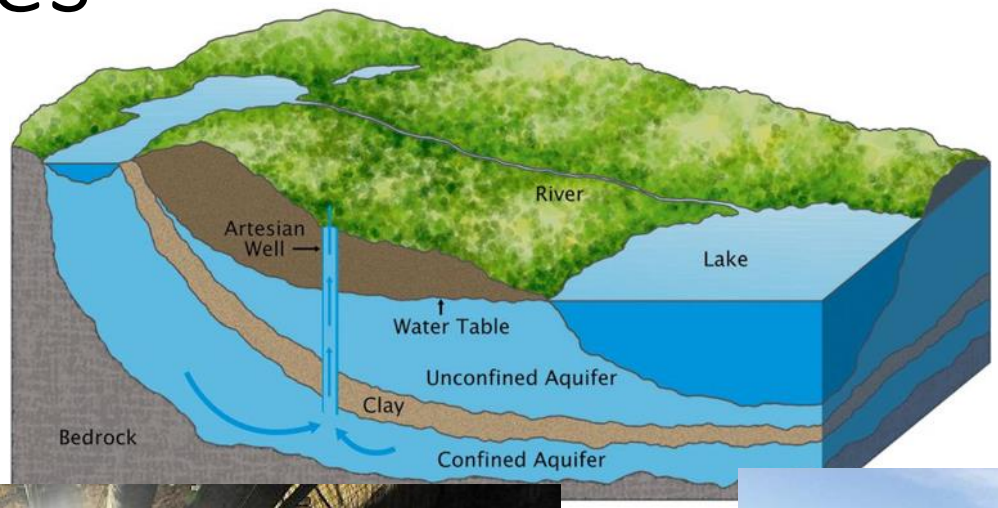
Heat demand

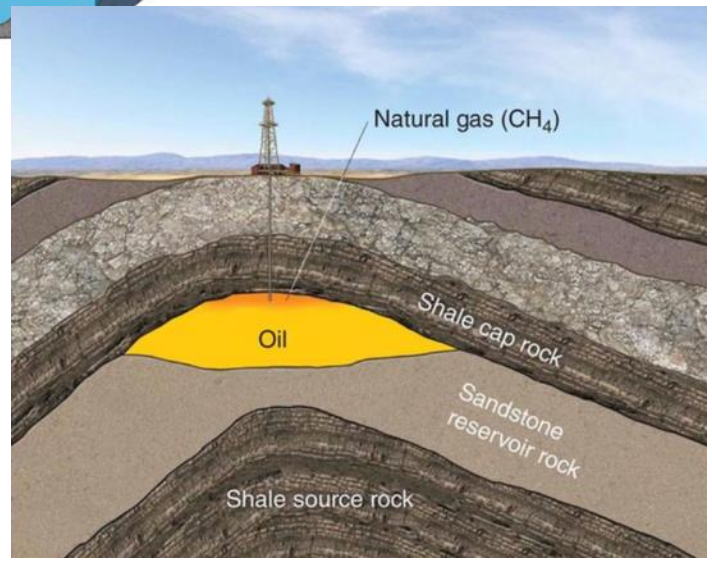
Former coal mining areas



Aquifers

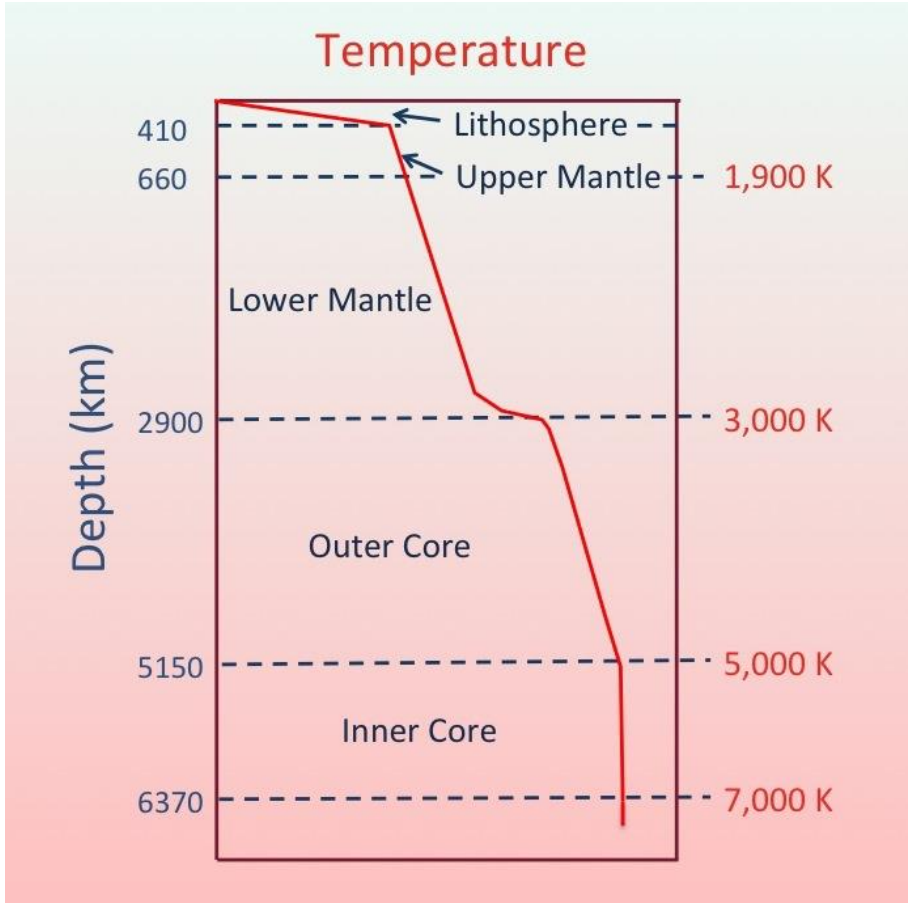
Subsurface Features

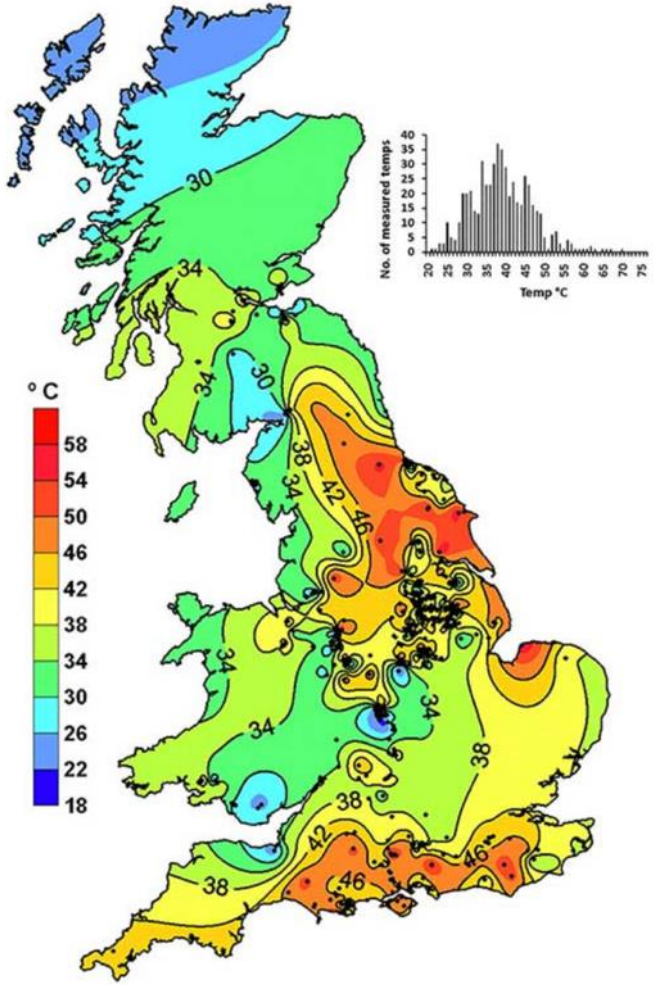




Need to be capable of storing and transmitting water

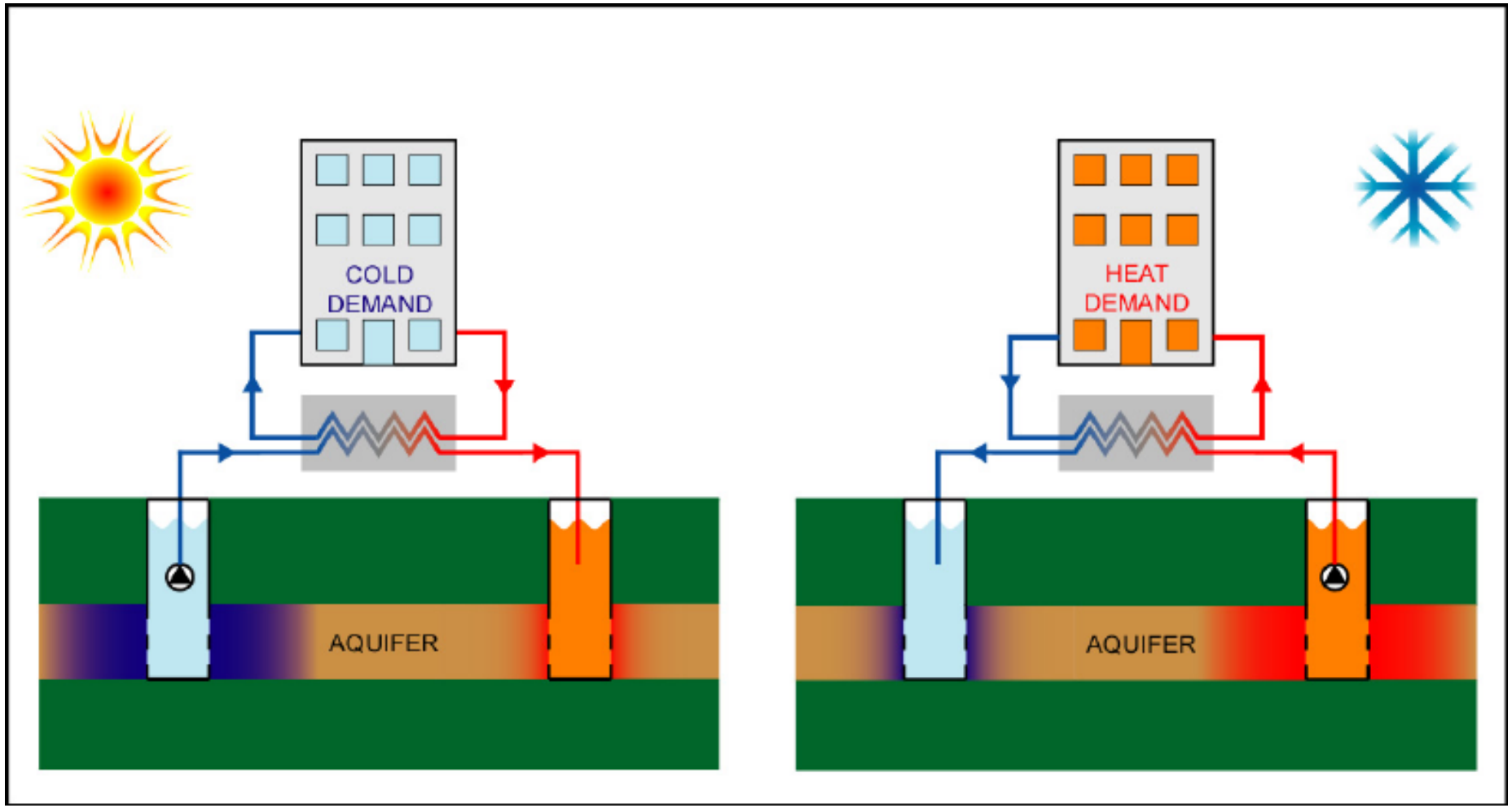
The Geothermal gradient





UK temperatures at 1km below ground from Busby et al. (2011).

Aquifer Thermal Energy Storage

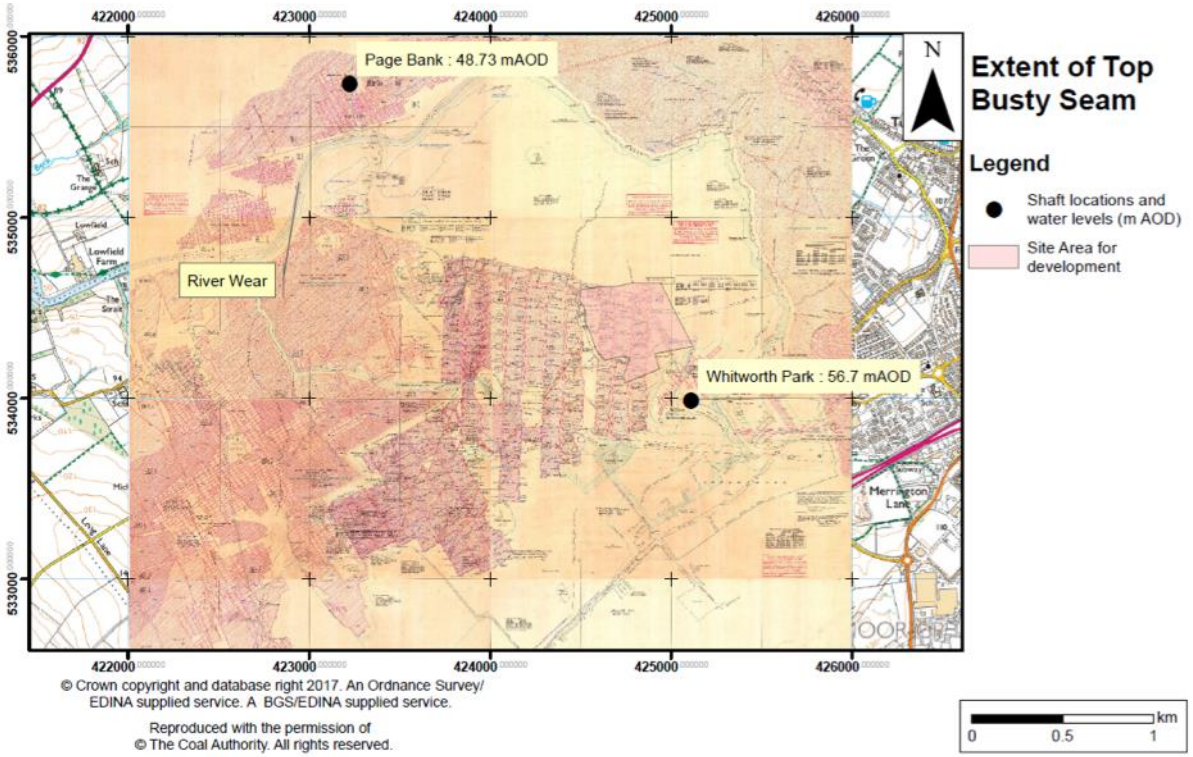


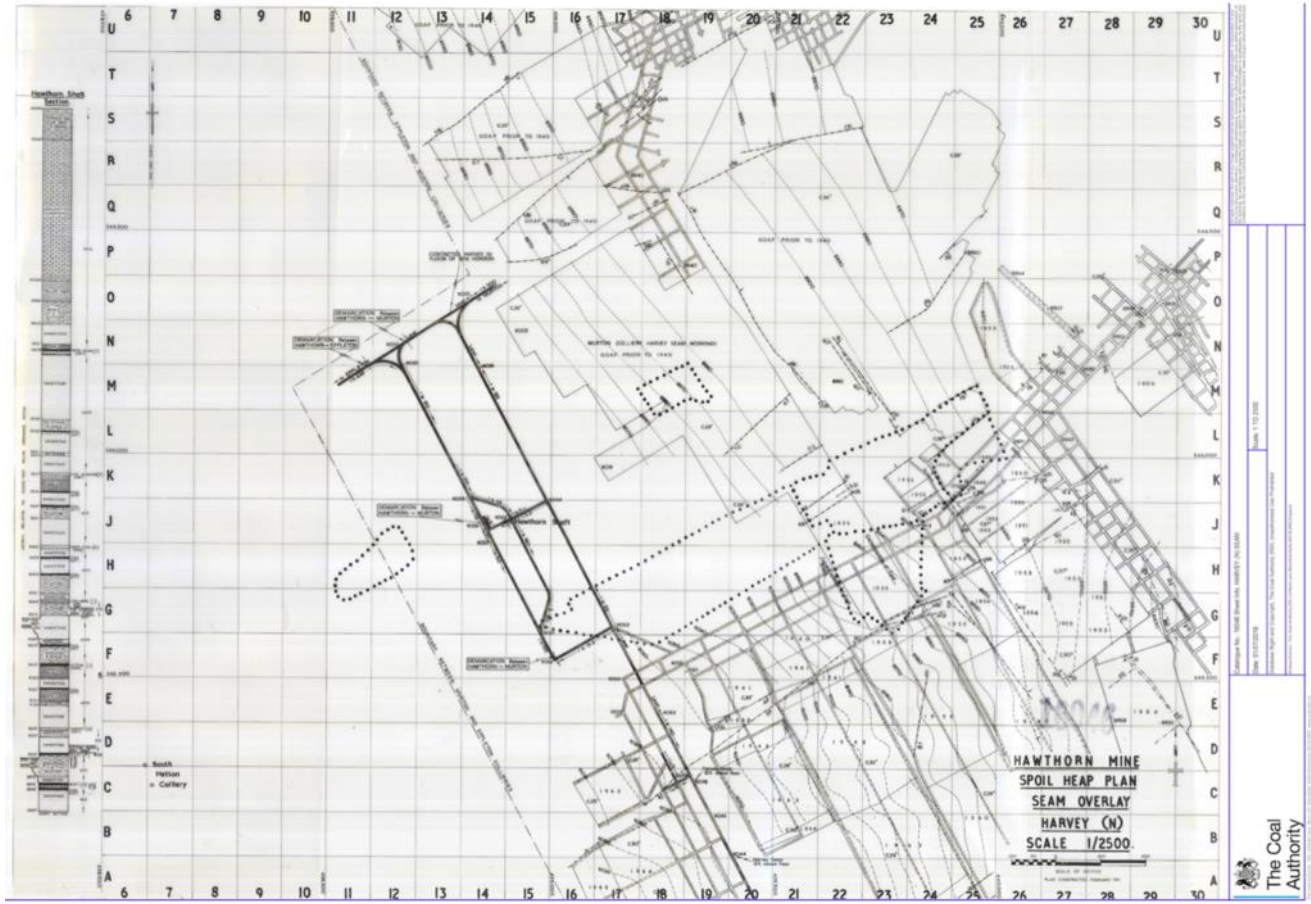
Source: Drijver and A. Willemsen 2001

Storengy ATES Geothermal at Issy Coeur Ville

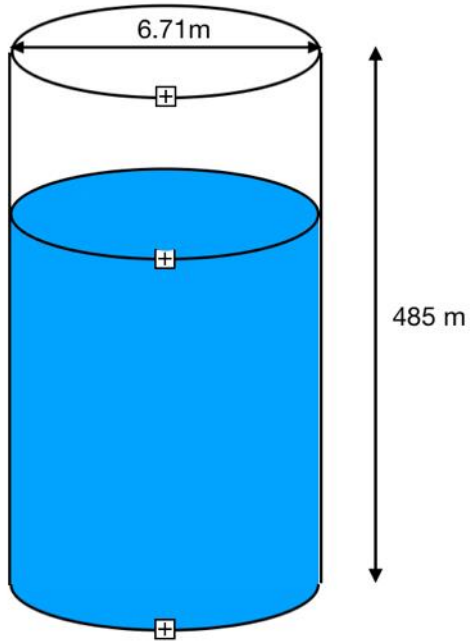
- An EcoQuarter with 95% Geothermal for Heating and Cooling - 5.2 GWh
- 40,000m^2 office space, 627 apartments, cinema and school
- 4 reversible wells 30m deep 16°C water
- Wells currently under construction, comissioning in 2021

Mine Energy Storage





Hawthorn Shaft



Shaft volume 16975m^3 = 16975000 litres

56 hours @ 83 l/s

Findings and next steps

- The subsurface has a valuable role in large scale energy storage and supply
- Available to most nations
- Capital cost of development means it is likely best suited to baseload generation
- Continuing work with CESI colleagues to integrate geothermal resource
- Test/model different storage configurations with respect to technical, economic and environmental performance

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NORTHERN POWERGRID

CESI National Centre for Energy Systems Integration

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