



The Coal
Authority

Decarbonising Heat with Disused Mines

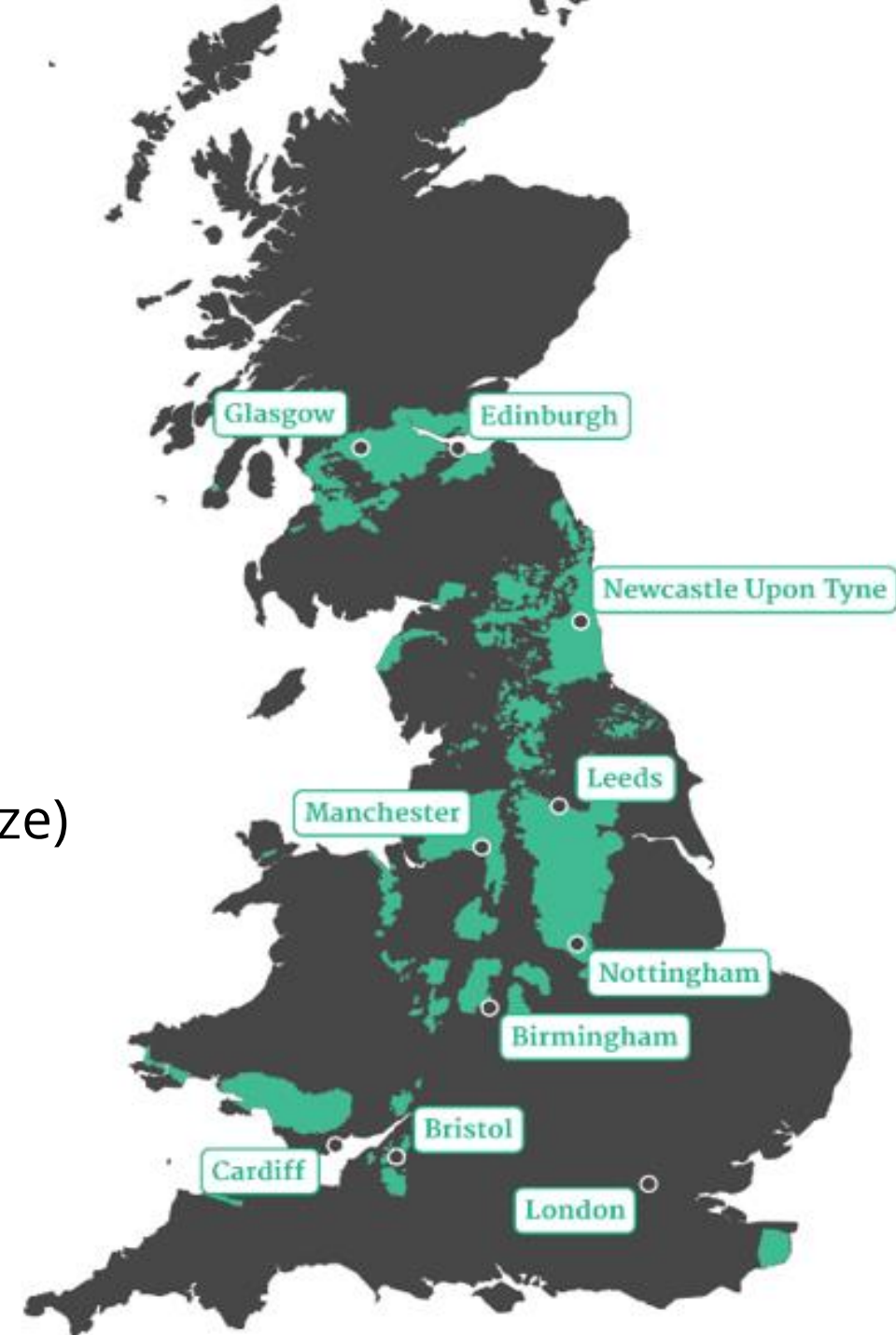
Charlotte Adams

Principal Manager Mine Water Heat



The Coal Authority

- Non-departmental Government Body
- Created by 1994 Coal Act
- Own and manage UK coal mines
- 25% of population live on coalfield
- 9 out of 10 or largest urban areas (geographical size)



The Coal Authority

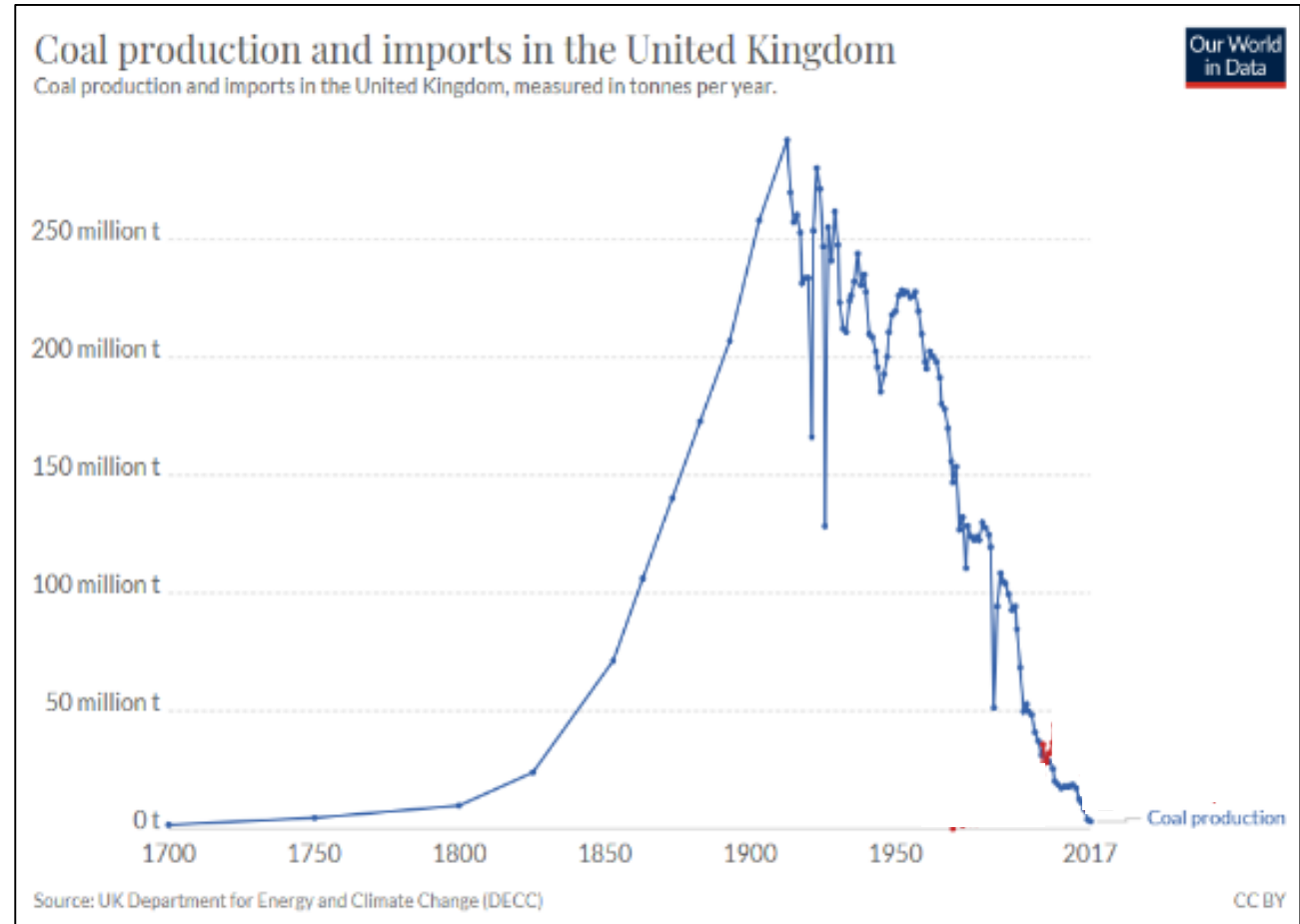


responsible for
£2.4bn
Of coal legacy
liabilities



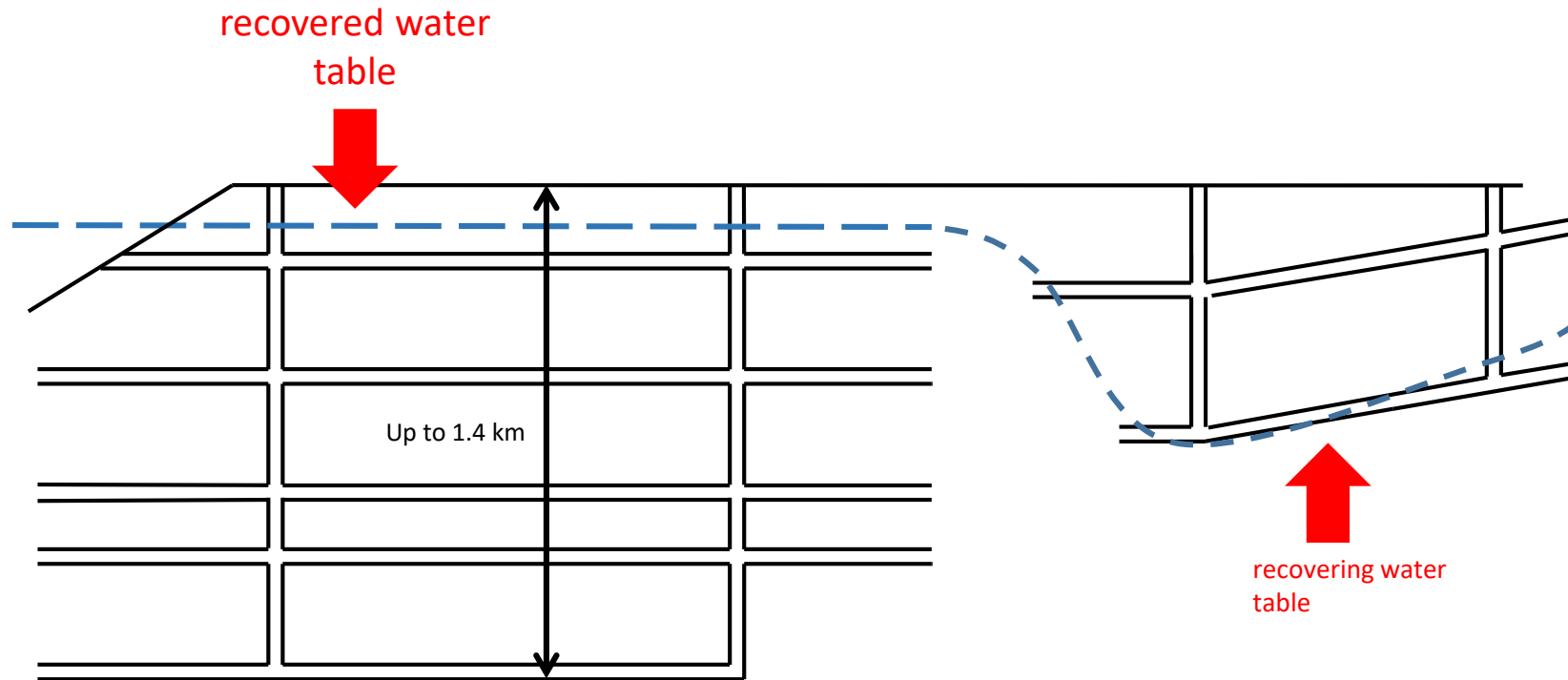
Over 400km rivers cleaned or protected – over £30million/annum aquifers protected

UK Coal Industry



17 Billion tonnes mined from 1700-2016

Mine Abandonment



Repurposing a Legacy

Water

- 122 million m³ treated per annum
 - 34% fresh
 - 38% brackish
 - 28% hypersaline
- Flood capture
- Water resilience

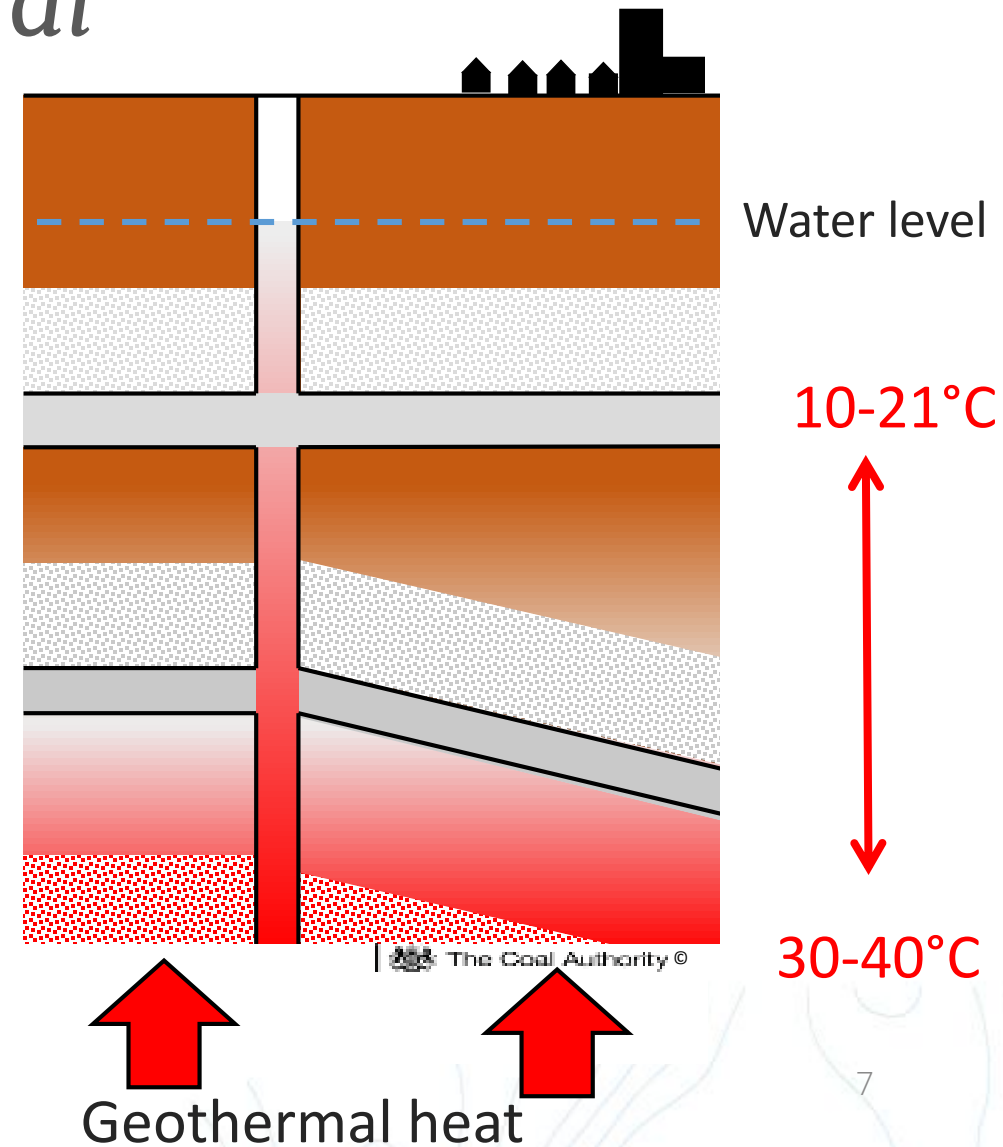
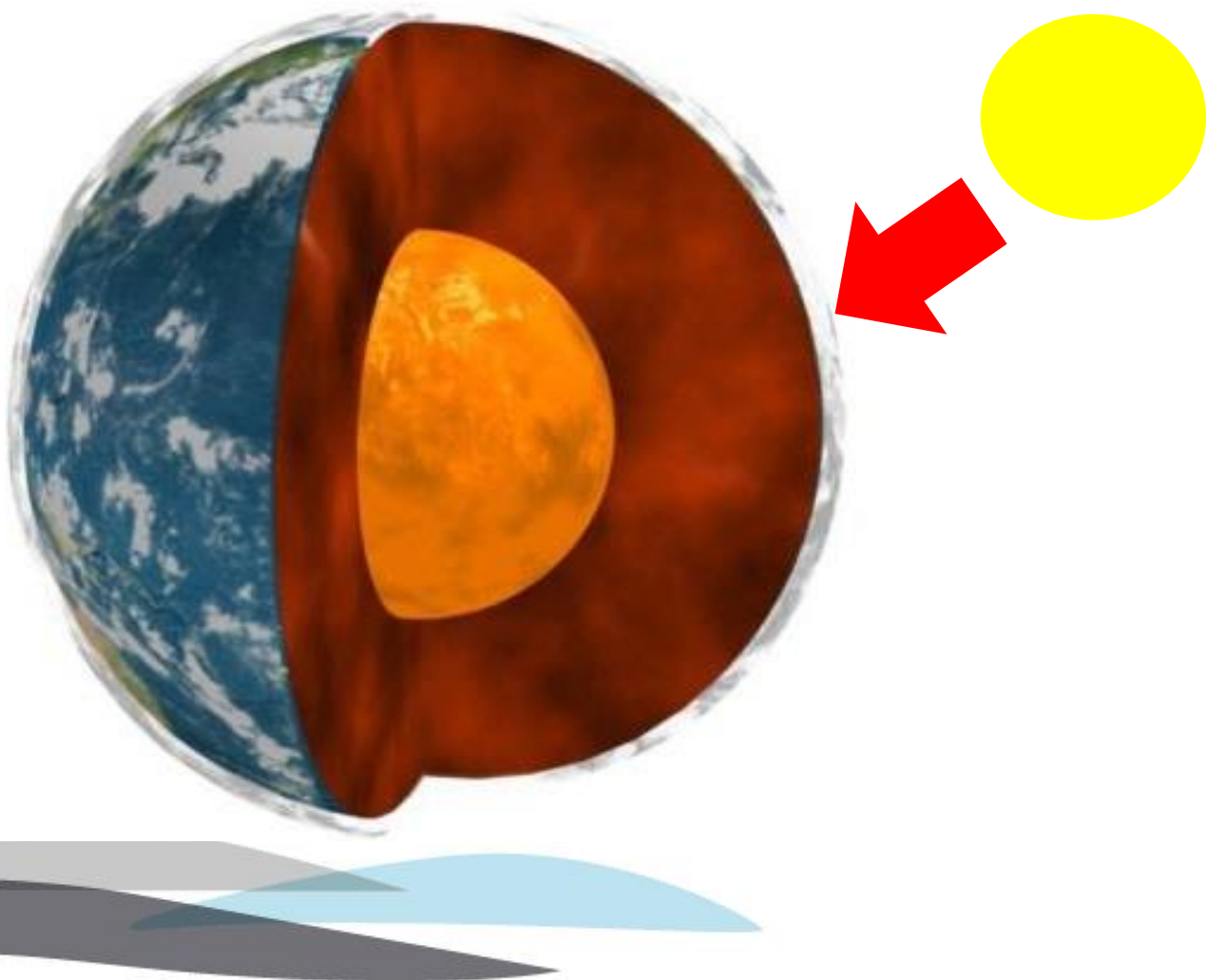
Ochre

- Produced from MWTS
- Water treatment
- Pigment
- Soil improver

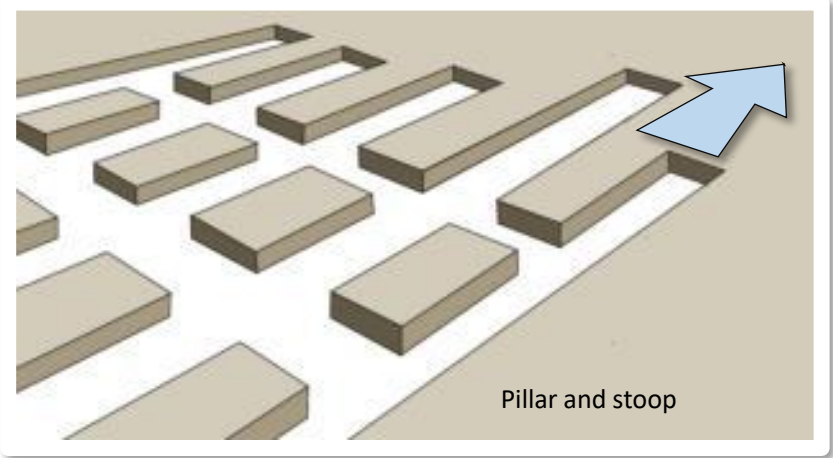
And mine water heat.....



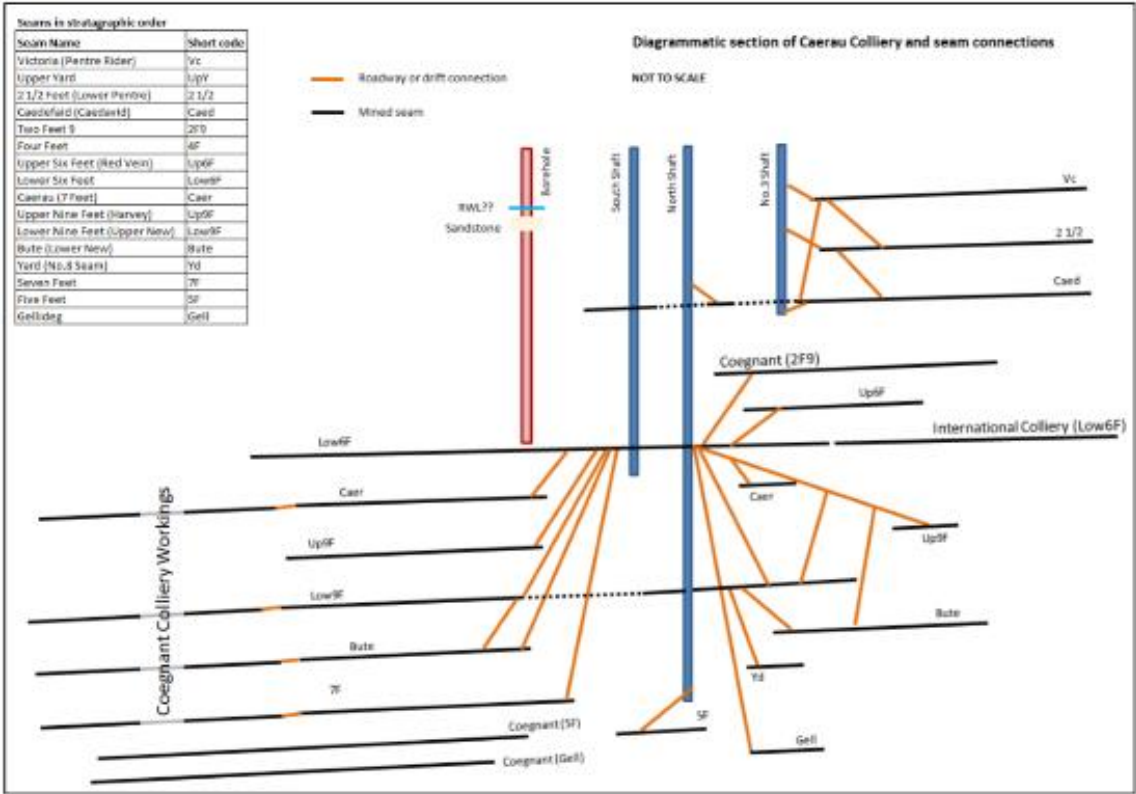
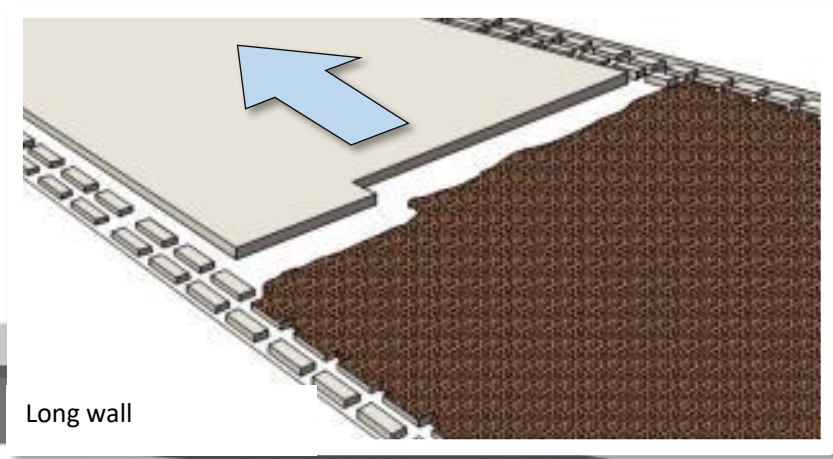
Mine Water Heat: Geothermal



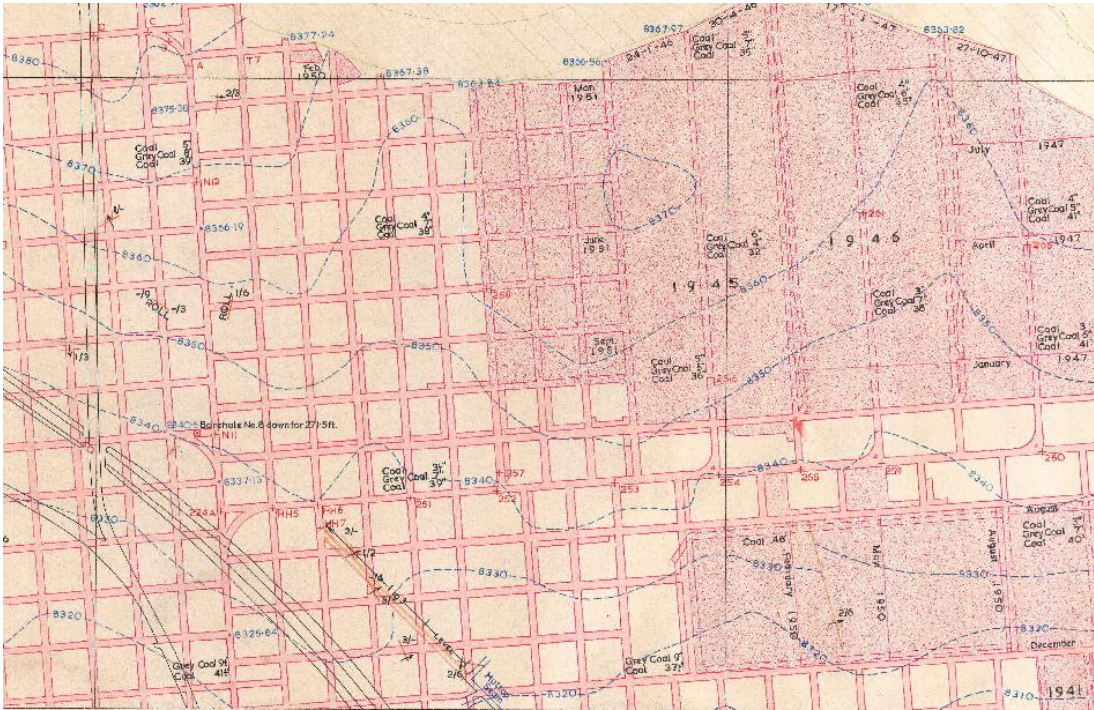
Type of Working



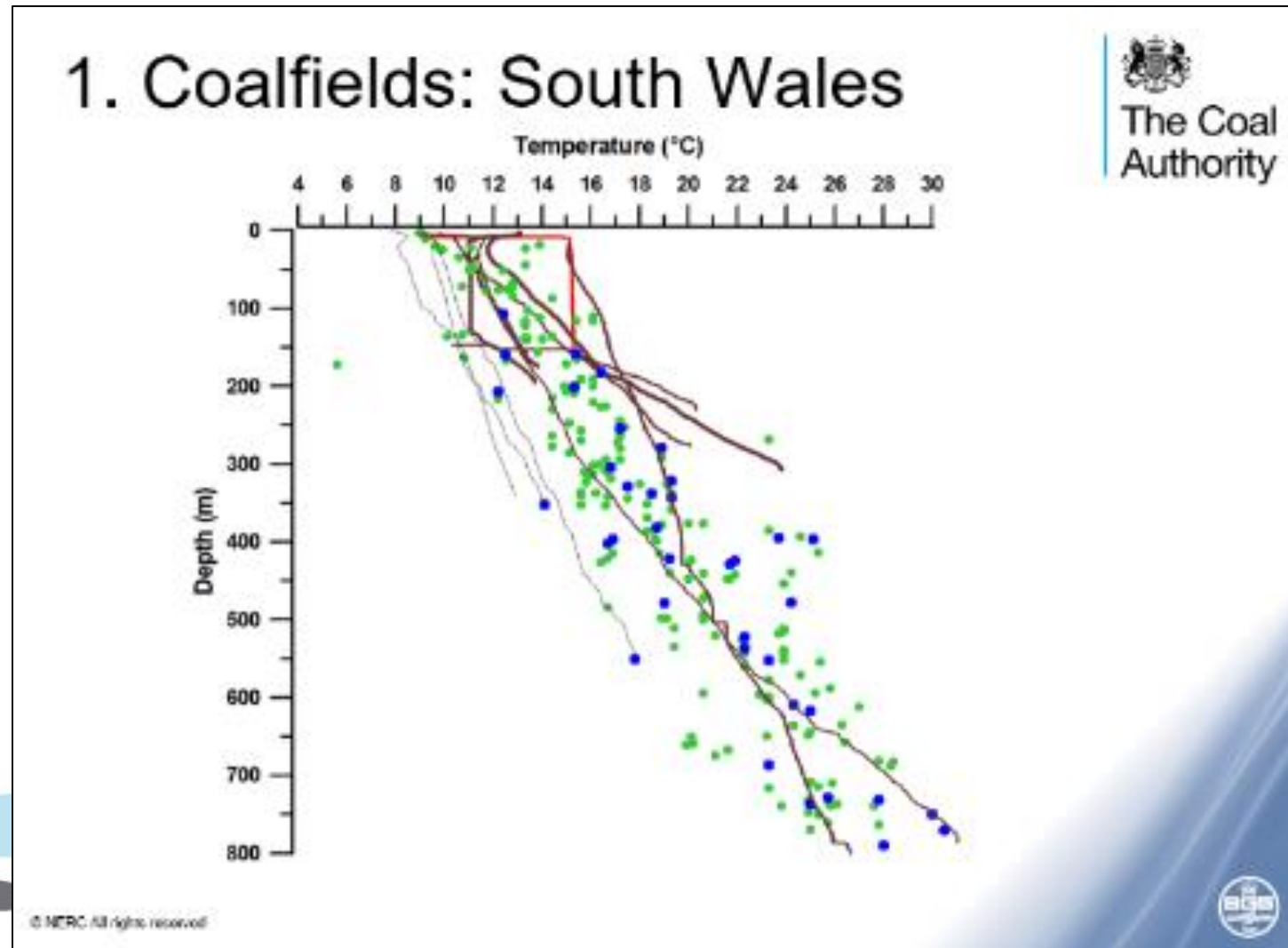
The Coal Authority ©



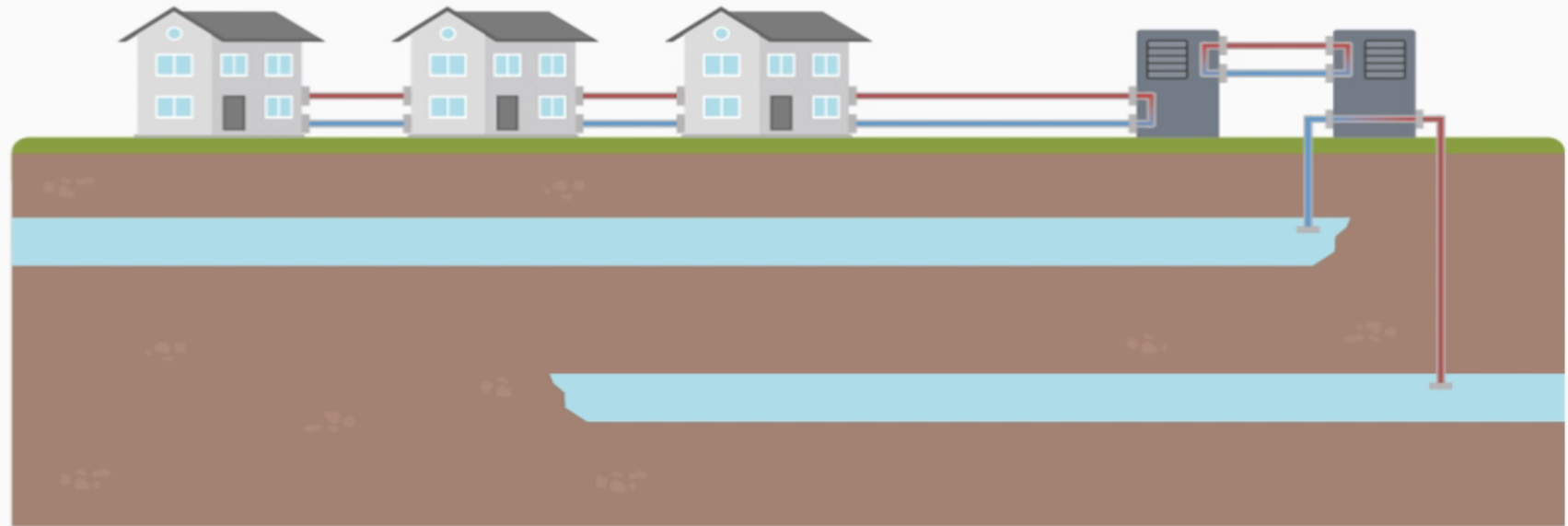
Mine Plans



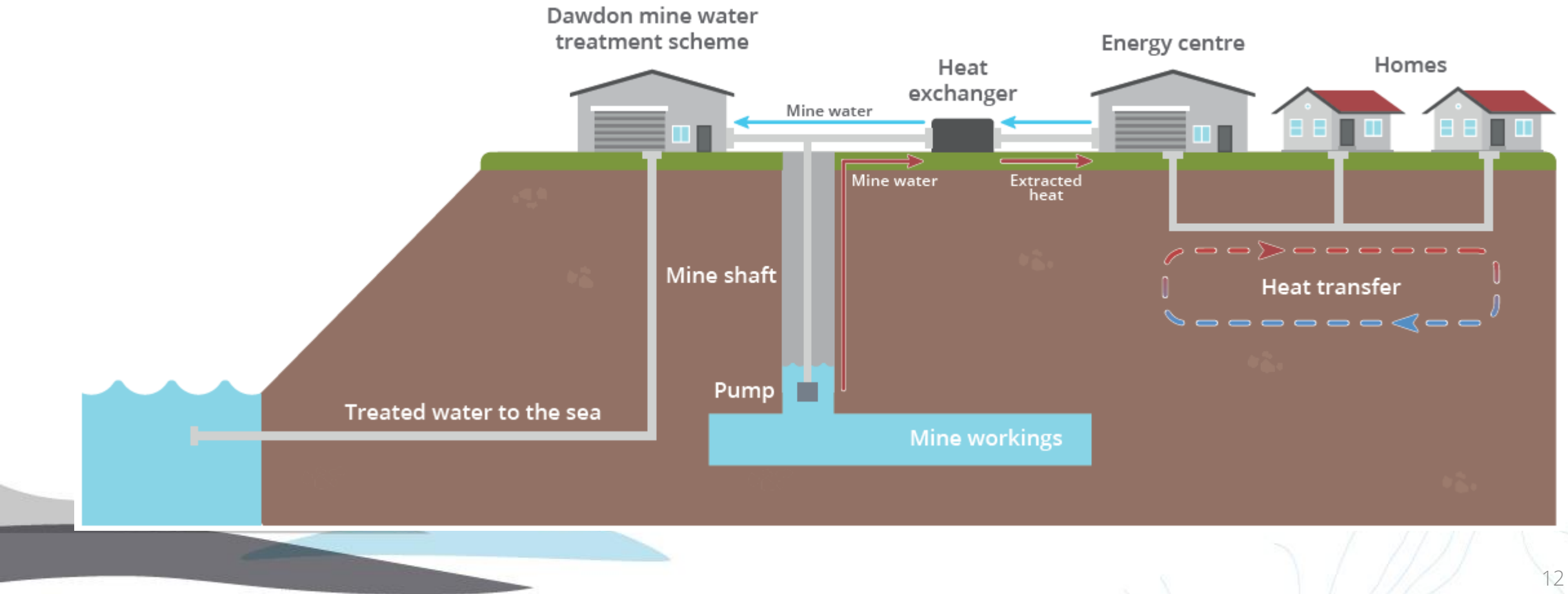
Water temperature



How does it work?



Extracting heat from mine water – bolt on



Seaham Garden Village

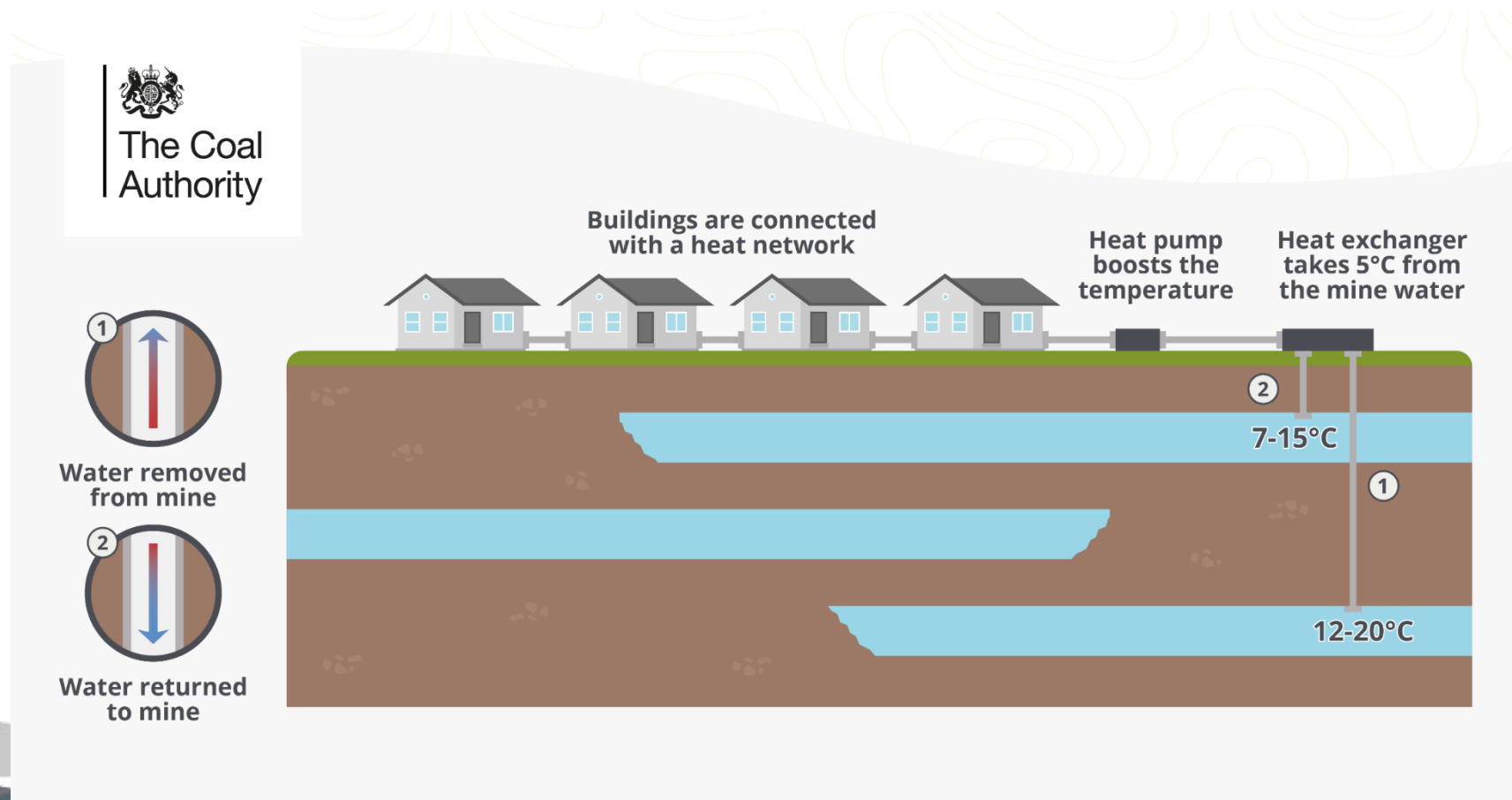


- Durham County Council
- 1,400 new homes 50-50 affordable -market
- Existing MWTS
- 2MW of heat
- Save 2,600 tonnes CO₂ per annum.



Dawdon MWTS

Extracting heat from mine water – Boreholes



Gateshead



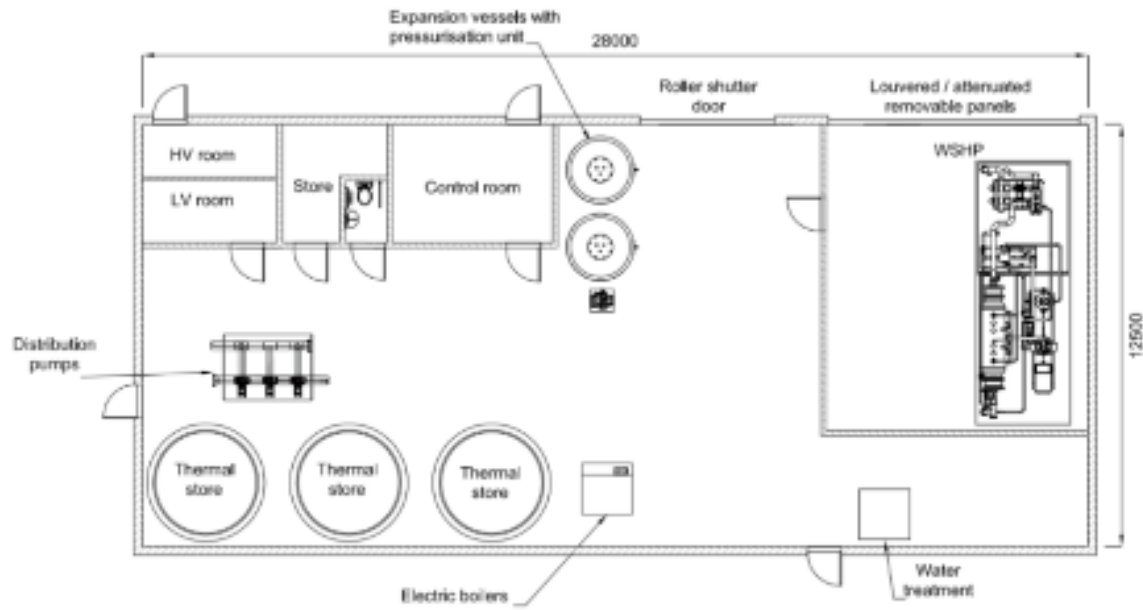
- Gateshead Energy Company
- Anticipated annual CO₂ savings 1,800 tonnes
- 1,250 homes and other buildings
- Due to be live 2022
- First mine water heat network in UK



- 2 x 150m boreholes for abstraction
- 1 x 50 m borehole recharge
- Funded by HNIP



Use in district heating



Licencing and Regulation

Environmental Regulator (EA, SEPA, NRW)

Abstraction Licence

Permit to discharge water

Coal Authority

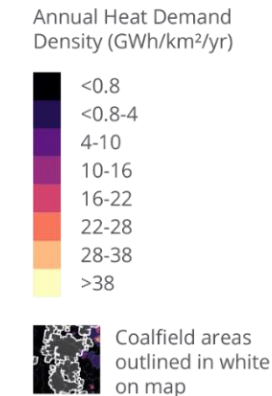
Heat Access Agreement

Permission to enter coal workings

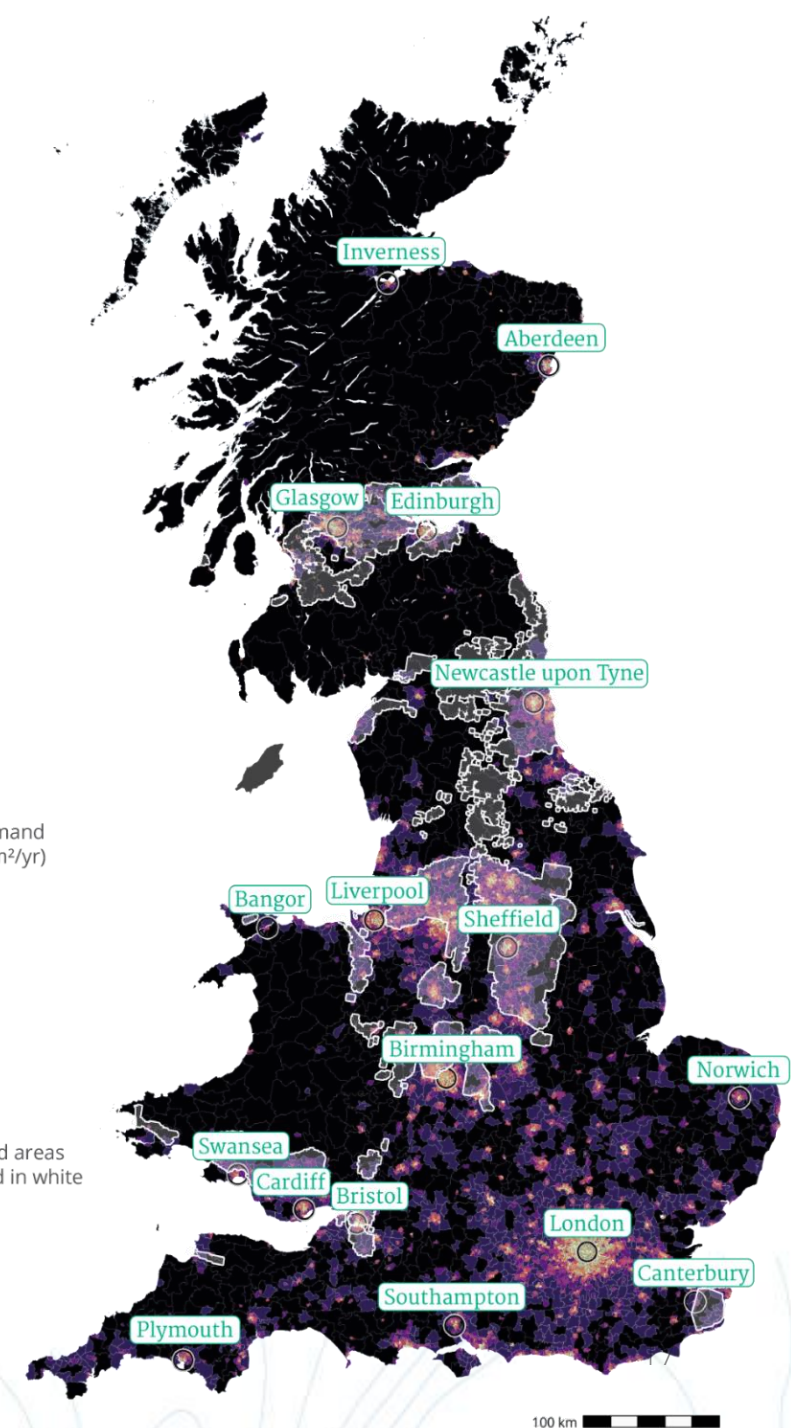
Challenges

Licencing multiple schemes in proximity

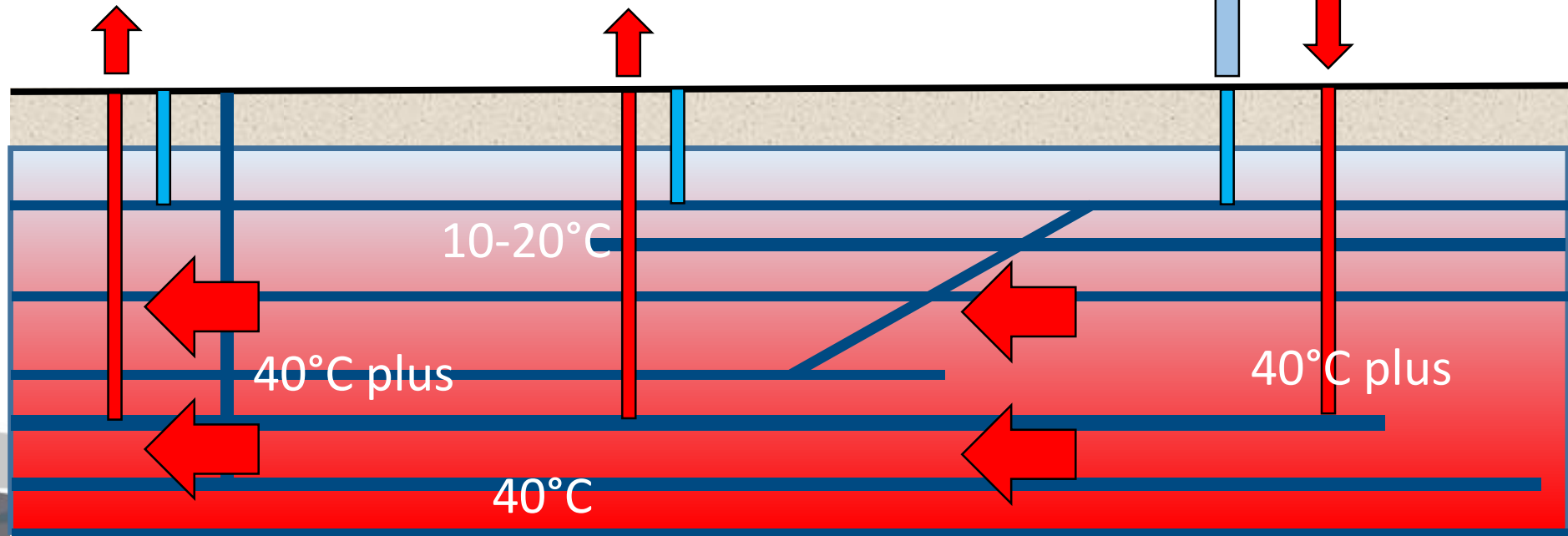
Thermal interaction of schemes



Heat demand map taken from BEIS' 2021 study, Opportunity Areas for District Heating Networks in the UK. Map shows demand by Middle Layer Super Output Area (England and Wales), Intermediate Zone (Scotland). Contains OS data © Crown copyright and database right 2021. Made with Natural Earth. Free vector and raster map data @ naturalearthdata.com.



Mine energy R&D



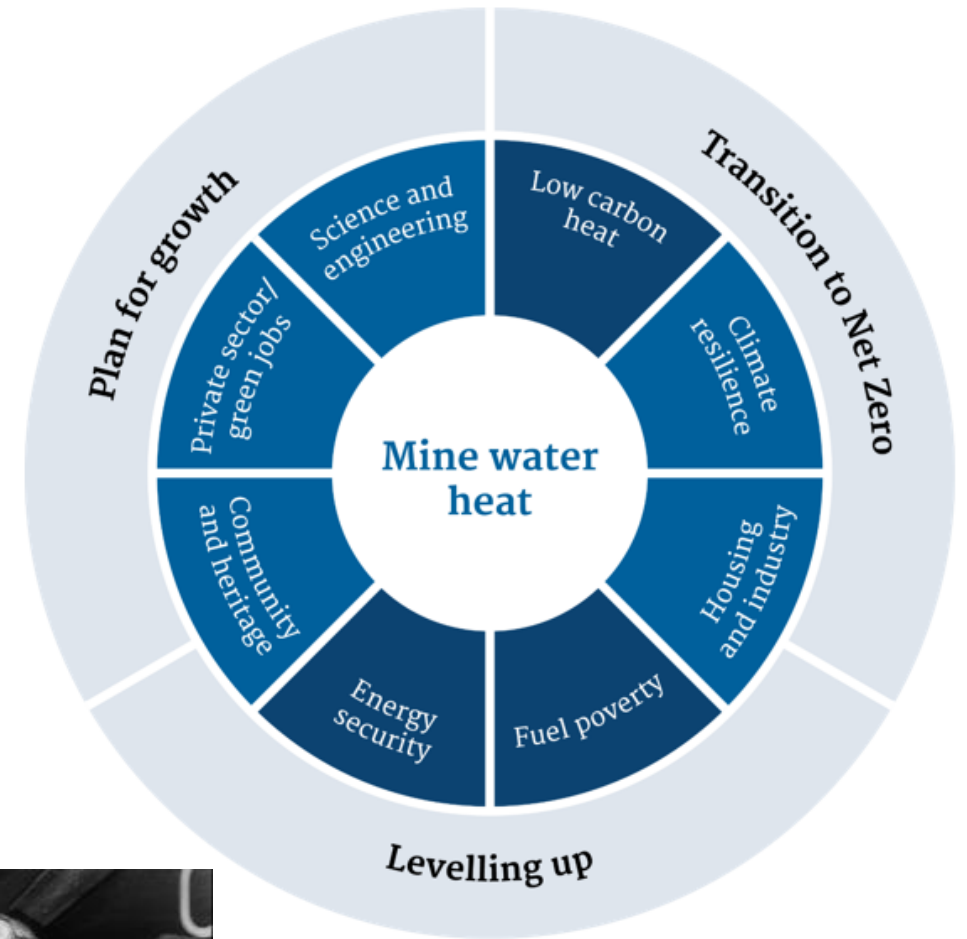
Partnership Working

- NE has become a focus for mine water heat
- 1 operational project, 4 more underway
- Support from BEIS, NELEP, Academic Institutions, Environment Agency, Local Authorities, Mine Energy Task Force
- Mine Energy White Paper
- Media attention



To Conclude

- Aligns with many government strategies
- Uses available technology
- Region has a long history of mining and energy innovation
- An opportunity to repurpose a legacy
- Share with other mining regions as part of just transition
- One size does not fit all





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Thank you

charlotteadams@coal.gov.uk

