



The Coal  
Authority

# *Mine Water Heat Opportunities for UK Coalfields*

Dr Charlotte Adams

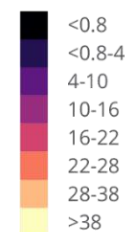
Principal R&D Manager Mine Water Heat




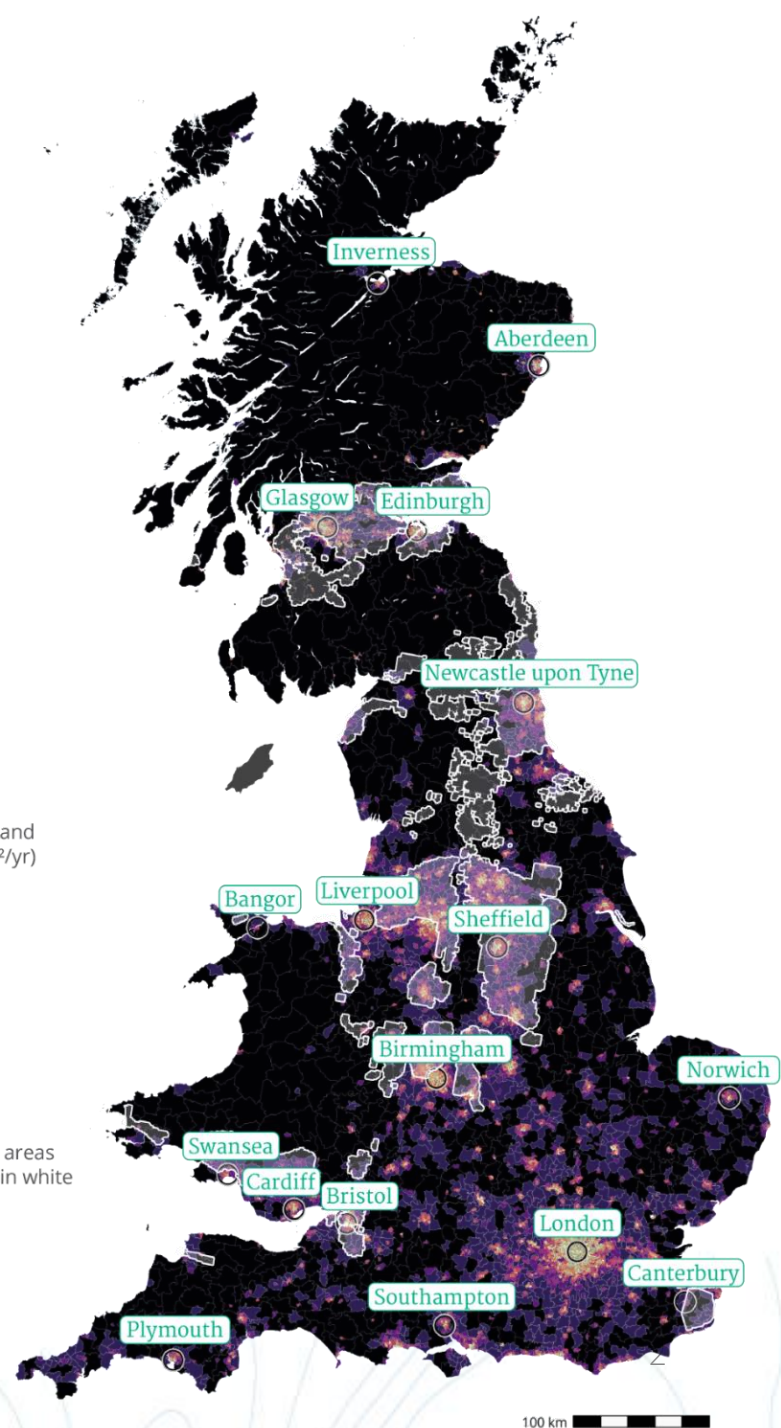
# Role and Opportunities

- *Non-departmental Government Body*
- *Created by 1994 Coal Act*
- *Coal Authority own and manage UK coal mines*
- *9:10 largest urban areas underlain by coalfields (geographical size)*
- *Repurposing and legacy*

Annual Heat Demand Density (GWh/km<sup>2</sup>/yr)



 Coalfield areas outlined in white on map



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.

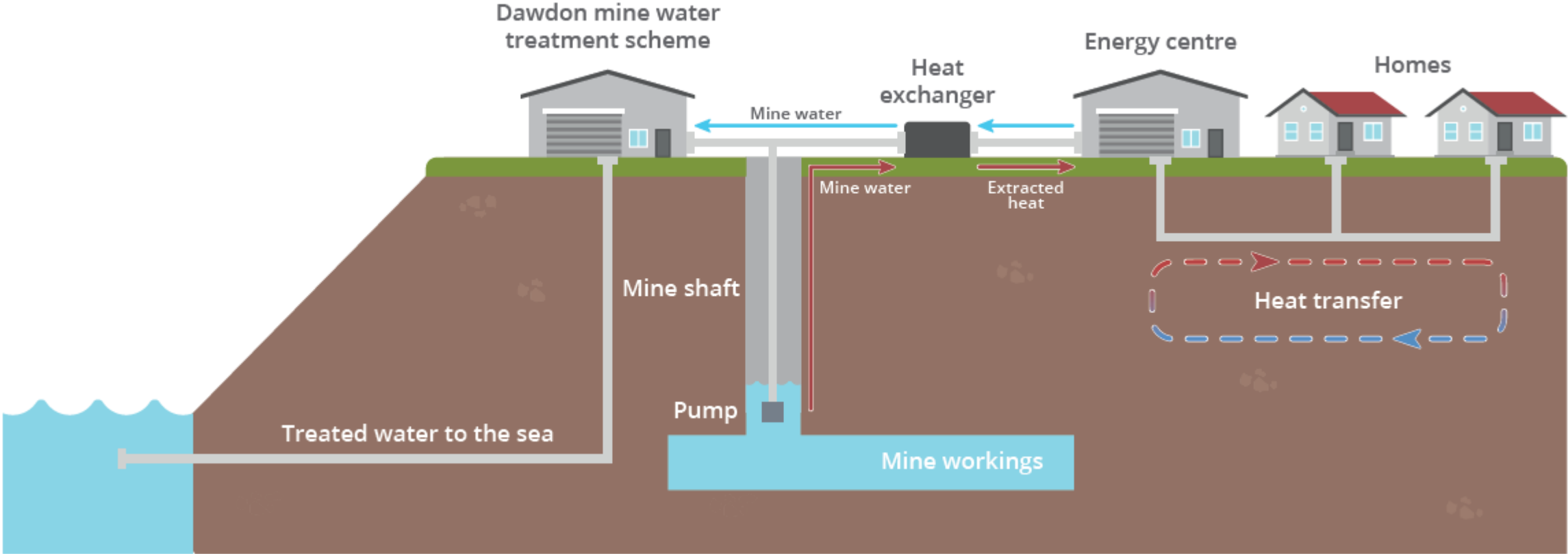
# *Our Responsibilities*



responsible for  
**£2.4bn**  
Of coal legacy  
liabilities



# Accessing Mine Water – Bolt On



# Accessing Mine Water - Boreholes



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Buildings are connected with a heat network

Heat pump boosts the temperature

Heat exchanger takes 5°C from the mine water



Water removed from mine



Water returned to mine



# *Gateshead and Living Lab*

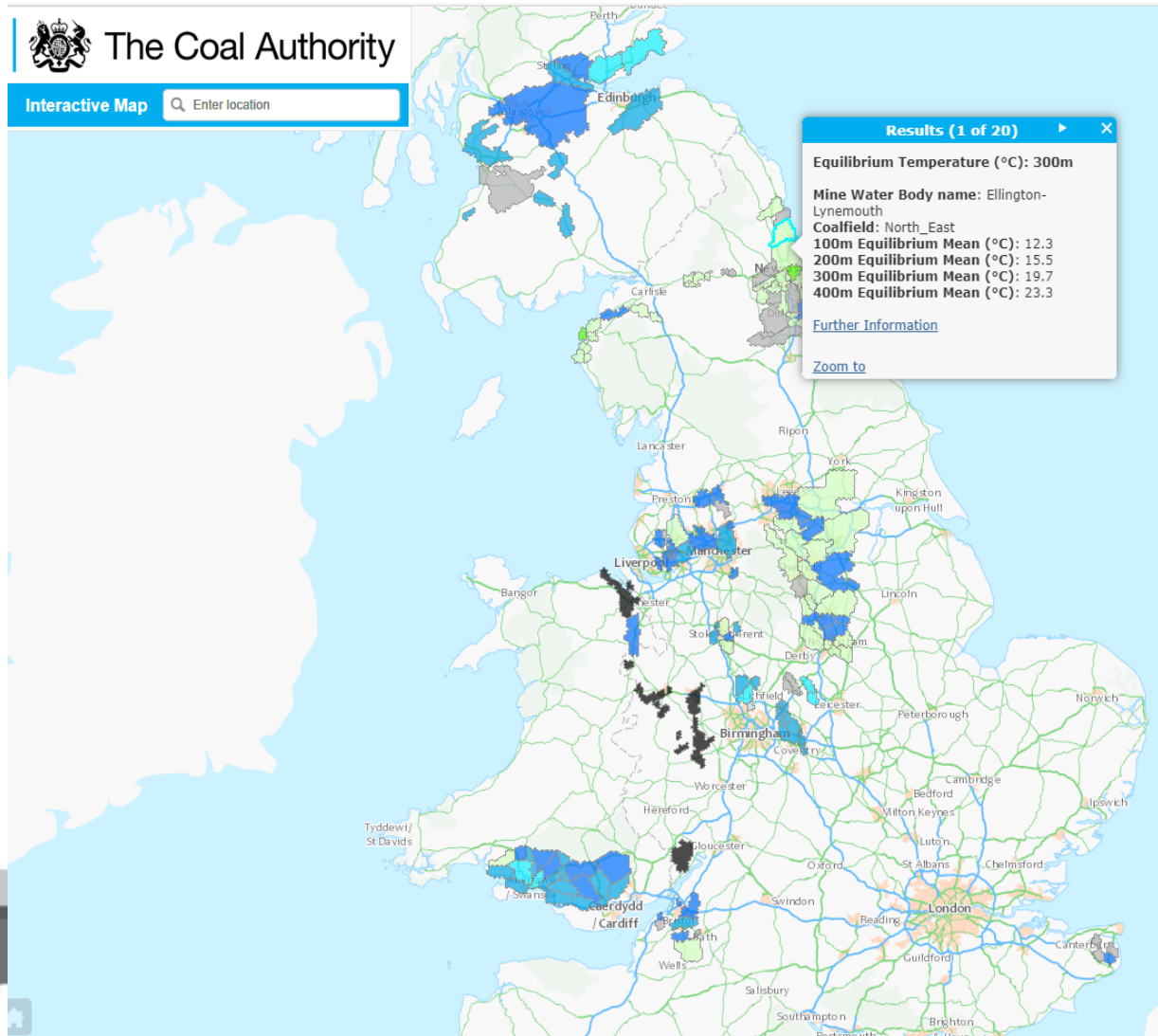


- Gateshead Energy Company
- Anticipated annual CO<sub>2</sub> savings 1,800 tonnes
- 1,250 homes and other buildings
- Due to be live 2022

- 2 x 150m boreholes for abstraction
- 1 x 50 m borehole recharge
- Funded by HNIP
- First mine water heat network in UK



# Interactive Viewer



- Criteria for an opportunity
- Level and depth of mine workings
- Mine water levels, quality and temperature
- Surface mine water discharge points
- Overall feasibility (desk based)
- Age and quality of plans
- Local geology

# *Regulation and Licensing*

## **Environmental Regulator (EA, SEPA, NRW)**

Abstraction Licence

Permit to discharge water

## **Coal Authority**

Heat Access Agreement

Permission to enter coal workings

## **R&D Challenges**

Licensing multiple schemes in proximity

Thermal interaction of schemes

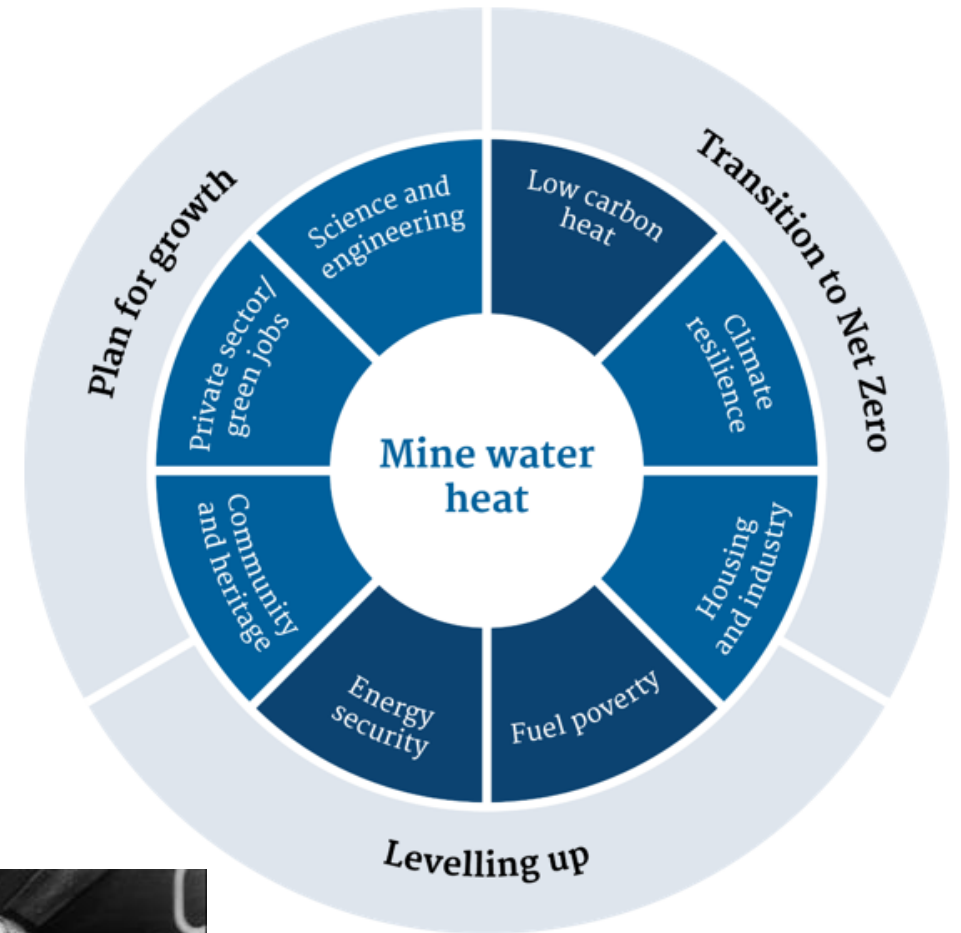
Who owns heat?





# To Conclude

- Aligns with many government strategies
- Low carbon and uses available technology
- 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*

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