



Implementing the Government's Heat Strategy: What it means for deep geothermal energy

Heat Strategy and Policy Team

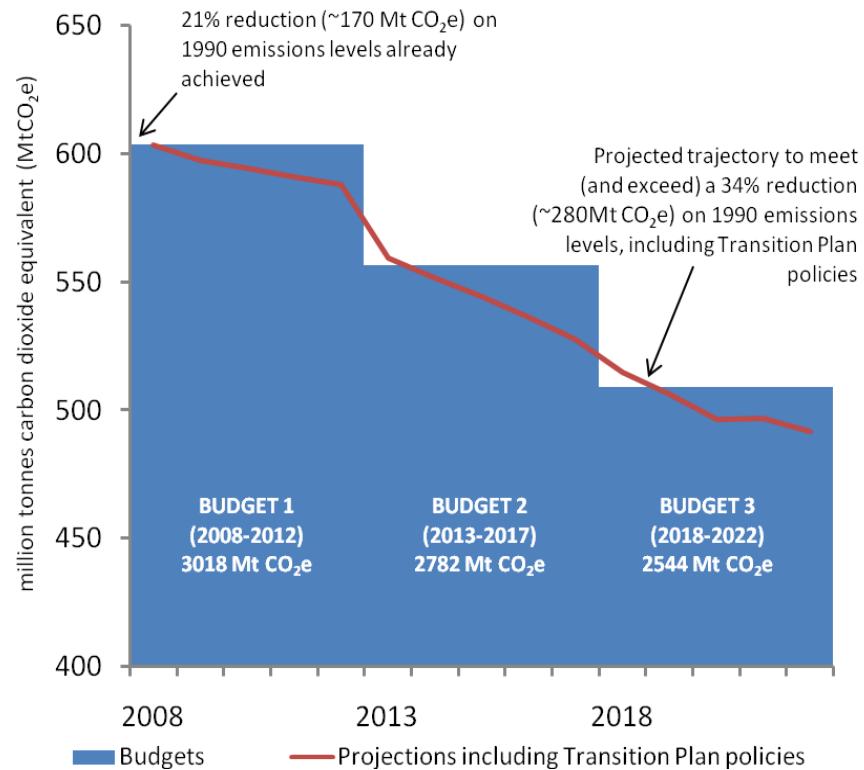
October 2014

Heat is the single biggest reason we use energy in our society



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- 47% of final energy consumed in UK is used to generate heat for domestic, commercial and industrial purposes
- Around a third of the UK's carbon emissions come from the energy used to produce heat
- Around 80% of all the heat used in the UK – in homes, businesses and industry – comes from fossil fuels



We started with a Strategic Framework for Heat and then turned this into a plan of action..



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March 2012

The Future of Heating:
A strategic framework
for low carbon heat in
the UK



March 2013

The Future of Heating:
Meeting the Challenge



March 2013



The transition to low carbon heat for buildings: the role of heat networks

UK Housing Stock

Dense Urban
22%



In all locations and building types, continue to drive down demand for heat through increasing thermal efficiency and influencing consumer behaviour.

We should facilitate heat networks in denser urban areas where there is limited space for heat pumps. Storage on the networks will help with grid balancing that could be a major barrier to building-level renewable heat dependent on electricity

Suburban
59%

Suburban areas are potentially last on our list, with high efficiency condensing boilers remaining a useful transitional technology into the 2030s

Gas used for heating in more efficient systems such as gas absorption heat pumps....

....and hybrid systems that comprise boilers and electric heat pumps

Rural
19%

High electric heat pump penetration faces fewer barriers in homes that are less clustered, starting with buildings off the gas grid which are more likely to have space and be using expensive, high carbon forms of fuel such as heating oil

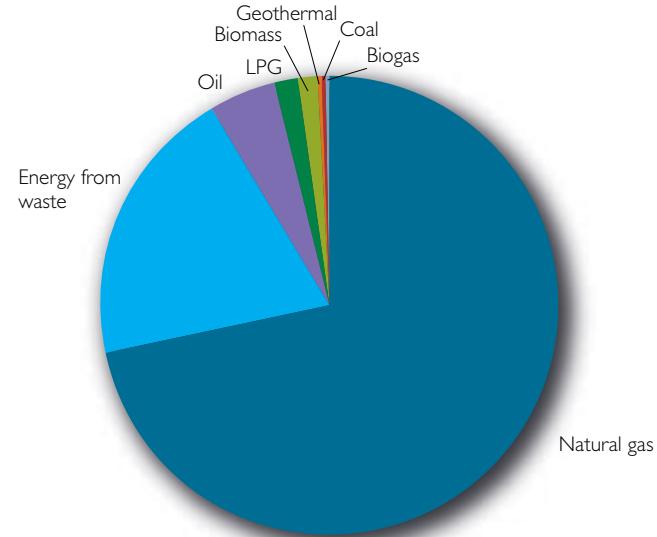
Significance for deep geothermal? Heat Networks provide the ‘demand-side’ for a deep geothermal project.



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NOW

- 2000 networks in the UK;
- 2% of domestic, public and commercial heat demand

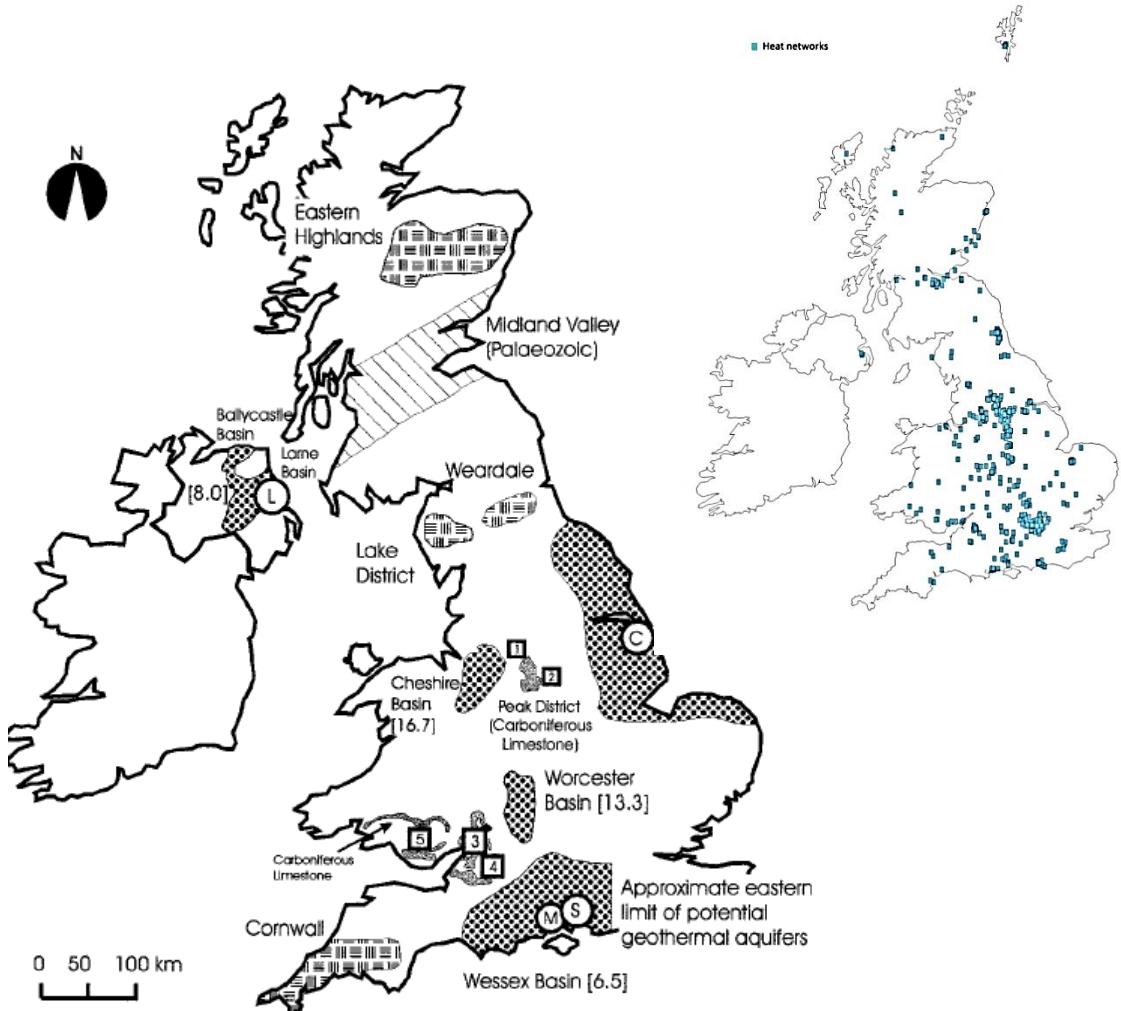


FUTURE

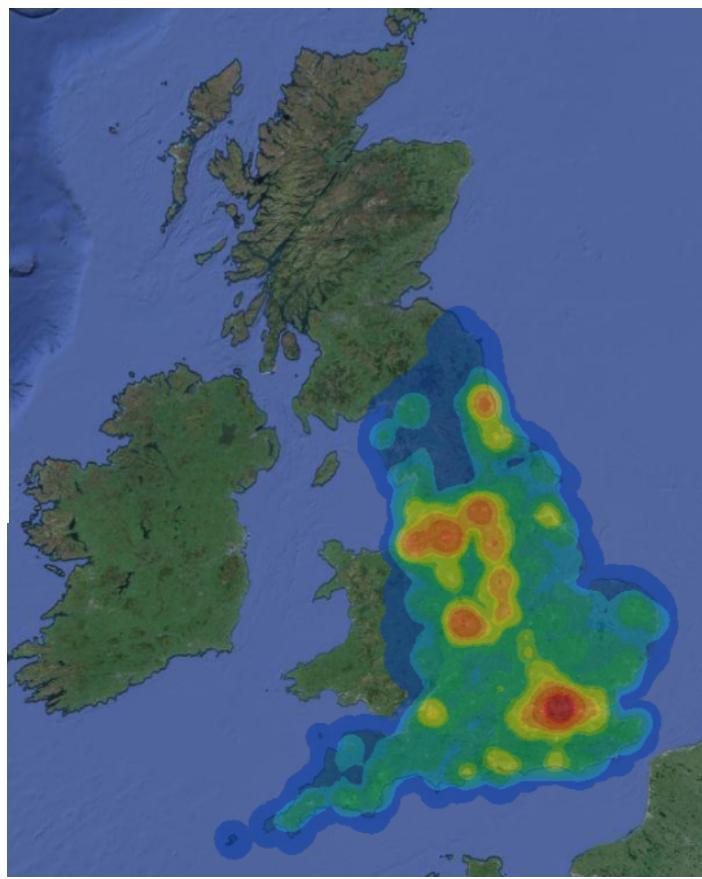
- Poyry (2009) heat networks could meet between 6% to 14% national heat demand
- ETI (2013) up to 43% of the current GB-buildings heat market can be connected economically to heat networks
- By end 2015 revised assessment of heat network potential will be undertaken through National Comprehensive Assessment



In the UK, geothermal energy can be a good geographical fit with heat demand



Source: Hydrogeothermal Studies in the United Kingdom



Source: CSE/DECC National Heat Map



Aside from geography, why is geothermal energy a good fit for heat networks?

- Renewable heat source (although we are supporting the development of all heat networks now but these must move to low carbon sources over time)
- Heat networks are heat source agnostic – ‘transmission technology’
- Marrying potential supply with heat loads (cost of transporting heat)
- Geothermal offers baseload supply
- Security of supply and security of demand
- Can be located in city centres – Southampton and Toys R Us Car park – unobtrusive, low visual and noise impacts (aside from drilling phase)
- Heat storage and heat networks – integral to deep geothermal projects



Supporting the development of geothermal heating networks

On the demand side: heat networks

- Heat Networks Delivery Unit
- Pioneer cities and City Deals
- New regulations and industry led measures to support sector and sector's consumers – consumer protection, implementing the Energy efficiency Directive, and a code of practice on g technical standards

On the supply side: geothermal heat generation

- RHI
- Underground access
- IEA-GIA

Some initiatives bridge both demand and supply

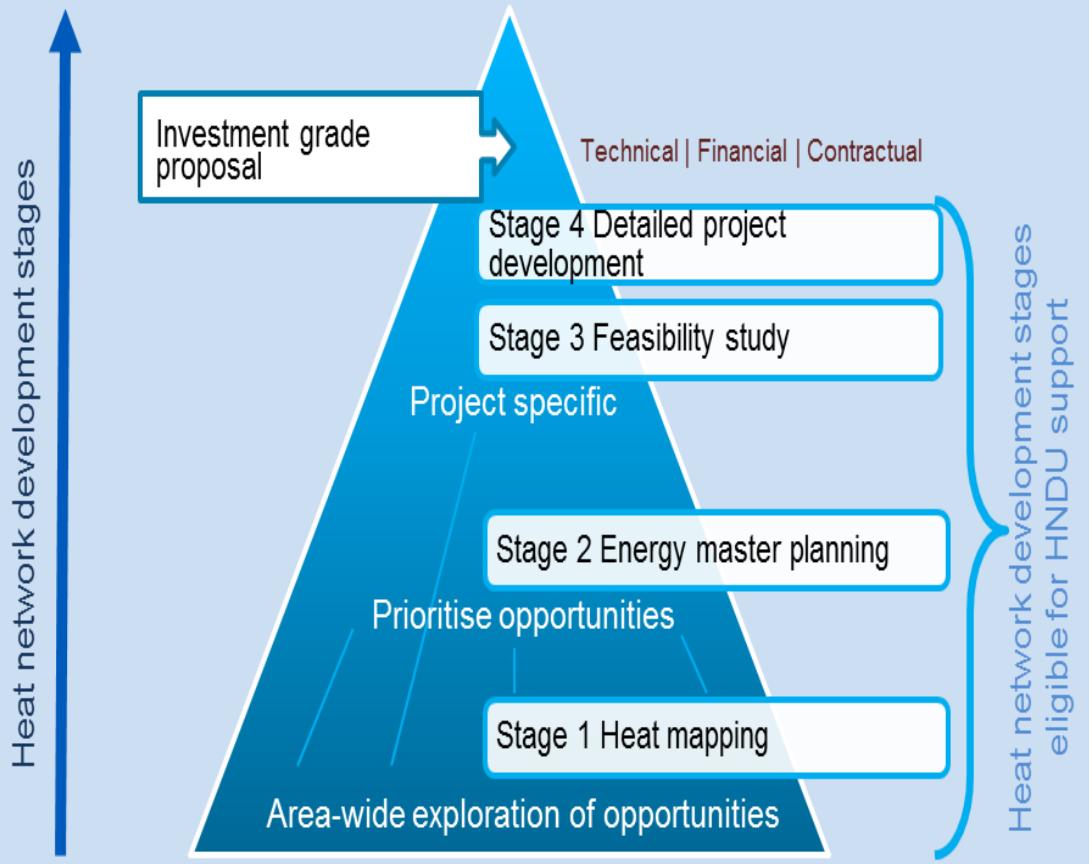
- Innovation funding
- National Heat Map 2

Demand side: Heat Network Delivery Unit: support for Local Authorities



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The HNDU offer



The results

Since September 2013 three rounds of the HNDU support programme have delivered;

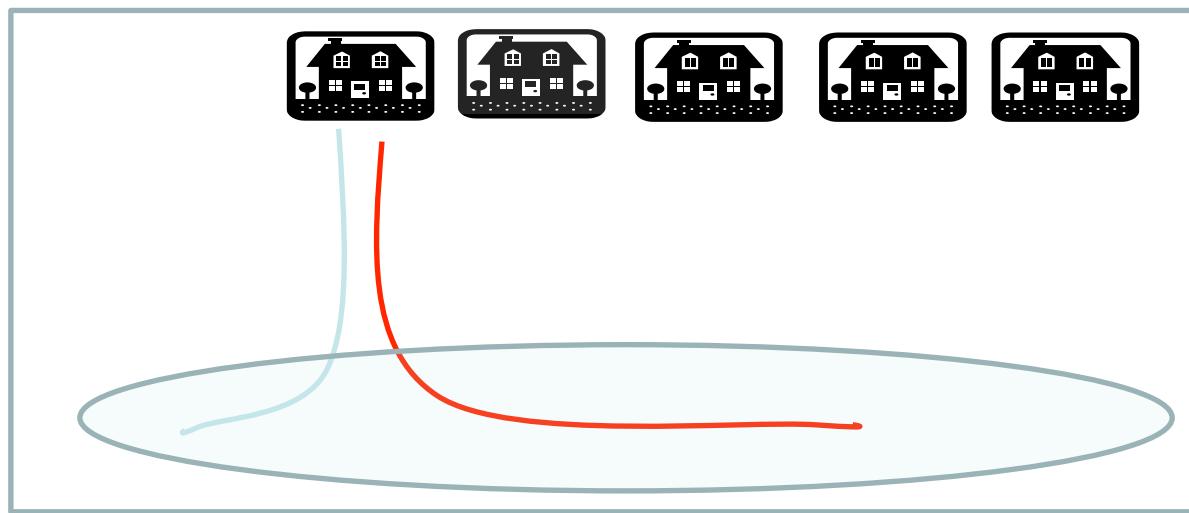
£7.1 MILLION has been awarded to over **80 LOCAL AUTHORITIES** for over **120 HEAT NETWORK PROJECTS** and a further **11 LOCAL AUTHORITIES** are receiving specialist support and guidance

9 LOCAL AUTHORITIES ARE INTERESTED IN DEEP GEOTHERMAL OR MINE WATER HEAT RECOVERY



Supply side: underground access

- Critical issue for deep geothermal schemes supplying heat networks. Directional drilling and numbers of landowner permissions required to gain necessary access, potentially running into thousands of landowners
- Infrastructure Bill: Draft clauses are being introduced to enable deep geothermal developers to drill in this way, subject to a requirement to notify and compensate local communities (£20k per lateral well and applies at depths greater than 300m).





The role of innovation funding

Past.....DECC Deep Geothermal Challenge Fund supported projects like test boreholes for example at Eastgate, Weardale



Present..... DECC Entrepreneurs Fund supporting Geothermal Engineering Limited in developing a single borehole heat only technology at Rosemanowes, Cornwall



Future: Heat Networks Demonstration project

<https://www.gov.uk/innovation-funding-for-low-carbon-technologies-opportunities-for-bidders> and future rounds of Entrepreneurs Fund:

Mapping future potential: Developing National Heat Map 2

- Meet the requirements of Article 14 of the Energy Efficiency Directive to show heating and cooling demand and supply points, and existing and planned district heating and cooling infrastructure
- Will support the Article 14 requirement for a National Comprehensive Assessment of the potential of heating and cooling demand and how this will change in the next 10 years
- Will include revised baseline demand data
- **Will include a number of additional layers, including a geology layer to support deep geothermal developments**
- Be extended to cover Wales and Northern Ireland
- Govt must submit National Comprehensive Assessment to the Commission by end 2015 (summer consultation)



Reminder of the opportunity....

“There is no question that the United Kingdom could be Europe’s fastest growing district heating market within the next few years... But if we want to enjoy the position of the nation’s third energy utility we will need to work hard together to build the confidence of consumers and investors alike.”

Paul Voss, from the international district heating equipment supplier Danfoss



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Thank you

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