Case Study: How Heat Networks can deliver Social, Environmental and Financial benefits to a local community

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Welcome to Islington







Planning context

The 2011 London Plan promoted the use of Decentralised Energy (DE) for both new developments and retrofitted old developments.

It had a target of 25% of heat and power used in London to come from DE by 2025 and required boroughs to identify and establish DE networks in their plans.

Target abolished in draft plan...







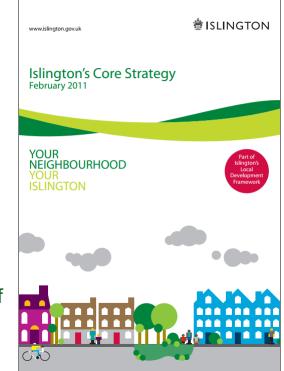
Planning policy – Islington Core Strategy (February 2011)

...Promoting zero carbon development by... working with partners to **promote and develop decentralised energy (DE) networks**, with a particular focus on areas of the borough with the greatest potential for such networks.

...Existing DE networks within the borough will be protected and their expansion supported.

...All development will be **required to contribute to the development of DE networks**, including by connecting to such networks where these exist [or planned] within the proximity of the development.

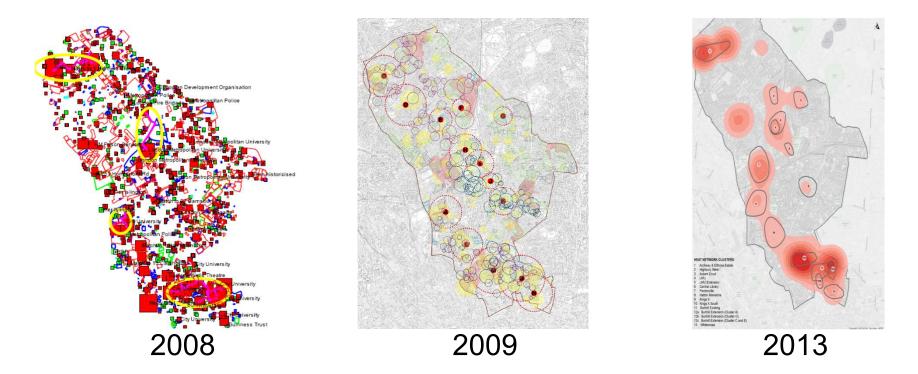
...**Major development in areas where connection to a decentralised energy network is possible** should achieve an onsite reduction in total (regulated and unregulated) CO2 emissions of at least 50% in comparison with total emissions from a building which complies with Building Regulations 2006, unless it can be demonstrated that such provision is not feasible.







Identifying opportunities: Heat mapping



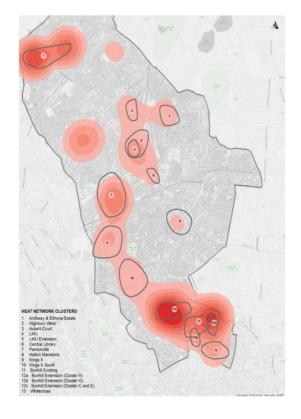
- 2009 Borough-Wide Decentralised Energy Strategy
- 2014 District Heating Masterplan



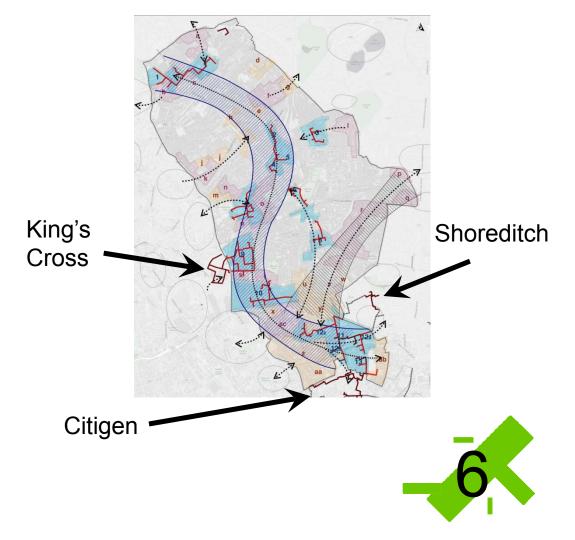


Council vision

Heat map

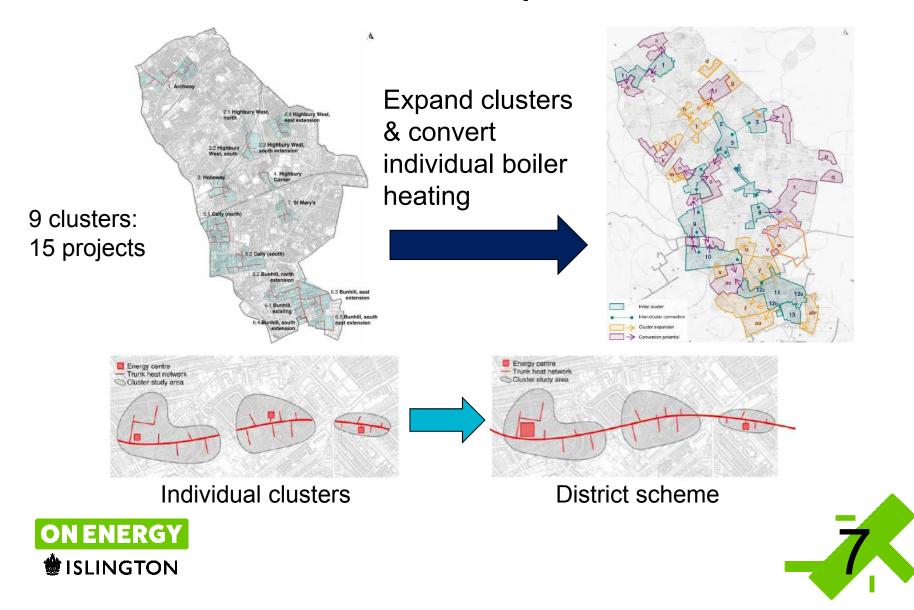


Heat network vision





Future scheme development



Bunhill Heat Network

Opened in November 2012

1.9MWe CHP plant

115m³ thermal store

1.5km pipe network

Currently provides heat to:

- 598 council homes (three estates)
- 212 private homes (two sites)
- 4 office buildings
- 2 leisure centres

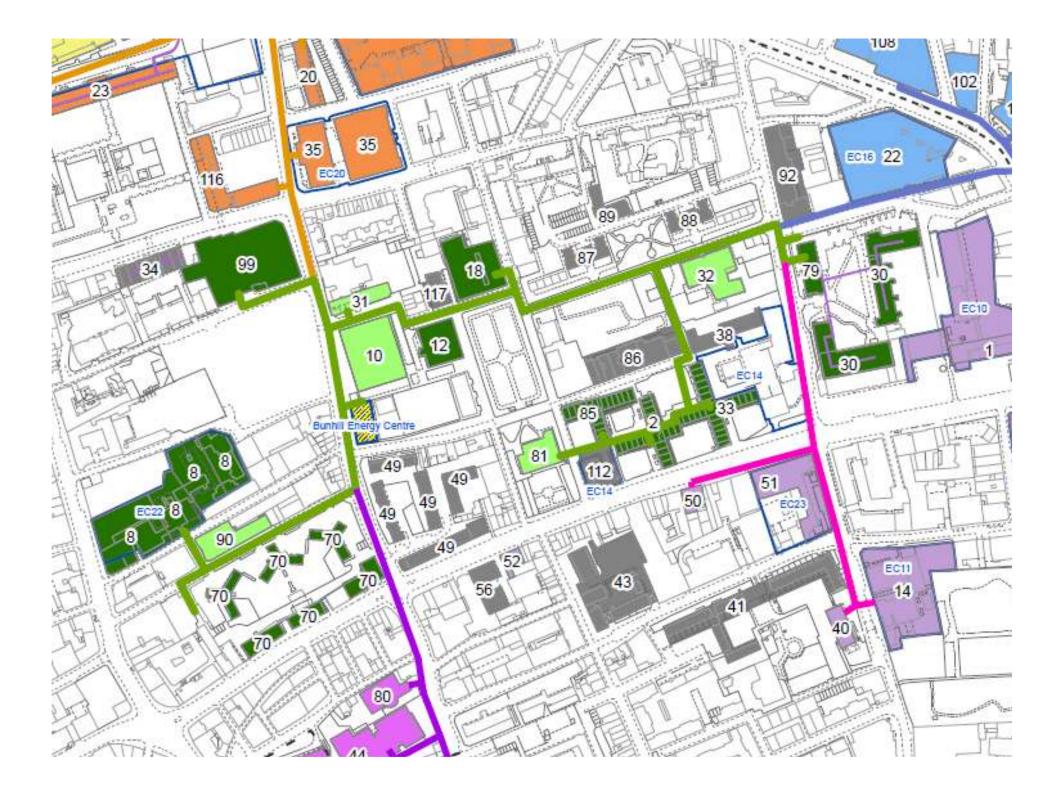
Electricity generated is sold to the national grid

Reduced carbon emissions by 2,000 tonnes CO₂e









Bunhill network - commercial structure

- Bunhill Heat and Power is fully owned by Islington Council, with an O&M contract to Vital Energi
- The system is operated on a break-even basis, which effectively reduces the cost of the heating tariff to all Council tenants.
- However, council tenants connected to the network pay a flatrate heat charge 10% cheaper than non-connected tenants.
- The flat rate charge helps offset the (often) inverse relationship between heating needs and ability to pay







Celsius Project – Bunhill Phase II

- Celsius project looks at new and existing smart infrastructure solutions for heating and cooling.
- Islington working with Transport for London (TfL) on extracting heat from the London Underground

COMMUTERS HIT BY 'BRUTAL' TEMPERATURES ON LONDON'S TRANSPORT NETWORK THAT IT WOULD BE ILLEGAL TO TRANSPORT LIVESTOCK IN - STANDARD

TUBE TEMPERATURES HIGHER THAN LEGAL LIVESTOCK LIMIT - METRO

COOKING ON THE CENTRAL LINE... MAP SHOWS HOT SPOTS ON LONDON UNDERGROUND UNFIT EVEN FOR TRANSPORTING CATTLE - DAILY MAIL

> LONDON HEATWAVE: TUBE PASSENGERS SWEAT IT OUT IN HOT WEATHER AS TEMPERATURES EXCEED 34C TO BEAT BALI - STANDARD

IS YOUR TUBE COMMUTE TOO HOT TO HANDLE? - METRO





Where does the heat go?

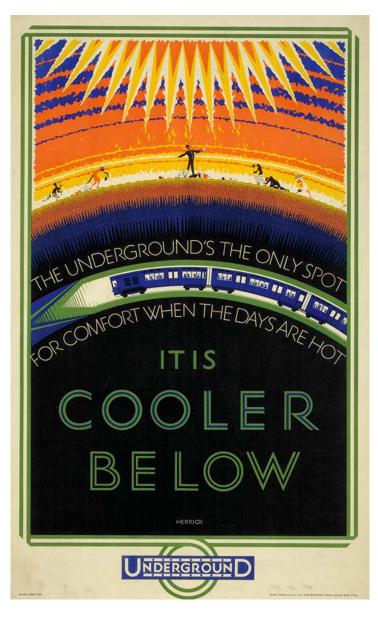


- 90% of heat absorbed into clay around tunnels
- LU tunnels built in London Clay, temperature around 14°C
- Temperature in the clay around the tunnels has warmed over time and can now reach over 30°C in summer





It wasn't always like this

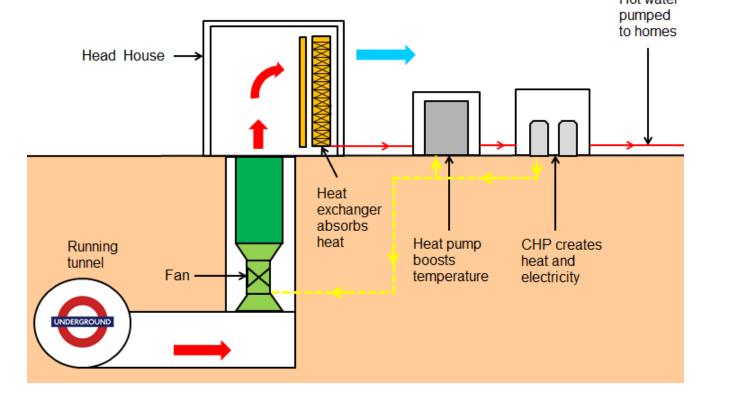






Bunhill II Energy Centre

Install heat pump to capture the heat from an Underground vent shaft

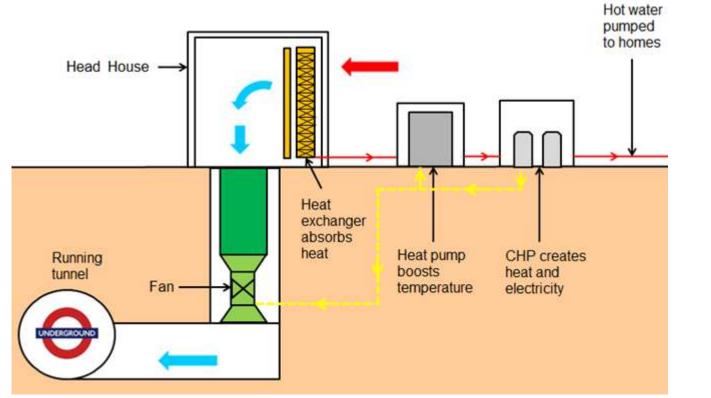






Bunhill II Energy Centre

But also cool it in the summer







Smart controls

- New control system enables switching between two energy centres based on real-time information from National Grid
- Operational model:
 - High electricity prices = Operate CHP and generate/sell electricity
 - Low electricity prices = Operate heat pump and use electricity
 - Heat can be stored if generation takes place outside of peak demand house
- Allows grid to function with greater proportion of fluctuating renewable generation







Objectives

- Connect a further 500 existing council homes, a school, a nursery and up to 1,000 more homes.
- CO₂ savings of at least 500 tonnes/year







Possible future schemes

- Feasibility studies carried out on:
 - Bunhill expansion using:
 - Water source heat pump
 - Electric substation heat pump
 - Data centre heat pump and boreholes
 - New heat networks in Archway, Caledonian Road and Highbury West
 - GreenSCIES





What do heat networks deliver?

Heat networks provide:

- <u>Reduced heating costs, helping with fuel poverty goals</u>
- Reliable and secure energy supply
- Reduced carbon footprint
- A long-term, flexible solution for transition to zero carbon

Council ownership also means:

- Not-for-profit means whole financial benefit goes to residents
- Can take long-term view on investment
- Subject to regulation and democratic control





Benefits of HN in Islington

Environmental

- o Over 2,000 tons/CO2 reduced
- Potential of reducing up to 40,000 tons/CO2 per year in the long term

• Financial

- More than £250,000 of direct savings on the tenants heating bills
- Heat from Bunhill up to 50% cheaper than traditional heat
- A cost effective alternative to CHP engines for new developments

Social

- Bunhill II will help to alleviate one of the most pressing issues for London Underground: Overheating
- Cheaper and fairer heat for the Borough
- A true statement of Islington's commitment with the sustainability agenda



Thank you!



