CARBON BITES

From the CIBSE YOUNG ENERGY PERFORMANCE GROUP

District Heat Networks

What are District Heat Networks?

Currently, heating and hot water demand in UK buildings is typically met via plant fed by conventional gas or electricity mains. Meeting most heating and hot water demand this way perpetuates a reliance on fossil fuels or nuclear power, and may slow progress toward meeting the nations carbon reduction targets. District Heat Networks (DHN) are a move toward more local generation and distribution of energy and heat, as well as an enabler of new lower carbon technologies for heat generation.

A district heat network is simply a network of pipes that are used to deliver heat to end users. Pipes in the network are insulated so as to allow for efficient transportation of heat from the point of generation. The Association for Decentralised Energy (ADE) explains 'networks vary in size and length, carrying heat just a few hundred metres between homes and flats, to several kilometres supplying entire communities and industrial areas. The distance a network can reach is also easily extended by simply adding more providers of heat, or 'heat sources', along the way' (ADE, 2015). While district heating is not a new concept, advances in technology such as pipe insulation are improving the efficiency and economics of networks, and the UK is now seeing an increase in the development in DHNs.

How do we ensure a heat network is successful?

Getting the design of a heat network right is crucial both for the success of a specific network, and for the continued development of DHNs in general. In the past, poorly designed DHNs have resulted in sub-optimal performance, leading to negative perceptions of district heating as a viable option among some. District heating remains a viable option, however, only if basic princples are followed. General rules for ensuring the success of a DH scheme include: sizing the network to real heat demand, utilising thermal storgae, using appropriate type and insulation of pipes – such as pre-insulated and flexible – and conducting a thorough feasibility study. A more complete set of standards can be found in the newly established **Heat Network Code of Practice**, set out by the CIBSE CHP and DHN group, led by Phil Jones. The code of practice sets out a number of minimum standards throughout the whole process of establishing a heat network, from prep through to operation and maintenance, and is the first of its kind in the UK.

What is being done to encourage uptake of DHNs?

While more and more successful DHNs are being rolled out across communities and areas of the UK, various other European countries, such as Denmark, already source large amounts of building heat from district heat networks rather than conventional methods. This is perhaps due to the more prescriptive nature those local authorities take with regard to heat networks – UK local authorities are typically reluctant to set targets for the estbalishment of DHNs. Further, developers have to fund their DH schemes without much government support. Despite this, district heat networks will play a increasinlgy central role in the UK's energy landscape as we look to the successes of other European and our own heat networks.

Robin Hamaker, Pulse Business Energy, May 2016

Key Issues & Considerations

- Are the heat networks designed well? As in, are there anchor loads to ensure a large baseload?
- Who pays for District Heat Networks – currently it is primarily the developers of the schemes, but should it be local government, national government?
- HIU (Heating Interface Units) and their affordability.
- Future of CCHP in the UK?

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How do District Heat Networks feature in the UK's future energy scenarios?

In London, the Mayor of London has produced a London Heat Network Manual and map, which aims to support local authories and other stakeholders in planning and developing heat networks. On a national level, the National Grid is considering just how district heating networks will fit into the UK's energy future in its studies of **future UK energy scenarios**. Working with Buro Happold, the National Grid is currently carrying out a large review of all existing heat networks in the UK, mapping their location. The review is also looking at the potential scale of economic heat networks, and how various sources of low carbon heat production could support a future heat network.

Robin Hamaker, Pulse Business Energy, 2016

Key Lessons Learnt

- How do heat networks feature in the future of the country's future energy scenarios
- How is the heat in the network supplied, and how will this change over the next decade and in the longer term? Decoupling heat networks from solely CHP.
- Heat networks as an enabler of low carbon technology, such as water source heat pumps

Further Information

- CIBSE District Heat Networks Code of Practice - http://www.cibse.org/knowledge/cibse-other-publications/cp1-heat-networks-code-of-practice-for-the-uk
- Association for Decentralised - http://www.theade.co.uk/more-about-district-heating_3592.html
- CIBSE CHP and DHN group – www.cibse.org/chp; twitter: @CIBSEchpdh
- National Grid Future Energy Scenarios – http://fes.nationalgrid.com
- London Heat Map - http://www.londonheatmap.org.uk/Content/home.aspx

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