Developing low-carbon heating networks

Heating accounts for around a third of UK greenhouse gas emissions, and is a major challenge to meeting carbon reduction targets. Heating networks – which can supply heat from a number of central sources through a network of pipes with hot water – can be a cost-effective low-carbon alternative, while reducing energy costs for households, businesses and public sector buildings.

Large city-scale heat networks have been instrumental in the transition to renewable energy sources in countries like Sweden and Denmark. A number of city authorities are currently developing district heating and cooling networks (DHC) as a means to achieve local sustainable and affordable energy. However, the take-up of district heating in the UK is still very low compared to comparable EU Member States in northern Europe, even in high-density areas of major cities.

There are currently substantial barriers to the development of district heat networks. With the UK energy system primarily focusing on the ‘macro level’ of legislation and infrastructure and the ‘micro level’ of household energy use, community-level heat networks have been less prioritised.

As part of the ESRC-funded research project Heat And The City: Comparing the Trajectory of Sustainable Heat and Energy Conservation in Municipal Communities, Professor Janette Webb, Dr David Hawkey and Dr Mark Winskel have explored energy governance models in three UK cities: Aberdeen, Birmingham and London (Woking).

The research findings show that DHC technology faces significant short- to medium-term barriers – due to economic risk, wariness among users about an unfamiliar form of heating, uncertainty around regulation, and an energy system geared to large-scale centralised technologies and networks.

Key findings

- With the current uncertainty over policy and regulatory support for localised governance of sustainable energy, the prospects of significant urban energy transformation remain slim.
- The current form of liberalised market regulation is proving unsupportive of localised energy such as DHC. As UK energy institutions and organisations are oriented towards short-term returns on financial capital, they emphasise reduced risk and standardised investment propositions – effectively ignoring the long-term value of local energy projects.
- Local developers rely on sources of social capital to make systems work, given the limited support from public policy and limited access to finance.
- Effective governance and organisation to optimise DHC are likely to require a combination of centrally-managed standards and incentives with devolved municipal powers – rather than top-down command and control planning.
- A number of systematic barriers to DHC development remain, especially the challenges of long-term infrastructure development. These include upfront costs, energy market volatility and long payback periods.
Policy relevance and implications

- There is a need to build local capacity and devolve more control to municipalities when it comes to financial and technical resources for sustainable urban energy.
- A more supportive government policy framework is needed to offset the difficulties of a centralised energy market, to make DHC fully effective in providing sustainable urban energy.
- Regulatory support from central government could integrate the social and environmental value of localised energy into financial evaluation, as practised in a number of other European countries.
- The policy framework must allow for local differences in actors and infrastructure. This would enable local actors to develop innovative solutions, reduce uncertainties and mobilise investment.
- UK and devolved governments could ensure more strategic use of spatial planning powers, as well as development of common technical DHC standards and consumer protections.

Effective governance and organisation are likely to require a combination of centrally-managed standards and incentives with devolved municipal powers.

BRIEF DESCRIPTION OF THE PROJECT

The findings are based on the research paper *Organisation and governance of urban energy systems: district heating and cooling in the UK*, which examines case studies in three UK cities to explore models of local energy governance and organisation, in the context of privatised energy and centralised markets. The ESRC-funded study is part of the Heat And The City research project, which is funded by the RCUK Energy Programme.

David Hawkey, Janette Webb and Mark Winskel: *Organisation and governance of urban energy systems: district heating and cooling in the UK*

Web: www.heatandthecity.org.uk/resources/documents

FOR MORE INFORMATION

Professor Janette Webb, School of Social and Political Science, University of Edinburgh
Email: jan.webb@ed.ac.uk

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Web: www.esrc.ac.uk
ESRC communications team: comms@esrc.ac.uk

The views expressed in this evidence briefing are those of the authors and not necessarily those of the ESRC.