District Heating in the DECC Heat Strategy
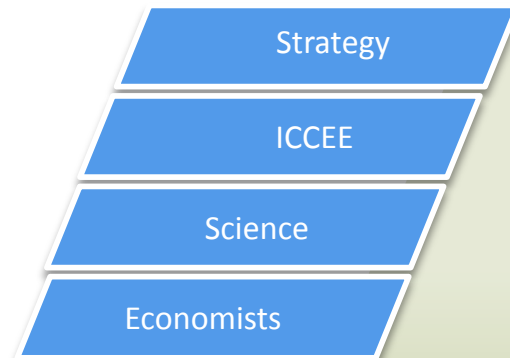
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Heat Strategy and Policy, DECC

17 May 2012

Sequenced strategy for buildings: mass deployment of low carbon heat in the 2020s

DEPARTMENT OF ENERGY & CLIMATE CHANGE

The Heat strategy was commissioned as a cross-DECC project to answer two questions:

Strategy

ICCEE

Science

Economists

1 What should the government do now and through the next decade, in order to ensure low carbon, secure and affordable heating (and cooling) supply for homes, businesses and industry, and to enable the UK to meet its carbon reduction and renewables targets?

2 How should DECC resource, organise and programmes its work on heat to ensure that it is deliverable, and that it is delivered?
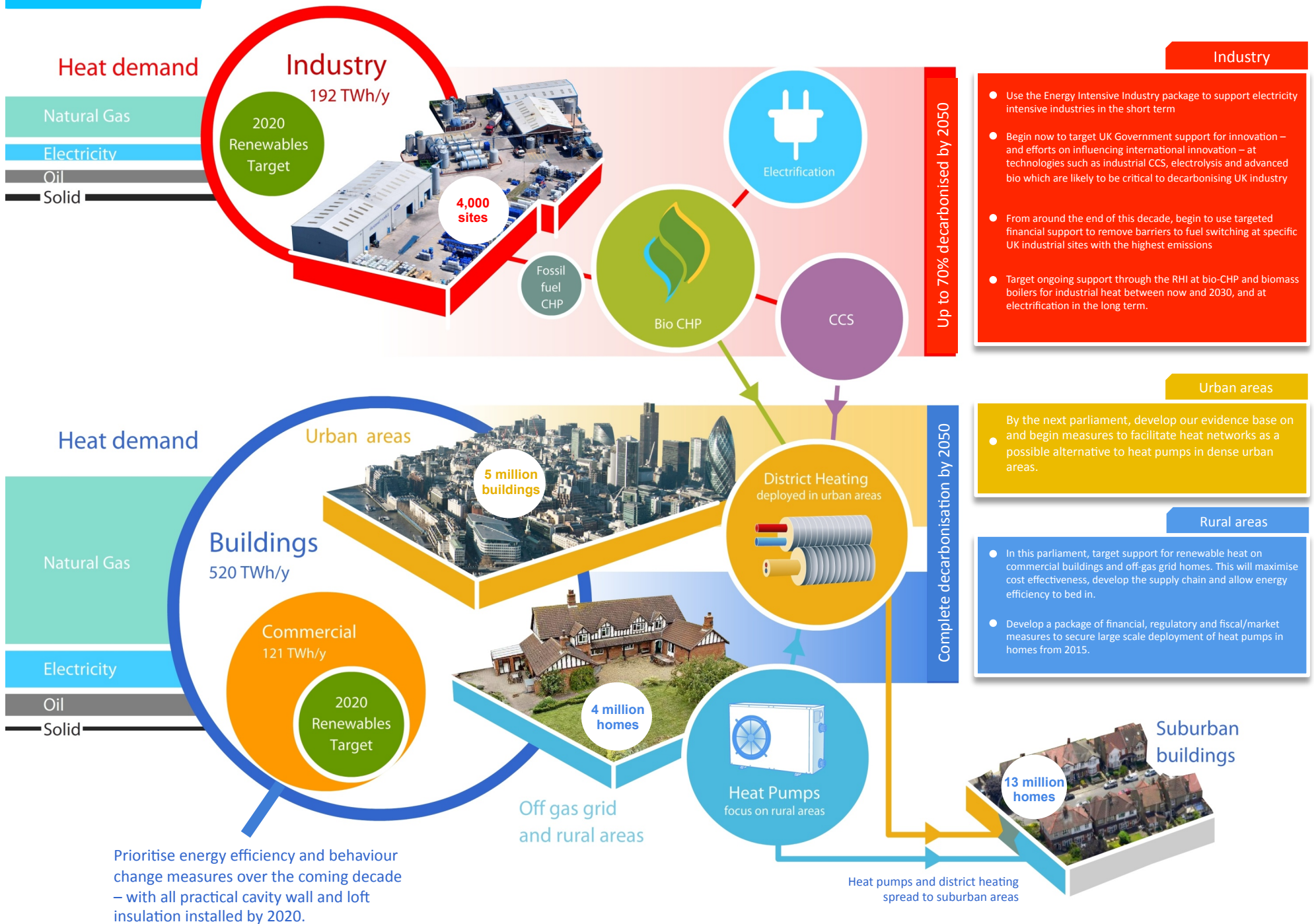
The strategy fills a gap in current strategy where we have not had a strategic view of how to decarbonise supply as well as demand.
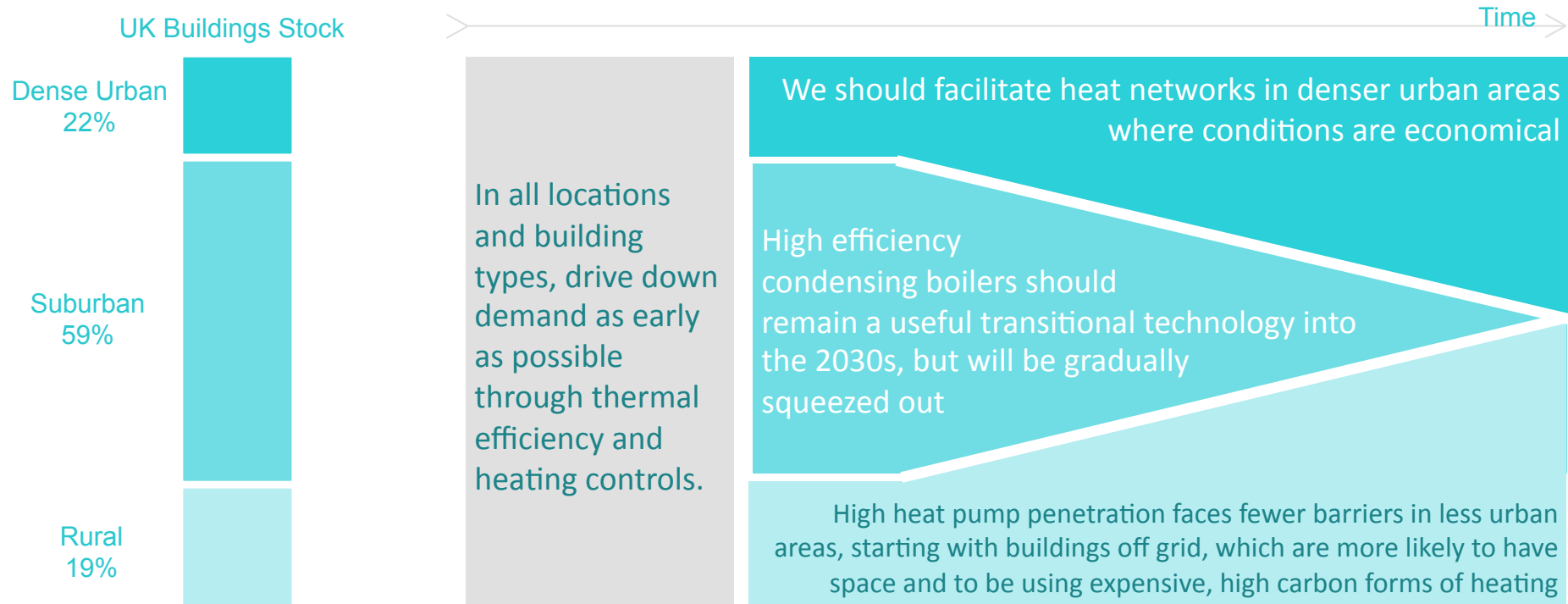
Heat demand

Industry
192 TWh/y

2020 Renewables Target

4,000 sites

Electrification

Fossil fuel CHP

Bio CHP

CCS

Up to 70% decarbonised by 2050

Industry

- Use the Energy Intensive Industry package to support electricity intensive industries in the short term

- Begin now to target UK Government support for innovation – and efforts on influencing international innovation – at technologies such as industrial CCS, electrolysis and advanced bio which are likely to be critical to decarbonising UK industry

- From around the end of this decade, begin to use targeted financial support to remove barriers to fuel switching at specific UK industrial sites with the highest emissions

- Target ongoing support through the RHI at bio-CHP and biomass boilers for industrial heat between now and 2030, and at electrification in the long term.

Heat demand

Buildings
520 TWh/y

Urban areas

Natural Gas

Electricity

Oil

Solid

Commercial
121 TWh/y

2020 Renewables Target

5 million buildings

District Heating
deployed in urban areas

4 million homes

Off gas grid and rural areas

Heat Pumps
focus on rural areas

Complete decarbonisation by 2050

Urban areas

- By the next parliament, develop our evidence base on and begin measures to facilitate heat networks as a possible alternative to heat pumps in dense urban areas.

Rural areas

- In this parliament, target support for renewable heat on commercial buildings and off-gas grid homes. This will maximise cost effectiveness, develop the supply chain and allow energy efficiency to bed in.

- Develop a package of financial, regulatory and fiscal/market measures to secure large scale deployment of heat pumps in homes from 2015.

Suburban buildings

13 million homes

Prioritise energy efficiency and behaviour change measures over the coming decade – with all practical cavity wall and loft insulation installed by 2020.

Heat pumps and district heating spread to suburban areas

Sequenced strategy for buildings: mass deployment of low carbon heat in the 2020s

DEPARTMENT OF ENERGY & CLIMATE CHANGE

- By 2050 we need to have eliminated fossil fuel usage for space heating and hot water in buildings
- A sequences transition is necessary, taking account of spatial/geographical factors and local contexts

UK Buildings Stock

Time

Dense Urban 22%

Suburban 59%

Rural 19%

In all locations and building types, drive down demand as early as possible through thermal efficiency and heating controls.

We should facilitate heat networks in denser urban areas where conditions are economical

High efficiency condensing boilers should remain a useful transitional technology into the 2030s, but will be gradually squeezed out

High heat pump penetration faces fewer barriers in less urban areas, starting with buildings off grid, which are more likely to have space and to be using expensive, high carbon forms of heating

Over time, reduced demand for gas is likely to make the gas distribution network uneconomic - we need to plan for this. The transmission network will still be needed for electricity generation and for some industrial sites.
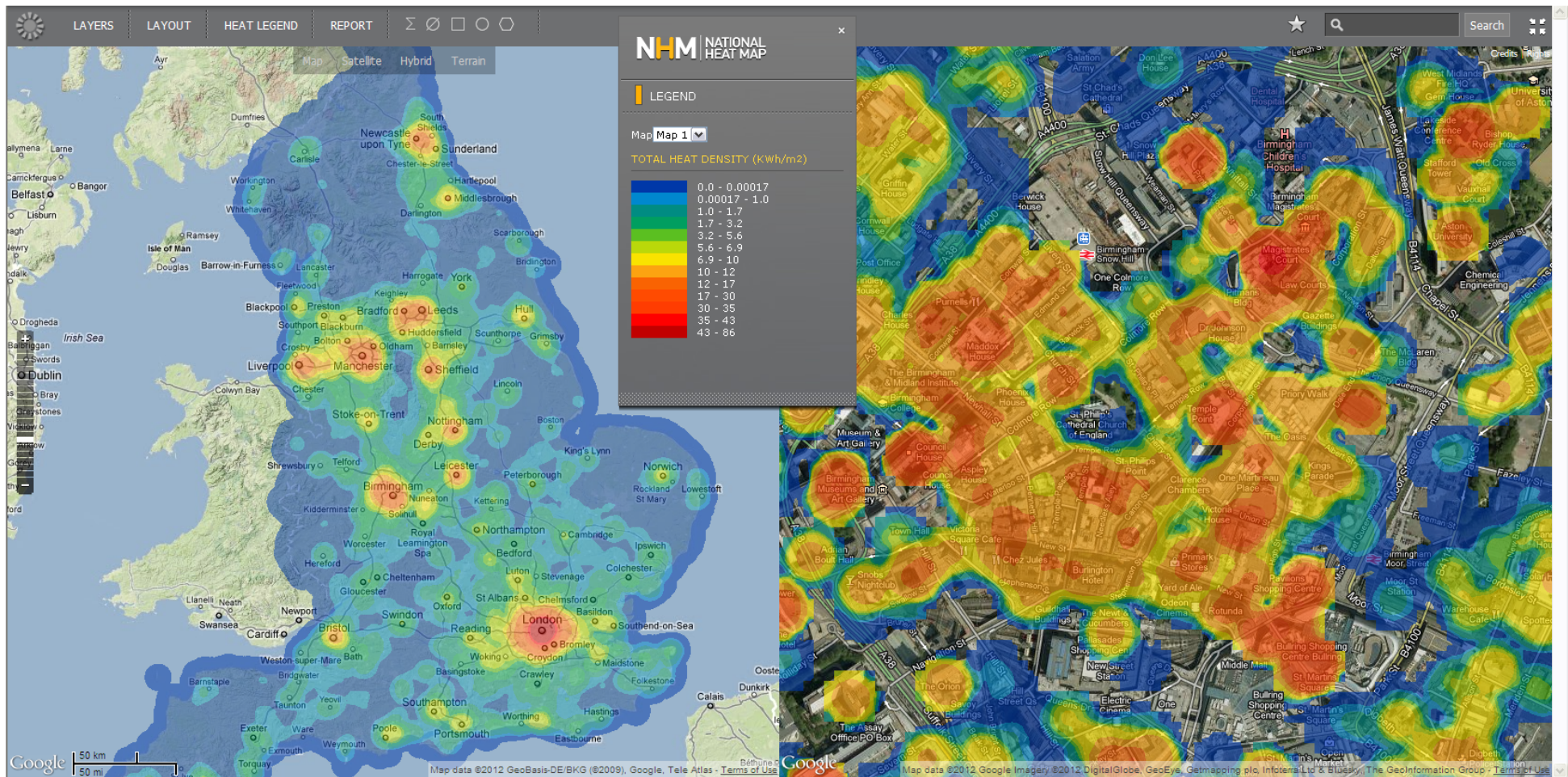
Heat Networks in the strategic framework

Why does the Government want significant district heating expansion?

- Under the right circumstances, heat networks can be the most effective way of supplying low carbon heat to buildings, and can offer greater convenience and reliability to consumers than conventional systems.

- Heat networks are best suited to areas with high heat demand density. They can be an excellent choice in urban areas, providing individually controlled and metered heat. Heat networks can also serve buildings where alternative systems are not feasible.

Heat Networks in the strategic framework

Why does the Government want significant district heating expansion?

- Heat Networks are flexible and compatible with a wide range of heat supply options. This means a number of different heat sources can be connected, improving efficiency and reliability. It also makes them easily upgradeable, creating flexibility to make the transition to low carbon heat over time.

- Heat networks can be integrated with Local Authority plans for urban growth and regeneration aimed at tackling environmental issues and social deprivation issues such as fuel poverty.

The National Heat Map
- supporting local planning

The National Heat Map
- supporting local planning

The National Heat Map
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The National Heat Map is a comprehensive spatial plan of heat demand density, equipped with a range of tools to help developers and planners identify priority areas for low carbon heat projects.

http://ceo.decc.gov.uk/nationalheatmap

Benefits of a National Heat Map

Value for money A fraction of the cost of individual LA maps	**Detailed reporting** Sectoral breakdown of buildings and heat demand
Precision and accuracy Zooms in to reveal heat demand density of individual streets and buildings	**Split screen function** Examine different data side by side, or compare locations
URL generator Save your investigations and share findings instantly	**Google API** User friendly and familiar to use
National datasets Based on more complete datasets than any other map of its kind	**Groundbreaking model** Developed by CSE and peer-checked by DECC Statistics and industry experts: "absolutely fantastic " (CIBSE)
Consistent mapping Allows consistent analysis of the entire country	**Cross-border opportunities** Neighbouring LAs can identify projects for collaboration

Next steps for heat networks

2012-2020

2020 and beyond...

Begin removing barriers: New schemes are likely to develop city by city as local authorities work in partnership with energy companies, waste companies and local industry. This will increase credibility in the market to drive investment, increased capacity in skills and the supply chain.

Prioritise schemes which can deliver environmental and social benefits in the relatively short term and can be expanded and upgraded in the future, subject to removing the necessary barriers to deploying heat networks.

Priority projects are likely to be: urban centres, new build, electrically heated high-rises, extension of existing networks, and making use of existing CHP plants and heat recovered from power stations and industrial processes.

Upgrading gas CHP networks to low carbon alternatives like energy from waste and large heat pumps

Establishing and expanding networks which use recoverable heat from low carbon power generation (e.g. new nuclear and power stations fitted with Carbon Capture and Storage)

Joining stand-alone renewable capacity to existing networks, and larger new build housing developments will help decarbonise our heat supply for the long term.

Planning heat storage into future heat networks to ensure that peaks of winter demand can be met from low carbon sources.

A role for local authorities
Local authorities should identify opportunities where energy can be supplied from renewable or low carbon energy supply systems and for co-locating potential heat customers and suppliers.

Bringing down costs
Bringing down the cost of pipe infrastructure would reduce capital costs substantially, and increase the economic viability of areas that might otherwise be considered marginal.

Understanding and awareness
Until heat networks are more widespread in the UK and understood, customers may be reluctant to connect to networks.

Quality assurance and consumer interests
The lack of specific protections may affect overall market growth as developers opt for alternatives that have greater consumer confidence.

A role for you

The ambition set out in the Heat Strategy can only be achieved through collaboration between Central Government, local government, developers, network operators, heat customers, the CHP industry, heat intensive industries, local land owners and local people.

Do you have evidence from existing projects to demonstrate the costs and benefits of heat networks in reducing emissions, alleviating fuel poverty or reducing fuel consumption?

Do you agree with the barriers and opportunities set out in relation to heat networks?

What policies should the Government pursue to promote or facilitate heat networks?

Do you see the need to regulate the supply of heat through heat networks and, if so, how?

If you have been practically involved in setting up heat networks, what lessons can you share?