Decarbonising Heating in Leeds

Delivering ambitious district heating systems and realising the potential for hydrogen gas
Contents

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Leeds Climate Change Strategy
Making the Change 2012 to 2015
LEEDS PIPES
Political driver: using spare heat to keep vulnerable people warm

- Fuel poverty
- Economic growth
- Air quality
- CO$_2$ reductions
- Circular economy
Installing 16.5km of pre-insulated pipe to deliver heat & hot water to 1,983 properties across the City of Leeds.
Leeds PIPES key stats...

- EfW – centralised low carbon heat source;
  - 13MW heat guaranteed– potential for 20MW
- Pipework stretches over 8km – 16.5km underground pipework.
- 1,983 council flat connections, 31 blocks.
- 33MW of back up boilers for resilience.
- £35m investment.
- Significant growth opportunity – c100GWh available.
- Design life of c60 years.
FUTURE OPPORTUNITIES
PLANNING
Where technically viable, appropriate for the development, and in areas with sufficient existing or potential heat density, developments of 1,000 sqm or more or 10 dwellings or more (including conversions where feasible) should propose heating systems according to the following hierarchy:

(i) Connection to existing District heating networks,
(ii) Construction of a site wide District heating network served by a new low carbon heat source,
(iii) Collaboration with neighbouring development sites or existing heat loads/sources to develop a viable shared District heating network,
(iv) In areas where District heating is currently not viable, but there is potential for future District heating networks, all development proposals will need to demonstrate how sites have been designed to allow for connection to a future District heating network.

Carbon savings and renewable energy generation achieved under this policy will contribute to EN1(i) and EN1(ii).
Benefits of connecting to Leeds PIPES

• Meets EN4 and contributes to EN1 and EN2
• Smaller plant room, no flues, no gas connection = lower capital costs
• Heat at least 5% cheaper than from gas (plus maintenance savings)
• Lower carbon (c60% reduction vs gas) so improved marketing (particularly young people, corporate market)
• Largest sites, DH companies willing to invest in the network
• Potential for invest to save support from the council
HYDROGEN
The Context: Current UK Energy Requirements

The challenge is to decarbonise all of the above!
The UK Government is setting strategic direction

Hydrogen pathway: ...‘we use hydrogen to heat our homes and buildings, as well as to fuel many of the vehicles we drive in 2050 and power the UK’s industry. We adapt existing gas infrastructure to deliver hydrogen for heating and a national network of hydrogen fuelling stations supports the use of hydrogen vehicles. A large new industry supports hydrogen production using natural gas and capturing the emissions with CCUS.’ (clean Growth Plan)

“We will also continue to explore the long-term options for clean heating and the many potential uses of low carbon hydrogen” (page 45, Industrial Strategy)
**H21 Leeds City Gate – The Headlines**

- 265,000 meter points
- 6Twh per annum, 3180MW peak
- 1% of UK population

**DEMAND**

**SUPPLY**

1025WM X4 256MW Steam Methane Reformers

**CONVERSION**

Early hours of the morning through summer - lowest demand
Key Features

- Conversion between 2028 and 2035, 12.5% of UK population covered by one project. Leeds, Bradford, Wakefield, Huddersfield, Manchester, Liverpool, Hull, York, Middlesbrough, Newcastle.

- Design capacity of 85 TWh, Decarbonising heat using existing infrastructure.

- Production in UK based on reforming of natural gas and CCS (17-18 million CO2 per year avoided)

- Equivalent security of supply during peak winter (the beast from the east).

- Offshore CO2 storage in either UK or Norway

- Supporting decarbonization of transport with hydrogen fueling stations

- Supporting decarbonisation of electric decentralized and centralized generation.

- Facilitating unlimited system coupling between gas and electricity.
Timeline to a Potential UK Policy & Conversion

2019

Critical Safety Evidence

2020

BEIS Led: £25m ‘Hy4Heat’

GDN Led: £10.3m H21 NIC

Strategic Evidence

2021

GDN led: £5m Field Trials (NOT YET FUNDED)

H21 North of England (H21 NoE)

H21 Strategic Modelling

Live Trial (one winter)

2022

H21 NoE: £250m FEED Study (NOT YET FUNDED)

2023

The Critical Evidence Justifies the safety case for the live trial (NOT YET FUNDED).

Earliest Policy Decision
Any Questions?

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