

Hub Guide 1 – Heat Networks

An introduction to heat networks

This guide is an introduction to heat networks. It covers what they are, their benefits and challenges and what support is available to develop them, including that provided by the Heat Networks Delivery Unit (HNDU), which is funded by the Department of Business Energy and Industrial Strategy (BEIS).

The guide is intended to provide inspiration and support to local authorities and developers that would like to provide a low carbon, income-generating alternative to conventional boiler systems.

If you have any further enquiries after reading the guide, please see the Greater South East Energy Hub website www.energyhub.org.uk or contact info@energyhub.org.uk.

Heat demand in the UK

In the UK, almost half of all energy consumed is used as heat, with 74% of this used for space and water heating¹. Heat networks supply about 2% of the overall UK heat demand, but a much higher share can be achieved. Government research suggests that by 2030, 14-20% of the UK's heat demand could be cost-effectively met by heat networks, with 43% met by 2050².

By the 2030s and 2040s, heat networks, in combination with low carbon hydrogen, will form an essential part of the decarbonisation of heat in buildings that are on the gas grid. Approaches based on heat pumps, hydrogen and heat networks will require coordination, and so will only be realised with strong leadership at both local and national levels.³

This guide will help organisations that are interested in delivering heat networks, to access the significant national funding and technical support available in both the public and private sectors.

What is a heat network?

Heat networks (also known as *district heating*) supply heat from a central source to consumers, via a network of underground pipes that carry hot water. The central heat source is often referred to as the *energy centre*. There are many technologies that can supply the energy centre, which are increasingly from renewable, low carbon fuel sources.

¹ ECUK: End uses data tables - Table U2. 2019. - <https://www.gov.uk/government/statistics/energy-consumption-in-the-uk>

² ADE – Market Report: Heat Networks in the UK. 2018.

³ Committee on Climate Change: Next steps for UK heat policy. 2016.

Heat is brought into each building through a Heat Interface Unit (HIU), which is similar in appearance to a conventional boiler. The HIU provides heating control and meters the heat supplied. This allows additional buildings and fuel sources to be added to the network over time.

The investment cost of a project can roughly be divided into: 25% project development, 25% energy centre and 50% pipe network installations. [Carbon Trust](#) research indicates that most UK schemes are expected to pay back in 20 years or less, alongside a lifetime of 25-50 years or more.

Benefits

Financial viability – Heat networks that use Combined Heat and Power (CHP) technology also generate income from electricity, which in some cases can offset the costs of fuel entirely.

Affordability – Heat networks can mean lower bills for consumers. Savings of at least 30% have been achieved when replacing electric heaters in tower blocks, helping to tackle fuel poverty.

Carbon emissions reduction – Due to their efficiency and use of renewable fuel sources, a heat network is one of the most cost-effective ways of reducing carbon emissions from heating.

Security of supply - Integrating heat and electricity generation in a development can reduce grid connection costs, while heat and power storage can help reduce costs during peak demand periods.

Challenges

Financing development – Heat network projects potentially require significant up-front capital investment to develop the energy centre and distribution system.

Complexity – The heat network supply chain is complex, with different organisations involved in their design, build, operation and maintenance. Heat, like electricity, will need to be metered if consumers are paying for the service, and this must be factored into the tariff administration.

Consumer Protection – Increasingly, the [Competition and Markets Authority](#) is concerned about poor pricing and service delivered through privately-operated monopoly suppliers. The [Heat Trust](#) was set up in 2015 to help provide better quality standards and consumer protection for heat networks.

Available Support

A range of [guidance notes](#) are available from BEIS, which include tools and toolkits, advice about investment in heat networks, regulation and consumer protection, and information for developers and the supply chain.

Heat Networks Delivery Unit (HNDU)

The Government established the [Heat Networks Delivery Unit \(HNDU\)](#) in 2013 to provide support and guidance to local authorities for heat network project development:

- **Advice and guidance** – Support is offered through a range of technical, commercial and legal guidance. This is delivered through the HNDU website, training sessions and other events across the UK. An online information-sharing site has been established which allows local authorities to exchange learning.
- **Project development funding support** – Since it was established, HNDU has run funding rounds totalling over £19 million. Round 9 is open until 3rd January 2020.
- **Scope of funding** – HNDU provides funding, advice and guidance to local authorities through the early stages of heat network development. Its services include:
 - Heat mapping
 - Energy master planning
 - Techno-economic feasibility
 - Detailed project development
 - Early commercialisation

The Unit will fund up to 67% of eligible costs of external consultancy costs during these stages.

- **Project management support** – HNDU will fund 100% of eligible external project management costs.
- **Capital funding for project delivery** – While HNDU does not fund late commercialisation, construction, operation or maintenance costs, the £320 million Heat Networks Investment Project (HNIP) is a fund that does, and which is used to support HNDU (see below).

The current tranche of HNDU funding, Round 9, is open until 3rd January 2020. For more information, please see the accompanying [guidance](#). To request an application form, contact hndu@beis.gov.uk.

Heat Networks Investment Project (HNIP)

The [Heat Networks Investment Project \(HNIP\)](#) is a significant Government initiative, which will invest up to £320 million of capital funding in heat network projects.

Any type of public, private or third sector organisation in England and Wales can apply, apart from Central Government departments. The types of finance available are grants, corporate loans, and project loans. Subject to Section 5.2 of the HNIP [guidance](#), applicants can apply for a grant, a loan or a combination of the two.

Key dates for HNIP funding Round 3 are:

- **Friday 20th September 2019** – Pre-application deadline for funding Round 3
- **Friday 18th October 2019** – Full application deadline for funding Round 3
- **November / December 2019** – Investment Committee will convene to award funding

Applications received after these dates will be considered in subsequent funding rounds, which will continue quarterly until the scheme closes. Applications (and pre-applications) can be made at any time, so please contact enquiries@tp-heatnetworks.org if you are thinking about applying.

The two-stage application process involves a pre-application, to ensure that projects applying for funding meet the HNIP eligibility criteria. This is followed by a full application to the scheme. Only successful pre-application projects will be eligible to submit a full application. This two-stage process is to ensure that only high-quality schemes are awarded HNIP funding, which is offered as *gap funding* through a combination of grants and loans.

Business Case Study – CHP System at University of Liverpool Main Campus

- CHP Installed Capacity – 4 MWe
- Investment Cost - £7.3 million. Annual Cost Saving - £1.5 million. Payback Period – 4.87 years.

The University needed to reduce its energy bill to offset the cost of expanding its estate. As there was already an existing heat network on campus, it cost relatively little to install increased capacity. Two CHP units, each generating 2MWe were installed into the existing network, which offered a fast financial return within 5 years. Generally, a CHP heat network would be expected to pay back within 20 years.

Lifetime savings from the project are estimated to be £22.6 million, with a 4.1 year payback period for the £6.1 million loan from [Salix Finance](#). In addition, significant carbon savings have been achieved at 5,730 tCO₂ tonnes annually.

Legal Disclaimer

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