



Department for  
Business, Energy  
& Industrial Strategy

# HEAT NETWORKS DELIVERY UNIT: 2018 Q2 PIPELINE



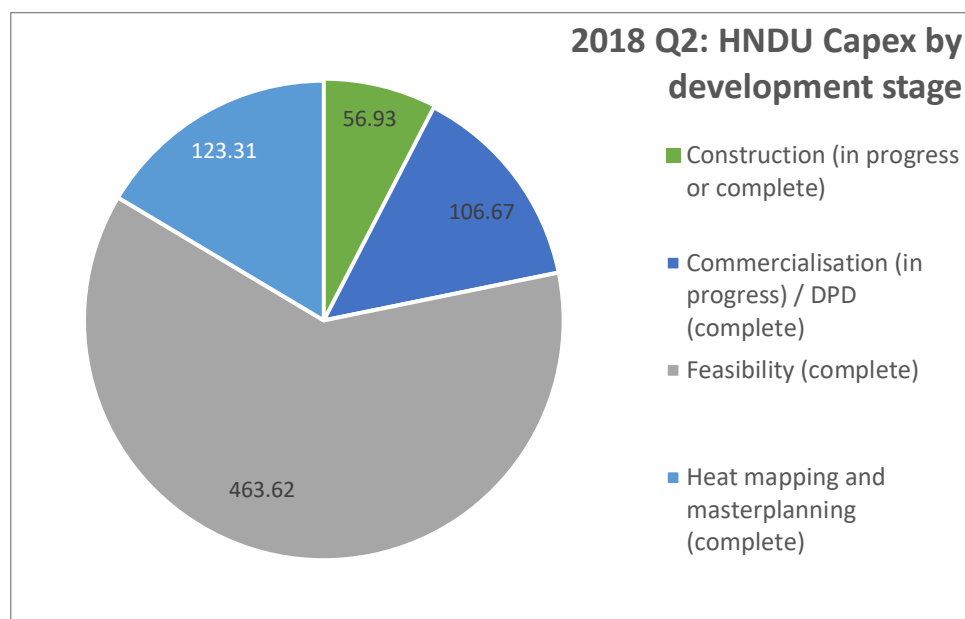
## Introduction

The projects we have captured in this pipeline are live projects with assumptions being refined on a regular basis as new information is made available. While every endeavour has been made to reflect as up-to-date information as possible, the information will invariably represent a single point in time (typically a consultant's report) and we have indicated the year of the information. The one-page summaries are intended to:

- increase the visibility of what is happening in district energy across England & Wales;
- better enable potential sources of finance to assess the scale of the sector;
- facilitate conversations between investors and projects; and
- ultimately enable new finance to enter the sector.

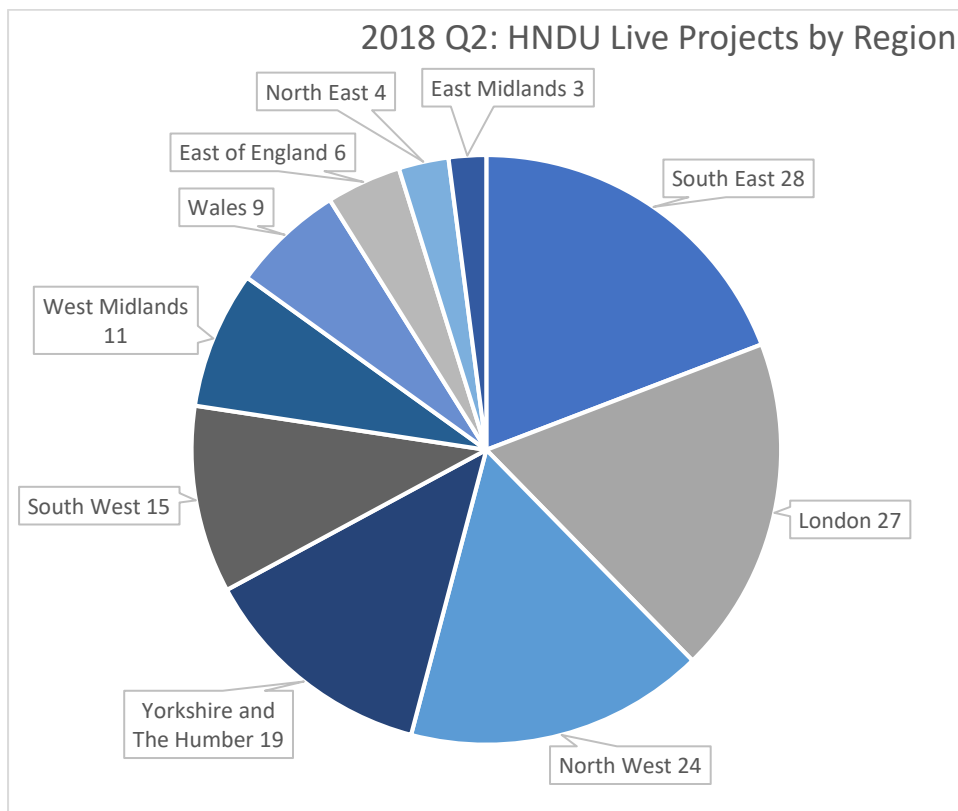
If you are an investor and have recommendations on what other information we could provide to better enable your investment, please email these to [hndu@beis.gov.uk](mailto:hndu@beis.gov.uk) FAO George Robinson.

2018 Q2 Total Capex: £750.53m





The above pipeline represents 56 opportunities for which we have relevant data in a format that we can publish (7 of these are currently not being pursued by their Local Authority sponsor – these are indicated in a section at the bottom of the document). However, we are currently working on approximately 140 live projects with Local Authorities across England and Wales, broken down as follows:



Region	# Live Projects
South East	28
London	27
North West	24
Yorkshire and The Humber	19
South West	15
West Midlands	11
Wales	9
East of England	6
North East	4
East Midlands	3

Total	146
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We are working to gather usable data on all the projects we support but this takes time.



# COMMERCIALISATION STAGE PROJECTS

(DETAILED PROJECT DEVELOPMENT  
WORK COMPLETE)

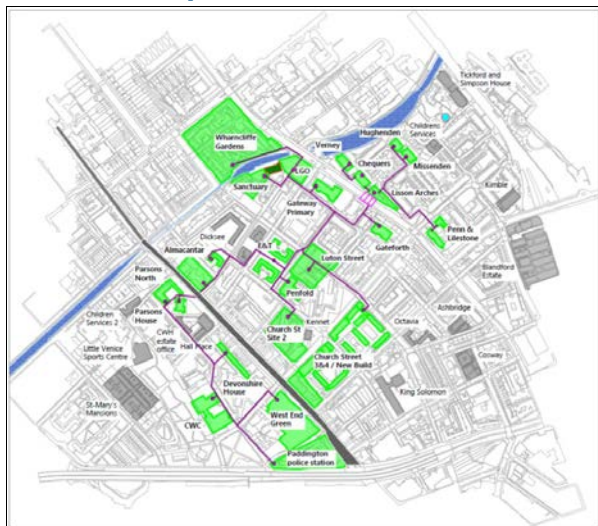


# Church Street\_COM

## Project Sponsor:

City of Westminster

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£8.47
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£6.27
Other capex (£m)	£1.17
<b>Total capex (£m)</b>	<b>£15.91</b>

Project IRR*	8.00%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
2018	2018	2019	2026

## Project Stage

Commercialisation

## Project Contact Details:

LA Name:	City of Westminster
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

Information valid as at: **Not Stated**

## Technical Information

### Primary energy source

CHP – Gas

### Project description:

This project is focussed around Church Street and the surrounding area, including, Luton Street, Lisson Green Estate, Wharnclyffe Gardens, City of Westminster College and West End Gate. At the heart of this is the Church Street Programme, a WCC led masterplan to deliver new development to the area, including residential, commercial, a green spine and future-proofed infrastructure to prepare the area for the coming decades and deliver benefits to the local residents.

### Energy centre description:

The first phase would utilise existing plant across the sites. In 2021/22 a new energy centre would be built.

### Heat/cooling demand phasing description:

Core connections comprise existing WCC buildings and the initial tranche of Church Street new build projects (broadly in line with WCC's Housing Zone). Thus, connections are made to the large existing blocks at Wharnclyffe, Church St 3&4, Eastlake and Tadema and the Lisson Green Estate; and to Luton St, Lisson Arches, Penn and Lilestone Offices along with Sanctuary and Lisson Grove offices redevelopment

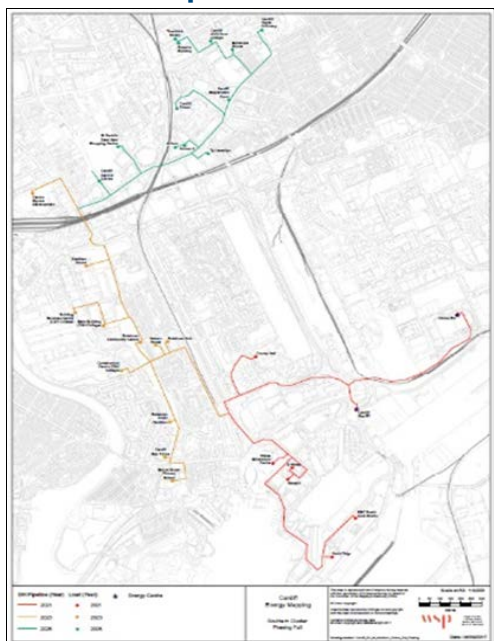
Westminster was a successful applicant for the HNIP pilot stage. Whilst this data is based on information received as part of DPD work supported by HNDU, the scheme has progressed much further

## Cardiff Bay (EFW)\_DPD

### Project Sponsor:

Cardiff Council

### Network Map:



### Summary forecast financial information:

Energy generation capex (£m)	£3.96
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£15.16
Other capex (£m)	£4.91
<b>Total capex (£m)</b>	<b>£24.02</b>

Project IRR*	6.50%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
2018	2018	2021	2025

### Project Stage

Detailed Project Development

### Project Contact Details:

LA Name:	Cardiff Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

### Technical Information:

#### Primary energy source:

CHP – EfW

#### Project description:

Phase 1 will start by serving public sector buildings from 4 core stakeholders, including Cardiff Council and the National Assembly for Wales, south of the mainline Cardiff to London railway line. The full network would expand north of the mainline and east, connecting other major public sector loads. Significant further potential exists to connect additional private sector load in close proximity to the planned route. The primary heat source for the network is envisaged to be an existing 30MW electrical capacity Energy from Waste plant, which has the potential to supply the vast majority of the heat demand across the full network and beyond. In the long term potential exists to connect loads further to the north in the Cathays Park.

#### Energy centre description:

The energy centre containing the primary heat source already exists. The Energy from Waste plant established through the Council's Proiect Gwyrdd Energy from Waste project, processes 350,000 tonnes of waste per annum raising steam used in a 30MWe pass-out condensing steam turbine. A separate energy centre, containing top-up/back-up gas boilers, is proposed for land adjacent to the Queen's Gate Roundabout.

#### Heat/cooling demand phasing description:

The heat demand for phase 1 and the full scheme is dominated by public sector heat demand. The total demand for the full scheme is 34.5GWh/annum; however, an additional private sector heat demand of circa 22GWh exists directly adjacent to the planned network route and which could be connected at very low cost.



# Town Centre Heat Network\_DPD

## Project Sponsor:

Crawley Borough Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£2.76
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£3.17
Other capex (£m)	£1.55
<b>Total capex (£m)</b>	<b>£7.48</b>

Project IRR*	6.11%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
2018	2018	2019	2020

## Project Stage

Detailed Project Development

## Project Contact Details:

LA Name:	Crawley Borough Council
Contact Name:	Brett Hagen
Email:	brett.hagen@crawley.gov.uk

Information valid as at: **Not Stated**

## Technical Information

### Primary energy source:

CHP – Gas

### Project description:

A three phase approach to delivering heat and power to Crawley Town centre has been assessed by Atkins. A number of different technical solutions have been assessed as potentially viable. The core heat load has been assessed to be 15GWh (including system losses) from a number of customers each with an average estimated heat density of 2MWh per meter of pipe installed.

### Energy centre description:

Two different heat sources have been identified: Option 1 - 1160kWe CHP with Private Wire (PW); Option 2 - 999kW Biomass boiler with a 1160kWe CHP & PW. Both options are suggesting a positive IRR. The option presented represents the CHP and biomass with Private wire option.

### Heat/cooling demand phasing description:

Key customers identified for the first phase are: 500 new residential units, the town hall, a police station, a library, a hotel, and a college.

Crawley was a successful applicant for the HNIP pilot stage. Whilst this data is based on information received as part of DPD work supported by HNDU, the scheme has progressed much further.

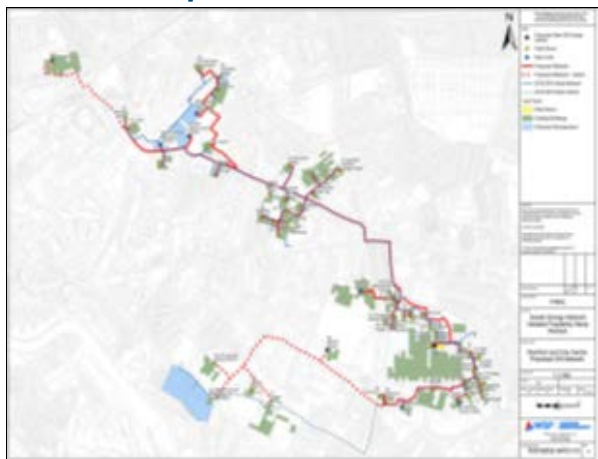


# Exeter City Centre\_DPD

## Project Sponsor:

Exeter City Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£10.40
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£8.20
Other capex (£m)	£0.00
<b>Total capex (£m)</b>	<b>£18.60</b>

Project IRR*	Not provided
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	Not Provided	Not Provided

## Project Stage

Detailed Project Development

## Project Contact Details:

LA Name:	Exeter City Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

The Exeter Energy Network project enlarges the energy centre at the RD&E hospital's Wonford site and delivers a 6.5km heat network to take heat from 3MWe of gas CHP at the hospital into the city centre to public sector and potential commercial offtakers. The public sector partners in the scheme have jointly established a company (Dextco Ltd) which is procuring a joint venture partner to undertake the project.

### Energy centre description:

The enlargement of the energy centre at the RD&E hospital's Wonford site increases the capacity of the current 1 MWe gas CHP to 3 MWe, replaces boilers and other equipment, and installs 100 m3 of thermal storage. The new CHP provides 16 GWh of electricity to the RD&E.

### Heat/cooling demand phasing description:

Heat supplied to the RD&E at Wonford comprises 4 GWhth of steam, 12 GWhth of medium temperature hot water and the supply of heat to outlying buildings on the site through the core heat network. The core heat network is 6.5 km long and provides a total of 21 GWhth through low temperature hot water to public sector buildings and other commercial heat users along a corridor into the city centre. Following a successful procurement in 2018 works would start in 2019 with completion by 2025.



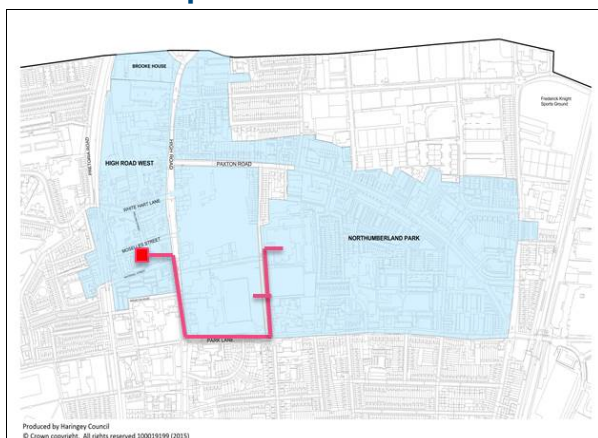


# North Tottenham\_DPD

## Project Sponsor:

London Borough of Haringey

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£4.65
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£3.89
Other capex (£m)	£2.13
<b>Total capex (£m)</b>	<b>£10.66</b>

Project IRR*	Not provided
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	Not Provided	Not Provided

## Project Stage

Detailed Project Development

## Project Contact Details:

LA Name:	London Borough of Haringey
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

3 large and adjacent development sites forecast to commence in next c.3 years (10 year build out). Spurs new 61,000 seat stadium opening in 2018, hotel and leisure facilities. Potential for 5000-8000 new homes, relocation of two schools into new facilities, new library and community facilities, and mix of employment space. Strong political support for the project.

### Energy centre description:

Heat and private wire. At full build out: peak heat c.30MW. Initially gas CHP, with gas boilers and thermal store. Potential to deliver future transition to lower carbon heat source at scale, and further carbon savings. Energy Centre Shell to be delivered by the High Road West Development Partner.

### Heat/cooling demand phasing description:

Tottenham Hotspur Football Club & partners. Haringey Development Vehicle (Council procured the partner for the JV). High Road West Development Partner (Council procured private sector partner). Existing sites. Others sites including Mayor of London / GLA (Housing Zone Funding, London Plan, DEEP), BEIS, existing and future residents and businesses.

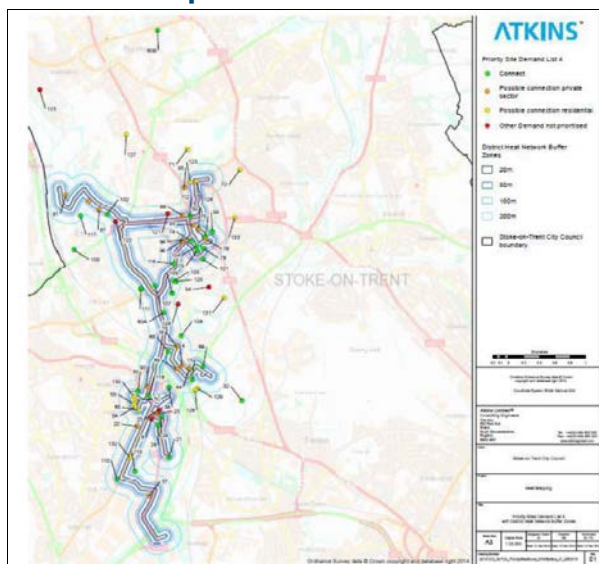


# Deep Geothermal\_DPD

## Project Sponsor:

Stoke-on-Trent City Council (SoTCC)

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£32.45
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£17.41
Other capex (£m)	£1.07
<b>Total capex (£m)</b>	<b>£50.93</b>

Project IRR*	Not provided
Considering third party finance?	Yes

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	2018	2020

## Project Stage

Detailed Project Development

## Project Contact Details:

LA Name:	Stoke-on-Trent City Council (SoTCC)
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

Information valid as at: 2017

WHILST THE DATA WE HAVE IS BASED ON  
DPD WORK WE ARE AWARE THAT THE  
PROJECT IS NOW UNDER CONSTRUCTION

## Technical Information:

### Primary energy source:

Geothermal

### Project description:

SoTCC is considering a structure whereby heat is supplied to a mix of commercial and public sector. Average annual heat supplied to customers is estimated to be 45GWh. The head demand for the first phase is proposed to be met through back-up gas boilers of 10.5MW. A deep geothermal well is the proposed primary technology due to connect in 2019. Anchor load customers are Staffordshire University campus and SoTCC owned buildings and various other public sector buildings representing 60% of the total demand.

### Energy centre description:

The deep geothermal energy centre will be owned and operated by a private sector owner operator. The project will own on site gas for system resilience and initial heat supply up to the point that the deep geothermal system is connected. The deep geothermal solution will comprise two wells, a doublet, drilled into the carboniferous limestone reservoir located at a depth of up to 4,000m. The production well will target the area where the reservoir is deepest and where a targeted production temperature of over 100°C is likely to be achieved. The hot geothermal fluid will be pumped to the surface using an electrical submersible pump where it will be passed through a heat exchanger and then send into the DHN.

### Heat/cooling demand phasing description:

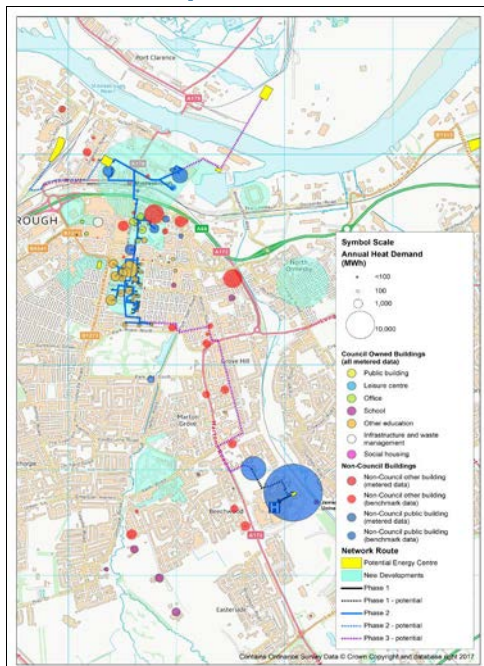
Heat connections are aimed to be in 2018/19 to the University, SoTCC buildings, schools, private housing association, local swimming pool and other commercial customers. Full loads are estimated to be connected by 2020.

# Middlesbrough\_DPD

## Project Sponsor:

Tees Valley Combined Authority

## Network Map:



## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

New gas CHP's in each of the town centre and hospital, connected via a heat network. Private wire network around the town centre. Potential to connect both the heat and private wire networks to local AD biogas CHP, biomass and waste industrial heat sources.

### Energy centre description:

The town centre energy centre location is on Richmond Street, on the western edge of the Middlehaven Regeneration area. The site is approximately 6,000m<sup>2</sup> and is bound on its north, south and west sides by roads, with further open space to the west of the site. This site is located north of the A66 and is considered suitable for gas CHP, standby boilers. The site is also well suited for the potential connection to one of two existing AD CHP plants, a biomass plant (under construction) or a WSHP. The hospital energy centre will be at the existing boiler house (within the hospital complex) or immediately adjacent (depending on access issues).

## Summary forecast financial information:

Energy generation capex (£m)	£0.00
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£0.00
Other capex (£m)	£0.00
<b>Total capex (£m)</b>	<b>£30.00</b>

Project IRR*	Not provided
Considering third party finance?	Yes

\* Real pre-tax pre-finance

### Heat/cooling demand phasing description:

3 phase build out: Hospital CHP scheme, town centre DE scheme, then the heat connection between the two.

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	Not Provided	Not Provided

## Project Stage

Detailed Project Development

## Project Contact Details:

LA Name:	Tees Valley Combined Authority
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

# TECHNO-ECONOMIC FEASIBILITY STAGE: STUDY COMPLETE

It should be noted that whilst these projects have completed a techno-economic feasibility study some, but not all, will have progressed to DPD or are aiming to soon progress to DPD.

The projects we believe are actively progressing towards DPD, or which are already working with consultants at this stage, are:

Organisation Name	Opportunity Name
Barnsley Metropolitan Borough Council	Barnsley Civic Quarter_FES
Bolton Metropolitan Borough Council	Bolton Town Centre_FES
Bradford Metropolitan District Council	Bradford Civic Quarter_FES
Calderdale Metropolitan Borough Council	Halifax Town Centre_FES
Cheshire East Council	Crewe Town Centre_FES
Kent county	Maidstone Heat Network_FES
London Borough of Haringey	Tottenham Hale_FES
London Borough of Haringey	Wood Green_FES
London Borough of Lewisham	North Lewisham Heat Network_FES
Manchester City Council	Manchester Open Corridor_FES
Newcastle-upon-Tyne City Council	Civic Quarter District Energy Scheme_FES
Plymouth City Council	Civic Centre_FES



# Lillyhall Hub\_FES

## Project Sponsor:

Allerdale Borough Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£0.00
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£0.00
Other capex (£m)	£2.44
<b>Total capex (£m)</b>	<b>£2.44</b>

Project IRR*	0.80%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	2018	Not Provided	Not Provided

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	Allerdale Borough Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

Boiler - Biomass

### Project description:

Lillyhall Hub. a proposed standalone network located at an out of town business park with a series of offices and light industry. The only economically feasible option, but still only feasible with grant funding. Scheme is in two phases, and is dependent on phase 2 connections being built, as at present they are not in existence.

### Energy centre description:

Biomass. Containerised woodchip biomass energy centre. 0.5MW. 85% Efficiency. 100m3 thermal store. 3MW gas back up boiler providing 26% of the load.

### Heat/cooling demand phasing description:

The most feasible project would be the Lillyhall Hub, There are several plots nearby earmarked for future development, which would provide phase 2 of the network. The network is only feasible if phase 2 heat demands are constructed. Total heat demand is 2,111MWh/yr.

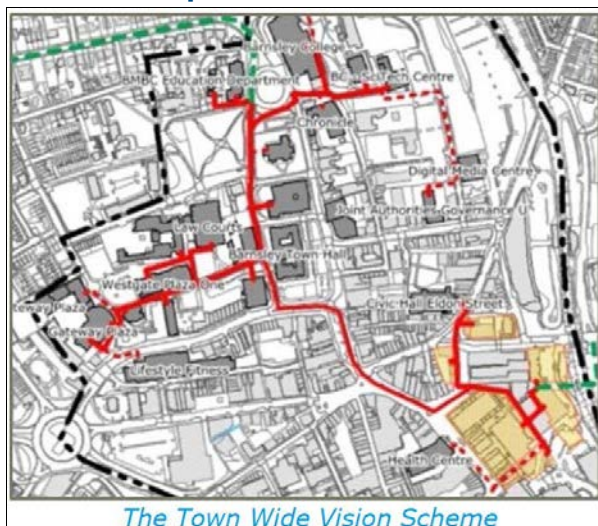


# Barnsley Civic Quarter\_FES

## Project Sponsor:

Barnsley Metropolitan Borough Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£2.37
Private Wire (£m)	£0.29
Pipework / distribution capex (£m)	£2.75
Other capex (£m)	£6.00
<b>Total capex (£m)</b>	<b>£11.41</b>

Project IRR*	4.40%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	2018	2019	2022

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	Barnsley Metropolitan Borough Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

The feasibility study concluded that the Town Centre Wide - Scenario 1 scheme is to be taken forwards to stage 2. This scheme includes all loads identified in the EMP, with inclusion of St Marys Church, the Digital Media Centre, Joint Authorities Governance Unit, Civic Hall, and Centre for Voluntary action. To also include the Alhambra Shopping Centre. Heat and power to be supplied to the Better Barnsley development phase 1, with only power being supplied to phases 2 and 3. Should this scheme not pass stage 2, there is the option to fall back on the Civic Quarter scheme.

### Energy centre description:

The site for the proposed EC is within the Better Barnsley development. The EC will contain Natural Gas CHP units. The proposed plant includes 7MW gas boilers, and 1,200kW gas CHP engines, 2x115m2 thermal stores.

### Heat/cooling demand phasing description:

Heat demand is 7,254 MWh/yr. Peak heat demand 4.7MW. Phase 1 in operation from 2019 is proposed to connect all stakeholders except St Marys Church, power from CHP to supply Better Barnsley Phase 1, and the Alhambra shopping centre. Phase 2 and 3, 2020 and 2021 would see power connected to the final phases of the Better Barnsley development. Phase 4 would see St Marys Church being connected in 2022.



# Langley & Peddimore\_FES

## Project Sponsor:

Birmingham City Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£11.69
Private Wire (£m)	£0.22
Pipework / distribution capex (£m)	£5.07
Other capex (£m)	£0.00
<b>Total capex (£m)</b>	<b>£16.98</b>

Project IRR*	6.60%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	Not Provided	Not Provided

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	Birmingham City Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

The district heat network consists of the new residential development parcel Langley South and the Peddimore Industrial Park development. Heat is supplied to Langley South and Peddimore by the CHP units at Peddimore along with a private wire electrical supply on the Peddimore site.

### Energy centre description:

The Energy Centre will be located on the Peddimore site, near the site's main entrance. The Energy Centre will contain 2 gas-fired CHP units (both 2 MWe capacity), backup gas-fired boilers, and thermal stores.

### Heat/cooling demand phasing description:

Because the network is comprised entirely of new developments, the demand phasing will be in sync with the completion of the buildings / residential areas. The construction of the new developments is expected to begin in 2020, completing in 2030.





# Bolton Town Centre\_FES

## Project Sponsor:

Bolton Metropolitan Borough Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£3.50
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£2.77
Other capex (£m)	£3.24
<b>Total capex (£m)</b>	<b>£9.51</b>

Project IRR*	4.70%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	2021	2022	2024

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	Bolton Metropolitan Borough Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

The proposal is to supply Town Centre loads in 3 phases with heat from CHP and biomass, with some loads (possibly the Town Hall and / or Cheadle Square development) being supplied with electricity via a private wire arrangement. The feasibility study concluded that under the base case scenario, there does not appear to be a viable investment, however with 30% HNIP funding, and private wire sales increased to 75% of electrical output, the IRR increases to 4.7% (8.1.5 p42)

### Energy centre description:

This study has assessed options for an energy centre in Bolton Town Centre. The current central bus station site was identified as the preferred location. Alternative sites including Cheadle Square (ranked 2nd, and Central Street ranked 3rd) were also identified should the bus station site prove unworkable. The proposed plant includes 150kW biomass boiler, 1.7MWe gas CHP and 10MW gas boilers, with 100m3 thermal store, and a 20m3 biomass fuel store.

### Heat/cooling demand phasing description:

Tier 1 connections heat on in 2022, tier 2 in 2023 and tier 3 in 2024. It is hoped that the network could be supplied with heat from the proposed adjacent Raikes Lane network from 2035.



# Castle Lane East Network\_FES

## Project Sponsor:

Bournemouth Borough Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£0.00
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£0.00
Other capex (£m)	£9.10
<b>Total capex (£m)</b>	<b>£9.10</b>

Project IRR*	11.10%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	2020	2023

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	Bournemouth Borough Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

Boiler - EfW

### Project description:

There is potential for a viable DH network in Bournemouth, with the Hospital being the key anchor load, and location for the EC. Viability depends on the expansion of the hospital and development of adjacent land.

### Energy centre description:

It is proposed to locate the EC at the Hospital and use the Incinerator as the main heat supply source. 2x CHP units each with capacity of 1580kW will be located alongside the incinerator to supply heat and power in the best performing scenario. Existing boilers are to be omitted from the scheme.

### Heat/cooling demand phasing description:

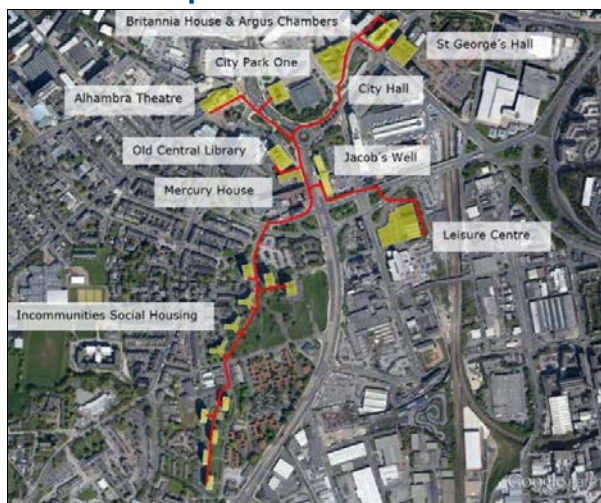
The phasing of the scheme will be coordinated to try and do most of the work in the summer when there is the lowest demand for the heat. The development is assumed to be connected in 3 equal loads in 2020, 2021 and 2023.

# Bradford Civic Quarter\_FES

## Project Sponsor:

Bradford Metropolitan District Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£3.02
Private Wire (£m)	£0.31
Pipework / distribution capex (£m)	£3.53
Other capex (£m)	£1.24
<b>Total capex (£m)</b>	<b>£8.09</b>

Project IRR*	Not provided
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	Not Provided	Not Provided

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	Bradford Metropolitan District Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

A priority network has been identified that offers a preferred business case; this comprises the installation of a 3MWe gas CHP in an Energy Centre within the Leisure Centre and 1MW of biomass heating capacity within the Old Central Library. The network would supply Britannia and Argus Chambers, City Park One, Alhambra Theatre, Old Central Library, Mercury House, St George's Hall, City Hall, Public Service Hub, Leisure Centre and eleven Incommunities social housing blocks.

### Energy centre description:

A 2MWe CHP and 1MW biomass boiler would be the primary heat sources. The CHP is intended to operate at full capacity between the hours of 6am and 7pm due to the large heat demand of the buildings. The biomass boiler is intended to operate throughout the day to satisfy the remaining demand, although peak demand from around 6am to 1pm exceeds capacity of both the CHP and biomass boiler and would be met by the existing fossil fuel boilers.

### Heat/cooling demand phasing description:

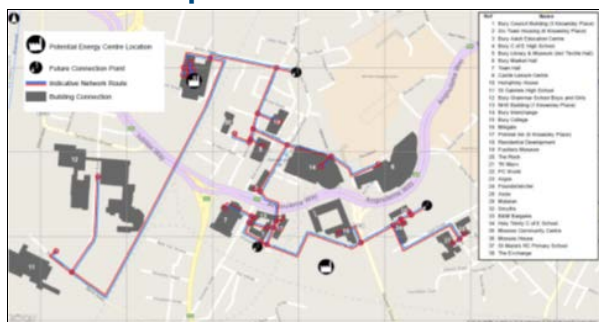
The priority network represents the first phase of development of a district energy network for the City of Bradford. In the future, additional heat demands may be added via extension to the network, as new developments are constructed near to the priority network or lower cost and carbon heat sources become available. In order to future proof the scheme and network outline design, consideration of proposed existing and planned heat loads was undertaken and future proofing design measures developed, such as increasing pipe sizes and specification to accommodate future increased heat flow.

# Bury Town Centre\_FES

## Project Sponsor:

Bury Metropolitan Borough Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£2.15
Private Wire (£m)	£1.07
Pipework / distribution capex (£m)	£4.10
Other capex (£m)	£0.00
<b>Total capex (£m)</b>	<b>£7.32</b>

Project IRR*	5.40%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	2018	Not Provided	Not Provided

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	Bury Metropolitan Borough Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

The preferred option for the town centre extends from St Gabriels High School in the West to Moses Community Centre in the East and covers the areas to the north and south of the A58. Once completed heat will be provided to 17 buildings. The network will be built in 3 phases, and future proofed to allow for further expansion. The network will be supplied with heat and power from CHP gas backup and thermal storage.

### Energy centre description:

The preferred energy centre location is in the Castle Leisure Centre. The energy centre has been developed as a phased build up over the duration of the network development to reduce initial CAPEX and redundant heat generation.

- Phase 1 - Two CHP units and two boilers
- Phase 2 - An additional boiler
- Phase 3 - An additional CHP unit and Boiler

The complete energy centre will contain 3x 400 kWe (504 kWth) CHP engines, and 4x 2MW gas boilers, with 60 m3 thermal storage.

### Heat/cooling demand phasing description:

Phase 1: Connection to buildings to the east of the Energy Centre up to the Metrolink underpass

Phase 2: Connection to Bury Grammar Boys school, Bury Grammar Girls school and St Gabriels High School with the pipe route along East Lancs Railway.

Phase 3: Connection to buildings east of the Metrolink.

The network has been future proofed to take account of potential new development by including planned blank connections, for future connections to:

- Eastern retail loads in Angouleme retail park
- Residential development on Knowsley Street
- Future connection to the Rock and Millgate retail (Exec Sum p6)

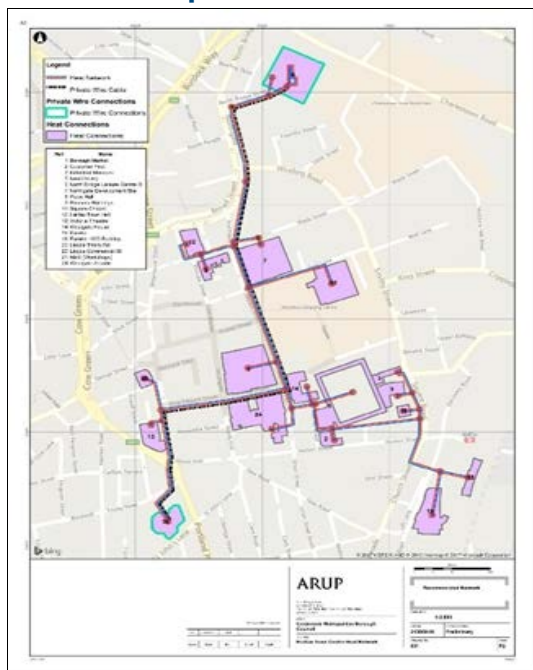


# Halifax Town Centre\_FES

## Project Sponsor:

Calderdale Metropolitan Borough Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£3.65
Private Wire (£m)	£0.41
Pipework / distribution capex (£m)	£5.26
Other capex (£m)	£0.23
<b>Total capex (£m)</b>	<b>£9.55</b>

Project IRR*	5.90%
Considering third party finance?	Yes

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
2019	2020	2021	Not Provided

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	Calderdale Metropolitan Borough Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

The network is designed around CMBC buildings incorporating all viable CMBC owned buildings in the Town Centre, including the Town Hall, Piece Hall, Northgate Development Site and North Bridge Leisure Centre Development amongst others. The scheme also connects to key private consumers in the area including Lloyds Trinity Rd and Eureka. A private wire connection is intended to be incorporated between the Energy Centre and Lloyds, a key anchor load central to the scheme viability. The scheme is designed to allow for future heat network expansion to Dean Clough but requires further engagement with the developer for this to be realised.

### Energy centre description:

The Energy Centre proposed is part of a Leisure Centre development north of the Town Centre (provision has been given in modelling and report for a standalone Energy Centre if this is not possible). The Energy Centre would contain two 1.5MWe gas-fired CHP engines along with ancillary and back-up plant including four 3.3MW gas boilers and a 150m<sup>3</sup> thermal store. As a standalone Energy Centre, the building would have an estimated 290m<sup>3</sup> footprint. The operational strategy is heat-led.

### Heat/cooling demand phasing description:

Through consultation with CMBC and HNDU, the scheme has been specified as a single phase. This has been selected as the network is not large enough to require multiple phases and all key internal and external stakeholders have engaged with the scheme. It is acknowledged that the major transport works planned throughout the Town Centre may impose build out constraints; however, the programme for this is unknown and therefore cannot be addressed at this stage.

# Cherwell - Bicester EcoTown\_FES

## Project Sponsor:

Cherwell District Council

## Network Map:

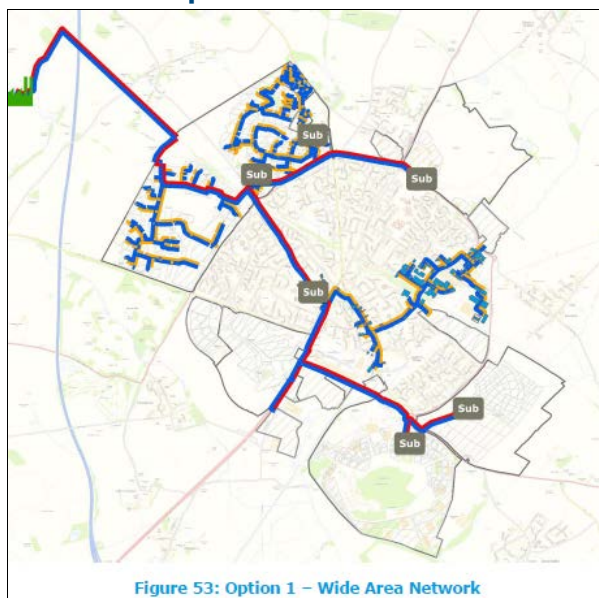


Figure 53: Option 1 – Wide Area Network

## Technical Information:

### Primary energy source:

CHP – EfW

### Project description:

Following an initial feasibility study looking at heat demand in Bicester and possible networks, a more detailed analysis of utilising waste heat from the Ardley EfW to be provided to the new 6,000 home Eco Town (with a zero carbon planning requirement) is being conducted.

### Energy centre description:

It is proposed that heat will be supplied from the 12.5MW capacity Ardley ERF facility

### Heat/cooling demand phasing description:

Much of the development is to be new build, and heat demand is projected to steadily grow from 2023 to full build out in 2042.

## Summary forecast financial information:

Energy generation capex (£m)	£0.00
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£0.00
Other capex (£m)	£64.00
<b>Total capex (£m)</b>	<b>£64.00</b>

Project IRR*	6.40%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	2023	Not Provided

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	Cherwell District Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

# Alderley Park\_FES

## Project Sponsor:

Cheshire East Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£5.83
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£1.35
Other capex (£m)	£0.00
<b>Total capex (£m)</b>	<b>£7.18</b>

Project IRR*	3.90%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	2019	2035

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	Cheshire East Council
Contact Name:	Renia Kotynia
Email:	Renia.Kotynia@cheshireeast.gov.uk

## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

Network at Alderley Park - installation of gas CHP at 2019, phasing the network towards an ambient loop solution utilising WSHP and open-loop GSHP.

### Energy centre description:

Initial phases utilise the existing energy centre. Future phases expect to build a new energy centre adjacent to Radnor Mere.

### Heat/cooling demand phasing description:

Phase 1 – Existing strategy, total heat load served by gas fired boilers supplying hot water at 176°C.

Phase 2 – A number of short term energy efficiency measures have been introduced., CHP supplies a portion of heat to the LTHW network and supply temperature drops to 90°C. A number of office buildings have converted to VRF systems and are thus disconnected from the existing network.

Phase 3 – Ambient loop system introduced powered by WSHP adjacent to Radnor Mere and initially serving the office buildings which are all served by VRF systems. Existing heat network continues to serve laboratory buildings.

Phase 4 – Ambient loop extended to laboratory buildings with additional capacity from open loop GSHP. Existing heat network decommissioned and CHP taken offline.

Phase 5 – Continual energy saving through improved network and building efficiencies

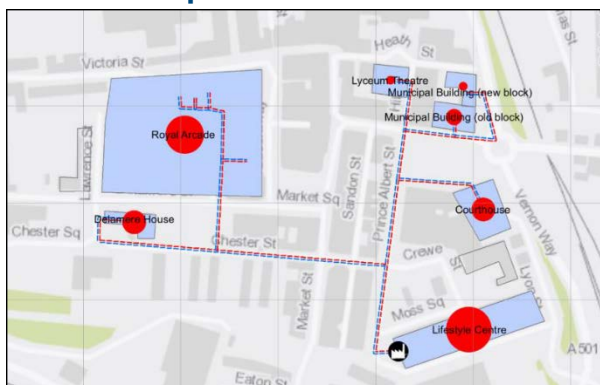


# Crewe Town Centre\_FES

## Project Sponsor:

Cheshire East Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£0.00
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£0.00
Other capex (£m)	£0.00
<b>Total capex (£m)</b>	<b>£3.90</b>

Project IRR*	3.40%
Considering third party finance?	Yes

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	Not Provided	Not Provided

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	Cheshire East Council
Contact Name:	Renia Kotynia
Email:	Renia.Kotynia@cheshireeast.gov.uk

## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

Heat and Power from CHP, with gas back up. Heat to be provided to Lifestyle Centre, Courthouse, Lyceum Theatre, Municipal Buildings and Delamere House. Electricity sold to Lifestyle Centre, Royal Arcade, Delamere House and Lyceum Theatre via a private wire network. Route Option B. (Table 6, p75)

### Energy centre description:

Energy Centre to include 550kWe CHP, 2.7MWth gas boiler, and 170m3 thermal store. Potential EC location in an extension of the plantroom of the Lifestyle Centre. The extension footprint to house scheme energy plants is proposed over two floors.

### Heat/cooling demand phasing description:

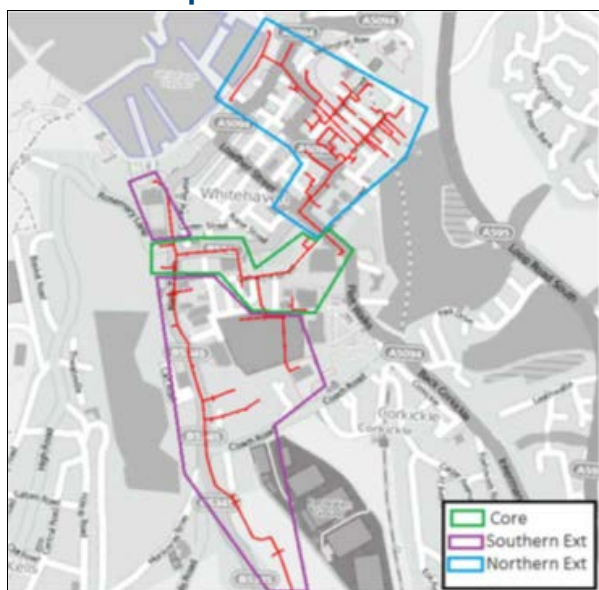
Peak heat demand is 9.3MW (Table 7, p79). There is no information on the phasing sequence in which loads could be connected at time of writing.

# Whitehaven Minewater Heat Kells Lane\_FES

## Project Sponsor:

Copeland Borough Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£3.80
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£2.18
Other capex (£m)	£2.17
<b>Total capex (£m)</b>	<b>£8.15</b>

Project IRR*	4.00%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	2021	2021	Not Provided

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	Copeland Borough Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

Mine Water Heat Recovery

### Project description:

Feasibility shows that minewater-fed network for Whitehaven town centre is technically feasible though financial performance is very poor, and without RHI payments the scheme is highly unlikely to make an operating surplus. Analysis shows that a low temperature scheme, serving only new developments with low temperature heating systems would make a profit, and without grant funding approaches an investible IRR. Such a scheme is dependent on buildings that do not yet exist so scheme development will need to wait until their construction is more certain.

### Energy centre description:

Suitable locations for an energy centre to house a 4MW minewater heat pump and ancillary equipment were identified. The preferred site – Castle Meadows car park – is council-owned and is in close proximity to a suitable minewater abstraction borehole and the key heat loads.

### Heat/cooling demand phasing description:

For the low temperature network, connections begin in 2021; Civic Quarter replacement, Plot 1 of The Ginns, Plot 1 of the Meadows, 13 Quay St developments. 2022: Plots 2 and 5 the Ginns, Plot 2 at 6 The Meadows. 2023 Plot 3 at the Ginns, and Plot 3 at 6 the Meadows, Preston St Gateway developments. 2024: Plot 4 at 6 the Meadows. 2025: Plot 4 The Ginns. 2026: Plot 5 at 6 The Meadows.

# Whitehaven Westlakes Science Park\_FES

## Project Sponsor:

Copeland Borough Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£3.67
Private Wire (£m)	£1.43
Pipework / distribution capex (£m)	£2.60
Other capex (£m)	£2.72
<b>Total capex (£m)</b>	<b>£10.43</b>

Project IRR*	3.88%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	2020	2025

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	Copeland Borough Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

The preferred option is for a network to supply the Westlakes Science Park, though the IRRs are unlikely to be investible even with HNIP funding. It has been advised that further funding be sought in addition to HNIP. (p.116). Investigations considering viability of connecting the Eastern Whitehaven cluster did not improve the economics. The Westlakes Science Park is a majority private sector proposal, that would serve non-domestic loads.

### Energy centre description:

A new energy centre site to the north side of Westlakes Science Park has been identified as the preferred option. The network would be supplied by 2x 1180kWth gas CHP engines. (p.62)

### Heat/cooling demand phasing description:

The network is proposed in 3 phases. The first connections (a selection of existing and planned buildings) are planned in 2020, the second phase includes the proposed buildings known as "Plot 526", and the third phase, Summergrove Hall is planned for after 2025.



# Durham Town Centre\_FES

## Project Sponsor:

Durham County Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£4.93
Private Wire (£m)	£0.63
Pipework / distribution capex (£m)	£3.75
Other capex (£m)	£1.84
<b>Total capex (£m)</b>	<b>£11.15</b>

Project IRR*	3.00%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	2019	2022

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	Durham County Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

Hence it is recommended that the “core scenario” of the Northern Quarter and Town Centre north is taken forward for detailed financial assessment. It is recommended that the most economic scheme, the CHP and heat pump solution for the Town Centre scheme is taken forward. (page 12, paragraph 3)

### Energy centre description:

The proposed Energy Centre location is the Milburn Gate development. The best economically performing option of the preferred scenarios is for 1x1MW River Source Heat pump initially and 2 x 800kWe CHP units to be located in the Energy Centre. After 15 years, the CHP units are to be retired, and Heat Pump capacity increased to 2x 1MW units.

### Heat/cooling demand phasing description:

The heat demand for the Town Centre North and Northern Quarter is 4055MWh in 2019, rising to 8,267MWh in 2020, 11,647MWh in 2021 and finally 14,769MWh in 2022. Electricity demand for the Private Wire network is 930MWh in 2019, and remains the same through the duration of the project. (Table 0-1, p3). The Private Wire network is designed to meet the baseline demand of the loads served.



# Durham University\_FES

## Project Sponsor:

Durham County Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£8.32
Private Wire (£m)	£2.37
Pipework / distribution capex (£m)	£10.18
Other capex (£m)	£1.23
<b>Total capex (£m)</b>	<b>£22.11</b>

Project IRR*	7.40%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	2019	2020	2023

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	Durham County Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

The report concluded that a CHP only system would be preferable, though the exact configuration hasn't been decided on yet. The figures in this appendix refer to CHP, Option B, with 23% of Capex supplied by grant funding. Private wire cables to use same trenches as the network pipes.

### Energy centre description:

The preferred location for the Energy Centre is known as EC1, the green space at A177 adjacent to Ogden Centre. Option B proposes 2 x 3333kW<sub>e</sub> CHP units and 1x 300m<sup>3</sup> thermal store.

### Heat/cooling demand phasing description:

The scheme is divided up into clusters-the Northern, Western Eastern and Southern clusters. These clusters will be connected in phases as follows. PHASE 1: Northern Cluster in yr 2020, (13,900MWh<sub>th</sub>, 15650MWh<sub>e</sub>), PHASE 2: Western cluster in yr 2021 (6630MWh<sub>th</sub>, 5360MWh<sub>e</sub>) PHASE 3: Eastern cluster in yr 2022 (6850MWh<sub>th</sub>, 2910MWh<sub>e</sub>), and PHASE 4: Southern Cluster in yr 2023 (3610MWh<sub>th</sub>, 1280MWh<sub>e</sub>). (Table 7-1 p67). This phasing arrangement and timetable has been used for theoretical demonstration purposes, and the real timetable will depend on the University construction timetable.

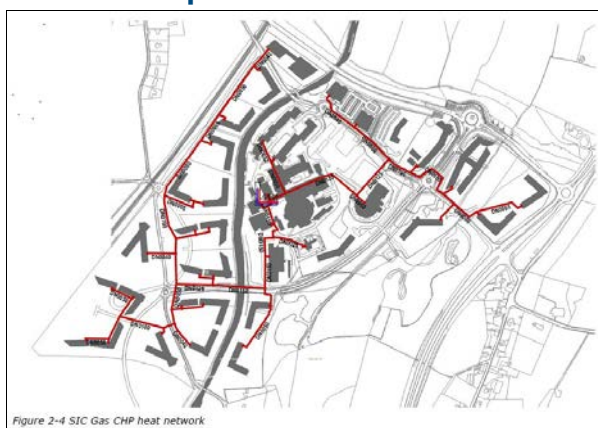


# East Runcorn Daresbury Energy Network\_FES

## Project Sponsor:

Halton Borough Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£3.45
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£4.77
Other capex (£m)	£1.90
<b>Total capex (£m)</b>	<b>£10.12</b>

Project IRR*	Not provided
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	2018	2034

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	Halton Borough Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

Over the next twenty years the construction of a new community in East Runcorn - with up to 2800 new homes alongside new schools and retail buildings, and the expansion of the existing Science and Innovation Campus and Business Park - represents a significant opportunity to develop a shared energy network.

### Energy centre description:

Gas CHP is assumed to provide baseload heat, hot water and power, with 3.3 MW (thermal) CHP and 5.8 MW of gas boilers required once all consumers are connected. Absorption chillers are considered for use to supply cooling to the Science and Innovation Campus data centre.

### Heat/cooling demand phasing description:

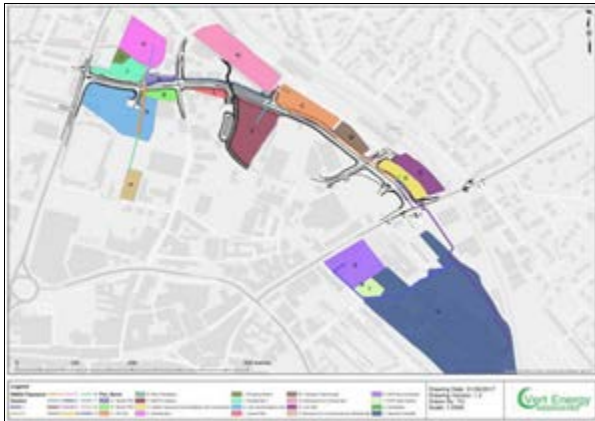
First stage connection forecast (as at 2016) to connect in 2018 with 4.5MW of thermal capacity installed (estimated 1.16GWh p.a. heat demand). This increases to installed capacity of 8MWth in 2026 (estimated 9.92GWh p.a. heat demand) rising to full capacity of 9MWth in 2031 (estimated 12.56GWh p.a. heat demand).

# Hereford Link Road\_FES

## Project Sponsor:

Herefordshire Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£1.87
Private Wire (£m)	£0.01
Pipework / distribution capex (£m)	£3.02
Other capex (£m)	£0.00
<b>Total capex (£m)</b>	<b>£4.90</b>

Project IRR*	Not provided
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
2018	2019	2019	2023

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	Herefordshire Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

District heating scheme using hereford hospital as anchor heat load although it only has a steam requirement. LTHW network is district scheme to be built to support the city centre redevelopment

### Energy centre description:

New energy centre of 300m2 to contain CHP Unit and Heat Recover Boiler, 3MW LTHW Gas boiler and thermal store. Existing Hospital energy centre to contain 3 x 2.8MW Byworth boilers

### Heat/cooling demand phasing description:

Hospital, 1 residential block, 2 public buildings to be connected 2020 and 1MWh other existing buildings. Remaining loads to come on stream over time to 2024 when all loads will be online

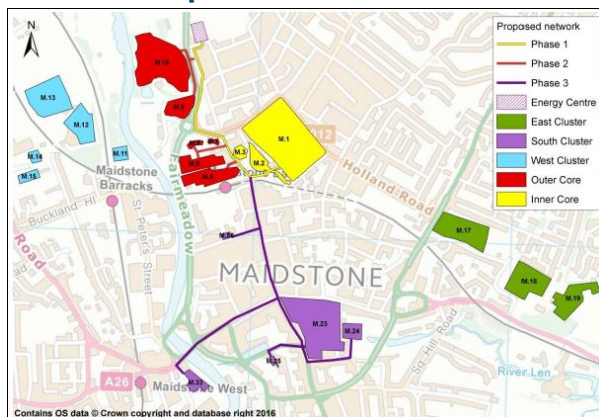


## Maidstone Heat Network\_FES

### Project Sponsor:

Kent county

### Network Map:



### Summary forecast financial information:

Energy generation capex (£m)	£17.28
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£3.76
Other capex (£m)	£2.88
<b>Total capex (£m)</b>	<b>£23.92</b>

Project IRR*	6.08%
Considering third party finance?	Yes

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	2021	2025

### Project Stage

Feasibility

### Project Contact Details:

LA Name:	Kent county
Contact Name:	Chris Gadsby
Email:	chris.gadsby@kent.gov.uk

### Technical Information:

#### Primary energy source:

CHP – Gas

#### Project description:

Central Maidstone has been identified as having good potential for district heating. A concentrated number of buildings are shown to have a high demand for heat, and consume significant quantities of natural gas in their respective onsite boiler heating systems. Building types range from offices and residential accommodation, to community facilities (such as libraries, museums and shopping centres) and a large detention centre (HMP Maidstone). Phase 1 will include the 3 large county council sites and HMP Maidstone.

#### Energy centre description:

A modular approach is proposed to allow for the build out of the three phases minimising upfront payment for key plant and equipment for future phases. Preliminary designs suggest total requirement as;

- 3 no 1MWe gas-CHP engines or fuel cell equivalent
- Total of 18MW gas boilers
- 3 no 25m<sup>3</sup> thermal storage vessels
- Selective catalytic reduction units (to reduce NOx emissions)
- CHP, boiler electrical and mechanical ancillary equipment
- Meters, management and control system
- Flues (20m)
- PV panels for centre load

#### Heat/cooling demand phasing description:

Phase 1 Q1 2021 Inner Core

- 8 MW – boiler
- 1 MW – CHP
- 25 m<sup>3</sup> thermal store
- Network length 693m

Phase 2 Q1 2024 Inner Core + Outer Core

- 12 MW – boiler
- 2 MW – CHP
- 50 m<sup>3</sup> thermal store
- Network length 1,434

Phase 3 Q1 2025 Inner + Outer Core + Southern

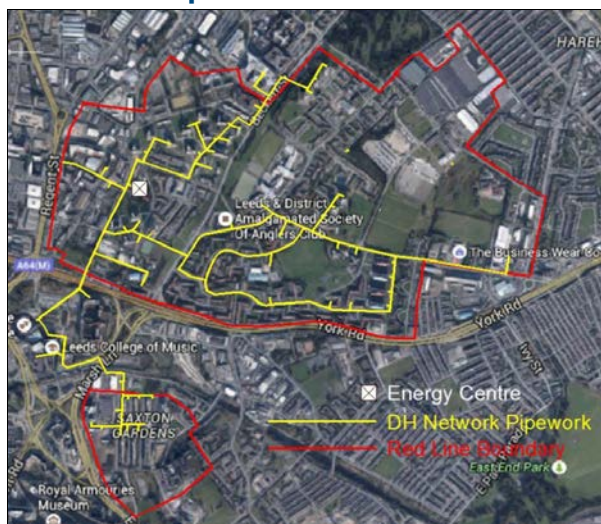
- 18 MW – boiler
- 3 MW – CHP
- 75 m<sup>3</sup> thermal store
- Network length 3,630

# Leeds Phase 2 DHN\_FES

## Project Sponsor:

Leeds City Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£0.00
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£10.00
Other capex (£m)	£2.00
<b>Total capex (£m)</b>	<b>£12.00</b>

Project IRR*	Not provided
Considering third party finance?	Yes

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	Not Provided	Not Provided

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	Leeds City Council
Contact Name:	George Munson
Email:	george.munson@leeds.gov.uk

## Technical Information:

### Primary energy source:

CHP – EfW

### Project description:

Leeds City Council is developing a flagship District Heating Network (DHN) that will use heat generated by processing waste at the council's newly constructed Recycling and Energy Recovery Facility (RERF). This multi-million pound investment will create a flexible 6km spine network and a connected local DHN to serve 1,983 flats, as illustrated. Vital Energi will start construction this year and complete the network in late 2019.

The council is now interested in developing a second phase of the spine network, to extend heat provision to the city centre and/or the rapidly developing Southbank area.

### Energy centre description:

The phase 2 extension will not require a new energy centre as the phase 1 spine network has been designed with growth in mind. The network will be provided with up to 20MWth of heat from the RERF with an additional c30MWth of peaking/back-up plant, plus significant thermal stores. This is sufficient for expansion, but the council is open to offers from existing/new heat sources that would offer lower cost and lower carbon heat, particularly to offset gas as the network grows.

### Heat/cooling demand phasing description:

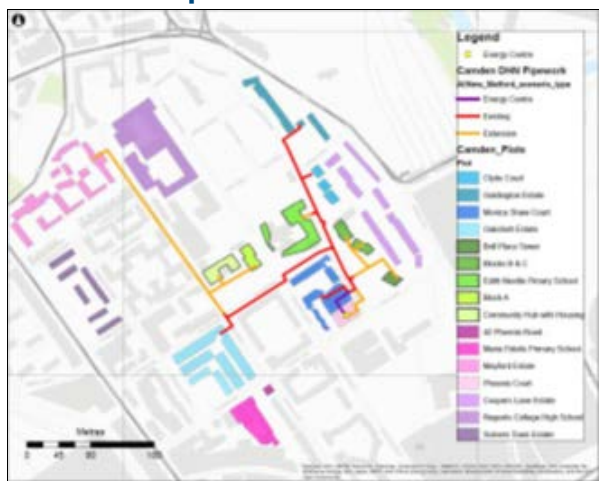
The network will initially connect to existing council/public sector buildings to provide an anchor load from day 1. The city centre and the Southbank have numerous active development sites and we anticipate that these will connect to the network between 2020 and 2025. The Southbank will also boast the HS2 station for Leeds so another tranche of development will happen as that is built and becomes established.

# Somers Town phase 2\_FES

## Project Sponsor:

London Borough of Camden

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£0.00
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£0.00
Other capex (£m)	£0.00
<b>Total capex (£m)</b>	<b>£6.00</b>

Project IRR*	5.80%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	2015	2017

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	London Borough of Camden
Contact Name:	James Davies
Email:	james.davies@camden.gov.uk

Information valid as at: 2016

## Technical Information

### Primary energy sources:

CHP – Gas

### Project description:

The project has been developed in two phases. Phase 1 was completed in 2015 and included a new district heating network supplying 330 homes. Phase 2 was commissioned in 2017 and extends the network to a further 200 homes, a school and community centre. Phase 2 also includes the installation of a CHP engine with electricity either sold to a 3rd party via private wire, or exported to the grid.

### Energy centre description:

The energy centre capacity is 3x1.3MW gas boilers. An additional 980kW CHP will be installed in 2018. The current services within the energy centre have been future proofed from the initial tender submission to accommodate additional heat demand. Pressurisation unit and flue sizes were increased to accommodate up to 6.5MW of heat generation.

### Heat/cooling demand phasing description:

Connections were separated into two phases-phase 1 in 2015 (4x connections), and the remaining connections (phase 2) occurring in 2018. Future phases are proposed.

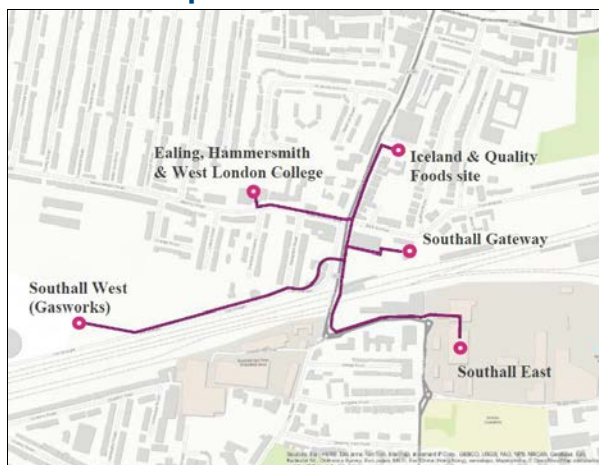
WHILST THE DATA WE HAVE IS BASED ON FEASIBILITY WORK WE ARE AWARE THAT THE PROJECT IS NOW UNDER CONSTRUCTION

# Southall DE\_FES

## Project Sponsor:

London Borough of Ealing

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£5.48
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£3.67
Other capex (£m)	£0.00
<b>Total capex (£m)</b>	<b>£9.15</b>

Project IRR*	12.40%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	2019	2043

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	London Borough of Ealing
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

Southall is a vibrant and bustling place, poised to play a renewed role as one of London's most significant growth areas. With the arrival of Crossrail, significant investment from the Mayor's Regeneration Fund and clusters of major development sites, including the Gas Works, Southall is capable of exploiting the opportunities presented by this enhanced connectivity and committed investment.

### Energy centre description:

Heat is provided for the scheme via combined heat and power (CHP) technology, with a large energy centre (EC) housing boilers and gas engines to be constructed on the site of the redeveloped Southall Gasworks. A heat network will take heat from the EC to serve new loads on the Gasworks site, as well as developments to the east, and to the south of the railway.

### Heat/cooling demand phasing description:

Cumulative heat loads (excluding primary and secondary losses) reach a plateau at 24,000 MWh/year as the full build-out of all connected development sites is expected to happen in 2043.



# Tottenham Hale\_FES

## Project Sponsor:

London Borough of Haringey

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£10.24
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£3.64
Other capex (£m)	£18.04
<b>Total capex (£m)</b>	<b>£31.92</b>

Project IRR*	7.10%
Considering third party finance?	Yes

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	2018	2018	2030

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	London Borough of Haringey
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

2 scenarios are considered; "Extended Tottenham Hale" and "Central Tottenham Hale". The figures shown below are for the scenario variation "Extended Tottenham Hale with expansion capacity and 20% grant". The scheme is for 3.5MWe CHP and gas back up to supply heat to majority new build domestic and non domestic loads, with a very small fraction of existing buildings. The work completed shows no economic benefit from private wire, though it has not been categorically ruled out at time of writing.

### Energy centre description:

An Energy Centre is proposed under the Watermead Way flyover and the area adjacent to this, subject to approval of detailed design proposals. It is proposed to develop the EC in two phases, phase 2 being developed after redevelopment of retail park. The Energy Centres will house 3.5MWe CHP and 17MWth gas boilers.

### Heat/cooling demand phasing description:

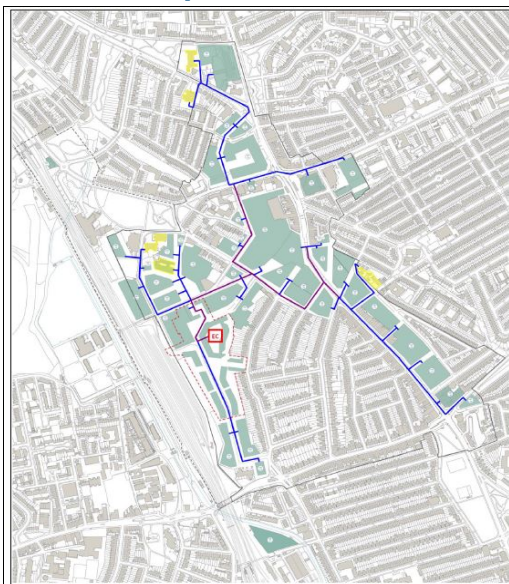
Extended Tottenham Hale has a peak heat demand of 17MW. Central Tottenham Hale has a peak heat demand of 11MW. For the extended Tottenham Hale scheme, heat demand is 12,853MWh/yr, and electricity demand is 14,442MWh/yr. Figure 6, p23 shows heat on in 2018, with 60% of total demand supplied by 2025. In 2030, phase 2 loads come online with the redevelopment of the retail park, gradually building up to 100% heat demand being supplied by 2035.

# Wood Green\_FES

## Project Sponsor:

London Borough of Haringey

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£22.10
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£6.80
Other capex (£m)	£2.00
<b>Total capex (£m)</b>	<b>£30.90</b>

Project IRR*	2.60%
Considering third party finance?	Yes

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	2019	2034

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	London Borough of Haringey
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

A new network is proposed. The initial source of low carbon heat is anticipated to be gas-fired combined heat and power, with an aspiration to connect to the energy from waste plant in Edmonton in the longer term. It is hoped that electricity can be sold via private wire to Haringay Council or the rail works to the west of the scheme. Heat will supply mainly new developments proposed in the area, alongside some existing loads.

### Energy centre description:

The proposed energy centre of footprint 2700m<sup>2</sup> will be integrated into the proposed Clarendon Square development. The energy centre is anticipated to need to be integrated with other building uses and will need to be fully built out at the start of the project. The fully built out scheme is estimated to require around 28MW of gas boiler plant and 5.3MWth of gas-fired CHP

### Heat/cooling demand phasing description:

The estimated total annual heat demand on full build out of the masterplan is 28.2 GWh Phase 1 has been taken as Clarendon Road, areas adjacent to the railway and the Cultural Quarter. Phase 2 has been taken as the Mall, Morrisons and High Road South. Phase 3 has been taken as the Civic Centre, Bus Depot and Mecca Bingo sites.

# New Cross Heat Network\_FES

## Project Sponsor:

London Borough of Lewisham

## Network Map:



## Technical Information:

### Primary energy source:

CHP – EfW

### Project description:

A route feasibility assessment was undertaken for a heat network linking the SELCHP energy from waste facility on Landmann Way and the Goldsmiths, University of London campus in New Cross.

### Energy centre description:

Not Provided

### Heat/cooling demand phasing description:

The scheme assessed is proposed as a kick start to a wider, area heat network, the economic performance of which has not yet been assessed. Goldsmiths are an existing, significant heat load with a strong interest in connection that can act as an 'anchor load' from which to build the wider network.

## Summary forecast financial information:

Energy generation capex (£m)	£0.00
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£4.68
Other capex (£m)	£0.00
<b>Total capex (£m)</b>	<b>£4.68</b>

Project IRR*	Not provided
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	Not Provided	Not Provided

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	London Borough of Lewisham
Contact Name:	Martin O'Brien
Email:	martin.obrien@lewisham.gov.uk





# North Lewisham Heat Network\_FES

## Project Sponsor:

London Borough of Lewisham

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£0.00
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£7.68
Other capex (£m)	£0.00
<b>Total capex (£m)</b>	<b>£7.68</b>

Project IRR*	15.30%
Considering third party finance?	Yes

\* Real pre-tax pre-finance

FID	Construction Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	Not Provided	2025

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	London Borough of Lewisham
Contact Name:	Martin O'Brien
Email:	martin.obrien@lewisham.gov.uk

## Technical Information:

### Primary energy source:

Boiler - EfW

### Project description:

The opportunity is to connect the SELCHP energy from waste facility to a number of new developments in the north Lewisham area. The North Lewisham continues from the point of interface with the New Cross study, which is the junction of Surrey Canal Road and Grinstead Road. The pipework running between SELCHP and this interface point (i.e. down Surrey Canal Road) was assessed in the previous feasibility study and the sizing included an allowance for the loads included in this North Lewisham extension study.

Note that the use of two different heat network names across the two studies gives the impression that there would be two separate heat networks – the New Cross and the North Lewisham heatnetworks. These two names are used to define two separate studies, focusing on two areas of what would be the same heat network if all loads connected.

### Energy centre description:

n/a - all heat to be supplied by SELCHP.

### Heat/cooling demand phasing description:

The scope of this feasibility assessment is therefore to build upon the analysis undertaken in the New Cross Heat Network feasibility assessment to include the following development sites: The Wharves, Deptford; Cannon Wharf; Marine Wharf East; Marine Wharf West; Yeoman Street; Neptune Wharf; Convoys Wharf; Arklow Road. Annual heat demand is estimated at 47GWh.

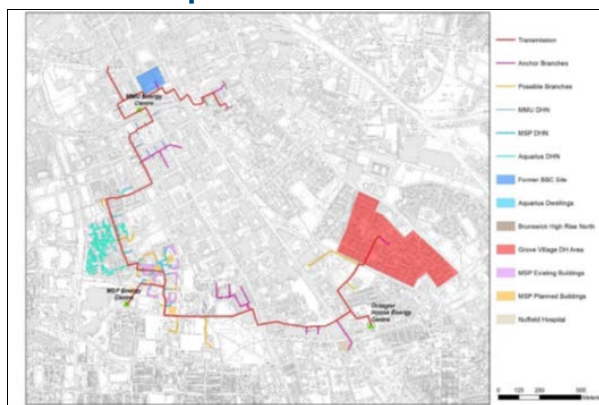
LBL planning officers and local housing associations will also be consulted to determine whether there are additional sites that should be considered for connection.

# Manchester Open Corridor\_FES

## Project Sponsor:

Manchester City Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£0.00
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£14.09
Other capex (£m)	£0.35
<b>Total capex (£m)</b>	<b>£14.44</b>

Project IRR*	5.40%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	2019	2019	2026

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	Manchester City Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

A Corridor-wide Transmission Network is proposed whereby heat producers provide heat to the proposed network in addition to supplying their own heat needs. There are 4 main “prosumers” (consumers and suppliers), 3 of which either already have CHP, or have plans to install CHP. The final proposed supplier is GT Energy’s planned Geothermal project. There are a further 21 potential heat consumers proposed. If built the network will supply the Oxford Road Corridor area of Manchester City Centre.

### Energy centre description:

Rather than one specific energy centre, this project aims to secure heat supply from 4 main suppliers, 3 of which will also consume heat (prosumers). Each of the heat producers connected to the transmission heat network will connect to a district heating substation located within their own Energy Centre. The 4 proposed suppliers are Octagon House CHP plant, MSP CHP plant, MMU CHP plant and GT Energy’s proposed geothermal borehole on Devonshire St, Ardwick.

### Heat/cooling demand phasing description:

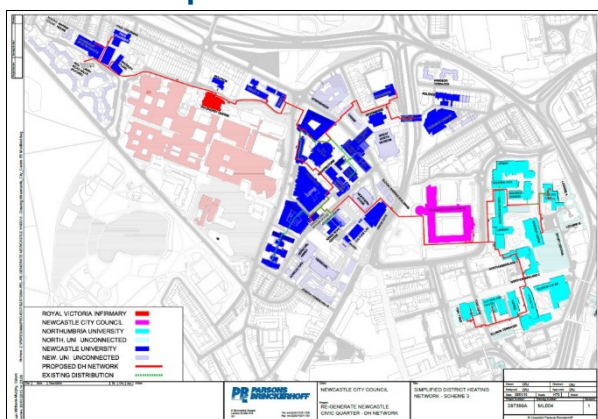
All three prosumer key loads connect in 2019, with slight load increases in 2020 for MSP and MMU All Saints. There are 21 additional proposed heat loads proposed for connection in 2019 and the majority have a consistent heat demand thereafter. Exceptions include Oxford Rd Station development which will connect in 2020, and the former BBC site which connects in 2019, but whose heat load increases in 2021, and again in 2023.

# Civic Quarter District Energy Scheme\_FES

## Project Sponsor:

Newcastle-upon-Tyne City Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£6.09
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£0.00
Other capex (£m)	£0.00
<b>Total capex (£m)</b>	<b>£6.09</b>

Project IRR*	10.70%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	2018	Not Provided

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	Newcastle-upon-Tyne City Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

The project is dependent on securing surplus heat from the energy centre at the Royal Victoria Infirmary (RVI). In order to secure sufficient heat to meet the project objectives of supplying heat to the three key stakeholders while meeting the RVI's requirement would require an upgrade of the existing energy centre at the RVI which is currently operated by Veolia (formally Dalkia). The preferred scheme supplies over 20GWh of low carbon heat from the RVI energy centre to key stakeholder buildings via a 1.8km buried heating network at a capital cost of £5million, resulting in a total CO<sub>2</sub> reduction of 6,300 tonnes per year.

### Energy centre description:

Two 1.9MW CHP engines are currently installed in the Royal Victoria Infirmary energy centre, manufactured by Jenbacher (model: JMS 612). The energy centre is operated under a 25-year PFI contract which ends in 2027. The CHPs are understood to have been installed in around 2002. They are due for a major refurbishment around 2017. The preferred replacement engines have been assessed to be 2 x JMS 624 CHP engines with 8.276MWth/8.802MWe capacity.

### Heat/cooling demand phasing description:

Not Provided

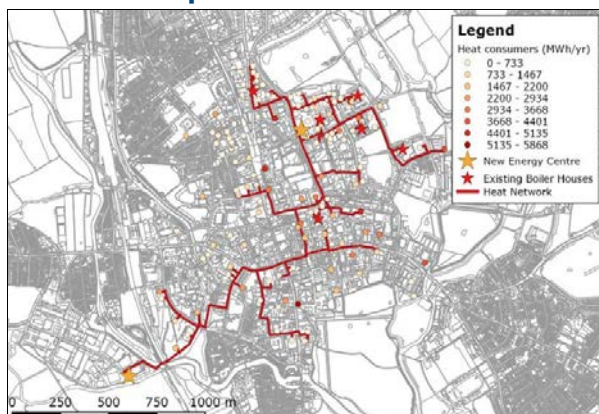


# Oxford City Centre\_FES

## Project Sponsor:

Oxford City Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	Not Stated
Private Wire (£m)	Not Stated
Pipework / distribution capex (£m)	Not Stated
Other capex (£m)	Not Stated
<b>Total capex (£m)</b>	<b>Not Stated</b>

Project IRR*	Not Stated
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	Not Provided	Not Provided

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	Oxford City Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

Carbon reduction has been the driver for Oxford's investigations into heat networks suitability. It is no longer considered appropriate for Oxford to pursue large scale gas CHP and biomass options for heat networks in the city centre (the approach that the feasibility studies favoured), as Oxford is now leading the way in setting up a zero emission zone for parts of the city that have air quality issues. The conventional large scale gas CHP option for heat networks involves burning more gas locally and more local emissions - significant carbon reduction would only kick in as a progressive move was made to biomass burning - again there will be more local emissions, and large truck deliveries of biomass fuel to the energy centres. (Also biomass fuel that is truly sustainable - ie. from managed woodland in the region - is expected to become more difficult to source.)

We are about to go out to tender for a new phase of the feasibility study, assessing innovative clean tech approaches that will not have an impact on Oxford's air quality, rather than pressing on with detailed project development using the gas/biomass combustion approach.

### Energy centre description:

Not stated

### Heat/cooling demand phasing description:

Not stated

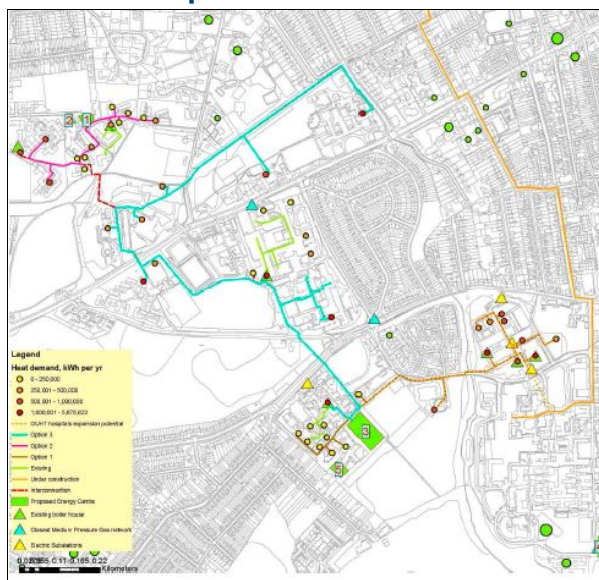


# Oxford Headington\_FES

## Project Sponsor:

Oxford City Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	Not Stated
Private Wire (£m)	Not Stated
Pipework / distribution capex (£m)	Not Stated
Other capex (£m)	Not Stated
<b>Total capex (£m)</b>	<b>Not Stated</b>

Project IRR*	Not Stated
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	Not Provided	Not Provided

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	Oxford City Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

Not Stated

### Project description:

Carbon reduction has been the driver for Oxford's investigations into heat networks suitability. It is no longer considered appropriate for Oxford to pursue large scale gas CHP and biomass options for heat networks in Headington area of the city (the approach that the feasibility studies favoured), as Oxford is now leading the way in setting up a zero emission zone for parts of the city that have air quality issues. The conventional large scale gas CHP option for heat networks involves burning more gas locally and more local emissions - significant carbon reduction would only kick in as a progressive move was made to biomass burning - again there will be more local emissions, and large truck deliveries of biomass fuel to the energy centres. (Also biomass fuel that is truly sustainable - ie. from managed woodland in the region - is expected to become more difficult to source.)

We are about to go out to tender for a new phase of the feasibility study, assessing innovative clean tech approaches that will not have a negative impact on Oxford's air quality, rather than pressing on with detailed project development using the gas/biomass combustion approach.

### Energy centre description:

Not Provided

### Heat/cooling demand phasing description:

Not Provided

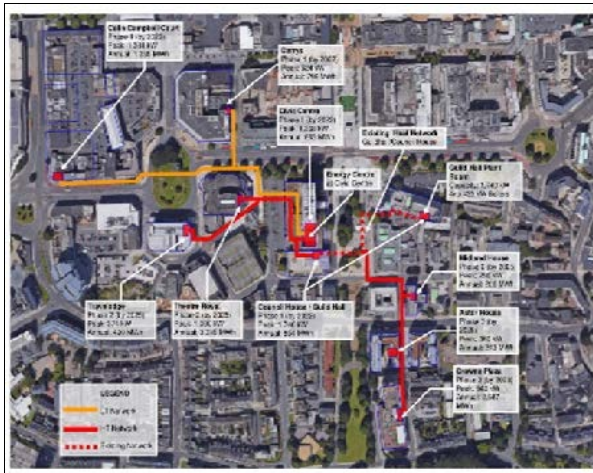


# Civic Centre\_FES

## Project Sponsor:

Plymouth City Council

## Network Map:



### Summary forecast financial information:

Energy generation capex (£m)	£1.10
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£1.66
Other capex (£m)	£0.79
<b>Total capex (£m)</b>	<b>£3.55</b>

Project IRR*	Not provided
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	2020	2021	2028

## Project Stage

## Feasibility

### Project Contact Details:

LA Name:	Plymouth City Council
Contact Name:	Jon Selman
Email:	jonathan.selman@plymouth h.gov.uk

### Technical Information:

**Primary energy source:**

CHP – Gas

### Project description:

A district heating network centred around the redevelopment of the Civic Centre in Plymouth. The scheme connects new development at Colin Campbell Court to the Civic Centre, Council House, Guildhall, with the opportunity to also connect the Derrys building. The energy centre for the scheme is to be located in the Civic Centre basement. The scheme uses ground source heat pumps and gas CHP as the low carbon heat sources. There is a private wire to the Council House. Additionally investigated is the expansion of the scheme through phases two and three, although these do not improve performance.

### Energy centre description:

The energy centre contains 350 kW of ground source heat pumps, which are to be connected to an open ground loop close to the civic centre, pending open loop viability. These pumps feed a 70 oC flow network, feeding the new/ redeveloped buildings. This scheme utilises a high temperature top up (80 oC) which is generated by CHP and gas boilers. This 80 oC circuit also feeds the Council House and Guildhall. There is a private wire connection from the CHP unit into an existing private wire network serving PCC buildings.

**Heat/cooling demand phasing description:**

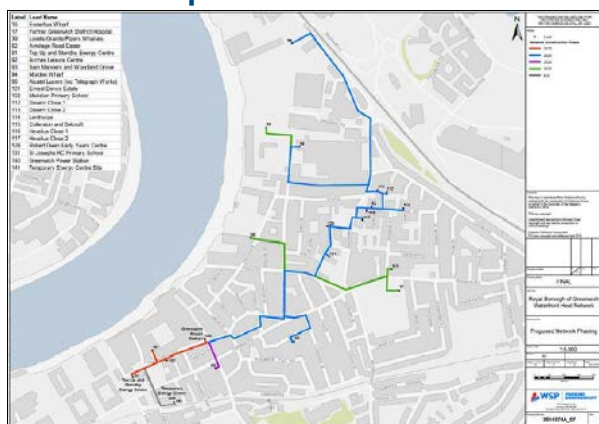
Phase 1 of the scheme contains 3.5 GWh/a heat load, the addition of Phase 2 raises this to 4.5 GWh/a, with Phase 3 bringing it to 7.3 GWh. It is recommended that the build out of the scheme commences with Phase 1 initially due to economic viability and also the proving of a starter scheme before being extended further.

## Greenwich Power Station District Heat Network\_FES

### Project Sponsor:

Royal Borough of Greenwich

### Network Map:



### Summary forecast financial information:

Energy generation capex (£m)	£0.98
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£5.48
Other capex (£m)	£0.20
<b>Total capex (£m)</b>	<b>£6.66</b>

Project IRR*	11.40%
Considering third party finance?	Yes

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	Not Provided	Not Provided

### Project Stage

Feasibility

### Project Contact Details:

LA Name:	Royal Borough of Greenwich
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

### Technical Information:

#### Primary energy source:

CHP – Gas

#### Project description:

The case for a decentralised energy network in the Greenwich Waterfront area was given momentum by TfL's proposal to install two CHP engines in Greenwich Power Station. TfL proposes to operate these units to supply electricity at an advantageous rate to the London Underground system. TfL does not have an immediate use for the heat produced as part of the power generation process, and is therefore interested in making this 'waste' heat available to a district heating network, for both economic and environmental reasons. The preferred option at this stage is that the network takes ownership of existing customer boiler plant rather than build a separate energy centre. This approach removes significant capex (c.£5.7m) but still provides system resilience for peak demand not met through the GPS CHP engines.

#### Energy centre description:

Given that resilience plant cannot be accommodated within Greenwich Power Station back up plant would be located in a separate permanent energy centre. For the permanent energy centre, a final boiler capacity of 3 no. 10MWth boilers is proposed, with space allowed for further potential expansion or use of a smaller 'summer' boiler to cope with potential lower levels of turndown required. However, the early phase operation of the network and the metered, actual peak demands of the initial phases should be used to guide this requirement as the project expands.

#### Heat/cooling demand phasing description:

2018: Kick-start network formed with existing loads in the immediate vicinity of GPS, opportunity to gain initial experience of network operation and establish working principles with TfL.

2020: Network extended to feed first phases of Morden Wharf. Connection of loads between GPS and Morden Wharf

2022: Assumed earliest date for redevelopment of Arches Leisure Centre

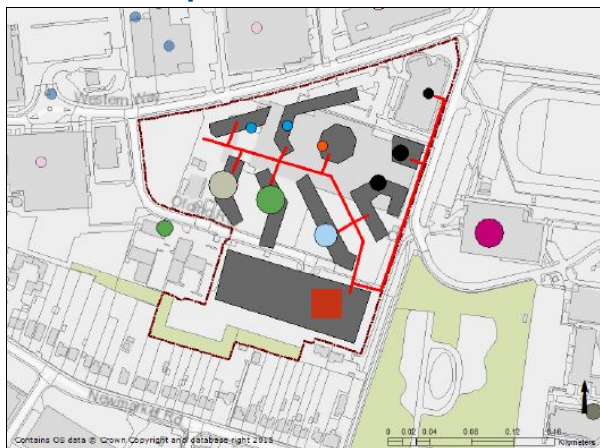
2030: Opportunity to displace CHP replacement at Enderby's Wharf, Greenwich Hospital site, and Greenwich Wharf.

# Public Service Village\_FES

## Project Sponsor:

St Edmundsbury Borough Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£0.00
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£0.36
Other capex (£m)	£0.30
<b>Total capex (£m)</b>	<b>£0.66</b>

Project IRR*	10.00%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	2016	2018	2019

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	St Edmundsbury Borough Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

The preferred option was found to be a DH network supplied by gas combined heat and power (CHP), connected to all new buildings within the Public Service Village in addition to the existing West Suffolk House. The supply of waste heat from British Sugar was also considered as a potential opportunity in the case of a wider network.

### Energy centre description:

The CHP size (0.834MWth) was established to deliver a total contribution of at least 60 of the annual heat load, whilst achieving a minimum number of running hours of approximately 4,500 peak load hours per annum. The gas boiler capacity (1.9MWth) is such that there is sufficient back-up capacity included if the CHP and/or boilers should fail or be offline for maintenance. This capacity typically equates to approximately 1.2 times the peak heat load.

### Heat/cooling demand phasing description:

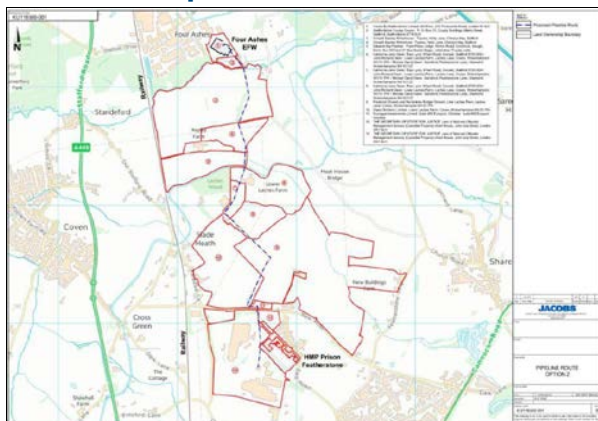
It was assumed that the development connects to the network in two phases to represent the phased construction of the site. At the time of writing (June 2016), PSV2 was expected to come forward in four phases. It was assumed from the scale of development that it was reasonable to divide this into two construction phases, with the first being available for connection to a heat network in 2018.

# Veolia Energy from Waste\_FES

## Project Sponsor:

Staffordshire Moorlands District Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£0.00
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£0.00
Other capex (£m)	£0.00
<b>Total capex (£m)</b>	<b>£4.77</b>

Project IRR*	Not provided
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	Not Provided	Not Provided

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	Staffordshire Moorlands District Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – EfW

### Project description:

Staffordshire County Council (SCC) is contracting with Veolia Environmental Services (Veolia) in the delivery of a 300,000tpa energy recovery facility (ERF) at Four Ashes Industrial Estate, Staffordshire. The facility has recently been completed and was deemed fully operational in 2014. The plant has been designed to be combined heat and power (CHP) enabled and it is estimated that the turbine has the capacity to provide up to 18.5MWth hourly which has the potential to be exported through a district heating scheme, to viable local end users. There are three prisons on the site at Featherstone and have a capacity of approximately 2,800 inmates. From discussions with the MoJ, it is understood that there are plans for expansion of the Oakwood facility which could increase the capacity by a further 500-1000 inmates over the coming years. Due to the nature of the operation of the three prisons, there is a demand for heating over a 24 hour period throughout the year, although this naturally fluctuates with the season, occupancy etc. Relative to other district heating schemes providing domestic hot water demands this project offers a potential to supply constant and relatively predictable base load heating requirement over a long term.

### Energy centre description:

The DH scheme considered includes modification of the existing ERF to accommodate a new heat recovery system, DH heat exchanger, district heating pipework and associated pumps, end users heat delivery substations and the modifications to the prisons' existing boiler plant to accommodate the heat delivery substations.

### Heat/cooling demand phasing description:

Not available

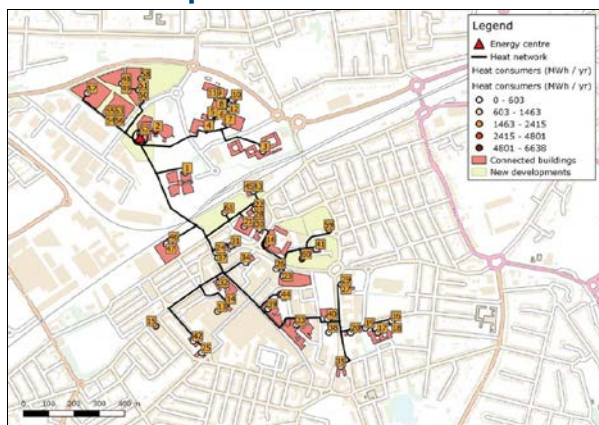


# North Star and Town Centre\_FES

## Project Sponsor:

Swindon Borough Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£8.46
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£7.14
Other capex (£m)	£4.68
<b>Total capex (£m)</b>	<b>£20.28</b>

Project IRR*	8.00%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	2019	Not Provided	2027

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	Swindon Borough Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

North Star is located to the north of Swindon town centre, the two areas divided by the London to Bristol rail line. The North Star area is a focus for major redevelopment involving the redevelopment of the Oasis Leisure Centre, the construction of an indoor ski facility, arena and associated leisure and retail development.

### Energy centre description:

3 x 5.8MWth gas CHPs plus 22.3MWth of gas boilers proposed to supply the full network. Absorption chillers considered for supplying cooling to the ski facility. The figures presented reflect the heat only scheme. The inclusion of cooling is still estimated to provide a positive return (6.2% PIRR over 40 years) but is slightly lower than the heat only scheme.

### Heat/cooling demand phasing description:

Within the Town Centre area 35 buildings were identified with sufficient heat consumption and proximity to a probable heat network route (from the North Star site) to enable connection to a heat network. Assumed connections include the station and Kimmerfields developments. These developments present an ideal opportunity where their phasing can coincide with the establishment of a network, particularly Kimmerfields which present a major load from a mix of commercial and residential properties.







# MAPPING AND MASTER PLANNING STAGE

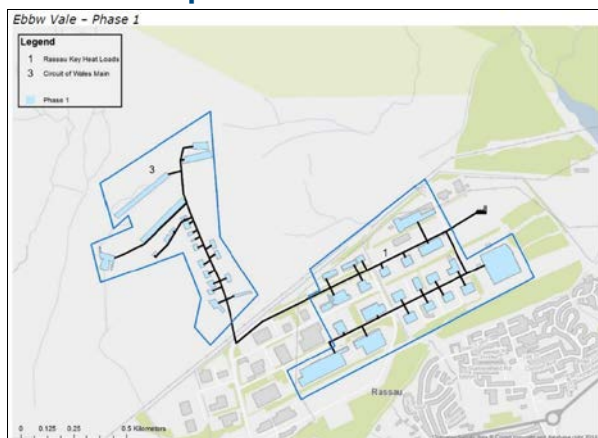


## Ebbw Vale (Rassau)\_MAP

### Project Sponsor:

Blaenau Gwent County Borough Council

### Network Map:



### Summary forecast financial information:

Energy generation capex (£m)	£4.98
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£5.93
Other capex (£m)	£1.10
<b>Total capex (£m)</b>	<b>£12.08</b>

Project IRR*	Not provided
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	2020	2030

### Project Stage

Heat mapping and masterplanning

### Project Contact Details:

LA Name:	Blaenau Gwent County Borough Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

### Technical Information:

#### Primary energy source:

CHP – Gas

#### Project description:

The Ebbw Vale offers a high heat density with the Rassau Industrial Estate and proposed Circuit of Wales race track adjacent to the site. Figures presented reflect the Phase 1 scheme.

#### Energy centre description:

A modular approach is proposed to allow for the build out of the three phases minimising up front payment for key plant and equipment for future phases. At phase 1 a 6MWth / 5.4MWe gas CHP is proposed as the primary heat source. Wales and West Utilities have confirmed that a 180mm gas main runs next to the proposed energy centre site and that there is likely to be available capacity (this would only be guaranteed as part of a formal application). For Phase 2 the gas CHP capacity is forecast to be increased to 10MWth/8.99MWe. For Phase 3 the gas CHP capacity is forecast to be increased to 12MWth/10.8MWe. Auxiliary boilers would also be required for system resilience.

#### Heat/cooling demand phasing description:

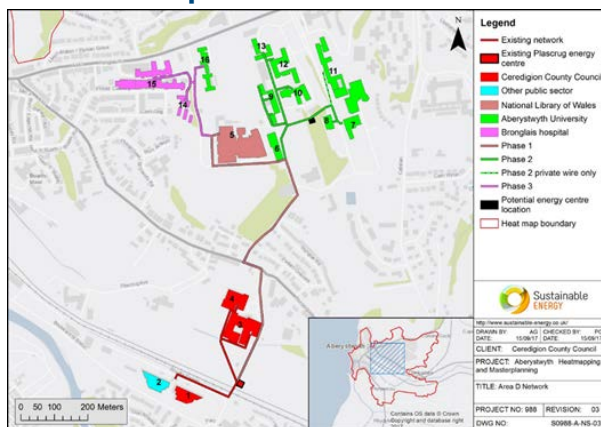
The proposed project is split into three phases. Phase 1 seeks to connect the Circuit of Wales (phase 1) and three private sector industrial buildings. Electrical demand from the phase 1 industrial customers is estimated to be high (c40GWh p.a.). Of this demand, phase 1 electrical output from the gas CHP engine is forecast to be 23.4GWh. Phase 1 completion is forecast for 2020. Phase 2 is expected to be possible to develop within the next 4-8 years to complement the next phases of the Circuit of Wales build out. Current estimates are completion for 2025. The third phase of development would coincide with development of the Rhyd-y-blew and/or Bryn Serth sites. At present, it is unclear as to exactly when this would take place. Current estimates are completion for 2030.

# Aberystwyth\_MAP

## Project Sponsor:

Ceredigion County Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£1.77
Private Wire (£m)	£0.29
Pipework / distribution capex (£m)	£1.89
Other capex (£m)	£0.00
<b>Total capex (£m)</b>	<b>£3.94</b>

Project IRR*	11.80%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	Not Provided	Not Provided

## Project Stage

Heat mapping and masterplanning

## Project Contact Details:

LA Name:	Ceredigion County Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

Boiler - Biomass

### Project description:

There is potential to extend the existing district heating network at Plasrugg (currently connecting Ceredigion County Council (CCC) offices, Welsh Government offices, Ysgol Penweddig and Plasrugg Leisure Centre) extending to include the National Library of Wales, Aberystwyth University and Bronglais Hospital. The network would be served by the existing biomass boiler, gas CHP and an additional biomass boiler. The project would have a material impact on heat decarbonisation in Aberystwyth. Benefits for CCC include reducing carbon emissions, potential revenue generation, reducing operational / energy costs, utilising local energy sources, improving energy security, and reducing fuel poverty.

### Energy centre description:

The network would be served from 2 energy centres; the existing Plasrugg energy centre and a new energy centre at Aberystwyth University. Plasrugg would house the 500kW gas CHP engine and backup boilers required for phase 1. For additional network phases, backup boilers would need to be housed at Aberystwyth University. Gas CHP units for additional network phases would be located in containerised units adjacent to the existing Plasrugg energy centre. For the full phase 3c network, an additional area of approximately 300m<sup>2</sup> would be required adjacent to the Plasrugg energy centre and approximately 220m<sup>2</sup> at Aberystwyth University.

### Heat/cooling demand phasing description:

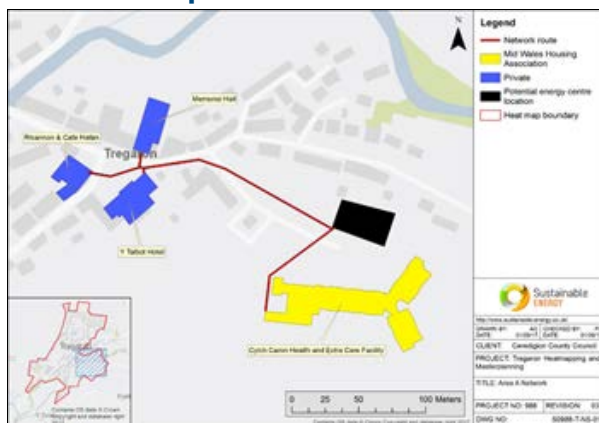
Phase 1 will extend the existing network to the National Library of Wales and connect existing heat network connections to private wire. Phase 2 will connect key buildings at Aberystwyth University. Phase 3 will then connect Bronglais Hospital and Pantycelyn (an additional Aberystwyth University building).

# Tregaron\_MAP

## Project Sponsor:

Ceredigion County Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£0.23
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£0.16
Other capex (£m)	£0.00
<b>Total capex (£m)</b>	<b>£0.40</b>

Project IRR*	6.60%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	Not Provided	Not Provided

## Project Stage

Heat mapping and masterplanning

## Project Contact Details:

LA Name:	Ceredigion County Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

Boiler - Biomass

### Project description:

A district heat network in this area would supply heat to Cylch Caron planned development, Y Talbot Hotel, Rhiannon and Café Hafan, and the Memorial Hall by means of a biomass boiler. The network will provide benefits to Ceredigion County Council (CCC) including generating revenue, local carbon reduction, and utilising local energy sources, through woodchip purchase. The network could also potentially improve energy security and resilience against rising energy prices.

### Energy centre description:

An energy centre and woodfuel delivery area to accommodate a 250 kW biomass boiler would require a land area of approximately 1,000 m<sup>2</sup>. It has been assumed that this would be located adjacent to the Council-owned car park to the north of the Cylch Caron development.

### Heat/cooling demand phasing description:

No potential viable network extensions have been identified. The network has therefore been presented as a single phase.



# Chesterfield\_MAP

## Project Sponsor:

Derbyshire county

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£14.09
Private Wire (£m)	£0.22
Pipework / distribution capex (£m)	£15.70
Other capex (£m)	£1.85
<b>Total capex (£m)</b>	<b>£31.86</b>

Project IRR*	10.28%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	Not Provided	2020

## Project Stage

Heat mapping and masterplanning

## Project Contact Details:

LA Name:	Derbyshire county
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

New network opportunity in central Chesterfield sourcing heat from a single energy centre containing gas CHP and gas boiler plant.

### Energy centre description:

Energy centre is proposed to be on the Royal Chesterfield Hospital Site and is estimated to require the following capacities of plant to serve the scenario 6 network: Initial phase - 6.6MWe of gas CHP, 13MW gas boiler, Final phase - additional 10MW gas boiler

### Heat/cooling demand phasing description:

Scenario 6 total heat demand is expected to be 60,006MWh p.a. with a peak demand of 19.6MW, the first phase (containing existing buildings only) has a peak demand of 11.3MW.

# Matlock\_MAP

## Project Sponsor:

Derbyshire county

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£4.01
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£14.73
Other capex (£m)	£1.34
<b>Total capex (£m)</b>	<b>£20.08</b>

Project IRR*	1.70%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	Not Provided	2020

## Project Stage

Heat mapping and masterplanning

## Project Contact Details:

LA Name:	Derbyshire county
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

Waste heat – Industrial (without heat pump)

### Project description:

New heating network opportunity utilising waste heat from an existing battery recycling facility and serving multiple sites in western and central Matlock.

### Energy centre description:

The network propose the use waste heat from the Enthoven site west of Matlock and the site operator has expressed interest in housing an energy centre on their site. It is expected that 4MW of heat will be available from the facility and a further 10MW of boiler capacity would be required.

### Heat/cooling demand phasing description:

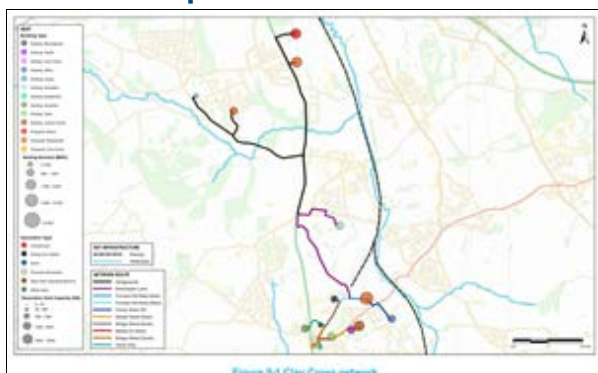
Total annual network demand is 20,657MWh. The majority of buildings listed as potential site connections are existing. Initial load is estimated to be 7.7MW with a further 3.3MW of load expected to arise between 2023 and 2028, which will be met through additional gas boiler capacity.

# Clay Cross\_MAP

## Project Sponsor:

Derbyshire county

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£2.68
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£5.55
Other capex (£m)	£0.41
<b>Total capex (£m)</b>	<b>£8.65</b>

Project IRR*	7.54%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	Not Provided	2020

## Project Stage

Heat mapping and masterplanning

## Project Contact Details:

LA Name:	Derbyshire county
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – EfW

### Project description:

New network opportunity sourcing heat from the proposed Clay Cross Energy from Waste facility and serving 11 sites in Clay Cross.

### Energy centre description:

The proposed Clay Cross Energy from Waste facility - planning permission on the facility has been granted and is to be installed and operated by Larkfleet group. Lark energy confirmed that the district heating network energy centre could be located on the same site as the EfW facility.

### Heat/cooling demand phasing description:

Boiler installation will be split into two phases (2020 and 2025). 12MW installed operational capacity is proposed in 2025 allowing full load to be met without any heat recovery element. Demand is estimated to be 3MW and 6MW for 2020 and 2025 respectively.

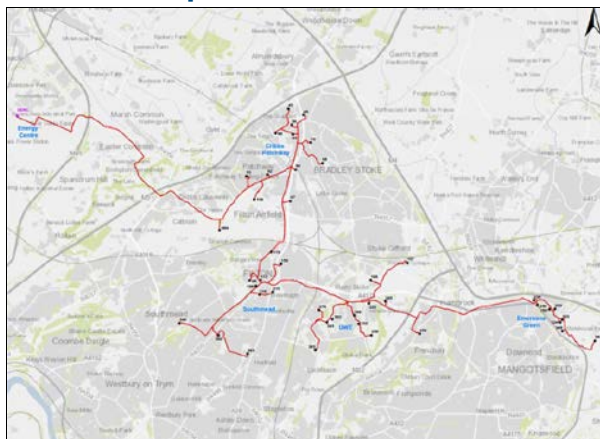


# SERC EfW heat supply\_MAP

## Project Sponsor:

South Gloucestershire Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£3.05
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£27.83
Other capex (£m)	£3.03
<b>Total capex (£m)</b>	<b>£33.91</b>

Project IRR*	Not provided
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	Not Provided	Not Provided

## Project Stage

Heat mapping and masterplanning

## Project Contact Details:

LA Name:	South Gloucestershire Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – EfW

### Project description:

A heat network is proposed to connect the significant heat loads in Cibbs Patchway, Southmead and UWE to the Sita Severnside energy recovery centre. With baseload heat estimated at 137.8GWh per year and potential additional annual heat loads of 33.2GWh the project offers an estimated heat density of just under 9MWh per meter of pipe installed and an undiscounted payback of 9 years.

### Energy centre description:

Not Provided

### Heat/cooling demand phasing description:

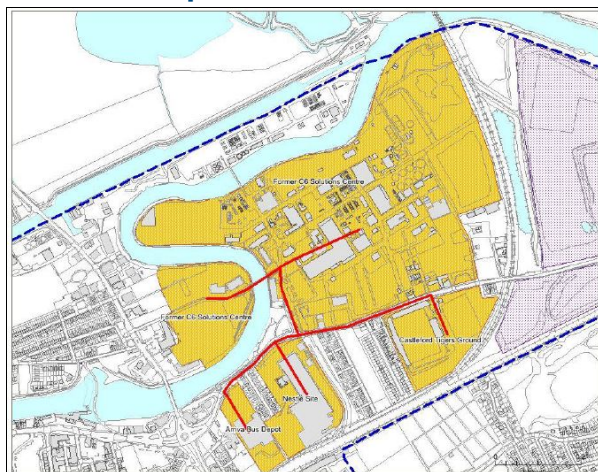
Cibbs Patchway is estimated to provide 49GWh p.a. of existing heat demand with a potential further annual 9.3GWh. Southmead is estimated to provide 33.3GW p.a. of existing heat demand with a potential further annual 22.9GWh from GKN Aerospace and Airbus. UWE is estimated to provide an annual 55.4GWh of heat loads. As such total heat loads assessed in the area have been estimated at 170GWh per year.

# Castleford C6 Development\_MAP

## Project Sponsor:

Wakefield Metropolitan District Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£1.28
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£4.53
Other capex (£m)	£0.30
<b>Total capex (£m)</b>	<b>£6.11</b>

Project IRR*	10.00%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	2018	2020

## Project Stage

Heat mapping and masterplanning

## Project Contact Details:

LA Name:	Wakefield Metropolitan District Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

Water source heat pumps

### Project description:

The Castleford C6 Solutions opportunity area is located to the east of Castleford and links four new residential developments: the former C6 Solutions site, Castleford Tigers, Nestle and Arriva Bus Depot sites.

### Energy centre description:

It was concluded that several spaces in Castleford have potential to offer suitable energy centre locations for different schemes. In technological terms, the main technologies being considered are gas CHP, industrial water source heat pumps (WSHP) extracting heat from the River and, potentially, the Calder Vale Waste Water Treatment Works (WWTW). The gas CHP options focused around the Town Centre have been assessed as economically viable, but would be heavily dependent on electricity sale revenue. The WSHP option exploring supply to the C6 development was found to achieve IRRs well in excess of the Sponsors hurdle rate and it is recommended that the scheme be considered for further investigation (the figures presented reflect this option).

### Heat/cooling demand phasing description:

The network infrastructure was modelled to come forward in three stages over three years from 2017 to 2019. The heat demands heat on year is 2018 except for phases 2 and 3 of the C6 Solutions site with come on in 2019 and 2020 respectively.







# PROJECTS CURRENTLY NOT BEING PURSUED BY LOCAL AUTHORITY SPONSOR



## Central Redcar\_FES

### Project Sponsor:

Tees Valley Combined Authority

### Network Map:



### Summary forecast financial information:

Energy generation capex (£m)	£0.00
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£0.00
Other capex (£m)	£1.08
<b>Total capex (£m)</b>	<b>£1.08</b>

Project IRR*	Not provided
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	Not Provided	Not Provided

### Project Stage

Feasibility

### Project Contact Details:

LA Name:	Tees Valley Combined Authority
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

### Technical Information:

#### Primary energy source:

CHP – Gas

#### Project description:

There is already an existing CHP unit in the Community Heart building which serves as the primary heat source for the Community Heart Building and the adjacent Redcar and Cleveland House. The proposed project will see the existing small network extended to serve some additional buildings in the area. To achieve a return, the existing CHP will have to be replaced with a larger gas fired CHP unit.

#### Energy centre description:

There is already an existing CHP in the Community Heart Centre. Three options for a new expanded Energy Centre location are all in the new Community Heart Building; in the plant room, basement car park or the courtyard. Gas CHP is the proposed technology with capacity 400kWe.

#### Heat/cooling demand phasing description:

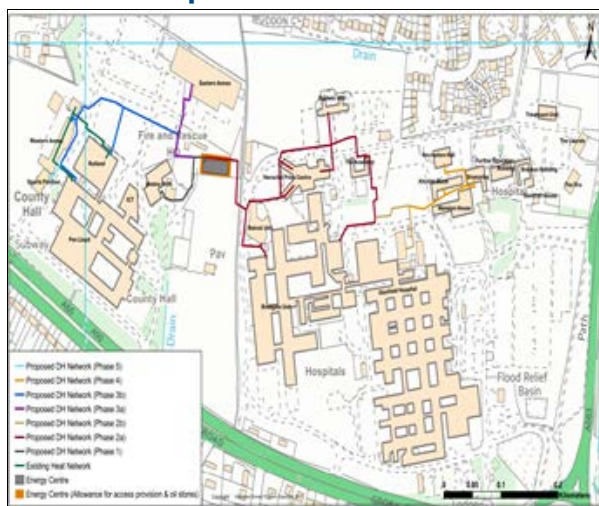
There is no information on phasing, other than that this network if constructed could be connected to the proposed South Tees network in the future. No timescales for this have been proposed as yet.

## County Hall site at Glenfield\_FES

### Project Sponsor:

Leicestershire county

### Network Map:



### Summary forecast financial information:

Energy generation capex (£m)	£5.17
Private Wire (£m)	£0.21
Pipework / distribution capex (£m)	£3.40
Other capex (£m)	£0.10
<b>Total capex (£m)</b>	<b>£8.94</b>

Project IRR*	4.83%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	2021	2030

### Project Stage

Feasibility

### Project Contact Details:

LA Name:	Leicestershire county
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

### Technical Information:

#### Primary energy source:

CHP – Gas

#### Project description:

Creation of a new energy centre within LCC land serving select LCC buildings, LPT building and Glenfield Hospital. Heat to be served in addition to HV power to two existing private wire ring mains. Existing Biomass boiler and Gas CHP to be retained (due to age). Ownership of existing biomass and gas CHP to remain with LCC and hospital respectively and not transferred to new Heat Co.

#### Energy centre description:

New build concrete and steel build energy centre. Gas boilers to be installed in two phase. Packaged CHP plant to housed externally to allow transition to new technology in the future

#### Heat/cooling demand phasing description:

All loads are existing and served by existing plant. Phase 1/2 will connect Hospital as a priority anchor load. All buildings modelled to be connected by 2030 but likely to be by 2025 or earlier. No cooling network proposed

# Euston DH network extension\_FES

## Project Sponsor:

London Borough of Camden

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£0.00
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£0.00
Other capex (£m)	£0.00
<b>Total capex (£m)</b>	<b>£0.00</b>

Project IRR*	Not provided
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	Not Provided	Not Provided

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	London Borough of Camden
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

Camden Borough Council is proposing an energy network to supply heating and hot water to six buildings within the Euston Road area of the borough:

- Camden Town Hall & Camden Centre
- Hastings House
- Tonbridge House (1-23)
- Tonbridge House (24-73)
- Argyle School
- Camden Town Hall Extension- (THX) – a private new hotel development. It is proposed to supply Camden Town Hall and THX with electricity via a private wire connection. Heat and electricity will be produced by a 600kWe CHP, and 2.3MW gas boilers.

### Energy centre description:

The proposed energy centre is in the basement of Camden Town Hall. This centralised plant will contain 1x600 kWe combined heat and power (CHP) engine, 2.3 MW peak condensing boiler plant, and a 50m<sup>3</sup> thermal store.

### Heat/cooling demand phasing description:

The feasibility study contains no information on phasing.





# Killingworth Moor\_MAP

## Project Sponsor:

North Tyneside Metropolitan Borough Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£0.77
Private Wire (£m)	£0.00
Pipework / distribution capex (£m)	£0.66
Other capex (£m)	£0.00
<b>Total capex (£m)</b>	<b>£1.43</b>

Project IRR*	13.30%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	Not Provided	Not Provided

## Project Stage

Heat mapping and masterplanning

## Project Contact Details:

LA Name:	North Tyneside Metropolitan Borough Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

The proposal is to supply anchor loads with heat and power, via private wire (PW) from gas CHP. All electricity generation can be accommodated by the PW. After the initial phase of the network is constructed, it is hoped that a reduction in operational temperatures can be achieved. Energy efficiency improvement opportunities have been investigated, and implementation would improve the economics slightly. It is hoped some of these improvements could be implemented prior to construction. Design is to take account of future efficiency improvements.

### Energy centre description:

The preferred site is immediately north-west of the George Stephenson secondary school. The footprint of the EC is proposed to be 150m<sup>2</sup>, to house 3x1000kW gas backup boilers, 2x165kWe gas CHP units, and 100m<sup>3</sup> thermal storage.

### Heat/cooling demand phasing description:

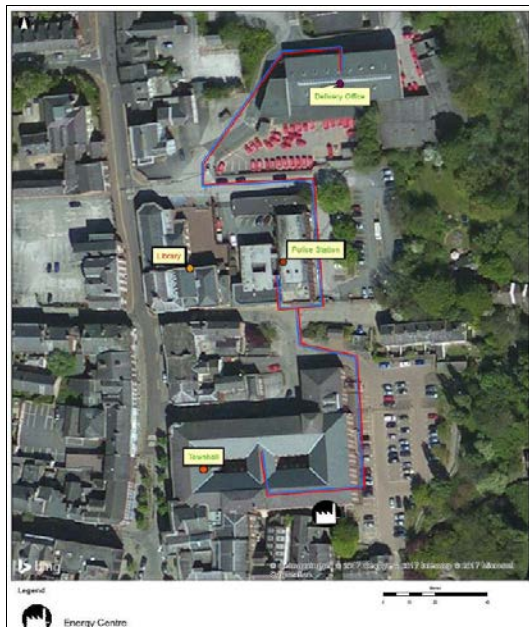
The project is currently proposed as a single phase.

# Macclesfield Town Centre Heat Network\_FES

## Project Sponsor:

Cheshire East Council

## Network Map:



## Summary forecast financial information:

Energy generation capex (£m)	£0.48
Private Wire (£m)	£0.05
Pipework / distribution capex (£m)	£0.46
Other capex (£m)	£0.02
<b>Total capex (£m)</b>	<b>£1.02</b>

Project IRR*	4.80%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
2018	2019	2020	2020

## Project Stage

Feasibility

## Project Contact Details:

LA Name:	Cheshire East Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

## Technical Information:

### Primary energy source:

CHP – Gas

### Project description:

A heat network would connect and provide heat via buried pipes to the Town Hall, Police Station and Royal Mail Delivery Office. A private wire electricity network would connect and provide electricity to the Town Hall, Library and Police Station.

### Energy centre description:

The 250kWe CHP engine, along with a 35m<sup>3</sup> (approx. 3.0m dia x 5.9m high) thermal store and other ancillary equipment would be located to the rear of the Town Hall in the location of the current bike shed. The New Town Hall plant room, on the second floor of the New Town Hall, would house the supplementary gas boilers (2No. 719kW) which would replace the existing 22-year old gas boilers.

### Heat/cooling demand phasing description:

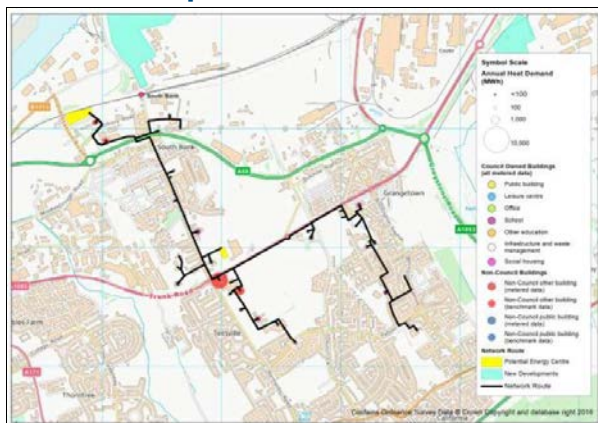
An additional 2 demand clusters have been identified with a potential additional 2.5GWh of thermal demand and 2GWh of electrical demand. These clusters have not been included in the economic appraisal at this stage but the proposed system design has been future proofed to enable expansion and future connection.

## South Bank\_FES

### Project Sponsor:

Tees Valley Combined Authority

### Network Map:



### Summary forecast financial information:

Energy generation capex (£m)	£0.11
Private Wire (£m)	£0.47
Pipework / distribution capex (£m)	£0.00
Other capex (£m)	£10.27
<b>Total capex (£m)</b>	<b>£10.85</b>

Project IRR*	7.20%
Considering third party finance?	Yes

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	Not Provided	Not Provided

### Project Stage

Feasibility

### Project Contact Details:

LA Name:	Tees Valley Combined Authority
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

### Technical Information:

#### Primary energy source:

CHP – Biogas

#### Project description:

Waste heat from local Anaerobic Digestion CHP Plant on Imperial Avenue. Network to provide heat and potentially power via private wire for connections in the South Bank area with potential for network to join up with other local networks in the future.

#### Energy centre description:

The first choice for energy supply is an AD CHP on Imperial Avenue. Output from AD CHP estimated to be 4,886kWe and 3,842kWth. The report recommends that testing should continue for a second EC in case the AD scheme fails. A second EC would allow for a gas CHP standalone supply as a fall back option.

#### Heat/cooling demand phasing description:

Heat demand includes a group of light industrial buildings to the north, several school buildings, a large care home and leisure centre. Total heat demand is estimated at 10,967MWth/yr. Total electricity is estimated at 1,806MWhe/yr. (figures are sum of loads in Table 81, p.137) There is no detail on phasing for the South Bank network, though there is an overview of how the South Bank network could connect to the proposed Redcar South and Middlesbrough networks in time. No dates have been proposed for this.

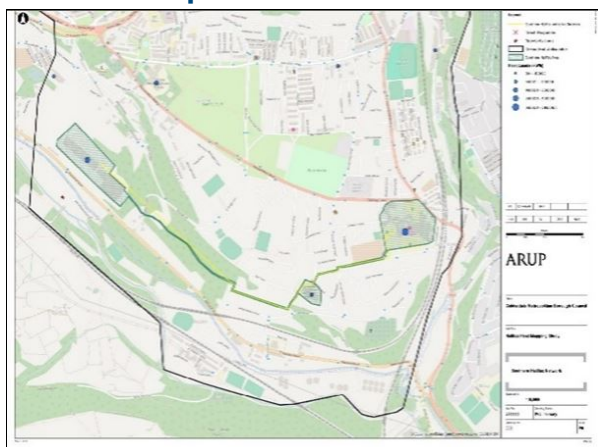


## South Halifax

### Project Sponsor:

Calderdale Metropolitan Borough Council

### Network Map:



### Summary forecast financial information:

Energy generation capex (£m)	£1.65
Private Wire (£m)	£0.07
Pipework / distribution capex (£m)	£2.85
Other capex (£m)	£0.27
<b>Total capex (£m)</b>	<b>£4.85</b>

Project IRR*	16.90%
Considering third party finance?	Not Stated

\* Real pre-tax pre-finance

FID	Construct ion Start	Heat On (initial)	Heat On (full)
Not Provided	Not Provided	Not Provided	Not Provided

### Project Stage

Heat mapping and masterplanning

### Project Contact Details:

LA Name:	Calderdale Metropolitan Borough Council
Contact Name:	George Robinson
Email:	heatnetworks@beis.gov.uk

### Technical Information:

#### Primary energy source:

CHP – Gas

#### Project description:

The network is designed around two major heat users to the south of Halifax Town Centre. The network route is predominately soft dig. CMBC have little to no influence on the commercial connections both of which are expected to have high resilience requirements.

#### Energy centre description:

The Energy Centre would contain one 1.75MWe gas-fired CHP engine along with ancillary and back-up plant including three 3.6MW gas boilers and a 100m<sup>3</sup> thermal store. As a standalone Energy Centre, the building would have an estimated 255m<sup>2</sup> footprint. The operational strategy is heat-led.

#### Heat/cooling demand phasing description:

Due to the small number of anchor loads this is a single phase development. There is minimal scope to connect to additional buildings through network expansion as the surrounding areas are either undeveloped or low density detached and semi-detached private housing.