

# Southampton

# Heat Network Zoning

# Zone Opportunity Report



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#### Acknowledgements





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# **Executive Summary**



**About Southampton**: Southampton is a city in Hampshire with a population of circa 250,000. It has a rich maritime heritage and is located on the south coast of England.



**Local Energy Policy**: Southampton City Council declared a climate emergency in 2019, aiming for net zero by 2030 for council operations and city-wide carbon neutrality by 2035.



**Existing heat networks**: The Southampton District Energy Scheme (SDES) is an existing heat network in the city centre, operational since 1986, with plans for expansion and decarbonisation.



**Zones identified**: A total of 18 potential heat network zones were identified in Southampton, with an overall annual heat demand of 275GWh/yr for all buildings within these zones which are identified as potentially required to connect.



**Strategic heat network zones**: Three strategic heat network zones were identified in Southampton, with an overall annual heat demand of 200GWh/yr for all buildings potentially required to connect within these zones.



**Key heat demands**: The total annual heat demand for buildings connected to the initial zone opportunities identified is 175GWh/yr. Key buildings are Southampton General & Princess Anne Hospitals, and the National Oceanography Centre.



**Key heat sources**: Potential heat sources include Marchwood Energy Recovery Facility, water source heat pumps, air source heat pumps, and geothermal heat from the Wessex Basin aquifer.



**Estimated CapEx**: The estimated capital expenditure for the full rollout of heat networks within identified zones is approximately £225m, of which the initial zone opportunities amount to approximately £175m.



**Other heat network zones**: Smaller heat network zones identified include areas like Southampton Airport, International Way, and Test Valley Business Park, with potential for future development.



**Carbon savings**: The initial zone opportunities identified could deliver carbon savings of approximately 30ktCO<sub>2e</sub> annually.

#### Figure 1: Overview of Heat Network Zones in Southampton



# 1) Introduction

Heat networks will play a crucial role in decarbonising heat in buildings. Heat networks take heating, cooling or hot water from a central source(s) and deliver it to a variety of premises such as public buildings, shops, offices, hospitals, universities, and homes. They are also an important part of securing the UK's energy independence through local, low carbon heat sources and reducing the cost of living through efficient, affordable heating in densely populated areas. Our analysis shows that heat networks could provide about 20% of total heat by 2050. They currently provide about 3%.

The Department for Energy Security and Net Zero (DESNZ) is enabling the development of heat network infrastructure through a range of targeted funding, policy and legislative support to de-risk projects and attract investment. The Energy Act 2023 establishes the regulatory framework for heat networks in Great Britain and provides powers to introduce heat network zoning in England through secondary legislation. A heat network zone (HNZ) is a formally designated geographical area in England where heat networks are expected to provide the lowest-cost solution for decarbonising heating.

Under heat network zoning, central and local government will work with industry and local stakeholders to identify and designate areas of England where heat networks are expected to be the lowest-cost solution to decarbonising heat. Heat network zoning will be essential to speeding up the development of new heat networks and we hope to catalyse growth where it's most needed.

Heat network zoning will significantly increase private sector investment in the sector by removing the barriers which currently limit the pace of developing large scale heat networks. It will also give local communities the tools to accelerate the development of heat networks in their own areas and ensure that more homes and businesses can have access to greener, cheaper heat. It also has the potential to create tens of thousands of jobs across the country.

This report shows the Pilot programme outputs for Southampton and is intended to showcase potential heat network zones in the city. The report indicates the heat network investment opportunity at a city scale, the potential location of heat network zones, and key opportunities for initial heat network development within those potential zones

Please note that all information presented in this report, including the location of identified heat network zones, is subject to change. These are the findings of Pilot programme that were developed alongside the emerging Heat Network Zoning policy and therefore reflect our understanding at a moment in time. As the methodology improves, we will update these reports to improve our understanding of how heat network zoning may be rolled out in each area. Any potential zones that are identified fully, or partly, in an adjacent local authority area will need to be discussed further once local zone co-ordinators are established.

# Heat Network Zoning Pilot Methodology

Heat network zones will be identified using a standardised national zoning methodology<sup>1</sup>. The Heat Network Zoning Pilot Programme (hereafter Pilot programme) set out to develop a process to identify potential zones in a consistent and standardised manner across a range of towns and cities in England. The programme was fully funded and led by DESNZ, working alongside 28 Local Authorities, and multiple consultancy firms, to develop and test this approach at a local level. As such the final outputs are supported by each Local Authority but do not reflect an approved, endorsed, or adopted position on how zones may be delivered.

Lessons from the Pilot have been used to inform the development of the Heat Network Zoning policy. This includes improvements to the identification approach itself, but also wider policy design relating to the number and size of potential zones; existing heat networks; and the impacts of the policy on a range of stakeholders. Once the response to the heat network zoning consultation is published, we will update the methodology to reflect the final policy position.

The key concepts, definitions and complementary workstreams relevant to this report are introduced below. For a fuller description of the Heat Network Zoning policy, and up to date information regarding its implementation, please visit <a href="https://www.gov.uk/government/collections/heat-network-zoning">https://www.gov.uk/government/collections/heat-network-zoning</a>.

# Heat Network Zone Identification

Heat network zones will be identified using a standardised national zoning methodology. The <u>December 2023 consultation on Heat Network Zoning</u> proposes that the methodology will consist of two stages:

- 1. a national mapping exercise (using a data-led spatial energy model the National Zoning Model, (or NZM), to identify indicative heat network zones across England;
- 2. a refinement stage where relevant local stakeholders will input to the review and refinement of potential heat network zones prior to formal designation.

For the purposes of this study, indicative heat network zones have been identified using a prototype version of the NZM. These indicative zones were then refined by technical consultants with input from local stakeholders. The NZM outputs are already of considerably higher quality than those shared for this work and therefore these reports will improve over time.

This study split heat network zones into two different categories. These are **'strategic'** zones – the largest zones which are generally seen as strategically significant to developing heat networks in an area; and **'other'** zones – which are generally smaller and discrete. These are terms specific to the Pilot programme and the report focuses primarily on the strategic zones.

<sup>&</sup>lt;sup>1</sup> More information can be found in the Heat Network Zoning Methodology Statements (Appendix 3, 4 & 5)

## **Initial Zone Opportunities**

Alongside the identification of potential heat network zones, the Pilot programme has attempted to define areas within zones where the most attractive heat network development opportunities might exist. For the purposes of this programme *only* these are called an "initial zone opportunity" (or IZO). The approach considered economic viability, investment scale and returns, decarbonisation impact and deliverability. They were developed solely around buildings which could potentially be required to connect<sup>2</sup> under the proposed Heat Network Zoning policy and did not consider potential voluntary connections.

Initial zone opportunity design targeted a linear heat density (LHD) of 4MWh/m/yr, for the existing built environment. This is considered a relatively low proxy for economic viability with the heat network sector in England. A more flexible approach was used for new development sites, where different economic success criteria are likely to be applied. To standardise the way opportunities were assessed, the IZOs presented in this report may differ from, or overlap with, existing or planned heat network infrastructure. Campus style heat networks (e.g. in hospitals or university campuses) were considered as potential heat loads with a single point connection. Figure 2 below shows an example of a heat network zone and an IZO.





<sup>&</sup>lt;sup>2</sup> The building categories being considered as potentially required to connect include new developments, large non-domestic buildings, and communally heated residential blocks as described in Heat Network Zoning Consultation (2023)

# Study Scope

This document is presented as a zone opportunity report as it was developed in advance of the final policy design. As such, the report does not include:

- references to the central authority or zoning co-ordinator roles;
- assumptions about rights of existing heat networks, or zone delivery areas;
- an options appraisal on which routes to market may be taken;
- calculations on the cost of heat (connection/tariffs) to specific buildings;
- any inferences as the suitability for public/private sector delivery unless it's matter of fact (existing network or Heat Network Investment Project/Green Heat Network Fund project);
- references to **local community benefit** or **consumer protection** (subject to a live consultation).

In the future, it is intended that a document, similar in style, will be produced to incorporate these policy design aspects and be used as a Zone Market Prospectus (ZMP) to market heat network zoning opportunities in an area. Further detail on the methodology and initial zone opportunity criteria is provided in Appendix 4 and Appendix 5.

# 2) Southampton Heat Networks Context

# 2.1) Southampton City Overview

Southampton is a city in Hampshire located on the south coast of England with a rich maritime heritage. The city has a population of circa 250,000<sup>3</sup>, making it one of the most populous cities in southern England, and is 28 square miles in area. The local authority is Southampton City Council (SCC) and is a unitary authority independent of Hampshire County Council.

The River Itchen and the River Test converge at Southampton which has created a natural harbour. Southampton is relatively flat with an average elevation of 22 metres above sea level. It lies above the Wessex Basin aquifer, a geothermal resource that has been utilised to serve the Southampton District Energy Scheme.

The Southampton District Energy Scheme is an existing heat network in the city centre which has been operational since 1986. SCC are working with the existing operator to expand and decarbonise this network.

Southampton's local planning policy actively supports the connection of new developments to heat networks. A total of 22% of homes across the local authority district are social rented homes; 14.6% are rented from the local authority. 27.4% of homes are privately rented.

# 2.2) Southampton Net Zero Targets and Commitments

SCC declared a climate emergency in 2019 and have set a target of being net zero by 2030 across council buildings and operations. SCC aims to reach city-wide carbon neutrality by 2035, as set out in the SCC Corporate Plan 2022-2030<sup>4</sup>.

To support the progress and document the aims of SCC, the Green City Plan was launched in March 2020, outlining the Climate Change Strategy and Action Plan<sup>5</sup>. SCC are working with partners to produce a Local Area Energy Plan (LAEP) with an aim to publish by 2025.

Figure 3 summarises key dates in SCC's plans for decarbonisation and demonstrates their progress towards decarbonisation targets announced.

<sup>&</sup>lt;sup>3</sup> Office for National Statistics (2022) -

https://www.ons.gov.uk/visualisations/censuspopulationchange/E06000045/

<sup>&</sup>lt;sup>4</sup> Southampton City Council (2022) - <u>https://www.southampton.gov.uk/media/ugshrc2w/corporate-plan-final-51222.pdf</u>

<sup>&</sup>lt;sup>5</sup> Southampton City Council (2020) - <u>https://www.southampton.gov.uk/media/3r0jtsra/green-city-strategy\_tcm63-</u> <u>424943.pdf</u>



#### **Figure 3: Southampton Decarbonisation Milestones**

# 2.3) Delivering Heat Networks in Southampton

SCC has been proactively developing heat network schemes over the last ten years and led multiple Heat Network Delivery Unit (HNDU) funding applications, successfully securing £285m for heat network development in the city.

There is currently a district-level heat network in Southampton that delivers heat across the city centre with significant potential for expansion, as well as a smaller communal system and two campus-wide networks.

The district-level Southampton District Energy Scheme (SDES) is operated by Bring Energy (formerly Equans) working in partnership with SCC, under the name Southampton Geothermal Heating Company Ltd. In 2021 a Heat Mapping and Master Planning (HMMP) Study was undertaken to investigate the potential to expand and decarbonise SDES. Further information is provided in Section 3.1.2.

The communal district heating scheme at Holyrood Estate<sup>6</sup> has secured funding of over £450,000 through the Heat Network Efficiency Scheme (HNES) to improve pipework and performance as detailed in Section 3.1.2.

Furthermore, there are two campus-wide networks: the University of Southampton Highfield Campus network and the Southampton General Hospital network, detailed in Sections 3.2.2 and 3.3.2, respectively.

Please refer to Appendix 2: Data Room Resources for further information about the evidence compiled for heat network opportunities in Southampton. This includes a stakeholder directory and records of interactions with those stakeholders as well key studies and reports.

<sup>&</sup>lt;sup>6</sup> Southampton City Council (2023) - <u>https://www.southampton.gov.uk/news/article/funding-secured-for-holyrood-from-the-heat-network-efficiency-scheme/</u>

# 2.4) Southampton Heat Network Zones

A total of 18 potential HNZs were identified in Southampton, with three considered Strategic HNZs. Figure 4 below shows the study area boundary, including the boundaries of all HNZs identified within Southampton. Strategic HNZs have been allocated a meaningful name agreed as relevant from a local perspective whilst Other HNZs have a reference number allocated instead. In both cases, these names are shown on the map.

Please see Appendix 1 for the following maps giving more detail:

- A: City Typology Map Shows building typologies which dominate by area.
- B: Key Heat Loads Map Highlights key buildings potentially required to connect by heat demand.
- C: Key Heat Sources Map Highlights key heat sources by type and potential energy centre locations as well as any existing district heat network energy centres.
- D: Existing / Planned Heat Networks Map Shows existing HNs and planned extensions to them as well as any planned HNs in advanced stages of development.
- E: Key Constraints Map Shows key topographical constraints identified.
- F: Off Gas Grid presents areas with differing levels of properties off the gas grid within the study area.

#### Heat Network Zoning Opportunity Report: Southampton



#### Figure 4: Heat Network Zones Identified within the Southampton Study Area

# 3) Strategic Heat Network Zones

# Strategic HNZs in Southampton

This section examines the strategic HNZs and IZOs identified within them. This covers the key heat demands, heat sources, energy centre locations and potential constraints. Heat network distribution routes are conceptual and designed to illustrate the potential size and scale of the heat network opportunity that may be realised as part of the upcoming Heat Network Zoning policy. Other heat network zones are listed in Section 4.

Table 1 below presents a high-level estimate of the scale of opportunities across Southampton. Please refer to Appendix 4 for more detail.

Scope	Annual heat demand (GWh/yr)
All buildings within zones <sup>7</sup>	275
All buildings within strategic zones	200
All buildings connected to the IZOs	175

#### Table 1: Annual Heat Demand for Buildings in All Zones, Strategic Zones and IZOs

Existing/planned heat networks that overlap with IZOs are described, though their locations may vary due to different approaches. The Pilot programme applied a standard set of technical and economic assumptions across each of the 28 areas that participated in the programme and uses a proxy for economic viability, see Section 1 and Appendix 4 for more detail. Existing and planned networks will often be based on more detailed design work and have taken account of strategic and commercial considerations that were relevant at the time of their development. Future iterations of this report will consider how to better align local studies whilst retaining a nationally consistent approach.

The strategic zones are summarised below. Figure 5 illustrates their size, alongside the key potential heat sources and the proportion of buildings that may be required to connect.

**Southampton City Centre** is the largest zone identified within Southampton, covering the city centre, the Cultural Quarter, and the eastern area of the Port of Southampton. For more information, please see Section 3.1.

<sup>&</sup>lt;sup>7</sup> Row 1 is an estimate of heat demand across buildings potentially required to connect in all zones identified. Row 2 is as per row 1, but only within strategic zones. Row 3 includes buildings connected to the IZOs described and largely comprise of buildings potentially required to connect. Figures are generally rounded up to the nearest 25 or 50GWh/yr.

**Southampton University Highfield** covers the University of Southampton (UoS) Highfield Campus, north of the city centre. For more information, please see Section 3.2.

**Southampton General Hospital** covers Southampton General Hospital are the north-west region of the Upper Shirley area. For more information, please see Section 3.3.



Figure 5: Summary of Heat Demands in the Strategic HNZs Identified

# 3.1) Southampton City Centre

## 3.1.1) Southampton City Centre – HNZ Summary

Southampton City Centre is the largest HNZ identified within Southampton, covering the city centre, the Cultural Quarter, and the eastern area of the Port of Southampton. It includes 237 existing buildings that are potentially required to connect to a heat network, including the West Quay Shopping Centre, as well as 44 future development sites. Key low carbon heat sources identified include Marchwood Energy Recovery Facility (ERF), the potential for water source heat pumps (WSHPs) and other waste heat opportunities. Two existing heat networks currently operate as described below.

## 3.1.2) Southampton City Centre - Existing Heat Networks

### **Operational Heat Networks**

The following operational heat networks have been identified and are shown in Appendix 1: Map D.

### Southampton District Energy Scheme (SDES)

The Southampton District Energy Scheme is located in Southampton City Centre and serves over 45 customers composed of commercial, retail, educational, health and residential end-users. The network was established in 1986 and supplies over 40GWh/yr. It is currently served by gas-fired combined heat and power (CHP) engines and back-up gas-fired boilers.

### Holyrood Estate

Holyrood Estate district heating scheme is operated on behalf of SCC and is located in the south-east of the city centre. It is currently served by gas-fired boilers in a central plantroom and generates space heating and domestic hot water to customers on the housing estate. It has been awarded funding through the HNES to improve the network's pipework and the heat exchangers<sup>8</sup>. The heat interface units will be replaced for more efficient equipment, improving the efficiency of the network and reducing the gas consumption needed to operate. The project is due for completion at the end of 2026.

### Proposed Heat Networks – Early stage

The following heat network development schemes are in early development stages of masterplanning and are not shown on Map D as firm plans on network routing are not yet established.

### Energy Mapping and Master Planning Study – SCC

In 2021, an energy mapping and master planning study was undertaken for SCC supported by the HNDU. The study assessed proposals to decarbonise the existing SDES, expand the existing network and connect the existing networks in Southampton.

<sup>&</sup>lt;sup>8</sup> Southampton City Council (2023) - <u>https://www.southampton.gov.uk/news/article/funding-secured-for-holyrood-from-the-heat-network-efficiency-scheme/</u>

## 3.1.3) Southampton City Centre - Initial Zone Opportunities

A single IZO was identified for Southampton City Centre zone. Potential routing<sup>9</sup> for the IZO is shown in Figure 6 and summary statistics provided in Table 2.

#### Table 2: Southampton City Centre - Summary Statistics for Initial Zone Opportunities<sup>10</sup>

CapEx	Heat	Network	CO₂₀ savings	Linear Heat Density	Heat Sources
~£100m	>50GWh/yr	~17km	~10ktCO <sub>2e</sub> /yr	4.4MWh/m	ERF, WSHP & Waste Heat

This IZO was identified due to the dense urban environment and therefore heat demand, as well as the existing heat networks within the zone. It is in good proximity to both the River Test and Marchwood ERF which offers potential for low carbon heat sources to supply a network.

<sup>&</sup>lt;sup>9</sup> Routes can be expected to change as a better understanding of local constraints is developed through design. <sup>10</sup> Please see Appendix 3 – Glossary, "Specific definitions" of the main report for definitions related to this table.

#### Figure 6: Initial Zone Opportunities in Southampton City Centre HNZ



## 3.1.4) Southampton City Centre - IZO Heat Demands

The heat demands identified within the IZO are described below. The Pilot programme used several sources including local data collected from building owners; national energy demand datasets; benchmarks applied via the National Zoning Model (NZM); and a standardised approach to estimate the potential heat demands of new development sites. More information is provided in Appendix 4.

Where there are different values between datasets, the methodology prioritised the use of the early prototype version of the National Zoning Model, for consistency. This has led to an overestimation of some commercial and light industrial heat demands presented in this report. Large anchor loads that are already connected to existing district-scale heat networks are not listed.

The IZO connects to 92 existing buildings and 10 new developments which could potentially be required to connect to a heat network. The overall heat demand is about 50GWh/yr. Key heat demands include Southampton City College, Holyrood Housing Estate, The National Oceanography Centre, and Solent University. Figure 7 shows the breakdown of heat demand based on building types and Table 3 lists the ten highest heat demands identified.





As shown in Table 3, the largest load connected is the National Oceanography Centre with a demand of 5,300MWh/yr. The Holyrood Residential Estate is the existing communal heating network in the city centre, consisting of 10 social housing blocks owned by SCC, served by a CHP system. The Southampton Ferry Terminal is a phased redevelopment project, with Phase One completed in 2022<sup>11</sup>.

<sup>&</sup>lt;sup>11</sup> Southampton City Council (2022) – <u>https://www.southampton.gov.uk/grow/invest/invest-news/article/southampton-ferry-firm-finishes-terminal-first-phase-redevelopment/</u>

BAR007, BAR008, BAR023, BAR006 and BAR025 are large planned residential developments, and relate to planning reference numbers provided by SCC which are referenced in the published Strategic Land Availability Assessment<sup>12</sup>. Detailed development plans are not available for the new development sites. BAR008, BAR023, BAR006 and BAR025 are expected to be supplied over the next five years, whilst BAR007 is a major site with estimated completion dates not yet available. The estimated heat demand, 4,950MWh/year, relates to a portion of the development expected to be delivered by 2035.

Building name	Building category	Number of connections	Annual heat demand (MWh)	Data source
National Oceanography Centre	Non-domestic	1	5,300	DEC
BAR007	New developments	1	4,950	Pilot methodology
Holyrood Estate	Residential	1	4,700	Metered
Southampton Ferry Terminal	Non-domestic	1	3,700	Benchmark (NZM)
Civic Centre	Public sector	4	2,300	DEC
BAR008	New developments	1	2,300	Pilot methodology
BAR023	New developments	1	2,100	Pilot methodology
BAR006	New developments	1	2,100	Pilot methodology
Dock warehouse	Non-domestic	1	1,900	Benchmark (NZM)
BAR025	New developments	1	1,800	Pilot methodology

Table 3: Southampton C	ty Centre - Ke	y Heat Demands Red	quired to Connect I	n the IZO 13

## 3.1.5) Southampton City Centre – IZO Heat Sources

Multiple low carbon heat sources have been identified in Southampton City Centre. A mixture of these sources would be suitable to supply the heat demand, with a full (total) opportunity

<sup>&</sup>lt;sup>12</sup> Southampton City Council (2022) – <u>https://www.southampton.gov.uk/media/dgnjbbxp/draft-strategic-land-availability-assessment-2022.pdf</u>

<sup>&</sup>lt;sup>13</sup> Please refer to Appendix 3 for definitions related to building categories in this table.

capacity of 72MW. Table 4 and Table 5 summarise the key heat sources and potential energy centre locations identified. These are also shown in Figure 6 in Section 3.1.3 above and on Map C in Appendix 1.

Key potential heat sources in the area include Marchwood ERF which has an estimated capacity of 30MW. The River Test has also been identified as a source of low carbon heat, with a WSHP estimated to be able to supply a heat capacity of 10MW. The SDES cooling network refrigerators offer potential for a waste heat pump with a capacity of 1MW, as shown in the Southampton HMMP study.

Other heat sources identified nearby include Millbrook Wastewater Treatment Works (WWTW) which offers potential for a sewer source heat pump (SSHP) of capacity 5MW, and Slowhill Copse WWTW with capacity 2.5MW. Southampton lies in a geothermal heat potential area, tapping into the Wessex Basin aquifer. This provides the city with an opportunity to utilise geothermal heat. The SDES network connects to a geothermal well which has provided heat in the past. The resource is currently closed for repairs, but in March 2025, Star Energy signed an MoU with Bring Energy to explore the further integration of geothermal energy into Southampton's city-centre heat network<sup>14</sup>.

Three potential energy centre locations have been identified. EC1 is land at to the Marchwood ERF site, EC2 is land allocated for future development next to Mayflower Park, and EC3 is at the existing plant room for the current SDES cooling network at Pirelli Street.

Heat source type	Capacity (kWp)	Temperature (°C)	Potential energy centre location
Marchwood ERF	30,000	60-100	EC1
WSHP – River Test	10,000	10-20	EC2
Waste heat – SDES	1,000	25-35	EC3

Table 4: Southampton City Centre - Key Heat Source Opportunities for the IZO

#### Table 5: Southampton City Centre - Potential IZO Energy Centre Locations

EC ref number	Site type	Size (m²)	Ownership	Heat source
EC1	Land	2,650	Veolia UK	Marchwood ERF
EC2	Land	1,200	SCC	WSHP
EC3	Building	900	SCC	Waste heat

<sup>&</sup>lt;sup>14</sup> Star Energy MoU with Bring Energy (2025) - <u>https://www.londonstockexchange.com/news-article/STAR/mou-</u> with-bring-energy/16964960

## 3.1.6) Southampton City Centre – IZO Heat Distribution

The approach to developing the heat network route considered economic viability, investment scale and returns, decarbonisation impact and deliverability. These criteria were applied in a standardised manner across all opportunities identified in the Pilot programme and therefore may not reflect detailed designs or proposed routes identified in more detailed feasibility work. Routing within the site boundary of a building or campus may not have been included if insufficient information was available. The routing was developed solely around buildings which could potentially be required to connect and did not consider potential voluntary connections.

The purpose of the concept heat network route is to define the scale, potential routing and identified associated constraints within the zone. Further work will be required to undertake a more detailed route assessment to take account of the buried utilities, building connections and other local strategic and local planning considerations.

Table 6 below, shows the network statistics including the network length and associated cost. Please see Appendix 5 for more detail.

The network route crosses the River Test from the Marchwood ERF and moves east across the large new development area to the city centre. Heat is distributed north to the Civic Centre and Solent University.

#### Table 6: Southampton City Centre - Indicative Heat Network Statistics for the IZO

IZO description	Network length (km)	Network cost (£m)
Southampton City Centre	~17	~50

## 3.1.7) Southampton City Centre - IZO Key Constraints and Mitigations

**[C1] River crossing**: The River Test runs to the south of the IZO with the network crossing the river to connect to Marchwood ERF. The crossing would be around 700m. There are no nearby bridges, and the area is an active port and dockland. A feasibility assessment would be required to assess any existing service tunnels currently running under the river for potential to install a heat transmission pipe. A study should be undertaken to assess the feasibility and impact of laying pipe across the river (directional drilling or open-cut crossing) if there is no existing crossing within proximity. An Environmental Impact Assessment (EIA) would need to be done, as well as informing the local authority and Associated British Ports (ABP), the Statutory Harbour Authority for Southampton Water, and VTS Authority and Pilotage Authority for the Eastern Solent and Approaches<sup>15</sup>.

**[C2] Railway crossing**: The IZO network crosses a local railway line running north-south near Maritime Way and Central Road. A feasibility assessment would be required to assess

<sup>&</sup>lt;sup>15</sup> ABP Southampton (2024) - <u>https://southamptonvts.co.uk/</u>

installing route pipework beneath the road and railway line and would require engagement with the local authority Highways team and Network Rail.

**[C3] Railway crossing**: The IZO network crosses a local railway line running north-south along the B3039, Canute Road. A feasibility assessment would be required to assess installing route pipework beneath the road and railway line and would require engagement with the local authority and Network Rail.

**[C4] Historic Roman Wall:** The IZO network is near the historic Southampton Castle walls. The area may present historic features such as the Roman Wall. It is routed in the highway to minimise risk of disrupting or damaging these features. A feasibility assessment would be required to assess installing route pipework beneath the road near the historic features to avoid disruption of any section of the Roman Wall.

# 3.2) Southampton University Highfield

## 3.2.1) Southampton University Highfield – HNZ Summary

Southampton University Highfield HNZ covers the University of Southampton (UoS) Highfield Campus and includes 46 existing buildings that could potentially be required to connect to a heat network. Key low carbon heat sources identified include the potential for air source heat pumps (ASHPs), with land on the future development site between Glen Eyre Road and Violet Road identified as a potential site for an energy centre.

## 3.2.2) Southampton University Highfield - Existing Heat Networks

### **Operational Heat Networks and Planned Expansions**

The following operational heat networks have been identified and are shown in Appendix 1: Map D.

### University of Southampton Highfield Campus

The Highfield Campus network currently serves most but not all the buildings on the site. It is currently served by two 1.4MW gas-fired CHP engines and six 1.4MW gas-fired boilers from a plant room on campus. It is understood that the existing plant is coming to the end of its life.

### Proposed Heat Networks – Early stage

The following heat network development schemes are in early development stages of masterplanning and are not shown on Map D as firm plans on network routing are not yet established.

### Energy Mapping and Master Planning Study – SCC

In 2021, an energy mapping and master planning study was undertaken for SCC supported by the HNDU. The study assessed the viability of connecting existing networks in Southampton, including the UoS Highfield Campus. It proposed two options, connecting directly to the existing boiler house or replacing the existing network with a new network and major plant replacement.

## 3.2.3) Southampton University Highfield - Initial Zone Opportunities

A single IZO was identified in the Southampton University Highfield zone. Potential routing<sup>16</sup> is shown in Figure 8 and summary statistics provided in Table 7.

<sup>&</sup>lt;sup>16</sup> Routes can be expected to change as a better understanding of local constraints is developed through design.

# Table 7: Southampton University Highfield - Summary Statistics for Initial Zone Opportunities<sup>17</sup>

CapEx	Heat	Network	CO₂₀ savings	Linear Heat Density	Heat Sources
>£25m	>25GWh/yr	>4km	~5ktCO <sub>2e</sub> /yr	6.9MWh/m	ASHP

This IZO presents an opportunity to decarbonise the existing heat network and nearby heat loads including schools and additional university buildings. It will connect to a total heat demand of about 50GWh/yr, with a linear heat density of 6.9MWh/m (excluding the impact of new developments).

<sup>&</sup>lt;sup>17</sup> Please see Appendix 3 – Glossary, "Specific definitions" of the main report for definitions related to this table.

#### Figure 8: Initial Zone Opportunities in Southampton University Highfield HNZ



Southampton
Zone: Southampton University Highfield
oundaries
Study Boundary
Local Authority Boundary
Other Local Authority Boundary
Heat Network Zone
Other Heat Network Zones
tworks
<ul> <li>Initial Zone Opportunity Network</li> </ul>
Existing and Planned Heat Network
at Source
Area Source
EfW
Industrial Waste Heat
Minewater
Other Waste Heat
Water Source
WWT Plant
ey Area Heat Sources
Deep Geothermal
J Ground Source
J Water Source
ergy Centres
Existing and Planned - Communal
Existing and Planned - District
Potential 120
Buildings Required to Connect
Campus
New Developments
0 0.125 0.25 0.5
yrights: Esri, Intermap, NASA, NGA, USGS, Esri Community os Contributors, Esri UK, Esri, Tomforn, Garmin, Foursquare,
mechnologies, Inc. METUNASA, USGS, Esrl UK, Esrl, TomTom, min, Foursquare, METUNASA, USGS

## 3.2.4) Southampton University Highfield – IZO Heat Demands

The IZO connects to 46 existing buildings, with an overall heat demand of up to 50GWh/yr. Key heat demands include the UoS Highfield Campus network and UoS Boldrewood Innovation Centre buildings. Figure 9 shows the breakdown of heat demand based on building types and Table 8 lists the ten highest demands identified.



Figure 9: Southampton University Highfield - Categorisation of Heat Demand for Buildings Potentially Required to Connect in the IZO

The largest load connected to the IZO is the existing UoS Highfield Campus network with a demand of over 25GWh/yr. This demand represents over 60% of the buildings on the campus, with the remaining buildings assumed to be prepared and ready to connect to a heat network. Cantell School is a secondary comprehensive school in Bassett. Most other top heat demands are education buildings that make up the UoS Boldrewood campus, which are primarily heated by natural gas.

# Table 8: Southampton University Highfield - Key Heat Demands Required to Connect in the IZO<sup>18</sup>

Building name	Building category	Number of connections	Annual heat demand (MWh)	Data source
UoS Highfield Campus network	Public Sector	1	17,025	Metered
Cantell School	Council owned	2	1,200	DEC
UoS Boldrewood Building 185	Public Sector	1	800	DEC
UoS Boldrewood Building 178	Public Sector	1	550	DEC
UoS Boldrewood Building 176	Public Sector	1	500	DEC
UoS Boldrewood Building 177	Public Sector	1	250	DEC
Bassett Green Primary School	Council owned	1	200	DEC
Brampton Tower	Residential	1	175	Benchmark (NZM)
Highfield Church	Non-domestic	1	125	Benchmark (NZM)
Highfield CoE Primary School	Council owned	1	100	DEC

<sup>&</sup>lt;sup>18</sup> Please refer to Appendix 3 for definitions related to building categories in this table.

## 3.2.5) Southampton University Highfield – IZO Heat Sources

An ASHP is the most likely heat source for this IZO. As this technology is location-agnostic, a potential energy centre location has been shortlisted on land designated as a future development site between Glen Eyre Road and Violet Road. Table 9 and Table 10 summarise the key heat sources and potential energy centre locations identified. These are shown in Figure 8 in Section 3.2.3 above and on Map C in Appendix 1.

Other heat sources identified nearby include Portswood WWTW which offers potential for a SSHP of estimated capacity 2.5MW, and the River Itchen, a potential site for a WSHP with estimated capacity 1MW. A feasibility assessment at both sites would be required to calculate the full opportunity capacity. These have not been proposed as the preferred heat source due to distance and the requirement to cross the railway to the east.

#### Table 9: Southampton University Highfield - Key Heat Source Opportunities for the IZO

Heat source type	Capacity (kWp)	Temperature (°C)	Potential energy centre location
ASHP	7,700	5-15	EC4

#### Table 10: Southampton University Highfield - Potential IZO Energy Centre Locations

EC ref number	Site type	Size (m²)	Ownership	Heat source
EC4	Land	2,600	SCC	ASHP

## 3.2.6) Southampton University Highfield – IZO Heat Distribution

Table 11 shows the network statistics including the network length and associated costs. Please refer to Section 3.1.6 and Appendix 5 for the assumptions used. Heat is distributed from the proposed energy centre on Glen Eyre Road and connects a residential block and the Cantell Community Campus to the north and the UoS Highfield Campus to the south, as well as the UoS Boldrewood Innovation Centre campus to the west.

#### Table 11: Southampton University Highfield - Indicative Heat Network Statistics for the IZO

IZO description	Network length (km)	Network cost (£m)
Southampton University Highfield	~4	~10

### 3.2.7) Southampton University Highfield – IZO Key Constraints and Mitigations

There are no major constraints identified for the proposed IZO network route.

# 3.3) Southampton General Hospital

## 3.3.1) Southampton General Hospital – HNZ Summary

Southampton General Hospital HNZ covers the north-west region of the Upper Shirley area. The HNZ includes 23 existing buildings that could potentially be required to connect to a heat network, including Southampton General Hospital, and one future development site. Key low carbon heat sources identified include the potential for ASHPs.

## 3.3.2) Southampton General Hospital - Existing Heat Networks

### **Operational Heat Networks and Planned Expansions**

The following operational heat networks have been identified and are shown in Appendix 1: Map D.

### Southampton General Hospital Campus

The Southampton General Hospital network currently serves Southampton General Hospital and Children's Hospital. It is currently served by two 2MWe gas-fired CHP engines with waste heat boilers and two 7.9MW gas-fired steam boilers from a plant room on the Hospital site.

### Proposed Heat Networks – Early stage

The following heat network development schemes are in early development stages of masterplanning and are not shown on Map D as firm plans on network routing are not yet established.

### Energy Mapping and Master Planning Study – SCC

In 2021, an energy mapping and master planning study was undertaken for SCC supported by the HNDU. The study assessed the viability of connecting existing networks in Southampton, including the Southampton General Hospital network.

## 3.3.3) Southampton General Hospital - Initial Zone Opportunities

A single IZO was identified in Southampton General Hospital zone. Potential routing<sup>19</sup> is shown in Figure 10 and summary statistics provided in Table 12.

Table 12: Southamptor	General Hospital -	- Summary Statistics	for Initial Zone	Opportunity <sup>20</sup>
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CapEx	Heat	Network	CO <sub>2e</sub> savings	Linear Heat Density	Heat Sources
~£50m	~100GWh/yr	~3km	~15ktCO <sub>2e</sub> /yr	34MWh/m	ASHP

It presents an opportunity to decarbonise the existing campus heat network, the wider hospital campus, and other nearby loads, connecting to a total heat demand of about 100GWh/yr.

<sup>&</sup>lt;sup>19</sup> Routes can be expected to change as a better understanding of local constraints is developed through design.

<sup>&</sup>lt;sup>20</sup> Please see Appendix 3 – Glossary, "Specific definitions" of the main report for definitions related to this table.

#### Figure 10: Initial Zone Opportunities in Southampton General Hospital HNZ



## 3.3.4) Southampton General Hospital – IZO Heat Demands

The IZO connects to 23 existing buildings and one future development site, with an overall heat demand of about 100GWh/yr. Key heat demands include Southampton General Hospital, Children's Hospital and Princess Anne Hospital. Figure 11 shows the breakdown of heat demand based on building types and Table 13 lists the ten highest demands identified.





The largest load connected is the existing Southampton General Hospital campus steam network with a demand of over 72GWh/yr. The Hospital is heated by several fuels, primarily natural gas with an existing plant room consisting of boilers and CHP units. Oil is used on site as fuel as well. There is an existing steam network that serves most buildings on the hospital campus. The surrounding Princess Anne Hospital also has a high heat demand of almost 9GWh/yr, served by natural gas boilers.

# Table 13: Southampton General Hospital - Key Heat Demands Required to Connect in the IZO<sup>21</sup>

Building name	Building category	Number of connections	Annual heat demand (MWh)	Data source
Southampton General Hospital campus	Public Sector	1	72,400	ERIC
Princess Anne Hospital	Public Sector	1	8,900	ERIC
Spire Southampton Hospital	Non-domestic	2	750	Benchmark (NZM)
Cancer Research UK Southampton Centre	Public Sector	1	600	Benchmark (NZM)
Wickes	Non-domestic	1	600	Benchmark (NZM)
Upper Shirley High School	Council owned	2	550	DEC
The Range	Non-domestic	1	500	Benchmark (NZM)
Shirley Junior School	Council owned	1	250	DEC
Centre for Cancer Immunology	Public Sector	1	250	Benchmark (NZM)
UHS Trust Management Office	Public Sector	1	250	DEC

## 3.3.5) Southampton General Hospital – IZO Heat Sources

An ASHP is the most likely heat source. As this technology is location-agnostic, a potential energy centre location has been shortlisted in the plant room that serves as the energy centre for the existing steam network (EC5). The current steam network is not compatible with a wider

<sup>&</sup>lt;sup>21</sup> Please refer to Appendix 3 for definitions related to building categories in this table.

heat network and so the energy centre needs replacing to introduce a hot water distribution system.

Table 14 and Table 15 in this section summarise the key heat sources and potential energy centre locations identified. These are shown in Figure 10 in Section 3.3.3 above and on Map C in Appendix 1.

		ultal Kavillaat	0	antum iti an fan tha 170
Table 14: Southam	pton General Hos	pital - Key Heat	Source Opp	ortunities for the IZO

Heat source type	Capacity (kWp)	Temperature (°C)	Potential energy centre location
ASHP	18,900	5-15	EC5

#### Table 15: Southampton General Hospital - Potential IZO Energy Centre Locations

EC ref number	Site type	Size (m²)	Ownership	Heat source
EC5	Existing plant room	2,500	NHS Foundation Trust	ASHP

### 3.3.6) Southampton General Hospital – IZO Heat Distribution

Table 16 shows the network statistics including the network length and associated costs. Please refer to Section 3.1.6 and Appendix 5 for the assumptions used.

The proposed IZO distributes heat from the existing plant room in Southampton General Hospital to the wider Hospital campus. It then distributes heat towards Upper Shirley connecting commercial and educational heat loads located there.

#### Table 16: Southampton General Hospital - Indicative Heat Network Statistics for the IZO

IZO description	Network length (km)	Network cost (£m)
Southampton General Hospital	~3	~5

## 3.3.7) Southampton General Hospital – IZO Key Constraints and Mitigations

There are no major constraints identified for the proposed IZO network route.

# 4) Other Heat Network Zones

This section describes the 'Other' potential heat network zones that were identified in Southampton. These are areas where heat networks were deemed to offer the lowest carbon route to decarbonising heat but are often much smaller or discrete in nature than the 'Strategic' heat network zones identified. The approach taken in the Pilot programme did not apply a minimum threshold for zone identification and therefore future work will need to consider factors such as size and aggregation to ensure efficient and effective delivery of heat networks in the area.

Figure 12 illustrates the total annual heat demand, and the proportion of which is associated with buildings that may be required to connect within each zone. A map of all zones can be found in Figure 4.





**Southampton Airport (SOTMP\_004):** is situated at the northeast edge of the study boundary. The area is dominated by buildings of a commercial nature and includes Southampton Airport. A future development area spans the zone which is anticipated to be delivered over 15+ years.

**International Way (SOTMP\_009):** is situated southeast of the city centre and is dominated by social housing, including the International Way tower blocks; Hampton, Oslo, Havre, Rotterdam, Canberra, and Copenhagen Towers.

**Test Valley Business Park (SOTMP\_011):** is situated at the western edge of the study boundary The area is dominated by industrial and retail buildings, including the Adanac Business Park and Southampton Retail Park. This area is an ongoing development area.

**SOTMP\_007:** is situated in the northwest of the study boundary in an area called Lordshill. It is a small commercial zone with planned expansion to social housing likely in the future.

**SOTMP\_013:** is situated in the centre of the Shirley district. It contains several large commercial buildings with potential to expand to social housing, depending on retrofit timeline for social housing.

**SOTMP\_005:** in Thornhill, is a zone with a small number of commercial buildings and a school, with opportunity for development likely to come after the timeframe for this Pilot programme.

**SOTMP\_010:** is situated east of the city centre across the River Itchen and has some potential to expand, with new residential developments likely to be constructed.

**SOTMP\_012:** is situated in between Southampton General Hospital and is a zone focussed on two schools.

**SOTMP\_014:** is situated northwest of the city centre and is a Tesco site and the Western Community Hospital with opportunity to connect a nearby sixth form college if a network was developed.

**SOTMP\_019:** is focussed on the Leaside Way estate. Development of a network is likely dependent on retrofit of existing social housing, and not of significant scale.

**SOTMP\_006:** is situated east of the city centre across the River Itchen and is centred on Bitterne. Development of a network would be led by new developments in the area, with timelines likely to be beyond 2025.

**SOTMP\_015:** is an industrial area next to Southampton City Centre and is earmarked as potential for development land.

**SOTMP\_016:** is an industrial area, earmarked as potential for development land.

**SOTMP\_017:** is situated east of the city centre across the River Itchen near zones 006 and 018 and is focussed on two schools.

**SOTMP\_018:** is situated east of the city centre across the River Itchen and is focussed on four schools.

# Appendix 1 – Maps and Legends

This section provides guidance on interpreting the icons and legends used throughout this report and Maps A-F that follow:

Legend / icon	Relevant map(s)	What this represents on the map	Comments on interpretation
C13	Report maps	Study boundary	Extends 1km beyond Local Authority boundary to includ
	Report maps	Local Authority boundary	
C13	Report maps	Other Local Authority boundary	
	Report maps	Heat network zones	This includes both Strategic HNZs and Other HNZs.
	Report maps	Other heat network zones	Smaller or discrete heat network zone opportunities
	Report maps	New developments	New development within heat network zones and IZOs t
Gates Hill	Report maps	Heat network zone name / reference number	'Strategic' zones are named; 'Other' zones are represen
	Report maps	Buildings potentially required to connect	Buildings that could be required to connect (as describe
525	Report maps	Campuses	Multiple buildings owned and operated by the same orga
	Report maps	Initial Zone Opportunity concept network route	Conceptual heat network pipe routes between buildings
	Report maps	Existing and Planned Heat Networks	Known existing or planned heat network pipe routes as
	Report maps	Potential energy centre - IZO	Potential energy centre location for an IZO (see Section
	Report maps	Existing/planned energy centre - Communal HNs	'Communal' energy centres are those operated within a
	Report maps	Existing/planned energy centre - District HNs	'District' energy centres supply multiple buildings across
Appendix 1: A – Typology map		·	
	Appendix 1: Map A	Dense City Centre	Locally recognised as the City or Town centre, where bu
	Appendix 1: Map A	City Centre Fringe	Around the City or Town Centre or at its outskirts, where
	Appendix 1: Map A	Mixed Use District	A variety of building typologies, with no single typology p
	Appendix 1: Map A	Social Housing	Public, private and third sector social housing
	Appendix 1: Map A	Campus (health / education)	Buildings that are owned and operated together (e.g. Ur

le	cross	boundary	opportunities

that will still be in construction post-2025

nted by a reference number

ed in the HNZ Consultation 2023)

anisation (e.g. Universities, Hospitals)

that could be required to connect

provided by local stakeholders

ı 3)

single building or across a campus

s multiple sites

uildings development is most dense

e both building density reduces

prevailing in the area

niversities, Hospitals)

	Appendix 1: Map A	Commercial / business office	Public & private office space
	Appendix 1: Map A	Industrial areas	Primarily used for manufacturing, engineering, and wareh
Appendix 1: B – Key heat deman	ds		
$\textcircled{\bullet}$	Appendix 1: Map B	Top 10 Heat Demands	The largest (anchor) heat loads within the Pilot programm
	Appendix 1: Map B	Local Authority	Buildings owned or operated by the Local Authority
	Appendix 1: Map B	Other public sector	Other buildings owned or operated by the public sector (e
	Appendix 1: Map B	Residential with existing communal heating	Residential buildings with existing communal heating syst
	Appendix 1: Map B	Non-domestic private	Non-domestic private buildings (e.g. commercial, offices)
	Appendix 1: Map B	Industrial	Mixed industrial sites (e.g. light or heavy industry, manufa
O 400 - 600	Appendix 1: Map B	Building heat demand (MWh/yr)	Circle size increases with size of heat demand
Appendix 1: C – Key Heat Source	es and Potential Energy	Centres	
	Appendix 1: Map C	EfW plant	Point heat sources have known or likely points of heat o
	Appendix 1: Map C	Industrial Waste Heat	Mine water and water source 'points' indicate potential ab
	Appendix 1: Map C	Mine water	
$\bigtriangleup$	Appendix 1: Map C	Other Waste Heat	Other waste heat sources include sewers, electrical subst for more detail on heat source capacities, where known.
	Appendix 1: Map C	Water Source	On the City layel Man C anky the heat waste symbol is si
	Appendix 1: Map C	Waste Water Treatment	On the City-level Map C only, the heat waste symbol is si
	Appendix 1: Map C	Deep geothermal or mine water heat	Area heat sources differ from point-heat sources in that
E13	Appendix 1: Map C	Ground source	resource is not yet determined
013	Appendix 1: Map C	Water source	
Appendix 1: D – Existing and pla	nned heat networks		
$\bigcirc$	Appendix 1: Map D	Existing and planned heat networks	At this scale, the route of an existing heat network cannot
Appendix 1: E – Physical constra	lints		
	Appendix 1: Map E	Key constraints	Key heat network routing constraints as described in Sec

#### nousing

ne study area (see Section 3)

e.g. hospital, universities, Govt. estates)

stems installed

acturing, warehouses, and distribution)

offtake/abstraction

bstraction points.

stations, and other sources of heat. See Section 3

sized according to its scale in GWh/yr

t the exact location for extracting heat from the

t be displayed, so an area outline is used instead

ction 3

# A.Southampton Typology Map



# B. Key Heat Demands



#### Table 17: Heat Demand split further by Building Categories across all Initial Zone Opportunities identified in Strategic HNZs in the Study Area

Building category	Number of Buildings Required to Connect in this Category	Annual Heat Demand of Buildings Required to Connect across IZOs (MWh)		Southampton heat demand building category summed for
Domestic	15	6,450	100% —	6,369 498
Education (schools & higher education)	58	39,250	90% —	6,432 8,443 8,451 2,511
Entertainment	2	750	80% —	14,067
Hospitals and residential / nursing homes	14	83,600	- %00 - %00 - %00	39 241
Hotels	3	1,200	de de	
Industrial buildings	10	8,450	f total	
Offices	28	8,450	° 40% – %	
Public buildings	7	2,500	30% —	00 507
Retail	22	6,350	20% —	83,587
Sports and recreation	2	500	10% —	
New Developments	11	14,050	0%	
Totals	172	171,550	0 70	Heat demand (MWhs)

Note: In Southampton there are 18 HNZs with a total of three IZOs identified across them. The table and graph above summarise the heat demand for buildings required to connect to these IZOs.

# d split by or all HNZs



# C. Key Heat Sources and Potential Energy Centres



# D. Existing and Planned Heat Networks



Fast Horton		
Golf Centre		
9 6 6		
Street		
A CONTRACTOR		
9-		
Brown Heat		
83354		
A LAND		
B3354		
Patlau		
Bolley		
A3051		
River Hamble Country Park		
A3051		
A		
E05 Whiteley		
Cart March 11		
A3051		
A27		
nampton		
an Lloat Maturalia		
ng Heat Networks		

# E. Physical Constraints



# F. Off-Gas Grid Areas in Southampton



# Appendix 2: Data Room Resources

Throughout the delivery of the Pilot programme, information resources have been compiled for future use in relation to the development of heat network zones.

These resources will remain restricted to DESNZ and the local authority. This is to ensure that the department remains within its Data Privacy Notice as shared with stakeholders providing the information. GIS outputs are not being published alongside the report as they are subject to change.

Information resource	Description of resource
Stakeholder Directory	A directory listing key stakeholders identified and approached during the Pilot programme, including organisation name, address, or website, contact names, work title, and contact details.
Stakeholder meetings log and records	A log of key meetings held and related meeting records.
Datasets Directory	A list of datasets / reports shared by stakeholders cross-referencing who provided the item from the stakeholder directory and a description of the dataset.
Geospatial packages and related geo-coded datasets	Geo-coded datasets and descriptions related to maps produced in this report.

#### **Table 18: Pilot Programme Standardised Information Resources**

#### Table 19: Pilot Programme Study-Area-Specific Information Resources

Information resource	Description of resource
Southampton Heat Network Mapping and Master Planning Study, 2021	Master planning study considering opportunities to decarbonise and expand existing Southampton district heat networks, completed by AECOM in 2021
Strategic Land Availability Assessment, 2022	Supporting document as part of the Southampton City Vision Local Plan – outlines land availability and identifies potential sites for development, matching reference numbers to GIS shapefiles received by SCC mapping planned new developments

This publication is available from: <u>https://www.gov.uk/government/collections/heat-networks</u>

If you need a version of this document in a more accessible format, please email <u>alt.formats@energysecurity.gov.uk</u>. Please tell us what format you need. It will help us if you say what assistive technology you use.