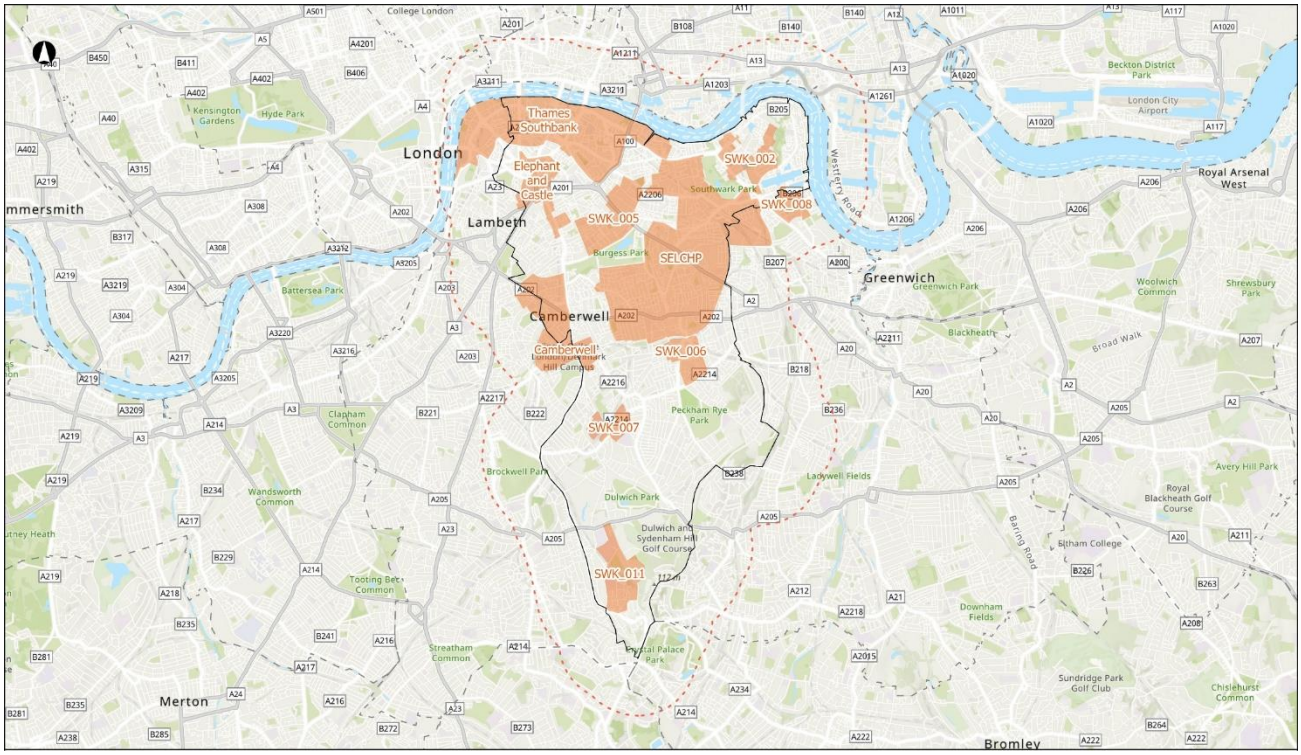
Department for Energy Security & Net Zero

London Borough of Southwark

Heat Network Zoning

Zone Opportunity Report



February 2025

Disclaimer

Please read the following licence conditions thoroughly to understand your responsibility for use of this report and data presented within it.

This report contains outputs from the Heat Network Zoning Pilot Programme. The Pilot was undertaken prior to full details of the Heat Network Zoning policy being available. Therefore, the contents, including data shown in maps, technical and economic data within the report, are likely to change and potentially sensitive information is withheld. No part of this report shall be relied upon for any business decisions.

Acknowledgements

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Contents

Executive Summary

About London Borough of Southwark: Southwark is centrally located in south London, on the banks of the River Thames. It comprises a high-density urban character with Lambeth to the west and Lewisham to the east.

Local Energy Policy: Southwark Council declared a climate emergency in May 2019, aiming for the borough to be carbon neutral by 2030 with a focus on decarbonising heat and power in buildings.

Existing heat networks: Southwark has large residential heat networks, including SELCHP, which supply heat to 17,000 properties. It also has several campus networks. Southwark is an Advanced Zoning Programme (AZP) area.

Zones identified: 10 potential heat network zones were identified, with four considered strategic zones The overall heat demand for all buildings required to connect within all zones is 900GWh/yr.

Strategic heat network zones: The four strategic zones are Thames Southbank, SELCHP, Camberwell, and Elephant and Castle. The overall heat demand for all buildings required to connect within strategic zones is 850GWh/yr.

Key heat demands: The total annual heat demand for buildings connected to the initial zone opportunities is 800GWh/yr. Some of the largest buildings include St Thomas' Hospital, Guy's Hospital, and Tate Modern.

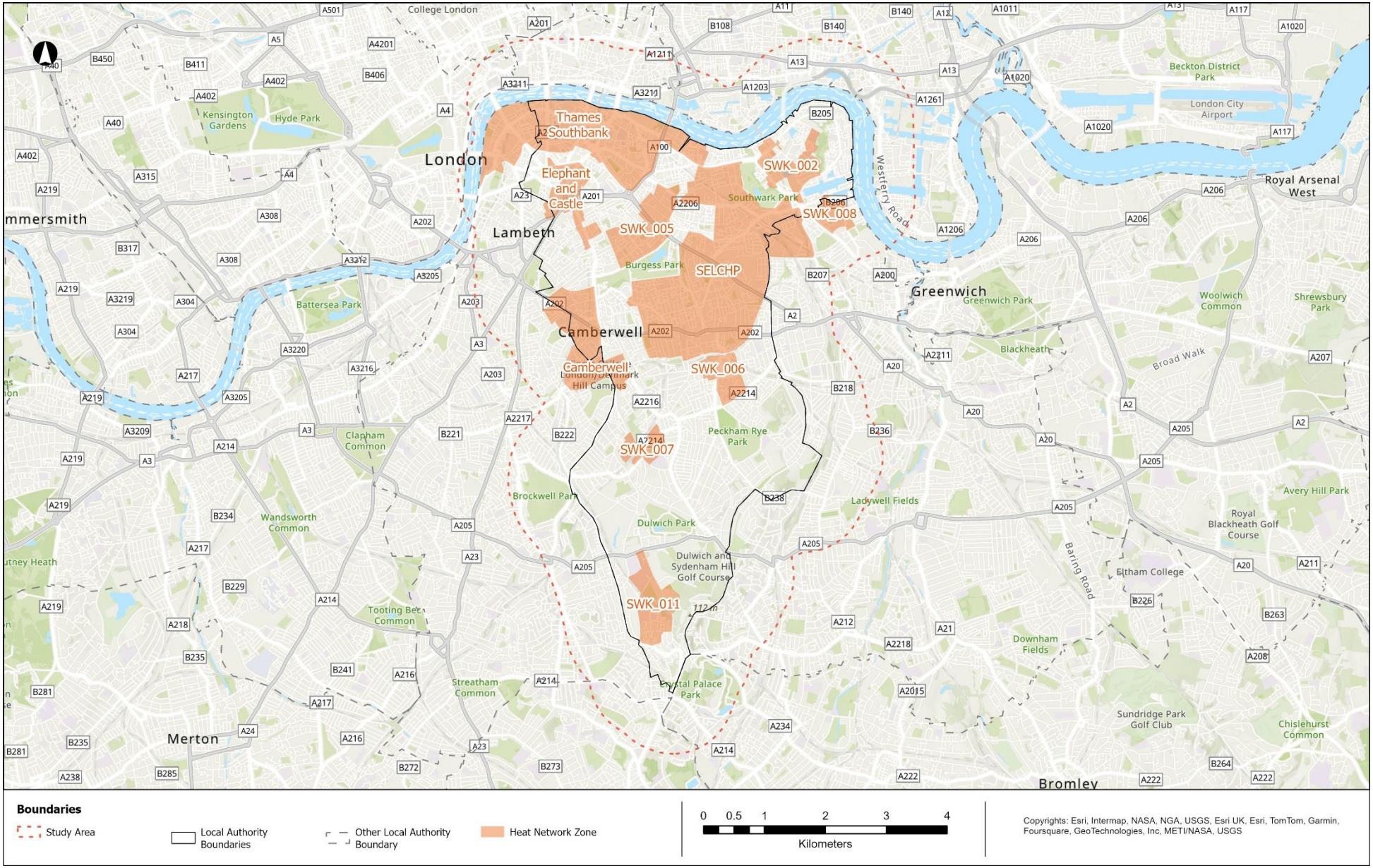
Key heat sources: Potential heat sources include energy from waste, river water source heat pumps, and air source heat pumps.

Estimated CapEx: The high-level estimate of capital expenditure to network all buildings required to connect in all zones is approximately £900m, of which the initial zone opportunities amount to approximately £800m.

Other heat network zones: Smaller heat network zones identified in areas with educational buildings, light industrial and commercial areas, or mixed-use areas.

Carbon savings: Initial zone opportunities identified could deliver carbon savings of more than 120ktCO_{2e} annually.

Figure 1: Overview of Heat Network Zones in Southwark



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. Analysis shows that heat networks could provide about 20% of total heat demand in the UK 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 the London Borough of Southwark 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[1]. 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 https://www.gov.uk/government/collections/heat-network-zoning.

Heat Network Zone Identification

Heat network zones will be identified using a standardised national zoning methodology. The December 2023 consultation on Heat Network Zoning 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.

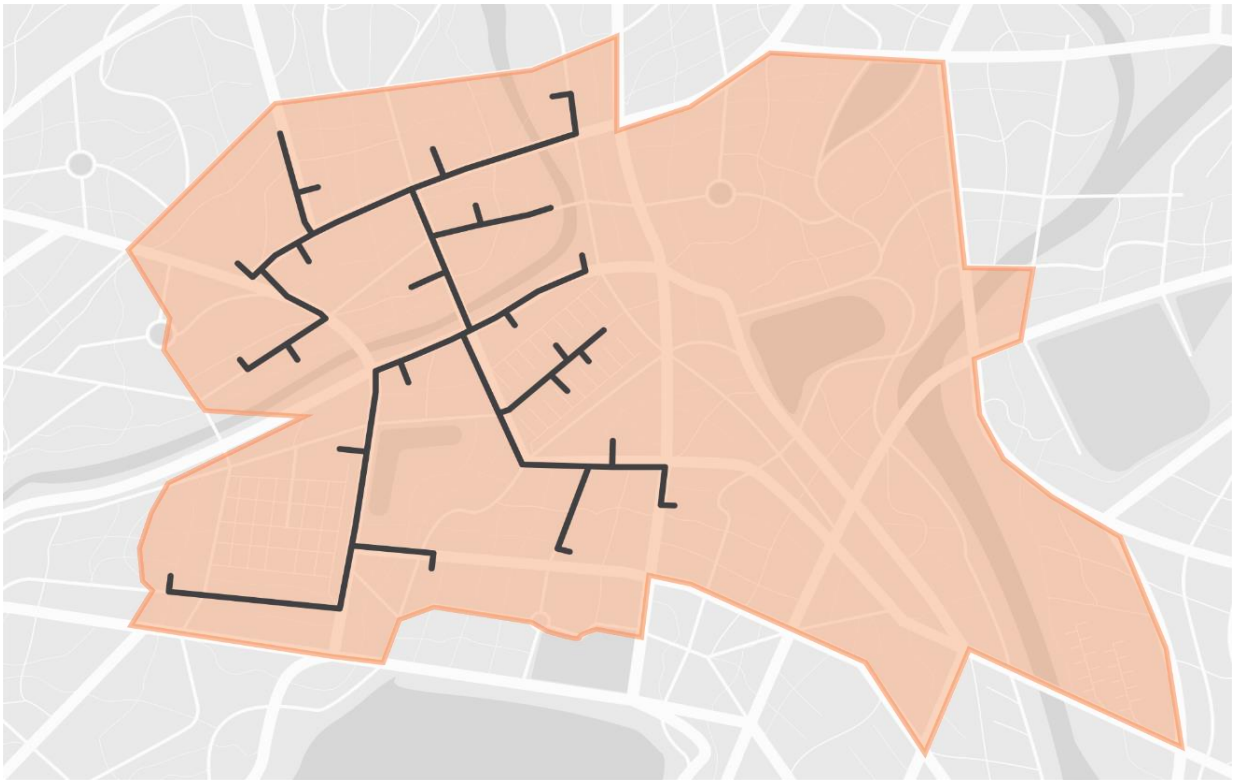
[1] More information can be found in the Heat Network Zoning Methodology Statements (Appendices 3, 4 & 5)

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 be required to connect[2] 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.

Figure 2: Illustration of a Heat Network Zone (HNZ) and an Initial Zone Opportunity (IZO)



[2] The building categories being considered as 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.

Advanced Zoning Programme

The Advanced Zoning Programme (AZP) is working with 19 areas (including Southwark) to support the construction of new zone scale heat networks as quickly as possible following the launch of heat network zoning in 2025. Amongst the programmes aims are to accelerate the delivery and construction of heat network zones; develop best practice guidance; provide project development support services; and promoting market transformation ready for the national rollout of Heat Network Zoning policy.

The programme builds upon lessons learnt from the Pilot programme and these outputs. In October 2024, DESNZ announced that ground-breaking heat network schemes in Leeds, Plymouth, Bristol, Stockport, Sheffield, and two more in London will receive prioritised support to advance to construction by the end of 2026.

AZP uses the latest zoning methodology (i.e. developed after the Pilot programme) and has undertaken further detailed development work with local stakeholders to further improve confidence and accuracy. The programme may also have applied local strategic and commercial considerations and therefore the opportunities may differ slightly from those presented here, using a national standardised approach. Where there is overlap, AZP studies should be considered more appropriate for use than the outputs from this Pilot programme.

2) LB Southwark Heat Networks Context

2.1) LB Southwark Area Overview

Southwark Council (SC) is the administrative body for the London Borough of Southwark (LB Southwark) in South London, forming one of the 32 London Boroughs, situated within the Greater London area. Delineated by the southern bank of the River Thames and the adjacent boroughs of Lambeth and Lewisham, this borough's northern section forms part of Central London, an area of particularly dense development.

LB Southwark includes a significant commercial sector, with approximately 15,000 businesses including retail and professional services. Additionally, Southwark is home to two university campuses. Europe's largest university teaching hospital is situated at the Guy's Hospital site. King's College and Maudsley hospitals are located on the southern border of the borough, in the Denmark Hill area. Urban regeneration efforts have transformed former industrial spaces across the borough, including Elephant and Castle, Aylesbury Estate, Old Kent Road, London Bridge, and Canada Water, aiming to create the first town centre in London for 50 years.

Southwark's most recent census[3] reports it to have a population of 307,700, making it the seventh most densely populated borough per area in London. Over one-quarter (27%) of households in Southwark are socially rented (35,400) this has decreased by 4% since 2011[4]. Southwark aligns with the majority of London Boroughs in its net delivery of 180 affordable, social, and discounted housing completions, over the last 3 years (average 0-250)[5].

2.2) LB Southwark Net Zero Targets and Commitments

SC is committed to delivering a net zero pathway. Having declared a climate emergency in May 2019, SC has set an ambition for the whole borough to be carbon neutral by 2030. SC has published its first Climate Change Strategy in July 2021. It has targeted five key areas: improving energy efficiency, transportation decarbonisation, promoting renewable energy, enhancing the natural environment, and increasing circular economy efforts. Its progress to date is tracked through its annual climate change strategy reports and interactive climate action SCATTER tool. SC recognise the extent of their carbon emissions, with 70% derived from its buildings alone.

SC understands the importance of working in partnership with its residents and businesses to drive its pathway to net zero. SC promotes climate action locally through its annual Climate

[3] Office for National Statistics (2022) How the population changed in Southwark, census 2021, ONS. Available at: https://www.ons.gov.uk/visualisations/censuspopulationchange/E09000028/

[4] Southwark Council (2023) Census 2021 Results: Housing. Available at: https://www.southwark.gov.uk/assets/attach/169634/census-2021-profile-housing.pdf

[5] Trust for London (2020). Borough comparison: Housing (2020) Trust for London. Available at: https://trustforlondon.org.uk/data/borough-comparison-housing/

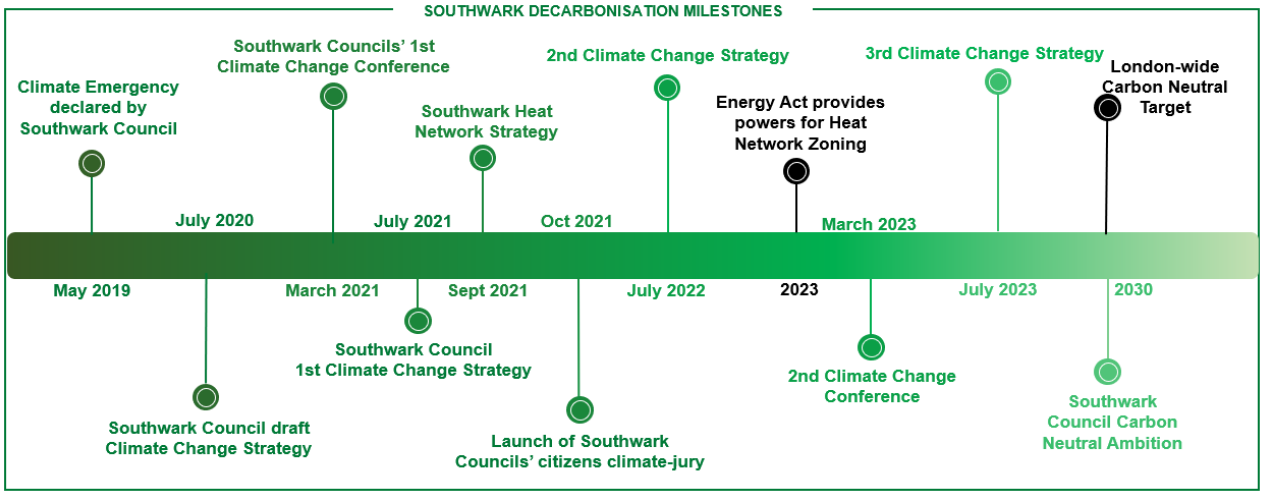
Change Conferences, Climate Change Citizens Jury, and Stakeholder Plans, which support and shape Southwark's action plans and climate strategies. As a result, SC's Climate Change Strategy has been voted the second-best in London by Climate Emergency UK.

Southwark recognises the importance of investing in heat networks as a fundamental component of its decarbonisation strategy. With existing and ageing networks, tackling heat network upgrades and decarbonisation has also been identified as a priority for SC in the 'Housing and Modernisation 2019/20 Business Plan'. In September 2021, Southwark agreed to a Heat Network Strategy that provided an update on the work to expand and decarbonise its existing heat networks. Notably, the strategy discusses the expansion of the SELCHP network alongside developing water source heat pump (WSHP) opportunities. In addition to the strategy, SC have established several groups to discuss and evaluate the heat network development through the Heat Network Governance Board and Heat Networks Residents Group. SC has been proactive in developing heat networks for council-owned buildings and estates and by expanding and continuing heat network development these will further help to meet decarbonisation targets.

Whilst driving a pathway to net zero, SC is futureproofing its assets. SC published a Climate Resilience and Adaptation Strategy in February 2024, to support and protect its communities, homes, infrastructure, and environment from climatic changes. A key aspect of this is to improve insulation standards in heat network pipes and reduce losses in building pipework.

Figure 3, below, summarises key dates in SC's plans for decarbonisation and demonstrates their progress towards decarbonisation targets.

Figure 3: LB Southwark Decarbonisation Milestones



2.3) Delivering Heat Networks in LB Southwark

The 2016 London Plan requires all London Boroughs, including Southwark, to support decentralised heat networks within their local plans. Policy 5.6 requires major developments to adopt heat network connections in a hierarchical approach: connecting to an existing heat network, applying site-wide CHP, and, lastly, opting for a communal heat network.

Southwark has multiple existing heat networks, varying in scale from small communal systems to larger heat networks. Almost a third of all council properties are connected to a heat network. The South-East London Combined Heat and Power (SELCHP) is Southwark's most prominent heat network with 5km of buried pipe, serving multiple estates. Veolia Environmental Services owns and operates SELCHP, which has maintained a contract with SC since 2013. This contract ensures heat provision from SELCHP to 2,650 council properties in Southwark[6].

Working with Veolia, SC has further secured £16m of central government funding for the extension of the SELCHP heat network under the Heat Networks Investment Project (HNIP), known as 'Southwark 2.0'. A local development order has approved the extension of the network, permitting the construction of a 7km network to 3,000 properties around Old Kent Road and Peckham. The AZP is exploring further expansion of the Southwark 2.0 network. The AZP and Pilot programme analyses suggest a positive case for heat network extension in this HNZ, with broad overlap. Please refer to Section 3.2, for further information on existing and planned networks in the SELCHP HNZ.

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

2.4) LB Southwark Heat Network Zones

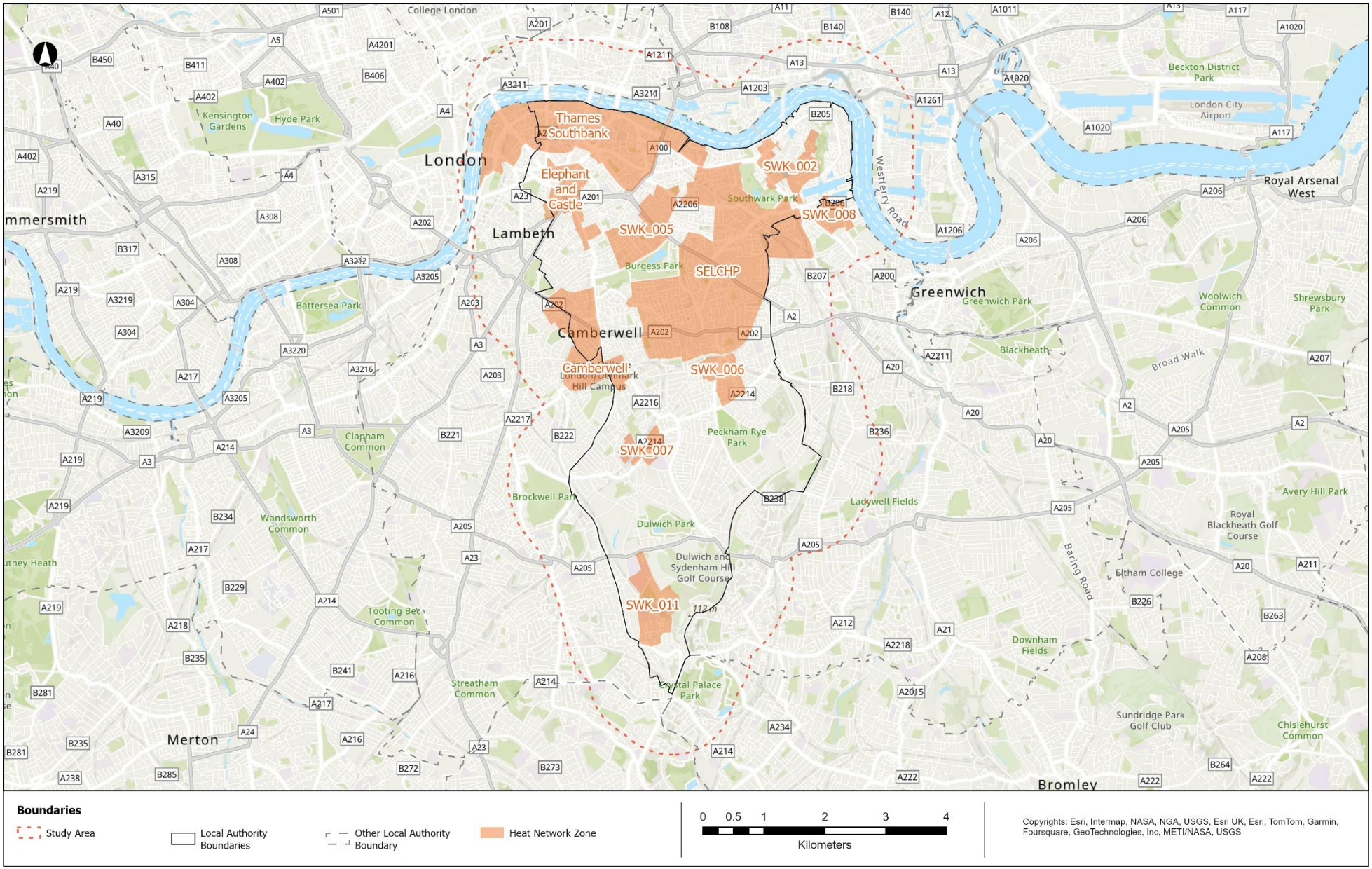
A total of ten potential HNZs were identified in LB Southwark, with four considered Strategic HNZs. Figure 4, shows the study area boundary as well as the boundaries of all HNZs identified within LB Southwark. Strategic HNZs have been allocated a meaningful name agreed as relevant from a local perspective 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 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 heat networks, planned extensions, and planned networks at an advanced development stage
- E: Key Constraints Map – shows key topographical constraints identified.
- F: Off-gas Grid Areas – presents areas with differing levels of properties off the gas grid within the study area.

[6] Southwark Council (undated). Projects and further information Southwark Council. Available at: https://www.southwark.gov.uk/housing/district-heating/projects-and-further-information

Figure 4: Heat Network Zones Identified within the LB Southwark Study Area



3) Strategic Heat Network Zones

Strategic HNZs in LB Southwark

This section examines the four strategic HNZs and the IZOs identified within each. This covers the key heat demands, heat sources, energy centre locations and potential constraints for each IZO identified. 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 Southwark. Please refer to Appendix 4 for more detail.

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

Scope	Annual heat demand (GWh/yr)
All buildings required to connect in all zones[7]	900
All buildings required to connect in strategic zones	850
All buildings connected to the IZOs	800

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

Thames Southbank is the largest potential HNZ identified by heat demand, bounded on the northern side by the River Thames in central London. It is an area of significant size and continuous heat density. For more information, please see Section 3.1.

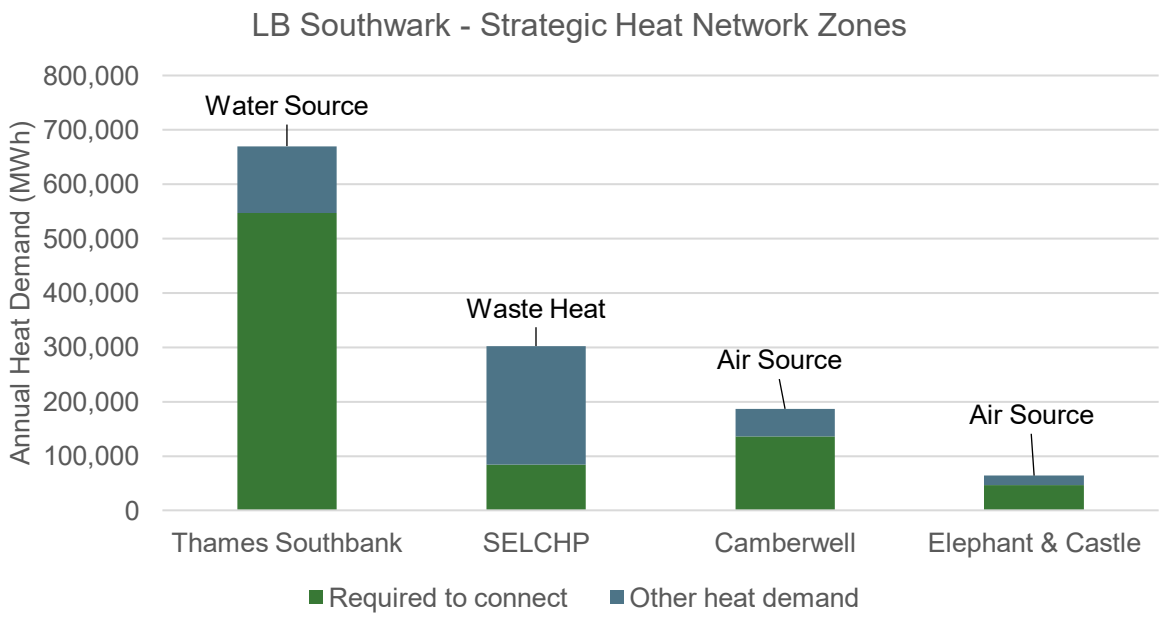
[7] Row 1 is an estimate of heat demand across buildings required to connect in all zones identified. Row 2 is as per row 1, but only within strategic zones. Row 3 includes buildings connected to the IZOs described and largely comprise of buildings potentially required to connect. Figures are generally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

SELCHP comprises the areas served by the existing SELCHP heat network and heat network expansion areas to the south, including potential customers across the public and private sector. For more information, please see Section 3.2.

Camberwell comprises King's College Hospital and The Maudsley Hospital, as well as other non-domestic and residential areas. For more information, please see Section 3.3.

Elephant and Castle comprises the central area of Elephant and Castle and is a relatively heat dense area with an even spread of office, domestic, and commercial buildings. For more information, please see Section 3.4.

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



3.1) Thames Southbank HNZ

3.1.1) Thames Southbank – HNZ Summary

Thames Southbank has the greatest heat demand and heat demand density of the HNZs identified across Southwark. Situated at the north borough boundary with the Thames, it is a strategic zone that offers cross-borough opportunities with Lambeth. The key anchor loads, and greatest demand derive from St Thomas' Hospital, Guy's Hospital and Tate Modern, followed by modern private commercial buildings. The linear heat density presents an attractive proposition to decarbonise this part of London.

The zone contains non-domestic private buildings with few local authority buildings, public sector and residential buildings, comprising 534 buildings that may be required to connect. Situated along the River Thames, it has direct access to water source heat. It manages space limitations with critical transport infrastructure throughout the area. The HNZ has a particularly high density of Transport for London (TfL) red routes. Mitigations to these constraints have been identified for the IZO in Section 3.1.7.

3.1.2) Thames Southbank – Existing Heat Networks

There are two operational heat networks at the Guy's and St Thomas' Hospital sites and one early stage proposed HN development in Thames Southbank.

Operational Heat Networks and Planned Expansions

Guy's Hospital
Guy's Hospital is served by a CHP cogeneration campus heat network which has been providing heat to the hospital for over 10 years. The site uses a 3MWe gas engine, with the waste heat from the CHP plant supplied to a high temperature hot water boiler, which reduces the carbon emissions from an otherwise gas boiler system[8].

St Thomas' Hospital
St Thomas' Hospital is also served by a CHP cogeneration campus heat network using a 3MWe gas engine, with the waste heat from the CHP plant supplied to a high temperature hot water boiler.

Proposed Heat Networks – Early stage

South Bank Heat Network
The South Bank Employers' Ground (SBEG) has conducted a feasibility study to assess the viability of establishing a decentralised heat network serving 14 of their members in the South Bank area. SBEG continues to work with Lambeth and Southwark Councils, and the GLA, to explore the opportunity further.

[8] (2023) Guy's and St Thomas' Hospital CHP Plants. Available at: https://www.clarke-energy.com/2012/guys-st-thomas-hospital-chp-plants/

3.1.3) Thames Southbank – Initial Zone Opportunities

A single IZO was identified in the HNZ. Potential routing[9] for the IZO is shown in Figure 6 and summary statistics provided in Table 2.

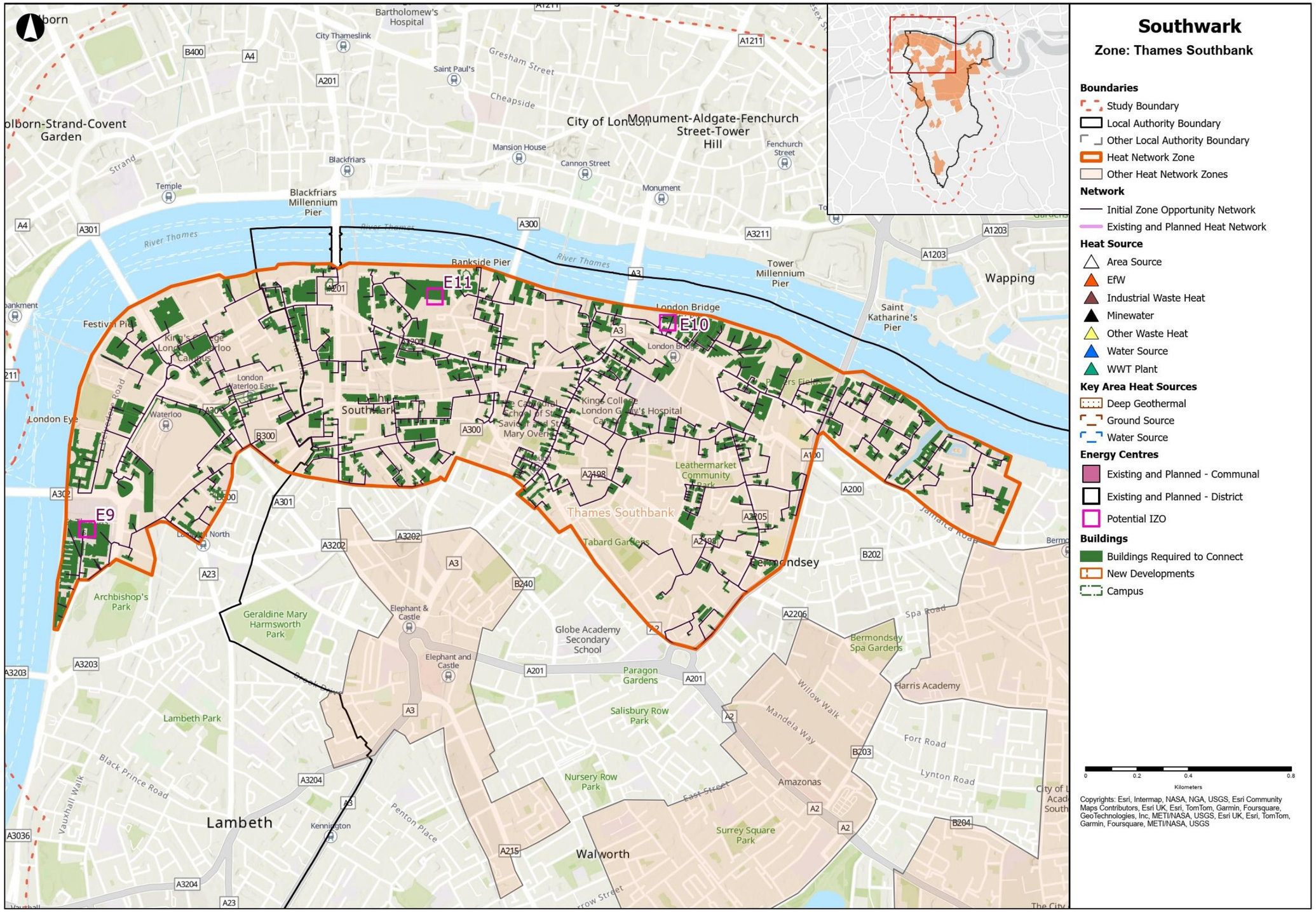
Table 2: Thames Southbank - Summary Statistics for Initial Zone Opportunities[10]

CapEx	Heat	Network	CO_{2e} savings	Linear Heat Density	Heat Sources
~£500m	~550GWh/yr	>40km	>80ktCO_{2e}/yr	13.3MWh/m	WSHP

The identified IZO covers most of the zone and was chosen based on the continuous high heat density across the northern part of Southwark towards the River Thames. Even when connecting all buildings that may be potentially required to connect across the HNZ, the IZO maintained its high heat linear heat density of 13.3 MWh/m. The estimated heat demand connected to the IZO is 550GWh/yr, across 534 customers, and includes the heat demands of the existing campus heat network for consistency across the Pilot programme.

[9] Routes can be expected to change as a better understanding of local constraints is developed through design.
[10] Please see Appendix 3 – Glossary, “Specific definitions” of the main report for definitions related to Table 2.

Figure 6: Initial Zone Opportunities in Thames Southbank



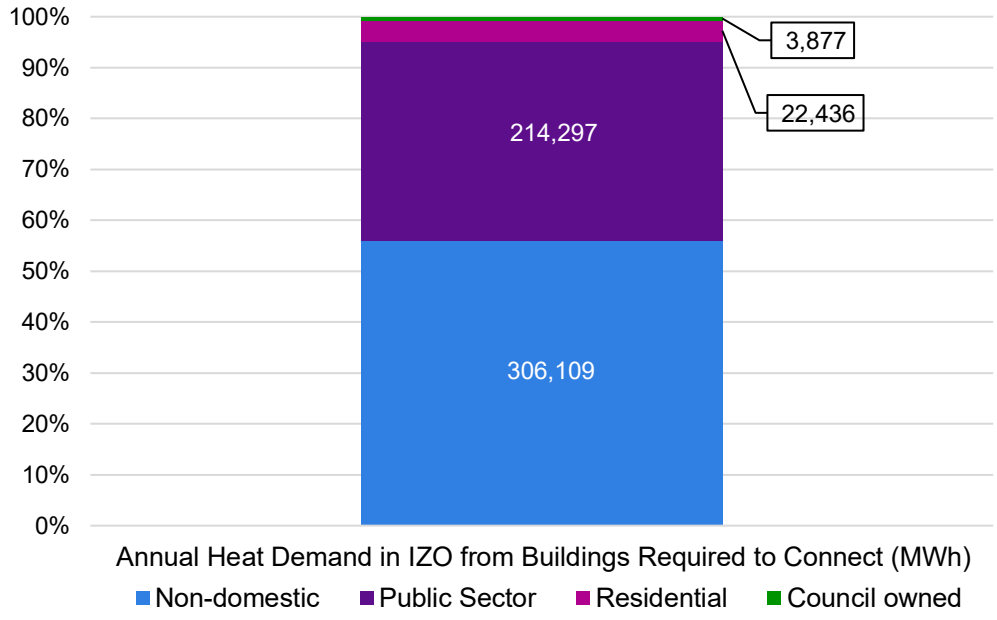
3.1.4) Thames Southbank – IZO Heat Demands

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.

Figure 7 shows the breakdown of heat demand for buildings potentially required to connect by building type. For the purposes of this study no new developments were included.

Figure 7: Thames Southbank - Categorisation of Heat Demand for Buildings Required to Connect in the IZO



Non-domestic and public sector buildings are responsible for >90% of heat demand. Non-domestic buildings mainly comprise of offices attaining a greater share of buildings required to connect (81%) than their total heat demand (56%). Public sector buildings including Guy's and St Thomas' Hospitals, comprise of only 7% of total buildings but contribute to 39% of overall heat demand. The remaining heat demand is residential (4%) and council owned buildings (1%). Further details of the key buildings potentially required to connect are provided in Table 3.

Table 3: Thames Southbank - Key Heat Demands Required to Connect in the IZO[11]

Building name	Building category	Number of connections	Annual Heat Demand (MWh)	Data Source
Guy's Hospital	Public Sector	2	78,350	ERIC National Dataset
St Thomas' Hospital and facilities	Public Sector	3-5	76,050	ERIC National Dataset
Tate Modern	Non-domestic	1	14,650	Benchmark (NZM)
County Hall	Non-domestic	1-3	13,450	Benchmark (NZM)
The Shard	Non-domestic	1-3	9,500	Benchmark (NZM)
Blue Fin Building	Non-domestic	1-3	8,500	Benchmark (NZM)
7 More London Riverside	Non-domestic	1	8,350	Benchmark (NZM)
Sampson House	Non-domestic	1	7,950	Benchmark (NZM)
Royal National Theatre	Non-domestic	1-2	7,880	Benchmark (NZM)
3 More London Place	Non-domestic	1	6,700	Benchmark (NZM)

3.1.5) Thames Southbank – Heat Sources

This section of the River Thames is tidal and influenced by the North Sea, affecting the design and installation costs of a WSHP. For this study, a high specification source heat pump energy centre was assumed (Table 4 and Table 5). The locations of these are shown in Figure 6 and in Appendix 1: Map C.

[11] Please refer to Appendix 3 for definitions related to building categories in this table.

The dense use of the area creates challenges with finding the best possible locations for energy centre(s), as there is little free land available. On the other hand, the commercial nature of the neighbourhoods may make planning and development easier than it would be in residential areas. Such a scheme could involve using repurposing existing buildings or plantrooms in large office buildings (E11), or in a hospital (E9 and 10).

Table 4: Thames Southbank - Key Heat Source Opportunities for the IZO

Heat source type	Supplied Capacity (kWp)	Temperature (ºC)	Potential Energy Centre Location (Ref number)
WSHP	124,000	5-15ºC	E9, E10 and E11

Table 5: Thames Southbank - Potential IZO Energy Centre Locations

EC Ref number	Site type	Size (m^2)	Ownership	Heat Source
E9	Existing plantroom	1,328[12]	Guy's and St Thomas' NHS Foundation Trust	WSHP
E10	Existing plantroom	8,000[13]	HCA healthcare	WSHP
E11	Extended plantrooms	8,000[13]	The Tate Group	WSHP

3.1.6) Thames Southbank – 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 IZO routing was developed solely around buildings which could 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

[12] Energy centre size based on site planning application: Lancaster, C. (2009) Site location plan: 09/AP/0832, Southwark Council Planning. Available at: https://planning.southwark.gov.uk/online-applications/files/D7220FB9FA78271A7A7BDBF00662A54F/pdf/09_AP_0832-SITE_LOCATION_PLAN-2932250.pdf

[13] Energy centre size required assumed 150m^2/MW including black back-up and thermal storage. Additional surveys are recommended to support approximation.

statistics for the IZO including the network length and associated cost. Please see Appendix 5 for related methodology statements and assumptions.

Table 6: Thames Southbank - Indicative Heat Network Statistics for the IZO

IZO Heat Network description	Network length (km)	Network cost (£m)
Thames Southbank	40	145

3.1.7) Thames Southbank – Key Constraints and Mitigations

Refer to Appendix 1: Map E for the constraints map and references.

[C9] Road crossing: The A3036 is a London A road and TfL red route. The proposed IZO pipework route overlaps the road by 300m and crosses along Royal Street. A feasibility assessment would be required to check the suitability of this crossing point and would likely require engagement with TfL.

[C10] Road crossing: The A302 is a primary A road and TfL red route. The proposed IZO pipework route overlaps the road at two 50m stretches, one before Westminster Bridge and the other along York Road. A feasibility assessment would be required to check the suitability of this crossing point and would likely require engagement with TfL.

[C11] Road crossing: The A3200 is a short A road and TfL red route. The proposed IZO pipework route crosses multiple stretches of the road, including an 800m stretch around the Imax roundabout to Cornwall Road, a 50m and 250m stretch to Blackfriars Road, and three more intersections totalling 750m to the A3. A feasibility assessment would be required to check the suitability of this crossing point and would likely require engagement with TfL.

[C12] Road crossing: The A201 is an A road and TfL red route. The proposed IZO pipework route covers three stretches of road, including 60m before Blackfriars Bridge, a 50m and 250m to Webber Street. A feasibility assessment would be required to check the suitability of this crossing point and would likely require engagement with TfL.

[C13] Road crossing: The A3 is a major A road and TfL red route. The proposed IZO pipework route crosses the road just before the London Bridge and Royal Street. It also runs across several stretches of the road, including a 50m stretch to the A3200 and a 500m stretch to Borough Station. A feasibility assessment would be required to check the suitability of this crossing point and would likely require engagement with TfL.

[C14] Road crossing: The A2 is a major A road and TfL red route. The proposed IZO pipework route covers a 150m stretch of the major road and crosses Royal Street. A feasibility assessment would be required to check the suitability of this crossing point and would likely require engagement with TfL.

[C15] Road crossing: St Thomas Street forms part of the TfL red route. The proposed IZO pipework route covers a 450m and 300m stretch of the road before and after Waterloo Station.

A feasibility assessment would be required to check the suitability of this crossing point and would likely require engagement with TfL.

[C16] Road crossing: The A200 is a London A road and TfL red route. The proposed IZO pipework route crosses multiple stretches of the road, including a 100m stretch and 525m stretch to the A100, 50m before Waterloo Station and 80m at the end of St Mary Overy Dock. A feasibility assessment would be required to check the suitability of this crossing point and would likely require engagement with TfL.

[C17] Road crossing: The A100, a key London road crossing and TfL red route. The proposed IZO pipework route covers a 100m stretch before Tower Bridge of the major road and the TfL red route, a 150m stretch before another 500m stretch at the southernmost point of the IZO around New Kent Road Roundabout. A feasibility assessment would be required to check the suitability of this crossing point and would likely require engagement with TfL.

3.2) SELCHP HNZ

3.2.1) SELCHP – HNZ Summary

SELCHP is the second largest strategic zone in LB Southwark. Situated to the east of the borough. The existing heat network is a key feature in the north of the borough, which is served by energy from waste heat in the London Borough of Lewisham. There are many potential customers, with key anchor loads including several business units and schools, the Tower Bridge Business Complex and Peckham Academy. This presents an opportunity to extend the existing heat network and meet the surrounding demand with economic low-carbon heat.

The SELCHP zone contains a mix of council-owned and non-domestic buildings, comprising 216 buildings potentially required to connect. These buildings are clustered around Old Kent Road, Rotherhithe, and Peckham, joining the current heat network and its proposed expansion. It is proposed to be served by the existing SELCHP Energy Recovery Facility (ERF) by increasing its capacity and using electrode boilers whilst retaining existing natural gas plant rooms as peaking plant. The urban nature means heat network developments face physical barriers due to the dense transport networks. It comprises several TfL red routes. Mitigations to these constraints have been identified for the IZO in Section 3.2.7.

3.2.2) SELCHP – Existing Heat Networks

Operational Heat Networks and Planned Expansions

SELCHP
The existing SELCHP heat network has been operational since 2014 and supplies 2,650 customers. SELCHP ERF provides both heat for heat network and power to the electricity network. The peak diversified demand of this network is understood to be around 9MW. Back up generation is supplied from a gas boiler house located at Clements Road, with a capacity of 16MW. Increasing the use of waste heat from SELCHP is a significant opportunity for Southwark's heat networks in the medium and long-term. The location of this heat source is shown in Figure 8, as well as the location of the area served by the existing network.

SELCHP extension
In partnership with Veolia, SC have been exploring the extension of the heat network. HNIP funding was awarded to Veolia for the construction of 'Southwark 2.0', expanding the reach of heat networks to additional Southwark owned social housing estates. The SELCHP energy centre site has additional capacity to supply an extended heat network, which is currently being explored under the AZP.

3.2.3) SELCHP – Initial Zone Opportunities

A single IZO was identified in the HNZ. Potential routing[14] for the IZO is shown in Figure 8 and summary statistics provided in Table 7.

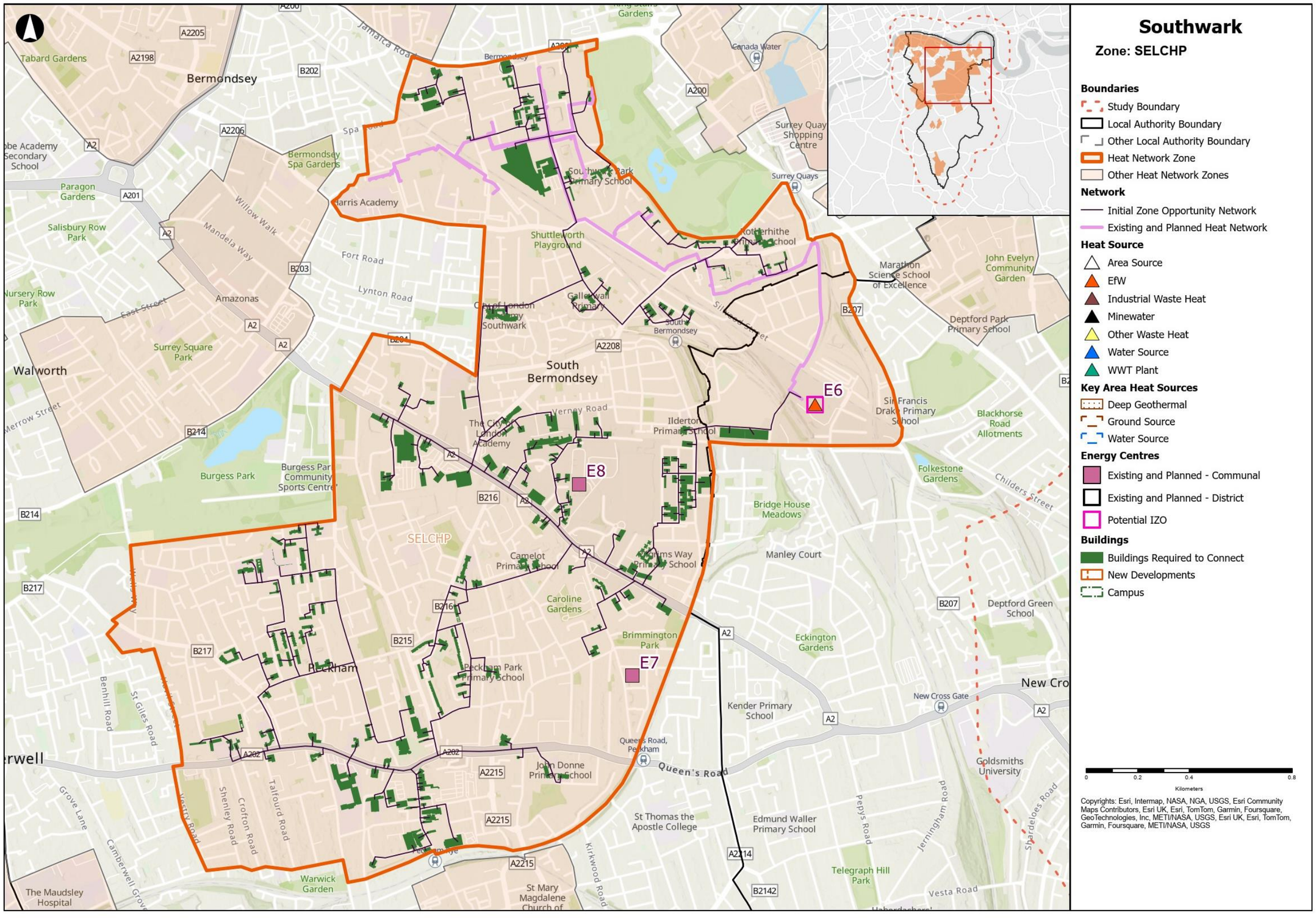
Table 7: LB Southwark SELCHP - Summary Statistics for Initial Zone Opportunities[15]

CapEx	Heat	Network	CO_{2e} savings	Linear Heat Density	Heat Sources
~£175m	~85GWh/yr	~26km	>15ktCO_{2e}/yr	3.2MWh/m	SELCHP ERF

The identified IZO covers most of the zone and was chosen due to the presence of the existing heat network together with the planned expansion. The IZO connects to approximately 85GWh/yr of heat across 216 customers, and includes the heat demands of the existing SELCHP heat network for consistency in approach across the Pilot programme.

[14] Routes can be expected to change as a better understanding of local constraints is developed through design.
[15] Please see Appendix 3 – Glossary, “Specific definitions” of the main report for definitions related to Table 7.

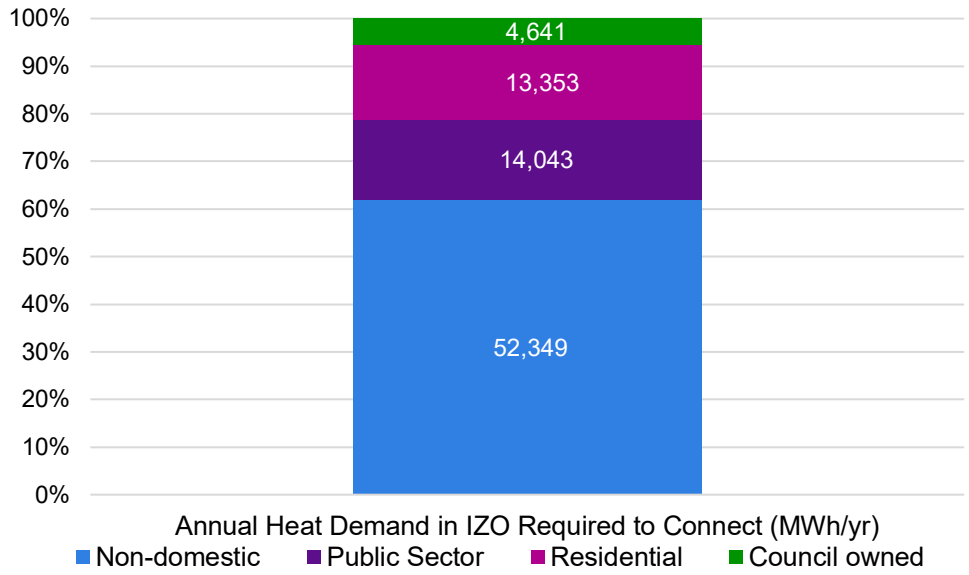
Figure 8: Initial Zone Opportunity in LB Southwark SELCHP HNZ



3.2.4) SELCHP – IZO Heat Demands

The IZO connects 216 buildings with an overall heat demand of 85GWh/yr[16]. It covers a mixed-use area in a relatively dense urban environment. The types of buildings potentially required to connect are mainly non-domestic by category, including offices, retail developments and two schools (see Figure 9). For the purposes of this study no new developments were included.

Figure 9: LB Southwark SELCHP - Categorisation of Heat Demand for Buildings Required to Connect in the IZO



The non-domestic demands comprise almost two thirds of the buildings potentially required to connect in the zone (62%). Public sector and residential heat demand comprise around 17% of total heat demand each. Council owned buildings comprise the smallest proportion of heat demand (5%) and buildings required to connect (7%). Further details of the key heat demands for buildings potentially required to connect in the IZO are provided in Table 8.

[16] Please refer to section 3.1.4 for a description of IZO heat demands.

Table 8: LB Southwark SELCHP - Key Heat Demands Required to Connect in the IZO[17]

Building name	Building category	Number of connections	Annual Heat Demand (MWh)	Data Source
Tower Bridge Business Complex	Non-domestic (industrial building)	1-3	7,100	Benchmark (NZM)
Harris Academy	Council owned / Public sector	1-2	2,850	Benchmark (NZM)
Asda Old Kent Road	Non-domestic	1	2,400	Benchmark (NZM)
Tower Bridge Business Complex	Non-domestic (office building)	1	2,150	Benchmark (NZM)
City of London Academy	Non-domestic	1	1,950	Benchmark (NZM)
Action House	Non-domestic	1	1,600	Benchmark (NZM)
Rye Lane Business Units	Non-domestic	1	1,550	Benchmark (NZM)
10 Melon Road	Non-domestic	1	1,300	Benchmark (NZM)
Stockholm Road Business Units	Non-domestic	1	1,250	Benchmark (NZM)
RTS Waste Management LTD	Non-domestic	1	1,150	Benchmark (NZM)

3.2.5) SELCHP – IZO Heat Sources

The SELCHP Energy Recovery Facility (E6) generates energy from household and business waste in and around London. It currently has a heat export capacity of 20MW and already

[17] Please refer to Appendix 3 for definitions related to building categories in this table.

planned expansion of heat exporting interfaces to serve up to 60MW. Further increase of heating capacity is potentially possible in tandem with additional flue gas heat recovery, which could provide additional 12MW.

There is also potential to use existing communal systems plant rooms from the council owned estates, with highest potential in Brimmington (E7) and North Peckham (E8), where gas-fired peak/back-up boilers could be connected. Furthermore, as part of the London Power Tunnel project, new and upgraded power infrastructure is being developed in the area. This initiative may provide adequate electrical grid capacity to support peaking electrode boilers at the New Cross high voltage substation.

Table 9 and Table 10 summarise the key heat sources and potential energy centre locations identified for this IZO. These are also shown on Figure 8 in Section 3.2.3 above and Appendix 1: Map C.

Table 9: LB Southwark SELCHP - Key Heat Source Opportunities for the IZO

Heat source type	Supplied Capacity (kWp)	Temperature (ºC)	Potential Energy Centre (Ref number)
SELCHP ERF	20,000 - 60,000	80-110 ºC[18]	E6

Table 10: LB Southwark SELCHP - Potential IZO Energy Centre Locations

EC Ref number	Site type	Size (m^2)	Ownership	Heat Source
E6	Land	~ 8,300[19]	Veolia	SELCHP ERF

3.2.6) SELCHP – IZO Heat Distribution

Table 11 shows the network statistics for the IZO including the network length and associated costs. Please refer to Section 3.1.6 and Appendix 5 for the assumptions used.

Table 11: LB Southwark SELCHP - Indicative Heat Network Statistics for the IZO

IZO Heat Network description	Network length (km)	Network cost (£m)
SELCHP	26	85

[18] The temperature at which existing energy centre plant supplies heat to buildings.
[19] Estimated existing energy centre size, further site investigation is recommended.

3.2.7) SELCHP – IZO Key Constraints and Mitigations

[C7] Road crossing: The A202 is a primary London A road and TfL red route. The proposed pipework route overlaps the road for 1300m. A feasibility assessment would be required to check the suitability of this crossing point and would likely require engagement with TfL.

[C8] Road crossing: The A2 is a major road and TfL red route. The proposed pipework route overlaps the road for 1000m. A feasibility assessment would be required to check the suitability of this crossing point and would likely require engagement with TfL.

3.3) Camberwell HNZ

3.3.1) Camberwell – HNZ Summary

Camberwell is the third largest strategic zone in LB Southwark. Situated to the west of the borough, it spans both the LB Southwark as well as the London Borough of Lambeth (see Figure 4). A key feature is its significant heat demand in the south from two hospitals: King's College Hospital (Lambeth) and The Maudsley Hospital (Southwark).

The zone contains a mix of public sector, non-domestic, and residential areas, comprising around 97 buildings that may be required to connect. The main heat source is anticipated to be air source heat pumps (ASHPs) and waste heat derived from electrical substations. There is one campus heat network which serves King's College London Hospital Denmark Hill campus. Further expansion of the network is anticipated, with the King's College Hospital NHS Foundation Trust awarded funding to connect to its own Ruskin building[20].

The urban nature means heat network developments face physical barriers due to the dense transport networks including several TfL red routes, although their presence does not prohibit the development of the IZO. Actions to address these are outlined in Section 3.3.7.

3.3.2) Camberwell – Existing Heat Networks

There are no operational or planned heat networks within the zone, other than the campus heat network which serves King's College London Hospital Denmark Hill campus.

3.3.3) Camberwell – Initial Zone Opportunities

A single IZO was identified in the HNZ. Potential routing[21] for the IZO is shown in Figure 10 and summary statistics provided in Table 12.

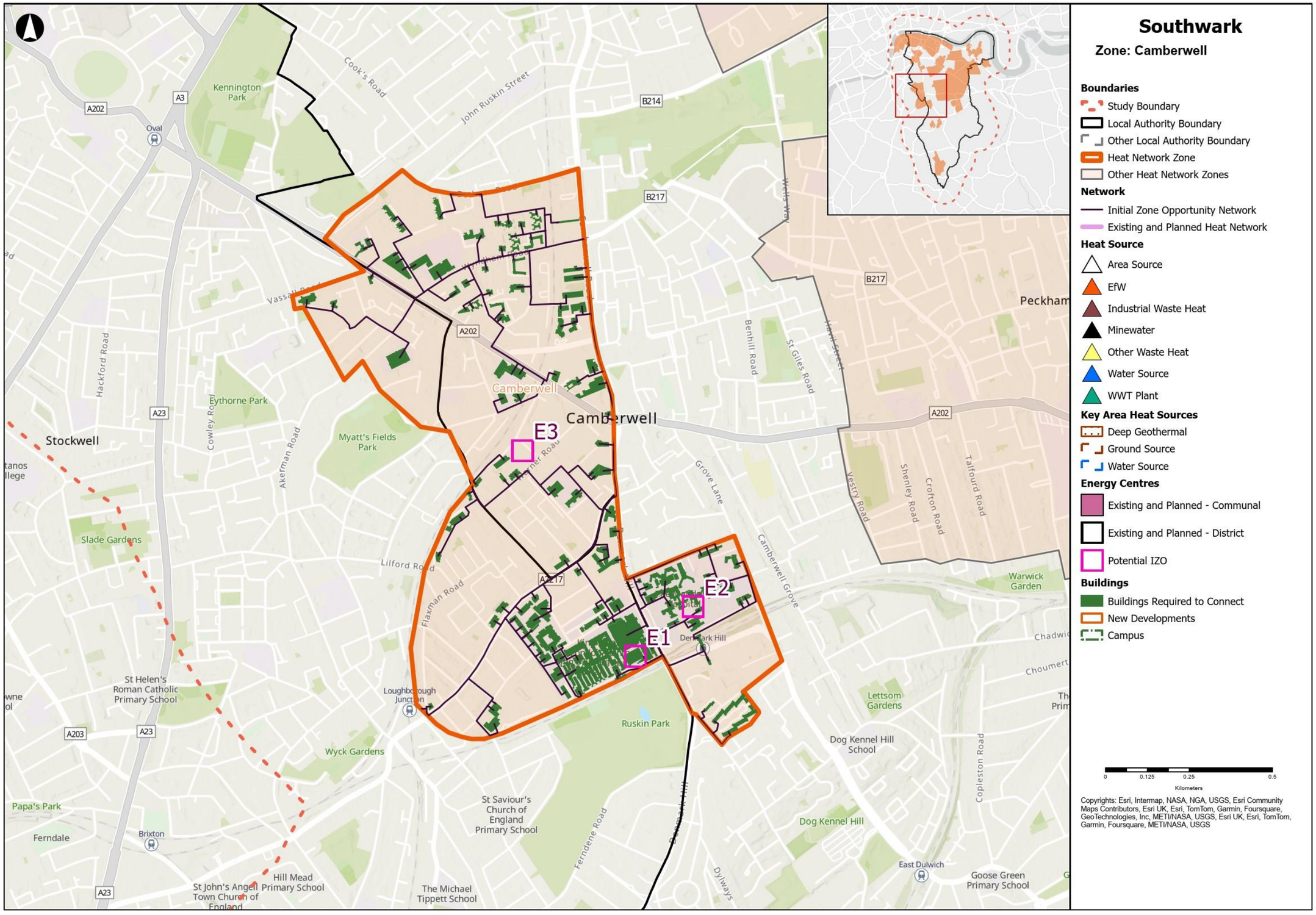
The IZO covers most of the zone due to the high heat density. The IZO connects approximately 150GWh/yr of heat demand across 97 customers, and includes the heat demands of the Denmark Hill campus network for consistency across the Pilot programme.

Table 12: LB Southwark Camberwell - Summary Statistics for Initial Zone Opportunities[22]

CapEx	Heat	Network	CO_2e savings	LHD	Heat Sources
~£125m	~150GWh/yr	~14km	~25ktCO_{2e}/yr	10.1MWh/m	ASHPs

[20] Phase 3A public sector decarbonisation scheme: Project summaries (2023) GOV.UK. Available at: https://www.gov.uk/government/publications/public-sector-decarbonisation-scheme-phase-3/phase-3a-public-sector-decarbonisation-scheme-project-summaries#greater-london
[21] Routes can be expected to change as a better understanding of local constraints is developed through design.
[22] Please see Appendix 3 – Glossary, "Specific definitions" of the main report for definitions related to Table 12.

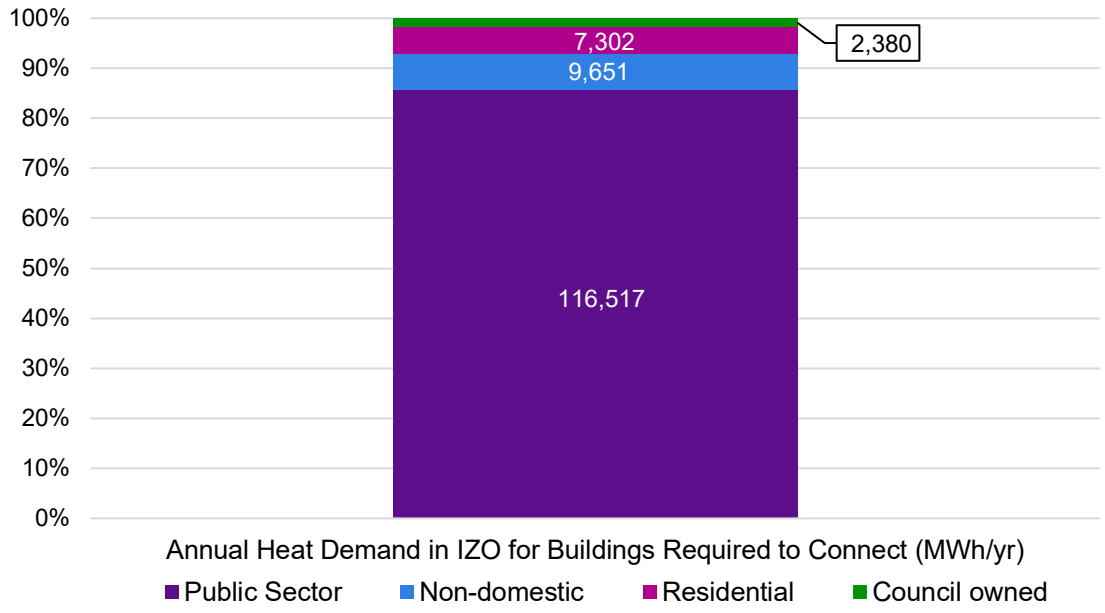
Figure 10: Initial Zone Opportunity in LB Southwark Camberwell HNZ



3.3.4) Camberwell – IZO Heat Demands

The initial zone opportunity in Camberwell connects 97 existing buildings with an overall heat demand of approximately 150GWh/yr[23]. The Camberwell strategic zone is anchored in the south with two large hospitals (King's College and Maudsley) and extends north to include schools and residential estates. For the purposes of this study no new developments were included (see Figure 11).

Figure 11: LB Southwark Camberwell - Categorisation of Heat Demand for Buildings Required to Connect in IZO



Heat demand mainly comprises public sector buildings, which constitutes only 21% of connections but more than 85% of total heat demand. The second largest building category is non-domestic, comprising of offices, churches, and leisure centres.

Further details of the key heat demands for buildings potentially required to connect in the IZO are provided in Table 13. Medical buildings are the main anchor loads in the zone, with King's College Hospital comprising of two-thirds of the total heat demand. Other medical facilities in the zone include the Maudsley Hospital, Weston Education Centre, affiliated with King's College Hospital and a behaviour and neuroscience centre. Other loads include educational buildings, a church, and non-domestic charity.

[23] Please refer to section 3.1.4 for a description of IZO heat demands.

Table 13: LB Southwark Camberwell - Key Heat Demands Required to Connect in the IZO[24]

Building name	Building category	Number of connections	Annual Heat Demand (MWh)	Data Source
King's College Hospital	Public Sector	12	87,150	ERIC National Dataset
Maudsley Hospital	Public Sector	1	4,700	ERIC National Dataset
Weston Education Centre	Public Sector	1	2,250	Benchmark (NZM)
Centre For Cellular Basis of Behaviour	Public Sector	1	1,050	Benchmark (NZM)
Maurice Wohl Clinical Neuroscience Centre	Public Sector	1	1,000	Benchmark (NZM)
Crawford Primary School	Public Sector	1	750	Benchmark (NZM)
St. John The Divine Church	Public Sector	1	750	Benchmark (NZM)
St. Gabriels College	Public Sector	1	700	Benchmark (NZM)
Sacred Heart Secondary School	Public Sector	1	650	Benchmark (NZM)
Centre Point	Non-domestic	1	600	Benchmark (NZM)

3.3.5) Camberwell – IZO Heat Sources

Camberwell is a relatively dense urban area with opportunities to recover heat from supermarkets and other local refrigeration systems. The scale of heat demand dictates that the

[24] Please refer to Appendix 3 for definitions related to building categories in this table.

primary source of the heat supply should likely be ASHPs. Table 14 and Table 15 summarise the key heat sources and potential energy centre locations identified for this IZO. These are also shown on Figure 10 in Section 3.3.3 and Appendix 1: Map C.

Finding space to locate energy centres in this densely populated area will be critical to the successful delivery of the zone. Existing plant rooms in the hospitals (reference E1 and E2) would have the advantage of being close to the centre of heat demand. Bus garages in the geometric centre of the zone could serve as energy centre locations if conditions are favourable (E3). The London Power Tunnel[25] project includes upgraded power infrastructure that could enable peaking electrode boilers at the Bengeworth high voltage substation.

Table 14: LB Southwark Camberwell - Key Heat Source Opportunities for the IZO

Heat source type	Supplied capacity (kWp)	Temperature (ºC)	Potential Energy Centre (Ref number)
ASHP	30,300	5-15 ºC	E1, E2 and E3

Table 15: LB Southwark Camberwell - Potential IZO Energy Centre Locations

EC Ref Number	Site type	Size (m^2)	Ownership	Heat Source
E1	Hospital plant room	1,500[13]	King's College Hospital NHS Foundation Trust	ASHP
E2	Hospital plant room	1,500[13]	South London and Maudsley NHS Foundation Trust	ASHP
E3	Bus garages	1,500[13]	Abello London, London Central/GoAhead	ASHP

3.3.6) Camberwell – IZO Heat Distribution

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

[25] London Power Tunnels: National Grid Et (no date) London Power Tunnels | National Grid ET. Available at: https://www.nationalgrid.com/electricity-transmission/network-and-infrastructure/london-power-tunnels-project

Table 16: LB Southwark Camberwell - Indicative Heat Network Statistics for the IZO

IZO Heat Network description	Network length (km)	Network cost (£m)
Camberwell	14	50

3.3.7) Camberwell – IZO Key Constraints and Mitigations

[C1] Road crossing: The A202 is a primary London A road and TfL red route. The proposed pipework route overlaps the road at two points (a 300m and a 200m stretch). A feasibility assessment would be required to check the suitability of this crossing point / parallel running of pipework and would likely require engagement with TfL.

[C2] Road crossing: The A215 is an A road and TfL red route. The proposed pipework route overlaps the road at the major junction between the A202 and A205. A feasibility assessment would be required to check the suitability of this crossing point and would likely require engagement with TfL.

3.4) Elephant and Castle HNZ

3.4.1) Elephant and Castle – HNZ Summary

Elephant and Castle is the smallest strategic zone in the LB Southwark, situated in central Elephant and Castle, to the north-west of the borough. It is a strategically heat-dense area with key anchor loads, including public sector and educational buildings such as the London College of Communication and South Bank University. Heat demand is anticipated to grow alongside the establishment of the new town centre. The zone partially encompasses an existing heat network to the east of the zone at Elephant Park and presents a key opportunity for connection to existing infrastructure.

The zone contains a mix of offices, domestic, and commercial buildings comprising around 67 buildings potentially required to connect. The main heat source is anticipated to be ASHPs. The urban nature means heat network developments face physical constraints including several TfL red routes. Section 3.4.7 outlines actions to address these constraints.

3.4.2) Elephant and Castle – Existing Heat Networks

There is one operational HN heat network in the area (see Appendix 1: Map D).

Operational Heat Networks and Planned Expansions

Elephant Park
The major new development area within Elephant and Castle contains the Elephant Park development with a new heat network. A 1.6MWe CHP plant provides heat and power to 2,500 new homes, shops and restaurants. The energy centre has the capacity to provide heat to additional homes across the area and is currently investigating decarbonisation options.

3.4.3) Elephant and Castle – Initial Zone Opportunities

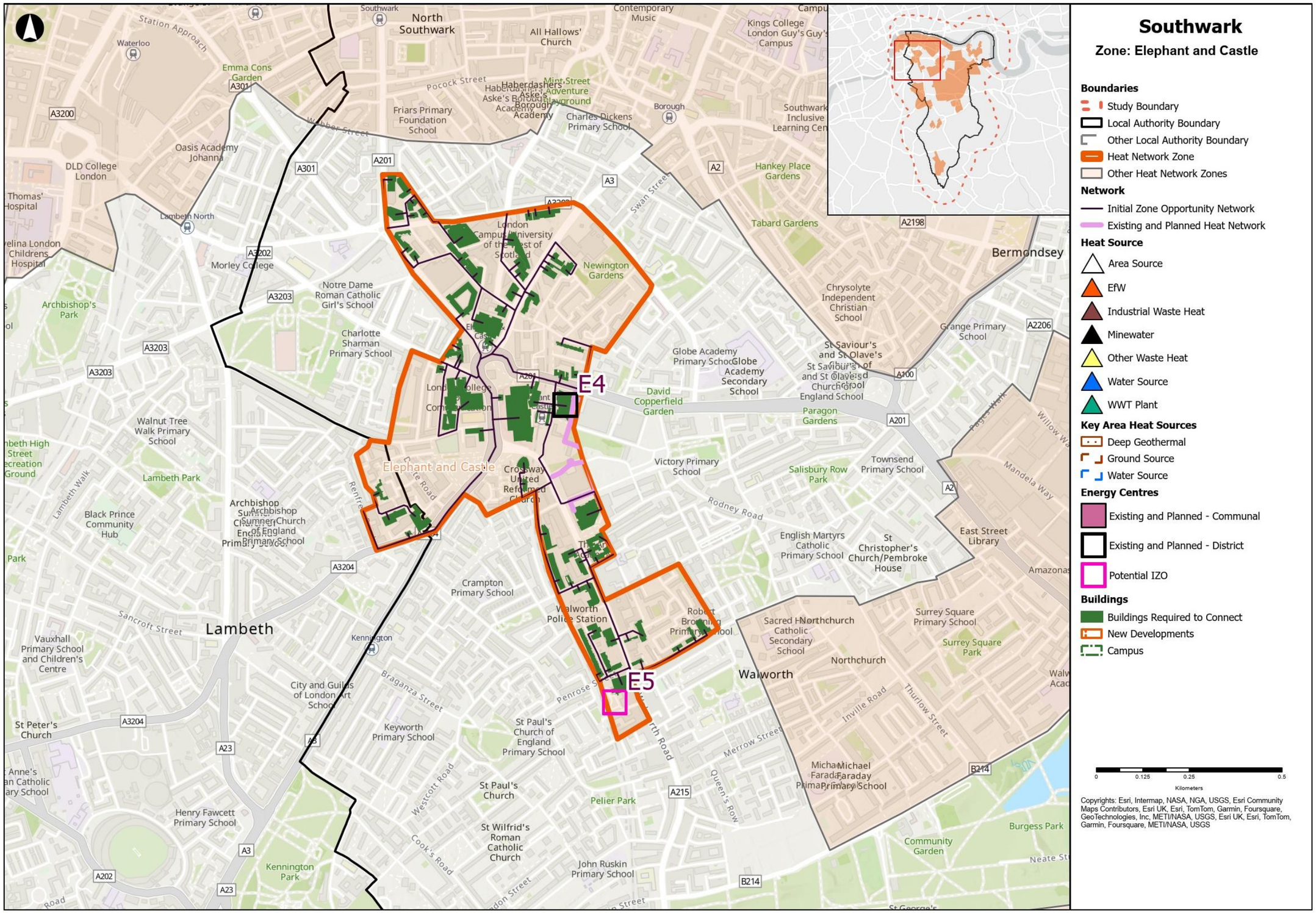
A single IZO was identified in the HNZ. Potential routing[26] for the IZO is shown in Figure 12 and summary statistics provided in Table 17. The identified IZO covers most of the zone due to the heat density across the zone. It connects 50GWh/yr, across 70 buildings, including the heat demand of the existing heat network for consistency across the Pilot programme.

Table 17: LB Southwark Elephant and Castle - Summary statistics for Initial Zone Opportunities[27]

CapEx	Heat	Network	CO_{2e} savings	Linear Heat Density	Heat Sources
~£75m	~50GWh/yr	~8km	>5ktCO_{2e}/yr	6.0MWh/m	ASHPs

[26] Routes can be expected to change as a better understanding of local constraints is developed through design.
[27] Please see Appendix 3 – Glossary, “Specific definitions” of the main report for definitions related to Table 17.

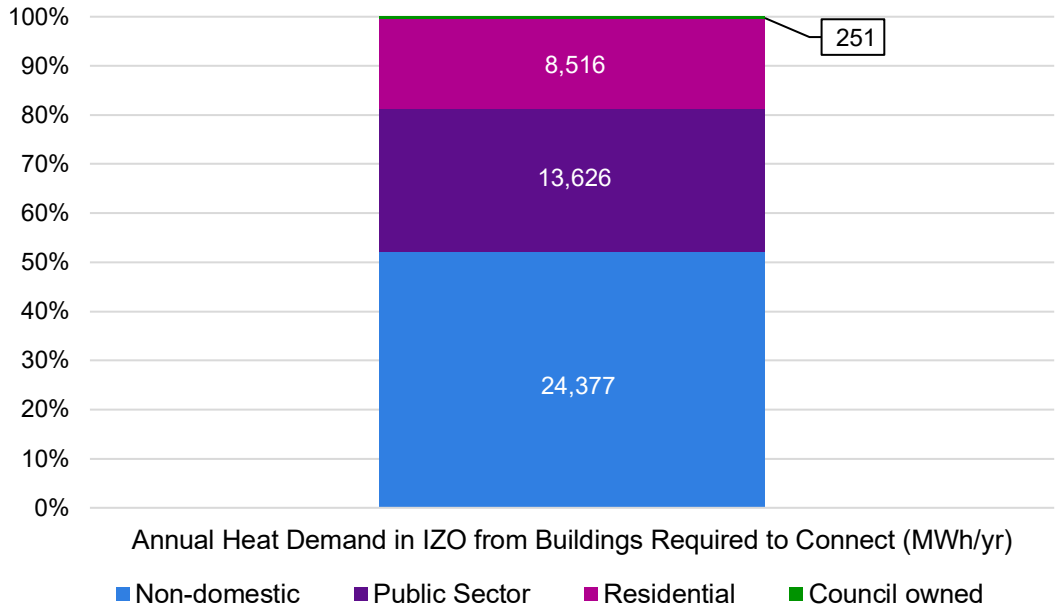
Figure 12: Initial Zone Opportunity in LB Southwark Elephant and Castle HNZ



3.4.4) Elephant and Castle – IZO Heat Demands

The IZO connects to 70 existing buildings with an overall heat demand of ~50 GWh/yr[28]. For the purposes of this study no new developments were included. Figure 13 shows the breakdown of heat demand for buildings potentially required to connect by building type.

Figure 13: LB Southwark Elephant and Castle - Categorisation of Heat Demand for Buildings Required to Connect in IZO



Non-domestic private sector buildings are expected to be responsible for over half of the total demand (52%), consisting of both retail and office buildings. Public sector buildings are expected to be responsible for 29% of the demand, and residential buildings 18%. Council owned buildings make up only 1% of heat demand.

Further details of the key heat demands for buildings potentially required to connect in the IZO are provided in Table 18. The largest five connections have noticeably larger annual heat demand (at or above 2.5GWh/yr) than the next five.

[28] Please refer to section 3.1.4 for a description of IZO heat demands.

Table 18: LB Southwark Elephant and Castle - Key Heat Demands Required to Connect in the IZO[29]

Building name	Building category	Number of connections	Annual Heat Demand (MWh)	Data Source
Elephant & Castle Shopping Centre	Non-domestic	2-5	6,400	Benchmark (NZM)
London College of Communication	Public Sector	2-3	4,700	Benchmark (NZM)
South Bank University	Public Sector	1-4	4,200	Benchmark (NZM)
Skipton House (Ministry of Health)	Public Sector	1-2	3,600	Benchmark (NZM)
Mawes House	Non-domestic	1	3,050	Benchmark (NZM)
South Bank Technopark	Non-domestic	1	1,700	Benchmark (NZM)
The Salvation Army HQ	Non-domestic	1	1,250	Benchmark (NZM)
Student Union Shopping Mall	Non-domestic	1	1,200	Benchmark (NZM)
Newington Court Business Centre	Non-domestic	1	950	Benchmark (NZM)
Newington Causeway	Non-domestic	1-2	900	Benchmark (NZM)

3.4.5) Elephant and Castle – IZO Heat Sources

Elephant and Castle is a dense, urban zone. This area focuses on location-agnostic technologies, with ASHPs as the likely main heat supply. Table 19 and Table 20 summarise

[29] Please refer to Appendix 3 for definitions related to building categories in this table.

the key heat sources and potential energy centre locations. These are also shown on Figure 12 in Section 3.4.3 and Appendix 1: Map C.

The zone benefits from existence of small heat network around the Elephant Park, operated by E.ON. The network has an energy hub 'Heygate' (E4) integrated within the residential area with gas-fired CHP and biogas boilers that can serve as a peaking plant.

Finding alternative locations could be critical for the zone development, one of such locations could be a Morrison's supermarket parking lot (E5) located between Penrose Street and Carter Place.

Table 19: LB Southwark Elephant and Castle - Key Heat Source Opportunities for the IZO

Heat source type	Supplied Capacity (kWp)	Temperature (ºC)	Potential Energy Centre (Ref number)
ASHP	11,400	5 - 15ºC	E5

Table 20: LB Southwark Elephant and Castle - Potential IZO Energy Centre Locations

EC Ref Number	Site type	Size (m^2)	Ownership	Heat Source
E5	Parking lot / land	2,500	Private	ASHP

3.4.6) Elephant and Castle – IZO Heat Distribution

Table 21 shows the network statistics for the IZO including the network length and associated costs. Please refer to Section 3.1.6 and Appendix 5 for the assumptions used.

Table 21: LB Southwark Elephant and Castle - Indicative Heat Network Statistics for the IZO

IZO Heat Network description	Network length (km)	Network cost (£m)
Elephant and Castle	8	30

3.4.7) Elephant and Castle – IZO Key Constraints and Mitigations

[C3] Road crossing: The A3204 is a short A road formed from several main roads and a TfL red route. The proposed pipework route overlaps the road by 150m. A feasibility assessment would be required to check the suitability of this crossing point and would likely require engagement with TfL.

[C4] Road crossing: The A3 is a major road and forms part of the TfL red route. The proposed pipework route overlaps the road by 700m to the Elephant and Castle roundabout. A

feasibility assessment would be required to check the suitability of this crossing point and would likely require engagement with TfL.

[C5] Road crossing: The A201 is a London A road and TfL red route. The proposed pipework route overlaps the road by 600m around the Elephant and Castle roundabout and 180m to the north of the IZO. A feasibility assessment would be required to check the suitability of this crossing point and would likely require engagement with TfL.

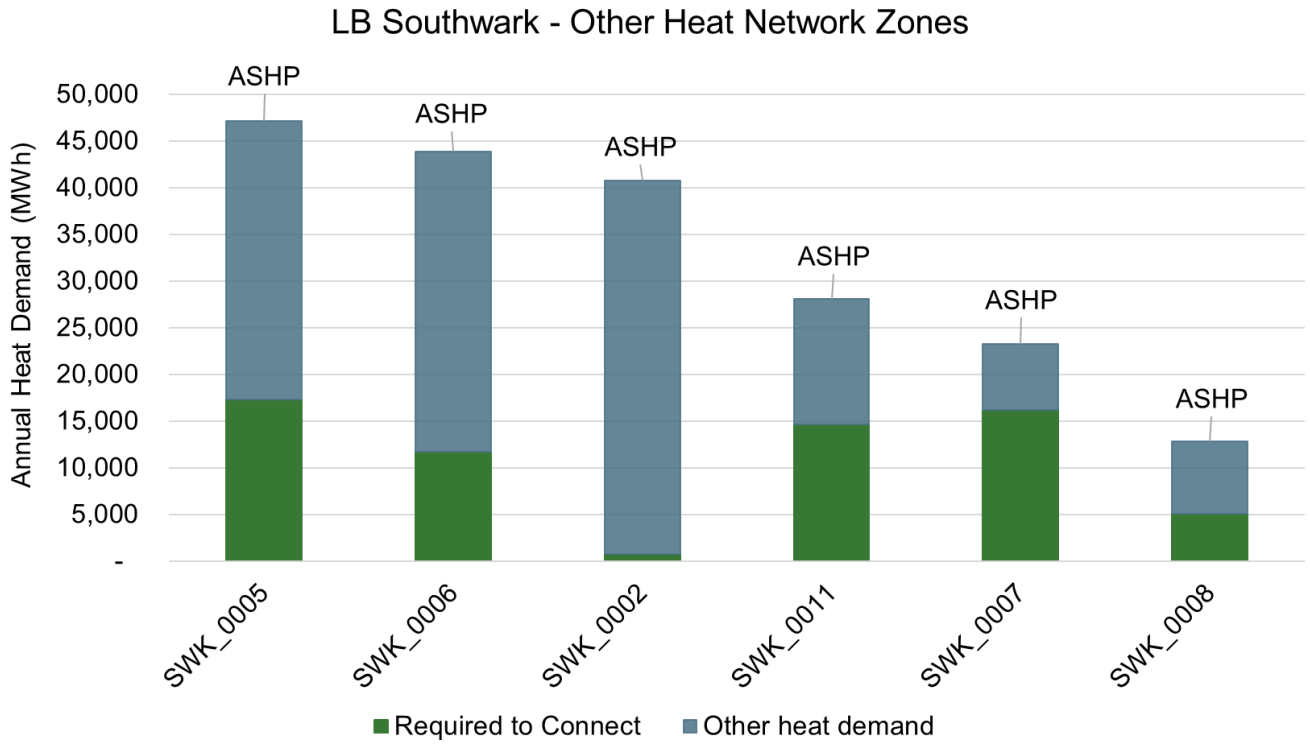
[C6] Road crossing: The A302 is a primary A road and TfL red route. The proposed pipework route overlaps the road by 120m. A feasibility assessment would be required to check the suitability of this crossing point and would likely require engagement with TfL.

4) Other Heat Network Zones

This section describes the 'Other' potential heat network zones that were identified in Southwark. 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 14 illustrates the total annual heat demand, and the proportion of which is associated with buildings that may be required to connect within each zone. Where potential heat sources have been identified these are labelled against each bar. A map of all zones can be found in Figure 4.

Figure 14: Total Heat Demand and Proportion Required to Connect in Other HNZs



SWK_0005 HNZ: is situated centrally within the north of the borough in Walworth and Grange areas. It mainly contains commercial and light industrial buildings, as well as some areas of high-density residential buildings. This zone is also close to the SELCHP energy centre, although otherwise has limited energy provision identified.

SWK_0006 HNZ: is situated towards the south of the borough, in South Peckham near to the southernmost point of the SELCHP zone boundary. The area contains mainly commercial buildings, as well as some areas of high-density residential buildings. It is also close to the SELCHP energy centre, although otherwise has limited energy provision identified.

SWK_0002 HNZ: This HNZ is situated in the northeast of the borough in Rotherhithe. The area contains educational and residential areas, including council-owned buildings, as well as a commercial shopping district in the centre. This HNZ is not far from the SELCHP energy centre, as well as potential WSHP installations.

SWK_0011, SWK_0007 and SWK_0008 HNZs: are smaller in size and located at Sydenham Hill, Greenland and East Dulwich. They largely centre around a single large educational campus or housing estate.

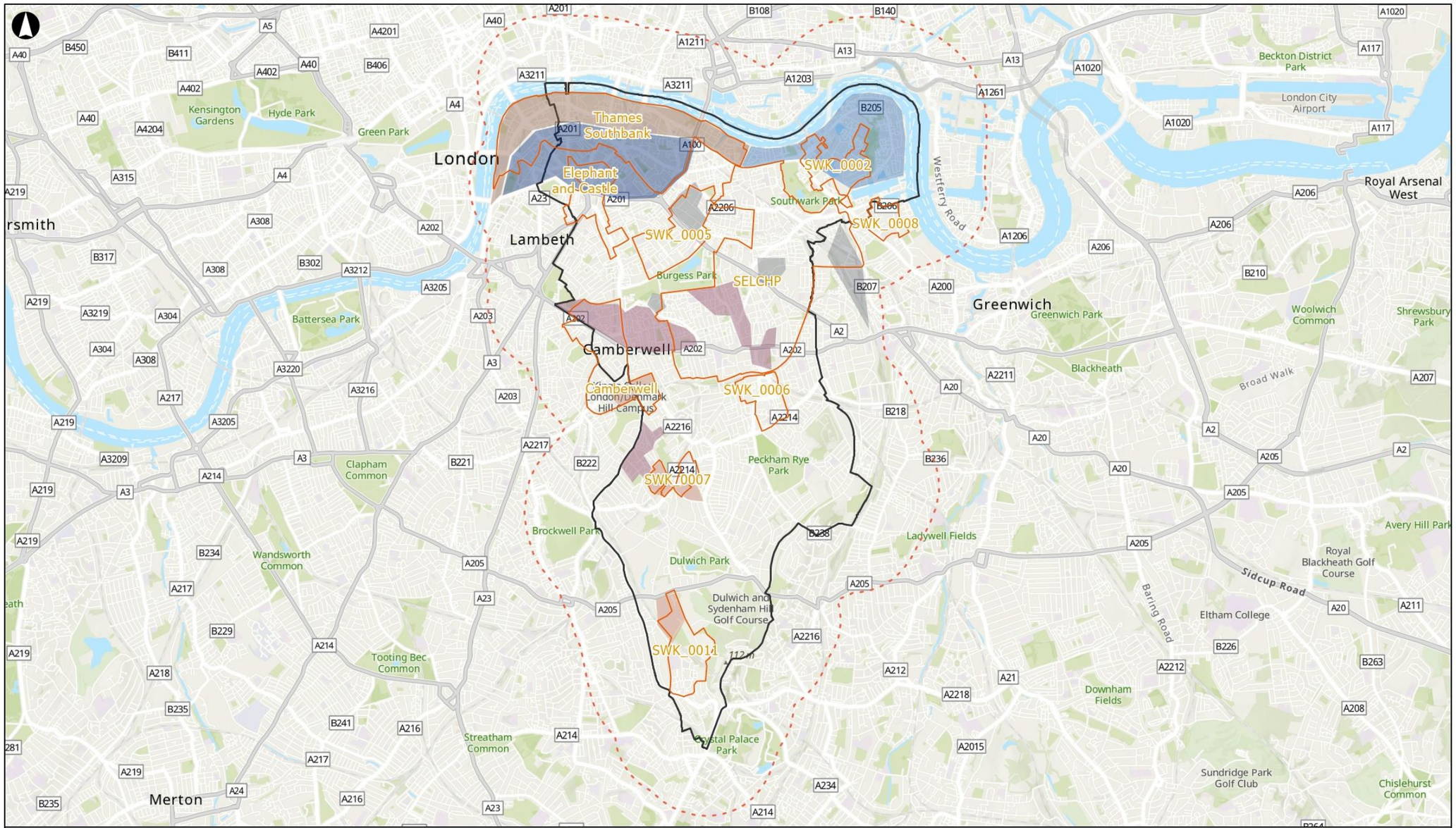
Appendix 1: Maps and Legends

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

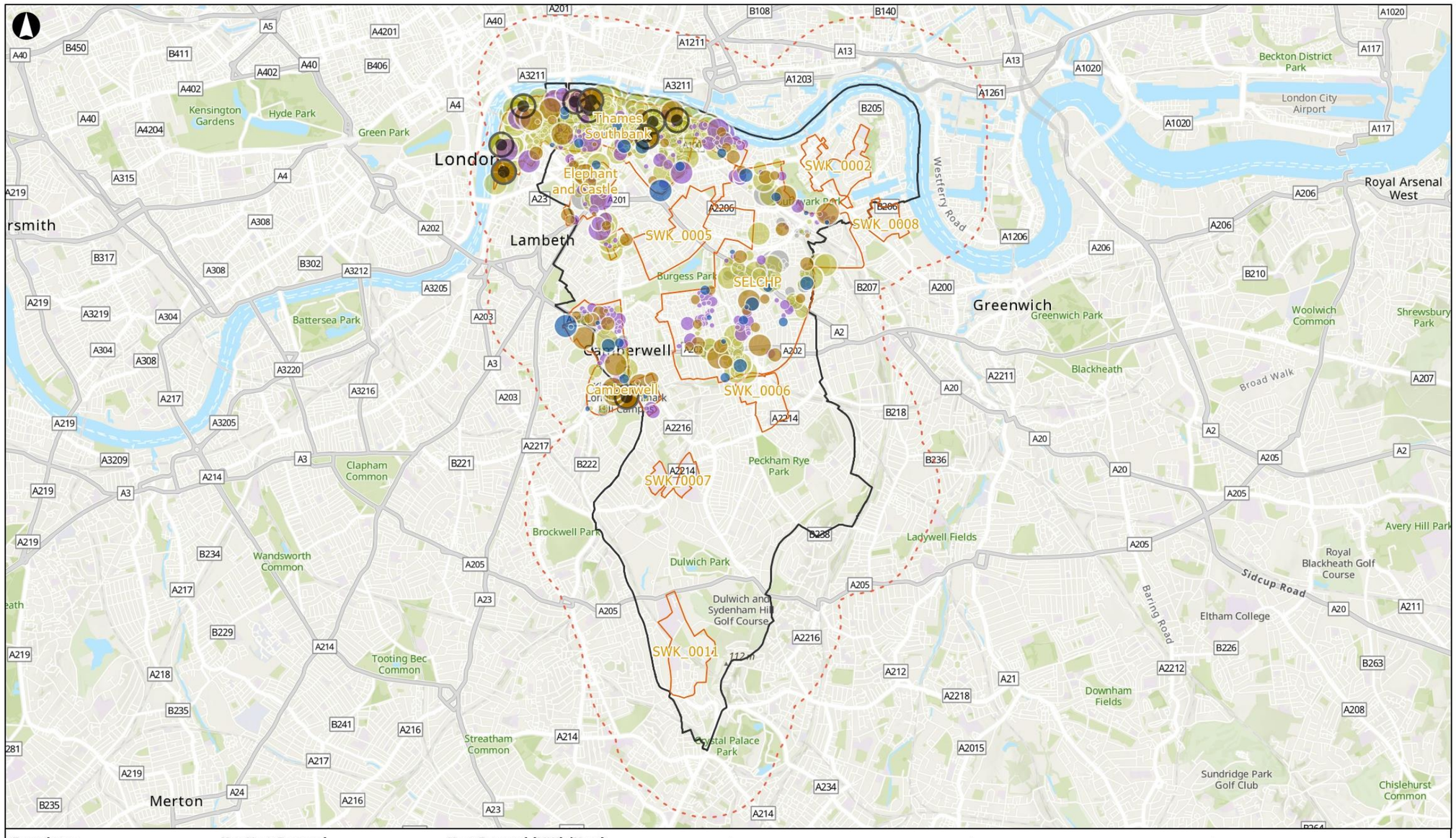
Legend / icon	Relevant map(s)	What this represents on the map	Comments on interpretation
	Report maps	Study boundary	Extends 1km beyond Local Authority boundary to include cross boundary opportunities
	Report maps	Local Authority boundary	
	Report maps	Other Local Authority boundary	
	Report maps	Heat 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 that will still be in construction post-2025
Gates Hill	Report maps	Heat network zone name / reference number	‘Strategic’ zones are named; ‘Other’ zones are represented by a reference number
	Report maps	Buildings potentially required to connect	Buildings that could be required to connect (as described in the HNZ Consultation 2023)
	Report maps	Campuses	Multiple buildings owned and operated by the same organisation (e.g. Universities, Hospitals)
	Report maps	Initial Zone Opportunity concept network route	Conceptual heat network pipe routes between buildings that could be required to connect
	Report maps	Existing and Planned Heat Networks	Known existing or planned heat network pipe routes as provided by local stakeholders
	Report maps	Potential energy centre - IZO	Potential energy centre location for an IZO (see section 3)
	Report maps	Existing/planned energy centre - Communal HNs	‘Communal’ energy centres are those operated within a single building or across a campus
	Report maps	Existing/planned energy centre - District HNs	‘District’ energy centres supply multiple buildings across multiple sites
Appendix 1: A – Typology map			
	Appendix 1: Map A	Dense City Centre	Locally recognised as the City or Town centre, where buildings development is most dense
	Appendix 1: Map A	City Centre Fringe	Around the City or Town Centre or at its outskirts, where both building density reduces
	Appendix 1: Map A	Mixed Use District	A variety of building typologies, with no single typology prevailing in the area
	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. Universities, Hospitals)

	Appendix 1: Map A	Commercial / business office	Public & private office space
	Appendix 1: Map A	Industrial areas	Primarily used for manufacturing, engineering, and warehousing
Appendix 1: B – Key heat demands			
	Appendix 1: Map B	Top 10 Heat Demands	The largest (anchor) heat loads within the Pilot programme study area (see Section 3)
	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.g. hospital, universities, Govt. estates)
	Appendix 1: Map B	Residential with existing communal heating	Residential buildings with existing communal heating systems installed
	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, manufacturing, warehouses and distribution)
400 - 600	Appendix 1: Map B	Building heat demand (MWh/yr)	Circle size increases with size of heat demand
Appendix 1: C – Key Heat Sources and Potential Energy Centres			
	Appendix 1: Map C	EfW plant	**Point heat sources** have known or likely points of heat offtake/abstraction Mine water and water source ‘points’ indicate potential abstraction points. Other waste heat sources include sewers, electrical substations and other sources of heat. See section 3 for more detail on heat source capacities, where known. On the City-level Map C only, the heat waste symbol is sized according to its scale in GWh/yr
	Appendix 1: Map C	Industrial Waste Heat	
	Appendix 1: Map C	Mine water	
	Appendix 1: Map C	Other Waste Heat	
	Appendix 1: Map C	Water Source	
	Appendix 1: Map C	Waste Water Treatment	
	Appendix 1: Map C	Deep geothermal or mine water heat	**Area heat sources** differ from point-heat sources in that the exact location for extracting heat from the resource is not yet determined
	Appendix 1: Map C	Ground source	
	Appendix 1: Map C	Water source	
Appendix 1: D – Existing and planned heat networks			
	Appendix 1: Map D	Existing and planned heat networks	At this scale the route of an existing HN cannot be displayed, so an area outline is used instead
Appendix 1: E – Physical constraints			
	Appendix 1: Map E	Key constraints	Key heat network routing constraints as described in section 3

A. LB Southwark Typology Map



B. Key Heat Demands



Boundaries
- Study Boundary
- Local Authority Boundary
- Other Local Authority Boundary
- Heat Network Zones
- New Development

Key Heat Demand
- Local authority
- Other public sector
- Residential with communal heating
- Non-domestic private buildings
- Industrial
- Top heat demands

Heat Demand (MWh/Year)
- < 200
- 200 - 400
- 400 - 600
- > 600

0 0.75 1.5 3
Kilometers

Scale: 1:55,000
Coordinate System: British National Grid

Department for Energy Security & Net Zero

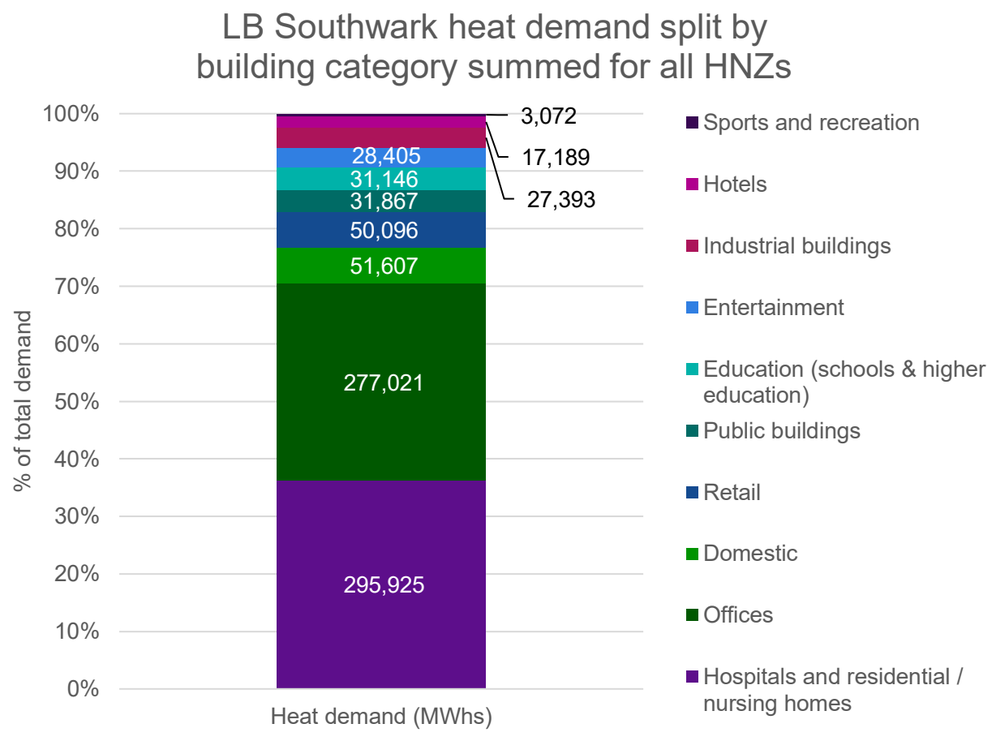
Southwark

Map B

Key Heat Demand

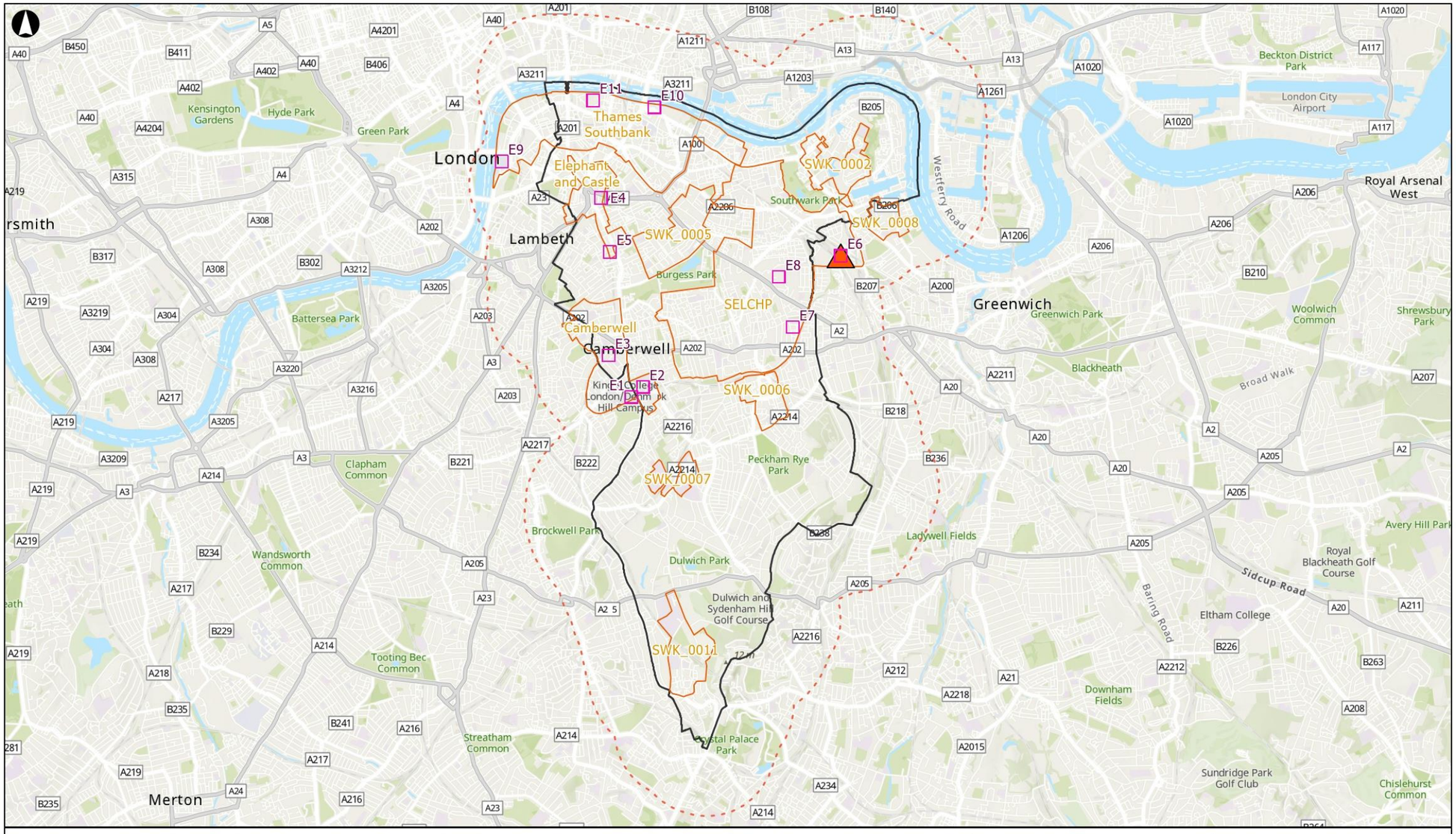
Table 22: Heat Demand split further by Building Categories across all Initial Zone Opportunities identified in Strategic HNZs in the Study Area

Building category	Annual Heat Demand of buildings required to connect across IZOs (MWh)
Hospitals and residential / nursing homes	295,925
Offices	277,021
Domestic	51,607
Retail	50,096
Public buildings	31,867
Education (schools & higher education)	31,146
Entertainment	28,405
Industrial buildings	27,393
Hotels	17,189
Sports and recreation	3,072
Totals	**813,722**



Note: In LB Southwark there are 10 HNZs with a total of four IZOs identified across them. The table and graph above summarise and categorise the heat demand for buildings required to connect to these IZOs.

C. Key Heat Sources and Potential Energy Centres



Boundaries
- Study Boundary
- Local Authority Boundary
- Other Local Authority Boundary
- Heat Network Zones

Key Area Heat Sources
- Deep Geothermal or Coal Minewater
- Ground Source
- Water Source

Heat Source
- Area Source
- EfW
- Industrial Waste Heat
- Minewater
- Other Waste Heat
- Water Source
- WWT Plant

Capacity (GWh/year)
- 0 - 10
- 10 - 20
- 20 - 50
- > 50

Energy Centres
- Potential IZO

0 0.75 1.5 3
Kilometers

Scale: 1:55,000

Coordinate System: British National Grid

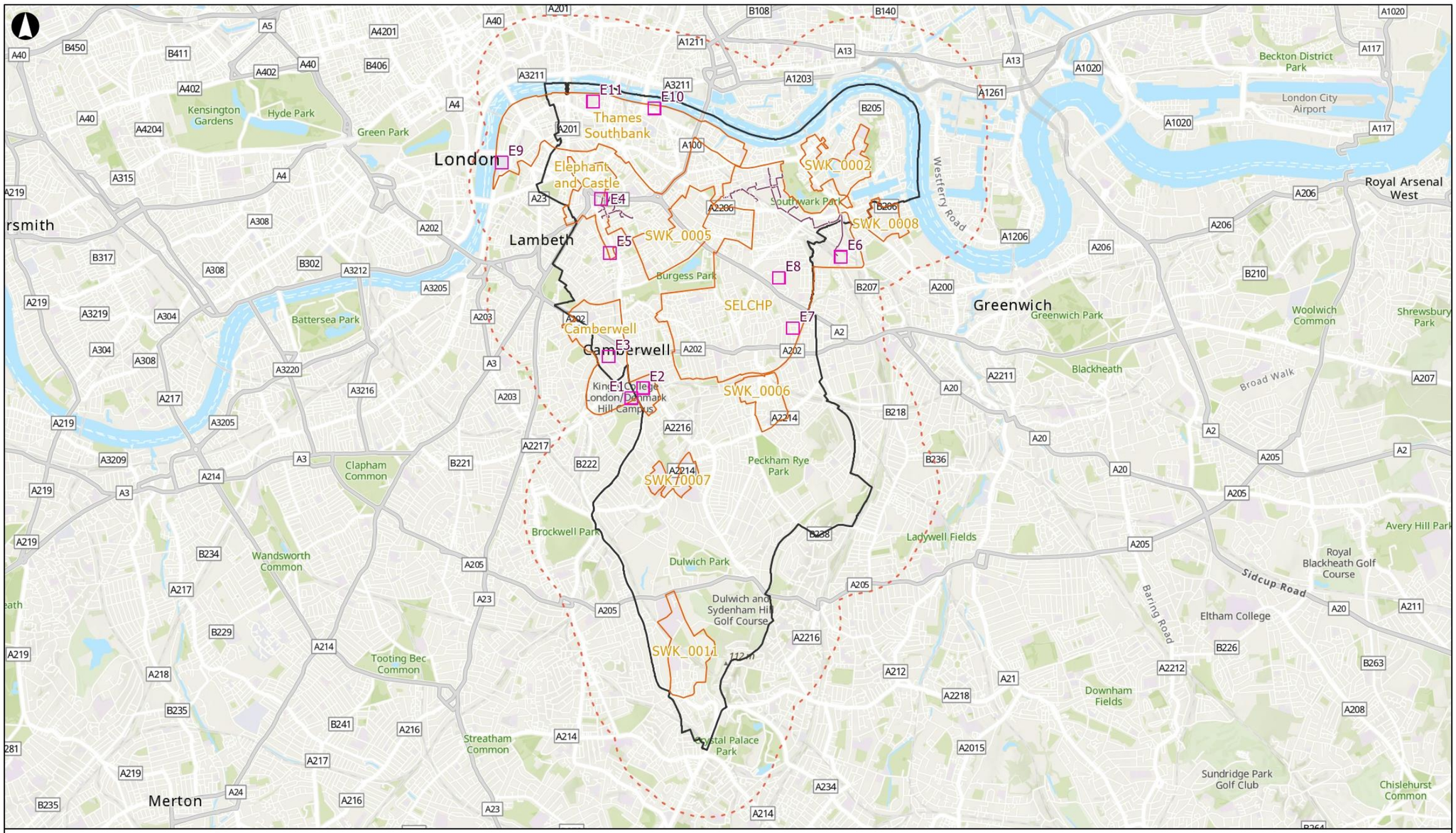
Department for Energy Security & Net Zero

Southwark

Map C

Key Heat Sources and Energy Centres

D. Existing and Planned Heat Networks



Boundaries
- Study Boundary
- Local Authority Boundary
- Other Local Authority Boundary
- Heat Network Zones

Existing and Planned Heat Networks

Energy Centres
- Potential IZO

0 0.75 1.5 3
Kilometers

Scale: 1:55,000

Coordinate System: British National Grid

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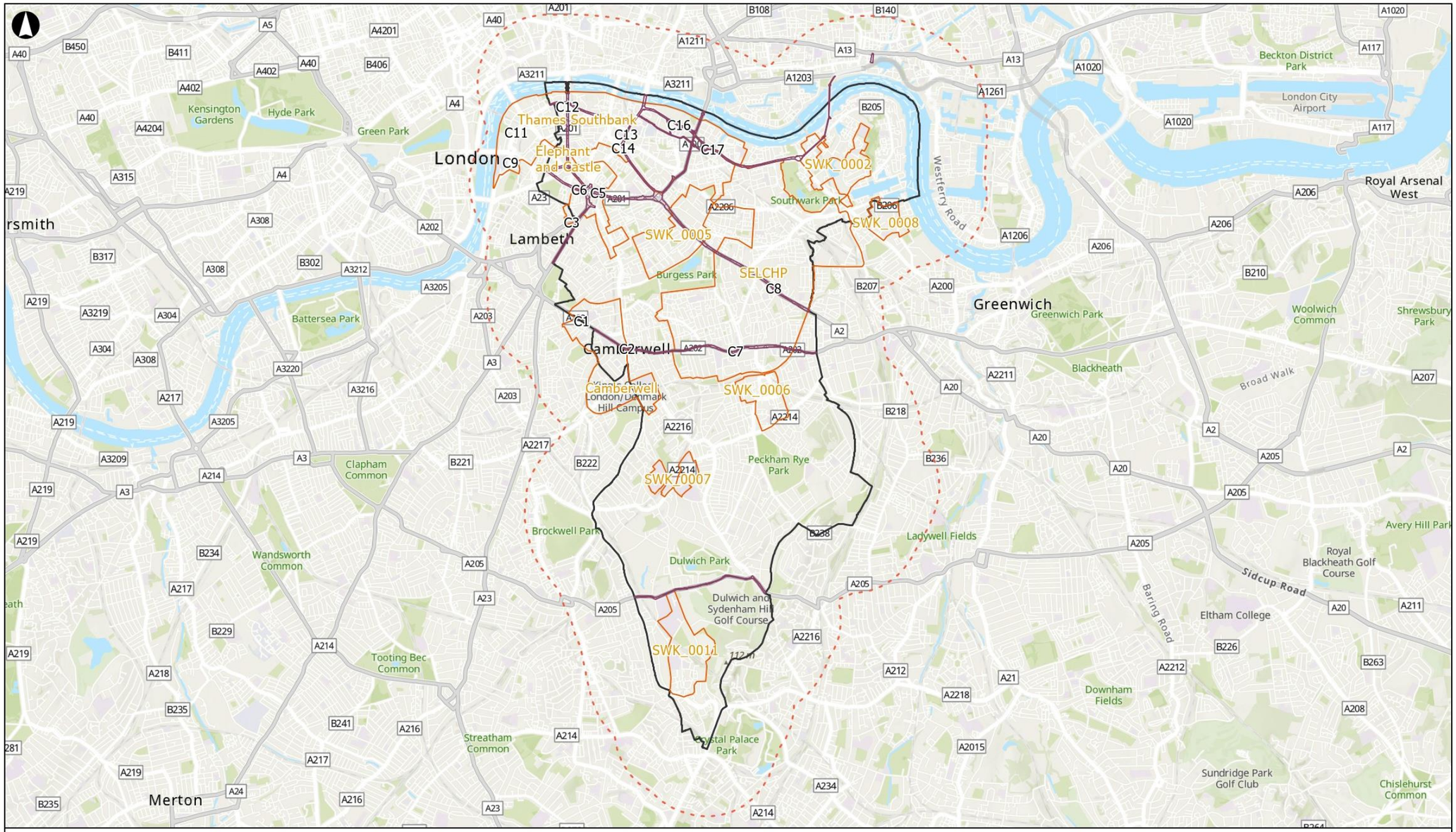
Southwark

Map D

Existing Heat Networks

E. Physical Constraints



Boundaries

- Study Boundary
- Local Authority Boundary
- Other Local Authority Boundary
- Heat Network Zones
- Key Constraints

0 0.75 1.5 3
Kilometers

Scale: 1:55,000

Coordinate System: British National Grid

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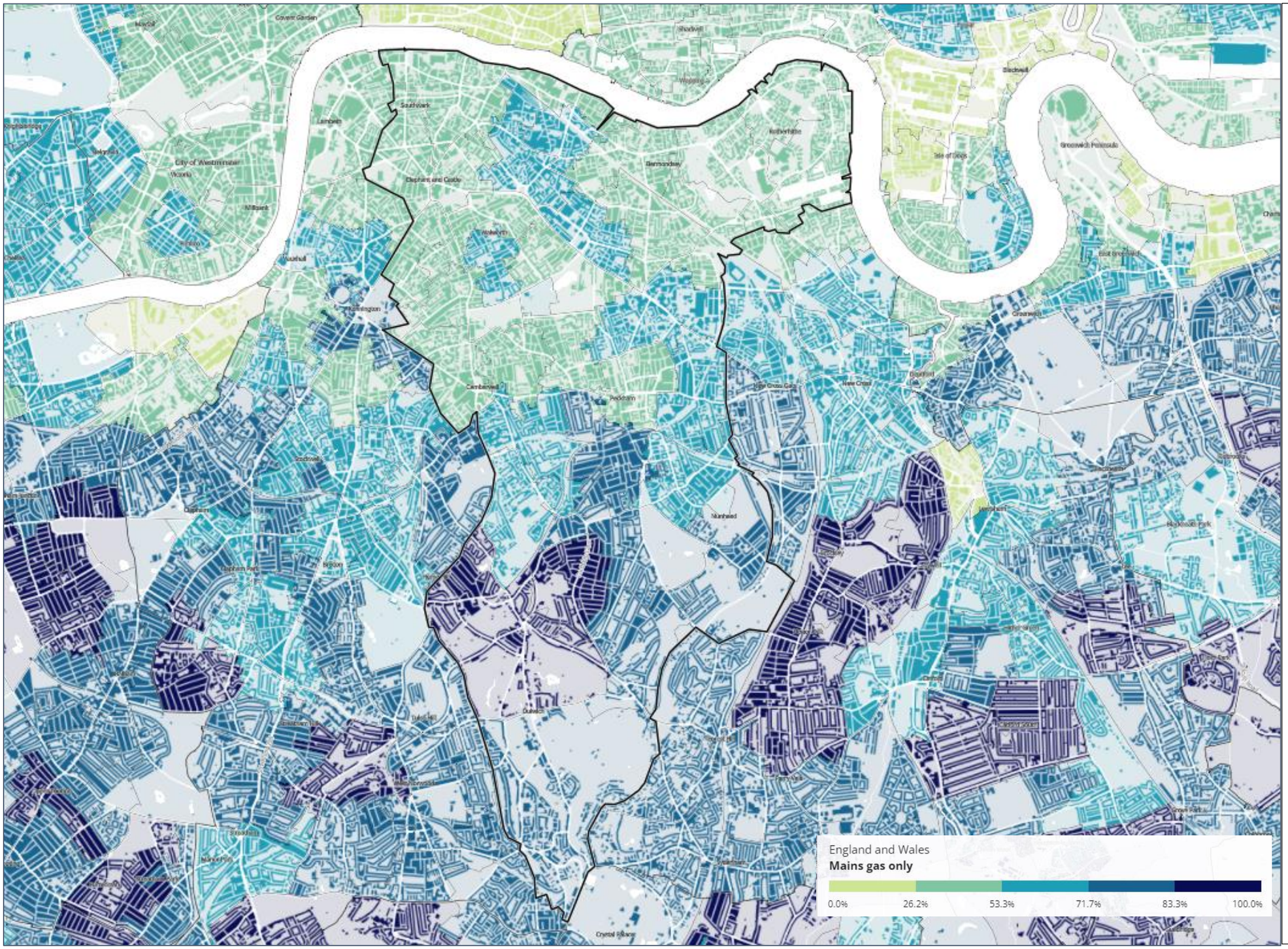
Map E

Physical Constraints

F. Off-Gas Grid Areas in Southwark



Credit: This is an excerpt from the ONS Census Maps 2021 which is available to explore online. The data shown is subject to Crown copyright protection, is published under the Open Government Licence (OGL) and embeds map data which is copyright of Ordnance Survey and Street maps.

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.

Table 23: Pilot Programme Standardised Information Resources

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 24: Pilot Programme Study-Area-Specific Information Resources

Information resource	Description of resource
SELCHP Operating information	Heat supply data from the SELCHP facility, dated 2019
HMMP Addendum – Sewer mapping study	Study to appraise opportunities for using heat offtake from public sewers to feed into large residential developments across Southwark
HMMP Addendum – GSHP mapping study	Study to appraise opportunities for heat offtake from GSHP systems with opportunity maps for use by Southwark Council.

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

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