Hackney Heat Mapping Study

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1. Introduction

1.1. Background

AECOM has been commissioned by the London Borough of Hackney to carry out a heat mapping exercise of the Borough as part of the London Development Agency's (LDA) Decentralised Energy Master Planning (DEMaP) programme.

The DEMaP programme is part of the strategy to meet the Mayor's target for 25% of London's energy supply to come from decentralised energy by 2020 and is responsible for the development of the web based London Heat Map.

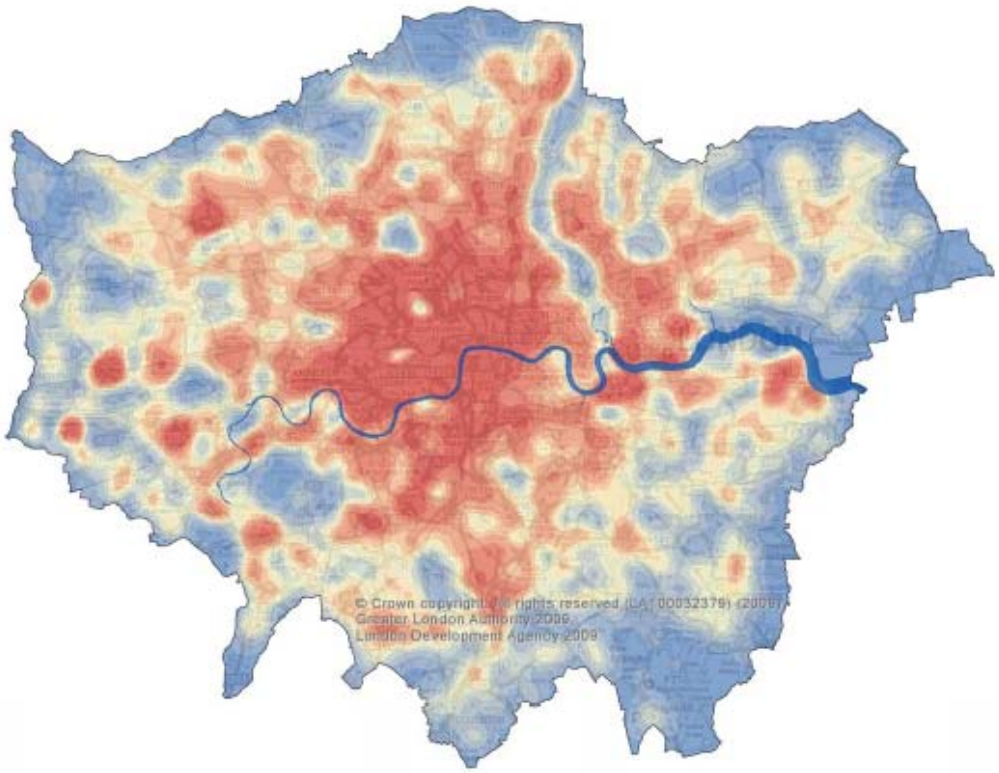


Figure 1: London Heat Map (courtesy of LDA)

The London Heat Map is currently mostly based on estimated energy data and the aim is to improve the accuracy of the map by replacing the estimated data with actual metered data wherever possible. In order to achieve this, the LDA has made available some funding for Boroughs to gather actual energy data and identify sites with potential for district heating (DH) networks within their boundaries. The London Borough of Hackney was successful in securing this funding and has appointed AECOM to carry out the work.

The heat mapping study is only phase 1 of the LDA's strategy to support Boroughs in promoting decentralised energy systems. Further funding will be made available for two more phases on successful application by the boroughs. The second phase, *Tranche 1*, will focus on carrying out a feasibility study and delivery and procurement strategies for the site(s) identified after phase 1 as having the highest potential for district heating. Phase 3, the *Implementation Stage* will focus on the financial, legal and procurement options available for the delivery of the preferred site.

1.2. Content of this report

This report summarises the methodology and outcomes of the heat mapping exercise carried out for the London Borough of Hackney and it includes:

- Details of the data sources used and methodology of data collection
- Graphical representation of data gathered
- Methodology used for data analysis
- List of priority sites and implementation plan

2. Data collection

The brief required the data to be collected in an Excel spreadsheet template provided by the LDA. The spreadsheet allowed the data to be easily uploaded into GIS and used to update the London Heat Map. The template required the following information:

Major heat loads:	Existing district heating networks:	Major heat supply plants:
• OS grid references • Name and address of site • Ownership of building • Whether the building is proposed or existing • Type and age of building • Type of heating system and fuel • Fuel consumption (MWh/year) • Gross internal floor area • Installed capacity (thermal and electrical where combined heat and power [CHP] is present) • CO_2 emissions associated with fuel consumption (tCO_2/year) • For new development – construction start and completion year • Year of data collection • Data source • Confidentiality of data	• OS grid references • Name and address of energy centre site • Ownership of building • Fuel source • Length of trench • Type of heating system and fuel • Fuel consumption (MWh/year) • Installed capacity (thermal and electrical where combined heat and power is present) • CO_2 emissions associated with fuel consumption (tCO_2/year) • For new development – construction start and completion year • Year of data collection • Data source • Confidentiality of data	• OS grid references • Name and address of site • Ownership of building • Whether the building is proposed or existing • Type of plant • Fuel source • Fuel consumption (MWh/year) • Installed capacity (thermal and electrical where combined heat and power is present) • CO_2 emissions associated with fuel consumption (tCO_2/year) • For new development – construction start and completion year • Year of data collection • Data source • Confidentiality of data

Table 1: Data requirements for LDA template

The aim was to collect as much of this information as possible, from as many buildings as possible. Given the wide scope of this exercise and the short timescale available, the search prioritised large buildings that are likely to have high heating loads. Public buildings were of particular interest as they are required to lead the way in terms of energy improvements and therefore are more likely to provide anchor loads for district heating networks than private buildings.

The search focused on the following building types:

- Hospitals
- Central government estate
- Local government estate (including social housing)
- Sport & leisure facilities
- Prisons
- Hotels

- Educational facilities
- Museums & art galleries
- Churches
- Private residential developments
- Private commercial developments
- Other public buildings (e.g. theatres, fire stations, police stations)

The focus was on collecting information about existing buildings, however data was also produced relating to proposed development. This is relevant due to the large quantum of development proposed in Hackney in the next few years and to the fact that it is much more cost effective to install district heating as part of the construction works than retrofitting.

2.1. Major heat loads - Existing buildings

Various institutions were contacted that were known to centrally collect energy consumption data for their estates. Other large individual buildings were identified looking at maps of Hackney and their occupiers were contacted directly to ask for their energy consumption data. Contact was made via phone and email and follow up calls were made over the 4 weeks that were assigned in the programme for data collection. The process was only partly successful as a considerable number of people contacted were not able to provide useful information within the required timescale.

Given below is a summary of the main institutions contacted and data obtained for the various building types listed above.

Building type	Contact	Data source
NHS	City & Hackney Teaching PCT Hospital Estates and Facilities Statistics	Hospital Estates and Facilities Statistics Display Energy Certificates Some metered data
Central Government Estate	n/a	Searched Borough but did not find any HMS Courts or other Central Government buildings within the Borough
London Borough of Hackney estates	LBH Facilities team	NI 185 data for civic buildings, schools, libraries and community buildings Energy bills for Hackney Homes housing estates
Sports and Leisure	Greenwich Leisure Limited	Metered data from LA leisure centres
Prisons	n/a	Searched Borough but did not find any HMS Prisons within the Borough
Hotels	Crowne Plaza Hotel, Shoreditch Holiday Inn Express, Old Street	Metered data

Educational facilities	LBH Facilities team Major private schools	NI185 data It was not possible to obtain metered data from private schools within the timescale
Museums & art galleries	Geffrye Museum Museum of London Archaeology	Metered data
Churches	Church of England Methodist Church	Church of England was interested in helping but could not provide useful data within the timescale[1]
Residential	Hackney Homes / LBH Facilities team Large private care home	It was not possible to obtain metered data from LBH housing estates and private care home within the timescale
Private commercial buildings	Tesco, Morrison, Iceland and others	Some metered data
Theatres and other public buildings	Hackney Empire, Arcola Theatre, Sutton House and others	It was not possible to obtain metered data within the timescale
Fire stations	London Fire Brigade	Some metered data, rest collected centrally by LDA
Police stations	Metropolitan Police	Collected centrally by LDA

Table 2: Summary of main data sources for existing buildings

It was not possible to source energy consumption data from Registered Social Landlords active in Hackney within the timescale of this project. This means that less than half of affordable housing in the Borough has been accounted for at this stage. If this data becomes available to LBH or the LDA at a later stage, it will be added directly onto the London Heat Map.

Similarly it was not possible to obtain data from the academies in the Borough, but contact has been made to try and source this. If the data becomes available at a later stage, it will be uploaded onto the London Heat Map directly by LBH.

The energy data provided for Hackney Homes estates included electricity consumption data. Most of this is associated with lighting and appliance use and therefore is outside the scope of this report. However some estates in the Boroughs have electric heating, therefore a proportion of the electricity consumption should be taken into account as part of this study.

The following estates were stated as having electric heating:

- Boscobel House
- Fields Estate
- Kingsgate Estate
- Lincoln Court
- Morland Estate

As the data did not differentiate between electricity used for space and water heating and electricity used for lighting and appliances, an assumption had to be made on what the split is likely to be. It was assumed that 65% of the total electricity consumption for the above estates was used for heating and hot water and therefore was included in the data collection template.

It may be that a proportion of the dwellings in other estates are served by electric heating, however there was no way of establishing this from the data set provided. It was also not possible to obtain this information by other means within the

[1] Note: it is worth the LDA contacting the Church of England directly to obtain energy data for all churches in London as the data is being collected as part of the Shrinking the Footprint campaign

timescale of the project. Therefore at this stage the electricity consumption from all other estates was assumed to be for lighting and appliances and not included in the data collection template.

If more detailed information about further estates that have electric heating becomes available, LBH will upload this data on to the heat map at a later date.

2.2. Major heat loads - Proposed new buildings

A considerable amount of redevelopment is proposed to take place in the London Borough of Hackney in the next few years. It is important to take this into account as part of the heat mapping exercise because new developments give the London Borough of Hackney the opportunity to have an active role in promoting the implementation of decentralised energy systems via the planning system.

The majority of regeneration will be concentrated in specific areas of the Borough, some of which have Phase 1 Area Action Plans or Planning Guidance finalised or in development. Given below is a list of the areas that were included in the assessment:

- Hackney Central
- Dalston
- Hackney Wick
- Woodberry Down
- Housing Estates part of the Estates Regeneration Programme
- Bishopsgate Goods Yard
- Major housing developments that have been granted planning permission

Heat mapping the proposed buildings presented various issues as it required to make predictions on how development will unfold in the future, which is difficult to do with any certainty due to the current financial and property market situation. The approach to be taken was discussed during one of the project meetings and can be summarised as follows.

Wherever possible data was collected on the quantum of development and phasing for specific sites within the areas listed above, however in many cases figures and phasing had to be estimated based on discussions with relevant members of the LBH, Hackney Homes, planning application documentation and masterplanning documents.

Regeneration area	Quantum of development and phasing source
Hackney Central and Dalston	LBH Strategic Delivery Team provided indicative figures for the strategic sites within Phase 1 of the two AAPs
Hackney Wick	Indicative figures were based on draft AAP. AECOM made some assumptions on building types and phasing
Woodberry Down	Planning Statement from the Outline planning application and the published phasing plan were used
Estates Regeneration Programme	The location and status of estates being regenerated was discussed in a meeting with the Housing Renewal Team at Hackney Homes. AECOM made some assumptions on phasing based on the discussion
Bishopsgate Goods Yard	Planning Guidance document and communication with Tim Midwood at LBH were used by AECOM to make some assumptions on building uses and phasing[2]
Granted housing developments	LBH Monitoring and Research Team provided a download from the London Development Database giving details of numbers of units and location of granted housing developments. AECOM made some assumptions on timing of development and phasing.

Table 3: Summary of data sources for proposed development

Benchmarks were used to associate energy demands with the proposed buildings, these area shown in Table 4 below. For domestic buildings the benchmarks are based on energy modelling carried out for typical house types averaged according to the housing mix expected in Hackney. Different benchmarks were used for different phases of development to take account of the minimum fabric improvements that will be enforced by future revisions of the Building Regulations. The building specifications used in the modelling are based on work carried out by the Zero Carbon Hub[3] and are expected to meet fabric efficiency levels likely to be required by future revisions of Building Regulations in 2013 and 2016.

For non-domestic buildings the benchmarks are derived from CIBSE Guide F and are the best practice figures. It has been assumed that the energy demands benchmarks will not change in future years and that the necessary carbon savings will be achieved by low and zero carbon technologies rather than efficiency improvements. This assumption had to be made because there is still considerable uncertainty around proposed future changes in Building Regulations for non-domestic buildings; the assumption reflects the difficulties associated with improving the fabric efficiency of non-domestic buildings without increasing demand for cooling.

It was agreed in one of the project meetings that the LDA would be developing these benchmarks so that the same assumptions are applied to the whole of the London Heat Map. Therefore the benchmarks used in the data collection tool are only indicative and will need to be replaced by those developed by the LDA in due course.

[2] Note: as the planning guidance states that development is not likely to begin in earnest until market conditions improved, we only included in the data set some transitional mixed uses that are proposed to be provided in the short term to support the new Shoreditch High Street station due to open later this year.
[3] Defining a fabric energy efficiency standard for zero carbon homes (November 2009)

Building type	unit	2010-2012	2013-2015	2016-2019	2019+
Dwellings (fuel consumption based on individual gas boilers)	kWh/m^2/year	64	59	54	54
Employment (air conditioned standard office)	kWh/m^2/year	97	97	97	97
Retail (clothes shop)	kWh/m^2/year	65	65	65	65
LA community centres	kWh/m^2/year	125	125	125	125
Primary school	kWh/m^2/year	113	113	113	113
PCT Clinic	kWh/m^2/year	174	174	174	174

Table 4: Benchmarks assumed for proposed new buildings

Please note that these are indicative only and have been included just to obtain some preliminary results within this project's timescale. They should be reviewed and updated by the LDA before the data is uploaded to the London Heat Map.

Assumptions had to be made in relation to the heating systems used in the proposed developments, as most of them are yet to be determined.

In many cases the proposals were at a very early stage and layout plans were not available, therefore it was not always possible to associate a specific grid reference to the data provided. In these cases assumptions had to be made.

Given below is a summary of the assumptions made:

- Sites with commercial development of less than 1000m^2 and housing developments of fewer than 35 dwellings were not included. This is already in excess of what stated in the LDA template, which requires only to include private residential development with more than 149 units and private commercial of more than 9,999m^2 of floor area. The LDA template focuses on *major* heat loads and the smaller sites were not thought to fall under this definition. This is particularly true for new development as, due to updates in the Building Regulations, new buildings have already considerably lower heating loads than existing ones.
- Where no other information was available, it was assumed that buildings would be served by gas boilers.
- Where planning information suggested that gas CHP and district heating networks were planned, this was stated in the spreadsheet but no details were provided on the heat load met by the CHP or its effect on the CO_2 emissions, as not enough information was available to provide this data. In these cases the heat loads and CO_2 emissions provided assume only the use of gas boilers.
- Where unknown, ownership was stated as "Other" from the drop down menu in the spreadsheet. It is assumed that many sites would include a combination of public and private ownership.
- For Hackney Wick, Woodberry Down and Bishopsgate Goods Yard, where information was not available for specific sites but only for phasing areas, the grid reference provided refers to as close as possible to the centre of the area the figures refer to.

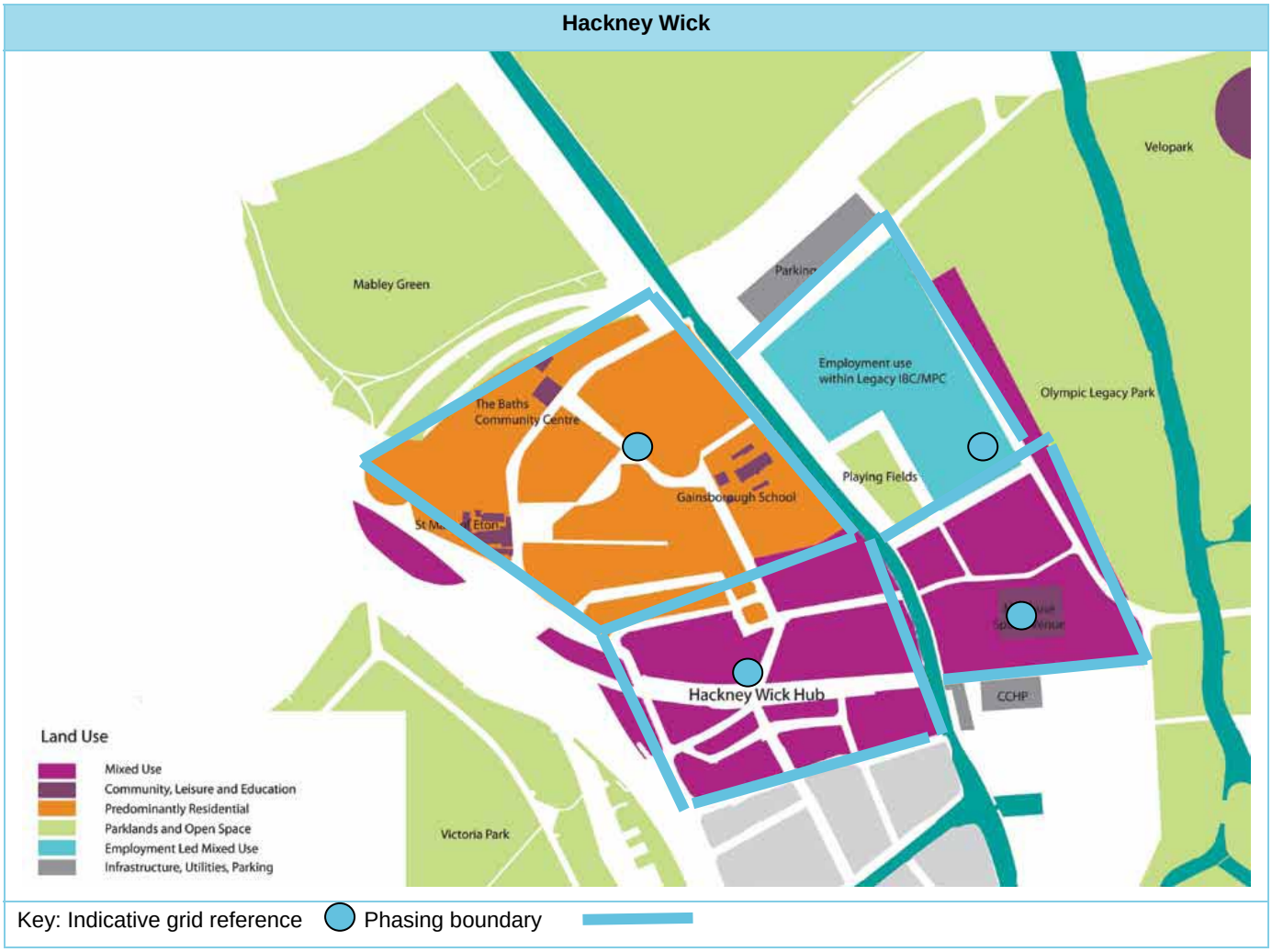


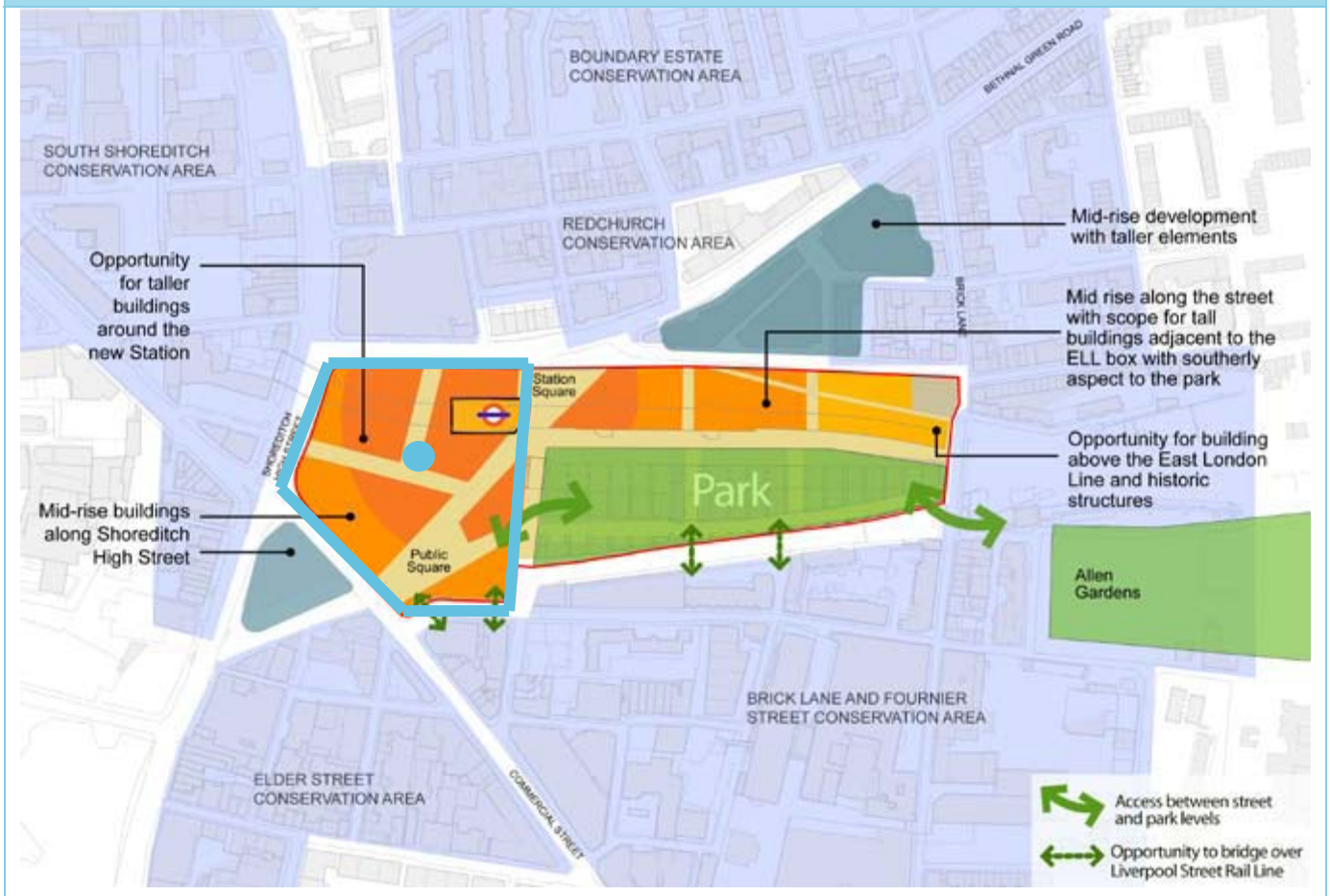
Figure 2: Hackney Wick indicative grid references and phases (land use map courtesy of LBH)

Woodberry Down

Key: Indicative grid reference

Figure 3: Woodberry Down indicative grid references and phases (phasing map courtesy of LBH)

Bishopsgate Goods Yard



Key: Indicative grid reference Area boundary within Hackney

Figure 4: Bishopsgate Goods Yard indicative grid references and phasing (only the selected area is within Hackney) (land use map courtesy of LBH)

2.3. Existing district heating networks

Two communal heating systems served by CHP have recently been developed and a further six are expected to be installed as part of new development proposals. Due to the fact that they are very new or in development, it was not possible to obtain detailed information about them; however they have been identified within the major heat loads data collection.

With regards to existing buildings, Hackney Homes provided a list of their estates that are currently served by communal heating systems. It was confirmed that none of them are currently powered by CHP and that only two are proposed for redevelopment to include district heating and CHP (Cranston and Woodberry Down). Six of the estates served by communal heating systems are currently fuelled by oil.

All the estates with communal heating were listed under existing district heating networks even though the systems were only serving part of the estate and do not extend outside the individual buildings. It should also be noted that the heating systems in these estates are very old and often with uninsulated pipework. Therefore in the event of connection to a wider district heating network, it is most likely that they would have to be replaced. Given below is a summary of the main findings relating to existing and proposed communal heating systems.

Proposed DH systems with CHP

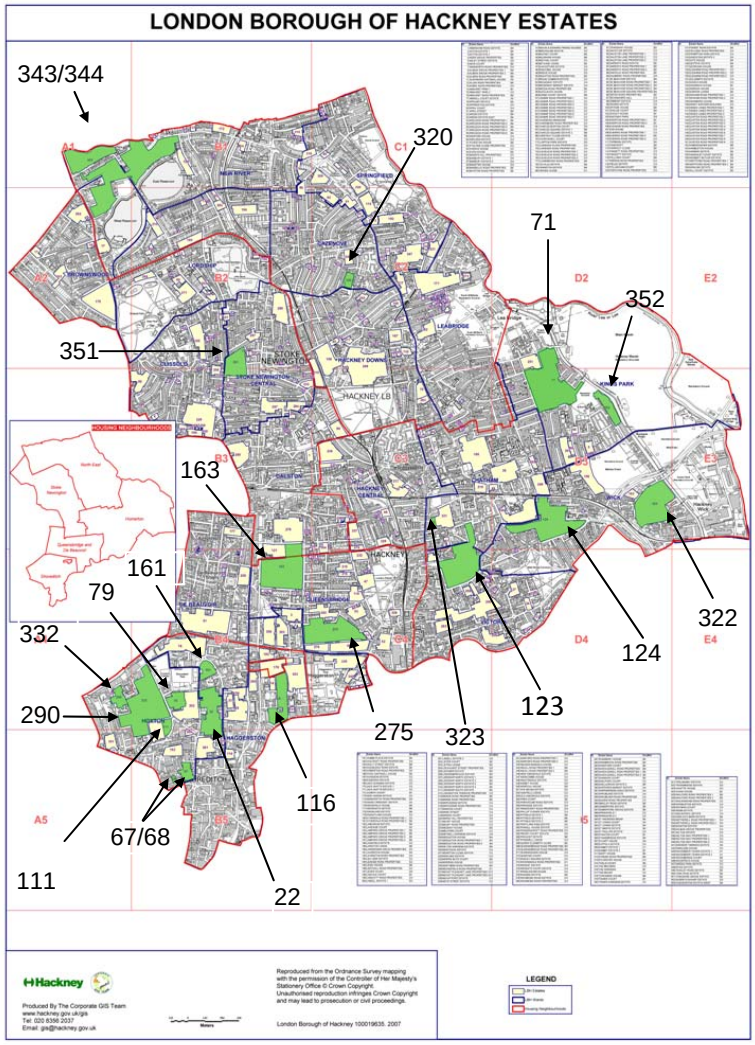
- Tesco – Hackney Central
- Cranston Estate (LBH)
- Woodberry Down Estate (LBH)
- King's Crescent Estate (LBH)
- Dalston F9
- Olympic DH – Hackney Wick

Recently completed DH and CHP

- Haggerston West & Kingsland
- Dalston Square

Existing communal heating systems

22	Arden Estate
67/68	Charles Square Estate
71	Clapton Park Estate
79	Cranston Estate
111	Fairbank Estate
116	Fellows Court
123	Frampton Park Estate
124	Gascoyne Estate New
161	Hobbs Place Estate
163	Holly Street Estate
275	Regent Estate
290	Shepherd Market Estate
320	Tower Gardens Estate
322	Trowbridge Estate
323	Valette House
332	Wenlock Barn Estate
343/344	Woodberry Down Estate
351	Yorkshire Grove Estate
352	Sherry's Wharf Estate



(estates marked in green have communal heating systems)

Figure 5: Summary of new and existing communal heating systems (estates map courtesy of LBH)

2.4. Major heat supply plants

No existing major heat supply plants were identified within Hackney, however the King's Yard energy centre was included in the data collection spreadsheet. King's Yard is just outside Hackney's boundary with Tower Hamlets in the south eastern corner of the Hackney Wick masterplan site. It will be the energy centre serving the district heating network for the Olympic site and therefore will be serving the eastern part of the Hackney Wick area. Depending on heat availability and ease of connection, the Olympic district network could potentially be extended to the western part of Hackney Wick.

It is also worth noting that proposals for the Cranston Estate CHP systems include the provision of spare capacity with the aim to extend the DH network to neighbouring estates in the future.

3. Outputs

3.1. LDA data collection template

The first output was the compiled LDA data collection template. This was submitted to the LDA and a final version is submitted with this report (see Appendix A).

3.2. Mapping

The LDA were expected to return an updated version of the London Heat Map for Hackney, after the inclusion of the data collected by AECOM. Issues with obtaining a licence for the use of floor area data from the Valuation Office Agency (VOA) meant that the LDA was not able to provide a heat map of the Borough within the required timescale. Instead maps were provided showing the location of the data points collected classified by building type.

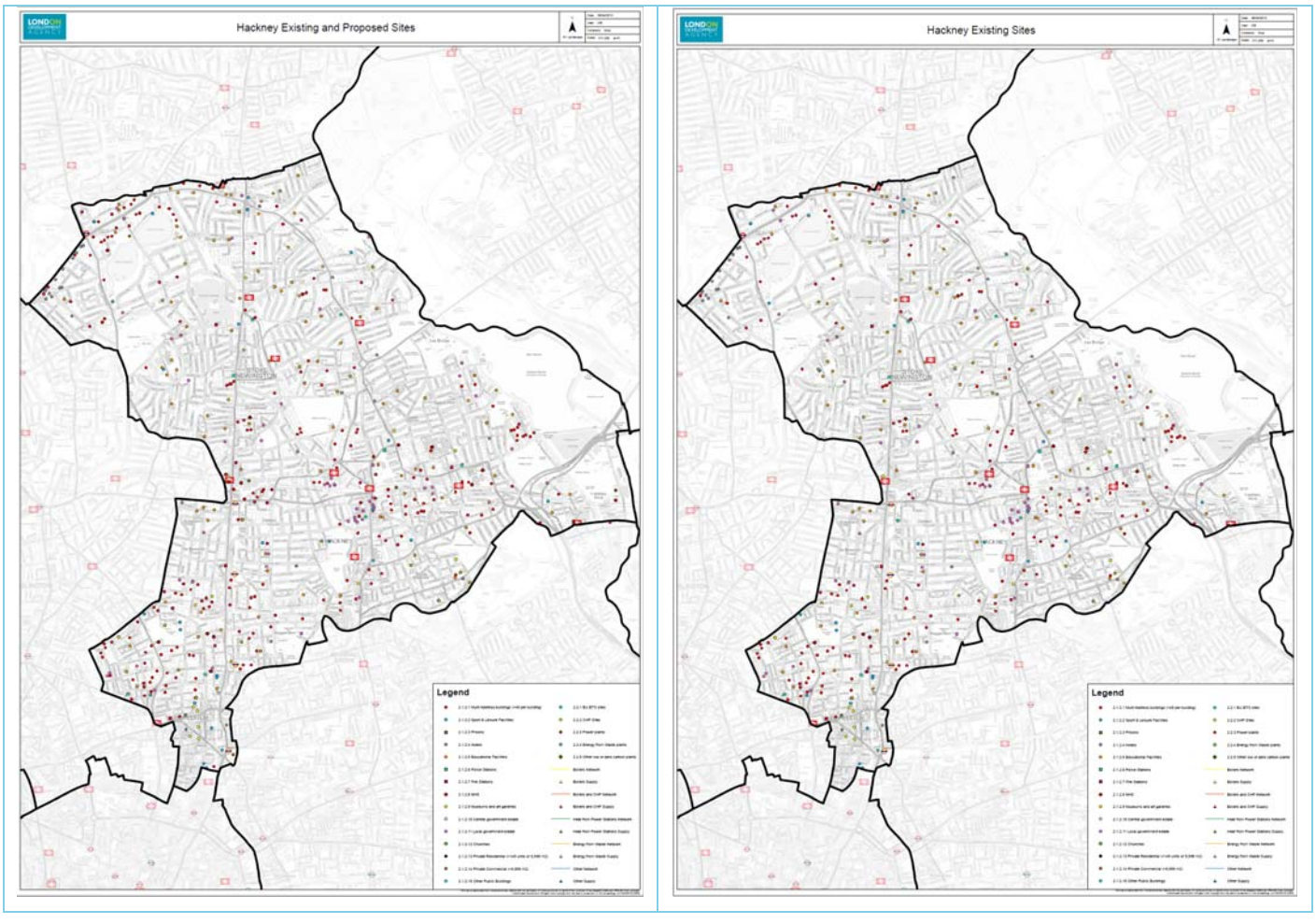


Figure 6: LDA site location maps (courtesy of LDA)

Two maps were provided, one with both existing and proposed sites, and one with only existing sites. These maps include data points collected by AECOM as well as points already held by the LDA. Larger versions of these maps are provided in Appendix B.

The maps given in Figure 6 were useful to identify clusters of buildings of different uses that could present opportunity areas for the development of district heating networks, however they did not include any information about the actual energy consumption of those buildings.

In order to include the energy data collected or estimated as part of this heat mapping exercise, AECOM produced a map showing the fuel consumption data against the background of the current London Heat Map.

The dots for the various sites were given different sizes depending on the energy consumption data associated with that building/site expressed in MWh of energy consumption (for heat and hot water) per year.

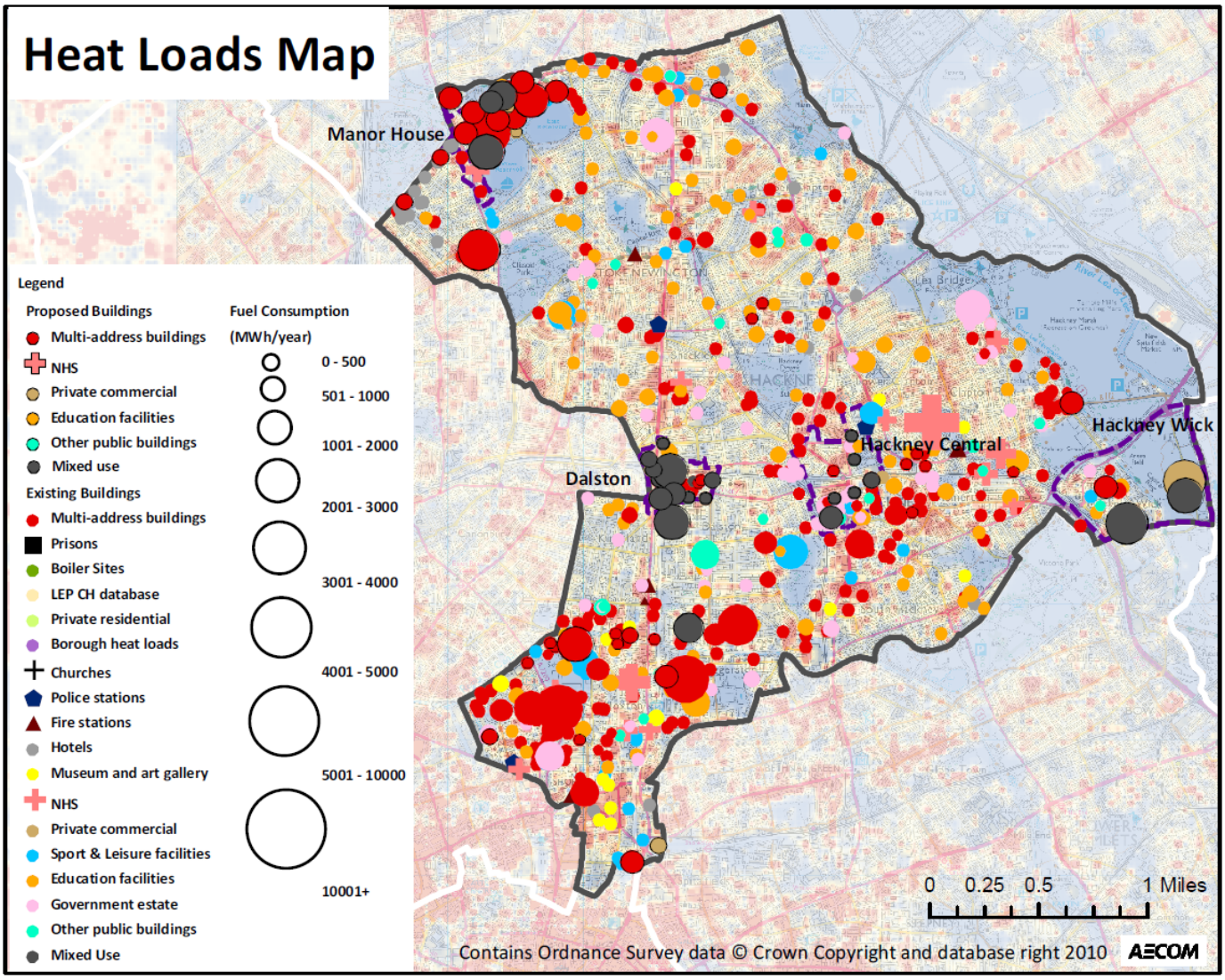


Figure 7: Hackney heat loads map

3.3. How to interpret the energy data map

The energy data given in Figure 7 is the yearly heating fuel consumption for the individual building or site. This means that a big circle on the map is equivalent to dark red on a heat map.

It is worth noting that there was huge variation in the data, which could not be easily shown on the map. Figure 8 represents the whole dataset on a logarithmic scale and shows that one site had a heat demand in excess of 10,000MWh/year (Homerton Hospital) and approximately 60 sites have heat demands over 1,000MWh/year. However the majority of the sites have significantly lower demands. The graph also shows that a large number of sites have very small demands, these are mostly individual dwellings from the Hackney Homes stock. In many cases these were flats in the same block therefore the data was aggregated and associated with a single grid reference point on the map in Figure 7.

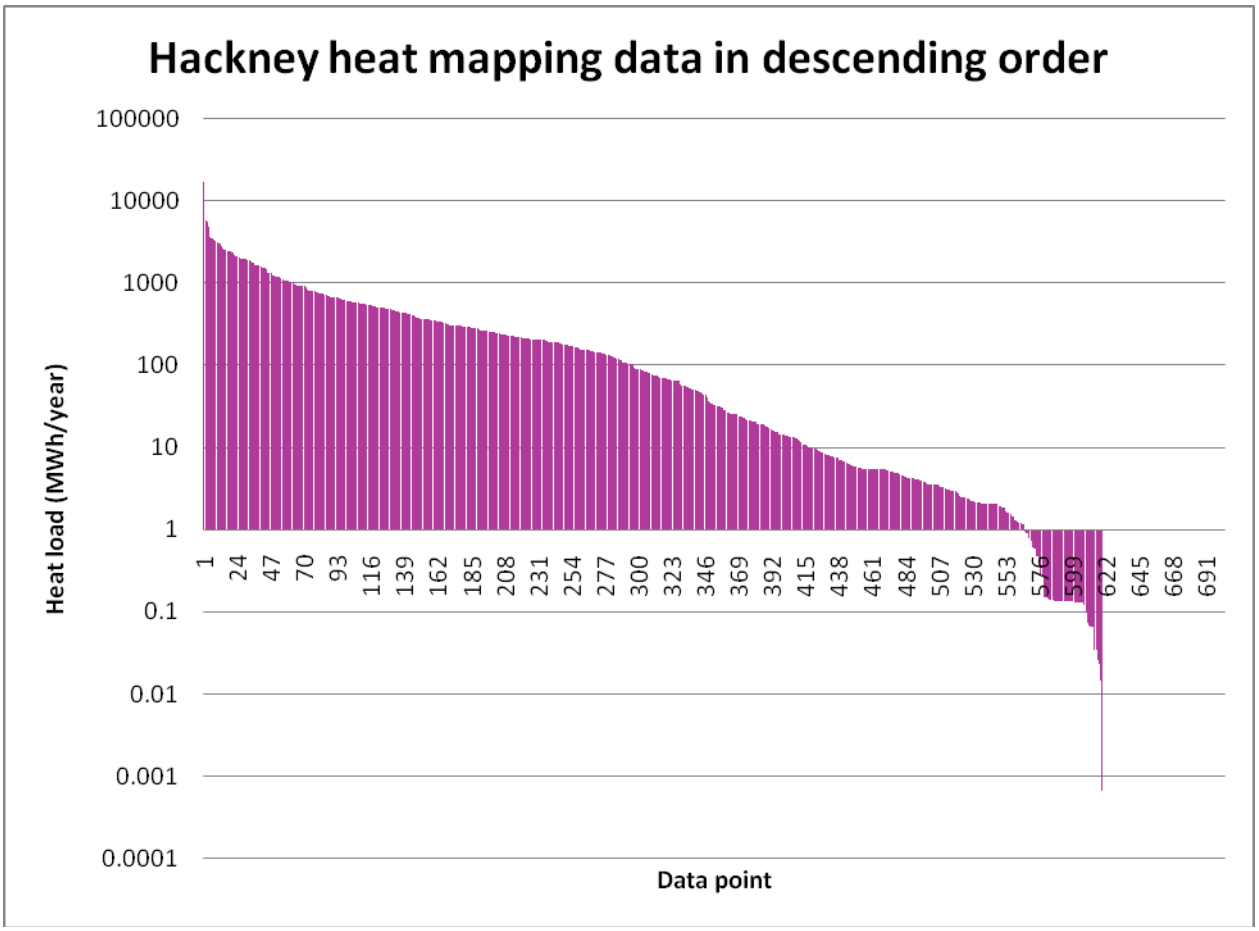


Figure 8: Heat load map data in descending order

It should be noted that in a few instances data was collected about existing buildings within areas that are planned for redevelopment (e.g. Woodberry Down, Hackney Wick). In these cases there is potentially double counting of heat loads as the estimated data for proposed development assumes the redevelopment of the whole area. In order to avoid confusion on this

issue, heat demands for proposed development have been differentiated by a black outline around the mapped items from heat demands from existing stock.

3.4. Limitations of data collected and outputs

The short timescale of the project and the nature of the task mean that there are a number of limitations to the data collected and the outputs produced. Despite these limitations, it is believed that the data and outputs can still be used successfully to identify a list of sites with high potential for DH within the Borough and develop a high level implementation plan for priority sites.

AECOM recommends that, before uploading the data to the London Heat Map, the LDA reviews these limitations and considers them in light of the results of the heat mapping work carried out by other Boroughs. A strategic review could allow to mitigate some of these issues or at least to standardise the approach taken across all boroughs.

Data collection limitations:

- Actual data has been collected for a small proportion of all the Borough's buildings; if the aim is to have energy figures for each building, the remaining data will have to be based on benchmarks or further research will be required to gather more data. Requests for energy data are outstanding with various RSLs and academies, therefore further information may be added to the heat map directly by Hackney BC once this data becomes available.
- Actual data provided is mostly metered gas consumption, which covers space heating and hot water but often also cooking, which should not appear on a heat map. The proportion of gas used for cooking in most cases is very small relative to the heating and hot water demand, therefore this issue is unlikely to affect the outcome of this study.
- In some cases electric heating was present, but the data provided did not differentiate between consumption due to heating and consumption due to lighting and appliances. In the case of the Hackney Homes estates known to have electric heating, an assumption was made about the proportion required for space and water heating and this proportion was included in the data set. In the case of commercial buildings (a museum and a hotel) it was not possible to make a reasonable assumption without further investigation of the load profiles of the relevant buildings. In these cases the electricity consumption data was not included in the major heat loads list, but was provided separately for the LDA's consideration.
- Without considerable detailed study there is no way of guaranteeing that the data collected is complete and correct. All relevant information collected and sources used have been provided. LDA can take a view as to whether some data should be excluded because considered unreliable.
- The benchmarks used for new development need to be reviewed and updated before the data is uploaded on the LHM to ensure that they match what has been used in other boroughs.
- No data has been included for the Manor House AAP as this is at a very early stage and no figures are yet available on the proposed quantum and phasing of development.

Outputs limitations:

- The limitations in data collection mean that some of the information represented in Figure 7 may be incorrect. Of particular concern are the figures for the PCTs as they come from various sources, the reliability of which is uncertain. Data for some of the PCTs are based on meter readings, but these did not appear to be complete. Data from other PCT sites is based on information provided on display energy certificates (DECs). As DECs should be based on verified metered data, where it was available, this data source was preferred over the monthly metered figures. Another site of concern is the Millfields Depot. The data for this site sourced from the NI 185 database appears to be unrealistically high and is thought to be incorrect. This means that the large pink circle near the eastern boundary of the Borough, near Hackney Marshes should probably be disregarded.

- The map in Figure 7 represents the energy data collected by AECOM as part of this project as well as some sites previously identified by LDA (and shown in Figure 6). For these additional points no energy data was provided, therefore they have been represented on the map in Figure 7 with the smallest sized dots.
- The data collected on proposed new buildings (i.e. points with black outline) is based on assumed quantum of development. The existence of these heat loads will rely on various privately owned sites coming forward with appropriate development, therefore cannot be guaranteed at present.
- As discussed in section 2.2, for new development it was often impossible to provide a specific grid reference for where the building would be built. In these cases a single grid reference was used for the centre of the area being redeveloped, and the predicted energy demands for the various building types expected to be built in that area were all associated with that same reference point. In these cases all the energy data associated with one grid reference was added together to produce a total energy consumption figure for that location. Where more than one building type was associated with one grid reference, the sites were classified as “mixed use”.

Site	Type	Deliverability	Priority Level given in Heatmapping report	Follow up discussion with DEMAP team and council officers. DEMAP stages recommended	Final Recommendation for DEMAP	time scale	Comments
Colville Estate and Britannia Leisure centre	Housing estate and leisure centre	High potential though over a longer period. Low potential in the short term	Medium		Reserve (future potential)	7-10 year plan	C. 850 units newbuild. Kickstart site starting soon with 41 units (CHP) + 12 units (MVHR), June 2010 - July 2011. Next phases pending on funding availability.
Gascoyn II estate (+ possibly Homerton Hospital and connecting to Olympic park CHP)	Housing estate and hospital	High potential - Hackney housing estate proposed to undergo Decent Homes	Medium/low	Feasibility study	**Feasibility Study**	Timescale for delivery of heat network - 2011/12	There are 4 tower blocks containing 160 flats that currently are heated by storage heaters and hot water is provided by electric immersion heaters. No Decent Homes works have yet been carried out and are currently programmed for 2013 but negotiations about bringing the scheme forward are in progress. Cabinet will consider final programme proposals in July: new double glazed windows, new roof, new kitchens and bathrooms. The blocks are of 'Bison' large panel concrete construction and the u-values of external walls are poor. Gas cannot be piped in to the building because of the risk of progressive collapse in an explosion.Initial feasibility work suggests that there are easy routes through the building to run district heating mains.Option 1 would be a connection to the Olympic Park CHP plant. Option 2 would be a CESP bid for fuel switching (to gas fired CHP), external insulation, and fuel-metered district heating.
Hackney Wick		Uncertain due to lack of information from ODA	High		**Feasibility Study**		Potential to connect CCHP system proposed on Tower Hamlets side of Olympic site to sites within Hackney. Yet to be confirmed by Tower Hamlets. Need further info. Total no. of Hackney Homes housing estates have been identified that can be served by the CCHP on the Olympic site. Clapton Park Estate – 3 small communal heating/hw systems, all gas fired at Belper Court (21 flats), Longford Court (75 flats) and Kirkstead Court (74 flats). Sherrys Wharf Estate – Larger gas fired DHS serving 60 flats and houses. Trowbridge Estate – Larger gas fired DHS serving 116 flats and houses. Gascoyne 2 Estate/Wyke Estate – no DHS, all individual gas boilers. However 140 flats in 4 tower blocks have electric storage heaters. There are easy routes through the buildings for heating mains. Ideal for conversion to heat network.
Cranston Estate	Housing estate	High potential - Hackney estate where CHP potential has already been investigated.	Not identified due to late arrival of info	Implementation stage	**Implementation stage**		Heating mains renewed and in place in kickstart sites with risers currently being installed. Good potential for expansion. CESP funding is also being investigated for this site. LDA supported scheme.
Regents Estate (Queensbridge)		High potential - Hackney estate with individual boiler houses	Not identified due to late arrival of info	Feasibility study	**Feasibility Study**		An estate of 297 flats, houses and maisonettes built in 1970s, currently heated via 19 gas-fired mini boiler houses. Not in Decent Homes programme because they pass decency standard. CERT bid for rationalisation of DHS to CHP. Possible extension of network to Ann taylor ecntre and London fields Lido. Timetable for delivery of heat network provided cert funding received: end of 2012
Woodberry Down	Housing estate, academy, retail and offices	High - already programmed for delivery	High	Implementation stage	Reserve	20 years phased development	Mix of refurbishments and newbuilds. 5000 units. Already has a comprehensive energy strategy and agreed DE plan. Potential to further connection to manor house, Haringey (retail park) and Islington (Finsbury Park)
Haggerston West and Kingsland + Haggerston Baths	Housing estate and leisure centre	High - energy strategy and CHP hubs already planned. Baths in pre app discussion	Not identified due to late arrival of info	Feasibility study	**Implementation stage (high potential although the extent to which LDA support is required needs further investigation)**		761 unit housing development. Energy centre already agreed for both sides of the canal. Discussion initiated with Haggerston baths to connect to energy centre on south side if baths are refurbished (Grade 2* listed building). Baths at pre app discussion stage, with proposal for additional well being centre (24 month programme start to completion). Housing development due to start imminently.

Site	Type	Deliverability	Priority Level given in Heatmapping report	Follow up discussion with DEMAP team and council officers. DEMAP stages recommended	Final Recommendation for DEMAP	time scale	Comments
Dalston Town centre	Mixed use developments	High - mixed use developments coming forward over 12 year period in growth area.	Medium	Feasibility study	**Feasibility Study**	2010 - 22	CHP system and biomass boiler already in place in Dalston square. Pontential for a central CHP system with anchor load in shopping centre, and connecting to sites coming forward.
Hackney central (Tesco site)	Supermarket and new housing	Medium - grwoth area though no main energy hub identified.	Medium		Reserve (future potential)	2010 - 22	Good anchor load on the Tesco site however uncertainties about additional developments coming forward in the vicinity.
Kings crecent and West reservoire leisure centre	Housing estate and leisure centre	High - Uncertainties pending on new development coming forward on site to house CHP hub.	Medium		Reserve (future potential)		Part refurb and part newbuild. Refurb part has undergone Descent Homes programme. If new build is built with CHP then CSH Level on refurb part can increase from 4 to 5. Connection to west reservoire leisure centre yet to be explored.
City Road	Housing estate, new hotels, new housing, new offices, student accomodation	High - uncertainties pending on new development coming forward on city road and potential to connect to a possible DE system in Islington.	High		**Feasibility study**	At various stages: under contruction/consent given/pre app discussions	Uncertainties around timescales and what comes forward within DEMAP timeframe. Potential to connect new develoments along City road to future Islington DE network, however islington yet to confirm plans. Several housing estates including wenlock barn and cranston estates located in the area.
St Leonards Hospital		Uncertain due to lack of information.	Low		None		
Old Hackney Hospital		Uncertain due to lack of information.	Low		None		

4. Data analysis

The outputs detailed above were reviewed with the aim to identify a list of sites with the potential for development of district heating networks. The analysis was based on a series of relevant criteria and was discussed with a number of stakeholders to ensure that the implementation plan was developed only for the most relevant sites.

4.1. Prioritisation criteria

The complexity of delivering a district heating network means that the selection of priority sites has to be based on technical viability, but also on financial viability and practical delivery issues. Table 5 shows the criteria that have been considered during the analysis of the data collected.

Technical viability criteria	Financial viability criteria	Deliverability criteria
• Size of heat loads • Type of building • Proximity to other high potential buildings • Phasing of development • Potential for extension of network	• Ownership of building • Financial delivery mechanisms • Length of pipe work • Potential for extension of network • Presence of existing Energy Services Companies (ESCos)	• For existing buildings – Proposals and extent of refurbishment • For new buildings – Proposals for energy strategy • Timescales and phasing of proposed refurbishment/development • Practical barriers to district network installation (e.g. railways, utilities)

Table 5: Site prioritisation criteria for district heating

The above criteria were used to review the maps in Figure 5, Figure 6 and Figure 7 and a number of sites were identified as of potential interest. These are shown in Figure 9.

Potential DH sites
1. Woodberry Down
2. Kings Crescent Estate and West Reservoir Leisure Centre
3. Somerford Grove PCT and surroundings
4. Dalston Town Centre
5. Colville Estate and Britannia Leisure Centre
6. City Road area
7. St Leonard's Hospital
8. Hackney Central Town Centre
9. Hackney Wick
10. Gascoyne Estate and Homerton Hospital
11. Nightingale Primary School and estate

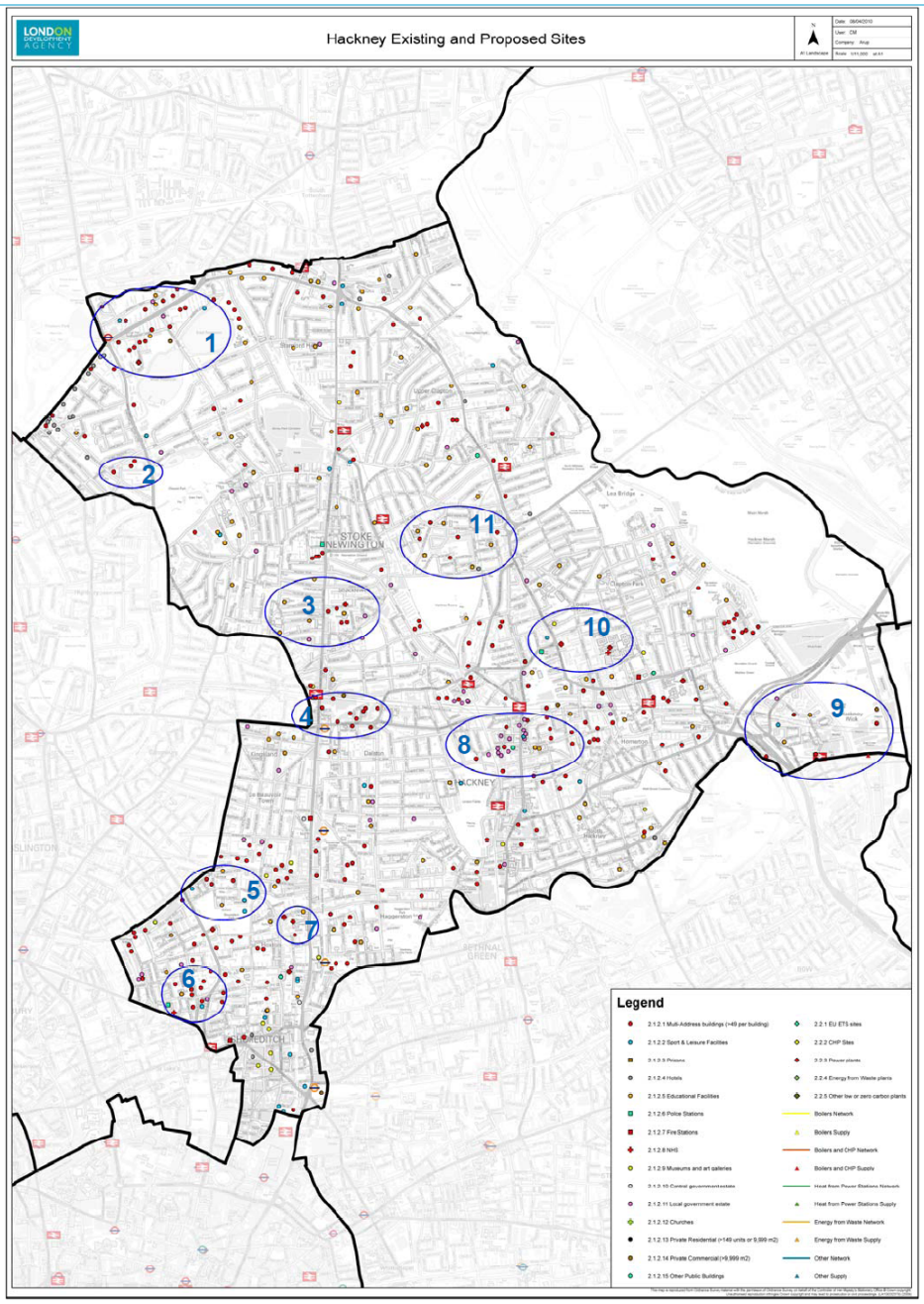


Figure 9: Preliminary sites identified to have district heating potential

In addition to the sites above, the map in Figure 7 shows that there are considerable heat demands to the east of the recently redeveloped Haggerston West Estate. Haggerston West is served by a CHP engine and, if extra capacity is available, consideration should be given to extending the network in this direction.

4.2. Connection to other boroughs

Consideration was also given to the potential for connection outside the Borough's boundaries, given the presence of some large heat users just outside Hackney. Specifically these were identified as:

- Moorfields Eye Hospital and City University - to the south west (LB Islington);
- Mildmay Mission Hospital and London Chest Hospital – to the south east (LB Tower Hamlets)
- College Library – to the west (LB Islington)

- Haringey Green Lanes Arena Shopping Park and St Ann's Hospital – to the north (LB Haringey)

Communication with the relevant people in these Boroughs is vital to gain a better understanding of the work that they are doing on the subject of district heating system and to exploit opportunities for collaboration where appropriate.

In particular, communication with Islington and Haringey is needed in the short term, as they are ahead of Hackney in the DEMaP programme, with Islington being in Phase 3, the Implementation Stage and Haringey in Phase 2, Tranche 1.

Tower Hamlets are also investigating the potential for decentralised energy within their boundary as shown by the following map (Figure 10) from their LDF evidence base. This shows that a Tower Hamlets DH network could potentially extend to serve the Bishopsgate Goods Yard development site.

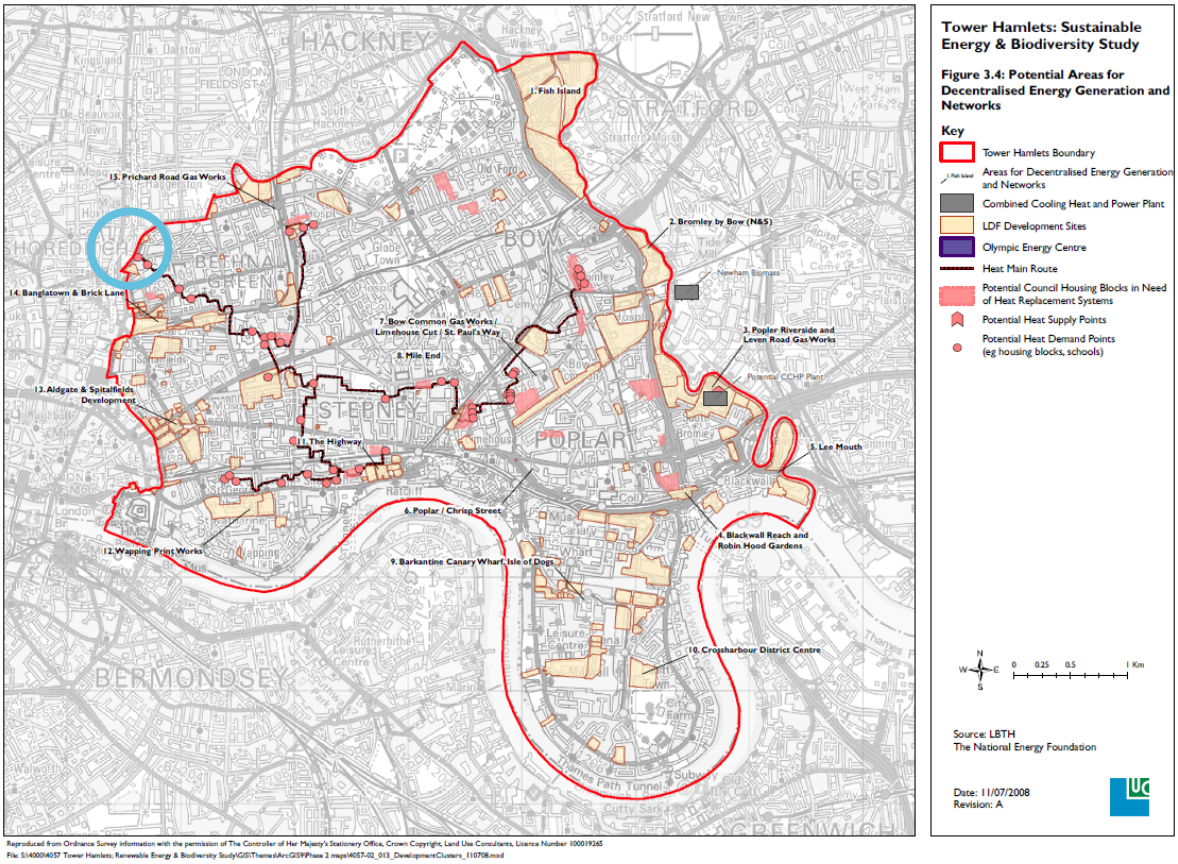


Figure 10: Tower Hamlets proposed district main (ref: Tower Hamlets LDF Evidence Base)

Although the City of London is not involved in the DEMaP programme, it is probably considering possible extensions of its Citigen Network. Therefore communication with the City is also recommended to consider further opportunities in the Shoreditch area.

4.3. Stakeholder engagement

After selecting the list of potential sites shown in Figure 9, a meeting was held with key stakeholders. This was done to gain a better understanding of the sites selected and obtain feedback on any issues that may affect the delivery of district heating networks in these areas. The following stakeholders were consulted:

- Hackney Homes
- Various members of LBH
- City and Hackney Teaching PCT
- The Learning Trust
- LDA's DEMaP Team

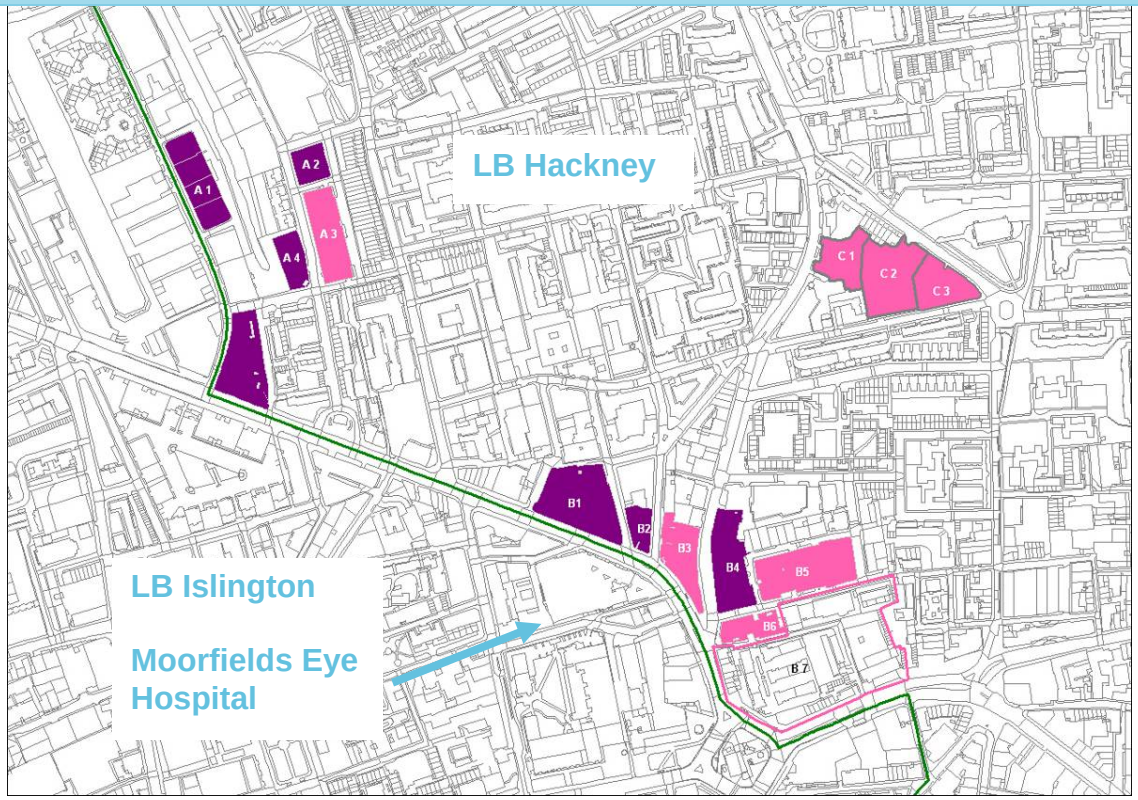
During the meeting, each site was discussed in turn and the relevant stakeholders were able to provide some additional information on some of the sites. In many cases development plans are still at a very early stage therefore it was not possible to

gain any more detailed information on timing and quantum of proposed development. However the information provided was used to check the assumptions made during the data gathering process.

The main outcomes from the meeting and subsequent additional feedback were as follows:

- The City and Hackney PCT is restructuring and rationalising its estates, this presents an opportunity where refurbishment work is taking place, but also may mean that some current PCT buildings will be abandoned.
- Various major developments are proposed in the area around City Road (see Figure 11 below). Islington is planning major redevelopment in the area around Old Street, including the use of CHP. These two facts increase the potential for DH development in this area.

Proposed development on City Road



Key:

Sites in pink are at pre-planning stage; sites in purple are at planning stage

A sites are primarily residential schemes ranging from 4 - 10 storeys; B sites are mixed used sites including offices, hotels, student accommodation, ranging from 18 – 25+ storeys; C sites are primarily residential schemes, ranging from 4 - 8 storeys

Site B7 could potentially be led by LBH, and it is likely that high density development will be encouraged

Figure 11: Proposed developments in south west of Hackney (map courtesy of LBH)

- A DH network could potentially be expanded in the north of the Borough to include developments in LB Islington and LB Haringey. Cross-borough discussions are already taking place between Hackney, Islington and Haringey to assess the potential for extending a district heating network in the north of the Borough. The cross-borough energy strategy could include Woodberry Down and Manor House in Hackney, Florentina Clothing Village and Overbury Road in Haringey and City North, 2 John Jones, Six Acres Community Project, 4 Isledon Road and Finsbury Park Station in Islington.
- The Castle Climbing Centre is near the West Reservoir Leisure Centre and, if they are planning refurbishment works, it may increase the potential for the King's Crescent Estate site (site 2 in Figure 9).
- The Somerford Grove PCT is small and may not be retained as a result of the City and Hackney Teaching PCT's restructuring. The nearby housing estates are not part of the Estates Regeneration Programme and the educational buildings are small primary schools. These facts combined with the lack of obvious nearby future connections suggest that this area (site 3 in Figure 9) can probably be taken off the list.

- The Haggerston & Kingsland sites (not too far from St Leonard's Hospital) have recently been completed and have DH with CHP. Scottish and Southern have already been selected as the ESCo for the schemes. Although these sites are not particularly close to any of the potential sites given in Figure 9, it may be worth assessing the interest of the ESCo in getting involved in other sites in the area, or in extending the network to the east to include the Regent Estate.
- St Leonard's Hospital is currently under redevelopment. The East London Foundation Trust will be taking over the Kingsland Road side of the site to develop a mental health unit (including some overnight accommodation). The City and Hackney Teaching PCT will retain the part of the site on Hoxton Street and will develop a PCT building with long opening hours (no overnight accommodation). Development is expected to start on site in September/October 2010 and the plan is to have a common energy strategy, but the details are yet unclear. The redevelopment of the site presents a great opportunity for the integration of DH and CHP, however the stage of development may mean that the design process has gone too far for the DEMaP programme to provide a useful contribution.
- The information provided on the Colville Estate (site 5 in Figure 9) confirmed that the assumptions made during data gathering were correct. During the stakeholders meeting it was stated the Britannia Leisure Centre site may also be redeveloped soon, which could present a good opportunity for its connection to a DH system serving the Colville Estate. However there is currently no information available about the proposed development.
- Cranston Estate (in the south west corner of the Borough) has been regenerated with the use of CHP and DH. The system has been developed with the capacity to extend the network to adjoining housing estates in the future, funding permitting. Potential extension sites include the Faibank Estate, where 72 out of the 118 units are still served by electric heating, and the Wenlock Barn Estate, which consists of 1,376 units.
- Homerton Hospital presents a good opportunity for DH and CHP given the high heat load, however this will depend on the nature of the existing building services and whether refurbishment work is planned to take place in the near future.
- Bridge House and Marian Court are two small estates to the south of the Homerton Hospital site that are part of the Estates Regeneration Programme. Bridge House is expected to start on site in October 2010.
- The Old Hackney Hospital site has not been included in Figure 9, but could potentially be of interest given the presence of a PCT building, a school and the John Howard Centre in close proximity. The PCT building submitted a planning application in early 2009 and the energy strategy proposed ground source heat pumps and solar PV panels. It is thought to be already under construction, therefore it is too late for it to be included in this study.
- The Nightingale Housing Estate has recently been regenerated and the college in the area has recently carried out extension works. As works have only just been carried out, it is unlikely that it will be acceptable to cause further disruption to develop a DH network.
- Berger School to the south west of Homerton station has recently been rebuilt with ground source heat pumps, under floor heating and solar panels on the roof, therefore it is not suited for connection even if the old Hackney Hospital site proved viable.

All the information collected was used to select the sites with the highest potential, which can then be taken forward for further consideration in the DEMaP programme.

4.4. List of preferred sites

Figure 12 below shows the list and location of the preferred sites selected after the data analysis and stakeholder engagement process and subsequent follow up with the London Borough of Hackney.

Preferred sites
1. Woodberry Down (and Manor House)
10. Gascoyne Estate and Homerton Hospital
6. City Road area
4. Dalston Town Centre
5. Colville Estate and Britannia Leisure Centre
8. Hackney Central Town Centre
9. Hackney Wick
2. Kings Crescent Estate
7. St Leonard's Hospital
12. Old Hackney Hospital
13. Cranston Road
14. Haggerston West and Kingsland + Haggerston Baths
15. Regents Estate

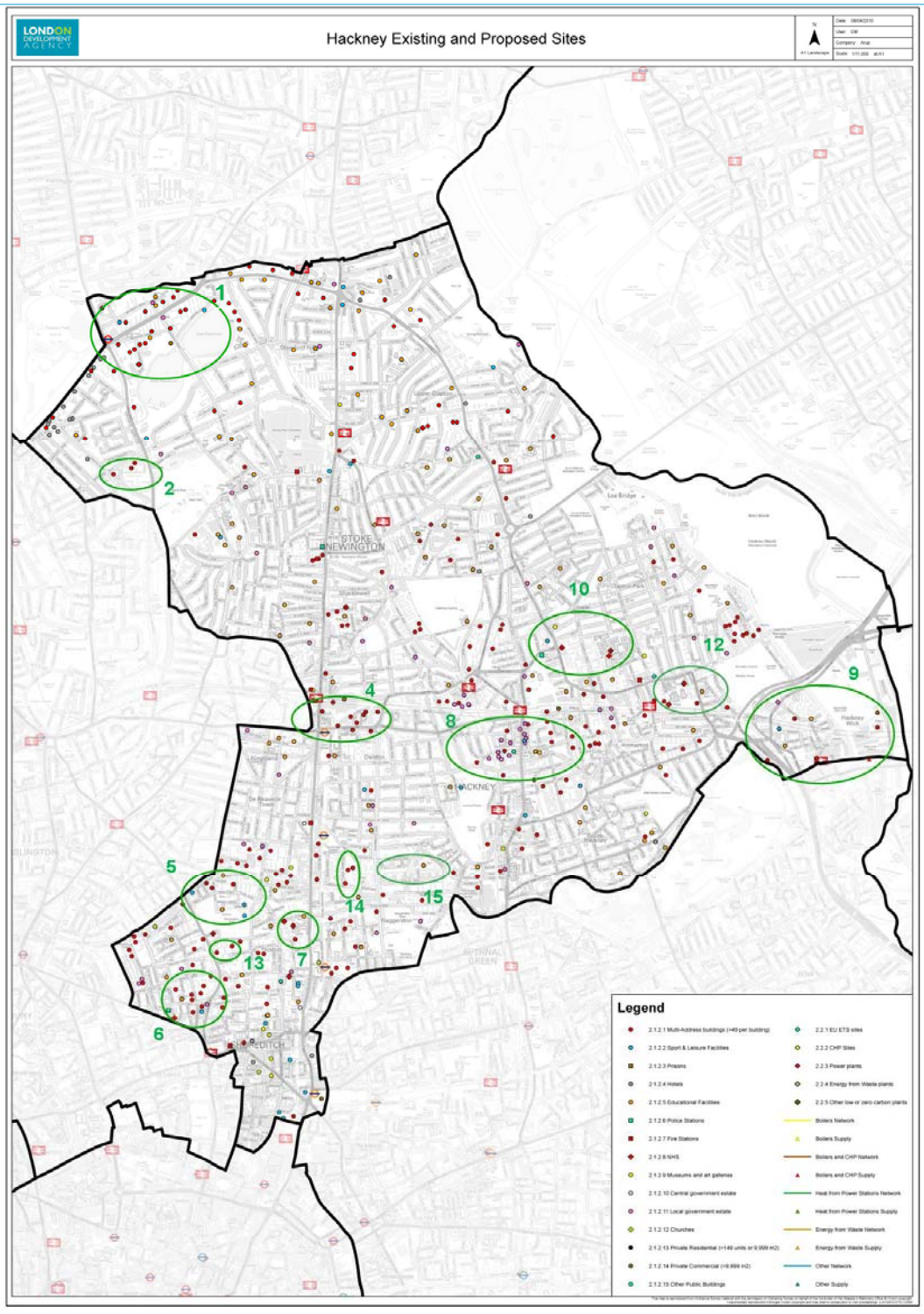


Figure 12: Preferred sites

These are the sites that appear to have the highest potential for development of district heating networks, however further investigation is required to reduce the list to the sites that could fit within the timeframe of the DEMaP programme. Given below are the main pros and cons associated with each of the selected sites.

Site Reference		Advantages	Disadvantages
1	Woodberry Down (and Manor House)	Large development with large proportions of Council owned development. Manor House is an Area Action Plan so LBH can potentially aid delivery. Potential for extension to high heat loads in Islington and Haringey	Very long phasing programme. Cooperation with other boroughs may affect programme.
2	Kings Crescent Estate and West Reservoir Leisure Centre	LBH ownership. Part of the site is already proposed to have DH and CHP. The DH system could benefit from extending to the Castle Climbing Centre.	It is quite a small site with little potential for extension in the short term.
4	Dalston Town Centre	Many mixed use developments, including redevelopment of a shopping centre, are proposed in the area providing a good base load. The site is an Area Action Plan so LBH can potentially aid delivery.	Relatively long phasing programme (depending on private developers coming forward). Presence of Overground lines could limit future extension of the network.
5	Colville Estate and Britannia Leisure Centre	Both the estate and leisure centre are planned to be redeveloped providing opportunity for installation of DH with minimum disruption. Proximity to other estates and public buildings present potential opportunities for extension.	There are few building types therefore the base load may be too low to make CHP viable.
6	City Road area	Many large, mixed use developments are proposed in the area providing very good heat loads. There may be opportunities for collaboration with Islington and potential connection of Moorfields.	Timing of proposed development north of City Road may be too far into the future for the DEMaP programme. Islington is already in Phase 3 of the programme so discussions on potential future connection need to take place as soon as possible.
7	St Leonard's Hospital	High heat demand with long running hours, so good base load. Its location presents good opportunities for further extension in the future (e.g. Geffrye Museum, Hackney Community College).	Development is expected to start on site this year so it may be too late for the site to be part of the DEMaP programme.
8	Hackney Central Town Centre	Many buildings are owned by LBH, which could make delivery easier. The site is an Area Action Plan so LBH can potentially aid delivery.	Many buildings are new therefore disruption caused by retrofit may prove unacceptable. Railway line could limit extension potential to the north.
9	Hackney Wick	Proximity to the Olympic site DH network may make connection easier. The site is an Area Action Plan so LBH can potentially aid delivery.	Timing of proposed development may be too far into the future for DEMaP programme. Presence of railway line and water courses may limit extension potential.
10	Gascoyne Estate and Homerton Hospital	Very high heat demand and good heat load for CHP. Proximity to LA housing estates presents an opportunity for extension.	Unlikely to be viable unless DH installation is part of wider planned refurbishment works.
12	Old Hackney Hospital	High heat demand and various buildings of different types could provide a good base load.	The PCT is already being built without DH and installation of DH in other buildings would probably only be considered as part of planned refurbishment works.

13	Cranston Road Estate	The site has been regenerated with the use of CHP and DH and has the capacity to extend the network to adjoining housing estates in the future.	Timing of proposed redevelopment of adjoining sites may be too far into the future for DEMaP programme.
14	Haggerston West and Kingsland + Haggerston Baths	High heat demand from 700+ units and baths. Energy centre already agreed for both sides of the canal. Housing development due to start imminently.	Timing and connection to the south across the canal could be unfeasible
15	Regent Estate	Would offer consolidation from 19 gas fired boilers which currently feed the estate of 297 flats. Potential connection to a Haggerston West and Kingsland system.	Unlikely to be viable unless DH installation is part of wider planned refurbishment works. Connection from HW and K could be cost prohibitive.

Table 6: Main advantages and disadvantages of preferred sites

5. Implementation plan

Table 7 and Table 7 below give a high level implementation plan for the preferred sites; the sites have been separated in existing buildings and new development. The aim of this is to help LBH and LDA to focus their efforts in investigating the sites further in order to establish the best ones to be taken forward to Phase 2 of the DEMaP programme.

Please note that the priority column is indicative only and it is based on information available to AECOM to date. The prioritisation is mostly based on technical feasibility (i.e. size of heat load, mix of uses and potential for extension), rather than short term deliverability. The prioritisation will significantly change depending on what is considered the most important assessment criteria. For example, if delivery in the short term is the priority, the preferred sites will be different than if ease of extension or overall CO_2 savings are the priority. For this reason it is recommended that further consideration is given to the prioritisation of the sites following further consultation with relevant members of LBH and the LDA's DEMaP team.

With regards to discussions with neighbouring boroughs, these contacts have been identified so far to begin communications:

London Borough of Islington	City of London
Charlotte Parkes Decentralised Energy Programme Environment & Regeneration Islington Council 222 Upper Street, London, N1 1XR Tel: 020 7527 3006 E-mail: Charlotte.Parkes@islington.gov.uk	Andrew Crafter Principal Engineer Property Services Division CHP and H&V Sections City Surveyor's Department City of London Corporation PO Box 270, Guildhall, London EC2P 2EJ Tel: 020 7332 1252 E-mail: Andrew.Crafter@Cityoflondon.gov.uk

With regards to discussing the real potential for some of the sites listed in the implementation plan, the following contacts have been identified:

Homerton Hospital NHS Trust	East London Foundation Trust (regarding St Leonard's Mental Health Unit)
Confidential	Confidential

Site ref. no.	DE Opportunity	Priority	Notes	Barriers	Next Steps	Key dates	Responsible person
	(Identified by location, name of development, scheme name or other)	(High, Medium or Low based on highest potential for delivery)	(Basis of assessment of delivery potential)	(Potential barriers for delivery of opportunity identified)	(Next steps for LA to facilitate delivery of opportunity identified)	(If action is not taken by this date the potential for delivery of the scheme may be reduced)	(Person responsible for taking action)
6	City Road area	High	Large, mixed use development, partly publicly owned proposed and various existing public buildings (23,000MWh/year from identified existing buildings in the area). Possible links with Cranston CHP, including Fairbank, Wenlock Barn and Arden Estate. Proximity to potential opportunity site in Islington. High potential for future extension.	Long development programme (of LBH sites)	Collect more detailed information on the proposed developments along City Road and their scheduling	Ideally in time with discussion with Islington	Project Manager for Old Street masterplan, Strategic Delivery Team, Regeneration and Planning, N&R
				Liaison with LB Islington is required	Liaise with Islington to discuss collaboration opportunities	ASAP as Islington is already in Implementation Stage of the DEMaP programme	Sustainability Officer, Conservation, urban design and sustainability team Regeneration and Planning, N&R
13	Cranston Estate	High	Heating mains renewed and in place in kickstart sites with risers currently being installed. Good potential for expansion. CESP funding is also being investigated for this site. LDA supported scheme.	Funding not secured from CESP	Submit CESP bid and secure funding	On-going	Head of Estate Renewal, Asset Management, Hackney Homes Sustainability Officer, Conservation, urban design and sustainability team Regeneration and Planning, N&R
10	Gascoyne Estate and Homerton Hospital	High	Publicly owned, high heat demand and good base load building (nearly 20,000MWh/year over 52,000m^2 floor area). Nearby housing estates present potential for future extension. There are 4 tower blocks containing 160 flats that currently are heated by storage heaters and hot water is provided by electric immersion heaters. No Decent Homes works have yet been carried out and are currently programmed for 2013 but negotiations about bringing the scheme forward are in progress. Cabinet will consider final programme proposals in July: new double glazed windows, new roof, new kitchens and bathrooms. The	Unlikely to be financially and practically viable unless part of planned refurbishment works	Contact relevant person at Homerton Hospital to establish refurbishment plans	No key date, but the sooner contact is made, the sooner site can be retained or removed from the list.	Sustainability Officer, Conservation, urban design and sustainability team Regeneration and Planning, N&R

			blocks are of 'Bison' large panel concrete construction and the u-values of external walls are poor. Gas cannot be piped in to the building because of the risk of progressive collapse in an explosion. Initial feasibility work suggests that there are easy routes through the building to run district heating mains. Option 1 would be a connection to the Olympic Park CHP plant. Option 2 would be a CESP bid for fuel switching (to gas fired CHP), external insulation, and fuel-metered district heating.				
14	Haggerston West and Kingsland + Haggerston Baths	High	761 unit housing development. Energy centre already agreed for both sides of the canal. Discussion initiated with Haggerston baths to connect to energy centre on south side if baths are refurbished (Grade 2* listed building). Baths at pre app discussion stage, with proposal for additional well being centre (24 month programme start to completion). Housing development due to start imminently.	Haggerston Baths refurbishment is subject to funding availability	Programme already developed and underway. Haggerston Baths already have sufficient support to make the necessary decisions. How the scheme will benefit from further LDA support is uncertain.	On-going	Head of Estate Renewal, Asset Management, hackney Homes Directorate Procurement Manager, N&R Sustainability Officer, Conservation, urban design and sustainability team Regeneration and Planning, N&R
15	Regents Estate	Medium	An estate of 297 flats, houses and maisonettes built in 1970s, currently heated via 19 gas-fired mini boiler houses. Not in Decent Homes programme because they pass decency standard. CERT bid for rationalisation of DHS to CHP. Possible extension of network to Ann Taylor Centre and London fields Lido. Timetable for delivery of heat network provided cert funding received: end of 2012	Funding not secured from CERT	Submit CESP bid and secure funding	On-going	Head of Estate Renewal, Asset Management, hackney Homes Sustainability Officer, Conservation, urban design and sustainability team Regeneration and Planning, N&R
5	Colville Estate and Britannia Leisure Centre	Medium	Large housing estate planned for regeneration. Leisure centre also planned for regeneration. Estimated heat demand of 6,500MWh/year over 68,000m^2 floor area of regeneration. Potential for extension of network in the future. C. 850 units newbuild. Kickstart site starting soon with 41 units (CHP) + 12 units (MVHR), June 2010 - July 2011. Next phases pending on funding availability.	Private developers will be involved	Ensure a strategic view of planning applications and conditions of approval (via development of a strong masterplan)	Ongoing, starting from May 2010, as masterplan for Colville Estate is just starting	Project Manager Colville Estate, Housing renewal team, Regeneration and planning, N&R
				Long development programme			
				Viability will depend on proposed redevelopment plans	Use planning process to steer proposals towards maintaining a good anchor load (e.g. swimming pool)	When initial enquiries relating to Britannia redevelopment are made	Case officer, Development Management, Regeneration and Planning, N&R

				Presence of Regent's Canal may limit potential for future extension of DH to the north	Carry out DH feasibility study, including assessment of potential for future extension	DEMaP Tranche 1 funding application deadline	Sustainability Officer, Conservation, urban design and sustainability team Regeneration and Planning, N&R
2	Kings Crescent Estate and West Reservoir Leisure Centre	Medium	LA housing estate partly to be refurbished and partly to be renewed. It is already planning to use CHP. Potential for connection to nearby leisure facilities. Estimated heat demand of 5,000MWh/year over 73,000m^2 floor area.	Lack of funding	Carry out financial feasibility study	ASAP as refurbishment work is already taking place	Asset Management Hackney Homes
				Refurbishment works already underway	Carry out energy strategy for whole site (i.e. if DH and CHP is to be included, the units being refurbished should be fitted with communal heating systems from now)		
7	St Leonard's Hospital	Low	Long operating hours provide a good anchor load (4,000MWh/year from existing NHS buildings). Publicly owned and planned for redevelopment. Proximity to sites with good potential for future extension (including Colville Estate and City Road Area)	Planning already agreed and start on site expected in autumn 2010	Establish if there is any opportunity to influence the energy strategy of the site	ASAP	Sustainability Officer, Conservation, urban design and sustainability team Regeneration and Planning, N&R LBH to speak to East London Foundation Trust and City & Hackney PCT
12	Old Hackney Hospital	Low	Mix of different building types provides good anchor load (4,000MWh/year over 25,000m^2).	PCT building is already under construction and housing proposed in the area does not have communal heating.	Establish whether refurbishment works are proposed for John Howard Centre and Cardinal Pole School	No key date, but the sooner contact is made, the sooner site can be retained or removed from the list.	LBH to speak to East London Foundation Trust

Table 7: Implementation plan for existing buildings

Site ref. no.	DE Opportunity	Priority	Notes	Barriers	Next Steps	Key dates	Responsible person
	(Identified by location, name of development, scheme name or other)	(High, Medium or Low based on highest potential for delivery)	(Basis of assessment of delivery potential)	(Potential barriers for delivery of opportunity identified)	(Next steps for LA to facilitate delivery of opportunity identified)	(If action is not taken by this date the potential for delivery of the scheme may be reduced)	(Person responsible for taking action)
1	Woodberry Down (and Manor House)	High	LBH led masterplan. Good mix of building types provides good base load (23,000MWh/year expected over 390,000m^2 floor area). There is potential for connections to nearby sites in the future, including in neighbouring boroughs Haringey and Islington.	Very long phasing programme (at present estimated to 2027)	LBH to liaise with LB Haringey and LB Islington to discuss potential connections	ASAP and ongoing	Sustainability Officer, Conservation, urban design and sustainability team Regeneration and Planning, N&R
				Delivery will depend on rate of development	Woodberry Down LBH team to liaise with LBH Manor House team to ensure strategic approach	ASAP and ongoing	Project manager Manor House AAP, Strategic Delivery Team, Regeneration and Planning, N&R
					Strategic plan to be considered as detailed planning applications are produced	As and when detailed planning applications are developed	Case officer, Development Management, Regeneration and Planning, N&R
9	Hackney Wick	High	The area is an opportunity site for large mixed use development, which could provide a good anchor load. DH is already planned for the Olympic part of the site. Site is covered by Area Action Plan meaning LBH could potentially aid delivery, furthermore there is considerable development planned in the area. A heat demand of 14,000MWh/year has been estimated for 200,000m^2 of development assumed. Total no. of Hackney Homes housing estates have been identified that can be served by the CCHP on the Olympic site. Clapton Park Estate – 3 small communal heating/hw systems, all gas fired at Belper Court (21 flats), Longford Court (75 flats) and Kirkstead Court (74 flats). Sherrys Wharf Estate – Larger gas fired DHS serving 60 flats and houses. Trowbridge Estate – Larger gas fired DHS serving 116 flats and houses. Gascoyne 2 Estate/Wyke Estate – no DHS, all individual gas boilers. However 140 flats	Private developers will be involved	Ensure AAP develops with strong support for DH	Ongoing (key dates as per Local Development Scheme)	Project manager Hackney Wick AAP, Strategic Delivery Team, Regeneration and Planning, N&R
				Long development programme (2013 - 2018)	Ensure a strategic view of planning applications and conditions of approval	Ongoing	Strategic Delivery team and relevant planning officers
					Ensure collaboration with LDA on plans for Olympic Games and Legacy	Ongoing	Regeneration Manager, 201Project manager Hackney Wick AAP, Strategic Delivery Team, Regeneration and Planning, N&R2 Team, Regeneration and Planning, N&R
				Presence of railway line and River Lee Navigation canal may affect financial viability	Carry out DH feasibility study	DEMaP Tranche 1 funding application deadline	Sustainability Officer, Conservation, urban design and sustainability team Regeneration and Planning, N&R

			in 4 tower blocks have electric storage heaters. There are easy routes through the buildings for heating mains. Ideal for conversion to heat network.				
4	Dalston Town Centre	High	The area is an opportunity site for large mixed use development, which could provide a good anchor load. Site is covered by Area Action Plan meaning LBH could potentially aid delivery, furthermore there is considerable development planned in the area. A heat demand of 14,200MWh/year has been estimated for opportunity sites in AAP phase 1.	Private ownership	Ensure AAP (Phase 2) develops with strong support for DH. Ensure implementation of Phase 1 AAP continues with strong support for DH.	Ongoing (key dates as per Local Development Scheme and as per Phase 1 AAP Implementation Plan)	Project manager Dalston Town Centre AAP, Strategic Delivery Team, Regeneration and Planning, N&R
				Long development programme (2010 – 2022)	Ensure a strategic view of planning applications and conditions of approval (e.g. require oversized energy centres for large developments surrounded by small ones that could not accommodate their own plant room)	Ongoing	Project manager Dalston Town Centre AAP, Strategic Delivery Team, Regeneration and Planning, N&R
				Presence of Overground lines may limit future extension of DH network	Carry out DH feasibility study, including assessment of potential for future extension	DEMaP Tranche 1 funding application deadline	Sustainability Officer, Conservation, urban design and sustainability team Regeneration and Planning, N&R
8	Hackney Central Town Centre	Medium	The area is an opportunity site for large mixed use development, which could provide a good anchor load. Many existing buildings are owned by LBH. Site is covered by Area Action Plan meaning LBH could potentially aid delivery. A heat demand of 4,000MWh/year has been estimated for opportunity sites in AAP phase 1. Potential extension to electrically heated Gascoyne Estate.	Private developers will be involved	Ensure AAP (Phase 2) develops with strong support for DH. Ensure implementation of Phase 1 AAP continues with strong support for DH.	Ongoing (key dates per Local Development Scheme and as per Phase 1 AAP Implementation Plan)	Project manager Hackney Central Town Centre AAP, Strategic Delivery Team, Regeneration and Planning, N&R
				Long development programme (2010 – 2022)	Ensure a strategic view of planning applications and conditions of approval	Ongoing	Project manager Hackney Central Town Centre AAP, Strategic Delivery Team, Regeneration and Planning, N&R
				Many LBH buildings are new meaning that further disruption may be unacceptable	Discuss with LBH facilities management current facilities situation and assess potential for connection to DH	DEMaP Tranche 1 funding application deadline	Sustainability Officer, Conservation, urban design and sustainability team Regeneration and Planning, N&R
				Presence of railway line may limit future extension of DH network	Carry out DH feasibility study, including assessment of potential for future extension		

Table 8: Implementation plan for proposed development

6. Conclusions

The aims of the project were:

- To collect actual heating energy data from as many buildings as possible within the London Borough of Hackney in order to update the London Heat Map;
- To use the information collected to select a number of priority sites for further investigation into the feasibility of delivering district heating networks in the Borough.

Data on energy consumption was collected from publicly available sources such as NI 185 database and the NHS Hospital Estates and Facilities Statistics. Various public and private building owners were also approached requesting energy consumption information. A large number of the organisations approached were not able to provide information within the project's timeframe, however it was possible to collect data for most of the major building types in the Borough.

As considerable development will be taking place in the Borough in the near future, the energy consumption of the proposed buildings also had to be considered. Indicative quantum of development figures were provided by various members of LBH and preliminary benchmarks were used to predict the energy demands of future development. The LDA will review these benchmarks and update them with figures that will be applied to the whole of London. The data in the spreadsheet collection tool can then be updated prior to uploading to produce the revised London Heat Map.

The data collected was used to generate maps showing the types of buildings and their location. As an updated heat map could not be produced by the LDA within the project's timeframe, a "hybrid" map was produced by AECOM showing the energy consumption data collected against the background of the London Heat Map. The aim of this map was to highlight the areas where buildings and building types with the highest heat loads are concentrated.

The maps produced were used to identify areas in the Borough with a high potential for the development of district heating systems. The criteria used to identify these sites were as follows:

Technical viability criteria	Financial viability criteria	Deliverability criteria
• Size of heat loads • Type of building • Proximity to other high potential buildings • Phasing of development • Potential for extension of network	• Ownership of building • Financial delivery mechanisms • Length of pipe work • Potential for extension of network • Presence of existing Energy Services Companies (ESCos)	• For existing buildings – Proposals and extent of refurbishment • For new buildings – Proposals for energy strategy • Timescales and phasing of proposed refurbishment / development • Practical barriers to district network installation (e.g. railways, utilities)

The preferred sites were discussed with relevant stakeholders to gain a better understanding of their current and future situation. The information gathered was used to reduce the list of sites and highlight any barriers or actions necessary to allow the delivery of district heating networks. A high level implementation plan was then developed.

The list of preferred sites and their delivery potential is summarised below.

Site ref no	DE Opportunity	Priority	Key characteristics	Next Steps
6	City Road area	High	Existing housing estates needing upgrades could provide an initial anchor load to be expanded with connection to proposed mixed use development.	Collect more detailed information on the proposed developments in the City Road area and their timing Liaise with Islington to discuss collaboration opportunities
13	Cranston Road	High	The site has been regenerated with the use of CHP and DH. Heating mains renewed and in place in some key areas. Offers the potential for expansion to adjoining sites. This is a LDA supported scheme.	Carry out DH feasibility study for the extension of the CHP system to neighbouring estates. Submit CESP bid and secure funding
14	Haggerston West and Kingsland + Haggerston Baths	High	Programme is already planned and ongoing	Carry out financial feasibility study perhaps separating out the option of including the baths in the scheme.
2	Kings Crescent Estate and West Reservoir Leisure Centre	Medium	Refurbishment works currently taking place present a great opportunity to prepare the retained units for connection to the proposed DH for the new units.	Carry out energy strategy for whole site (i.e. if DH and CHP is to be included, the units being refurbished should be fitted with communal heating systems from now)
5	Colville Estate and Britannia Leisure Centre	Medium	Masterplan for estate redevelopment is being designed now therefore there is high potential for influencing the output. Proximity of Leisure Centre and other estates present opportunities for DH extension.	Ensure a strategic view of planning applications and conditions of approval (via development of a strong masterplan) Use planning process to steer proposals towards maintaining a good anchor load (e.g. swimming pool) Carry out DH feasibility study, including assessment of potential for future extension
15	Regents Estate	Medium	Timetable for delivery of a heat network provided cert funding is received would be scheduled for the end of 2012 which should meet the DEMaP programme schedule.	Carry out energy strategy for whole site, consider the implications for including as part of a wider scheme or standalone. Submit CESP bid and secure funding
10	Homerton Hospital and estates	Medium / Low	Good anchor load but potential for CHP will depend on whether heating system upgrade is planned for the near future.	Contact relevant person at Homerton Hospital to establish refurbishment plans
7	St Leonard's Hospital	Low	Good anchor load but due to start on site later in 2010, therefore the design may be too progressed to be influenced by the DEMaP programme.	Establish if there is any opportunity to influence the energy strategy of the site
12	Old Hackney Hospital	Low	Good anchor load but PCT building is already on site, therefore it is probably too late for DEMaP programme to influence design.	Establish whether refurbishment works are proposed for John Howard Centre and Cardinal Pole School

Table 9: Summary of preferred sites – existing buildings

Site ref no	DE Opportunity	Priority	Key characteristics	Next Steps
1	Woodberry Down (and Manor House)	High	Large development, mostly in LBH's control. Long development programme (present to 2027).	LBH to liaise with LB Haringey and LB Islington to discuss potential connections Woodberry Down LBH team to liaise with LBH Manor House team to ensure strategic approach Strategic plan to be considered as detailed planning applications are produced
9	Hackney Wick	High	High potential for extension of the Olympic DH network.	Ensure AAP develops with strong support for DH Ensure a strategic view of planning applications and conditions of approval Ensure collaboration with LDA on plans for Olympic Games and Legacy Carry out DH feasibility study
4	Dalston Town Centre	High	Good anchor load but potentially long development programme (2010-2022).	Ensure Phase 2 of AAP develops with strong support for DH Ensure a strategic view of planning applications and conditions of approval (e.g. require oversized energy centres for large developments surrounded by small ones that could not accommodate their own plant room) Carry out DH feasibility study, including assessment of potential for future extension
8	Hackney Central Town Centre	Medium	Good anchor load but potentially long development programme (2010-2022).	Ensure Phase 2 of AAP develops with strong support for DH Ensure a strategic view of planning applications and conditions of approval Discuss with LBH facilities management current facilities situation and assess potential for connection to DH Carry out DH feasibility study, including assessment of potential for future extension

Table 10: Summary of preferred sites – proposed development

Please note that the list of sites provided is based on the data collected to date and the information gathered during this project. The list of sites and their prioritisation may well change as more data becomes available and more specific information is gathered about plans and timing for the individual sites.

It is recommended that the list of sites and their order of priority is reviewed on a regular basis as more information on plans for regeneration or redevelopment becomes available.

Appendix A – Compiled LDA spreadsheet template

Final version of the compiled LDA spreadsheet provided electronically under separate cover.

Appendix B – LDA Hackney site location maps

Electronic versions and hard copies of the maps in Figure 6 provided under separate cover.