OPDC
OLD OAK AND PARK ROYAL DEVELOPMENT CORPORATION

Old Oak Decentralised Energy

LOCAL PLAN SUPPORTING STUDY

Draft for Regulation 18 Consultation
4 February 2016

Role of this study

This study has been produced to inform the draft Local Plan and should be read alongside other relevant studies, the draft Local Plan and the London Plan.

Study overview

Document title	**Smart Strategy Interim Report**
Lead author	Greater London Authority
Purpose of the study	Review of the potential for a decentralised energy network to supply the Old Oak with competitive low to zero carbon heat.
Stage of production	Draft completed to inform Regulation 18 version of the Local Plan
Key outputs	A review to determine the potential for a heat network to supply the Old Oak Common Opportunity Area with competitive low to zero carbon heat. Draft recommendations include: ■ There is potential for a Decentralised Energy (DE) heat network to supply low or zero carbon. ■ The DE system could be delivered in phases which early indicators show could be based on: Phases 1 and 2 between 2016 – 2025, and Phases 3 and 4 combined from 2025 – 2050. However, more work is needed to develop a comprehensive Utilities and Energy Strategy. ■ The proposed initial energy production plant would comprise of three energy centre buildings. The energy centres could be consolidated into a single energy centre by 2031 provided the heat network is dimensioned for this duty. ■ The overall network length would be approximately 8.2km. ■ High-level CAPEX for plant and distribution pipework to serve the phases has been estimated at £32.5m.
Key recommendations	■ Produce an Energy Masterplan once the development quantum is better defined. The EMP should consider energy centre locations and options in more detail which may lead to changes in the proposed energy requirements and network. ■ Co-ordinate infrastructure operators ■ Co-ordinate the production of the energy masterplan with other utility planners and interested parties including transport, water, gas, electricity and land developers. ■ Consider alternative energy sources / technologies ■ Assess opportunities for the use of other energy sources including energy from waste, heat pumps, and secondary heat sources etc. ■ Consider connecting to nearby DH networks ■ Opportunities to connect to the nearby decentralised energy developments proposed at White City and Wembley to be considered.

Relations to other studies	Outputs to inform forthcoming Utilities and Infrastructure Strategy. Outputs to inform and be informed by Green Infrastructure and Open Space Strategy, Public Realm Strategy, Integrated water Management Strategy, and Smart Strategy.
Next steps	The Strategy is in draft and is available for comment. Necessary revisions will be made following public consultation before the document is finalised to sit alongside the Regulation 19 consultation on the Local Plan.

Consultation questions

1. Do you agree with the recommendations of this supporting study? If not, please explain why.
2. Do you agree with the methods used in delivering the recommendations? If not, please set out alternative approaches and why these should be used.
3. Are there any other elements which the supporting study should address? If yes, please define these.

You can provide comments directly through:

opdc.commonplace.is

DECENTRALISED ENERGY FOR LONDON

Old Oak Decentralised Energy Strategy

Document Verification

Project Title	**Old Oak Common Energy Strategy**	Job Number	**218060-26**
Report Title	**Old Oak Common Energy Strategy**	File Reference	**218060-016-03**

Revision	Date		Prepared By	Checked By	Approved By
Issue 1	22/06/2015	Name	Julius McGillivray	Oliver Pitchers	Peter North
		Signature			
		Name			
		Signature			
		Name			
		Signature			

Table of Contents

Executive Summary

This Energy Strategy presents the results of the work carried out to determine the potential for a heat network to supply the Old Oak Common Opportunity Area with competitive low to zero carbon heat.

The report follows the publication of the GLA's Old Oak and Park Royal Opportunity Area Planning Framework (2015), and presents the findings of the Energy Strategy assessment.

Key Findings

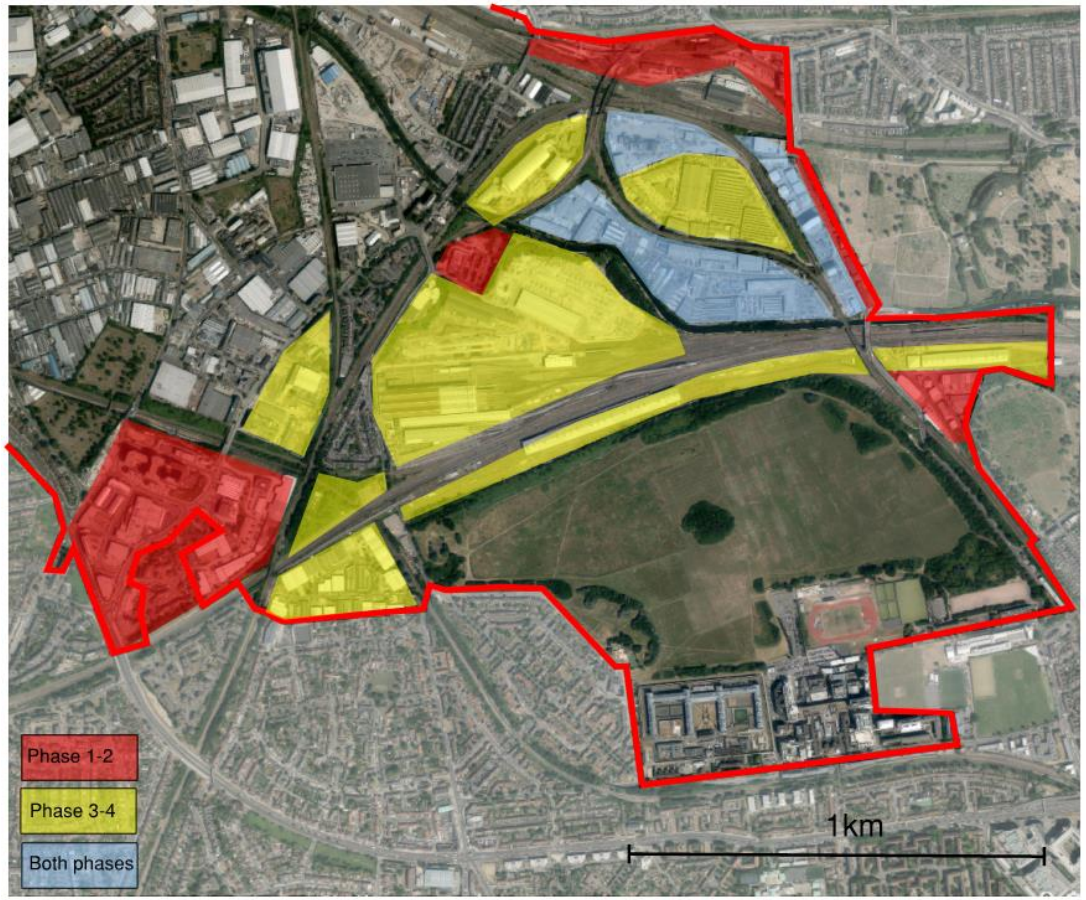
- There is potential for a Decentralised Energy (DE) heat network to supply low or zero carbon heat to more than 24,000 new homes as part of the redevelopment of the Old Oak Common area.
- The DE system would be delivered in four phases, comprising: Phases 1 and 2 between 2016 – 2025, and Phases 3 and 4 combined from 2025 – 2050+in accordance with the building development forecasts.
- The proposed initial energy production plant would comprise gas-fired CHP, supplemented by gas boilers, accommodated within three energy centre buildings. The energy centres could be consolidated into a single energy centre by 2031 provided the heat network is dimensioned for this duty.
- The overall network length would be approximately 8.2km.
- High-level CAPEX for plant and distribution pipework to serve the phases has been estimated at £32.5m.

Next Steps

1. Develop an energy masterplan to refine the findings of this report when the development quantum is better defined.
2. Co-ordinate with other infrastructure developments involved on the site e.g. transport, water, electricity etc.
3. Consider alternative low-carbon energy sources and technologies.
4. Consider opportunities for connecting to nearby existing and future DE networks.

Strategic Approach

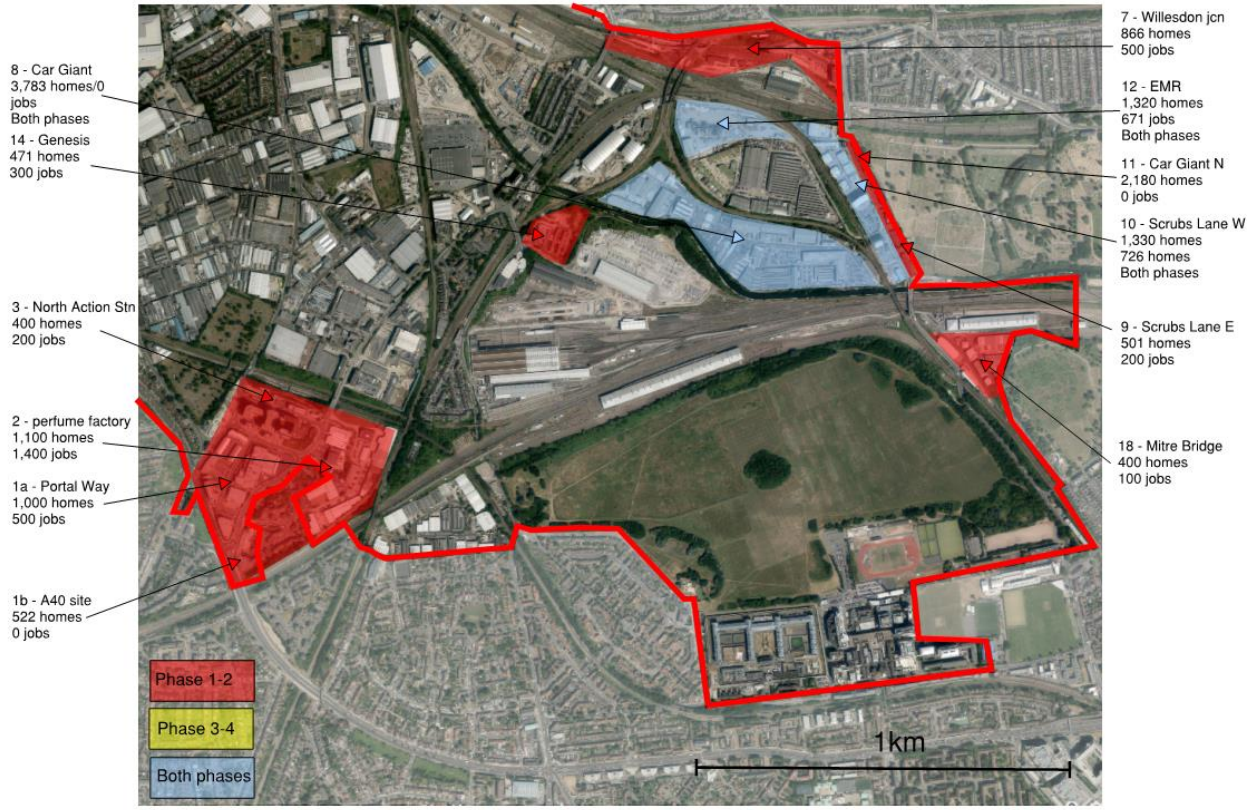
The Old Oak Common area will be redeveloped broadly in 4 phases over the next 30 or so years. The early feasibility of using a DE network to supply 24,000 new homes from dedicated energy centres has been considered.



- The Old Oak Common Opportunity Area is being regenerated to create a sustainable new neighbourhood, to comprise at least 24,000 new homes and 55,000 jobs.
- This Decentralised Energy Strategy addresses projected heating and cooling requirements and the potential for connecting to local district heating networks at White City and Wembley.
- The proposed development of a DE network to serve this redevelopment would be carried out in four phases.
- In Phases 1-2 (2016-2025), the DE network and initial energy centre would be developed to supply energy to around 8,600 homes, including mixed house types and tenures.
- Phase 3-4 (2026-2050+) would see the expansion of plant capacity, now co-located within 2 or 3 energy centres, to serve a further 15,500 homes.
- The space requirements for the energy centres have been assessed on the basis of primary heat (and power) generation from gas-fired CHP, supplemented with gas boilers.

Opportunity Analysis – Phase 1 & Phase 2 (2016-2025)

The proposed DE network would supply energy from a dedicated energy centre to over 8,000 homes as part of phases 1 & 2 of the redevelopment. Operation of CHP would be supplemented by gas boilers to meet peak demand, estimated at 24MW.



Phase 1: Sites 1a, 1b, 2 and 3 (North Acton Area)

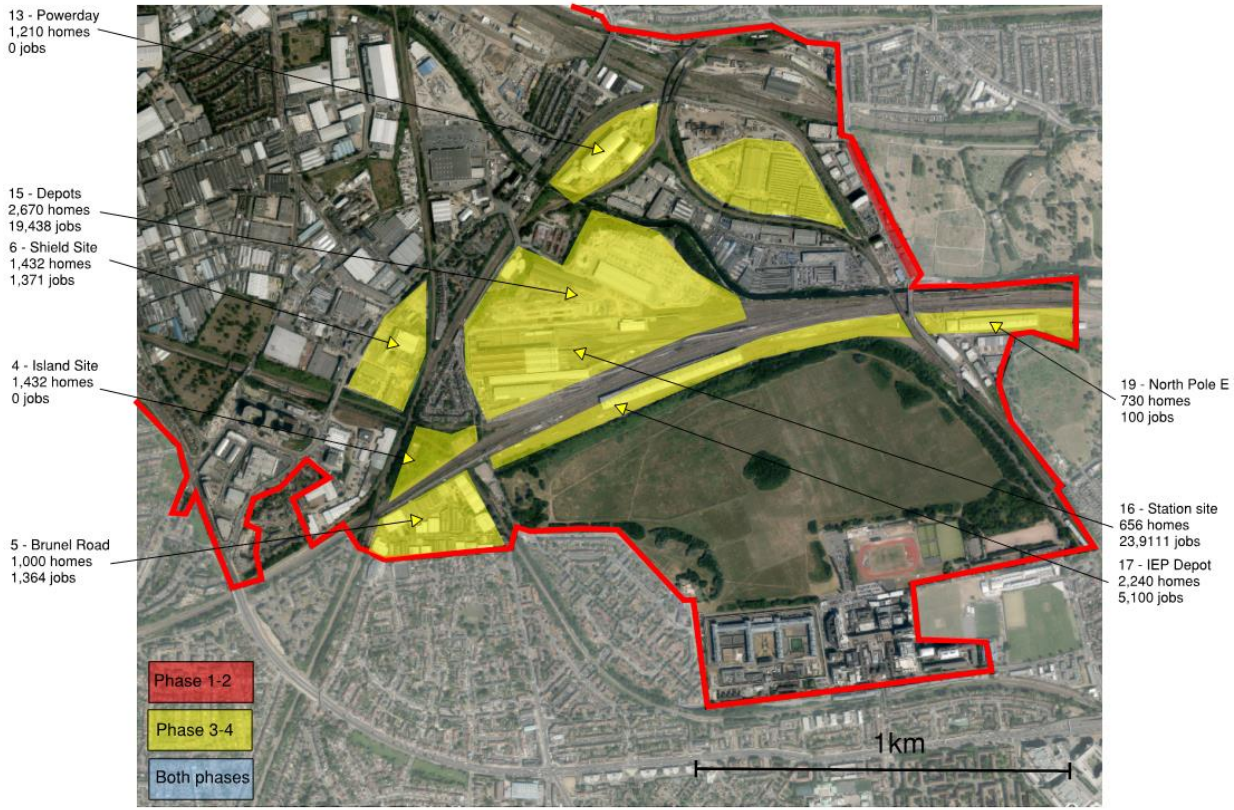
- The DE network would supply approximately 3,000 homes in Phase 1, plus 20,900m^2 of commercial floor-space totalling approximately.
- CHP plant nominally sized at 770 kWe (from start year 2018), plus gas boilers of 8,650 kW, requiring a combined energy centre footprint of 650m^2.
- Network length (main transmission) would be approximately 1.2 km, with a maximum nominal diameter of DN250.

Phase 2: Sites 7, 8 (54.3%), 9, 10 (91.3%), 11, 12 (92.5%), 14, 18

- Approximately 5,600 additional homes supplied by the DE network in Phase 2, plus additional commercial floor-space of approximately 22,800m^2.
- CHP plant nominally sized at 2.1 MWe (start year 2020) and total gas boiler capacity of 24 MWe, requiring an energy centre footprint of around 1,500m^2.
- The network length (main transmission) will be approximately 3 km long with a maximum nominal diameter of DN300, based on supplying solely Phases 1-2 (depending upon network layout, pipe diameter may be future-proofed to serve additional load from later phases).

Opportunity Analysis – Phase 3 & Phase 4 (2026-2050)

A single energy centre would supply energy to a further 15,500 homes as part of phases 3 & 4 of the scheme. Operation of CHP would be supplemented by gas boilers to meet peak demand, estimated at 66MW. Phase 1 and 2 energy centres could be consolidated into this energy centre by 2031

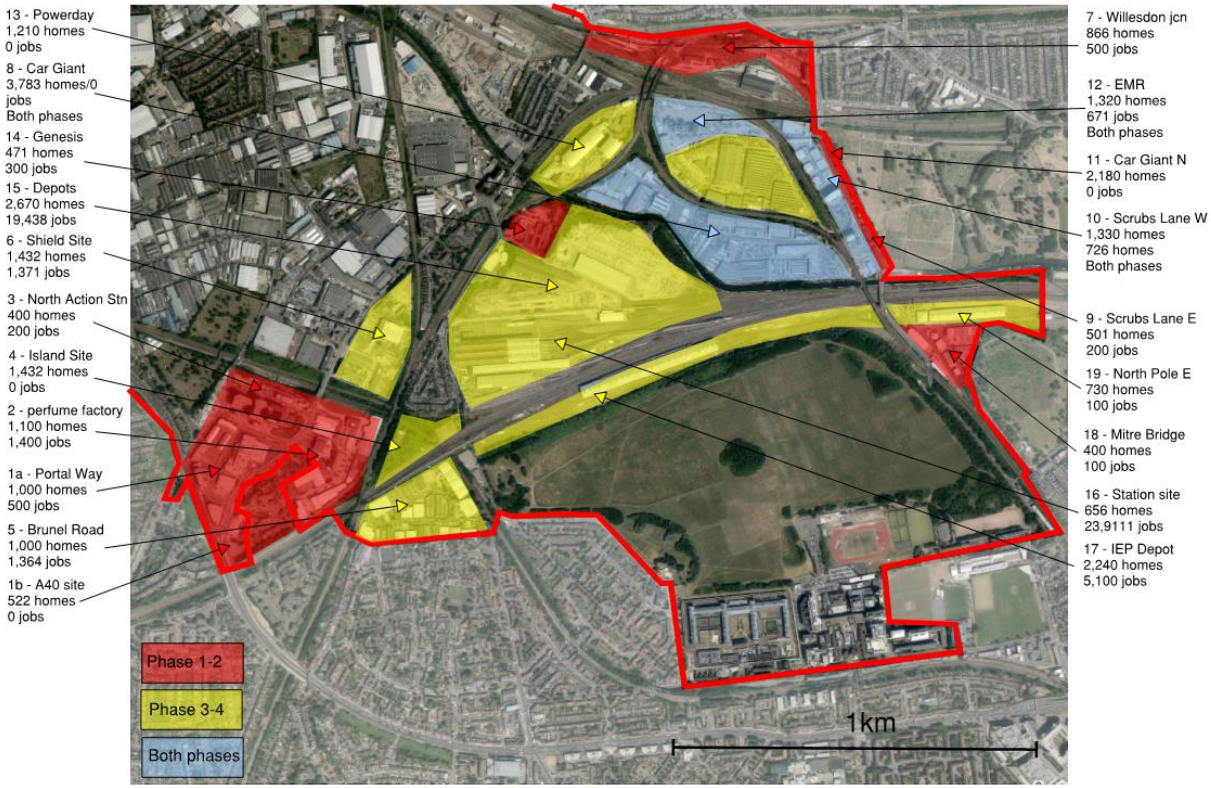


Phase 3-4: Sites 4, 5, 6, 8 (45.7%), 10 (8.7%), 11, 12 (7.5%), 13, 15, 16, 17, 19

- The District Heating (DH) network will supply approximately 15,500 further homes in phases 3 and 4, making a combined total of over 24,000.
- This includes additional commercial floor-space of approximately 560,000m^2, totalling around 604,000m^2 for the whole scheme.
- CHP plant nominally sized at 6 MWe (start year 2031), plus gas boilers of 66,000 kW. would require an energy centre foot print of approximately area of 3,800m^2
- Consolidating the two phase 1 and 2 energy centres in year 2031 into the phase 3 and 4 energy centre would increase the plant size to 8 MWe CHP and 90 MW of gas boilers and require an energy centre area of around 5,500m^2.
- Final plant capacities may be rationalised once split of plant and energy centres is determined.
- The length (main transmission) for the Phase 3-4 network had been estimated at around 4 km long, with maximum nominal diameter DN550.
- Approximate total transmission pipe length for the scheme of 8.2 km, with final lengths (and diameters) subject to detailing of development layouts.

Commercial Analysis – Phases 1 - 4

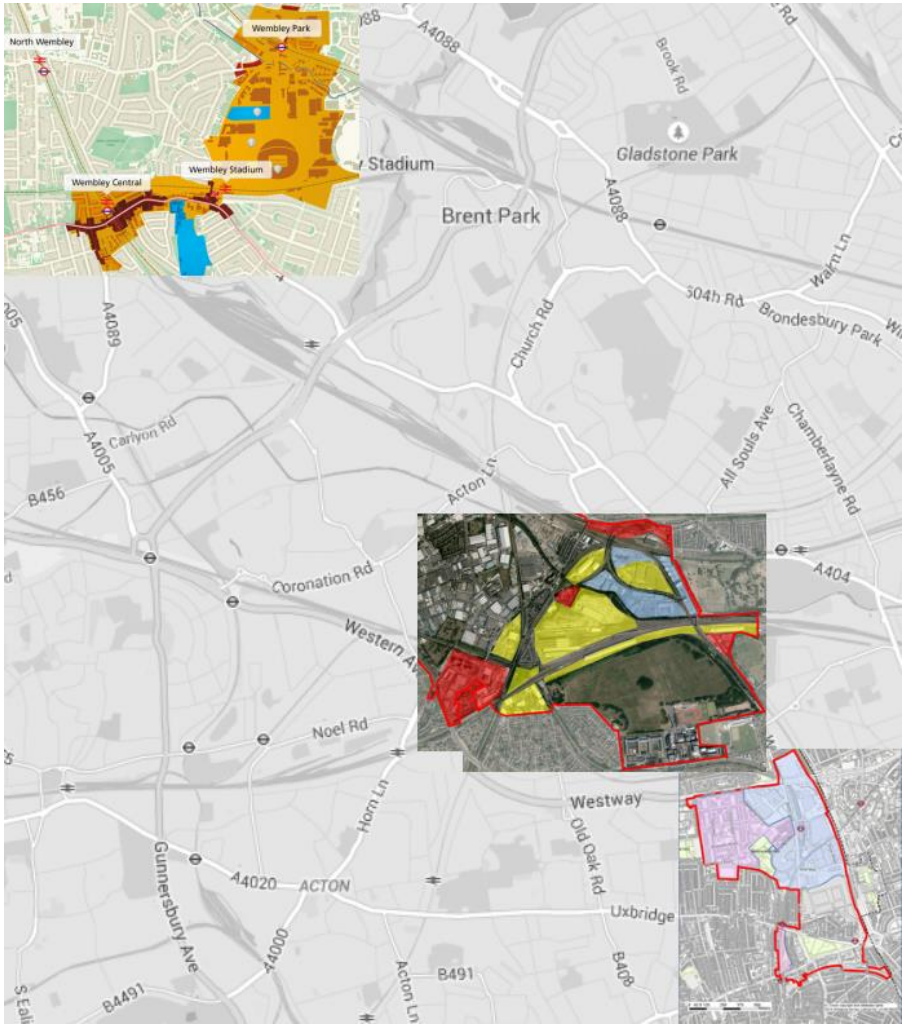
The development of a District Heating network for the Old Oak area, comprising energy centres and distribution pipework, is estimated to cost £32.5 million.



- Discrete CAPEX figures for development of plant and networks to serve the Phases of development have been estimated as follows:
  - Phase 1: £4.5m
  - Phase 2: £9m
  - Phases 3 and 4: £19m
- These costs have been built-up on the basis of plant and distribution pipework necessary to meet the estimated combined heat loads for the 24,000 homes and 604,000m^2 of commercial floor space.
- In the absence of development area layouts, it has not been possible to determine and cost numerous additional scheme components.
- Key aspects of excluded costs in lengths of secondary and tertiary pipework required to connect to specific buildings and homes. These are normally met by the building developer
- The density of build-out for the area will have a big impact upon the ultimate costs of a connecting heat network.
- More detail study work is required to refine the project costs.

Adjacent Regeneration Areas

Old Oak Common is one of a number of major regeneration areas within West and North-West London. Consideration for a integrated approach to energy masterplanning for these is recommended.



- In addition to redevelopment plans for the Old Oak Common area plans exist for similar redevelopment of the Wembley and White City area.
- The approximate positions of these areas are indicated opposite.
- The White City regeneration area is of a similar scale to that of Old Oak Common and is almost directly adjacent to the south of the area.
- With parallel requirements to consider strategies for delivering affordable low carbon energy to regeneration areas, an integrated approach to considering DE opportunities should be considered.

Conclusions and Recommendations

The Energy Strategy has identified an opportunity for a DE heat network as part of the redevelopment of the Old Oak Common area. The following next-steps are recommended.

The Energy Strategy should be used as the basis to inform future planning policy in the Local Plan. The next steps include:

1. Produce an Energy Masterplan

An Energy Masterplan (EMP) should be carried out once the development quantum is better defined. The EMP should consider energy centre locations and technologies options in more detail, heat network routing and building connection principles defined. The capital investment costs should be determined at a higher level of detail.

2. Co-ordinate infrastructure operators

Co-ordinate the production of the energy masterplan with other utility planners and interested parties including transport, water, gas, electricity and land developers. This will be particularly relevant for the network routing study to ensure that heat network planning is coordinated with other development plans in the area.

3. Consider alternative energy sources and technologies

Assess opportunities for the use of other energy sources including energy from waste, heat pumps, and secondary heat sources etc.

4. Consider connecting to nearby DH networks

Opportunities to connect to the nearby decentralised energy developments proposed at White City and Wembley should also be considered as part of the next phase of development work.