

December 2011

Olympic Legacy Supplementary Planning Guidance

## Energy Study



This study was prepared by the Greater London Authority



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## Executive Summary

London's hosting of the 2012 Olympic and Paralympic Games at Stratford and the creation of a purpose built district energy scheme that will be owned, operated and maintained by COFELY for the next 40 years provides a unique opportunity to share and expand the benefits of low-carbon energy generation and distribution into the area's surrounding the main Olympic site in the Legacy period after the Games.

Specifically, the Olympic Park District Energy Scheme (OPDES) that supplies heating and cooling to the Olympic Park and Westfield's development at Stratford City has the ability to serve new and existing developments in the Olympic Legacy Supplementary Planning Guidance (OLSPG) area as well as the development platforms within the Olympic Park.

The OPDES is expected to expand substantially over the coming years, supported by the existing and emerging planning policies of the 'host' Boroughs of Hackney, Tower Hamlets, Newham and Waltham Forest and the Mayor of London as set out the London Plan.

However, success is not without challenges, and there are a number of commercial, regulatory and technical issues that will need to be addressed by stakeholders, in particular public authorities, the Olympic Park Legacy Company (OPLC), major developers and landowners in the OLSPG area, and COFELY (the OPDES scheme owner and operator).

Furthermore, recent and proposed changes to Building Regulations, along with the requirements of the Mayor's London Plan, will require residential developers to comply with higher CO<sub>2</sub> reduction targets as set out in Policy 5.2 of the London Plan.

The OPDES provides low carbon heat and cooling from a number of sources including natural gas-fired Combined Heat & Power (CHP), biomass and biofuel boilers as well as conventional back-up heating and cooling plant. One advantage of this scheme is that it is capable of delivering heat from any energy source. This fact, coupled with the modular design of the two Energy Centres, enables new energy production technologies to be incorporated alongside the existing equipment, enabling the most appropriate mix of fuels and technologies to be deployed in the future.

Depending on the degree of change to current Building Regulations, further reductions in the carbon content of delivered heat and cooling may be required. This could involve operating existing plant in a different configuration or by using renewable fuels in some of the existing plant, although there are technical challenges with the latter option in particular. However, despite these challenges, overall it is likely that it will be more cost effective to deliver the additional carbon savings centrally and at scale, rather than by deploying discrete and disconnected renewable solutions on individual development sites.

One such option that has been considered for the future is the use of waste as a renewable source of fuel. Such a solution presents a number of technical, as well as commercial, issues, for example in relation to the quality and availability of the waste stream that would need to be resolved before progressing this as a deliverable & feasible option. However, commitment has been shown by the relevant stakeholders and further progress is expected.

Expansion of the network is however currently constrained by a lack of available exit points from the Park into neighbouring areas and this Study has therefore identified four key points where new connections should be provided to facilitate such an expansion. A further five transport corridors have been identified in the Legacy Communities planning application submitted by the OPLC in October 2011 (see Section 5.3 for more details) , which will be assessed by the GLA and may be referenced in the final OLSPG.

Provision should therefore be made within the design of new or improved bridges and these four areas to incorporate district heating pipes and infrastructure as set out in section 2.E of the draft OLSPG. This is described more in detail in Section 5.2 of this Study.

Where existing infrastructure is not suitable for crossings, bespoke pipe gentries or tunnels could potentially be used although these are likely to be more expensive and could potentially limit the economic viability of extensions to the network.

## 1 Introduction

The Mayor is committed to supporting the deployment of decentralised energy in London in order to develop a more sustainable, secure, cost-effective and low to zero carbon energy supply in the capital. The Mayor has set a target to supply a quarter of London's energy from decentralised sources by 2025.

The Mayor, through the London Development Agency, and with the London Thames Gateway Development Corporation have already invested in the extension of the Olympic Park district energy network outside the Park effectively enabling the delivery of the Olympic Legacy benefits in advance of the games. This work marked the start of the expansion of the district energy network outside the Park boundary.

This Study provides guidance to ensure the scheme's continued expansion and to help realise the contribution that it can make towards the Mayor's climate change targets for London.

In addition to this, this Study presents the key regulatory, commercial and technical issues that will influence the future development of the district energy network that serves the 2012 London Olympic and Paralympic Games, Stratford City and legacy developments in the east end of London.

It also provides technical background to Development principle E1 (Energy), to support the intentions in relation to energy stated within the 'Sustainable development' chapter of the OLSPG, prepared by the Greater London Authority (GLA). This document is based on the information available at the time of writing<sup>1</sup>, and therefore data presented here, such as projected demands and capacities of the OPDES may change once Planning Permission is granted or qualified accordingly.

## 2 Description of the OLSPG area

The OLSPG area lies within the boundaries of the London Boroughs of Hackney, Tower Hamlets, Waltham Forest and Newham (see figure 2, Section 4), and the consultation draft OLSPG anticipates that most new development in the OLSPG area over the next 20 years will be located close to the Olympic Park and Stratford City and that the more peripheral areas to the north, east and west comprise existing relatively low density housing that are unlikely to significantly change over this period. The OLSPG area contains one large hospital, Homerton and some industrial activity will be retained along the River Lea and its waterways.

The OPDES is being delivered for the 2012 Olympic and Paralympic Games and the adjacent Stratford City development. This scheme has the capacity to expand into the surrounding areas, providing an opportunity for the benefits of the investment in the scheme on the Park to be shared more widely, particularly in the Legacy period after the Games. This network is depicted on figure 3, Section 5.2.

## 3 Current and planned energy provision

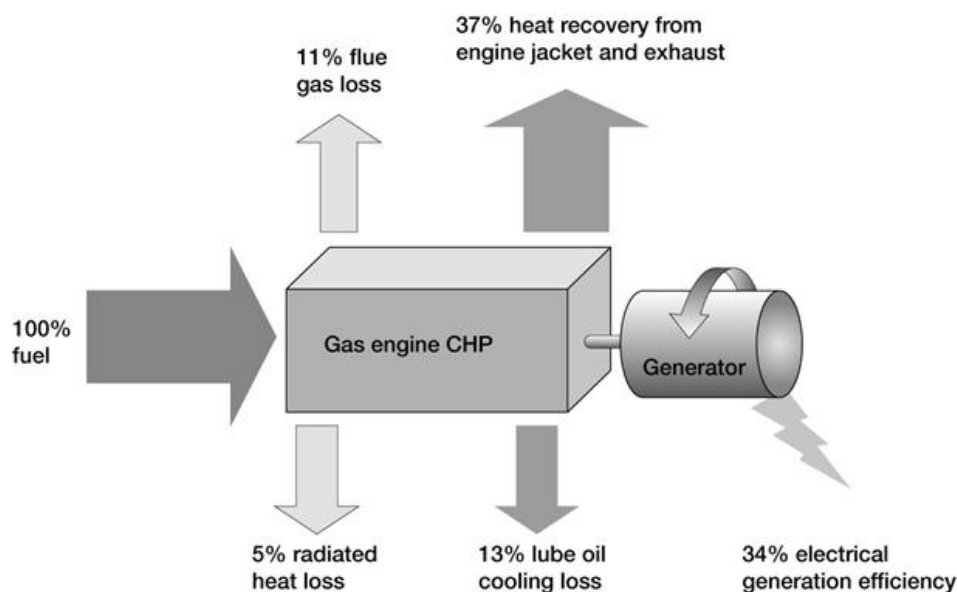
### 3.1 The existing CHP and District Energy Scheme

The primary energy asset in the OLSPG area, other than the conventional utility infrastructure, is the OPDES being built to serve the Olympic Park and Stratford City Development area. This scheme is owned, operated and maintained by COFELY under a 40 year Concession Agreement with the Olympic Delivery Authority (ODA) and Stratford City Developments Ltd.

The OPDES was designed and planned around assumptions contained in the LDA's 2009 Legacy Masterplan Framework (LMF). Since then, as the Olympic Park Legacy Company (OPLC) has taken forward and refined this work, the scale of anticipated development in the Olympic Park has been reduced and the OPLC has now submitted a planning application for its Legacy proposals at Stratford.

One of the main ambitions for the 2012 Olympic and Paralympic Games was the low impact they would have on the environment. A key driver for that was to be a district energy scheme that would provide low CO<sub>2</sub> heating, cooling and electricity to the Olympic Park and Athlete's Village. To deliver this, in October 2006, the ODA and Stratford City Developments Ltd agreed to jointly procure the utilities required to serve the Olympic Park and Stratford City Zones 1-7 (otherwise named "the exclusivity area" shown on figure 3, Section 5.2). Following a competitive OJEU tender process, COFELY (a subsidiary of GDF SUEZ) signed a 40 year Concession Agreement in April 2008 for the design, financing, construction, operation and maintenance of the district heating and cooling networks, associated energy centres and energy generation plant. One of the clauses of this contract requires all development within the "exclusivity area" to connect to this network.

The OPDES comprises a number of generating plant items, including Combined Cooling Heat and Power (CCHP), and gas, oil and biomass boilers. CHP is a technology, which recovers useful heat from the electricity generating process, and delivers it where it is needed, in this case through the district heating network. This process makes a better use of the fuel when compared to electricity generation alone, and decreases overall energy generation related CO<sub>2</sub> emissions.



**Figure 1: Diagram of a CHP unit (% indicative only)**

### 3.2 Benefits of connection

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The existing OPDES supplies low carbon heat to the Olympic Park and surrounding areas and cooling to specific areas of the Park and Stratford City. The benefits to developers in connecting to such a scheme is the potential reduction in capital cost compared with having to install their own standalone solution and the consequent saving in energy plant room area and the cost savings in reduced operation and maintenance and the avoidance of having to periodically replace plant and equipment. It should also be easier to demonstrate compliance with London Plan policies and Building Regulation requirements.

### 3.3 Concession Agreement

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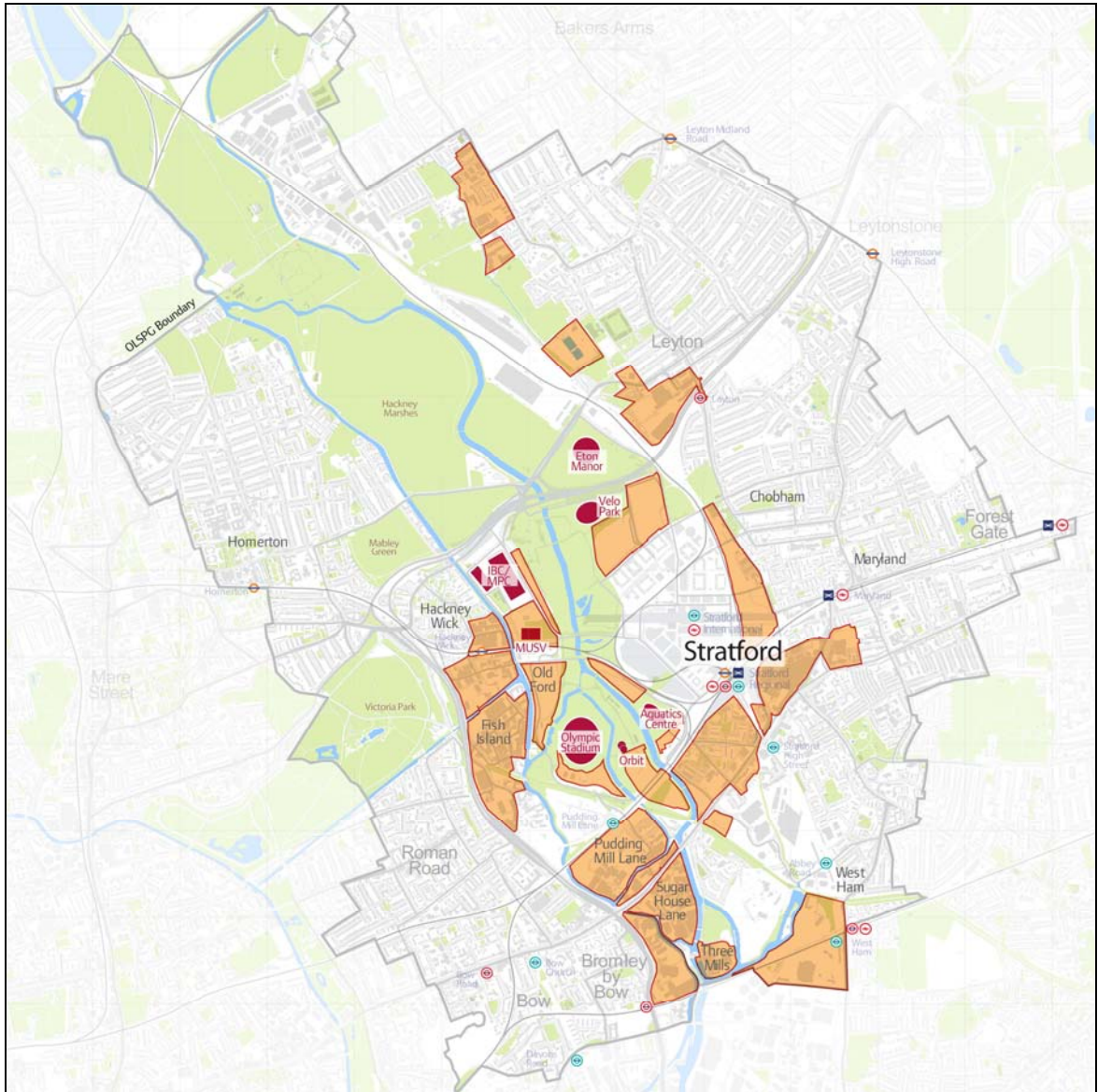
The OPDES will be operated under a Concession Agreement between the Employers on the one hand (ODA and Stratford City Developments Ltd) and COFELY East London Energy Ltd (the operator). The agreement requires that all new buildings and developments built within the Olympic Park 'Exclusivity Area' purchase heat from the energy network and that operator provides the connections and supply's heat to developments within the 'Exclusivity Area'. The concession lasts for 40 years. The exclusivity agreement does not apply to all areas for cooling.

The Concession Agreement requires that the operator undertake all aspects of service provision for the energy network, including design, financing, construction, connections, operation and maintenance of the energy centres and networks. Further information on the Agreement is available from the ODA website (<http://www.london2012.com/about-us/the-people-delivering-the-games/the-olympic-delivery-authority/>)



## 4 New development in the OLSPG Area

Based on the GLA's strategic modelling, an estimated total of nearly 3.7 million m<sup>2</sup> of new development is anticipated in the Olympic Legacy area, with some 29,200 housing units (including both Areas of Change and Strategic Housing Land Availability Assessment) and 1.36 million m<sup>2</sup> of commercial space. The figure below shows the Area of Change sites only.



**Figure 2: OLSPG Areas of Change**

## 4.1 Description of Energy Demand by Sub Areas

Sub Area Totals	New and improved commercial floorspace (m <sup>2</sup> )	Areas of Change Housing (units)	SHLAA Housing (units)	Housing Total (units)
Hackney Wick Fish Island	176,800	3,147	2,711	5,858
Northern Olympic Fringe	20,000	2,201	1,016	3,217
Olympic Park	42,000	3,078	0	3,078
Southern Olympic Fringe	206,000	6,962	2,642	9,604
Stratford	915,000	6,940	462	7,402
<b>Total</b>	<b>1,359,800</b>	<b>22,328</b>	<b>6,831</b>	<b>29,159</b>

This development is spread within the boroughs of Hackney, Tower Hamlets, Waltham Forest, and, mostly, Newham and if realised will result in significant energy demand increases over the next 20 years.

A prediction of space heating & Domestic Hot Water (DHW), cooling and electricity consumption and demands has been estimated, based on the GLA's strategic modelling, the Housing Space Standards <sup>2</sup> and using the benchmarks below <sup>3</sup>. As benchmarks vary considerable from building typology and use, these figures should be revised once Planning Permission is granted or qualified accordingly.

	Heating & DHW (kWh/m <sup>2</sup> p.a.)	Heating & DHW (W/m <sup>2</sup> )	Electricity (kWh/m <sup>2</sup> p.a.)	Cooling (kWh/m <sup>2</sup> p.a.)	Cooling (W/m <sup>2</sup> )
Employment floorspace	97.0	70.0	54.0	29.6	54.0
Housing	60.0	60.0	37.0	0.0	0.0

### 4.1.1 Hackney Wick Fish Island

New development is planned in Hackney Wick Fish Island, with an estimated 467,292 m<sup>2</sup> of total housing, and 176,800 m<sup>2</sup> of employment areas.

Assuming a diversity factor <sup>4</sup> of 73%, it is estimated that the future demand for these developments, when finished, will be:

Hackney Wick Fish Island		
Employment floorspace	176,800	sq. m.
	3,147	units
Areas of change, Housing	251,036	sq.m.
	2,711	units
SHLAA, Housing	216,256	sq.m.
	5,858	units
Snippet_3052E3E61.idms Total, Housing	467,292	sq.m.
Heating consumption	32,784	MWh/annum
Heating & DHW demand	29.3	MW
Electricity consumption	19,470	MWh/annum
Cooling consumption	3,797	MWh/annum
Cooling demand	6.9	MW

#### 4.1.2 Northern Olympic Fringe

New development is planned in the Northern Olympic Fringe, with an estimated 280,311 m<sup>2</sup> of total housing, and 20,000 m<sup>2</sup> of employment areas.

Assuming a diversity factor of 93%, it is estimated that the future demand for these developments, when finished, will be:

Northern Olympic Fringe		
Employment floorspace	20,000	sq. m.
Areas of change, Housing	2,201	units
	191,783	sq.m.
SHLAA, Housing	1,016	units
	88,528	sq.m.
Total, Housing	3,217	units
	280,311	sq.m.
Heating consumption	17,509	MWh/annum
Heating & DHW demand	17.0	MW
Electricity consumption	10,689	MWh/annum
Cooling consumption	553	MWh/annum
Cooling demand	1.0	MW

#### 4.1.3 Olympic Park

New development is planned in the Olympic Park, with an estimated 229,864 m<sup>2</sup> of total housing, and 42,000 m<sup>2</sup> of employment areas.

Assuming a diversity factor of 85%, it is estimated that the future demand for these developments, when finished, will be:

Olympic Park		
Employment floorspace	42,000	sq. m.
Areas of change, Housing	3,078	units
	229,864	sq.m.
SHLAA, Housing	0	units
	0	sq.m.
Total, Housing	3,078	units
	229,864	sq.m.
Heating consumption	15,106	MWh/annum
Heating & DHW demand	14.1	MW
Electricity consumption	9,109	MWh/annum
Cooling consumption	1,051	MWh/annum
Cooling demand	1.9	MW

#### 4.1.4 Southern Olympic fringe

New development is planned in the Southern Olympic Fringe, with an estimated 803,026 m<sup>2</sup> of total housing, and 206,000 m<sup>2</sup> of employment areas.

Assuming a diversity factor of 80%, it is estimated that the future demand for these developments, when finished, will be:

Southern Olympic Fringe		
Employment floorspace	206,000	sq. m.
Areas of change, Housing	6,962	units
	582,119	sq.m.
SHLAA, Housing	2,642	units
	220,907	sq.m.
Total, Housing	9,604	units
	803,026	sq.m.
Heating consumption	54,247	MWh/annum
Heating & DHW demand	49.8	MW
Electricity consumption	32,499	MWh/annum
Cooling consumption	4,853	MWh/annum
Cooling demand	8.9	MW

#### 4.1.5 Stratford

New development is planned in Stratford, with an estimated 537,843 m<sup>2</sup> of total housing, and 915,000 m<sup>2</sup> of employment areas.

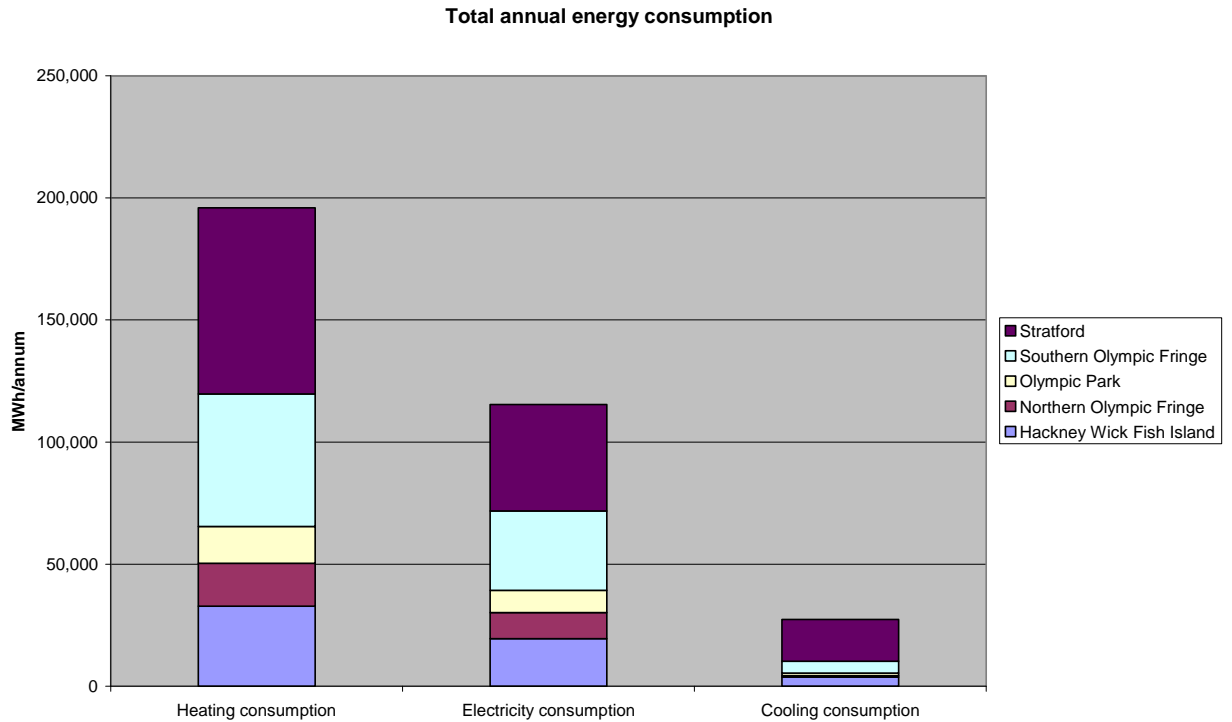
Assuming a diversity factor of 63%, it is estimated that the future demand for these developments, when finished, will be:

Stratford		
Employment floorspace	915,000	sq. m.
Areas of change, Housing	6,940	units
	504,273	sq.m.
SHLAA, Housing	462	units
	33,570	sq.m.
Total, Housing	7,402	units
	537,843	sq.m.
Heating consumption	76,222	MWh/annum
Heating & DHW demand	60.7	MW
Electricity consumption	43,652	MWh/annum
Cooling consumption	17,057	MWh/annum
Cooling demand	31.1	MW

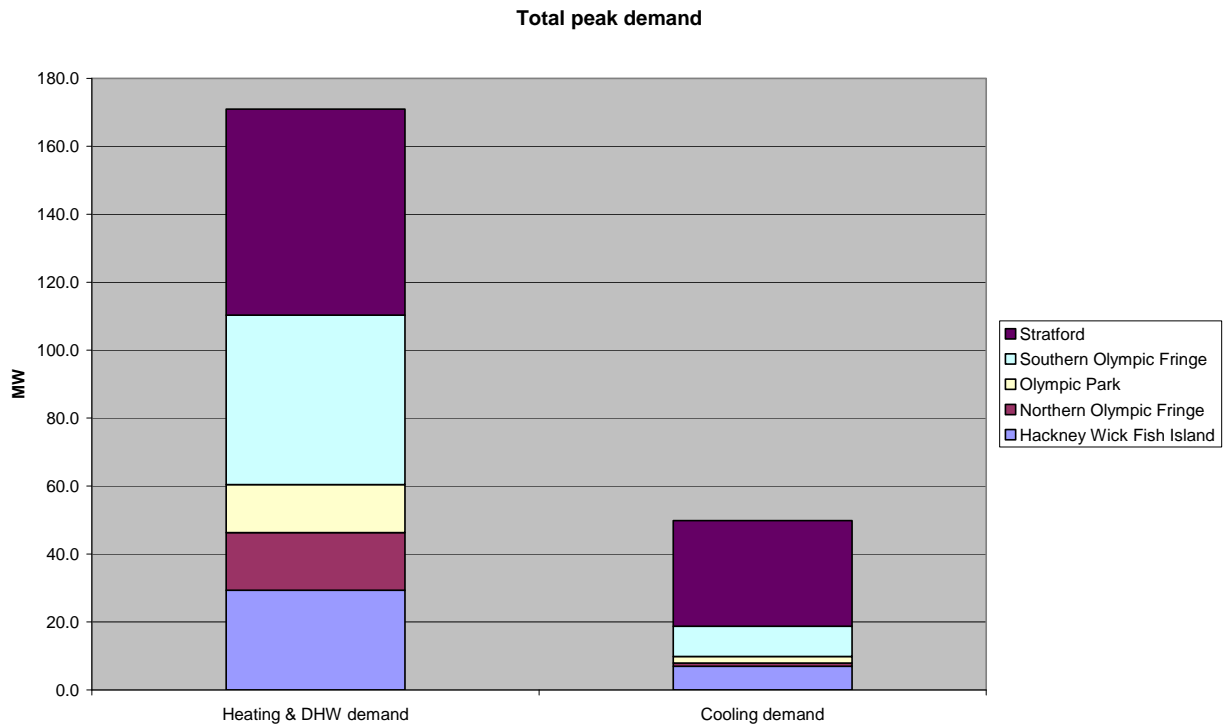
## 4.2 Energy Demand Summary total

Total annual energy consumption for new development for the Olympic Legacy area is presented in the graphs below.

The annual heating consumption from this form of development is expected to total 196,000 MWh.



Therefore peak demands are expected to develop in the same fashion.



### 4.3 Existing development

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Although low density housing is prominent in the periphery of the OLSPG area, parts of the more peripheral areas do have the potential to receive a connection from the main energy network. Those sites include both residential – in the form of estates that contain their own centralised systems – and facilities like the Homerton hospital.

Even though existing sites without centralised energy systems will require a high capital investment to retrofit, this investment can be reduced or offset against other costs when major refurbishments take place, and therefore these opportunities to future proof developments should be encouraged wherever possible.

### 4.4 Conclusions

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Given the expected heat demands associated with new developments in the legacy area, there is clearly a strong case for extension of the planned network out into the OLSPG area to help achieve Mayoral planning and energy objectives.

## 5 Further expansion of the OPDES

With the expected decrease in energy demands in the Olympic Park due to the reduced development that is being proposed in the area and the “oversupply” and spare capacity built into their original designs, capacity for export beyond the boundaries of the exclusivity area is likely to be available from the district energy scheme. In addition, the network can be expanded further by connecting boilers or other plant that can meet more localised peak demands. Expansion of the network would be funded through capital contributions from developers and from the system operator, depending on the location and scale of the development to be connected. Further details are provided below;

- Developers’ contributions: developers will be required to build low and zero carbon developments in the near future, and through the Allowable Solutions mechanism set out in Part L of the Building Regulations costs can be levied against those of providing renewable energy generation on site, providing a valuable contribution towards the network infrastructure
- The operator’s connection model involves three key financial elements:
  - 1) A connection charge linked to the avoided cost of providing a stand alone comparable system
  - 2) Availability Charge which covers lifecycle replacement and ongoing maintenance of the primary plant
  - 3) Consumption Charge which is based on metered consumption data.
- Energy prices for consumers of the district energy network are regulated via price control formula which links the price to conventional energy costs. The price control mechanism was agreed during the public procurement process, providing protection for customers
- Public funding: when the developer’s contributions, together with any operator contributions are insufficient to justify the business case for extending the network, public sector contributions may be required, either from the local borough, London or national level authorities. Information regarding possible funding sources is available via the UK District Energy Association ([www.ukdea.org.uk](http://www.ukdea.org.uk)) and the Decentralised Energy Knowledge Base ([www.dekb.co.uk](http://www.dekb.co.uk)).

In addition to the above, for the network to be able to expand, appropriate points of connection need to be planned for and developed. Section 5.2 sets out where these should be located and what arrangements are required to ensure they are adequately safeguarded.

### 5.1 Technical specifications

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Connection of any new heat customers to the district energy scheme is made more straightforward if systems are designed to be compatible, particularly in terms of operating temperatures and pressures. This ensures that new developments being undertaken in the legacy area can be connected retrospectively after construction. This is useful in the case of, for instance, a new development being built too far from the Olympic Park may not justify the cost of a connection pipe on its own. However after some years once more schemes are developed locally a connection may be viable. If the original development is compatible it could be connected at this later date. Developments in the Legacy areas surrounding the Park should always connect to the existing scheme unless they are able to demonstrate that the whole life costs of the DH/DC supply are greater than a compliant alternative solution.

The GLA is currently developing a District Energy Manual outlining technical specifications and design principles to enable connection to district heating networks. The Manual will be published in March 2012 via the London Heat Map website ([www.londonheatmap.org.uk](http://www.londonheatmap.org.uk)).

## 5.2 Points of connection

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The GLA and COFELY have identified four Points of Connection (POCs), most of which would be made through bridges and under track crossings which are needed to expand the network outside the 'exclusivity area'. These bridges, over the Lea River navigation channel and HS1 railway need to be designed to carry district heating pipe work.

The connection points A, B, C and D are aligned with the main areas of opportunity, for existing and planned heat demand in each of the four boroughs.

Point A is the London Borough of Waltham Forest heat export point, Point B will pick up the new development planned at Chobham Farm but also represents the best route to access the redevelopment of Stratford Island over Angel House Lane Bridge both in Newham. Point C – is already in place picking up the Genesis development and allowing access to Stratford High Street, Carpenters Estate, Sugar House Lane and Bromley-by-Bow.

Point D is the connection over to Fish Island and Hackney Wick with the potential to service the redevelopments to the west of the Olympic Park in the boroughs of Tower Hamlets and Hackney.

Figure 2.E.1 in the draft OLSPG (reproduced below), indicates where the above POCs have been identified. The final likely spare capacities in each of these points will not be clear until the OPLC's Legacy proposals are determined and any reduction in load within the Park is compared and understood.

### *POC A:*

This POC would cross the railway northwards and could possibly take advantage of the existing road bridges either in Ruckholt Road or Temple Mills Road. The network could then serve the sites planned in Waltham Forest, namely Leyton and Lea Bridge road, which combined have a predicted peak demand of around 9MW.

### *POC B:*

These POC would provide a link towards the eastern developments and expansion of the network. The crossing points would be directed towards Leyton Road and Angel Lane, with one of them using the CTRL link. They would initially have the potential to serve development in the following areas:

- Maryland and Chobham: 3.5 MW peak heat demand
- Metropolitan Stratford: 19 MW peak heat demand.

### *POC C:*

This POC is already being built and COFELY have received funding from the London Development Agency and the London Thames Gateway Development Corporation to link the district energy scheme and the redevelopment plots on the southern fringe of the park. The first one of these being connected is the Ardmore Development called Genesis which is 700 residential units. Current designed capacity in this link is limited to 20 MW. The link is beneath the railway close to Waterworks River with a mapped out route under Stratford High Street. This connection will enable connections to the following:

- Pudding Mill Lane: 3 MW peak heat demand
- Sugar House Lane: 5 MW peak heat demand
- West Ham: 4 MW peak heat demand
- Bromley by Bow: 2.7 MW peak heat demand



POC D:

This POC next to Hackney Wick Rail Bridge would link to the western side of the Hackney Wick development, which has an expected peak heat demand of 1 MW, the remainder being on the east bank of the canal. This extension of the network could also be extended further west. Currently identified sites with potential for connection would be the Homerton hospital and a number of housing estates, managed by Hackney Homes, which already have a common centralised heating system and would therefore be candidates for connection provided the heat densities are of the right size to grant a favourable business case for expansion.

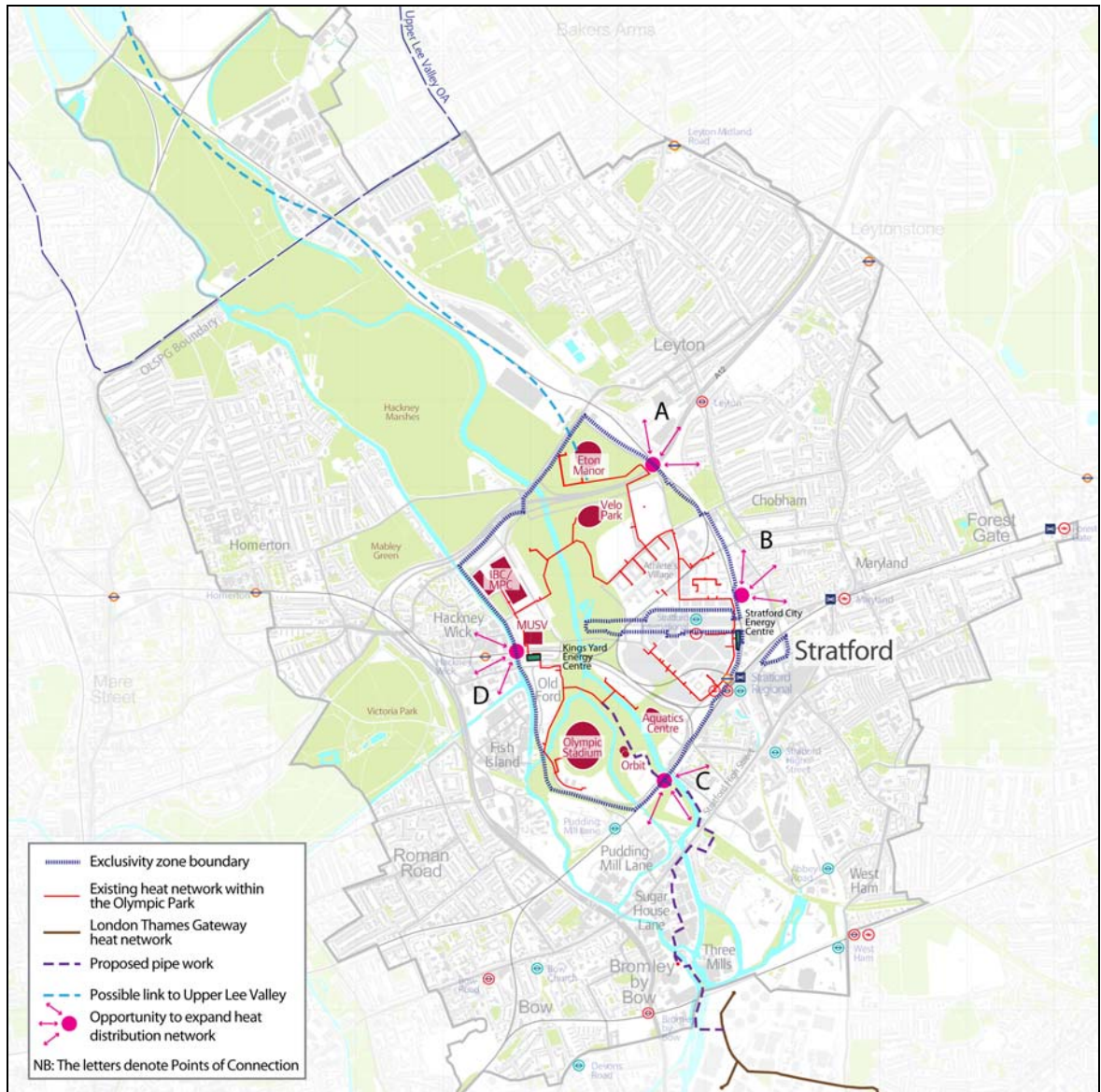


Figure 3: Points of connection outside the "exclusivity zone"

## 5.3 Conclusions

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There are four potential transport corridors for interconnecting heat pipes to link with nearby developments. There is also expected to be sufficient capacity in the heat network at these points to support substantial exports of heat. A further five transport corridors have been identified in ODA Legacy Planning Application Forms as potential points of connection in the future. The relevant document is the Legacy Communities Scheme Development Specification and Framework, which can be accessed at the following link:

<http://planningforms.newham.gov.uk/online-applications/simpleSearchResults.do?action=firstPage>.

To ensure that capacity is available at these points in the future, the provision of space in bridges and other planned infrastructure crossings should be a requirement placed on the infrastructure developer to ensure that pipework can be incorporated either immediately or easily at some later date. Consultation on this aspect should be a requirement of any planning application for such structures.

## 6 Further decarbonising the OPDES energy supply

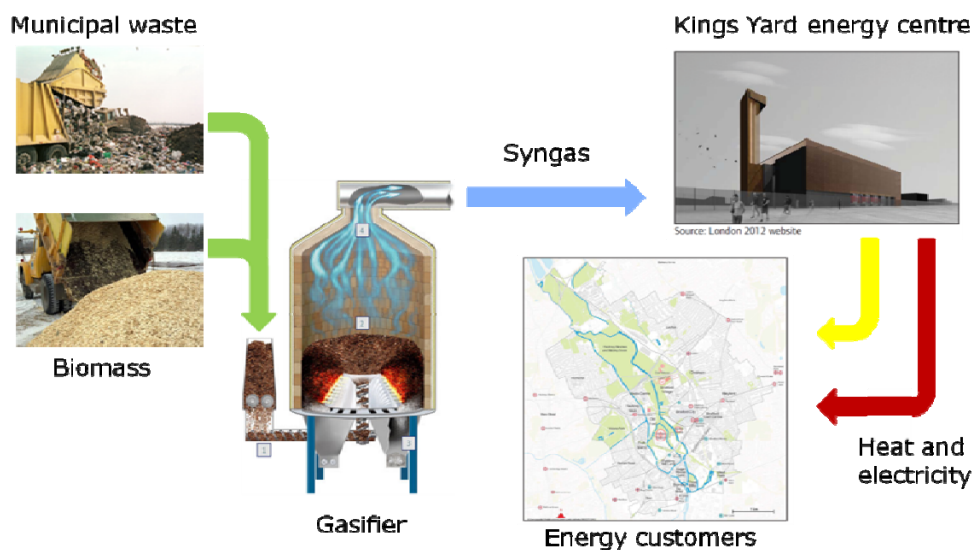
The buried pipework forming the district heating and cooling schemes is not fuel or technology specific. Once the buried infrastructure has been installed it can be used to deliver heat from a variety of sources. Whilst the current mix of gas fired CHP and large scale biomass installed at the Olympic Park scheme delivers substantial carbon savings, over the life of the scheme further renewable fuels and new thermal conversion technologies could be incorporated, further decarbonising the energy supply, as the economic and/or regulatory environment changes.

There are a number of possible technologies that could potentially be incorporated into the scheme. The key impacts and constraints are likely to be the space required, the reliability of the technology and the economic impact on the operation of the district energy system. Each technology or fuel will have a different impact and would need to be assessed on a case by case basis.

Where a requirement for lower carbon energy exists owing to a regulatory change, the base case commercial position changes for both parties and further investment can potentially be made by both the developers and the operator.

Given the investment already made in energy supply equipment, consideration could be given to use of a renewable gaseous fuel (syngas) in the existing gas CCHP engines. Syngas from waste gasification is currently considered as a renewable resource and would therefore be considered as CO<sub>2</sub> neutral as would biogas generated in an anaerobic digestion plant.

A gasifier can operate on two main forms of input fuel, biomass and waste.



While this option appears to present an integrated solution to the subject of decarbonisation of the energy supply, the issues noted above (space, reliability, economics) would need to be resolved:

- **Commercial viability:** COFELY operate under an existing business plan and therefore any permutation should not have a negative impact on this
- **Waste to energy plant location:** A correct location of the waste to energy plant will aid the economics of the project as the gas would have to be transported to the receiving energy centre/production site. One possible location would be close to the Lea River, in Fish Island, as this would enable pipes to be laid in the river banks, therefore reducing any civil works required and reducing the complications of the engineering

- *Technical viability:* Syngas produced by gasification of waste is not of the same quality as natural gas, with high tar content and a lower calorific value. For the gas to be accepted the production equipment must be designed to take this fuel source, and the gas has to be cleaned and pressurised, incurring both capital and operational costs, and increasing the technological risk of the operation. The lack of maturity of such technology and the low number of proven commercial installations presents significant operational risk.

The amount of fuel available locally is a key variable determining the viability of this proposal. The next two sections will go some way towards ascertaining this.

## 6.1 Municipal Solid Waste

### 6.1.1 Resource

The amounts of municipal waste sent to landfill are measured for National Indicator 193 ([http://data.gov.uk/dataset/ni\\_193\\_-\\_municipal\\_waste\\_land\\_filled](http://data.gov.uk/dataset/ni_193_-_municipal_waste_land_filled)). The amounts sent for disposal to landfill in recent years have declined sharply (refer to Table 6.1.1). This is a reflection of the significant decline in the amounts of waste that are collected for disposal, although the percentage of such waste sent to landfill has also been reduced.

#### Hackney and Waltham Forest

The Municipal Solid Waste (MSW) arising from the London Borough's of Hackney and Waltham Forest are managed by the North London Waste Authority (NLWA). The other Borough's being Barnet, Camden, Enfield, Haringey and Islington.

The following table indicated the amount of waste being sent to landfill:

	2006/07	2007/08	2008/09
Tonnes of municipal waste sent to landfill	346,815	292,497	264,148
% of municipal waste sent to landfill	36%	31%	29%
% of municipal waste sent to landfill with energy recovery	100%	100%	100%

This waste is transported by rail from the Hendon Rail Transfer Station to a landfill site that is able to recover energy in the form of landfill gas, which is then converted into electricity.

The NLWA is currently going through procurement for waste handling services to manage the production of 300,000 tonnes of solid refuse fuel (SRF), and a separate contract for the energy conversion of this waste. This may be split into three separate bundles of 100,000 tonnes. The procurement will be completed by around 2014 and will be a 25 year contract.

#### Newham

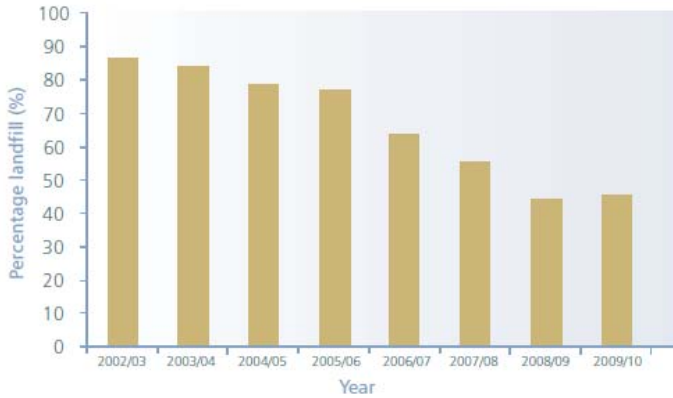
The Municipal Solid Waste (MSW) arising from the London Borough of Newham is managed by the East London Waste Authority (ELWA). The other Borough's being Redbridge, Barking and Dagenham and Havering.

The ELWA commissioned the first large Integrated Waste Management System (IWMS) (recycling and disposal) contract in London, in 1998, which is one of the largest IWMS contracts in the UK, a 25 year contract, which will deal with the local area's waste until 2021.

The Frog Island bio-Materials Recovery Facility (MRF), commissioned in 2006 and the Jenkins Lane bio-MRF commissioned in 2007, together handle most of the MSW from the 4 Boroughs within the ELWA.

A MRF works by separating the renewable fraction of the waste stream, to which the residual waste then undergoes Mechanical Biological Treatment (MBT). The MBT process shreds the residual waste and then dries it out, reducing its volume and stabilising it. It is the dried fraction of the waste i.e Solid Recovered Fuel (SRF) that can be used to generate electricity.

A gasification plant; East London Sustainable Energy Facility (ELSEF) next door to Frog Island bio-MRF, processes about 13T/hr of RDF, approx. 90,000T/yr, generating about 10MW of electrical energy, which is used by the nearby Ford Motor Company plant at Dagenham.



**Percentage of Waste landfilled by East London Waste Authority between 2002 – 2010<sup>5</sup>**

**ELWA is developing a plan to manage the MSW that is generated as a result of the 2012 Olympic and Paralympic Games (which will be taking place in one of the ELWA partner boroughs) and the legacy the games will leave behind.**

Tower Hamlets

The London Borough of Tower Hamlets will have 400,000 tonnes of waste per year to handle, and with the current waste contract ending in 2014 a new contract is being sought.

OPLC are investigating a joint approach with LBTH to integrate a waste-to-energy strategy. Proposals looking at 4 sites for advanced waste treatments, including gasification, form a key part of the options being considered. One of which, Fish Island, is within 1km of Kings Yard Energy Centre.

At the time of writing there are complications around the viability of the Fish Island site in relation to acquiring a site large enough to construct the desired facility for low carbon fuel generation. There remains some uncertainty around this going forward and discussions are ongoing between key stakeholders.

Summary of Potential MSW Resource

Source	Tpa
North London Waste Authority	300,000 (SRF)
East London Waste Authority	131,911 (MSW)
Tower Hamlets	400,000 (MSW)

## 6.1.2 Waste Incineration Directive

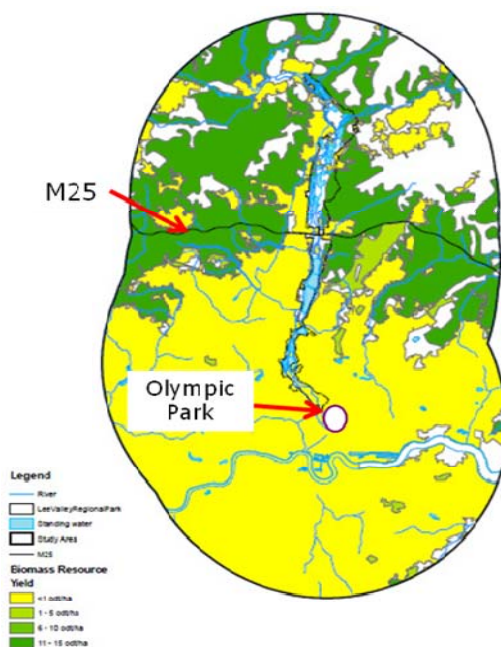
In the UK, all waste incineration plant and ATT plant treating waste must comply with the Waste Incineration Directive (WID). The Directive sets the most stringent emissions controls for any thermal processes regulated in the European Union. The objectives of WID are to minimise the impact from emissions to air, soil, surface and ground water on the environment and human health resulting from the incineration and co-incineration of waste.

The WID also covers the combustion of syngas produced from ATT processes treating MSW. The key requirements in the WID for the operation of a facility are:

- A minimum combustion temperature and residence time of the resulting combustion products. For MSW this is a minimum requirement of 850°C for 2 seconds
- Specific emission limits for the release to atmosphere of certain compounds
- A requirement that the resulting bottom ash that is produced has a total organic carbon content of less than 3%.

All wood fuel which is not specifically grown and harvested specifically as a wood fuel (i.e. if it is not an energy crop) is classed as “waste”. However if it is uncontaminated then it is classed as “waste exempt”.

There are currently no British or European standards for wood chip although European standards are being drawn up. In the absence of any British or European Standards the Austrian standards are used by many suppliers. Please see Appendix C for example wood chip standards as supplied by SEWF. The production of wood chip conforming to these standards i.e. “Good Quality” wood chip requires controlled chipping or the screening of wood chip supplied from uncontrolled sources which increases the cost of the fuel. Lower quality wood chip fuel with a larger percentage of outsize chips, suitable for large boiler systems, is usually supplied at a lower cost.



Forestry maintenance

## 6.2 Biomass

### Arboriculture arisings

Arboriculture arisings refers to wood waste resulting from tree surgery. This resource is found in urban locations and is highly variable depending on the density of trees and the different species planted. Arboriculture arisings are generally chipped on location, which reduces the volume of the biomass and the associated transport costs. As arboriculture arisings are chipped soon after the wood is cut they have a high moisture content (m.c.) of around 45 - 50% (wet basis).

Managed woodlands abate a greater level of CO<sub>2</sub> than unmanaged woodland as the rate of woodland growth increases if the woods are properly managed. Woodland management can provide wood chips using the whole stem of the tree as well as the branches. Typically timber is felled and stacked to dry in the woodland for around six months and the moisture content is reduced from 45 – 50% to around 30% (wet basis).

The Department of Forestry indicates that managed UK woodlands generally produce annual biomass yields of 2 ODT per hectare per year. [Biomass Energy Centre].

### **Waste / Recycling**

London Waste is the principal wood recycling agent in the Lee Valley and handles around 37,000 tonnes per year of dry wood, collected from around the seven boroughs of north London. This wood is chipped and sold to large consumers such as Slough Heat and Power. London Waste will not guarantee a contaminant level of less than 2% of contaminated wood chip (chip formed from treated wood such as painted or varnished wood or MDF) so the market for wood chips made from this feedstock is limited to biomass boilers which have emission monitoring. These are generally large industrial scale biomass boilers.

The maximum theoretical resource and the practical resource are therefore both equal to 37,000 ODT per year. This resource could provide valuable feedstock to start up a biomass supply chain.

### **Energy crops**

Arup has contacted a number of stakeholders to enquire about the cultivation of energy crops in the study area. To date it is understood that there are no energy crops being grown in the study area and therefore all estimates will start from zero.

A range of plant types can be used as energy crops. Those crops that can support a wood fuel supply chain in the UK include crops such as short rotation coppice (SRC) willow, SRC poplar, short rotation forestry (SRF) and grasses such as miscanthus.

Both SRC and miscanthus are reported to give maximum yields of up to 18 ODT/hectare.

- Short Rotation Coppice - Willow and poplar are by a large margin the most popular crops for growing woody biomass in northern Europe. After the initial growth period, usually around two to three years SRC can be harvested once every three years for the next twenty years
- Short Rotation Forestry - Similar to SRC but harvest is once every 5 to 15 years. This has a number of benefits, including potential higher yield and improved quality of biodiversity
- Grasses - Crops such as miscanthus and switchgrass are fast growing woody grasses which can be used for energy production in much the same way as wood (burned directly or after conversion into a more convenient fuel type such as pellets).

Crop	Yield range (ODT/yr)	Estimated practical yield (ODT/yr)
SRC	3,000 – 253,000	110,000
Miscanthus	150,000 – 330,000	240,000

### **Estimated feasible potential energy crop resource in Lee Valley area**

## **6.3 Conclusions**

The results of this section indicate that while significant volumes of zero carbon fuel will be required, there is the possibility of sourcing some of it locally. Waste is likely to form the most viable source given the limited amount of biomass available.

## 7 Smart solutions

In the coming years there are a number of changes anticipated to the way energy is supplied to customers, in particular a greater awareness of customers as to the volume and nature of the energy they are using. This will be achieved by more interactive forms of meters, for instance smart meters. This will also open up further possibilities for advancement such as smart grids,<sup>6</sup> enabling greater and more effective integration of decentralised energy.

The government has set a nation wide target for roll out of smart meters by 2020, and it's in its Prospectus on Smart Grids has provided guidance on how this is to be done and what is required.<sup>7</sup> The inclusion of smart meters in all new properties within the Olympic Legacy area would support this ambition.

A report undertaken for the Institute of Sustainability into sustainable infrastructure in the Lower Lee Valley (which includes the Olympic Legacy area) highlighted the possibility of the region hosting a smart grid pilot project. This would enable greater integration of decentralised energy and potentially reduce the energy bills of customers in the region.



## 8 Policy and regulatory framework

Building Regulations as well as a number of policies at national, regional and local levels need to be considered for their impact on the developments of the Legacy area, which should help realise the potential role of the District Energy network in meeting these requirements. Given the OLSPG area covers four local authority boundaries, these are constantly evolving but a number of key requirements are summarised below.

### 8.1 National

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At a national level, the Government passed the Climate Change Act in December 2008, setting a legally binding target of at least an 80% cut in greenhouse gas emissions by 2050, to be achieved through action in the UK and abroad.

#### 8.1.1 New and emerging regulation

The Government introduced the Planning Act 2008, which is of considerable importance for energy infrastructure projects, as well as the Energy Act and Climate Change Act 2008, which ensures that legislation underpins the long term delivery of the UK's energy and climate change strategy. More details can be found at

<http://www.berr.gov.uk/energy/sources/renewables/policy/index.html>

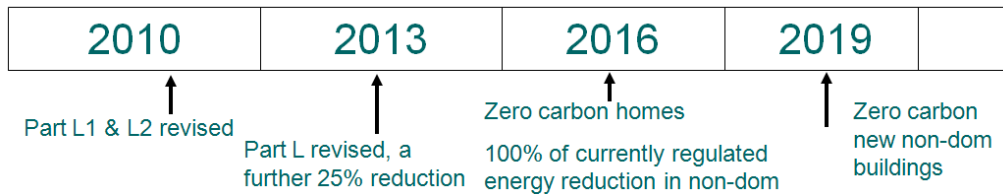
The Renewable Heat Incentive is currently in development, which would establish a financial support mechanism for renewable heat, for example from an anaerobic digestion plant (a process by which biogas, a mixture of methane and other gases, is produced from organic waste). Current proposals are for the introduction of a 'banded' system, similar to that of the Renewables Obligation, whereby suppliers can trade ROCs, potentially creating an additional revenue stream.

The Renewable Energy Strategy, which maps out how the UK will deliver its renewable energy target by 2020, was published in July 2009 after widespread public consultation. The Strategy addresses the need to radically reduce greenhouse gas emissions, as well as diversify the UK's energy sources. As part of this move to a low-carbon economy, a step change is required in renewable energy use in heat, electricity and transport over the next 8 years.

The electricity Market Reform proposals are currently under development. These are outlined in the Government's White Paper published in July 2011 – 'Planning our electric future: a White Paper for secure, affordable and low carbon electricity'. These proposals will introduce a new system for the support of low and zero carbon electricity generating plant, by means of a feed-in-tariff regulated by a contract for differences, ensuring that low and zero carbon generators get a minimum income for the electricity they generate. It is proposed that this new system replace the Renewables Obligation in 2017. The White Paper also contains proposals for a carbon floor price and a capacity mechanism to ensure a minimum reserve of electricity generating capacity, all of which should incentivise low and zero carbon electricity.

## 8.1.2 Building Regulations (Part L)

The Government has expressed the aim that all new homes should be zero carbon by 2016<sup>8</sup> and all new non-domestic buildings should be zero carbon by 2019.<sup>9</sup> This will result in a significant step change in the national Building Regulations (Part L) in terms of the minimum improvements over the Target Emission Rate (TER)<sup>10</sup> for new development.



**Figure 4: Regulation changes towards zero carbon buildings**

The government's Code for Sustainable Homes (CSH) outlines targeted improvements, as individual code levels for residential buildings, towards the achievement of full zero carbon (code level 6). The baseline for the CSH is the energy performance standard set in Part L of Building Regulations 2006. Building Regulations 2010 require residential developments to make a 25% improvement on Building Regulations 2006 and set higher improvement requirements for non-residential developments, depending on development type. These standards will get progressively higher, until the 2016 and 2019 dates.

Zero carbon homes and buildings will be designed and built to be highly thermally efficient, and therefore demand for space heating and hot water will be greatly reduced.

The net emissions of buildings, taking account of their energy efficiency and on-site energy supply (including, where relevant, connections to heat networks) will then meet a minimum "carbon compliance" standard - in effect a regulatory level of carbon reduction, to be achieved on-site. This level of on-site carbon compliance is still being discussed.

Any carbon not mitigated on site will finally be dealt with through a range of good quality and "additional" allowable solutions, also being currently discussed:

- Further carbon reductions on site beyond the regulatory standard
- Energy efficient appliances meeting a high standard which are installed as fittings within the home
- Advanced forms of building control systems which reduce the level of energy use within the buildings
- Exports of low carbon or renewable heat from the development to other developments.

Other allowable solutions remain under consideration. The allowable solutions are highly relevant to the development of the Legacy area's Devolved Energy networks, as it may be possible to use investment in the network and connection between developments as a way of achieving zero carbon schemes in a more cost-effective way than pursuing on-site solutions.

## 8.2 Regional

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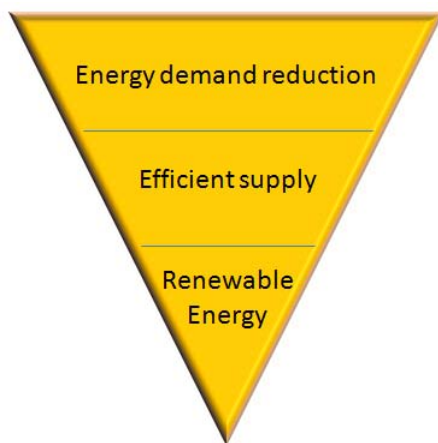
### 8.2.1 The London Plan

The London Plan (July 2011) provides the framework for the development of land use and infrastructure in London. It sets out a range of policies that have statutory application to new developments and the local development documents of London boroughs must be in general conformity with it. Policies under Chapter 5 of the Plan cover London's response to climate change and have relevance for this energy strategy.

Policy 5.2 sets carbon dioxide emissions targets for new developments and obliges developments to meet them following an energy hierarchy that gives primary consideration to energy efficiency, then to efficient supply (including heat network connection, the use of combined heat and power and communal heating systems), then to renewable energy. It also contains provision for cash in lieu of carbon saving, payments to be made where it can be demonstrated that targets cannot be fully met on site. These payments may be used to support the development of local heat networks.

Policy 5.5 has relevance to the area – wide energy strategy Olympic Legacy area. It puts obligations on London boroughs, within their Local Development Frameworks:

- To safeguard heating and cooling networks
- To identify opportunities to expand them
- To develop new networks, including connection of its own buildings, where feasible
- To develop energy master plans for decentralised energy opportunity areas (such as the Olympic Legacy area) and to require developers to prioritise connection to existing or planned networks, where feasible.



The Mayor's Climate Change Mitigation and Energy Strategy (October 2011) further articulates the vision for energy supply in London and in particular the expectation that decentralised energy generation and heat networks will contribute 25% of London's energy by 2025.

## 8.3 Local

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In September 2004 the government introduced a new planning system through the Planning and Compulsory Purchase Act 2004. Each local planning authority's forward planning document - the Unitary Development Plans (UDP) will be replaced by a Local Development Framework (LDF).

The LDF, together with the Regional Spatial Strategy (RSS), will form the development plan that will determine how the planning system will shape your community in the future. In London the Regional Spatial Strategy is the London Plan prepared by the Mayor of London.

All 33 London Boroughs' plans must be in 'general conformity' with the London Plan.

The sections below comprise a review of UDP and LDF policy on energy within the Olympic boroughs of Hackney, Newham, Tower Hamlets and Waltham Forest, and present those policies that promote energy efficiency and distributed energy in particular.

### 8.3.1 London Borough of Newham

#### Local Development Framework

##### Core Strategy

Newham has prepared a Core Strategy - a new spatial plan for the borough. It will form the overarching development plan in the Local Development Framework. Relevant information can be accessed at the following link:

<http://www.newham.gov.uk/Planning/PlanningPolicy.htm>

##### Stratford and Lower Lea Valley Area Action Plan

Consultation on the Issues and Opportunities stage of the Area Action Plan (AAP) took place between July and September 2008. The early document promotes energy efficiency and zero carbon development.

##### Lower Lea Valley Energy Strategy

The report prepared by Arup in September 2009 made the following key recommendations:

- Establish a district heating network in the core areas of Canning Town (cluster 10, 11 and 12) and safeguard a route for the buried mains in the strategic open space
- Incorporate a range of energy generation technologies including CHP (biogas and natural gas), biomass heat and conventional boilers, to provide a reliable and low carbon supply of heat to the area
- Encourage the collection and processing of organic waste across the Lower Lea Valley (LLV) using the planned waste facilities in Tower Hamlets
- Consider mandating connections to the district heating network in the core area for new developments in Canning Town
- Provide technical standards to developers to ensure developments are designed to be compatible with the planned district heating network
- Consider connecting the Canning Town scheme to the LTG heat network once this is built
- Key stakeholders to work together with the GLA, LDA and Boroughs to develop implementation plan and agree delivery vehicle
- Collaborate with Poplar Harca in developing an energy strategy for Poplar Riverside.

### Regeneration projects

Relevant information on Newham's regeneration projects can be accessed at the following link:

<http://www.newham.gov.uk/regen/Regeneration.htm>

### Heat Mapping Report

Thanks to the GLA support, the Council appointed Arup to produce a Heat Mapping report of the Borough. The report will be available for download from April 2012 at the following link:

[http://www.londonheatmap.org.uk/Content/borough\\_heat\\_map.aspx](http://www.londonheatmap.org.uk/Content/borough_heat_map.aspx)

## 8.3.2 London Borough of Tower Hamlets

### Local Development Framework

The Council is now consulting on the draft Planning Obligations SPD until 16th September 2011. Consultation on two new Development Plan Documents (Site and Placemaking and Development Management) and the Fish Island Area Action Plan has now closed.

The Tower Hamlets Local Development Framework (LDF) currently includes the following documents:

- Core Strategy
- Local development scheme (2010)
- Statement of community involvement (2009)
- Annual monitoring report
- LDF consultation.

Plans currently being prepared which will be incorporated into the Local Development Framework include:

- Site and Place-Making Development Plan Document
- Development Management Development Plan Document
- Fish Island Area Action Plan
- Local Development Scheme
- Past draft LDF documents.

Following the withdrawal of several Local Development Framework documents in 2007, the Council has approved the withdrawn documents to be used as interim planning guidance for the purposes of development control. The council's Local Development Scheme provides details and a timetable for new LDF documents.

The council did not progress the Central Area Action Plan. Instead this work and all the consultation feedback has informed the new Core Strategy.

Relevant information can be accessed at the following link:

[http://www.towerhamlets.gov.uk/lgsl/851-900/856\\_local\\_development\\_framework.aspx](http://www.towerhamlets.gov.uk/lgsl/851-900/856_local_development_framework.aspx)

### Environmental Strategy and Action Plan

Tower Hamlets Council's Environmental Strategy and Action Plan were officially adopted by cabinet in June 2007. They set out the Council's vision for improving its environmental performance.

In addition to this, they identify the environmental initiatives which need to be undertaken in order to minimise the Council's impact on the environment and what outcomes are expected to achieve as a result. Both documents can be accessed at the following link:

[http://www.towerhamlets.gov.uk/lgs/451-500/495\\_environmental\\_strategy.aspx](http://www.towerhamlets.gov.uk/lgs/451-500/495_environmental_strategy.aspx)

### Core Strategy

The Core Strategy is one of the key tools to realise the vision of the Community Plan. It provides us with a 15-year-plan which will shape what the borough looks like in the future.

Following the core strategy examination in public, it was found sound by the Planning Inspector and was formally adopted by the council on September 15<sup>th</sup> 2010. The document is formed of strategic objectives and spatial policies, of which the following are relevant:

#### Strategic Objective 3: Achieving Wider Sustainability

‘Tower Hamlets will achieve environmental, social and economic development simultaneously; the improvement of one will not be to the detriment of another. Where trade-offs between competing objectives are unavoidable, these will be transparent and minimised. This will be realised by mitigating and adapting the built environment to climate change by limiting carbon emissions from development, delivering decentralised and renewable or low carbon energy and minimising vulnerability to a changeable climate.’

#### Spatial Policy 11:

1. Implement a borough-wide carbon emission reduction target of 60% below 1990 levels by 2025.
2. Ensure that all new homes are built in-line with government guidance to reach zero carbon by 2016, and that all new non-domestic development reaches zero-carbon by 2019.
3. Promote low- and zero-carbon energy generation through:
  - a) Safeguarding existing renewable energy decentralised energy systems
  - b) Implementing a network of decentralised heat and energy facilities that connect into a heat and power network, including working with the LDA to link with the Olympic Park Energy Centre and the wider East London Heat Network
  - c) Promoting the development of new decentralised energy facilities that have the potential to link into a wider sub-regional network
  - d) Exploring the use of waste-to-energy facilities, particularly in the east of the borough, to support the borough’s waste management and recycling targets
  - e) Working with partners inside and outside the borough to explore ways of implementing decentralised energy systems
  - f) Supporting development that uses intelligent design to make use of renewable-energy technologies.
4. Reducing carbon emissions in non-domestic buildings by:
  - a) Working with partners to implement ways to reduce carbon emissions, particularly large businesses in the borough
  - b) Supporting non-domestic developments that promote the use of renewable energy technologies
  - c) Reducing the carbon emissions of all public buildings in the borough.
5. Implement an area-based approach in which new development should achieve higher levels of carbon reductions than elsewhere in the borough.
6. Maximising the energy efficiency of existing housing stock by:

- a) Working with housing providers to ensure regeneration of existing housing stock and redevelopment promotes carbon emissions reductions and is adapted for climate change
- b) Seeking to establish Energy Opportunity Areas in places likely to be affected by fuel poverty.

7. Require all new developments to provide 20% reduction of carbon dioxide emissions through on-site renewable energy generation where feasible.

8. Ensure the built environment adapts to the effects of climate change.

Spatial Policy 5:

2. Plan and provide for the total waste generated in the borough, in line with the apportionment targets set out in the London Plan, by:

- c) Working with the Olympic Delivery Authority to connect any energy-generating waste facility with the Olympic Energy Centre in Fish Island
- d) Developing an interconnected network of waste management facilities that can respond to changing technologies, demands and have the scope to generate energy.

3. Ensure that any new waste management facility can accommodate a range of waste management technologies, including waste-to-energy facilities, with the potential to be linked into a borough-wide heat and power network.

The council has also produced an Adoption Statement and a Sustainability Appraisal Adoption Statement to accompany the Core Strategy. All documents can be accessed at the following link:

[http://www.towerhamlets.gov.uk/lgs/851-900/855\\_planning\\_consultation/core\\_strategy.aspx](http://www.towerhamlets.gov.uk/lgs/851-900/855_planning_consultation/core_strategy.aspx)

#### Managing Development DPD

The Managing Development DPD is currently being developed and provides further detail to the Core Strategy to help guide development in the borough. The MD DPD is currently expected to be adopted in late 2012.

#### Fish Island Area Action Plan

The Fish Island Area Action is currently under development alongside the Managing Development DPD and is for adoption in 2012.

#### Leaside Area Action Plan

Tower Hamlets withdrew several Local Development Framework documents in October 2007, including the Leaside Area Action Plan. The Council maintains its support for the policy direction in these plans, which have been adopted as Interim Planning Guidance for the purpose of development control until the emerging Managing Development DPD is adopted. The following policy and guidance areas within the Leaside Area Action Plan are therefore relevant:

#### Policy L9 Infrastructure and Services

1. The Council will closely monitor the capacity of key infrastructure essential to the creation of sustainable communities in Leaside, to ensure the pace of development corresponds with infrastructure availability. This includes monitoring transport, public open space, health, and education infrastructure and facilities.

2. Applications for development in Leaside will be required to ensure that new and/or upgraded infrastructure will be in place to support the development prior to the development being occupied. Local improvements may be required to electricity, gas, water, district energy, wastewater and telecommunications infrastructure and services.

3. The Council will encourage the use of on-site renewable energy technology provision, particularly at Fish Island East, Bromley-by-Bow North and Leamouth.
4. The Council will seek to facilitate the improvement and establishment (where necessary) of infrastructure to support the emergency and essential services in Leaside.

Paragraph 3.20:

There is massive potential for Leaside to meet some of its energy demands by utilising renewable energy, drawing upon and developing the high standards set out by the London 2012 Olympic and Paralympic Games. The highest standards and creative use of renewable energy technology will be encouraged by the Council in all new developments. Such technologies include; wind turbines, solar water heating, photovoltaics, ground sourced heating, ground sourced cooling, combined heat and power (CHP), and of particular relevance to Leaside is tidal power due to the area's relationship with the tidal Thames and River Lea (see Development Control Policy DEV6 for more detail).

#### Heat Mapping Report

Thanks to the LDA support, the Council appointed Ramboll in November 2010 to produce a Heat Mapping report of the Borough. The report was completed in February 2011 and highlighted a number of areas which are considered suitable for potential for heat network development. The information collated from the Heat Mapping study is available for download at the following link: [http://www.londonheatmap.org.uk/Content/borough\\_heat\\_map.aspx](http://www.londonheatmap.org.uk/Content/borough_heat_map.aspx)

### 8.3.3 London Borough of Hackney

#### Local Development Framework

Hackney LDF comprises a suite of planning documents, including Development Plan Documents (DPDs), Supplementary Planning Documents (SPDs) and Statutory Documents.

Development Plan Documents (DPDs):

- Core Strategy
- Development Management DPD
- Site Allocations DPD
- Proposals Map
- Area Action Plans
- North London Waste Plan.

Supplementary Planning Documents (SPDs):

- South Shoreditch SPD
- Affordable Housing SPD
- Residential Extensions and Alterations SPD
- Planning Contributions SPD
- Sustainability of Built Environment SPD (to follow)
- Waterfront Development SPD (to follow)
- Public Realm and Design Guide
- Street Scene SPD (to follow).

Statutory Documents:



- Local Development Scheme - outlines the work programme for preparing Hackney's LDF
- Statement of Community Involvement - outlines Council's standards to involve the public in the planning process
- Annual Monitoring Report - monitors the progress on documents set out in the Local Development Scheme and whether policies are on target at regional and national level
- Evidence Base Studies - A comprehensive and credible evidence base underpins the LDF.

All relevant documents listed above can be accessed at the link below:

<http://www.hackney.gov.uk/ep-local-development-framework-856.htm>

#### Regeneration projects

Relevant information on Newham's regeneration projects can be accessed at the following link:

<http://www.hackney.gov.uk/regeneration.htm>

#### Heat Mapping Report

Thanks to the LDA support, the Council appointed AECOM in June 2010 to produce a Heat Mapping report of the Borough. The report highlighted a number of areas which are considered suitable for potential for heat network development. The information collated from the Heat Mapping study is available for download at the following link:

[http://www.londonheatmap.org.uk/Content/borough\\_heat\\_map.aspx](http://www.londonheatmap.org.uk/Content/borough_heat_map.aspx)

### 8.3.4 London Borough of Waltham Forest

#### Unitary Development Plan

Waltham Forest's Unitary Development Plan First Review was adopted in March 2006. In March 2009 the Secretary of State issued a Direction, saving nearly all policies within the UDP for development control purposes, until they are replaced by the emerging Local Development Framework (LDF). The following policies are therefore relevant:

#### Policy WPM20: Energy Efficiency

In all new residential, commercial and industrial developments, the Council will seek to ensure that issues affecting design, density, location and orientation have regard to the principles of energy efficiency.

#### Policy WPM 21: Renewable Energy

The Council expects that proposals to incorporate and enable 10% of total predicted energy consumption to be from renewable energy sources, through on-site generation for all new commercial/industrial developments over 1000 sq ms and housing developments of 10 or more units.

#### Local Development Framework

#### Core Strategy

Waltham Forest published the Core Strategy Preferred Options document for public consultation in January and February 2010, comprising preferred policy options for the borough. The responses to the consultation are currently being considered and a consultation report is to be published by July 2010. The following policy is of relevance:

#### Policy CS4

In responding to climate change, the Council will seek to address issues holistically, relating to the four key themes of minimising climate change and achieving CO2 reduction targets while adapting to climate change; protection and enhancement of the natural environment; sustainable waste management; and sustainable transport.

## Minimising and Adapting to Climate Change

Waltham Forest will promote requirements and actions to minimise and adapt to climate change by:

- Seeking to prioritise the reduction of CO2 emissions in new and existing buildings and ensuring design, construction and occupation minimises energy use, uses energy efficiently and makes use of energy from the most efficient sources including the achievement of applicable CO2 reductions or minimum energy sourcing requirements from renewable or low carbon energy
- Requiring new and existing buildings to be designed and constructed to take account of the impacts of climate change over their lifetime including use of sustainable methods for heating and cooling as well as flooding, water scarcity and overheating; and to not put people or property at unacceptable risk while ensuring development has sufficient emergency planning measures in place
- Setting specific requirements for environmental performance of new and existing development in line with appropriate standards such as BREEAM, Code for Sustainable Homes and EcoHomes assessments
- Establishing a system for improving existing buildings' resilience to climate change as well as energy and water efficiency, which will be applied through area and/or site specific requirements
- Promoting and facilitating the delivery of decentralised energy systems in appropriate areas of the Borough; particularly there generation areas of Walthamstow, Blackhorse Lane, Wood Street and the Northern Olympic Fringe and Lea Bridge area
- Promoting the use of renewable energy in development
- Promoting the use of innovative energy technologies that reduce CO2 emissions and use of fossil fuels such as electrical, hydrogen, and energy from waste sources.

### Northern Olympic Fringe Area Action Plan

The Council is currently preparing the Northern Olympic Fringe Area Action Plan (AAP) to form part of the Council's Local Development Framework, which will coordinate investment and planning in the area, through land use designations and close working with the Olympic Delivery Authority, land owners, service providers and residents groups. The major aim for the AAP will be to channel investment so that local people have a better quality of life and greater opportunities, in the form of jobs, homes, services, open spaces, and public realm improvements. Two separate studies have been brought together to form the basis for this AAP. The Northern Olympic Fringe Masterplan examined options for future development in the Leyton and Stratford New Town areas, in which future inward investment would enable a whole range of improvements to travel routes, open spaces and shopping areas. The Lea Bridge Planning Framework sought to establish a long-term vision for the Lea Bridge area that would underpin major changes and development proposals affecting residents, transport corridors and the Lee Valley Regional Park.

Local residents, businesses and other stakeholders were consulted on the Preferred Options in January and February 2011. Reports on these exercises were taken to the Council's Cabinet in October 2011. The Council is currently in the process of combining and further developing the plans previously developed for the Northern Olympic Fringe to produce the Proposed Submission for the AAP. The Proposed Submission consultation of the AAP is likely to be in December 2011 and January 2012. The following AAP policy is relevant:

## Policy NOF 17

Minimising climate change and its environmental impacts is a particular challenge in the light of the anticipated growth in the Northern Olympic Fringe, but the scale of the regeneration envisaged in the area in the borough also offers the opportunity to develop holistic sustainability design solutions.

### Reduction of Carbon Emission through Energy Efficiency

Developments need to demonstrate compliance with the Energy Hierarchy set out in the London Plan and the Core Strategy. The following criteria will apply to the Northern Olympic Fringe:

- All new major developments, refurbishments and conversions of the AAP area will be required to provide a Sustainability Assessment
- All major developments must implement, where appropriate, decentralised heat and energy networks, including the potential to link into and expand existing networks; as a minimum requiring developments to be designed to connect to a district heat and energy network in the future
- All new major developments will need to achieve at least Code for Sustainable Homes Level 4 and BREEAM 'excellent' or equivalent standards
- Retrofitting of existing buildings for energy efficiency will be encouraged.

### Upper Lea Valley Energy Strategy

The report prepared by Arup in April 2010 made the following key recommendations:

- Key stakeholders to work with GLA, LDA and Boroughs of Waltham Forest, Enfield and Haringey as part of an Upper Lea Valley (ULV) District Heating Steering Group, to establish a district heating network in the Opportunity Area (OA)
- North London Waste Authority (NLWA) to ensure that bidders under the waste services procurement process consider the technical and economic impact of extracting useful heat from any proposed thermal process which is put forward as part of their tenders, for the purpose of providing heat to a local district heating network in the ULVOA
- Option 1 in this document should be encouraged as a priority. If this Option is not delivered, Option 2 should be considered. If Option 2 is not achieved Option 3 should be considered finally
- Take a collective approach, through the establishment of an ULV District Heating Steering Group, to determine the optimum ownership and contracting structure of the scheme, identify sources of funding and agree the preferred delivery approach. The steering group would likely include all major stakeholders including representatives from all the major developments in the main scheme area, the LB's of Haringey, Waltham Forest and Enfield, E.On, London Waste, the North London Waste Authority, London ReMade, British Waterways, the GLA, and COFELY
- Ensure that key developments identified in this report connect to the district heating network. Where a development is completed before the network is available, the development should be designed using technical standards established by the ULV District Heating Steering Group to ensure it can connect to the network with the minimum delay and modifications. The same should be required of existing buildings undergoing refurbishment. Planning obligations will be used to ensure connections occur
- Ensure all Borough strategy documents and corporate strategy take cognizance of the findings of this report, and disseminate this information to the relevant internal departments

- Steering group to investigate piping routes in more detail, particularly on a demand hub level, and to make recommendations to Local Authorities on enabling actions (allocating land for pumping and thermal storage facilities, provide information on utilities and services etc)
- Steering group to engage with and encourage British Waterways to secure space within the waterways identified in this document as vital for delivering a DHN in the ULVOA
- The steering group to engage with the major potential heat customers identified in this document to ensure no significant replacement of energy systems is undertaken without cognizance of this document
- Develop and put in place technical standards and guidelines to ensure compatibility between developments and the main district heating network and to ensure a consistent approach to metering and connection protocols. Ensure that these are acted upon
- Investigate the potential for the London Boroughs of Haringey, Waltham Forest and Enfield using the Community Infrastructure Levy, JESSICA and the London Green Fund as a means of generating funds to support a district energy scheme in the ULVOA.

#### Heat Mapping Report

Thanks to the LDA support, the Council appointed PB in November 2010 to produce a Heat Mapping report of the Borough. The report highlighted a number of areas which are considered suitable for potential for heat network development. The information collated from the Heat Mapping study is available for download at the following link:

[http://www.londonheatmap.org.uk/Content/borough\\_heat\\_map.aspx](http://www.londonheatmap.org.uk/Content/borough_heat_map.aspx)

## Notes

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<sup>1</sup> Source: GLA strategic modelling, December 2010

<sup>2</sup> Source: The London Plan, GLA, 2011 - Table 3.3. The Minimum Internal Dwelling Areas was increased of 10%.

<sup>3</sup> Source: CIBSE Guide F and BSRIA Blue Book. The Greater London Authority (GLA) has produced this Study to support the OLSPG. However, the GLA accept no responsibility for and exclude all liability in connection with use of information on this document, including but not limited to, any liability for errors, inaccuracies, omissions or misleading statements including those contained in any results of any analysis carried out on any material from this document.

<sup>4</sup> The diversity factor (DF) takes into account that the actual load for a mixed used development never equals the sum of all individual loads.  $DF = 1 - [\text{employment floorspace}/(\text{employment floorspace} + \text{total housing floorspace})]$

<sup>5</sup> ELWA Annual Report 2009/10

<sup>6</sup> Smart grids differs from ordinary electrical grids as they deliver electricity to consumers using two-way digital communications to control appliances at end users' homes, with the final effect of reducing energy consumption and therefore operating costs for the consumers.

<sup>7</sup> Smart Metering implementation programme: prospectus. DECC, 2010.

<http://www.decc.gov.uk/assets/decc/Consultations/smart-meter-imp-prospectus/220-smart-metering-prospectus-condoc.pdf>

<sup>8</sup> Building a Greener Future. Department for Communities and Local Government (2007)

<sup>9</sup> Budget Report 2008. HM Treasury (2008)

<sup>10</sup> TER is the calculated target CO<sub>2</sub> emission rate for a development, expressed in kilograms of carbon dioxide (CO<sub>2</sub>) per annum.