

Housing Select Committee		
Title	Communal heating review: scoping paper	
Contributor	Scrutiny Manager	Appendix D
Class	Part 1(open)	1 October 2014

## 1. Purpose

- 1.1 At its meeting on 22 July 2014, the Committee decided to carry out a review into communal heating systems.
- 1.2 This paper sets out the rationale for the review<sup>1</sup>. It provides background information about communal heating and puts forward terms of reference for discussion and agreement by the Committee.

## 2. Recommendations

The Select Committee is asked to:

- note the contents of the report
- discuss and agree the proposed terms of reference and timetable for the review, outlined in sections 6 and 7.

## 3. Policy context

- 3.1 Energy use in housing is responsible for a quarter of energy consumption and carbon dioxide emissions in the UK<sup>2</sup>. In Lewisham (where there are a relatively small number of large businesses) the use of energy in housing is responsible for the largest proportion of the borough's carbon dioxide emissions.
- 3.2 The Climate Change Act (2008) has committed the UK to becoming a low carbon economy, with a target of reducing carbon dioxide emissions by at least 80% on 1990 levels by the year 2050. Initiatives to increase the efficiency of energy usage in housing will be a central part of ensuring the country is able to meet this target.
- 3.3 Government guidance on improving energy efficiency in new build homes is set out in the Code for Sustainable Homes. The Code defines standards of energy efficiency and sustainability for new homes and coordinates a system of assessment and certification. Developments aiming for certification under the Code are required to achieve standards, for which they are able to gain credits, in the following areas:
  - energy/carbon
  - water
  - waste
  - materials

<sup>1</sup> The in-depth review process is outlined at Appendix A.

<sup>2</sup> United Kingdom housing energy fact file, Department of Energy and Climate Change (2012)

- surface water run-off
- health and well being
- pollution
- ecology
- management

- 3.4 Building regulations require all new homes to be built to the level three standard of the Code for Sustainable Homes. Homes built with government funding are required to achieve level four. Aside from this, the Code remains a voluntary assessment mechanism. Nonetheless, the Council has incorporated the Code into its planning processes. All new developments are currently required to achieve level four of the Code. This will be increased to level six from 2016 in line with the Government's commitment to ensuring that all new homes are 'zero carbon'<sup>3</sup> by 2016.
- 3.5 London's strategic plans set out a hierarchy for achieving reduced carbon emissions in all new developments. The ambition for London is that it should reduce its carbon dioxide emissions by 60% on 1990 levels by 2025. Through the London Plan, the Mayor expects all new developments to:
- Be lean: use less energy
  - Be clean: supply energy efficiently
  - Be green: use renewable energy
- 3.6 Proposals for major developments are required to include detailed energy assessments as part of their submission for planning permission to demonstrate how they intend to meet the London Plan target for carbon dioxide emissions within the framework of this energy hierarchy (London Plan p134).
- 3.7 Major developments are also required to assess the feasibility of joining existing heat networks by linking to existing infrastructure. The viability of site-wide combined heat and power systems and communal heating are included in this assessment.
- 3.8 Lewisham's sustainable communities strategy sets out the ambition for Lewisham to be 'clean green and liveable'. The strategy highlights the importance of ensuring Lewisham's contribution to a sustainable future by tackling waste and making effective use of resources.
- 3.9 Lewisham's Carbon Reduction and Climate Change Strategy was published in 2008. In 2013 the Council set a new target of a 44% reduction in the borough's carbon emissions by 2020 from a 2005 baseline.
- 3.10 Lewisham's Core Strategy, which directs the borough's planning framework, includes the objective that:  
'All new residential development (including mixed use) will be required to achieve a minimum of Level 4 standards in the Code for Sustainable Homes from 1 April 2011 and Level 6 from 1 April 2016, or any future national equivalent.'  
(Lewisham Core Strategy, p97)

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<sup>3</sup> From 2016, all new homes will be required to reduce their carbon emissions by 70% against 2006 standards. The achievement of 'zero carbon' status can be achieved through energy efficiency measures, use of renewable energy and contributions towards off site 'allowable solutions', to offset emissions.

## **5. Meeting the criteria for a review**

A review into communal heating systems meets the criteria for carrying out a scrutiny review, because:

- it is a strategic and significant issue;
- it affects a number of people living in Lewisham;
- the Council is embarking on a programme of house building, with the intention of providing 500 new homes in Lewisham by 2018.

## **6. Communal heating and energy efficiency**

- 6.1 Consumption of energy in Lewisham's households is the borough's single largest source of CO<sub>2</sub> emissions. National averages show that 60% of the energy used in homes is for heating<sup>4</sup>, so increasing the energy efficiency of homes has the potential to bring about a significant reduction of carbon emissions. As recognised by the Committee in its damp and mould review, efficient affordable heating can also help to alleviate the problems caused by condensation, damp and mould.
- 6.2 Insulating homes is one of the principal ways for buildings to reduce their energy consumption. In existing buildings, walls, floors and roof spaces are filled with insulating materials. New buildings are constructed with the insulating properties of their construction materials in mind. Windows and doors are designed to reduce heat loss and floor, wall and ceiling spaces are either insulated or constructed using materials with insulating properties.
- 6.3 Existing buildings can also be draught proofed to reduce the flow of cold air into the building and the loss of heat to the outside. New buildings are designed to eliminate draughts and heat loss. High levels of airtightness are achieved through building design and construction techniques. Factors affecting heat loss and heat gain, as well as requirements for internal and external ventilation are calculated at design stage.
- 6.4 Communal heating via a centralised heat production and distribution to a number of properties can be set up in a number of different ways. A communal heating system might incorporate a single building, a number of buildings (community heating) or a wider larger area, incorporating a number of buildings including homes, schools and businesses (district heating). There are thought to be between 10 and 15 thousand communal heating systems in operation in the UK.
- 6.5 A number of benefits are claimed for communal heating systems. In theory, efficiencies should be achieved through the scale of heat production. The use of communal heating systems also allows for the deployment of low carbon technologies that might not be feasible on a home by home basis. Communal heating systems might also reduce the requirement to carry out unit by unit maintenance and checks, in contrast to individual boiler systems. Though it should be noted that most modern communal heating systems include heat interface units in each property, which are designed to regulate and measure the flow of heat into and out of each home.

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<sup>4</sup> Uk Energy Fact File (2012) page 33

- 6.6 Provision of communal heating can also be combined with the generation of electricity, which is intended to reduce duplication and transmission costs whilst delivering efficient energy at a reasonable cost. The production of decentralised energy is thought to have a number of benefits. Such as reducing community reliance on centralised infrastructure and providing some measure of local control. The efficiency of communal heating systems relies on the realisation of these benefits, and as such, is contingent on a range of factors, which may vary on a case by case basis.
- 6.7 The Mayor of London's energy hierarchy requires new developments to ensure that they are reducing the requirement for energy consumption: As a minimum, energy assessments submitted with planning applications are expected to include the following details:
- calculations of the carbon dioxide emissions covered by the building regulations at each stage of the energy hierarchy;
  - proposals to reduce carbon dioxide emissions through the energy efficient design of the site, buildings and services;
  - proposals to further reduce carbon dioxide emissions through the use of decentralised energy where feasible, such as district heating and cooling and combined heat and power (CHP)
  - proposals to further reduce carbon dioxide emissions through the use of on-site renewable energy technologies.

(Energy planning: monitoring the implementation of the London Plan energy policies in 2013, p14)

- 6.8 The London Plan stipulates that 'development proposals should evaluate the feasibility of Combined Heat and Power (CHP) systems, and where a new CHP system is appropriate also examine opportunities to extend the system beyond the site boundary to adjacent sites.' The Plan sets this hierarchy for new developments:
- 1 Connection to existing heating or cooling networks;
  - 2 Site wide CHP network;
  - 3 Communal heating and cooling;
- 6.9 The London Authority has established a city wide programme to identify existing heat networks in order to create opportunities for new developments to meet the first priority in the hierarchy. (London Plan p141)
- 6.10 In Lewisham a number of developments have communal heating systems. The largest to date is the decentralised energy scheme at the Renaissance development in Lewisham Gateway. The project covers 800 homes, as well as the Glass Mill leisure centre and a local primary school. Plans are also being developed to widen the district heating system which utilises the heat produced by the South East London Combined Heat and Power plant (SELCHP) in north Lewisham and Southwark.

### **Challenges**

- 6.11 At its meeting on 5 March 2014 the Committee received an update from Council officers about housing regeneration schemes in the borough. Members discussed

concerns that had been brought to their attention about the Heathside and Lethbridge development in Blackheath, including:

- Overheating in communal areas of the development
- The cost of energy charges for residents
- The reliability of the heating and hot water system
- Significant overheating in individual units

6.12 There is some evidence that the concerns raised at this scheme are not individual to this case. Reports by the housing industry press highlight cases of overheating and inefficiency of some systems<sup>5</sup>.

6.13 Overheating in developments might be caused by any one of a number of different factors. The high levels of airtightness specified in new buildings combined with insufficient natural or mechanical ventilation might lead to overheating, particularly in the summer months. This challenge is recognised in the Mayor of London's Heat Network Manual, which includes a section about overheating in communal areas. The Manual illustrates the importance of careful design and installation of communal heating systems to ensure that heat loss in communal areas is minimised. It includes these methods of minimising overheating:

- Increasing the thickness of insulation on pipe work;
- Ensuring that insulation is correctly installed to the specification and inspected;
- Increasing the differential between supply temperature and return temperature; this enables smaller diameter pipes to be installed reducing the rate of heat loss from pipes which is proportional to the surface area for heat transfer.  
(London Heat Network Manual 2014, p43)

6.14 A Government consultation into heat metering has recently closed. Heat meters allow individual homes in communal heating networks to control the flow of heating into their properties and they allow accurate billing, based on consumption. The Department of Energy and Climate Change estimates that the majority of homes with communal heating systems do not have individual heat control and metering systems. Nonetheless, whilst individual controls may allow homes to manage their consumption households connected to a communal heating system still have to pay set charges for the operation and maintenance of the communal heating system. These costs will be dependent on the technology being used to power the system as well as its design, commissioning and its on-going operational costs. A report by the National Housing Federation on the lifetime costs of installing renewable energy technologies reports that Hyde Housing Association:

'...have consistently found that the extra capital costs of heat networks, metering and billing fees, and management costs have resulted in such high costs that the housing association has had to subsidise resident fuel bills to avoid fuel poverty'.  
(National Housing Federation 2010, p44)

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<sup>5</sup> Inside Housing: room to breathe <http://www.insidehousing.co.uk/room-to-breathe/6514729.article> and Inside Housing: benefits of communal heating <http://www.insidehousing.co.uk/benefits-of-communal-heating/7003694.article>

## Combined heat and power

- 6.15 The efficiency of a communal heating system is dependent on the difference between the amount of the heat being generated and the volume of heat being used. Where a heating system is required to run on a continuous basis without the demand for that heat (in the summer, for example) the efficiency of the system may substantially reduce. Excess heat may also have to be vented from the system, which has a potential to exacerbate any issues of overheating. Sites with a constant, stable demand for heat are likely to be able to achieve the highest levels of efficiency.
- 6.16 One of the anticipated benefits of communal heating is that the installation of a heat network will allow for the use of technologies that would not be feasible in an individual home. An important technology that is increasingly being used with communal heating systems is combined heat and power. The London Plan stipulates that, where new developments cannot connect to an existing heat network, the use of site wide combined heat and power (CHP) systems should be examined.
- 6.17 Local Government Association guidance notes that CHP systems can be highly efficient and result in significant CO<sub>2</sub> reductions<sup>6</sup>. However, it is recognised that sufficient density of heat demand as well as the continuous requirement for heat will work best for CHP systems. CHP systems are intended to reduce inefficiency by producing heat and electricity at the same time. Typically, the heat generated as a by-product of electricity generation is lost. Combining heat and power production and locating both processes near to the homes being supplied is supposed to improve efficiency, reduce costs and decrease CO<sub>2</sub> emissions. The realisation of these benefits is dependent on a number of factors, including the design of the system and the fuel being used to power the CHP process.
- 6.18 Biomass (often wood pellets) boilers are expected to be less carbon intensive than CHP powered by natural gas because biomass materials can be sourced sustainably. Nonetheless, issues of storage, the fluctuating costs of biomass materials, operation and maintenance of biomass CHP systems as well as the potential negative impacts on air quality<sup>7</sup> remain. In addition the failure of the biomass supply (due supply chain problems, issues with storage or persistent adverse weather conditions) would have a detrimental impact on the entirety of a development in contrast to the failure of individual boiler unit in a single home.
- 6.19 There are a range of technologies that can be used to supply communal heating systems. The design and development of each system will be dependent on the site specific circumstances of the building being supplied with heating, as well as the design, construction and commissioning of the heating system.
- 6.20 Government, the Mayor of London and the Council are all committed to reducing carbon emissions and meeting the zero carbon standard for homes by 2016. As such, the Committee might decide to focus this review on the ways in which the Council can ensure that it supports the development of comfortable, high quality homes, whilst ensuring that Lewisham meets its commitments to reducing carbon

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<sup>6</sup> Combined heat and power: [http://www.local.gov.uk/climate-change/-/journal\\_content/56/10180/3510573/ARTICLE](http://www.local.gov.uk/climate-change/-/journal_content/56/10180/3510573/ARTICLE)

<sup>7</sup> Greater London Authority: air quality support: biomass and CHP efficiency standards

<https://www.london.gov.uk/sites/default/files/AMEC%20Emissions%20Standards%20Final%20Report%2013103i1.pdf>

emissions. The review might examine the effectiveness of current approaches and the potential challenges to delivering sustainable heat for homes.

## **New homes**

- 6.21 The Council is embarking on a programme of building new homes – under the New Homes Better Places programme, with the intention of providing 500 new homes by 2018. As stated above, the Council has also committed to reducing the amount of carbon produced – and supporting residents in reducing their heating and energy costs. The second phase of the scheme is due to be implemented.
- 6.22 Lewisham’s core strategy anticipates that 1000 homes a year will be built across all tenures before 2026. Ensuring that the Lewisham invests and supports efficient provision of energy will be of vital importance to achieving the borough’s ambitions for carbon reduction.

## **7. Key lines of inquiry**

- 7.1 The Mayor of London has a clear position on the development of communal heating. The London heat map is designed to ensure that new developments make use of decentralised energy sources.
- 7.2 The Committee might aim to add value to future plans for development in the borough by looking at the design and delivery of communal heating systems in Lewisham. This could be achieved through a comparative analysis of information and case studies. The Committee may also want to explore the issues which lead to the selection of some technologies over others.
- 7.3 The Committee might also wish to examine the impact of current policies and plans on residents in order to achieve a balanced view of the benefits and challenges associated with the development and deployment of new technologies.
- 7.4 Review questions
- How can the Council help to ensure the effective deployment of communal heating systems in the borough, where appropriate?

In order to answer this question the Committee will need to establish the following:

- An understanding of the issues influencing the development and deployment of heating systems in Lewisham;
- Evidence of the benefits and drawbacks of existing communal heating systems in the borough;
- The factors influencing the effective design and operation of heating systems.

This might focus on the following key areas:

- Design (including predicted costs and energy consumption contrasted with actual costs and energy consumption from case studies)
- Implementation (including problems with construction)
- Monitoring and operation (including running costs)
- Lessons that can be learnt for future developments

- 7.5 Issues outside of the scope of the review:

- Government's carbon reduction targets;
- The Council's climate change targets and planning policy;
- Individual householder issues.

## 8. Timetable

The Committee is asked to consider the outline timetable for the review as set out below.

Given the nature of the topic for review, the Committee may wish to carry out its investigation by asking key informants and case studies focused around two evidence-taking sessions at the Committee's meetings on 11 November 2014 and 17 December 2014:

- Officers from two developments with communal heating schemes inside or outside of the borough.
- Officers from the GLA to update on the delivery of the London heat map project.
- Expert witnesses from the energy sector to talk about the opportunities and challenges of communal heating.
- Officers of the Council to provide information and evidence about the Council's planning and building control responsibilities.
- Residents who live in developments with a communal heating systems

## 9. Recommendations and final report (January 2015)

- The Committee may choose to consider a final report presenting all the evidence taken and agree recommendations for submission to Mayor and Cabinet.

## 10. Further implications

At this stage there are no specific financial, legal, environmental or equalities implications to consider. However, each will be addressed as part of the review. It should be anticipated that there will be implications arising from the Council's obligations to carbon reduction, agreed planning policy and building regulations.

### Sources

Code for Sustainable Homes

<https://www.gov.uk/government/policies/improving-the-energy-efficiency-of-buildings-and-using-planning-to-protect-the-environment/supporting-pages/code-for-sustainable-homes>

Energy for London G15 slides

<http://www.energyforlondon.org/london-housing-and-community-heating-presentations/>

Gov.uk: housing energy fact file

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/201167/uk\\_housing\\_fact\\_file\\_2012.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/201167/uk_housing_fact_file_2012.pdf)

GLA energy planning monitoring report (2013)

<http://www.london.gov.uk/priorities/environment/publications/monitoring-the-implementation-of-london-plan-energy-policies-in>

Housing Select Committee: damp and mould review

<http://www.lewisham.gov.uk/mayorandcouncil/overview-scrutiny/Overview-and-Scrutiny-Reports/Documents/ShortReviewHealthImpactOfDampMould.pdf>

Lewisham Carbon reduction and climate change strategy

<http://www.lewisham.gov.uk/mayorandcouncil/aboutthecouncil/strategies/Documents/ClimateChangeStrategyFINAL.pdf>

National Housing Federation: Lifetime costs of installing renewable energy technologies: [http://s3-eu-west-](http://s3-eu-west-1.amazonaws.com/pub.housing.org.uk/Lifetime%20costs%20of%20installing%20renewable%20energy%20technologies.pdf)

[1.amazonaws.com/pub.housing.org.uk/Lifetime%20costs%20of%20installing%20renewable%20energy%20technologies.pdf](http://s3-eu-west-1.amazonaws.com/pub.housing.org.uk/Lifetime%20costs%20of%20installing%20renewable%20energy%20technologies.pdf)

The London Plan

<https://www.london.gov.uk/priorities/planning/london-plan>

Zero carbon homes: definition

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/8557/1415525.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/8557/1415525.pdf)

## **Background Papers**

Housing Select Committee minutes 22/07/14 <http://tinyurl.com/pmykvlz>

For further information please contact Timothy Andrew, Scrutiny Manager on 02083147916.

# How to carry out an in-depth review

