
Overview and Scrutiny

Communal Heating Systems Review

Housing Select Committee

March 2015

Membership of the Housing Select Committee in 2014-15:

Councillor Carl Handley (Chair)

Councillor Peter Bernards (Vice-Chair)

Councillor Paul Bell

Councillor John Coughlin

Councillor Amanda De Ryk

Councillor Maja Hilton

Councillor Simon Hooks

Councillor Olurotimi Ogunbadewa

Councillor Jonathan Slater

Councillor Susan Wise

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- A. Visits to Bunhill Heat and Power, Pimlico District Heating Undertaking (PDHU) and South East London Combined Heat & Power (SELCHP)**
- B. Invitations to Comment to Registered Housing Providers - submission from Family Mosaic**
- C. Case Studies supplied from Combined Heat and Power Association**
- D. Paper from Max Fordham LLP**

Chair's Introduction

To be added.

Councillor Carl Handley
Chair of the Housing Select Committee

1. Executive summary

To be finished in light of the recommendations, once agreed

2. Recommendations

The Committee would like to make the following recommendations:

Recommendation 1:

xxx

Recommendation 2:

xxx

Recommendation 3:

xxx

Recommendation 4:

xxx

Recommendation 5:

xxx

3. Purpose and structure of review

At its meeting on 22 July 2014, the Committee decided to carry out a review into communal heating systems. At its meeting on 1 October 2014, the Committee considered a scoping report for the review and agreed terms of reference. It was decided that the review would explore the following themes and seek answers to the following questions:

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

Evidence sessions were held on 9 December 2014 and 20 January 2015. Witnesses were:

- Jonathan Graham (Policy Manager, Association for Decentralised Energy (formerly the Combined Heat and Power Association (CHPA))
- Robin Feeley (Director, L&Q Energy, L&Q Housing Association),
- Peter North (Senior Manager, Programme Delivery - Sustainable Energy) (Greater London Authority)
- Brian Regan (Planning Policy Manager)
- Bertie Dixon (Max Fordham LLP)
- James Gallagher (Chair, Parkside Residents Association)
- Vimal Bhana (Head of Energy, Barratt Homes)
- Jeremy Bungey (Head of Community Energy, E.ON)

In addition, the Committee considered the following written reports:

- Communal Heating Review: Scoping Paper - Officer Reports

- Combined Heat and Power – Policy and Practice in Lewisham, Brian Regan, Planning Policy Manager
- District Heating System – Case Studies
 - First Choice Homes, Oldham
 - West Bridge Mills District Housing
 - Brownrigg Communal Heating Scheme
- Lincoln Court building, Hebburn
- Max Fordham - Written Comments

The Committee also went on the following visits:

- Bunhill Heat and Power – Monday 19 January 2015
- Pimlico District Heating Undertaking (PDHU) – 22 January 2015
- South East London Combined Heat & Power (SELCHP) – 26 January 2015

The Committee concluded its review and agreed its recommendations in March 2015.

Definitions

The review will define ‘a communal heating system’ as a heating system which supplies heat to a number of dwellings from a common heat source. Communal heating systems range in complexity from simple systems which might heat a single block of apartments to larger scale systems which might heat many buildings, both domestic and commercial (often known as district heating systems).

Provision of communal heating can also be combined with the generation of electricity, known as a combined heat and power system.

This type of system uses significantly less energy than traditional heating systems.

4. The Theory Behind Communal Heating Systems

Policy Context: policy from the European Union, The Government, Greater London Authority and LB Lewisham

- 4.1 The European Union has developed the 'Europe 2020' strategy, which is a growth strategy about moving decisively beyond the Financial Crisis of 2008, to create the conditions for a more competitive economy with higher employment. It is to enable the EU to become a smart, sustainable and inclusive economy. These three mutually reinforcing priorities should help the EU and the Member States deliver high levels of employment, productivity and social cohesion. The Union has set five ambitious objectives - on employment, innovation, education, social inclusion and climate/energy - to be reached by 2020. Each Member State has adopted its own national targets in each of these areas. Concrete actions at EU and national levels underpin the strategy.
- 4.2 As part of this, one of the targets is related to 'Climate change and energy sustainability' with the targets being:
- greenhouse gas emissions 20% (or even 30%, if the conditions are right) lower than 1990
 - 20% of energy from renewables
 - 20% increase in energy efficiency
- http://ec.europa.eu/europe2020/europe-2020-in-a-nutshell/targets/index_en.htm)
- 4.3 The Heat Network (Metering and Billing) Regulations 2014 implement the requirements in the Energy Efficiency Directive (EED) with respect to the supply of distributed heat, cooling, hot water and cold water. The EED promotes energy efficiency in the EU to achieve the Commission's 2020 '20% headline target' on energy efficiency. It lays down rules to overcome market failures that impede efficiency in the supply and use of energy. The legislation is enforced in the UK by the National Measurement Office (NMO). (<https://www.gov.uk/heat-networks#regs>)
- 4.4 The issue of energy use is an issue within the UK, as energy use in housing is responsible for a quarter of energy consumption and carbon dioxide emissions in the UK (United Kingdom housing energy fact file, Department of Energy and Climate Change (DECC) (2012)). 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.

4.5 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
- surface water run-off
- health and well being
- pollution
- ecology
- management

4.6 The Government has stated that while heat networks are firmly established in other countries they currently provide less than 2% of the UK's heat demand. In April 2009 the DECC commissioned an assessment of the technical potential and costs of district heating in the UK. This showed that in the right conditions heat networks could:

- supply up to 14% of the UK's heat demand
- be a cost-effective and viable alternative to individual renewable technologies while reducing the cost of energy for consumers.

The Government has also published a heat map for England, to assist local authorities in planning. It shows that nearly 50% of heat demand in England is concentrated with enough density to make heat networks worth investigating (<https://www.gov.uk/heat-networks#regs>)

4.7 In 2012 DECC also commissioned 'Databuild' to compile a database of heat networks in the UK. Summary evidence on district heating networks in the UK from this database has been published. On 26 March 2013 DECC set out the next steps to ensure affordable, secure, low carbon heating plays an important role in the nation's energy mix in the publication: 'The Future of Heating: Meeting the challenge'. The actions identified for heat networks were:

- Support local authorities in developing heat networks by establishing a Heat Networks Delivery Unit (HNDU) within the Department that will work closely with individual authorities' project teams in England and Wales.
- Provide funding over two financial years to contribute to local authorities' costs in carrying out early stage heat network development. This will enable local authorities to bring forward projects to the stage where they are suitable for investment

including loan finance from the Green Investment Bank or commercial lenders.

- Work over the remainder of this year with the Low Carbon Innovation Coordination Group (which includes the Carbon Trust, BIS, the Energy Technology Institute, the Technology Strategy Board and the Scottish Government) to identify the key technological solutions that require innovation support to deliver the Government's ambitions for heat network development out to 2020.
- Explore the scope for extra financial incentives for renewable heat networks within the Renewable Heat Incentive (RHI) in 2014 and also access to a number of streams of capital funding provided by government.
- Seek to endorse an industry-led consumer protection scheme for heat network users later this year, and encourage the heat networks industry to work with consumer groups in developing this practice.
- Consult this year on options for requiring heat meters to be installed in heat network developments.
[\(<https://www.gov.uk/government/policies/increasing-the-use-of-low-carbon-technologies/supporting-pages/heat-networks>\)](https://www.gov.uk/government/policies/increasing-the-use-of-low-carbon-technologies/supporting-pages/heat-networks)

4.8 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

4.9 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 (page 134; London Plan, Consolidated with Alterations since 2004).

4.10 The London Plan also states that "The Mayor will and boroughs should in their Development Plan Documents (DPDs) require all developments to demonstrate that their heating, cooling and power systems have been selected to minimise carbon dioxide emissions" (page 204; London Plan, Consolidated with Alterations since 2004). It also states that "developments should evaluate combined cooling, heat, and power (CCHP) and combined heat and power (CHP) systems and where a new CCHP/CHP system is installed as part of a new development, examine opportunities to extend the scheme beyond the site boundary to adjacent areas" (page 204; London Plan, Consolidated with Alterations since 2004). The Mayor of London will also expect all major

developments to demonstrate that the proposed heating and cooling systems have been selected in accordance with the following order of preference:

- connection to existing CCHP/CHP distribution networks
- site-wide CCHP/CHP powered by renewable energy
- gas-fired CCHP/CHP or hydrogen fuel cells, both accompanied by renewables
- communal heating and cooling fuelled by renewable sources of energy
- gas fired communal heating and cooling.
(page 204; London Plan, Consolidated with Alterations since 2004).

- 4.11 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. 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 resource. 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.
- 4.12 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.'
(page 97; Lewisham Core Strategy, 2011)

Evidence to the Select Committee

- 4.13 Peter North (Programme Manager, Sustainable Energy, Greater London Authority) gave evidence to the Committee. He reported that a third of London's CO₂ emissions were generated by heating; and that more energy was used to heat buildings in the UK than was used for transport or electricity generation. So in order to deliver reductions in CO₂ in buildings, it would be necessary to increase the energy efficiency of buildings and how the energy is supplied.
- 4.14 He also reported that London had a target of 60% reduction in 1990 levels of CO₂ by 2025 alongside a target to supply 25% of its energy from local decentralised sources. The carbon content of electricity generation would be an important part of future work in this area. He also noted that a public role was required in order to enable district energy.

4.15 The Committee heard that there were three main categories of decentralised energy projects:

- single sites utilising small/medium CHP systems
- multi-site mixed use schemes
- area wide transmission networks with extensive heat pipe systems

In 2011 the GLA carried out a decentralised energy capacity study and it found that London had more capacity potential than the 25% target for decentralised energy set by the Mayor.

4.16 The Committee also heard that the London Plan contains a range of specific policies to promote the development of decentralised in new developments, and that densely developed areas were the most suitable for decentralised energy schemes. It was also reported that area planning was an important part of enabling the future connection of new developments to existing networks. In respect of London boroughs, they could be involved in the delivery of decentralised energy projects in a number of different ways. They might choose to deliver their own schemes, or they might only act as a planning authority, facilitating delivery by others. Development of energy master plans was a long process taking around six months from start to finish, but work had taken place in 10 boroughs to achieve a coordinated policy.

4.17 Peter North informed the Committee that the GLA's EU funded technical, commercial and financial advisory services had helped develop a £300m pipeline of projects. The advisory support was running down and the GLA are proposing a successor arrangement that will operate until 2020. Two of the major projects were:

- Gospel Oak Hospital,
- Islington Heat and Power scheme

Phase two of the Bunhill scheme sought to use waste heat from the underground and other sources. It was also reported that there were four energy from waste plants in and around the city that could provide heat for tens of thousands of homes. South East London Combined Heat & Power (SELCHP) was finally providing heating to estates in Southwark after 15 years of operation as a power-only energy from waste facility. The Committee also heard that it was recognised that residential units had periods of peak demand; schemes which incorporated commercial units were able to sustain more consistent demand.

4.18 The Committee heard from Brian Regan, Planning Policy Manager of Lewisham Council. He advised the Committee that Lewisham's policy was to ask for major planning schemes (with 10 units or above) to consider the installation of a communal heating system.

- 4.19 The Committee also heard evidence from Jonathan Graham of the Association for Decentralised Energy (formerly the Combined Heat and Power Association (CHPA)). The Association has over 90 members, ranging from industrial and heat supply companies to local authorities, including Birmingham, Nottingham and Southampton. He informed the Committee that transparency and fairness should be the driving principles of decentralised energy provision. Also, district heat was technology neutral; and Combined Heat and Power (CHP) was one means for providing heat to a shared heating system, amongst others.
- 4.20 Jonathan suggested that registered social landlords and local authorities were leading the way in implementing new heating systems. CHP provided 2% of UK heat – and was not a new technology; however, CHP was being deployed in new places. He also reported that communal heating systems were popular across Europe, and that communal heating systems had been delivered in a number of places, and had a number of benefits, such as reducing costs and tackling fuel poverty, when they were done right. The Committee also heard that the UK was lucky to have cheap natural gas – but this would not last – so alternative sources of heating need to be found and that there was an impetus to decarbonise heating.

5. Design, Implementation and Practice

The Policy Context

- 5.1 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 SELCHP plant in north Lewisham and Southwark.
- 5.2 Consumption of energy in Lewisham's households is the borough's single largest source of CO₂ emissions. National averages show that 60% of the energy used in homes is for heating, 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.
- 5.3 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.
- 5.4 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.
- 5.5 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. The Department for Business, Innovation & Skills and the DECC state that there are many thousands of heat networks in the UK, supplying hundreds of thousands of dwellings, commercial premises, and public buildings.

- 5.6 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 (page 33; UK Energy Fact File, 2012).
- 5.7 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.
- 5.8 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 CHP.
 - proposals to further reduce carbon dioxide emissions through the use of on-site renewable energy technologies (ref: page 14; Energy planning: monitoring the implementation of the London Plan energy policies in 2013,)
- 5.9 The Association for Decentralised Energy (formerly the Combined Heat and Power Association (CHPA)) state on their website, that with a district heating system, "networks also have the ability to balance the supply and generation of heat, across location and over time. Over the course of the day, heat demand shifts between residential consumers to commercial, industrial and public buildings and back again. A heat network can match and manage these flows, whilst maximising the utilisation of the plant providing the heat. Demand can also be managed across seasons, with networks supporting the operation of distributed absorption cooling plants in the summer providing cooling

on a significant scale.” (http://www.theade.co.uk/what-is-district-heating_191.html).

5.10 The website also lists a number of benefits for district heating networks:

- enabling the efficient transportation and use of heat for a wide variety of users
- allowing a broad range of energy generation technologies to work together to meet demand for heat
- enabling fuel flexibility
- helping to efficiently manage supply and demand of energy
- lowering costs of energy generation
- dramatically increasing fuel efficiency through use of CHP
- reducing labour and maintenance cost as compared to individual systems

These in turn deliver a range of beneficial outcomes:

- provides a means of securing significant reduction in CO₂ emissions through the optimisation of heat supply in the UK
- extending the reach of renewables, by using renewable heat efficiently and providing opportunities for the deployment of renewable technologies that otherwise wouldn't be viable
- improving security of supply
(http://www.theade.co.uk/advantages--benefits_192.html).

Combined heat and power

5.11 Communal Heating Systems are 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.

5.12 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.

5.13 Local Government Association guidance notes that CHP systems can be highly efficient and result in significant CO₂ reductions. 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 CO₂ 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.

Evidence to the Select Committee

- 5.14 The Committee heard evidence from representatives from E.On and Barratt - Jeremy Bungey, Head of Community Energy E.ON and Vimal Bhana, Head of Energy, Barratt Homes. The Committee heard that E.On currently operates 28 communal heating systems in various types of housing developments. When designed, constructed and operated correctly communal heating systems can deliver value for money for residents without compromising on service and protection whilst also delivering significant carbon benefits.
- 5.15 The Committee heard that the average Barratt customer heat bill is approximately £500 per year and the average carbon saving on heat produced during 2014 was 30%, compared to a gas boiler. The average cost of heating a property in the UK including a fully maintenance and replacement service based on market data, is approximately £1,000-£1,100 a year. It was also noted that E.On and Barratt have worked closely over a number of years and endeavour to provide high-quality fully-maintained customer services to their residents, for example a 24-hour/7-day call-out.
- 5.16 The Committee heard that E.On has a 25-year 'Price Promise' to its customers; larger communal heating schemes would ensure that the Price Promise would be more beneficial to their customers. For a rough estimate, the smallest scheme to get the most benefit out of the E.On Price Promise would be about 120 homes and a leisure centre, or between 300-500 homes. It was also reported to the Committee that whilst planning for a communal heating system, a developer or local authority should consider whether they should have an ESCO or Energy Services Company, who can take the risk of operation of the communal heating system. If they are to use an ESCO, it is important to make this decision early in the process so leases can be amended, they are involved in the design and customers are informed.
- 5.17 The Committee also heard that there are currently over 5,500 Barratt Development customers connected to a district heating network. This will increase to over 13,500 when fully built out. Some of the developments that Barratt's have are as follows:

- Cannon Wharf – 679 units + 14 commercial units & business centre.
- Catford Stadium – 588 units + 2 retail units & community centre.
- Loampit Vale – 794 units + leisure centre.

- 5.18. In discussion, the Committee heard that it is difficult to determine a ‘minimum’ amount of properties to make a communal heating system viable. However, depending on the density of properties, there would be more benefit for the customer, and the beneficial in decarbonise energy, if there was a minimum of 250 properties for a high-density property scheme, and a minimum of 800 for a terraced property scheme. It was also reported that the larger the amount of properties attached to a communal heating system, economies of scale dictate that it would be of more benefit to the user in respect of cheaper costs and less wasted energy. It was also noted in evidence that operationally, communal heating systems are at their most efficient when they capture a lot of ‘waste heat’. That way you can recycle its use, and keep costs to a minimum. One way of achieving this is having a diverse mix of properties in the heating system, like leisure centres, or swimming pools, that use heat and power throughout the day.
- 5.19 The Committee also heard that E.On and Barratt were involved in the Steering Group for the Department of Energy-sponsored ‘Independent Heat Customer Protection Scheme’ Independent Heat Customer Protection Scheme, and saw this scheme as a precursor to a statutory scheme in the future, once communal heating systems expand in use. In other evidence to the Committee, Peter North also noted that insulation was the first and most important part of ensuring the efficient use of energy. Generating energy from renewables had proved difficult in the urban environment. Jonathan Graham reported that the GLA has previously published that 500 is the minimum amount of units to make a system viable.

Visits to Communal Heating Systems

- 5.20 Visits were arranged for the Committee to three Communal Heating Systems: Bunhill Heat and Power in the London Borough of Islington, Pimlico District Heating Undertaking (PDHU) in the London Borough of Westminster, and South East London Combined Heat & Power (SELCHP). These visits would give the Committee members an opportunity to see other systems that have been successful implemented and the officials have gathered expertise and experience in this area.
- 5.21 Bunhill Heat and Power’s district wide heat network provides cheaper, greener heat to homes on several estates and buildings in the Bunhill Ward in the London Borough of Islington. The project uses low temperature waste heat to supply heat to new and existing homes. The purpose is to reduce energy costs by at least 10%, reduce carbon emissions and improve the security of the resident’s heat supply. The

system runs on a “Flow and Return” system, where the same heat that is generated and sent out is returned and reused in a recyclable system. The purchasing of fuel and selling generated electricity is done in house by Islington council, as are developing private connection heat supply agreements, monitoring and optimising systems and maintaining specialist systems.

- 5.22 The visit demonstrated that an-house team (Islington Council Decentralised Energy Team) could plan, and deliver, a successful heat and power project, that is delivering lower costs to its residents. The scheme also gives residents a 10% discount on the full energy price to ensure prices are kept at a reasonable level. They were also able to freeze prices in 2014-15 for those on the Bunhill network to reflect the cheaper energy that comes from their investment in the combined heat and power system. The scheme has also contributed to reducing the carbon footprint by 2000 CO2 tonnes per year. It has been success enough to ensure that a phase two expansion of the Bunhill heat and power network is now underway. Funding has been secured by the London Borough of Islington, from the EU CELSIUS research project (managed by the GLA in London) to extend the heat network, and provide additional heat production capacity for connected buildings.
- 5.23 Pimlico District Heating Undertaking (PDHU) is owned by Westminster City Council and managed by CityWest Homes. Built over 50 years ago to help combat London’s air pollution, the PDHU continues to be a crucial source of clean, affordable energy in the city. The network was the first major initiative to combat London’s air pollution, ahead of the Clean Air Act of 1956. PDHU originally used waste heat from Battersea Power Station to supply housing that, needing no coal fires, could be built without adding to London’s smog. This was a landmark initiative following the Great Smog of 1952, which caused the death of an estimated 4,000 people. The system was upgraded in 2006 with a £6.9million boiler plant being added to the system, able to heat an additional 1,400 homes.
- 5.24 PDHU was another successfully operated communal heating system that is delivering reducing heating costs to those connected to the network, and will deliver savings on nearly 3,000 tonnes of carbon dioxide each year – the equivalent of taking 1,000 cars a year off the roads of London. The system has been planned and implemented with much skill, and all costs are covered by the service charge to those connected to the communal heating system, and earnings from selling energy to the National Grid. They are also able to approximately £1m of electricity to the National Grid per year. They also work closely with those on the network, with a pro-active User Group, to ensure that the service charge is kept to a reasonable rate. The last increase in price was in 2011.
- 5.25 SELCHP is converting waste to deliver heat and power to 16 residential blocks in the London Borough of Southwark with around

2,500 residential units. Heat and Power for these estates is currently supplied from five centralised boiler houses at four locations. The London Borough of Southwark had the initial 'anchor load' which allowed the SELCHP development to move forward, and in 2012 Southwark signed a PFI contract with Veolia to run the plant. There exists a clear demarcation of responsibilities between Southwark and Veolia, for example maintenance of external boilers and who residents need to go to when they have issues.

- 5.26 The financial benefits for Southwark Council using SELCHP are that it provided a 10% saving on energy and maintenance costs from their previous contract. Furthermore, the SELCHP contract is long term – 20 years - which means the Council know what they will be paying in the long term, and are not subject to energy price fluctuations. Another benefit of a long term contract with SELCHP is that it reduces the change of boiler breakdown and residents being left cold and without heating, as it is SELCHP's responsibility to respond as soon as possible and this responsibility is clear. The London Borough of Southwark is able to provide cheaper energy costs to their residents, and are also looking to expand the system and were currently in on-going dialogue with five or six developments in the area. SELCHP were able to build in any direction provided that there would be a sufficient load (i.e. residential units) to supply to.

6. The User, Challenges and Concerns

The Policy Context

- 6.1 The officer report for the Review noted a number of challenges for communal heating systems. For example, at the Housing Select Committee meeting on 5 March 2014, the Committee received an update from Council officers about housing regeneration schemes in the borough, and 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
- 6.2. The officer report also highlighted some evidence that the concerns raised at this scheme are not individual to this case. Reports by the housing industry press (Inside Housing) highlighted cases of overheating and the inefficiency of some systems.
- 6.3 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 (page 43; London Heat Network Manual 2014)
- 6.4 The Government conducted a consultation into heat metering early in 2014. 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, an management costs have resulted in such high costs that the housing association has had to subsidise resident fuel bills to avoid fuel poverty". (page 44; National Housing Federation 2010)

- 6.5 Which? Magazine have also been looking into communal heating systems, highlighting such issues, for example, "district heating schemes are a monopoly and consumers have little choice but to remain with the same supplier even if they are dissatisfied. Also, unlike consumers with gas or electric heating, the supply of heat to homes on heat networks is not regulated and these consumers do not have access to the Energy Ombudsman. So it's hard to know who to turn to when things go wrong." (<http://conversation.which.co.uk/energy-home/district-heating-communal-heating-problems>). There will be a Which? report scheduled for February 2015 that compares the costs for properties that are currently using communal heating systems.

Evidence to the Committee

- 6.6 In hearing evidence from Peter North, the Committee heard that there had been anecdotal information of discontent about some schemes. The detail of which was not available at the time. Also, further analysis of concerns and the associated costs would be required in order to understand how these problems arose and how they might be avoided in future. It was also reported that there had been some work carried out to investigate problems with insulation levels of pipework. The lack of effective insulation could lead to overheating and excessive heat losses.
- 6.7 The Committee also heard that there might be different reasons for problems on different schemes, requiring further work in different cases to understand the source of the specific problem or range of problems. Also, it was recognised that the levels of fixed charges for some systems, which remained in the summer months, despite reductions in usage, were of concern on some schemes.
- 6.8 In the evidence that the Committee heard in its first evidence session with the Planning Policy Officer, concerns raised about the speed with which communal heating systems were being deployed, despite signs that there were problems. The potential lessons to be learnt from the issues at Heathside and Lethbridge, including – the importance of good planning; technical expertise; project and contract management.

- 6.9 The Committee also noted, when taking evidence from Jonathan Graham, that there were problems for all modern buildings, which were often the unintended consequence of too much air tightness. It was also reported that common challenges included:
- network losses and overheating
 - poor value from electricity generation
 - low build quality through value engineering
 - poor communication between partners
 - lack of transparency for end users
- 6.10 The Committee heard that the Association for Decentralised Energy (formerly CHPA) would work to offer solutions where problems had been identified. A code of practice was also being developed between the Chartered Institution of Building Services Engineers (CIBSE) and the Association. It was also noted in discussion that there should be obligations on all parts of the supply chain to improve performance. The Committee also heard that the Heat Customer Protection Scheme, required heat to be sold directly to customers – but the industry would build on the foundation to help people supplied by an energy supply company. In terms of the customer, it was intended that there would be transparency for customers on costs & customer protection. It was reported that gas costs are not the same as heat costs, boiler maintenance and replacement needed to be taken into account, and it was acknowledged that information and clarity are needed around costs and expenditure on the different systems available.
- 6.11 Further evidence to the Committee stated that in order to maximise the benefits of communal heating and avoid future problems, all parts of the system had to ensure that they were committed to building and operating systems to a high standard. The Committee heard that communal heating could be efficiently delivered, but this had not been consistent in every case. The Association for Decentralised Energy was developing tools to ensure that there were not problems in the future. It was noted that new build developments were different from the communal heating systems that had been in development previously, new rules for insulation in residential buildings and energy efficiency meant that there was an inconsistent level of demand.
- 6.12 The Committee also heard evidence from Bertie Dixon, an Engineer from Max Fordham. He reported to the Committee that Max Fordham LLP is a consultancy specialising in engineering and construction, and has been in business for over 50 years. The company has worked with numerous local authority housing developments, including projects in Lewisham such as Milton Court. They have installed and refurbished all types of heating system in that period, and followed up the results where possible.

- 6.13 The Committee heard that the general convention since the 1980s has been to fit individual boilers rather than communal heating when constructing housing developments. However, in the last 10 years there has been a move to fit communal heating systems. This is due to the very strong policy position that has developed that combined heat and power is the most efficient way to generate heat. The GLA and in turn local councils now all but require communal heating systems in major housing developments in London, and strongly encourage combined heat and power. Max Fordham LLP believes that there is an 'gap in understanding' in the information that has led to this policy position held by the GLA and others, on the operational use of communal heating systems and the inappropriate use of small scale combined heat and power units.
- 6.14 The Committee also heard that the Government published calculation methods used for building control and planning state that there is a 5% loss in energy with communal heating systems; but Max Fordham LLP own calculations state that for new flat developments it is more like 50%-70%. Losses as low as 30% are possible but with unusually high standards of design and installation. This causes higher carbon emissions, significantly higher bills than one would predict using the government calculator. Furthermore the uncontrolled heat loss in the distribution system causes overheating with attendant health risks to the tenants.
- 6.15 Bertie Dixon also said that Housing developers are now expected by planners to install communal heating systems to meet sustainability requirements for new developments, when better energy-efficient building would have been a more effective solution. One of the issues is that policymakers seem not know how inefficient communal heating systems are, particularly in current UK practice, and seem to be unaware of the problems that social housing tenants have with these systems.
- 6.16 The Committee also heard that with communal heating systems, the capital costs are substantially higher due to the increased level of infrastructure, and the running costs are higher due to the increased fuel used, maintenance and management. Bills are generally much lower for the tenant with a single boiler system in their dwelling. Bertie Dixon also reported in his evidence that housing developers do have an option not to install communal heating systems if they so wish, especially if they build more energy-efficient properties. However the policy is loaded against this as installing communal heating systems is a cheaper option to achieve the carbon reduction targets on new housing development than greater levels of insulation, given the unrealistically low loss figures provided in the Governments statutory calculation method. The pressure from planning to install communal heating make not installing it a greater planning risk. Therefore a policy which encourages district heating discourages inherently energy efficient buildings. Bertie Dixon observed that those installing

communal heating systems should publish the efficiency performance figures at planning and during operation to make these issues public and plain to see. It is acknowledged that there is still a lot of learning to be done in terms of the knowledge of how communal heating systems function.

- 6.17 The Committee also heard from James Gallagher, Chair of Parkside Residents Association. This gave the Committee an insight into how a communal heating system affects users in Lewisham. He reported to the Committee that, as well as being Chair of Parkside Residents Association, he also has worked as a construction economist during his career, so has some experience of the issues in respect of different heating systems. The Committee heard that he queried the cost of moving to a communal heating system, and residents were told that the cost to them would be approximately £2-3 a week, which was a factor in many residents staying in Parkside. However the cost to residents has worked out to be in the region of £8-9 a week, a significant increase in what they were originally quoted.
- 6.18 James Gallagher reported to the Committee that he estimated that the cost of putting in communal heating systems for the amount of new housing developments planned for London over the next 20 years would be in the region of £2bn, and feels that this money could be put to better use. The Committee heard that communal heating systems are utilised better in high demand environments, where they could be in use 24 hours a day/7 days a week; that is not the case in residential housing. The Carbon Trust suggests that communal heating system need to be in use for approximately 4,500 hours a year to be energy-efficient. The communal heating systems in Parkside are only in use for approximately 1400-1750 hours a year.
- 6.19 James Gallagher reported to the Committee that he believed that the EU Directives of 2002/91/EU and 2010/31/EU should have been considered for housing developers, which would mean they would have to look at various heating systems before start of construction. The Mayor of London has a target to achieve 25 per cent of London's energy supply from decentralised energy sources by 2025. However, James Gallagher believes that communal heating systems are not the best way to achieve this objective due to their inefficiency, and they also do not help in reducing energy poverty.
- 6.20 The Committee also heard that James Gallagher's own calculations concluded that communal heating systems add over £400 a year to bills, when you include tariff, operational, depreciation, and replacement costs. He also reported that landlords install communal heating systems with the objective of reducing tenants' energy bills, but this has led to some instances to an increase in overall bills.

- 6.21 E.On and Barratt, as part of their evidence, reported to the Committee that some of the challenges in respect of communal heating systems are:
- Installing the best equipment for the communal heating system required (e.g.) piping, Hydraulic Interface Units (HIUs) etc.).
 - Managing the demand throughout the day.
 - Installation of adequate heat storage and back-up boilers where necessary.
- 6.22 The Committee also heard that in dealing with possible overheating issues after communal heating systems are installed, Barratt's Dalston Square development had some overheating issues in the past. These had been addressed with ventilation, distribution design techniques and employing different types of heat exchangers. The Committee was told that Barratt employs staff on-site in the major developments they are involved in, for after-care services, to deal with any issues that may occur. In respect of other developments with overheating issues, some developments are designed differently to Barratt/E.On developments, so there may be additional factors as to why some buildings suffer from overheating once communal heating systems are installed. The Committee heard that customers are able to leave communal heating systems if they so wish, but there are infrastructure costs that may prohibit them from leaving, such as the cost and installation of an individual boiler.
- 6.23 Further challenges that Barratt have dealt with are addressed in 'Lessons Learned and the Future'.
- 6.24 The Committee was also concerned that it appeared as though there were sectional interests at every part of the communal heating supply chain, including glaziers, boiler engineers, plumber, developers and supply companies; meaning that the end users were frequently an afterthought, when they should be of primary importance.
- 6.25 The visit to PDHU also outlined a number of challenges to communal heating systems, for example the cost of the capital – plant, pipeline, putting in block or individual metering – could be prohibitive, tax issues, noise (communal heating systems can in some instances be a noisy operation with the large fans that are needed to cool the engines that run the systems) and the availability of skilled and dedicated staff.

7. Lessons Learned and the Future

- 7.1 The Committee received evidence about how some of the challenges have been met, or attempts to address the. Members also received evidence about possible action that could be taken in the future from various witnesses. The evidence received was based on experience of the development, installation and the operation of communal heating systems, and what can be learned as a result of this.
- 7.2 Peter North also reported that the future of heat networks would be to utilise heat lost from other processes - which would require technical availability and economic viability. In order to meet the government's carbon targets, decentralised energy and communal heating would need to be part of the solution. The Committee recognised that in order to demonstrate commercial viability and bring in private sector money, work had to be done to develop the economic case for decentralised energy schemes. Also, projects had to be configured to attract lending and sustainable rates of return for investors. Councils could also use funds from the public loans board, the green investment bank and the London green fund to get projects started.
- 7.3 Jonathan Graham reported that the working communal heating system in Lewisham - the South East London Combined Heat and Power plant (SELCHP) - provided an example of the viability of decentralised energy schemes. There would also be more protection for the user very shortly as there are two different Code of Practice schemes being delivered in 2015. There is the Code of Practice, developed jointly by CHPA and CIBSE, and there is the Independent Heat Customer Protection Scheme that Barratt and E.ON have signed up to.
- 7.4 Max Fordham presented some further written evidence to the Committee after its evidence session, which outlined some proposals to progress Lewisham's policy on communal heating systems. The proposals included changing Lewisham's present planning policy that asks for major schemes (with 10 units or above) to consider the installation of a communal heating system. Another proposal was to ensure that the price that a resident pays for heat from a district heating system is capped at what a resident would pay for gas burned in a combi boiler that is replaced on a 15 year cycle and maintained on a bulk purchase maintenance agreement available to larger landlords such as Registered Social Landlords (RSLs). Another proposal would be for all planning applications to be accompanied with realistic projected carbon emissions based on accurate calculated assessments of the system losses.
- 7.5 Jeremy Bungey evidence contained some lessons learnt by E.On in their development of communal heating systems, which were as follows:
- Early consideration of operating and billing requirements
 - Early consideration of Customer Protection requirements

- The system needs to work for the first customer to the last and needs to be designed as such
- Things tend to go wrong with setting up the automatic meter reading (AMR) and control systems
- Ensure the low carbon technology actually runs
- Communicate with the customers early

7.6 Jeremy Bungey also reported that the individual metering of properties or block-level metering is a requirement for new housing developments incorporating communal heating systems from April 2015. The Committee heard that the Department of Energy-sponsored 'Independent Heat Customer Protection Scheme', also mentioned in Robin North's evidence is an attempt to provide customers who are in communal heating systems with some protection in a fairly new industry. Suppliers must provide customers with transparent heat charge calculations indicate how prices might change in the future and provide an industry-wide heat charge comparator. It's a voluntary regulatory scheme, which E.On and Barratt has been involved in developing, and will join.

7.7 Vimal Bhana also gave evidence to the Committee on some of the challenges and lessons learnt by Barratt. They are listed as follows:

- Inform the customer what a communal heating system is, and how it operates, alongside all the information they receive whilst buying a home (Barratt's have developed their training of staff so they are able to provide customer-friendly information on communal heating systems)
- Provide a Customer Sales Code for customers
- Make sure customers are aware of Landlord and Tenant Act Provisions in relation to their property
- Sign up to the Independent Heat Customer Protection Scheme (Barratt have done this)

7.8 Some of the technical lessons that Barratt have learned are as follows:

- Air quality Nitrogen Oxide (NOx) target levels can impact carbon performance and costs to end users. Communal heating systems are good at producing low carbon heat and power, but can emit some NOx is an irritant gas, which at high concentrations causes inflammation of the airways. The installation of ultra low NOx boilers will reduce the impact considerably but have a shorter life-span before they would need to be replaced.
- There are issues over whether there should be individual cylinders installed versus whether additional storage in apartments is preferable to residents.
- Overheating in developments – communal heating systems causing overheating can be designed out at the installation

stage, or mitigated at a later date once the causal factor has been identified.

7.9 Some of the planning issues that Barratt has learned are, for example:

- Requirement to connect to future strategic networks – need to consider whether this might be feasible when planning heating systems for its developments.
- Expanding communal heating networks to neighbouring loads – this is difficult to plan in advance without knowing what the technology will be in the future. However they will where appropriate, such as its expansion of the Loampit Vale development communal heating system to connect to properties on Thurston Road.

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8. Monitoring and ongoing scrutiny

A number of issues were discussed during the course of the review which could not be considered in depth. The Committee might want to consider these issues further at a later date. These include:

- The Ultra Low Emissions Zone
- Planning and Air Quality/Environmental issues

The Committee may decide to consider these issues as part of its 2015/16 work programme (time permitting). The Committee would also like an update on the implementation of any agreed recommendations before the end of the 2015/16 municipal year.

Recommendation #:

An update on the implementation of any agreed recommendations should be brought before the Committee before the end of the 2015/16 municipal year.

Sources

1. European Commission – Europe 2020 website.
2. Government UK website - Heat Networks Metering and Billing: compliance and guidance.
3. Government UK website - Increasing the use of low-carbon technologies.
4. London Plan, Consolidated with Alterations since 2004
5. Lewisham Core Strategy, 2011
6. Communal heating review: scoping paper, Officer Report
7. UK Energy Fact File, 2012
8. Energy planning: monitoring the implementation of the London Plan energy policies in 2013
9. The Association for Decentralised Energy website - What is District Heating?
10. The Association for Decentralised Energy website - Advantages & Benefits
11. London Heat Network Manual 2014
12. Which? Conversation website – ‘District heat users – are you happy with your service?’

Appendix A

Bunhill Heat and Power Centre Visit – 19 January 2015

Attendees from Lewisham Council:

Councillor Maja Hilton

Roger Raymond, Scrutiny Manager, Overview and Scrutiny Team

James Linton, Officer, Business and Committee Team

Background

The London Borough of Islington is at the forefront of creating affordable energy solutions which are kind to the environment and the Bunhill Heat and Power scheme installed by Vital Energi is now providing cheaper energy bills for residents and is responsible for lowering CO2 emissions.

Progress on Phase 1 and Phase 2

Phase 1

- Bunhill Energy Centre and the district wide heat network provides cheaper, greener heat to homes on several estates and buildings in the Bunhill Ward.
- Phase 1 of the development was delivered in December 2012. The heat network installed thus far is fed by the local energy centre on Central Street which produces both electricity and heat.

Phase 2

- Phase 2 of the Bunhill Heat and power network is now underway. Funding has been secured from the Council, Bunhill ward and the EU CELSIUS research project (managed by the GLA in London) to extend the heat network, and provide additional heat production capacity for connected buildings.

- The final scope of the second phase is under development by the Islington Council Decentralised Energy Team. The project aims to continue with Phase 1 goals and provide cheaper, low carbon heating to Islington residents, businesses and organisations connected to the district heating network. The network is proposed to be extended northwards to supply Islington council's King Square estate and other properties adjacent to this and the existing network.

Observations from the visit

- The second phase of the project will use low temperature waste heat to supply heat to new and existing homes. The purpose is to reduce energy costs by at least 10%, reduce carbon emissions and improve the security of the resident's heat supply.
- A 1.9MW CHP plant is in place that generates heat and electricity. It currently powers 720 council homes and 162 private homes and two leisure centres. Generated electricity is sold to the National Grid by the council. The heating is not subsidised.
- The heating temperature is changed at the radiators in the homes rather than with switches or meters on the wall. Hot water is provided 24hrs a day and the CHP engine is run a maximum of three times a day.
- Pricing problems are occurring for residents because the management companies are putting the heating prices up *after* the council supplies the heating. This is a problem that the council is attempting to solve by negotiating with the companies for more affordable pricing.
- The benefits of their communal heating system are
 - reduced heating costs
 - efficient scale of operation
 - the small size of the container means a small site
 - reduced heating costs for residents
 - reduced the carbon footprint by 2000 CO² tonnes per year

- The system runs on a “Flow and Return” system, where the same heat that is generated and sent out is returned and reused in a recyclable system. The purchasing of fuel and selling generated electricity is done in house by Islington council, as are developing private connection heat supply agreements, monitoring and optimising systems and maintaining specialist systems.
- The council has a planned growth of another 500-1000 homes in Phase 2. The funding so far is £1m from the EU and £2.7m from the council. Construction is planned in 2015, with testing and tuning due to run in 2016/17. Full operation of the system is planned to begin in 2017.
- Existing DE networks within the borough will be protected and the expansion will be supported. All developments in the council will be required to contribute to the development of DE networks.
- The hot water consumption is currently not monitored on old buildings due to the lack of water meters on the site, but new builds should be fitted with meters. Because of this, residents not using/using less heating each day are still charged the base charge which applies to all the residents on the system (approximately 70p per day).

Visit to Pimlico District Heating Undertaking (PDHU) – 26 January 2015

Attendees from Lewisham Council:

Councillor Simon Hooks

Roger Raymond, Scrutiny Manager, Overview and Scrutiny Team

Background

PDHU:

- The PDHU is owned by Westminster City Council and managed by CityWest Homes. Built over 50 years ago to help combat London's air pollution, the PDHU continues to be a crucial source of clean, affordable energy in the city. The network was the first major initiative to combat London's air pollution, ahead of the Clean Air Act of 1956.
- The PDHU is the UK's first combined heat and power network and provides heating and hot water services to 3,256 homes, 50 commercial premises and three schools in the area.
- The PDHU originally used waste heat from Battersea Power Station to supply housing that, needing no coal fires, could be built without adding to London's smog. This was a landmark initiative following the Great Smog of 1952, which caused the death of an estimated 4,000 people. The system was upgraded in 2006 with a £6.9million boiler plant being added to the system, able to heat an additional 1,400 homes. This will lead to further savings on nearly 3,000 tonnes of carbon dioxide each year – the equivalent of taking 1,000 cars a year off the roads of London.

Observations from the visit

- The system is a not for profit operation – all costs are covered by the service charge to those connected to the communal heating system, and earnings from selling energy to the National Grid.
- They sell approximately £1m of electricity to the National Grid per year.

- PDHU does have access to back-up, oil-fired boilers , though they have rarely been used.
- It is priced by a service charge; there is no individual metering of properties, and they sell heat at the present time at 5 pence per kWh.
- PDHU operates the largest thermal store in the UK; this means that the system is able to store water overnight to manage the use of heat and power and on the rare occasions when there are problems with the system.
- Those who manage the system work closely with a pro-active User Group to ensure that the service charge is kept to a reasonable rate. The last increase in price was in 2011.
- Residents are asked to agree a short Heat Supply Agreement to sign up to PDHU. Individuals are able to leave the heating system if they so wish; however no-one has requested to leave as yet.
- The officers estimate that there is an approximately a 7% loss of heat in the residential blocks.
- As communal heating is a new, and thus not as regulated as other energy industries, there could be issues in the pricing in other communal heating systems. This is important because communal systems are meant to be more efficient than conventional boiler systems and should over time reduce energy bills and help tackle fuel poverty.
- The London County Council (General Powers) Act 1949 provides the power to London Boroughs to develop and operate heat networks and sell heat energy.
- The original timeframe that the Department of Energy and Climate Change envisioned to expand the use of communal heat systems and connect heat networks had to be revised as it was ambitious. At present, The Department of Energy now envisage that an n estimated 14 per cent of UK heat demand could be cost effectively met by heat networks by 2030.
- Some of the challenges for communal heating systems are as follows:
 - The cost of the capital – plant, pipeline, putting in block or individual metering – could be prohibitive
 - Taxes – PDHU residents are subject to carbon tax: they are the only residents in the UK that have to pay this tax. They are also subject to the European Union’s emission tax. More work needs to be done on the establishment of fair taxes in this industry.
 - There are issues in respect of ‘heat loss’ within the residential blocks that are more likely to be addressed by new builds that install communal heating systems
 - Noise – communal heating systems can in some instances be a noisy operation with the large fans that are needed to cool the

engines that run the systems. So care must be taken to place the engines/boilers/fans in an area that will not disturb residents, if possible

- The nitrogen oxides (NO_x) still need to be managed with a communal heating system, so there are air quality issues that need to address
- Daily Metered gas – the issue of metering is complex, and like PDHU, some communal heating systems may set a service charge than have a Daily Metered that has a data logger fitted to record, store and transmit daily readings and measurements.
- Water treatment - the water that is used for communal heating systems needs to be treated to protect the copper pipes that are used in the system
- Skills and Commitment – there is a skills shortage for staff that understand how to operate big networks of communal heating systems; and you need dedicated and stable staff to manage the systems effectively

Appendix B

Officers wrote to Registered Housing Providers in Lewisham, and asked them whether they would want to submit some written evidence to the Communal Heating Systems Review. This would have enabled the Registered Housing Providers to add to the Review with their expertise and knowledge in the area of communal/district heating. Hexagon Housing and Family Mosaic responded, with Hexagon Housing reporting that as an organisation much experience of communal heating except in hostels, so did not provide a written submission. Family Mosaic's response is below

SUBMISSION FROM FAMILY MOSAIC

DICK MORTMIER - DIRECTOR OF PROPERTY SERVICES

I have looked at the review and I have looked at some of the key questions that are being raised. I think it is absolutely vital that Council also considers as part of this review a number of other factors:-

1. What are the plans for reviewing energy price predictions over the next 10 years and comparing that to the present position. Reviewing a district heating system in isolation as opposed to a 10, 20, 30 year prediction, would be I suggest more beneficial. Housing isn't just about residents today, it is about the needs and the customer use in the future.
2. Many local authorities look at the communal heating systems as a long term strategy for a potential "network" of sites across the borough. Indeed, many local authorities have concrete plans for this. Lewisham will no doubt be looking at this for the future as well.
3. The reduction in CO2 emissions through the set up with a combined heat and power system will and does constitute a significant and beneficial change to the reduction of emissions into the atmosphere.
4. Design and operation of communal heating systems continues to evolve and the down side of these systems is that when something goes wrong, it doesn't just go wrong for one resident it can go wrong for hundreds of residents, hence exacerbating the problem. The committee might actually like to ascertain how many times individual gas boilers go down across the borough over a period of time to see

just how many individual residents are effected rather than assuming that communal heating systems always produce the worst service.

5. Overheating – this is an important area and good design is absolutely vital to producing better quality systems. However, our buildings are becoming more and more “air tight” and with the push for higher density this can create problems. We are now ensuring that the design and calculations associated with potential overheating form part of the decision making process very much at the start of the scheme rather than later on during the construction process. This of course is not only about heat levels within the flats it is also about the distribution areas such as corridors and risers.

