

Energy Statement



Chalton Street

September 2016

REPORT REF: ES/CS/092016 - BC

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DOCUMENT CONTROL SHEET:

Rev.	Issue Purpose	Checked	Signature	Author	Signature	Date
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1. EXECUTIVE SUMMARY

- 1.1 NRG Consulting have been appointed by Rangepay Ltd to undertake an Energy Statement on a proposed development in the London Borough of Camden on 53-55 Chalton Street NW1 1HY and 60 Churchway NW1 1LT.
- 1.2 The scheme comprises of a 6–storey hotel with 60 guest rooms and an associated internal floor area of circa 1,600m².
- 1.3 This document has been produced to satisfy:
- Policies 5.1: Climate Change Mitigation, 5.2: Minimising Carbon Dioxide Emissions, 5.3: Sustainable Design and Construction, 5.5: Decentralised Energy Networks and 5.7: Renewable Energy of the *London Plan*.
 - London Borough of Camden *Core Strategy Policy CS13: Tackling climate change through promoting higher environmental standards, Camden Local Development Framework - Policy DP22 – Promoting sustainable design and construction and Camden Planning Guidance – Sustainability – CPG 3*.
- 1.4 This strategy illustrates high standard of energy efficiency and sustainability achieved via:
- Passive Design Measures
 - Low U-Values
 - Low Air Permeability
 - Mechanical Ventilation
 - Efficient Building Services including Ventilation and Cooling
 - A CHP unit as the lead boiler for Heating and Hot Water
 - 100% Low Energy Lighting
- 1.5 A BREEAM Pre-Assessment under the “Other - Residential institutions (short term stay)” issued under a separate cover shows how a “Very Good” rating will be achieved.
- 1.6 This document has been written in adherence to the GLA Guide to Energy Statements (March 2016) and with the Mayor’s Sustainable Design and Construction SPG (April 2014).

Disclaimer

The performances of renewable systems, especially wind and solar, are difficult to predict with any certainty. This is due to the variability of environmental conditions from location to location and from year to year. As such all budget/cost/sizings, which are based upon the best available information, are to be taken as estimation only and should not be considered as a guarantee. This report relates to pre-planning stage therefore final specification must be provided by an M & E consultant after stage C.

NRG Consulting disclaims any responsibility to the Client and others in respect of any matters outside the scope of this report. This report is confidential to the Client and NRG Consulting accepts no responsibility of whatsoever nature to third parties to whom this report or any part thereof is made known. Any such party relies upon the report at their own risk.

2. POLICY FRAMEWORK

- 2.1 With over 1000m² of floor area proposed the development falls within the Government's "major" category of planning applications.

NATIONAL POLICIES

- 2.2 On 25 March 2015, the Government confirmed its policy to limit local energy requirements and continue to support low carbon infrastructure. The Mayor has considered the Government's intentions regarding energy performance standards and its support for energy infrastructure and aligns his energy targets within his energy hierarchy this approach. It encourages developers to make carbon savings on-site, firstly through demand reduction. These reductions are in line with the Government's preferred maximum energy requirement (19 per cent reduction beyond Part L 2013 (Code 4) equivalent). The remaining energy savings are met through low carbon infrastructure, either on-site or off-site.
- 2.3 The Mayor has also commissioned a viability study as part of his Minor Alterations to the London Plan which confirms that current and future London Plan targets are viable for development in London. The targets in the London Plan will therefore continue to be applied in line with the energy hierarchy, across both residential and non-domestic development until the implementation of zero carbon policies in 2016. (Source: Pg.11 *GLA Guide to Energy Statements* – April 2015)

REGIONAL POLICIES

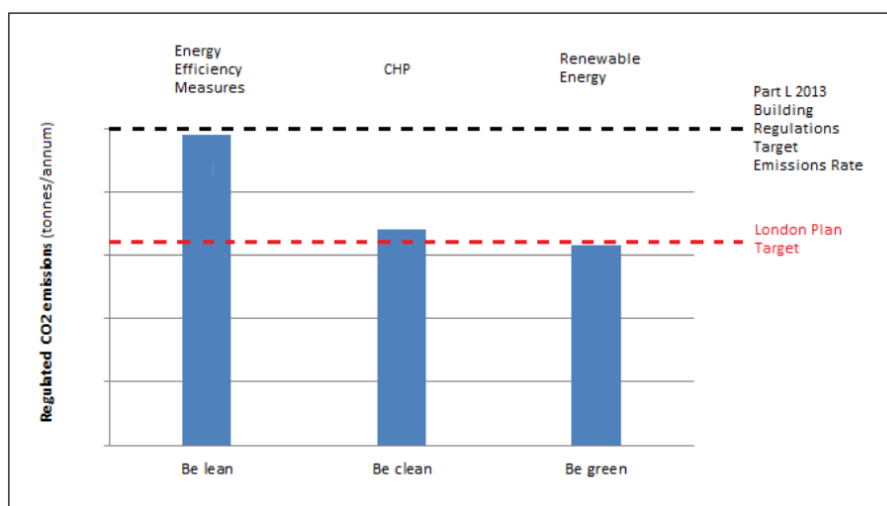
- 2.4 The London Plan was updated in March 2015. A link to the new version can be found here:
<https://www.london.gov.uk/priorities/planning/london-plan/further-alterations-to-the-london-plan>
- 2.5
- A** Development proposals should make the fullest contribution to minimising carbon dioxide emissions in accordance with the following energy hierarchy:
1. Be lean: use less energy.
 2. Be clean: supply energy efficiently.
 3. Be green: use renewable energy.
- B** The Mayor will work with boroughs and developers to ensure that major developments meet the following targets for carbon dioxide emissions reduction in buildings. These targets are expressed as minimum improvements over the Target Emission Rate (TER) outlined in the national Building Regulations leading to zero carbon residential buildings from 2016: Improvement on 2013 Building Regulations: 2013 - 2016 – **35%** (as of 6th April 2014).
- C** Development proposals should include a detailed energy assessment to demonstrate how the targets for carbon dioxide emissions reduction outlined above are to be met within the framework of the energy hierarchy.
- D** As a minimum, Energy Assessments should include the following details:

- i. Calculation of the energy demand and carbon dioxide emissions covered by the Building Regulations and, separately, the energy demand and carbon dioxide emissions from any other part of the development, including plant or equipment, that are not covered by the Building Regulations.
- ii. Proposals to reduce carbon dioxide emissions through the energy efficient design of the site, buildings and services.
- iii. 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).
- iv. Proposals to further reduce carbon dioxide emissions through the use of on-site renewable energy technologies.

- 2.6 As of 6th April 2014, The London Plan changed the targets required for major developments from 40% reduction in CO₂ emissions over the Part L 2010 baseline to 35% reduction in CO₂ emissions over the Part L 2013 baseline. Text from the GLA Website confirms this:

The GLA provides guidance for developers and their advisers on preparing energy assessments to accompany strategic planning applications. Each assessment is required to demonstrate how the targets for regulated CO₂ emission reductions over and above 2013 Building Regulations will be met using the Mayor's energy hierarchy. As outlined in the Sustainable Design and Construction SPG, since 6 April 2014, the Mayor has applied a 35 per cent carbon reduction target beyond Part L 2013 of the Building Regulations - this is deemed to be broadly equivalent to the 40 per cent target beyond Part L 2010 of the Building Regulations, as set out in London Plan Policy 5.2 for 2013-2016. (Source: GLA. 2015. Energy Planning - GLA Guidance on preparing energy assessments. [ONLINE] Available at: <https://www.london.gov.uk/priorities/planning/strategic-planning-applications/preplanning-application-meeting-service/energy-planning-gla-guidance-on-preparing-energy-assessments>) [Accessed April 15].

- 2.7 A visual representation of the GLA Target in relation to Building Regulations where feasible is:



(Source GLA. 2015. Pg.13 ENERGY PLANNING Greater London Authority guidance on preparing energy assessments (April 2015). [ONLINE] Available at: <https://www.london.gov.uk/sites/default/files/GLA%20guidance%20on%20preparing%20energy%20assessments%20April%202015.pdf>. [Accessed April 15].

LOCAL POLICIES

- 2.8 This document has been produced to meet compliance with the requirements of London Borough of Camden Council's Core Strategy (Adopted 2010) and the Local Development Framework (2010) which set out the following policies in relation to climate change and energy efficiency:

CS13 - Tackling climate change through promoting higher environmental standards

Reducing the effects of and adapting to climate change

The Council will require all development to take measures to minimise the effects of, and adapt to, climate change and encourage all development to meet the highest feasible environmental standards that are financially viable during construction and occupation by:

- a) ensuring patterns of land use that minimise the need to travel by car and help support local energy networks;
- b) promoting the efficient use of land and buildings;
- c) minimising carbon emissions from the redevelopment, construction and occupation of buildings by implementing, in order, all of the elements of the following energy hierarchy:
 - ensuring developments use less energy;
 - making use of energy from efficient sources, such as the King's Cross, Gower Street, Bloomsbury and proposed Euston Road decentralised energy networks;
 - generating renewable energy on-site; and
- d) ensuring buildings and spaces are designed to cope with, and minimise the effects of, climate change.

The Council will have regard to the cost of installing measures to tackle climate change as well as the cumulative future costs of delaying reductions in carbon dioxide emissions

Policy DP22 - Promoting sustainable design and construction

The Council will require development to incorporate sustainable design and construction measures. Schemes must:

- a) demonstrate how sustainable development principles, including the relevant measures set out in paragraph 22.5 below, have been incorporated into the design and proposed implementation; and
- b) incorporate green or brown roofs and green walls wherever suitable.

The Council will promote and measure sustainable design and construction by:

- c) expecting new build housing to meet Code for Sustainable Homes Level 3 by 2010 and Code Level 4 by 2013 and encouraging Code Level 6 (zero carbon) by 2016.
- d) expecting developments (except new build) of 500 sq m of residential floorspace or above or 5 or more dwellings to achieve "very good" in EcoHomes assessments prior to 2013 and encouraging "excellent" from 2013;
- e) expecting non-domestic developments of 500sqm of floorspace or above to achieve "very good" in BREEAM assessments and "excellent" from 2016 and encouraging zero carbon from 2019.

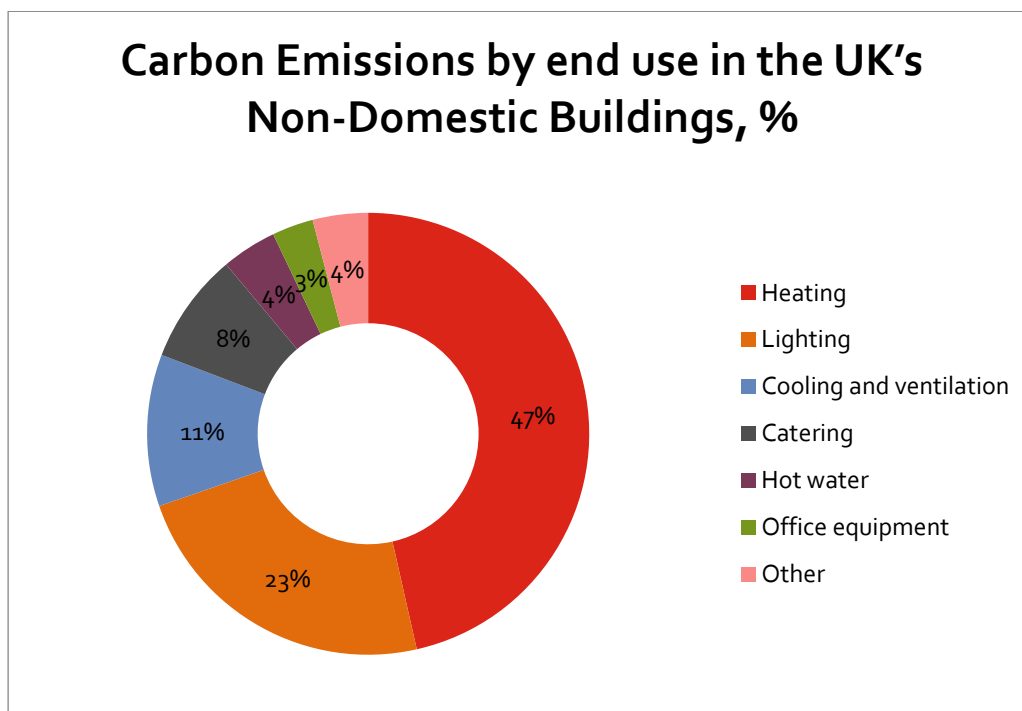
The Council will require development to be resilient to climate change by ensuring schemes include appropriate climate change adaptation measures, such as:

- f) summer shading and planting;
- g) limiting run-off;
- h) reducing water consumption;
- i) reducing air pollution; and
- j) not locating vulnerable uses in basements in flood-prone areas.

- 2.9 This assessment will show how the development engages with issues of sustainable construction, design and energy, by integrating low energy requirements and sustainable practices to minimise the impacts of the development on climate change. To comply with the Camden Council's CO₂ reduction requirements, the main focus of the energy strategy will be on the proposed energy efficiency measures detailed in section 4 and low carbon energy sources described in section 5.

3. BASELINE CO₂ EMISSIONS

- 3.1 A full SBEM Calculation has been carried out using IES Version 7.0.2 to gain the regulated emissions for the site. A licensed and accredited NDEA (SBEM Assessor) has carried out the calculations.
- 3.2 Typical CO₂ emissions for non-domestic developments are broken down as follows:



- 3.3 The BRUKL documents include the Unregulated Emissions of the hotel which are not counted for the purpose of Part L of the Building Regulations. In line with CIBSE Guide F and other best practice standards, unregulated emissions cover the use of:
- a) Appliances
 - b) Commercial Laundry
 - c) Restaurant/Catering
- 3.4 Despite being considered extremely difficult to reduce, the following measures will be adopted to try and minimise these emissions:
- Energy Efficient lifts with measures such as power conservation.
 - Provision of low energy fittings with PIR sensors for the communal and external areas.
- 3.5 In accordance with potential planning requirements, compliance is to be achieved with BREEAM "Very Good".

4. BE LEAN

- 4.1 Construction Details have been selected to ensure that all fabric U-Values exceed the requirements of Part L of the Building Regulations (2013) and all Heating, Hot Water and Ventilation elements are in compliance with the Domestic Building Services Compliance Guide (2013). The proposed construction details for the development are as follows:

Elements	U-Value/Specifications	Development Notes
Ground Floor	0.18 w/m ² /k	
External Walls	0.2 w/m ² /k	
Semi Exposed Walls	0.2 w/m ² /k	Walls to Lifts
Roof	0.16 w/m ² /k	
Windows	1.7 w/m ² /k	Double glazed
Doors	1.8 w/m ² /k	
Air Permeability	5 m ³ /hm ² @50Pa	
Ventilation	Mechanical Ventilation with Heat Recovery	via Air Handling Unit
Heating	Mitsubishi VRF	via LTHW boilers
Hot Water	Instantaneous Hot Water	via HIU
Cooling	Via Split or Multi-Split System	
Lighting	100% Low Energy	Low Energy Bulbs with a luminous efficacy of 85 lumens/watt.
Thermal Bridging	ACDs	Accredited Construction Details to be followed.

- 4.2 The U-Values of all glazed elements will exceed Building Regulations standards, and incorporate low emissivity coating, resulting in an efficient balance between passive solar gain and the thermal losses from each room.

Daylight levels are high throughout and are supplemented with low energy light bulbs. The orientation of the building reduces peak solar gain while ensuring optimum levels of daylight both morning and evening.

5. BE CLEAN

5.1 Policy 5.6B of the London Plan advises the following:

Major development proposals should select energy systems in accordance with the following hierarchy:

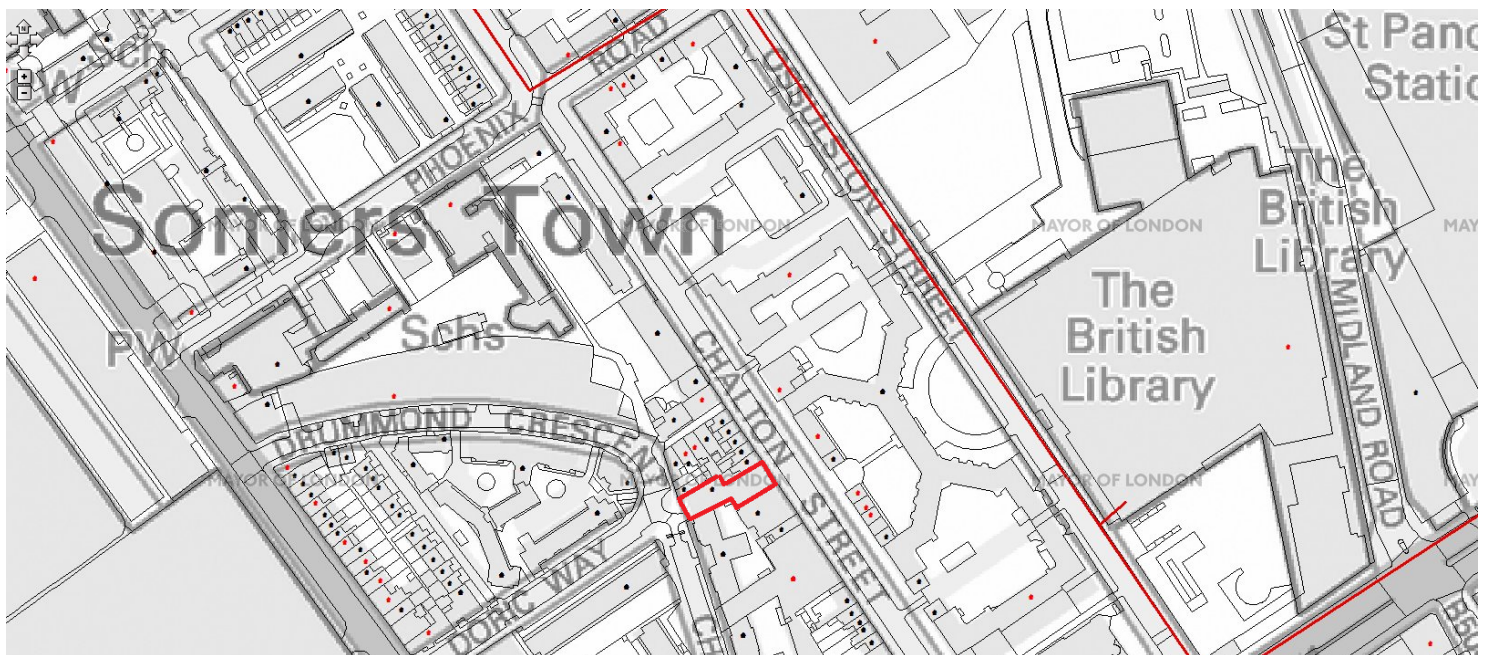
1. Connection to existing heating or cooling networks;
2. Site wide CHP network;
3. Communal heating and cooling;
4. Individual heating

(Source: Mayor of London. 2015. Pg. 197, *The London Plan March 2015*. [ONLINE] Available at:

<https://www.london.gov.uk/sites/default/files/London%20Plan%20March%202015%20%28FALP%29.pdf>

[Accessed April 15].

5.2 HEAT MAP



Heat Network Parameters	Details
Name	Somers Town Heat Network
Distance from Site to Network	<1km
Size	Unknown

5.3 FEASIBILITY OF UTILISING EXISTING AREA WIDE CONNECTION

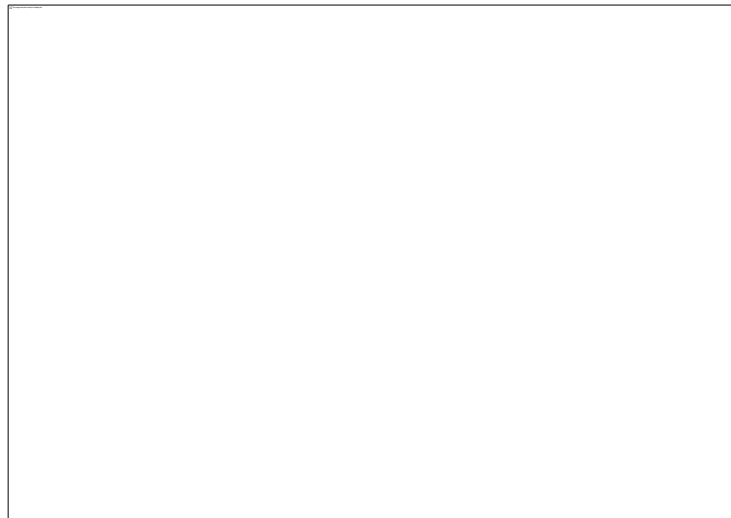
Infeasible due to the above heat network not being currently operational and having been designed for a specific use (4 residential blocks and Medical institute) - not for the connecting of new developments.

5.4 DECENTRALISED ENERGY – ON-SITE CHP

The feasibility of providing a site-wide CHP is investigated below:

Advantages

- Compared to a standard fossil fuel Power Plant reaching efficiencies of up to 40%, a Combined Heat and Power (CHP) benefits from higher Thermal and Electrical Efficiencies, making it more advantageous than conventional power stations.
- A CHP system is able to modulate the heat and power depending on the dwellings requirements and system configuration and it is therefore constantly in operation to maintain steady heating, hot water and electricity.
- To maximise its efficiencies, it is recommended that the system should operate for a minimum of 3,000 hours per year, making it suitable for hotel applications with 24/7 heating and hot water demand.
- CHP systems are eligible for several Government incentives, including Exemption from the CCL and from the Carbon Price Support Tax for the gas purchased.
- The system generates free electricity, resulting in reduced energy bills.
- CHP benefits from reduced distribution losses compared to standard Power Plants.



Disadvantage

- It is capital intensive, with installation costs of up to £10,000 per unit.
- Compared to a standard communal gas heating system, the CHP requires a larger plant room.
- Increased overheating risk due to escalating return temperatures.
- Difficulties in obtaining an ESCO arrangement.

Feasibility

The domestic hot water demand in hotels is likely to be a significant source of energy use and carbon emissions, providing an ideal baseline heating load for the use of CHP. It is therefore proposed that the heating and hot water demand will be served by a community CHP system as the lead heating source. Thermal storage will be included to avoid insufficient heat output, allowing the CHP to run for longer hours to its benefit.

Such installation would reduce the development's CO₂ emissions significantly and it can contribute to strategic heat network policies by allowing future connection to district heating.

The basic specifications of the proposed unit are:

CHP Model	Further Information
ENERGIMIZER EM 16NG	Total efficiency: 96%
Natural Gas CHP	Electric efficiency: 29%
	Thermal efficiency: 67%
	Performance at rated output:
	Thermal efficiency: 67%
	Heat output: 37.50 kW
	Power efficiency: 29%
	Performance at minimum output:
	Fraction of rated heat output: 50%
	Thermal efficiency: 57%
	Power efficiency: 20%

- 5.5 With the proposed CHP unit, the development exceeds Camden Council's required CO₂ emissions reduction.

6. BE GREEN

- 6.1 As the development achieves the 35% CO₂ emission reduction over the baseline on-site via Energy Efficiency and CHP, there is no further requirement for any renewable technologies.

7. COOLING AND OVERHEATING

THE COOLING HIERARCHY

7.1 Pursuant with Policy 5.9 of the London Plan the following measures have been investigated:

Cooling Hierarchy	Measures Undertaken
1. Minimising internal heat generation through energy efficient design	<ul style="list-style-type: none"> Heat distribution infrastructure within buildings should be designed to minimise pipe lengths, particularly lateral pipework in corridors of apartment blocks. Adopting pipe configurations which minimise heat loss e.g. twin pipes.
2. Reducing the amount of heat entering the building in summer	<ul style="list-style-type: none"> Carefully designed shading measures have been considered, including: <ol style="list-style-type: none"> Specification of Internal blinds
3. Use of thermal mass and high ceilings to manage the heat within the building	<ul style="list-style-type: none"> Level of exposed thermal mass has been maximised to help to absorb excess heat within the building.
4. Passive Ventilation	<ul style="list-style-type: none"> The use of: <ol style="list-style-type: none"> Openable windows; Designing in the 'stack effect.
5. Mechanical Ventilation	<ul style="list-style-type: none"> An Air Handling Unit with heat recovery Supply SFP - 0.80 W/l/s Heat recovery seasonal efficiency – 90%

OVERHEATING RISK ANALYSIS

7.2 Criterion 3 of Part L 2013 of the Building Regulations relates to limiting the effects of heat gains in summer. All dwellings pass this Criterion.

7.3 CIBSE Guide A – Environmental Design (2015) is the reference standard for overheating in the GLA SPG on Sustainability and the current industry standard amongst other CIBSE guides such as CIBSE TM52 “The Limits of Thermal Comfort: Avoiding Overheating in European Buildings” (2013). These set out guidelines on the number of hours a dwelling should not exceed a certain temperature.

ACTIVE COOLING

7.4 Active Cooling in the form of Air Conditioning is being installed for the benefit of the potential guests. The CO₂ emissions associated with this have been included within the Energy Calculations. The specification of the Cooling is:

COOLING	Split or Multi-Split System	<p>Cooling system type: Heat Pump</p> <p>Chiller Fuel Type: Electricity</p> <p>Generator Seasonal EER Value: 6.04</p> <p>Generator Nominal EER Value: 3.51</p> <p>Heat Recovery Seasonal Efficiency: 90%</p> <p>Pumps: Variable speed with differential sensor across the pump.</p>
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8. WATER EFFICIENCY

- 8.1 It is a requirement that the scheme achieves a Water Efficiency of less than 105ltrs/person/day. This is in excess of the Building Regulations requirement of 125litres/person/day and encourages the conservation of potable water.
- 8.2 The specification proposed has been produced in-line with the calculation method used to assess compliance against the water performance targets in Building Regulations 17.K and is in-line with the Government's *The Water Efficiency Calculator for new dwellings – September 2009*.
- 8.3 Copies of the Manual and the Calculation Tool itself can be found here:

Guide

[https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/11722/The Water Efficiency Calculator for new dwellings.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/11722/The_Water_Efficiency_Calculator_for_new_dwellings.pdf)

Calculator Tool

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/205789/The_water_efficiency_calculator_tool.xls

- 8.4 Based on this, the proposed specification for the development is as follows:

	House Type	Description	
	ALL	FOR PLANNING	
Installation Type	Is a Dual or Single Flush WC specified?	Dual	
	WC	Full flush volume	6
		Part flush volume	3
	Basin Taps	Flow rate (litres/min)	5
	Kitchen Sink Taps	Flow rate (litres/min)	9
	Are both Bath & Shower present?	Bath & Shower	
	Bath	Capacity to overflow	155
	Shower	Flow rate (litres/min)	8
	Has a Washing Machine been specified?	Yes	
	Washing Machine	litres/kg of Dry Load	8.17
	Has a Dishwasher been specified?	Yes	
	Dishwasher	litres/place setting	1.25
		Nominalisation Factor	0.91
		Internal Potable Water Usage	Total Consumption (litres/person/day)

- 8.5 With the above proposed specification, the development achieves a Water Efficiency of less than 105ltrs/person/day and therefore is compliant with the Building Regulations.

9. CONCLUSION

- 9.1 This document is written in accordance with the guidelines and requirements of:
- i. GLA Guide to Energy Statements (March 2016)
 - ii. The London Plan (March 2015) – Section 5
 - iii. The Core Strategy of the Local Borough Camden
- 9.2 The development has CO₂ baseline emissions that are compliant with Camden Council's policies via Passive Design and Energy Efficiency Measures alone.
- 9.3 Further to this an on-site CHP is being installed to achieve the required 35% reduction in CO₂ emissions over the Part L 2013 baseline.
- 9.4 As the development achieves the 35% CO₂ emission reduction over the baseline on-site via energy efficient design measures and low carbon technology, there is no need for any Renewable energy sources or carbon offsetting payments on this project.