

# Energy & Sustainability Statement

# 4 Oak Hill Park, London, NW3 7LG

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### **Executive Summary**

This energy statement has been prepared in order to assess the improvement in energy performance as a result of the proposed development of 4 Oak Hill Park. The site of the development is located within the London Borough of Camden.

The development comprises the demolition of an existing property and the redevelopment of the site, mirroring the overall design of the existing building while modernising the façade, general construction and building services of the building. The footprint of the building is to be expanded to the rear creating useable living space in what is currently and overshadowed courtyard. The proposed building will be a 2-storey home with associated access and landscaping.

An energy assessment has been carried out based on design information to identify the most appropriate way to reduce CO<sub>2</sub> emissions and energy demand.

Following the thermal and M&E equipment upgrades described, the energy strategy for the proposed building has been demonstrated to be capable of achieving an improvement of 78.71% CO<sub>2</sub> emissions.



## 1 Introduction

This sustainability statement has been prepared for the development at 4 Oak Hill Park. The development comprises a 2-storey single dwelling.

This statement summarises the sustainable design and construction measures that have been incorporated into the project in order to meet the sustainability requirements of the London Borough of Camden and the London Plan.

#### 1.1 Assessment approach

This report summarises the work undertaken to support the development of an energy strategy for the new development, following the energy hierarchy 'Be Lean, Be Clean, Be Green, Be Seen'.

Standard Assessment Procedure for the Energy Rating of Dwellings (SAP) calculations have been carried out for the residential unit. These are used to assess the impact on energy demand and CO<sub>2</sub> emissions of improvements through the hierarchy and demonstrate the most appropriate solution for the development to meet the relevant planning requirements.

### 2 Policy

This development consists of one dwelling unit and does not surpass the requirement for a major development, therefore the London plan and London Borough of Camden referring to major developments are not relevant.

#### 2.1 London Borough of Camden – Local Plan

#### Policy CC1: Climate Change Mitigation

The Council will require all development to minimise the effects of climate change and encourage all developments to meet the highest feasible environmental standards that are financially viable during construction and occupation.

We will:

- a) promote zero carbon development and require all development to reduce carbon dioxide emissions through following the steps in the energy hierarchy;
- b) require all major development to demonstrate how London Plan targets for carbon dioxide emissions have been met:
- c) ensure that the location of development and mix of land uses minimise the need to travel by car and help to support decentralised energy networks;
- d) support and encourage sensitive energy efficiency improvements to existing buildings;
- e) require all proposals that involve substantial demolition to demonstrate that it is not possible to retain and improve the existing building; and
- f) expect all developments to optimise resource efficiency.

For decentralised energy networks, we will promote decentralised energy by:

- g) working with local organisations and developers to implement decentralised energy networks in the parts of Camden most likely to support them;
- h) protecting existing decentralised energy networks (e.g. at Gower Street, Bloomsbury, King's Cross, Gospel Oak and Somers Town) and safeguarding potential network routes; and
- requiring all major developments to assess the feasibility of connecting to an existing i) decentralised energy network, or where this is not possible establishing a new network.

To ensure that the Council can monitor the effectiveness of renewable and low carbon technologies, major developments will be required to install appropriate monitoring equipment.

#### Policy CC2: Adapting to Climate Change

The Council will require development to be resilient to climate change. All development should adopt appropriate climate change adaptation measures such as:

- a) the protection of existing green spaces and promoting new appropriate green infrastructure;
- b) not increasing, and wherever possible reducing, surface water runoff through increasing permeable surfaces and use of Sustainable Drainage Systems;
- c) incorporating bio-diverse roofs, combination green and blue roofs and green walls where appropriate; and
- d) measures to reduce the impact of urban and dwelling overheating, including application of the cooling hierarchy.

Any development involving 5 or more residential units or 500 sgm or more of any additional floorspace is required to demonstrate the above in a Sustainability Statement.

Sustainable design and construction measures

- The Council will promote and measure sustainable design and construction by:
  - e) ensuring development schemes demonstrate how adaptation measures and sustainable development principles have been incorporated into the design and proposed implementation;
  - f) encourage new build residential development to use the Home Quality Mark and Passivhaus design standards;
  - g) encouraging conversions and extensions of 500 sqm of residential floorspace or above or five or more dwellings to achieve "excellent" in BREEAM domestic refurbishment; and h) expecting non-domestic developments of 500 sqm of floorspace or above to achieve "excellent" in BREEAM assessments and encouraging zero carbon in new development
  - from 2019.

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### 2.2 The London Plan Policies on Energy

#### Policy SI 2 Minimising greenhouse gas emissions

A Major development should be net zero-carbon. This means reducing greenhouse gas emissions in operation and minimising both annual and peak energy demand in accordance with the following energy hierarchy:

- 1) be lean: use less energy and manage demand during operation
- 2) be clean: exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly
- 3) be green: maximise opportunities for renewable energy by producing, storing and using renewable energy on-site
- 4) be seen: monitor, verify and report on energy performance.

This is not a major development, but will follow the energy hierarchy in line with Camden's requirements. The other London Plan policies do not apply.

### 3 Energy Strategy

An energy strategy has been developed following the energy hierarchy 'Be Lean, Be Clean, Be Green', 'Be Seen'. Energy calculations using Building Regulations approved and accredited software have been undertaken at each stage to calculate the savings associated with the measures incorporated.



Figure 3.1 The Energy Hierarchy

The energy consumption and carbon emission figures within this report have been calculated using the approved Standard Assessment Procedure for the Energy Rating of Dwellings (SAP).

#### 3.1 Energy Targets

Table 3.1 below details the energy and carbon breakdown of the Part L target emission rate. These have been calculated using the SAP10 carbon factors.

Energy (kWh/yr)							
Heating	Hot Water	Pumps & Fans	Lighting	PV	Electricity CO₂ (kg/yr)	Total Energy (kWh/yr)	Total CO₂ (kg/yr)
26,689	3,840	86	555	-14,334	-1,736	16,836	4,675

Table 3.1 Target regulated energy demand and carbon emissions per energy source

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#### 3.2 Be Lean

As part of the Be Lean approach, passive design measures have been considered throughout the pre-planning stage to reduce initial energy demand.

#### Solar Gain Control and Daylight

Solar gains are a passive form of heating from the sun's radiation and are beneficial to a building during winter months as they provide an effective source of heat and reduce internal heating requirements. However, summer months they must be controlled in order to mitigate the risk of overheating. They can be controlled through glazing and shading design in order to allow low level winter sun to enter the building and to limit access to high level summer sun.

The glazing strategy design has carefully considered orientation and window size in order to maximise daylight while controlling excessive solar gains. Glazing will incorporate low emissivity coatings to limit overheating without compromising light transmittance.

#### **Building Fabric**

Designing an efficient thermal envelope will greatly reduce the need for space heating and cooling as heat transmittance through the thermal elements is reduced. Low air permeability rates will also reduce heating and cooling energy demand by reducing the volume of air that can penetrate the building. As part of a 'fabric first' approach, the building fabric has been carefully considered and specified to meet or exceed current Building Regulations minimum requirements, as detailed in table 3.2.

Fabric Component	Residential Specification
External Walls	0.14 W/m <sup>2</sup> K
Roof	0.11 W/m <sup>2</sup> K
Ground/ Exposed Floor	0.12 W/m <sup>2</sup> K
Windows	Double Glazing, 1.0 W/m <sup>2</sup> K, G=0.4
Rooflights	1.2 W/m <sup>2</sup> K, G=0.4
External Doors	1.2 W/m²K
Air Tightness	3m³/m²/h
Thermal Bridging	Maximum Psi values are outlined in table 3.3 Requires further calculation at detailed design

Table 3.2 Proposed Be Lean passive design measures

Thermal Bridge	Psi Value
Other lintels (including other steel lintels)	0.30
Sill	0.04
Jamb	0.04
Ground Floor	0.16
Exposed floor	0.32
Intermediate floor within a dwelling	0.07
Flat roof with parapet	0.56
Corner (normal)	0.09
Corner (inverted)	-0.09

Table 3.3 Initial thermal bridge Psi values used in the model

#### **Building Services**

Services have been specified to maximise efficiency therefore reducing energy used. Table 3.4 shows the proposed services strategy and energy efficiency measures for the development.

Services Component	
Heating distribution & water storage	
Cooling	
Heating Controls	Ti
Ventilation	
Lighting & Controls	

Table 3.4 Proposed energy efficient design measure

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4 Oak Hill Park Energy Strategy

#### **Residential Specification**

Underfloor Heating 800L hot water cylinder Measured Loss: 3kwh\day

me and temperature zone control

MVHR, SFP 0.61, 89% Efficiency

100% Low Energy Lighting

### 3.3 Be Green

#### Renewable systems

An Air Source Heat Pump (ASHP) and PV panels have been identified as the most appropriate technology for the development.

System	Residential Specification
ASHP	Induvial Air Source Heat Pump (ASHP) system providing 100% of heat and hot water 14kW
PV Paneis	8κwp, min. 20% efficiency
	South facing
	30° Elevation
	Approximately 25 panels

Table 3.5 Proposed LZC specifications

#### **ASHP System**

The specified heat pump will need to be taken from the SAP appendix Q database to allow the correct efficiencies to be applied. For the purposes of this preliminary assessment, we have used the Mitsubishi Ecodan 14kW heat pump.

#### **PV** Panels

The PV specification was based on dwelling orientation and availably roof space. The above specifications are based on preliminary analysis only and further analysis should be undertaken at detailed design stage.

The dwelling PV array has been specified with a meter capable of exporting electricity generated by the PV panels.

### 3.4 Energy and Carbon Savings

#### Energy Use

The breakdown of carbon and energy use has been identified for the site. Table 3.6 shows the breakdown of carbon and energy use for regulated energy uses once the strategies proposed in this report are incorporated.

	Electricity (kWh/yr)				
Space Heat	Hot Water	Pumps & Fans	Lighting	Total	Electricity CO <sub>2</sub> (kg/yr)
7,412	2,999	1,620	620	5,741	995

Table 3.6 Estimated regulated energy demand and carbon emissions per energy source

#### **Carbon Savings**

Table 3.7 demonstrates the percentage improvement in emission reduction over the notional baseline levels for the development considering only regulated energy use and associated emissions.

	CO₂ Emissions (T/yr)	CO₂ Savings (T/yr)	% Saving
Building Regulations 2021 Baseline	4.67		
Proposed Building	1.00	3.68	78.71%

Table 3.7 Regulated emissions improvements over Part L

The SAP calculations also confirm that the proposed development performs above the Fabric Energy Efficiency (TFEE), Primary Energy Rate (TPER) and Emission Rate (TER) targets. This is outlined in Table 3.8.

Dwelling Fabric Energy Efficiency Improvement Over the TFEE	Dwelling Primary Energy Rate over the TPER	Dwelling Emission Rate over the TER
0.40%	48.22%	78.71%
6 6.1		

Table 3.8 performance of the proposed development over the TFEE, TPER and TER

#### 3.5 Water efficiency

Water fittings will be specified with the following or similar flow rates to meet the target water consumption of 105L/Person/Day in line with London plan and London Borough of Camden

water efficiency requirements:

- Wash basin taps 6.5 l/min
- Showers 7.5 l/min ٠
- Bath 120l to overflow •
- Dishwasher 1.2 l/place setting
- Washing machine 9 l/kg load •
- WC 6/4 litre dual flush
- Kitchen taps 6.5 l/min

Water meters will be installed to encourage residents to limit their consumption.

#### 3.6 Materials

All timber used on site during the construction phase and within the building will be from legal sources, FSC or equivalent timber will be used. Sourcing of other materials will include products where the manufacturer employs an environmental management system such as ISO 14001 or BES 6001. Where possible, materials will be sourced locally.

Non-toxic materials will be used wherever possible, including the specification of products with low VOC content in line with European testing standards.

Taking into account embodied carbon, where possible, low life cycle cost items will be selected. However, other factors, such as site restriction, cost and aesthetic preferences are considered when making design choices.

### 3.7 Waste Management and Construction

Construction site waste will be managed in such a way to reduce the amount of waste produced as much as possible, and the waste hierarchy will be followed. In addition, at least 85% of waste that does arise will be recycled using an external waste contractor and the Civil Engineer's Demolition Protocol. This will encourage materials to be re-used on site or where this is not possible, salvage appropriate materials to enable use off-site.

Household waste will be recycled through the local authority collection scheme. Internal recycling bins in a kitchen cupboard will be provided to facilitate this.

#### 3.8 Nature Conservation and Biodiversity

The site is occupied by an existing building and minimal vegetation and is therefore considered to be of low ecological value. Care will be taken during construction to avoid damage to any existing trees. Measures will be taken during construction to minimise impact on ecology by timing works appropriately and following best practice guidance. Landscaping and native planting will be incorporated into the scheme. Urban greening opportunities will be maximised where possible to the rear and front of the proposed development. The development will also incorporate a green roof with native plant and wildflower species.

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### 3.9 Climate Change Adaptation

#### Tackling Increased Temperature and Drought

Windows will incorporate low emissivity coatings to reduce solar gain. Other than mandatory ventilation to meet AD Part F, the development utilises a mechanical ventilation strategy.

#### Flooding

The site is in a low flood risk zone as shown and will not increase the impermeable area.



#### 3.10 Pollution Management

#### Air Quality

The construction site will be managed in such a way that the environmental impact is minimised. This includes following best practice policies for dust pollution by using dust sheets, covering skips and damping down where appropriate.

#### Noise

The dwellings will comply with Building Regulations Part E providing a good level of sound insulation. All windows are to be specified as high efficiency triple glazing to minimise the transmission of noise between the property and surrounding area.

#### Light Pollution

All external lighting will be adequately controlled to ensure that spaces are only lit out of daylight hours and when the area is occupied. As the proposed building use is residential; there will be no illuminated signage or up lighting incorporated. The proposed dwelling is in a highly urbanised location, and therefore will not significantly contribute to increasing the effects of light pollution.

#### 4 Conclusion

This sustainability statement has been prepared for the development at 4 Oak Hill Park. The development comprises a single new dwelling.

The development follows the energy hierarchy, incorporating passive design measures and energy efficient equipment. The development employs an efficient building fabric, including highly efficient insulation and highly efficient glazing, ASHPs and PV panels to maximise carbon savings for the site, resulting in 78.71% savings over the Target Emissions Rate. Measures are also incorporated to minimise pollution and reduce water use. The development complies with sustainability policy of the London Borough of Camden and the London Plan, for minor developments.

The figures within this report are based on preliminary analysis only and further detailed studies will be required at the detailed design stage before specifying any of the proposed systems.

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