

# WIC House Energy Strategy Report

For Oxford Biomedica

22/12/2020

Ref: TS1036368



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# Document History

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## Revision History

Revision No.	Issue Date	Summary of Changes	Author
DRAFT	23/12/20	First issue	DS
Issue	25/01/21	Taken to issue	DS

# Contents

<b>1</b>	<b>Introduction</b>	<b>4</b>
1.1	Introduction	4
1.2	Energy Hierarchy / Management	4
<b>2</b>	<b>Supporting Planning Statement</b>	<b>5</b>
2.1	Energy Management	5
2.2	Low Carbon Development Statement	5
2.3	BREEAM	6
2.4	Water Management	6
2.5	Ecology & Biodiversity	6
2.6	Travel and Transport	6
2.7	Energy Performance Certificate (EPC)	6

# 1 Introduction

## 1.1 Introduction

The new development WIC house for Oxford Biomedica is to contain 6 laboratory modules ranging from CL2 to CL3 classification. To support the labs a 3-story office section is to be included in the development

This short report outlines the key energy and environmental features of the development, which combine to deliver the targets for the scheme, and meet the sustainability principles set out in the Oxford Energy Statement (November 2018): Aims for Oxfordshire to be at the forefront of energy innovation to foster clean growth.

This document focuses on two key areas, Energy Management and BREEAM / Environmental Issues, each building being addressed in the following sections of the report.

## 1.2 Energy Hierarchy / Management

An energy hierarchy approach has been adopted in the design of the proposed office building for development. This approach will allow the development to meet and better the carbon reduction requirements of Part L of the Building Regulations for the new buildings. Energy data to support this approach is usually based on the SBEM calculations, the Government approved method for demonstrating compliance with Part L2A (2013) of the Building Regulations.

Oxford Energy Statement (November 2018): Aims for Oxfordshire to be at the forefront of energy innovation to foster clean growth

- Oxford City Council aim to lead nationally and internationally to reduce countywide emissions by 50% compared with 2008 levels by 2030 and set a pathway to achieve zero carbon growth by 2050. They realise the economic benefits of low carbon transition.
- It must be highlighted that opinion is divided on the pace required to meet this emergency; Extinction Rebellion state that we should aim for carbon net zero by 2025, The UK Committee on Climate Change along with the IPCC both reference dates of 2050 for carbon neutral, which the UK Government announced that it would adopt on the 12 June 2019. For Oxfordshire to meet its target of 2030 will require local systems change that falls outside of the national legislative cycles that will be developed for a target of 2050; support from Government will be vital in achieving our accelerated goals and will need to be targeted in areas with most impact to unlock our ambitions. The way that communities live and operate is crucially bound up with infrastructure for transport, jobs and homes. The process of change for this is long but needs to begin now.
- The City Council will encourage the development of city-wide heat networks. If a heat network exists in close proximity to a scheme it is expected to connect to it and this will

count towards the development's carbon reduction requirements. Evidence will be required to demonstrate why connection to the network is not possible.

- To ensure that the Council can monitor the effectiveness of renewable and low carbon technologies, non- residential, C2, and C4 and Sui Generis developments will be required to install appropriate energy metering and monitoring equipment and a Display Energy Certificate (DEC) The DEC would be secured by planning condition. DEC assessments must be made available to the Council for the three years after occupation and a DEC rating of A will be expected by the end of the three-year period. C3 developments will be required to install appropriate energy metering (smart meters).
- Policy RE1 of the recently adopted Oxford Local Plan 2036 requires that planning permission will only be granted for non-residential development proposals that meet the BREEAM excellent standard (or recognised equivalent assessment methodology). In addition to meeting BREEAM excellent (or recognised equivalent assessment methodology) Planning permission will only be granted for development proposals over 1000m<sup>2</sup> which achieve at least a 40% reduction in the carbon emissions compared with a code compliant base case.

The aim is to increase the overall energy efficiency of the development through energy efficient design and management. An energy strategy has been developed to optimise the incorporation of energy efficiency measures into the building and meet the 2013 Building Standards carbon reduction requirements of Part L, a thermal model has been developed for the building, to test the energy strategy, and includes the key stages illustrated below:

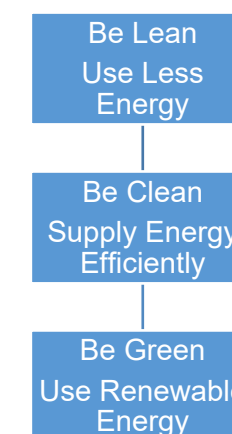


Figure 1: Energy Hierarchy Approach

## 2 Supporting Planning Statement

### 2.1 Energy Management

A holistic design approach has been adopted to achieve compliance, following a Lean, Clean, Green energy hierarchy. Passive design measures, energy efficiency initiatives and Low and Zero Carbon Generating Technology (LZCGT) have been considered and integrated to the scheme to reduce resource demand. This strategy is expected to deliver the required energy and carbon savings to meet and improve on the Building Standards target.

**Energy Strategy Key Elements:**

Fabric U-Values better than 2013 minimum standards.

Fabric	Part L U-Limiting Value	WIC house U-Value
Roof	0.25 W/m²/K	0.12 W/m²/K
External Wall	0.35 W/m²/K	0.12 W/m²/K
Party Walls	0.35 W/m²/K	N/A
Floor	0.25 W/m²/K	0.15 W/m²/K
Window	2.00 W/m²/K	1.15 W/m²/K
External Solid Door		2.20 W/m²/K

A maximum air permeability rate of 2m³/m²/hr @ 50 Pa – certified air tightness test.

Reduced lighting power densities and energy efficient lamps.

Daylight dimming controls and motion sensing controls (manual on–auto-off) to all areas.

Solar PV is be included which is an eligible LZCGT.

4 Pipe heat pump system providing Heating and cooling to the building. This also incorporates a HT circuit for the generation of hot water. These systems are air source heat pumps and therefore an eligible LZCGT in heating mode.

Mechanical ventilation with heat recovery and reduced specific fan powers.

VAV ventilation to reduce airflows through the building, thus reducing energy consumption when not required.

Fume cupboard extract to operate on low volumes and able to be switched off when not in use. Separate chemical storage cabinet extract systems allow fume cupboards to be turned off when not in use.

Heat interface units are to be used reducing DHW circulation and eradicating stored water.

These technologies and key features will be included within the final scheme subject to further detailed design development.

### 2.2 Low Carbon Development Statement

The development has been designed Part L of the Building Regulations for the new buildings. Energy data to support this approach is usually based on the calculations SBEM, the Government approved method for demonstrating compliance with Part L2A (2013) of the Building Regulations.

The output from the preliminary modelling, following the energy strategy, demonstrates that this is achieved and bettered.

Policy RE1 of the recently adopted Oxford Local Plan 2036 requires for Oxfordshire to be at the forefront of energy innovation to foster clean growth and states that a building over 1000m2 will achieve at least a 40% reduction in the carbon emissions compared with a code compliant base case.

It is demonstrated that the development will achieve a CO<sub>2</sub> saving greater than required by the current building standards through passive and energy reduction measures, and the use of LZCGT. This strategy has been found to demonstrate substantial predicted energy savings when compared to the notional but equivalent sized development/building, as set out in the National Calculation Methodology.

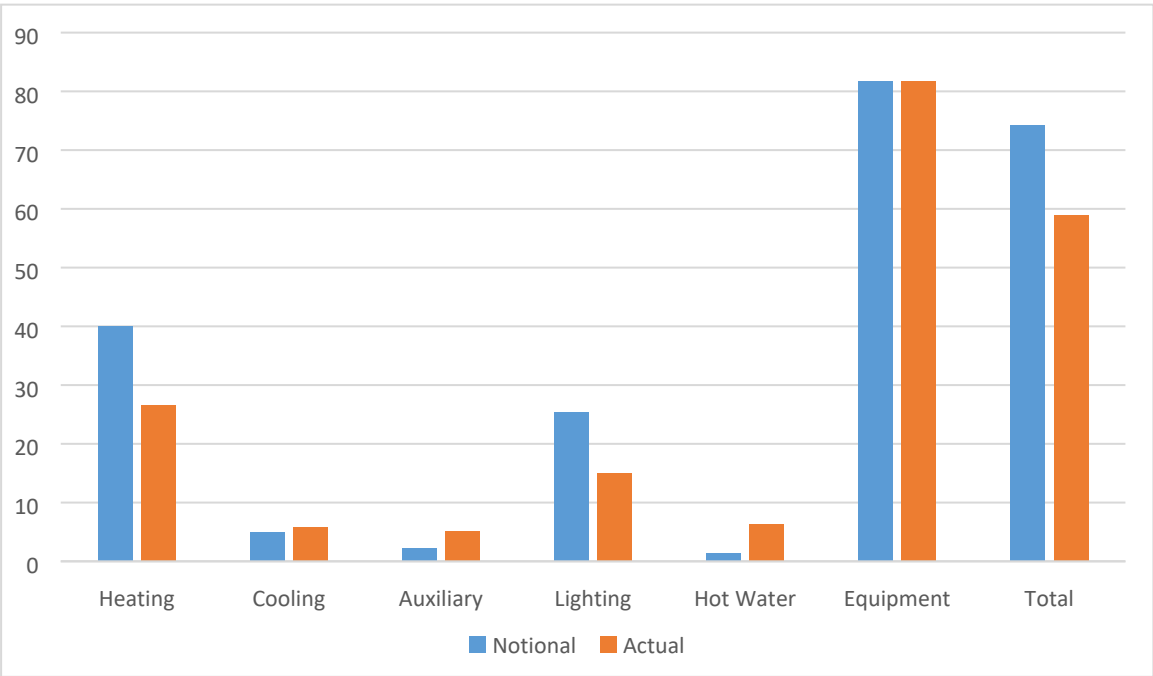


Figure 3: Annual Energy Usage – ‘Actual’ vs. ‘Notional’ (kWh/m².yr)

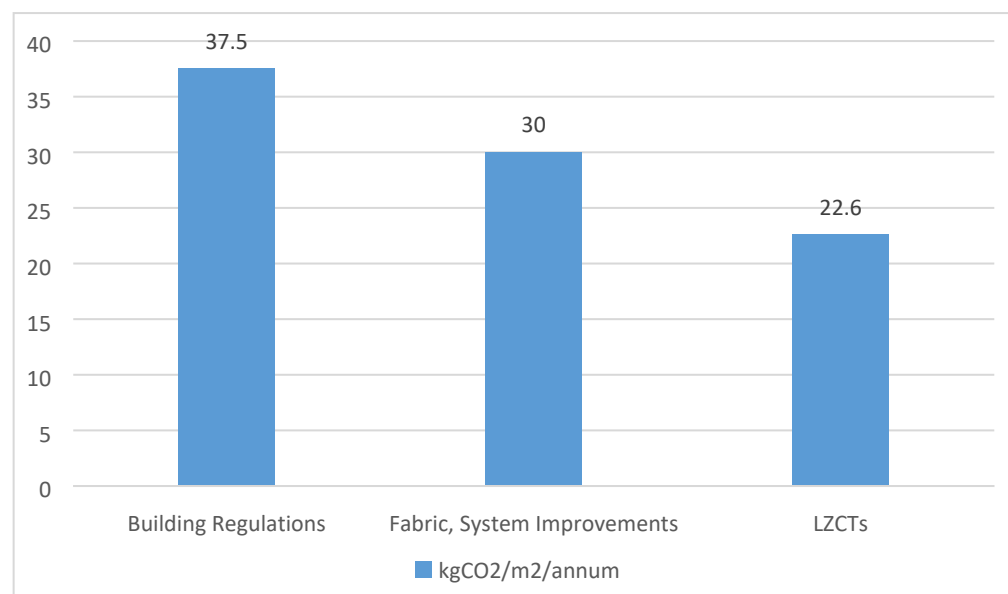


Figure 4: Annual CO<sub>2</sub> Emissions – ‘Actual’ vs. ‘Notional’ (kgCO<sub>2</sub>/m<sup>2</sup>.yr)

The proposed building, modelled in line with the 2013 Building Standards, has a Target Emissions Rate (TER) of 37.5 kg CO<sub>2</sub>/m<sup>2</sup>. The proposed energy strategy (building features and building systems) delivers a Building Emissions Rate (BER) of 22.6 kg CO<sub>2</sub>/m<sup>2</sup>, which is a 40% improvement on the 2013 Building Standards.

These figures demonstrate that the proposed building achieves a CO<sub>2</sub> saving significantly better than that required by the current Building Standards, and therefore the development can be deemed to comply with Policy R7 of the LDP.

### 2.3 BREEAM

The building shall target a BREEAM New Construction 2018 Excellent rating. The BREEAM assessment will also focus on the following key areas outside of energy performance detailed above:

#### 2.4 Water Management

Water management principles will be achieved through compliance with the following BREEAM credits:

**Credit Wat 1, Water Consumption** - Potable water use will be minimised through the use of low flow fixtures.

**Credit Wat 2, Water Monitoring** - Water meters will be provided to aid monitoring and in use reduction management.

**Credit Wat 3, Major Leak Detection & Prevention** – A detection system will be provided to avoid major losses due to pipework damage or faulty sanitary-ware. A presence detection system will be provided to shut off water supply to toilets when not occupied to reduce wastage.

### 2.5 Ecology & Biodiversity

Ecology & Biodiversity sustainability principles will be achieved through compliance with the following BREEAM credits:

**Credit LE 3, Mitigating Ecological Impact** - The development will demonstrate that the impact on the site’s existing ecological value, as a result of the works, is minimised.

**Credit LE 4, Enhancing Site Ecology** – The development will include Ecologists recommendations to maintain and enhance the ecological value of the site as a result of the works.

**Credit LE 5, Long Term Impact on Biodiversity** – The development will consider the long-term impact of the works on the site and the surrounding area’s biodiversity.

### 2.6 Travel and Transport

Low carbon travel principles will be achieved through compliance with the following BREEAM credits:

**Credit Tra 1, Public Transport Accessibility** - The development can be accessed by the public transport network.

**Credit Tra 3, Cyclist Facilities** – The development will include cycle storage facilities to encourage building users to use cycles.

**Credit Tra 5, Travel Plan** – A travel plan will be developed for the site tailored to the specific needs of the building users.

### 2.7 Energy Performance Certificate (EPC)

It is predicted that the development shall achieve an EPC rating of A.



Energy Performance Certificate

Non-Domestic Building

Oxford Biomedica

Transport Way

Cowley

Address 4

Oxford

OX4 6LT

Certificate Reference Number:

7122-0974-8177-7501-5685

This certificate shows the energy rating of this building. It indicates the energy efficiency of the building fabric and the heating, ventilation, cooling and lighting systems. The rating is compared to two benchmarks for this type of building: one appropriate for new buildings and one appropriate for existing buildings. There is more advice on how to interpret this information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government's website at [www.gov.uk/government/collections/energy-performance-certificates](http://www.gov.uk/government/collections/energy-performance-certificates).

Energy Performance Asset Rating

More energy efficient

A+

A 0-25

B 26-50

C 51-75

D 76-100

E 101-125

F 126-150

G Over 150

Less energy efficient

Net zero CO<sub>2</sub> emissions

24

This is how energy efficient the building is.

Technical information

Main heating fuel:

Grid Supplied Electricity

Building environment:

Air Conditioning

Total useful floor area (m<sup>2</sup>):

5828.887

Building complexity:

Level 5

Building emission rate (kgCO<sub>2</sub>/m<sup>2</sup> per year):

22.6

Primary energy use (kWh/m<sup>2</sup> per year):

176.42

Benchmarks

Buildings similar to this one could have ratings as follows:

40

If newly built

106

If typical of the existing stock

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Page 7



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