Unit 1, Gateway 36, Dearne Valley Parkway, Barnsley

15% CARBON REDUCTION REPORT

December 2015

Introduction

This report has been prepared by Award Energy Consultants on behalf of Harworth Estates to support the planning application for the proposed development of Unit 1 at Dearne Valley Parkway, Rockingham Business Park. This report considers and evaluates the renewable technology measures utilised in order to reduce the predicted carbon emissions of the site by 15% as per Barnsley Metropolitan Borough Council's development policies.

Policy Context

The following documents were considered:

Building Regulations 2013 –Part L2a sets minimum standards for fabric and energy efficiency for new build non-domestic buildings.

National Planning Policy Framework 2012 – strengthens the emphasis on sustainable development, and requires new developments to secure the highest viable resource and energy efficiency and reduction in emissions by considering Governments and other national standards.

Barnsley Metropolitan Borough Council's Policy CSP 5 – requires that all development (either new build or conversions) of 10 or more dwellings or 1000m^2 of non-residential floorspace will be expected to incorporate decentralised, renewable or low carbon energy sources and other appropriate design measures sufficient to reduce the development's carbon dioxide emissions by at least 15%, subject to such measures being practicable and not unacceptably prejudicing the viability of the development.

Site Layout


UNIT B
UNIT A
totem sign
Site boundary
subject to confirmation

Carbon Reduction Calculations

A set of BRUKL calculations showing compliance with Part L2a of the 2013 Building Regulations were undertaken on the design of the thermal elements and building services of each unit, using approved SBEM software.

The predicted baseline carbon emissions produced by the proposed development were then calculated; data was entered in line with the design team's construction specification and drawings, as per Table 1 below.

The resulting BRUKL calculations were then used to calculate the total baseline carbon emissions from the site as 178.2 $KgCO_2/m^2/Year$. SBEM software was then used to calculate the amount of photovoltaic (PV) power required to reduce the site's carbon emissions by a minimum of 15%. It was established that the installation of 13.0 kWp of PV panels to appropriate roof-space will reduce carbon emissions by **15.43%**, as shown in Table 2.

Table 1

Element	2013 Building Regulations Limiting Fabric Parameters* (u-values)	Unit 1a Proposed Specification BER<TER (u-values)	Unit 1b Proposed Specification BER<TER (u-values)
Wall	0.35 w/m^2k	0.21 w/m^2k	0.21 w/m^2k
Floor	0.25 w/m^2k	0.14 w/m^2k	0.14 w/m^2k
Roof	0.25 w/m^2k	0.25 w/m^2k	0.25 w/m^2k
Windows (average u-value)	2.2 w/m^2k	1.62 w/m^2k	1.7 w/m^2k
Personnel Doors	2.2 w/m^2k	-	2.2 w/m^2k
Air permeability	10 m^3/hm^2	5 m^3/hm^2	5 m^3/hm^2

* For U-values: See Approved Document L2a 2013 Building Regulations

Table 2

	Proposed Specification Part L2a 2013 Total Carbon Emissions ($KgCO_2/m^2/Year$) Baseline	Total Carbon Emissions with added PV ($KgCO_2/m^2/Year$)	Amount of PV (kWp)	% reduction in Carbon Emissions
Unit 1a	75.6	64.1	6.5	15.21%
Unit 1b	102.6	86.6	6.5	15.59%
Total	**178.2**	**150.7**	**13.0**	**15.43%**

*BRUKL documentation available on request

Carbon Reduction Measures

The following summarises the proposed carbon reduction and energy efficiency strategies that have been incorporated into the development of Unit 1 at Gateway 36, Dearne Valley Parkway, Rockingham.

- High levels of insulation across all thermal elements within the build
- A Solar thermal water heating system is proposed for KFC
- Mechanical Ventilation Heat Recovery systems will be considered in order to use recovered heat for space heating
- High levels of air tightness to be achieved within the construction of the dwelling to reduce unnecessary heat loss
- 100% dedicated low energy lighting, with daylight dimming to restaurant areas, and Passive Infra-Red controls in toilets and kitchen is anticipated
- All external light fittings will be provided with energy efficient light bulbs with appropriate control systems for efficient usage
- Automatic controls to taps, low flush WCs and waterless urinals
- Materials with low Ozone Depleting Potential and Global Warming Potential are proposed compared to those with higher environmental impacts

Conclusion

This report therefore demonstrates that site-wide carbon emissions been reduced by **15.43%** through the application of 13.0 kWp of photovoltaics to the roofs of the proposed development. This exceeds the 15% carbon reduction requirement of Barnsley Metropolitan Borough Council's planning policy CSP5.