



LZ CARBON PROFILE

Profile: 003
February 2009

One Brighton

New England Quarter: Blocks E & F

EcoHomes Excellent

Developer: **Crest Nicholson BioRegional Quintain LLP**
Architect: **Fielden Clegg Bradley**
Completion: **First Phase expected June 2009**
Location: **Brighton, East Sussex**



One Brighton forms part of the New England Quarter mixed use regeneration of Brighton city centre. Blocks E & F comprise 172 residential units along with 2,063m² of community, commercial and services space. 54 of the 172 units are designated as affordable housing. Development includes:

Eco-studios: 19 units - Average floor area 32.5m²
1-Bedroom: 68 units - Average floor area 46.5m²
2-Bedroom: 81 units - Average floor area 65.0m²

The site has been developed in accordance with the 10 'One Planet Living' principles and should become the first One Planet Community in the world. These sustainability principles were developed by BioRegional and WWF International and aim to provide a balanced social-economic-environmental approach to achieving sustainability, including achieving zero CO₂ emissions.

Low carbon approach

Fabric Building designed to be airtight and insulated to minimise heat losses, using materials with the lowest possible environmental impact.

Heat and power generation All space heating and hot water will be provided through an on-site biomass boiler utilising local woodchips. The boiler will form part of a district heating system and will be operated by an Energy Services Company (ESCO), set up specifically for the development.

Roof mounted photovoltaic (PV) panels supply 7,600 kWh/yr of electricity. Remaining electricity needs will be purchased from 100% renewable sources off-site (REGO certified).



Outline energy strategy

The design involves reducing energy demand through improving building fabric performance, use of energy efficient lighting and appliances, and provision of guidance to residents on reducing energy use. This is combined with on-site and off-site microgeneration, and low-impact heating equipment, to achieve no net CO₂ emissions.

Envelope

Walls U = 0.21 W/m²K

100mm wood-fibre water-resistant breathable insulation board (Pavatex Diffutherm).

Roof U = 0.19 W/m²K

170mm extruded polystyrene (XPS) rigid insulation.

Windows U = 1.4 W/m²K

Triple glazed, low e and argon gas filled units with PEFC Certified timber frame which is faced with aluminium due to coastal location and low maintenance requirements.

Ground Floor U = 0.19 W/m²K

50mm XPS rigid insulation.

Airtightness (Design)

<5 m³/m²/hr at 50 Pa

Internal wall plaster, insulating masonry units with thin-joint mortar and interlocking insulation boards minimise air-leaks.

Low carbon heat and power

Biomass Boiler 500 kWp

Binder communal biomass boiler will use locally-sourced woodchips for space and water heating. This will be backed-up by a natural gas boiler. Hot water to be stored in a communal storage tank to act as a thermal store (smoothing out energy demands and minimising required power rating of biomass boiler).

Photovoltaic Panels 9.36 kWp

52 roof mounted Sharp PV panels provide a small amount of on-site generated electricity.

Contacts

Design: Feilden Clegg Bradley Architects

E contact: London@fcbstudios.com

Construction: Crest Nicholson

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Acknowledgement

This LZ Carbon Profile has been prepared for the Zero Carbon Hub by BRE

Low energy alignment with Ecohomes (design)

Energy Issue	Credits awarded
ENE 1 CO₂ Emissions ≤ 0 kg/m ² /yr	10 of 10
ENE 2 Building Fabric 22.83% improvement in average U-value	5 of 5
ENE 3 Drying Space Credit not sought	0 of 1
ENE 4 Eco-labelled Goods A rated fridge freezer, dishwasher and washer	2 of 2
ENE 5 External Lighting Fluorescent luminaries for stairwells and low energy lighting for apartment entrances. Passive Infra-Red (PIR) controlled fluorescent lighting for car parking.	2 of 2

Total 19 credits*

* out of a maximum of 20 credits for the Energy Category

Construction type

Foundation: In-situ concrete.

Structure: Post-tensioned in-situ concrete slabs.

Ground Floor: Blinded sub-base, in-situ reinforced concrete slab, rigid XPS insulation, calcium sulphate based screed.

Walls: Fired clay insulating masonry units, mineral render, wood fibre insulation, mineral render.

Roof: Post-tensioned concrete slab, hot-melt rubberised membrane, rigid XPS insulation, brown roof.

Learning from One Brighton

Recycled materials Recycled low embodied energy materials in the building envelope can reduce total life cycle CO₂ emissions and produce an attractive modern-looking apartment block. For example, concrete uses 50% GGBS (cement replacement) and 100% secondary (recycled) aggregates while the Bakor bitumen roof membrane uses at least 25% post-consumer recycled content.

Off-site electricity Using off-site generated electricity from large wind farms can enable large energy-intensive residential buildings to be energy self-sufficient and have zero net CO₂ emissions.

