

LZ CARBON PROFILE

Profile: 025
January 2011



Carter Homes East Row

Level 5 Code for Sustainable Homes

CO2 emissions: **103% reduction over Part L2006**

Contractor: **Carter Homes**

Developer: **New Linx Housing Trust**

Architect: **Lincs Design Consultancy**

Completed: **August 2010**

Location: **South Somercotes, Lincolnshire**



Carter Homes worked in partnership with ESHA Developments and Lincs Design Consultancy to design and construct this Code Level 5 home. It is a general-need, affordable home, and includes features that improve the environmental performance whilst providing flexibility so that a number of alternative or additional features and technologies can be added. A thermally-efficient design, together with low carbon energy technology, enables the home to achieve 100% reduction of regulated carbon emissions, compared with 2006 standards. The project was part funded by the Homes and Communities Agency and East Lindsey District Council.

Living spaces have been positioned to the southern side of the building to maximise the potential for passive solar gain with bedrooms located at the rear, where the possibility of overheating is minimised.

Low carbon approach

Fabric The careful design of the home, with high levels of insulation and achievement of good airtightness minimises the amount of heat lost through the building fabric, reducing the overall heating demand and the CO₂ emissions from the home.

Heat and power generation A dedicated internal store is used for a biomass boiler and fuel storage. The boiler provides both space heating and hot water, and photovoltaic panels on the south-east facing roof provide electric power for the house. Mechanical background ventilation ensures the house has clean, fresh air, and a heat exchanger extracts heat, from the exhaust air, and uses this to pre-heat the incoming fresh air.



Outline energy strategy.

The design involves improving building fabric performance and, together with low emission heating equipment and photovoltaics, achieving a significant reduction of CO₂ emissions – over 100% reduction compared with 2006 Building Regulations.

Envelope

Walls U = 0.20 W/m²K

300mm overall wall thickness, with full-fill high-performance insulation in the cavity.

Roof U = 0.10 W/m²K

450mm of glass wool roll insulation between and over joists.

Windows U = 1.3 W/m²K

Triple glazed low e glass, argon gas filled.

Airtightness 1.9 m³/m²/hr at 50 Pa

Adopting approved details and excellent on-site management to improve performance.

Low impact heat and power

Biomass Boiler

A HETAS approved dedicated boiler to provide both the heating and hot water requirements of the home.

Photovoltaic (PV) System 1.85 kWp

10 Solar Century PV panels producing a predicted output of 1461 kWh per year of renewable electric power.

Mechanical Ventilation Heat Recovery

A Vectaire MVHR system provides fresh, clean air throughout the house, and recovers and recycles heat extracted from the exhaust air.

Contacts

Design, sustainability and environmental:

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Acknowledgement

ESHA developments and ELDC for their commitment to achieving the higher level of the Code for Sustainable Homes

Low energy alignment with the Code for Sustainable Homes (Design Stage)

Energy Issue	Credits awarded
ENE 1 Dwelling Emission Rate 111% reduction in carbon emissions	14 of 15
ENE 2 Building Fabric Heat loss parameter lower than 1.10	2 of 2
ENE 3 Internal Lighting 100% of fixed fittings to be dedicated and energy efficient	2 of 2
ENE 4 Drying Space 40 m of drying line in Garden	1 of 1
ENE 5 Energy Labelled White Goods B rated washer dryer and A+ rated fridge freezer	2 of 2
ENE 6 External Lighting Space light fittings are dedicated and energy efficient	2 of 2
ENE 7 Low or Zero Carbon Technologies Significant reduction in carbon emissions achieved with the biomass boiler and roof PV	2 of 2
ENE 8 Cycle Storage Bicycle sheds are water-proofed, of adequate size and readily accessible, with fixings set into the ground for security	2 of 2
ENE 9 Home Office Bedroom provided with desk, openable windows for natural ventilation and day lighting, power and telephone sockets for internet connectivity	1 of 1
Total 28 credits*	

* out of maximum of 29 credits for the Energy Category

Construction type

Foundation: Piled foundations

Walls: Recycled block with render

Floors: Beam and insulated polystyrene block

Roof: Trussed rafter and concrete tiles

Learning from Carter Homes East Row

Target Code Level Initially the building was aimed at Code Level 6, but a number of additional features were not cost effective or justifiable for the project.

Rural affordability This project is located in a rural area and may be the kind of housing approach that will help solve the issue of local people wanting to live in their community but being forced to move away because of affordability.