

# LZ CARBON PROFILE

Profile: 029  
January 2011



## Greenwatt Way by SSE

### Level 6 Code for Sustainable Homes

CO2 emissions: **>150% reduction over Part L2006**  
Contractor: **Bramall Construction Ltd**  
Developer: **SSE**  
Architect: **PRP Architects**  
Completed: **September 2010**  
Location: **Slough, Berkshire**



Greenwatt Way is a development of 10 homes completed in 2010 by a partnership led by SSE (Scottish and Southern Energy). All the homes are designed to meet the May 2009 definition of Level 6 of the Code for Sustainable Homes. The development is a live demonstration project, testing small-scale district heating and occupant engagement and interaction with low carbon technologies.

The development includes one-bed apartments, terraced and detached homes. These are currently home to SSE and Slough Borough Council staff who contribute to ongoing monitoring, including technical performance and occupant satisfaction surveys.

## Low Carbon Approach

**Fabric** Greenwatt Way homes are all built to a very high fabric standard, with U-values and design performance well in excess of current Building Regulations standards and the Fabric Energy Efficiency Standard (FEES) that is likely to be introduced in 2016 for zero carbon homes.

**Heat and Power Generation** This site has a large amount of roof-mounted PV. It has an Energy Centre housing the project's heat supply technologies, which feed into a small-scale district heating network connected to all the homes. The Energy Centre also has a solar thermal array for additional water heating, and a large thermal store which enables efficiency in the sizing and operational performance of the heating technologies deployed.

## Outline energy strategy

This project is designed to achieve Code for Sustainable Homes Level 6. High fabric performance coupled with an innovative, small scale district heating scheme is central to the strategy.

**Photovoltaic slates** 63 kWp  
Roof mounted, slate-effect PV units cover each south facing roof slope. These provide sufficient electric power for the development and some excess for selling back to the National grid.

**Heating technologies**  
Three heating technologies are housed in the site's Energy Centre. Each has been sized to supply heat (water at flow temperature 55°C) to the ten houses via the innovative low heat loss district heating network. Each can be run separately and their performance evaluated in different conditions:

**Biomass boiler** (30 kW)  
**Air source heat pump** (40 kW)  
**Ground source heat pumps** (x2 at 17 kW).

In addition, the Energy Centre roof has 20 m<sup>2</sup> of solar thermal panels to augment the three main heating technologies. Heated water is stored in a stratified thermal store that allows a staged and energy efficient water heating strategy.

**Energy savings in each house**  
Each house has a MVHR system and is equipped with energy efficient appliances including induction hobs and ovens.

**Learning from Greenwatt Way**  
SSE has initiated a two year research and monitoring project to evaluate the performance of Greenwatt Way. The headline interests are in developing a better understanding of energy consumption and usage, the performance of the different technologies, and how the occupants interact with their zero carbon homes.

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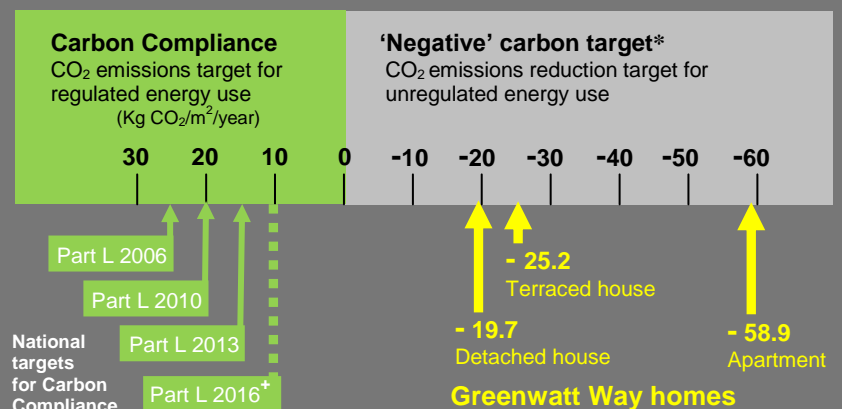
## Fabric performance target at Greenwatt Way

	Greenwatt Way*	Part L 2006 Compliant*	Part L 2016 Compliant*
<b>Wall</b> W/m <sup>2</sup> K	<b>0.12</b>	0.30	0.18
<b>Floor</b> W/m <sup>2</sup> K	<b>0.10</b>	0.25	0.18
<b>Roof</b> W/m <sup>2</sup> K	<b>0.10</b>	0.22	0.13
<b>Window</b> W/m <sup>2</sup> K	<b>0.80 (TG)</b>	1.80 (DG)	1.40(DG)
<b>Door</b> W/m <sup>2</sup> K	<b>0.88</b>	1.20	1.00
<b>Airtightness</b> m <sup>2</sup> /m <sup>3</sup> /hr@50Pa	<b>2</b>	7	5
<b>Thermal bridging</b> W/m <sup>2</sup> K	<b>0.04</b>	0.08	0.04

\* This table shows the target fabric performance for houses built at Greenwatt Way. For comparison, example fabric performance profiles which are compliant to the 2006 Building Regulations and the likely (zero carbon) 2016 Building Regulations are shown. The 2006 and 2016 figures are for an end of terrace house. TG = triple glazed DG = double glazed

## Carbon Compliance at Greenwatt Way

(CO<sub>2</sub> emissions level achieved by fabric energy efficiency plus low carbon energy technologies on site)



\* This is when a project's on-site construction and technologies not only eliminate emissions from all regulated energy use but also target the elimination of some (or all) of the emissions from non-regulated (eg household appliance) energy use.

\*The 2016 Part L target level shown is that recommended by the Zero Carbon Hub in December 2010: 11 and 10 kgCO<sub>2</sub>/m<sup>2</sup>/year respectively for attached and detached houses.