



ENERGY STATEMENT

WILLTHORPE ROAD, BARNSELY

JSP SUSTAINABILITY LTD
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EXECUTIVE SUMMARY

- The proposed residential development off Willthorpe Road, Barnsley will see the construction of 326 no. properties.
- The developer, Persimmon Homes, is required by condition 19 to include energy efficiency design measures and install renewable technologies capable of reducing the site's emission rate by 15%.
- The fabric efficiency measures proposed by the developer will shrink the site's emission rate by 10.51%.
- The addition of PV panels capable of generating 44,763.05kWh/year will increase the reduction to 15%.



1 INTRODUCTION

JSP Sustainability Ltd has been commissioned by Persimmon Homes to prepare an Energy Statement in response to condition 19 of the decision notice for the residential development at Willthorpe Road, Barnsley. The approved development includes the construction of 326 no. 1, 2, 3 and 4 bedroom properties, landscaping and associated works. For completeness the condition is included below:-

“Prior to commencement of development, details of a scheme to reduce the developments carbon dioxide emissions by at least 15% by using decentralised, renewable or low carbon energy sources or other appropriate design measures shall be submitted to and approved in writing by the Local Planning Authority. The development shall be carried out in accordance with the approved details and upon completion of the development a report shall be submitted to and approved by the Local Planning Authority demonstrating that at least a 15% reduction in carbon dioxide emissions has been achieved. In the event that the use of other decentralised, renewable or low carbon energy sources or other appropriate design measures are also required to achieve a 15% reduction in carbon dioxide emissions, full details of such proposals and a timetable for their implementation shall be submitted to and approved in writing by the Local Planning Authority prior to installation. The approved details shall be implemented in accordance with the approved timetable and all the approved measures shall be retained as operational thereafter.”

This report details the energy efficiency and renewable energy measures proposed by Persimmon Homes to address the condition and confirms that the design measures will achieve a 15% reduction in CO₂ beyond Part L of the Building Regulations.

A number of documents have been used to complete this report. These include:-

National Planning Policy Framework (NPPF) includes a presumption in favour of sustainable development. The Framework expands upon the guiding principles and objectives of a successful planning system. These include the building of a strong and competitive economy, delivering high quality housing, requiring good design and meeting the challenges of climate change.

Approved Document L1A sets fabric efficiency standards and together with SAP, establishes a maximum CO₂ emission rate for new build residential properties. The Approved Document is the Government's sustainable design benchmark in England and is the principle delivery vehicle for the Government's Zero Carbon Homes policy.

Barnsley Metropolitan Borough Council Core Strategy policy CSP 5 requires development of 10 or more dwellings to include renewable technologies to reduce CO₂ emissions by 15%.



2 ENERGY STRATEGY

2.1 Sustainable Development Proposals

In line with the wording of condition 19 Persimmon Homes proposes to incorporate energy efficiency measures into the design and build of every property at Willthorpe Road to reduce CO₂ emissions beyond what is required by the Building Regulations Part L. These measures will account for the majority of the saving necessitated by the condition. In addition to this photovoltaic panels will then be installed on a number of properties to increase the CO₂ emissions reduction to 15%.

2.2 Establishing a Baseline

Before expanding on the strategy proposed by the developer, it is first necessary to calculate the development's Part L compliant emission rate. This task was achieved through house type modelling in SAP. SAP, or Standard Assessment Procedure, is the Government's approved methodology for the calculation of a residential property's energy requirement and corresponding emission rate. Table 1 below summarises the baseline calculation.

Table 1 – Willthorpe Road Part L Baseline

House Type	No	Target Emission Rate (kg/year)
Winstar	18	37,067.42
Chedworth	9	17,930.48
Kendal	22	45,001.18
Roseberry	39	74,844.08
Clayton	15	26,443.44
Hatfield	39	67,745.34
Souter	40	61,814.56
Rufford	54	86,242.46
Hanbury	34	45,644.32
Alnwick	9	10,332.04
Moseley	2	2,638.95
Brampton	25	31,043.70
Willow	8	10,134.43
Flats	12	10,906.90
TOTAL	326	527,789.29

Table 1 confirms a Part L target emission rate of 527,789.29kg/year. As such the measures proposed by Persimmon Homes must reduce the CO₂ emission rate to no more than 448,620.90kg/year.



2.3 Energy Efficiency Measures

Persimmon Home's exposure to the marketplace has confirmed that purchasers demand energy efficient homes with low operating costs and familiar user friendly technologies. As such the proposed construction specification has been tailored to these demands and incorporates many of the lean and clean measures of the Energy Hierarchy. Listed below are some of the measures that will be incorporated into the detailed design of the scheme;

- The construction specification of every home will include high levels of insulation in the ground floor, external walls and roof spaces.
- The detailed house type designs will incorporate the thermal bridging guidance produced by Constructive Details and the Government, thereby reducing a significant source of heat loss.
- An efficient heating system, most likely a gas condensing boiler will be installed. The heating designs will incorporate zoned and timed heating controls in line with the Non-Residential Compliance Guide.
- Energy efficient lighting will be installed and where appropriate motion sensors installed.
- A centralised ventilation system will be installed with a low SVP and high efficiency. The option of heat recovery will be examined at the detailed M&E design phase.

The table below provides a summary of the energy efficiency standards targeted in the design and construction of each home;

Table 2 – Specification Summary

Element	Part L	Enhanced Specification
Wall	0.30W/m ² K	0.28W/m ² K
Cold Roof	0.20W/m ² K	0.11W/m ² K
Floor	0.20W/m ² K	0.22W/m ² K
Glazing	2.00W/m ² K	1.40W/m ² K
Door	2.00W/m ² K	1.30W/m ² K
Air Permeability	10 m ³ /(h.m ²) @ 50 Pa	5.0 m ³ /(h.m ²) @ 50 Pa

The targeted u-values go beyond the minimum standards of Part L. This will ensure the thermal envelope of each home will be energy efficient, thereby reducing energy consumption and CO₂ emissions.



2.4 Performance of the Energy Efficiency Measures

The specification summarised overleaf was modelled in SAP to determine the anticipated CO₂ emission rate and hence the reduction achieved. The table below summarises the results calculated.

Table 3 – Willthorpe Road Emission Rate

House Type	No	Calculated Emission Rate (kg/year)
Winster	18	32,401.73
Chedworth	9	15,616.22
Kendal	22	39,086.87
Roseberry	39	65,337.60
Clayton	15	24,719.76
Hatfield	39	59,471.10
Souter	40	55,872.80
Rufford	54	79,507.30
Hanbury	34	40,821.08
Alnwick	9	9,395.10
Moseley	2	2,407.41
Brampton	25	28,641.60
Willow	8	8,996.54
Flats	12	10,025.40
TOTAL	326	472,300.55

Table 3 confirms an energy efficient emission rate of 472,300.55kg/year, representing a permanent 10.51% reduction over Part L. This accounts for just over two thirds of the reduction required by condition 19.



2.5 Photovoltaic Panels

Persimmon Homes intends to install photovoltaic panels on a number of properties to reduce the site's emission rate by a further 4.49% beyond the Part L target emission rate for the site. Photovoltaic panels convert sunlight into electricity for use within a property. A PV cell usually consists of 1 or 2 layers of a semi-conducting material such as silicon. The greater the intensity of sunlight, the more electricity is generated. PV systems can come in different forms. The most popular are modules which can either sit on the roof or be integrated into it. The technology is most efficient when oriented due south. However panels orientated south of east or west are suitable.



The installed arrays must generate 44,763.05kWh/year of electricity to offset 23,679.65kg/year of CO₂. To generate such a figure the installed arrays will likely total 54.5kWp if installed in a south easterly to south westerly orientation. Note however that another method of calculation, such as the MCS method may produce a lower kWp rating.



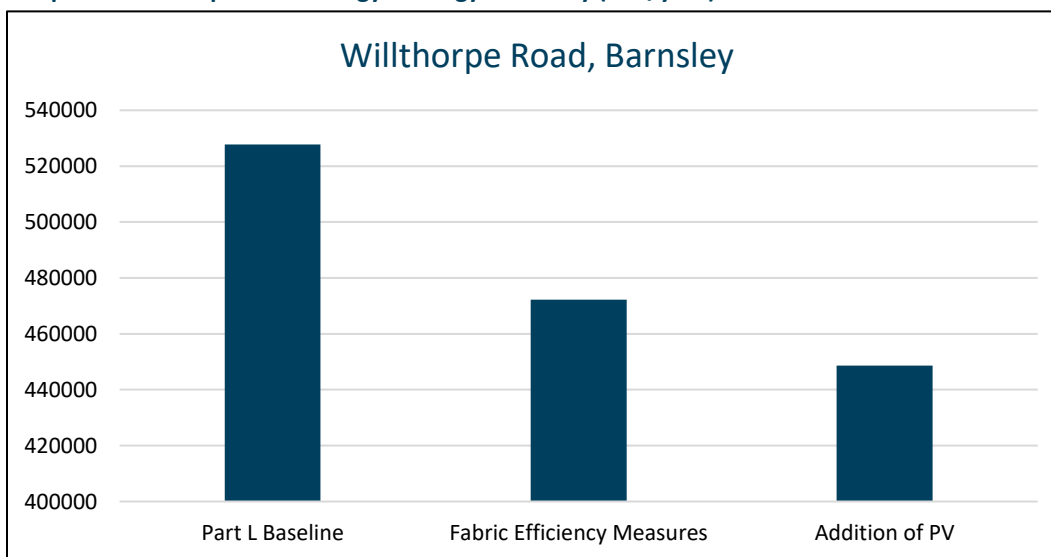
3 EVALUATION

Persimmon Homes has devised an Energy Strategy for the Willthorpe Road, Barnsley development which includes energy efficiency measures into the design of every property and the installation of roof mounted PV arrays on a number of properties. [JSP Sustainability](#) was instructed by Persimmon Homes to review this strategy and confirm that the proposals comply with condition 19 and achieve a 15% reduction in CO₂ emissions. Following a review we can confirm the following:-

- Each property will be constructed to a specification which better the minimum standards of Part L.
- The proposed fabric efficiency measures will shrink the site's emission rate by 10.51%.
- The installation of PV arrays capable of generating 44,763.05kWh/year will increase the reduction to 15%.

The graph below provides a summary of the strategy.

Graph 1 - Willthorpe Road Energy Strategy Summary (CO₂/year)



We can conclude that the proposals advanced by Persimmon Homes are sustainable and comply with condition 19. As such we recommend the adoption of the strategy by the developer and its approval by Barnsley Metropolitan Borough Council.