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The Old School
Wallasey
Wirral
CH44 5TN

ENERGY STATEMENT

Land at No's. 23 -25 Old Row, Barrow, Clitheroe

Ref: PBS/19/1627

Client: Mulbury Homes
Great Oak Farm
Mag Lane
Lymm
WA13 0TF

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1.0 Introduction

The developer proposes 23 No. new build residential units consisting of two, three and four bed terraced, semi-detached and detached 1 and 2 storey houses.

The site lies to the south of Barrow Primary School and to the east of Whalley Road . The surrounding environment is typically low rise suburban with some light commercial/retail use to the south and east

An Energy Statement has been prepared to accompany the Planning Approval, specifically to demonstrate how a minimum of 10% of the predicted total energy requirements of the development could be generated on site from renewable sources **.**

The approach as set out in this energy statement is to follow the energy hierarchy:

- Use less energy through an efficient building fabric
- Supply energy efficiently
- Use renewable energy generated on site

The Energy Statement will assess the predicted energy requirements for the development and propose a strategy for a 10% improvement in energy efficiency by the use of renewable technology in line with the condition outlined above. The current Standard Assessment Procedure (SAP 2012) will be used to assess energy use and associated CO_2 emissions. Regulated energy as calculated in SAP includes all fixed consumption inherent in the building, i.e. fixed lighting, space heating, water- heating and ventilation.

2.0 Calculation Process

Standard Assessment Procedure, SAP 2012, is used for assessing dwellings falling under the 2013 Building regulations. SAP considers various parameters to calculate the energy performance of a dwelling by calculating a building regulations Part L compliance threshold, the Target Emission Rate (TER) against which the as-designed Dwelling Emission Rate (DER) is measured. The calculation includes but is not limited to:

- Location
- Orientation
- Exposure
- Size
- Living area
- Building fabric construction
- Thermal bridging
- Solar gain
- Ventilation
- Air leakage
- Building services energy demand and heat gains
- Space heating design & water heating design
- Lighting

3.0 Energy Efficiency Measures

The broad energy strategy for the proposed development is to produce a design that will positively influence the overall predicted energy supply and demand. The aim is to create dwellings which use less energy and for the energy supply to be clean and efficient and with enough generation by renewable technology to effect a 10% reduction in energy consumption.

Natural daylight

The windows will allow a degree of passive solar gain particularly on the south-western elevation of houses thus reducing some of the requirement for heating. 'A'-rated windows will provide a net energy input into dwellings. In addition to creating a pleasant living environment and reducing heating demand through solar gain the glazing characteristics will help to reduce the lighting load and therefore electricity consumption.

Building fabric

Fundamental to energy efficiency best practice is a 'fabric first' approach. This is underpinned by the notion that it is much better to ensure less energy is needed in the first place so that, regardless of how energy is generated and supplied, a building requires less of it. This means that if less renewable technology is implemented e.g. due to development budgets and/or should future owners remove any technology, e.g. if it reaches the end of its serviceable life, then the latent energy demand will be lower than otherwise.

The glazing is to be specified with an overall u-value of 1.4 Wm^2K combined for the frame and glass. This will provide a balance between maximising solar gain and light levels into the internal spaces whilst keeping heat loss down and retaining a reasonable range of product choice. The selected windows are to be equivalent to BFRC 'A' rated.

An air permeability test target of 5 has been set and is 50% lower than the current Building Regulations requirement but without being so low as to create unfavourable air quality conditions with the potential for mould growth and implications for respiratory health. Sufficient background ventilation should be provided in accordance with Part F of the Building Regulations to avoid the need for mechanical ventilation systems which are a further source of energy consumption.

Insulation and resultant u-values are to be specified as better than current Building Regulations. Table 3.2a below sets out the proposed fabric standards in the context of the current regulatory standards.

Research has demonstrated that heat loss through cavity party walls is a much more significant issue than previously thought and was not accounted for in previous versions of SAP. It is now incorporated in the revised methodology of SAP 2012 and as such all party walls are to be specified as fully filled and edge sealed to avoid the loss of heat.

Analysis of heat loss goes further than basic elemental insulation and u-values, consideration should also be given to limiting the effects of thermal bridging. This is where heat loss occurs through 'junctions' in the construction which bridge the insulation layer. Standardised junction-detailing known as 'Accredited Construction Details' and thermally insulated lintels have been adopted in order to limit thermal bridging and aid air tightness.

Fig 3.2a – Comparative building fabric specification

	Proposed	Compliance	Improvement
Roof	0.10	0.20	50%
Walls	0.23	0.30	23%
Floors	0.12	0.25	52%
Party Wall	0.00	0.20	100%
Windows	1.40	2.00	30%
Air Permeability	5.00	10.00	50%

Lighting, appliances & usage

The proposed residential development will make use of low energy lighting in line with BRE and former Code for Sustainable Homes best practice – 100% of the lighting is to be comprised of energy efficient fittings with a minimum lamp luminous efficacy of 45+ lumens per circuit watt. This will apply to both internal and external lighting. Any security lighting will have appropriate wattage, sensors and controls to ensure efficient operation.

4.0 Energy Supply

Heating & hot water system & controls

Individual boilers are to be specified and will be gas fired condensing boilers that are SEDBUK 'A' rated with low NOx emissions (class 5) with a target of 40mg/kWh dry NOx emissions max and a SEDBUK 2009 efficiency of at least 89% (note this is more than 91% under SEDBUK 2005). Any storage vessels are to have class leading levels of insulation to limit standing losses. These boilers have high combustion efficiencies and some of the highest overall energy efficiencies available.

These will be complemented with intelligent controls to produce an efficient and responsive heating system design that minimises gas consumption and works in tandem with an efficient building fabric. Full time and temperature zone control will allow end users to adopt a heating strategy appropriate to their usage patterns of the different areas of their dwellings and at relevant times thus minimising wasted energy. Weather compensation will modulate boiler output to be appropriate for external temperature changes.

5.0 Renewable Technology

All units have been modelled in SAP2012 software incorporating specification elements detailed within this report, the client's brief and our recommendations.

The SAP calculation indicates a regulated energy usage for the development of 199,269 kilowatt hours per year (Kwh/yr) or 199.3 megawatt hours per year (MWh/yr) prior to the introduction of renewable technologies. The introduction of roof mounted PV systems equivalent to 0.5 kilowatt peak (kWp) per dwelling will reduce the energy demand to 174.9 MWhr/yr, equivalent to an 12.2% reduction in energy demand across the site. Specific system parameters will be determined at detailed design stage but a typical installation to deliver 0.5 kWp would be in the order of 3.0m^2 per plot. The panels will be distributed on selected plots to optimise orientation and solar yield and avoid having panels orientated to sub-optimal compass directions however the total reduction of not less than 10% will be achieved.

Solar PV represents a well proven, reliable technology requiring minimal maintenance operating in a passive system from the perspective of the end user. The site in question offers favourable orientation for solar panels with mostly south-western elevations and units with minimal over-shading.

The data in Appendix I shows the regulated energy requirements for each dwelling on site and the calculated energy requirements following the application of energy efficient design and solar PV. This demonstrates that the proposals meet the target for a **10%** reduction and therefore complies with the requirements of the Local Planning Authority.

All data is derived from full SAP 2012 calculations based on specification advised at the time of this report.

APPENDIX I – SAP 2012 DATA

Dwelling	Type	Built Form	Energy demand (kWhr/year)	Energy from PV (kWhr/year)	Energy demand with PV (kWhr/year)
Plot 1	Type B	End-terrace	6767	1060	5707
Plot 2	Type B	Mid-terrace	5968	1060	4908
Plot 3	Plot 745	End-terrace	6363	1060	5303
Plot 4	Type J	Semi-detached	5960	1060	4900
Plot 5	Type J	Semi-detached	5874	1060	4814
Plot 6	Type L	Detached	9020	1060	7960
Plot 7	Type G	Detached	10651	1060	9591
Plot 8	Type G	Detached	10651	1060	9591
Plot 9	Type L	Detached	9052	1060	7992
Plot 10	Type G	Detached	10651	1060	9591
Plot 11	Type D	Detached	9461	1060	8401
Plot 12	Type K	Detached	6598	1060	5538
Plot 13	Type H	Detached	11726	1060	10666
Plot 14	Type F2	Semi-detached	7303	1060	6243
Plot 15	Type F2	Semi-detached	7263	1060	6203
Plot 16	Type G	Detached	10343	1060	9283
Plot 17	Type H	Detached	11288	1060	10228
Plot 18	Type H	Detached	11532	1060	10472
Plot 19	Type D	Detached	9458	1060	8398
Plot 20	Type K	Detached	6768	1060	5708
Plot 21	Type K	Detached	6878	1060	5818
Plot 22	Type D	Detached	9351	1060	8291
Plot 23	Type G	Detached	10343	1060	9283
		TOTAL	199269	24380	174889

% REDUCTION	**12.23**

Note

It is advised that anyone considering installing renewable technology should consult a dedicated specialist installer who is accredited to the Micro-generation Certification Scheme (MCS) and who can provide detailed system feasibility design and costing analysis to assess suitability.

APPENDIX II – SITE PLAN