



**PROPOSED RESIDENTIAL DEVELOPMENT**

**BARNSLEY ROAD, DENBY DALE**

**SUSTAINABILITY & CLIMATE CHANGE STATEMENT**

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**strata**

**February 2025**

## Introduction

This report has been prepared by Award Energy Consultants on behalf of Strata for the proposed development of 30 new build dwellings at Barnsley Road, Denby Dale. This statement has been produced to address Kirklees Council's Local Plan Policy LP 24 and highlights the key sustainability features to be incorporated into the development to enhance sustainability.

## Policy Context

The following documents were considered:

**Building Regulations Part L1 2021** – Part L1 sets minimum standards for fabric efficiency, primary energy and carbon emissions for new build dwellings, with Carbon Emissions Targets set at 31% over Part L1a 2013

**National Planning Policy Framework 2024** – strengthens the emphasis on sustainable development, and requires new developments to secure the highest viable resource and energy efficiency and reduction in emissions by considering Governments and other national standards

**Kirklees Council's Local Plan Policy LP24: Design** - encourages high levels of sustainability to mitigate the effects of climate change

**Kirklees Council's Housebuilders Design Guide SPD (June 2021)** – outlines guidance pertaining to the design of dwellings relating to sustainability

# Renewable Technology Analysis

Strata have considered the use of renewable technology for the development at Barnsley Road. The matrix table below shows the feasibility study that was undertaken to understand the opportunities available for the application of renewable technologies.

Technology	Evaluation
<b>Wind turbines</b>	The national wind database for the site suggests that the average wind speed on the site will be 5.2 m/s at 10 m above the ground. Micro-wind turbines generally have a low-level cut off speed of c. 4 m/s which will result in any turbine only operating for a small proportion of the year. There may also be issues with vibrations and noise for residents in addition to having an adverse impact on the visual amenity for residents and neighbours. Wind technology is therefore not considered appropriate for the development.
<b>Solar Hot Water (SWH)</b>	Solar Hot Water panels could not provide a sufficient effective contribution to offset energy requirements for hot water within the building due to the excellent efficiencies within the proposed heating systems.
<b>Biomass Heating (including Biomass CHP)</b>	Biomass boilers can provide a cost-effective contribution to the building space heating and hot water demand. However, biomass boilers would be used through a central energy centre which is excessively complex for this type of development. Lack of space for storage of pellets is also a consideration. In addition, biomass would result in regular heavy transportation vehicles to the site and the increased levels of noise and air pollution associated with this technology is not considered suitable for the development.
<b>Air Source Heat Pumps (ASHPs)</b>	Air Source Heat Pumps can provide low grade heat potential for the buildings, however, are not suitable for schemes such as the development at Barnsley Road due to space and noise considerations
<b>Ground Source Heat Pumps (GSHPs)</b>	GSHPs are not a suitable technology for large scale developments due to space considerations and marketability.
<b>Photovoltaics (PV)</b>	<b>Photovoltaics have been chosen as the most appropriate method of achieving compliance with Part L1 2021 carbon and primary energy targets</b>
<b>Small Scale Hydro</b>	There are no suitable watercourses at or near the development site.

As a result of the above analysis, photovoltaic panels will be applied, where applicable, to meet the requirements of Part L1 2021.

## Proposal

In order to evaluate the proposed energy strategy, it is important to determine firstly the baseline. This is the level of energy efficiency against which any strategy must be judged using a selection of proposed typical house types and the standard specification that shows a compliance with Building Regulations.

Award Energy have compared this specification that will achieve minimum compliance with Part L1 2021 with the intended enhanced specification, as shown in Table 1. Within the enhanced specification, all heat loss elements have been insulated beyond regulation.

**Table 1**

Element	Value required by AD Part L1 2021 (u-value)	Enhanced specification (u-value)
Walls (w/m <sup>2</sup> k)	0.26	0.20
Roofs (w/m <sup>2</sup> k)	0.16	0.09
Floors (w/m <sup>2</sup> k)	0.18	0.12
Windows (w/m <sup>2</sup> k)	1.6	1.3
Doors (w/m <sup>2</sup> k)	1.6	1.3
Design air pressure test (m <sup>3</sup> /h/m <sup>2</sup> )	8	4.5

## Renewable Technology

In the absence of a local District Heating Network, Strata propose to install renewable technology in the form of Photovoltaic panels, along with appropriate Waste Water Heat Recovery systems where feasible. Table 2 below shows the anticipated amounts of photovoltaics in kWp to be applied to each house type.

**Table 2**

House Type	Photovoltaics Per Plot kWp (approximate)
Copenhagen	1.55
Florence	2.25
Valencia	4.90
Naples	5.20
Siena	2.60
T1	0.10
T2	0.90

# Fabric Energy Demand Calculations

Using SAP10 software and the specification detailed in Table 1, the predicted fabric energy demand for each house type in kWh/m<sup>2</sup> per year was calculated, as shown in Table 3 below.

**Table 3**

House Type	Fabric Energy Demand (kWh/m <sup>2</sup> /yr) Part L1 2021 TFEE	Fabric Energy Demand (kWh/m <sup>2</sup> /yr) Part L1 2021 DFEE	% Reduction in Fabric Energy Demand
Copenhagen	41.10	36.20	11.92%
Florence	40.00	35.90	10.25%
Valencia	44.20	42.80	3.17%
Naples	42.00	40.70	3.10%
Siena	41.10	36.20	11.92%
T1	36.70	34.70	5.45%
T2	34.70	34.40	0.86%

\*calculated using SAP10 software

As outlined in Table 4 below, the baseline weighted average predicted Fabric Energy Demand for the site was then calculated to be **40.45 kWh/m<sup>2</sup>/yr** (with all properties meeting the minimum requirements of Part L1 2021). The weighted average predicted Fabric Energy Demand with Strata’s enhanced specification is **37.93 kWh/m<sup>2</sup>/yr** – a **6.22%** improvement over the 2021 Building Regulations (approximately 21.22% over Part L1a 2013).

**Table 4**

Property Type	No	Fabric Energy Demand (weighted) (kWh/m <sup>2</sup> /yr) Baseline specification TFEE	Fabric Energy Demand (weighted) (kWh/m <sup>2</sup> /yr) Enhanced specification DFEE
Copenhagen	3	4.11	3.62
Florence	3	4.00	3.59
Valencia	2	2.95	2.85
Naples	11	15.40	14.92
Siena	5	6.85	6.03
T1	3	3.67	3.47
T2	3	3.47	3.44
<b>Total</b>	<b>30</b>	<b>40.45</b>	<b>37.93</b>
<b>Weighted Average Fabric Energy Demand Reduction over Part L1 2021 (kWh/m<sup>2</sup>/yr) 6.22%</b>			

\*calculated using SAP10 software. Award Energy can, upon request, provide reports from SAP10.



## Carbon Reduction Calculations

Award Energy have compared the specification that will achieve minimum compliance with Part L1 2021 with the intended enhanced specification as shown in Table 1 plus the application of approximately 94.4 kWp of Photovoltaic panels across the site on the most appropriate plots. Table 5 below shows the predicted Carbon Emissions for the proposed house types.

**Table 5**

House Type	Carbon Emissions (KgCO <sub>2</sub> /Year/m <sup>2</sup> ) Baseline specification	Carbon Emissions (KgCO <sub>2</sub> /Year/m <sup>2</sup> ) Enhanced specification + PV	% Reduction in Carbon Emissions
Copenhagen	10.66	10.39	2.53%
Florence	9.78	9.53	2.56%
Valencia	9.97	9.86	1.10%
Naples	10.23	10.05	1.76%
Siena	9.48	9.32	1.69%
T1	12.47	11.58	7.14%
T2	11.20	10.79	3.66%

\*calculated using SAP10 software. Award Energy can, upon request, provide reports from SAP10.

Table 6 below shows the predicted Carbon Emissions for each house type, weighted to represent fairly the mix on site. The predicted baseline weighted Carbon Emissions for the site are **10.41 KgCO<sub>2</sub>/Year/m<sup>2</sup>** (with all properties meeting the minimum requirements of Part L1 2021). The average predicted Carbon Emissions with Strata's enhanced specification plus the application of approximately 94.40 kWp of Photovoltaic panels site-wide are **10.12 KgCO<sub>2</sub>/Year/m<sup>2</sup>**, representing a **2.71%** reduction in site-wide carbon emissions over Part L1 2021 (approximately 33.71% over Part L1a 2013).

**Table 6**

House Type	Number	Weighted Average Carbon Emissions (KgCO <sub>2</sub> /Year/m <sup>2</sup> ) Baseline specification	Weighted Average Carbon Emissions (KgCO <sub>2</sub> /Year/m <sup>2</sup> ) Enhanced specification
Copenhagen	3	1.07	1.04
Florence	3	0.98	0.95
Valencia	2	0.66	0.66
Naples	11	3.75	3.69
Siena	5	1.58	1.55
T1	3	1.25	1.16
T2	3	1.12	1.08
<b>Total</b>	<b>30</b>	<b>10.41</b>	<b>10.12</b>
<b>Weighted Average Carbon Emission Reduction over Part L1 2021= 2.28%</b>			

\*calculated using SAP10 software. Award Energy can, upon request, provide reports from SAP10.

## Passive Design

Consideration has been given to the orientation and layout of the buildings to help maximise energy efficiency as part of the development.

- The layout has also been designed to maximise a north-south orientation to allow for passive design whereby dual aspect dwellings enable views, good daylighting and cross ventilation. Each of the principal living rooms has sufficient glazing to allow natural light to penetrate into the rooms. Numerous studies have shown this to be beneficial to the general health and happiness of occupants
- Hard landscaping has been minimized as much as possible to maximize soft landscaping thus providing natural and localized infiltration
- The site has been designed to promote sustainable travel making connections to established local transport links, cycle and pedestrian routes
- The construction specification of every home will include high levels of insulation in the ground floor, external walls and roof spaces
- Internally, the accommodation has been laid out to maximise the internal space and light afforded, with primary habitable rooms benefitting from a southern orientation. Each of the principal living rooms will have sufficient glazing to allow natural light to penetrate the rooms, reducing the need for artificial lighting. Overheating risk will be addressed through high quality glazing and an appropriate ventilation strategy
- An efficient gas condensing boiler will be installed in each property. The heating designs of each house type will include dual zone controls with delayed start thermostats, where possible
- Energy efficient lamps will be installed in every light fitting. Each entrance will be illuminated with an energy efficient external light or provision will be made for a purchaser to install such a fixture
- Each property will also have a designated space for refuse and recycling in the rear garden or as a purpose-built store to the front of the property.
- Mitigation of flooding risk is incorporated in the site design and is addressed in a Flood Risk Assessment submitted separately to meet the requirements of LP27 and LP28
- Electric Vehicle Charging Points or Bollards will be provided for each dwelling
- All houses will have access to a private garden and garden areas will be fully accessible for disabled occupants, where possible.

## Material Selection

Significant amounts of energy and natural resources are consumed in the production, transportation and disposal of building materials. Two issues are significant in the specification of building materials; the environmental impact of materials and the responsible sourcing of materials. Strata are dedicated to taking pro-active measures to address these issues and commit to obtaining responsible sourcing certification for at least 90% of the building elements of each dwelling.

## Pollution

The dwellings will be constructed with insulating materials that have a Global Warming Potential of less than 5. In addition, all dwellings will be heated by highly efficient gas boilers, with those that have NOx emissions of less than 40 mg/kWh being considered.

## Travel, Highways and Access

Policies LP20 and LP21 are addressed by a Transport Report submitted separately.

## Waste

Strata have company-wide policies to promote the reduction and effective management of construction related waste. Robust procedures are in place to share materials such as soil and aggregate between sites and to sort waste on and off site to divert waste from landfill.

All construction activities will be carried out to minimise dust, fumes, discharges and any other form of pollution on site, in line with best practice policies.

# Water Efficiency

The Approved Document G (2010) restricts new build dwellings to a maximum consumption of 125 litres per person per day. It is proposed that eco-sanitary ware and restricted flow rates will be introduced into the design of each development to obtain the appropriate level of water efficiency. Whilst the exact sanitaryware specification has not yet been decided, the following table has been extracted from the Water Efficiency Calculator using a reasonable anticipated specification, indicating that a higher level of efficiency than that required by the Building Regulations will be achieved.

## Water Consumption

Installation Type	Unit of Measurement	Capacity/Flow Rate	Use Factor	Fixed Use	Litres Per Person per day
WC (Dual Flush)	Full Flush (litres)	6	1.46	0.00	8.76
	Part Flush (litres)	4	2.96	0.00	11.84
Taps (excluding kitchen tap)	Flow rate (litres/minute)	6	1.58	1.58	11.06
Baths (where shower present)	Capacity to overflow (litres)	225	0.11	0.00	24.75
Showers (where bath present)	Flow rate (litres/minute)	8	4.37	0.00	34.96
Kitchen sink tap	Flow rate (litres/minute)	6	0.44	10.36	13.00
Washing Machine	Litres/kg dry load	8.17	2.1	0.00	17.16
Dishwasher	Litres/place setting	1.25	3.60	0.00	4.50
	<b>TOTAL</b>				126.03
<b>Total Internal Water Consumption</b>		126.03			
<b>Normalisation Factor (x 0.91)</b>		114.68			
<b>External Use</b>		5.00			
<b>Part G Water Consumption</b>		<b>119.7</b>			

## Conclusion

This report demonstrates that the proposed enhanced fabric specification reduces average Fabric Energy Demand on the site by **6.22%** over Part L1 2021 and, with the application of approximately 94.4 kWp of photovoltaic panels, the average predicted Carbon Emissions by **2.71%**. Water consumption per person per day is anticipated to be less than that required by Building Regulations and sustainable measures are proposed that are in line with Kirklees Council's Policy LP24 and the National Planning Policy Framework 2024, which emphasises sustainable development, energy efficiency and reduction in carbon emissions. Strata's proposed sustainability strategy for Barnsley Road, Denby Dale places great importance on the efficiency of a property's thermal envelope and internal building service therefore ensuring that each dwelling on the development benefits from built-in energy reduction measures before the consideration of renewable technologies.

## Caveat

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