



Energy Statement

Woolley Colliery Road, Darton, Barnsley

Stroma Reference: OP-C522 ES1 Date: 18/09/2024 Prepared for: Gleeson Homes

1. Executive Summary

This Energy Statement has been produced on behalf of Gleeson Homes to support the planning application submitted for the proposed development of 114 dwellings at Woolley Colliery Road, Darton, Barnsley.

This report outlines how the proposed development meet Building Regulations 2021 Part L1A and meet the requirements of Policies CC2 and RE1 of the Barnsley Local Plan (adopted January 2019), which outlines the sustainable design standards for this borough.

This report outlines Gleeson Homes commitment to reduce energy demand and carbon dioxide emissions, also monitoring and achieving the committed standards though post-construction testing to help bridge the performance gap.

The proposed energy strategy will undertake a fabric first approach and incorporate renewable technology on-site via air source heat pumps which are a zero NOx solution at the source to achieve the above targets. Gleeson Homes adopt this approach as standard to achieve building regulations compliance resulting in the specification being thermally efficient, air tight with the necessary ventilation, efficient heating and hot water systems meaning there is no need to offset with Photovoltaics etc. – the effect of this specification to the customer is to ensure that energy builds are kept as low as possible.

The below results show that the development can achieve a 67.98% reduction on the dwelling (carbon dioxide) emission rate (DER) against Target Emission Rate (TER) as defined in the 2021 Building Regulations. With the integration of air source heat pumps the development can provide 90.02% of the predicted regulated energy contribution from a low carbon source.

1.1. Results Summary

Predicted regulated carbon dioxide savings					
Carbon dioxideStage savingsCO2 reduction (%)emissions (Tonnes(Tonnes CO2 perCO2 per annum)annum)					
Baseline: Part L 2021 of the Building Regulations Compliant Development	112.45	_	_		
Site Wide CO2 savings	36.01	76.44	67.98%		

Table 1. Predicted site wide regulated annual carbon dioxide savings

Predicted regulated energy consumption			
	Predicted energy	Predicted heat pump	Total reduction (%)
	consumption (kWh	energy (kWh per	
	per annum)	annum)	
Contribution from a low carbon	244,115	219,747	90.02%
source			

Table 2. Predicted site wide regulated energy contribution from a low carbon source

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2. Quality Management

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Date: 18/09/2024		Date: 18/09/2024
File reference:	OP-C522 ES1	

Version	Status	Date	Change Summary
ES1	First Issue	18/09/2024	-



Registered office as above. Company reg. no. 4507219

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3. Introduction

Stroma Built Environment has been commissioned on behalf of Gleeson Homes to support the planning application submitted for the proposed development of 114 dwellings at Woolley Colliery Road, Darton, Barnsley.

The proposed development is located within Darton, Barnsley and will therefore need to meet the requirements Policies CC2 and RE1 of the Barnsley Local Plan (adopted January 2019), which outlines the sustainable design standards for this borough. The energy strategy for the proposed development is as follows:

- 1. Minimal heat loss through fabric, thermal bridging and air infiltration.
- 2. Installation of air source heat pumps which are a zero NOx solution at the source.

4. Development Site

The development site is located within Darton, Barnsley on land off Woolley Colliery Road. The proposal will consist of the development of 114 dwellings split into 72 dwellings on Site A and 42 dwellings on Site B. There will be a mixture of 2-4 bedroom detached and semi-detached houses, with associated access, landscaping and parking.



Figure 1. Proposed site layout

5. Planning Policy

5.1. National Policy - England

The Department for Communities and Local Government (DCLG) released the National Planning Policy Framework (NPPF) in March 2021. In revising this framework, the Government's objective is to streamline the process encouraging sustainable development and promoting the needs and priorities of local communities.

This framework is to be used as the base by councils to develop their own local policy. Section 14of the framework addresses climate change, flooding and costal change. Considerations include:

- Minimising CO₂ emissions
- Vulnerability of fuel supply
- A promotion of decentralised, low carbon and renewable energy sources wherever viable

5.2. Barnsley Local Plan (adopted January 2019) - Policy CC2 Sustainable Design and Construction

Development will be expected to minimise resource and energy consumption through the inclusion of sustainable design and construction features, where this is technically feasible and viable. All nonresidential development will be expected, to achieve a minimum standard of BREEAM 'Very Good' (or any future national equivalent). This should be supported by preliminary assessments at planning application stage.

19.3 Development proposals will be expected to consider energy efficiency and sustainable design from the outset and will be required to include details of their sustainability within their Design and Access Statement.

19.4 For housing development energy efficiency is regulated by Building Regulations. We will encourage energy efficiency that exceeds those minimum standards set out in national standards and take that into account where proposed in support of a planning application.

19.5 We will use the BREEAM (British Research Establishment Assessment Method) to measure the environmental performance of all non domestic buildings. As well as energy use and the emissions generated BREEAM deals with water use, materials and waste management, land use and ecology, pollution, health and well-being and transport.

19.6 We will encourage and plan for sustainable decentralised zero or low carbon energy generation, such as biomass-fuelled district heating or combined heat and power (CHP) schemes. Where a heat network is not available or viable, a contribution ensuring connection to a future district heating scheme is required on suitable developments. Developments not connected and unsuitable for future connection to a heat network will rely on energy generated from renewables, like solar panels, photovoltaics and heat pumps.

5.3. Barnsley Local Plan (adopted January 2019) - Policy RE1 Low Carbon and Renewable Energy

All developments will be expected to seek to incorporate initially appropriate design measures, and thereafter decentralised, renewable or low carbon energy sources in order to reduce carbon dioxide emissions and should at least achieve the appropriate carbon compliance targets as defined in the Building Regulations.

We will allow development that produces renewable energy as long as there is no material harm upon:

- The character of the landscape and appearance of the area;
- Living conditions;
- Biodiversity, Geodiversity and water quality;
- Heritage assets, their settings and cultural features and areas;
- Key views of, from or to scenic landmarks or landscape features;
- Highway safety, or Infrastructure including radar.

In assessing effect, we will consider appropriate mitigation which could reduce harm to an acceptable level. Proposals will be expected to include information regarding their efficiency. Proposals must be accompanied by information that shows how the local environment will be protected, and that the site will be restored when production ends.

20.3 Taking into account the energy hierarchy, new buildings and conversions should in the first instance be designed and constructed to be energy efficient in particular through using the principles of passive design, including high insulation levels, solar heating, natural lighting and ventilation, thermal mass and passive cooling. Thereafter, decentralised, renewable or low carbon energy sources should be considered for use in order to reduce carbon dioxide emissions.

20.4 The domestic and industrial sectors are responsible for a majority of Barnsley's total emissions and this policy aims to create a framework that promotes and encourages a reduction in emissions.

20.5 Proposals for development that produces renewable energy will be assessed against this policy. Such developments can include wind turbines, biomass heating systems, roof mounted wind turbines, photovoltaic cell, ground source heating and cooling systems and hydroelectric power. The policy does not apply to wind turbines, which will be considered against government policy as set out in the written ministerial statement of 18 June 2015 and clarified in Planning Practice Guidance. Given Barnsley's coal mining history, the potential for water at or near 2 the surface of flooded redundant mineworking's may form a sustainable local means to power ground source heat pumps. We encourage consideration of the use of this technology in commercial properties and in the future, as technology advances, in domestic properties.

20.6 We will support proposals for renewable energy unless there are significant harmful effects which cannot be prevented or mitigated. Proposals should be accompanied by information setting out the effects of the proposal and any proposals to reduce or mitigate the effect. We will refuse planning permission for proposals that are not accompanied by enough supporting information.

20.7 The Council's energy strategy 2015-2025 sets out the low carbon goals for the borough. The wider use of renewable energy is a key component of the strategy which contains an ambition for 20% of the energy consumed by the borough to be derived from renewable sources by 2025.

20.8 In addition our Housing Strategy 2014-2033 includes the Strategic Objective 'to ensure the design and delivery of new high quality, desirable and sustainable homes', and includes the key ambition 'to achieve 15% renewable energy on new build developments'.

20.9 Inevitably some proposals for renewable energy will have significant effects on the local area. For example, large scale renewable energy developments will be prominent in the landscape. In these cases we will carefully weigh up the environmental, social and economic benefits of the proposals against effects on the local area including any effects on the National Park, the Green Belt and European Natura 2000 designations (presently the South Pennines Moors Special Area for Conservation and Special Protection Area which abut the borough's western boundary).

20.10 It is important to assess the efficiency of devices, particularly large scale installations such as wind turbines, in order to balance the benefits and impacts.

20.11 The eastern part of the borough lies within the 30km Wind Farm Safeguard Zone around Robin Hood Airport Doncaster Sheffield (RHADS). Within this Zone in particular wind turbines must not have a harmful effect on infrastructure including radar.

6. Assessment Methodology

6.1. Building Regulations – England Approved Document Volume 1 Domestic

Approved document L1A – Conservation of Fuel and Power sets the standard for carbon emissions for new dwellings and was last revised in June 2022 (Part L: 2021). The properties will need to comply with the criteria set out in the document, as follows:

The predicted Dwelling Emission Rate of CO2 emissions from dwellings (DER) are not greater than the Target Emission Rate (TER).

The fabric energy efficiency rates for the building shall be no greater than the target fabric energy efficiency rate.

The primary energy rate for the building shall be no greater than the target primary energy rate.

That the performance of dwellings as-built comply with the DER values achieved, including site testing that the 'air permeability' rate achieved is as per that specified, or better.

The necessary provisions for energy efficient operation of dwellings are put in place, including operation and maintenance instructions aimed at achieving economy in the use of fuel and power in a way that householders can understand.

6.1. Domestic (SAP 10.2)

The Standard Assessment Procedure (SAP 10.2) is the Government's approved methodology for assessing the predicted energy consumption and carbon dioxide emissions of new buildings. Results are derived in respect of floor area and consider energy use (kWh/m²/yr) and associated CO₂ emissions (kg.CO₂/m²/yr) from the following:

- Space heating
- Domestic hot water
- Ventilation
- Lighting
- Ancillary pumps and fans
- Energy generating technology

SAP calculations have been undertaken for all dwellings, by a trained and accredited energy assessor using approved software, and results have been used to determine the predicted energy consumption and CO_2 emissions.

The BREL and Full SAP calculations (DER/TER, DFEE/TFEE & DPER/TPER calculations), for each dwelling, have been provided within the appendix.

7. Energy Strategy

This section outlines the proposals for specifying building fabric and services beyond the requirements of Building Regulations (the baseline).

Fundamental to achieving energy efficiency in any new building is the specification of a thermally efficient building envelope. Passive design features such as high levels of insulation, designing to maximise solar gain and limiting heat loss through reduced air leakage are all proven techniques to reduce energy consumption and emissions. In addition, the use of thermally broken lintels and enhanced thermal bridging details will help to minimise thermal bridging.

7.1. Building Fabric

A fabric specification has been developed to meet the efficiency targets for Building Regulations 2021.

The following tables illustrate the proposed building fabric performance specification, with respect to the limiting values stipulated in Table 4.1 of Part L 2021. It is shown that the proposed specification represents a significant betterment of the minimum standards.

Element	Part L limiting U-value (W/m²K)	Proposed U-value (W/m²K)	% Improvement
Ground Floor	0.18	0.14	22%
Exposed Floor	0.18	0.20	-
External Wall	0.26	0.18	31%
Garage Wall	0.26	0.18	31%
Dormer Cheeks	0.26	0.27	-
Party Walls	0.20	0	100%
Roof – horizontal ceiling	0.16	0.10	38%
Roof – sloping ceiling	0.16	0.20	-
Dormer Roof	0.16	0.30	-
Front Doors	1.6	0.80	50%
Rear Doors	1.6	1.20	25%
Glazed Doors/Windows	1.6	1.20	25%

Table 3. Proposed Building fabric specification

Element	Part L Maximum Permeability m³/(h.m²) @50 Pa	Proposed Permeability m³/(h.m²) @50 Pa	% Improvement
Air permeability	8	5.00	38%

Table 4. Building airtightness specification

7.2. Building Services

Space heating and domestic hot water (DHW) will be provided by air source heat pumps with hot water cylinders to each individual dwelling. Air source heat pumps (ASHP) extract heat from ambient air via a reversed refrigeration cycle. Heat is absorbed into an evaporator (outdoor unit) and increased via compression. This useful heat is transferred to the building via a refrigerant to provide space and/or water heating.

Although the system uses electricity, high Coefficient of Performances (COP) can be achieved resulting in overall CO_2 emissions and running costs below that of an efficient gas-fired boiler. The COP is a function of the difference between ambient air (source) temperature and output (flow) temperature.

Ventilation to all dwellings will be via intermittent extract fans installed within the kitchen and all wet rooms.

Low energy lighting will be specified throughout. In line with building regulations this means each internal light fitting should have lamps with a minimum luminous efficacy of 75 light source lumens per circuit-watt. Typically, this will be achieved with LEDs or compact fluorescent lights and not low voltage Halogen variants.

Element	Specification
Heating	Air Source Heat Pump Panasonic WH-MDC05J3E5 (Index number 105525) Flow temperature 45°C
Heating emitter	Radiators
Heating control	Programmer and Room Thermostat
Domestic hot water	Hot water cylinder
Water consumption	≤125 litres/person/day
Internal fixed lighting	100% low energy lighting with a minimum luminous efficacy of 75 light source lumens per circuit-watt.
Ventilation	Intermittent Extract Fans

Table 5. Building services specification

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8. Post-construction testing, monitoring and achieving the committed standards

Gleeson Homes carry out post-construction testing on all dwellings as required by the current building regulations. This includes an independent third party to 'air-test' all dwellings, testing and commissioning of the heating system and the ventilation solution all in line with current regulation and testing standards.

To ensure the design is in line with Building Regulations; all house types and supporting information (including heating designs, thermal designs and structure) are submitted to the NHBC to achieve Type Approval.

Gleeson Homes are obliged by regulation and also by their commitments through membership with the NHQB to provide all customers with a comprehensive Home User Guide; which includes all the information listed above; as well as linking to online material such as videos; which detail exactly how the technology in the homes works and should be used and most importantly guides on how to use these systems effectively / efficiently; where appropriate.

As Gleeson Homes have signed up to Science Based Targets; we have committed also to reducing our embodied and in use carbon usage; by employing our fabric first approach to compliance; we reduce embodied carbon at its core by utilising efficient and sustainable materials to achieve the objective of our commitments. In contrast a lower performing fabric will need to utilise Photovoltaics (or other technologies) which hugely increase the embodied carbon of the homes; due to materials used in their production and the transport required to get them to site from the place they were produced; which is predominantly overseas.

9. Conclusions

This report outlines how the proposed development will achieve compliance with Building Regulations 2021 Part L1A and meet the requirements of Policies CC2 and RE1 of the Barnsley Local Plan (adopted January 2019), which outlines the sustainable design standards for this borough.

This report outlines Gleeson Homes commitment to reduce energy demand and carbon dioxide emissions, also monitoring and achieving the committed standards though post-construction testing to help bridge the performance gap.

The energy strategy will undertake a fabric first approach and incorporate renewable technology onsite via air source heat pumps providing space heating and domestic hot water generation.

The below results show that the development can achieve a 67.98% reduction on the dwelling (carbon dioxide) emission rate (DER) against Target Emission Rate (TER) as defined in the 2021 Building Regulations. With the integration of air source heat pumps the development can provide 90.02% of the predicted regulated energy contribution from a low carbon source.

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Table 6. Predicted site wide regulated annual carbon dioxide savings Table 7.

Predicted regulated energy consumption				
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	per annum)	annum)		
Contribution from a low carbon	244,115	219,747	90.02%	
source				

Table 8. Predicted site wide regulated energy contribution from a low carbon source

Appendix A BREL and Full SAP calculations