

Energy Statement

24- 26 Wantage Road Reading RG30 2SE

7 January 2026

This document was prepared by
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Doc Name:	Energy Statement
Doc Ref:	RSP/01109
Issue Date:	January 2025
Planning Consultant :	Riarch Planning Solutions

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1.0 EXECUTIVE SUMMARY

1.1 Riarch Planning Solutions have been appointed to undertake an Energy Statement on a proposed development in the Reading Borough.

1.2 The scheme comprises the erection of two semi-detached dwellings (Use Class C3) on land to the rear of 24 and 26 Wantage Road, Reading, RG30 2SE, in accordance with the submitted drawings (Proposed Block Plan Drg. 06, Proposed Floor Plans Drg. 03 and Proposed Elevations Drg. 05, dated Dec 2025).

1.3 This document has been produced to satisfy:

- A Building Regulation baseline energy assessment for the proposed development.
- Energy conservation measures to be undertaken in the design of the development.
- A calculation of CO2 savings that are to be achieved as a result of energy efficiency measures. The proposed site is to be built to Part L 2021 of the Building Regulations, therefore SAP 10.2 methodology has been used for the energy assessment detailed within this report. The original Energy Statement was carried out by AES in August 2022. SAP calculations were carried out on a sample of units across the development and established the predicted CO2 emissions when built to Part L1A 2021.

1.4 This document details how the targets are met via:

- Passive Design Measures
- Low U-Values
- Low Air Permeability
- Air Source Heat Pump

1.5 This document has been written in adherence to the GLA Guide to Energy Statements.

2.0 POLICY FRAMEWORK

2.1 The following section outlines the relevant policy frameworks at national, regional and local level.

NATIONAL POLICIES

2.2 In March 2016, the Government confirmed its policy to limit local energy requirements and continue to support low carbon infrastructure. The Mayor has considered the Government’s intentions regarding energy performance standards and its support for energy infrastructure and considers his energy targets within his energy hierarchy to be in line with this approach. It encourages developers to make carbon savings on-site, firstly through demand reduction. The remaining energy savings are met through low carbon infrastructure, either on-site or off-site

CC2: SUSTAINABLE DESIGN AND CONSTRUCTION

2.3 Proposals for new development, including the construction of new buildings and the redevelopment and refurbishment of existing building stock, will be acceptable where the design of buildings and site layouts use energy, water, minerals, materials and other natural resources appropriately, efficiently and with care and take account of the effects of climate change.

To meet these requirements:

- ☐ All major non-residential developments or conversions to residential are required to meet the most up-to-date BREEAM ‘Excellent’ standards, where possible;
- ☐ All minor non-residential developments or conversions to residential are required to meet the most up-to-date BREEAM ‘Very Good’ standard as a minimum;
- ☐ All non-residential development or conversions to residential should incorporate water conservation measures so that predicted per capita consumption does not exceed the appropriate levels set out in the applicable BREEAM standard. Both residential and nonresidential development should include recycling greywater and rainwater harvesting where systems are energy and cost effective.

3.0 BASELINE

3.1 SAP Calculations have been carried out on a representative sample using the Stroma FSAP Software Version 1.0.5.50 to gain the regulated emissions for the site.

Regulated Emissions are the CO2 emissions covered under Part L of the Building Regulations and comprise of:

- a) Space Heating and Cooling
- b) Hot Water
- c) Lighting
- d) Pumps and Fans

A licensed and OCDEA accredited SAP Assessor has carried out the calculations.

Development emissions at this stage of the hierarchy are as follows:

	Regulated CO2 Emissions – kg of CO2 per m2	SAP 10 Conversion Factor Adjusted Figures	% Improvement on TER
Baseline: Part L 2013 of the Building Regulations Compliant Development (TER)	21.13	18.9	
After energy demand re- duction ‘Be Lean’			
After CHP ‘Be Clean’			
After renewable energy ‘Be Green’			

4.0 BE LEAN

4.1 High energy efficiency standards are demonstrated in the table below. Construction Details have been selected to ensure that all fabric U-Values exceed the requirements of Part L of the Building Regulations (2013) and all Heating, Hot Water and Ventilation elements are in compliance with the Domestic Building Services Compliance Guide (2013). The proposed construction details for the residential units are as follows:

Elements	U Value	Development Notes
Ground and first Floor Main External Walls	0.11 w/m2/k	e.g. 150mm Celotex
	0.17 w/m2/k	e.g. 90mm Kingspan 108
	0.21 w/m2/k	e.g. 100mm Dritherm 32
Roof	0.14 w/m2/k	e.g. 150mm Celotex
Windows	1.20 w/m2/k	Argon filled 16mm
External Doors	1.00 w/m2/k	Solid
Air Permeability	4.5m³/hm²@50Pa	
Ventilation	Natural Ventilation	
Heating	Combi Gas Condensing Boilers	92.5% Efficiency
Heating Controls	Time & Temperature Zone Control	
Emitters	Radiators	
Secondary Heating	No	
Thermal Bridging	Constructive Details	
Lighting	100%	

A full sample SAP Input Data Sheet and SAP L1A Checklist can be found in Appendix 1 to verify the above inputs. Following SAP Calculations, CO2 emissions at this stage of the hierarchy are as follows:

	Regulated CO2 Emissions – kg of CO2 per m²	SAP 10 Conversion Factor: Adjusted Figures	% Improvement on SAP 10 adjusted TER
Baseline: Part L 2013 of the Building Regulations Compliant Development (TER)	21.13	18.9	
After energy demand reduction <i>‘Be Lean’</i>	21.08	18.9	0%
After CHP <i>‘Be Clean’</i>			
After renewable energy <i>‘Be Green’</i>			

5.0 BE CLEAN

5.1 The site lies outside of any existing decentralised energy networks. There is a proposed heat network 2729m away from the site.

EXISTING NETWORKS

5.2 There are no existing heat networks within the site of the development. The possibility of utilising an existing area wide connection is therefore unfeasible.

PLANNED NETWORKS

5.3 There is no potential heat network within 2km of the development

5.4 It is therefore proposed that the ‘Be Clean’ stage of the hierarchy is bypassed due to the lack of feasible and realistic options. The remaining required reduction will therefore be met during the ‘Be Green’ stage of the hierarchy.

	Regulated CO2 Emissions – kg of CO2 per m ²	SAP 10 Conversion Factor Adjusted Figures	% Improvement on SAP 10 adjusted TER
Baseline: Part L 2013 of the Building Regulations Compliant Development (TER)	21.13	18.9	
After energy demand reduction <i>‘Be Lean’</i>	21.08	18.9	0%
After CHP <i>‘Be Clean’</i>	21.08	18.9	0%
After renewable energy <i>‘Be Green’</i>			

5.5 Development emissions at this stage of the hierarchy

- floor area of each dwelling and respective emission rate.
- the Target Emission Rate (TER) and Dwelling Emission Rate (DER) in terms of kg/m²/year.
- the percentage reduction of the DER over the TER.
- the CO2 saved through the proposed use of energy efficient measures.

Elements	U Value	Development Notes
Basement/Ground Floor	0.11 w/m2/k	e.g. 150mm Celotex
Main External Walls	0.17 w/m2/k	e.g. 90mm Kingspan 108
Basement Walls	0.21 w/m2/k	e.g. 100mm Dritherm 32
Flat Roof	0.14 w/m2/k	e.g. 150mm Celotex
Windows	1.20 w/m2/k	Argon filled 16mm
External Doors	1.00 w/m2/k	Solid
Air Permeability	4.5m³/hm²@50Pa	
Ventilation	Natural Ventilation	
Heating	Combi Gas Condensing Boilers	92.5% Efficiency
Heating Controls	Time & Temperature Zone Control	
Emitters	Radiators	
Secondary Heating	No	
Thermal Bridging	Constructive Details	
Lighting	100%	

6.0 BE GREEN

6.1 The potential renewable energy applicable to this development and its feasibility is investigated below:

Renewable	Advantages	Disadvantages	Feasibility
Photovoltaic Panels	Can have significant impact on carbon by offsetting electricity which has a high carbon footprint. Low maintenance. No noise issues associated with PV. No additional land use from the installation of PV panels.	High capital investment required. Needs unobstructed space on roof. Solar PV has a reduced carbon reduction effect when incorporating the new SAP 10 emission factors than it did previously.	The development incorporates a flat roof which is potentially suited to PV. There is sufficient space for a reasonable PV system. However, the roof of the neighbouring property means that the south orientation would face considerable overshadowing. The PV would therefore need to be installed on an East or West facing roof – decreasing its effectiveness.
Solar Thermal Collectors	No additional land use from the installation of solar thermal collectors. Low maintenance and easy to manage. Low capital cost. No noise issues associated with Solar thermal collectors.	Limited CO2 offset No Grants or Tariffs for new build installations.	Solar thermal collectors are feasible for the development, although it is not possible to meet the required carbon saving as the maximum demand that solar thermal collectors can be designed to meet can be no greater than 50% of the hot water demand.
Biomass Heating	Potential to reduce large component of the total CO2. A biomass boiler would replace a standard gas heating system so some of the cost may be offset through money saved on a traditional boiler.	Regular maintenance will be required. Reliability of fuel may become a problem, therefore limited cost saving for residents. A plant room and fuel store will be required which may take additional land from the proposed development or surroundings. The fuel will need to be delivered, which can cause issues with access etc.	This is a small tight site in a dense urban area. Biomass is not considered feasible for such a development due to the need for space to accommodate fuel storages, access for delivery vehicles and local NOX emissions.

Ground Source Heat Pumps	Low maintenance and easy to manage Optimum efficiency with under- floor heating systems. As heat pumps would replace standard heating systems, some of the cost may offset through money saved on a traditional boiler.	The heat pump has a noise level around 45- 60dB so some attenuation may be required and it should be sensibly located. Relatively high capital cost. Requires electricity to run the pump, therefore limited carbon savings in most cases. For communal systems plant room required which may take additional land from the proposed development/ surroundings. High payback.	Limited Space on site and large communal infrastructure needed would remove and reduce amenity space.
Air Source Heat Pumps	ASHP systems are cheaper than ground source as there is no requirement for long lengths of buried piping. Low maintenance and easy to manage. Optimum efficiency with under- floor heating systems. As heat pumps would replace standard heating systems, some of the cost may offset through money saved on a traditional boiler.	The heat pump has a noise level around 50- 60dB so some attenuation may be required, and it should be sensibly located. The potential noise from the external unit may mean there is local opposition to their installation. Requires electricity to run the pump, therefore limited carbon savings in most cases. For communal systems, plant room is required which may take additional land from the proposed development/surroundings Potential noise issues.	This option is deemed the most appropriate. There would be space for the outdoor wall units to be fitted. This option previously did not meet a 25% reduction alone, but under the new SAP 10 figures – it becomes more favourable. This is due to the significant carbon emission reduction associated with the updated national grid figures.

6.2 The 25% offset has not been achieved without the need for the above renewable technologies.

6.3 The required reduction is to be achieved with the provision of an Air Source Heat Pump. Reductions are shown in the table below.

Elements	U Value	Development Notes
Main External Walls	0.17 w/m2/k	e.g. 90mm Kingspan 108
Basement Walls	0.21 w/m2/k	e.g. 100mm Dritherm 32
Roof	0.14 w/m2/k	e.g. 150mm Celotex
Windows	1.20 w/m2/k	Argon filled 16mm
External Doors	1.00 w/m2/k	Solid
Air Permeability	4.5m³/hm²@50Pa	
Ventilation	Natural Ventilation	
Space Heating/Water Heating	Air Source Heat Pump	
Heating Controls	Time & Temperature Zone Control	
Emitters	Radiators	
Secondary Heating	No	
Thermal Bridging	Constructive Details	
Lighting	100%	

Appendix 2 shows the full breakdown of:

- floor area of each dwelling and respective emission rate.
- the Dwelling Emission Rate (DER) in terms of kg/m2/year.
- the CO2 saved through the proposed use of energy efficient measures.

6.3 Development emissions at this stage of the hierarchy are as follows:

	Regulated CO2 Emissions – kg of CO2 per m ²	SAP 10 Conversion Factor: Adjusted Figures	% Improvement on SAP 10 adjusted TER
Baseline: Part L 2013 of the Building Regulations Compliant Development (TER)	21.13	18.09	
After energy demand reduction ‘Be Lean’	21.08	18.9	0%
After CHP ‘Be Clean’	21.08	18.9	0%
After renewable energy ‘Be Green’	25.63	11.5	39.15%

7.0 COOLING AND OVERHEATING

THE COOLING HIERARCHY

7.1 Pursuant with Policy 5.9 of the London Plan the following measures have been investigated:

Cooling Hierarchy	Measures Undertaken
1. Minimising internal heat generation through energy efficient design	Individual heating means the associated heat loss associated with communal heat pipes will not apply to this project.
2. Reducing the amount of heat entering the building in summer	Carefully designed shading measures have been considered, including: Specification of blinds.
3. Use of thermal mass and high ceilings to manage the heat within the building	Level of exposed thermal mass has been maximised to help to absorb excess heat within the building.
4. Passive Ventilation	The use of: Openable windows, Dual aspect units, Designing in the ‘stack effect.
5. Mechanical Ventilation	N/A

OVERHEATING RISK ANALYSIS

7.2 Criterion 3 of Part L 2013 of the Building Regulations relates to limiting the effects of heat gains in summer - this is implemented for new dwellings as set out in Appendix P of SAP 2012.

The project passes this criterion. However, the Building Regulations recognises that Criterion 3 does not cover all factors influencing overheating and that there is no guarantee that buildings will not overheat.

7.3 CIBSE Guide A – Environmental Design (2015) is the reference standard for overheating in the GLA SPG on Sustainability and the current industry standard amongst other CIBSE guides such as CIBSE TM52 “The Limits of Thermal Comfort: Avoiding Overheating in European Buildings” (2013). These set out guidelines on the number of hours a dwelling should not exceed a certain temperature.

7.4 The risk of summertime overheating has been assessed as ‘slight’.