

Carbon and Energy Statement

(Supporting planning application to Bury Council)

4 Parkstone Avenue

Revision:

-

Site Address:

4 Parkstone Avenue, Whitefield, Manchester, M45 7QH

Architect:

Thorp Design Services Ltd

Client:

Mr Anthony Addis

Project Reference:

2526/017

Date:

01st October 2025

SAP Assessor:

Matthew Jones (BSc Hons, OCDEA - Accreditation ref EES/032701)

Robmar Energy Solutions

Robmar, 321 Manchester Road, Blackrod, Bolton, BL6 5BE

Tel: 07922986981

Email: info@robmarenergysolutions.co.uk

robmarenergysolutions.co.uk

CARBON AND ENERGY STATEMENT

This statement has been prepared by Robmar Energy Solutions on behalf of the applicant in support of a planning application at the below site:

Address: 4 Parkstone Avenue, Whitefield, Manchester, M45 7QH

In particular this statement addresses Policy JP-S2: Carbon and Energy Requirements, of Bury Council's 'Places for Everyone Joint Development Plan Document'.

"Provide an energy statement to set out how the proposal complies with Policy JP-S2. The statement should set out how you intend to minimise energy demand and maximise energy efficiency unless it can be demonstrated that it is not practicable or financially viable. Development should comply with the 2022 Part L Building regulations."

Development Description

The proposed development consists of 1 no. two bedroom new build detached dwelling on land at; 4 Parkstone Avenue, Whitefield, Manchester, M45 7QH.

The completed dwelling will be highly energy efficient with carbon dioxide emissions from regulated energy uses lower than the building regulations minimum standards. This will be achieved by installing high levels of insulation and the use of renewable technologies.

Proposed Energy Strategy

Reductions in CO2 emissions compared to building regulations : 4%

It is predicted that the proposed design and specifications of the dwelling will produce 1270 kgs of CO2 emissions per year, this equates to an overall reduction of the CO2 emissions by approximately 4%.

This will be achieved by means of improving the thermal performance of the buildings beyond the levels required to comply with the current regulations. This will include a highly insulated building envelope, high specification windows and doors and excellent levels of air tightness. This 'fabric first' approach reduces emissions by lowering the demand for heating.

The dwelling will also include high efficiency heating systems with enhanced control systems.

Further Information

This report has been prepared by Matthew Jones of Robmar Energy Solutions, On Construction Domestic Energy Assessor accreditation number EES/032701. It is based upon proposed drawings and other information provided by the architect and client.

Robmar Energy Solutions

Robmar, 321 Manchester Road, Blackrod, Bolton, BL6 5BE

Tel: 07922986981

Email: info@robmarenergysolutions.co.uk

robmarenergysolutions.co.uk



Technology Feasibility Study

In this section we will look at the various strategies available that could be utilised to reduce the CO₂ emissions of the dwelling. These will include renewable technologies and passive measures.

Wind Turbines

Small scale on-site wind turbines can have the potential to make a contribution to on-site renewables targets. However barriers such as noise, and visual impact (planning issues), can severely restrict their use.

The space available for locating wind turbines on this development is limited and is restricted solely to the use of roof mounted units. The performance of roof mounted turbines is considerably reduced when compared with freestanding models. Recent studies have also found that wind speeds actually seen in urban environments are considerably less than given in meteorological data.

In light of the visual impact, turbulence problems caused by the urban environment, and the low contribution to the renewables requirements, we would consider that wind turbines are not viable for this development.

Ground Source Heat Pumps

Ground source heating takes advantage of the stable ground temperature of 12°C to heat either air or water to provide energy efficient heating (and optional comfort cooling) to a building.

The system involves the installation of underground pipework laid in a horizontal or vertical pattern in land adjacent to the dwelling, usually underneath the garden or driveway.

The size of the adjacent gardens to the dwelling mean that a ground source heat pump system is technically feasible on this site, however, the installation costs are very high therefore we would not recommend ground source heat pumps for this development.

Air Source Heat Pumps

Air source heat pumps work in the same manner as ground source heat pumps, but instead of extracting low temperature heat from the ground, they extract it from the air. They can do this even when the outside temperature is -15°C.

On this project the proposed dwelling has no suitable outside area for the external unit to be located, without impacting on the surrounding neighbours due to the noise creation.

Whilst the installation costs of these systems are not as high as with ground source heat pumps, they are still significant. It should also be noted that efficient running of the system can only be achieved with careful management of the controls by the house holder. There are many cases of heat pumps actually increasing energy use and costs when compared to traditional solutions.

The layout of the site means that an air source heat pump system is technically feasible on this site, however, the noise that these units create will have a negative impact upon the surrounding neighbours - as the unit will need to be placed close to the site boundary, therefore we would not recommend air source heat pumps for this development.

Biomass

The use of biomass systems to provide heating and hot water often lends itself towards a district heating approach whereby a central system is provided which distributes low temperature hot water to each unit. Smaller units are available for installation in individual dwellings but, despite their continual development, these are still quite large and require a dedicated plant room equivalent to the size of a typical utility room.

One of the key downsides of the use of biomass in development of this nature is the space required for the storage and delivery of fuel for both the district and individual systems. The costs of the systems is also very high when compared to traditional mains gas heating.

Therefore we do not feel that a biomass scheme is suitable for use in this development.

Combined Heat and Power

Combined Heat and Power (CHP) is the simultaneous production of heat and electricity. Using a reliable internal combustion engine fed from a single source of fuel, such as natural gas or LPG, a CHP system can produce usable amounts of both heat and electricity.

The Government's Micro-generation Strategy has identified Micro-CHP as one of the key technologies which offers a realistic alternative to centrally generated electricity.

Previously, CHP systems have only been suitable for large developments due to the size and complexity of the systems available. Small scale CHP systems are now on the market for individual dwellings. These systems are not much larger than a typical gas boiler, and have a built-in turbine to produce electricity for the home.

However it is recommended that CHP is not installed in newly built dwellings. The system only produces electricity when the boiler is producing heat. In a new build the heating demand will be considerably less due to a tighter build quality and better u-values of heat loss elements. The system would not be able to generate enough power to be considered financially viable.

We would therefore consider that combined heat and power is not viable for this development.

Enhanced Efficiency Heating Systems

The heating system is usually the main generator of CO₂ emissions of a dwelling. Traditional mains gas boilers produce significantly lower emissions when compared to electric, oil and LPG systems.

The addition of flue gas heat recovery systems and improved heating controls are proven to bring effective reductions in emissions. They also have the advantage that most house holders would not consider this an unfamiliar technology when compared to other renewable options.

The costs of these options are not significant therefore this option is suitable for this development.

Photovoltaics (PV)

The cost of producing electricity by photovoltaic's was once seen as being prohibitive. However, with improved efficiencies, reduced costs, and the introduction of feed-in tariffs in the UK, the use of PV is now considered a viable renewable technology and is serious competition for solar water heating for available roof space.

To achieve maximum output from photovoltaic's they should ideally be located on south facing surfaces, with clear, unobstructed views of the sky.

Due to the roof design of the proposed dwelling within this development there is available space for the installation of photovoltaic's, especially on the south facing roof surface.

The installation of PV is technically feasible and could lead to CO₂ reductions for this dwelling however the costs of the installations are high. We would consider that PV is suitable for this development but the cost implications would need careful consideration.

Solar Water Heating

Solar water heating systems use the energy from the sun to heat water for domestic hot water needs. Solar water heating systems use a heat collector that is usually mounted on a roof in which a fluid is heated by the sun, this fluid being used to heat water that is stored in a hot water cylinder.

Domestic installations usually comprise of 4m² collection area, which can provide 50%-70% of the hot water requirement for a typical home if provided on south facing roofs at the optimum 30° pitch.

The CO₂ savings are not as great as those achieved through PV, as a result we consider that solar water heating is not suitable for this development and PV should be considered in its place.

Enhanced Construction

The use of enhanced insulating materials, high specification glazing, composite insulated doors and improved air tightness can significantly reduce the energy demand of the dwellings. Indeed the current Building Regulations Approved Document L1A has introduced a target fabric energy efficiency that must be achieved in addition to the target emissions rate.

Using this method alone will have significant cost implications. However the use of improved construction in combination with other options will achieve the required emissions reductions and therefore is suitable for this development.

Proposed Energy Strategy

It is proposed that the dwellings will incorporate enhanced construction and enhanced efficiency heating systems to reduce CO2 emissions.

The dwellings will adopt a 'fabric first' approach to energy efficiency following the principle that the demand for energy should first be minimised before addressing how the energy is produced. The building fabrics will be highly insulated and the target air tightness is high performing yet achievable when using high quality workmanship. This will mean that energy efficiency will be embedded within the dwelling throughout its lifetime rather than placing over reliance upon renewable technologies with a restricted working life.

The following u-values and air tightness rates are being proposed which significantly improve upon those required for Building Regulations Part L1A compliance, and therefore will provide high levels of energy efficiency.

Thermal Transmittance (U-Values):	Wall: 0.13 W/m ² K
	Roof: 0.13 W/m ² K
	Floor: 0.14 W/m ² K
	Glazing: 1.20 – 1.40 W/m ² K
	Doors: 1.20 W/m ² K
Design air tightness:	4.00 m ³ /hr.m ²

The dwellings will also incorporate building materials that have been independently assessed for thermal bridging leading to reduced heat loss at construction junctions. This detailed analysis of the construction details is often overlooked in energy assessments but it gives significant reductions in CO2 emissions.

The building services within the dwelling will use proven efficient technologies.

The heating and hot water system are currently proposed to be by means of highly efficient gas boiler, so to provide a reduction in the overall CO2 emissions for the dwelling whilst providing the client with a suitable heating system for their energy usage and way of living.

The heating controls will be fully zoned so that the timing of the heating and the temperature settings can be changed in the various rooms of the houses. This will mean that the heating will not operate in at a time when the room is not used. Delayed start thermostats will also be incorporated that will further reduce the time when the heating is operating.

All internal and external light fittings will have low energy lamps / bulbs. The external lighting will also have controls that restrict operation to 'dusk to dawn' periods. A MVHR system will also be installed to the entire property.

Energy Assessment Method

CO2 calculations have been carried out using Elmhurst Energy Systems SAP 10 programme which is in compliance with Approved Document L Volume 1 Dwellings 2021.

The SAP method assesses the energy demand of the particular dwelling design. It then calculates the resulting CO2 emissions based upon the proposed building services technologies, mainly the heating and hot water systems. For each dwelling it calculates a target emissions rate of CO2 which is referred to as the TER and a predicted as designed dwelling emission rate CO2 which is referred to as the DER. To comply with basic building regulations the DER must be no greater than the TER.

The proposed energy strategy of this development will reduce the designed dwelling CO2 emissions below the building regulations target emissions rates.

Predicted Energy and CO2 Emissions

A baseline total target emissions rate has been calculated for the proposed dwelling within the development as **630.36 kgCO2/year** as summarised in the table below:

Floor Level	Floor Area (m ²)	Emissions (kg CO2/yr/m ²)	Total emissions (kg CO2/yr)
Ground Floor	52.46	6.94	364.07
First Floor	38.37	6.94	266.29
Total target emissions for full development			630.36

The proposed energy strategy that is to be adopted on this development will reduce the predicted CO2 emissions for the dwelling. The total as designed predicted CO2 emissions for the dwelling within the development is **605.84 kg CO2/year** as summarised in the following table:

Floor Level	Floor Area (m ²)	Emissions (kg CO2/yr/m ²)	Total emissions (kg CO2/yr)
Ground Floor	52.46	6.67	349.91
First Floor	38.37	6.67	255.93
Total target emissions for full development			605.84

By comparing the total target emissions and the total predicted emissions, the predicted reduction in CO2 emissions is calculated as follows:

$$\text{Predicted CO2 reduction} = (1 - (605.84/630.36)) \times 100 = 3.89\%$$

The overall 'DER' CO2 emissions for the dwelling is as follows:

$$\text{Predicted CO2 emissions} = 605.84 \text{ kg CO2 / year}$$

A copy of the predicted energy assessment is included in this report.

Summary for Input Data

Property Reference	4 Parkstone Avenue		Issued on Date	30/09/2025
Assessment Reference	Updated Assessment (29.09.25)	Prop Type Ref		
Property	4, Parkstone Avenue, Whitefield, M45 7QH			

SAP Rating	94 A	DER	6.67	TER	6.94
Environmental	93 A	% DER < TER			3.89
CO ₂ Emissions (t/year)	1.27	DFEE	39.81	TFEE	40.67
Compliance Check	See BREL	% DFEE < TFEE			2.09
% DPER < TPER	4.36	DPER	35.87	TPER	37.50

Assessor Details	Mr. Matthew Jones	Assessor ID	DR89-0001
Client	Thorp Design Services Ltd, Mr Zach Thorp		

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	East	
Property Tenture	1	
Transaction Type	5	
Terrain Type	Suburban	
1.0 Property Type	House, Detached	
2.0 Number of Storeys	2	
3.0 Date Built	2025	
4.0 Sheltered Sides	3	
5.0 Sunlight/Shade	Average or unknown	
6.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	167.83	kJ/m²

7.0 Electricity Tariff	Standard
Smart electricity meter fitted	No
Smart gas meter fitted	No

7.0 Measurements				
	Ground floor:	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
	1st Storey:	52.46 m	141.42 m ²	2.45 m
		38.37 m	49.99 m ²	1.80 m

8.0 Living Area	56.38	m ²
-----------------	-------	----------------

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area(m ²)	Nett Area (m ²)	Shelter Res	Shelter	Openings	Area Calculation Type
External Walls	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.13	60.00	146.48	112.96	0.00	None	33.52	Enter Gross Area

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
GF Studwork	Plasterboard on timber frame	9.00	144.76
GF Blockwork	Dense block, dense plaster	100.00	54.31
FF Studwork	Plasterboard on timber frame	9.00	33.88

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area(m ²)	Nett Area (m ²)	Shelter Code	Shelter Factor	Calculation Type	Openings
FF Sloping Roof	External Slope Roof	Plasterboard, insulated slope	0.13	9.00	157.72	144.28	None	0.00	Enter Gross Area	13.44
GF Flat Roof	External Flat Roof	Plasterboard, insulated flat roof	0.13	9.00	11.48	11.48	None	0.00	Enter Gross Area	0.00

Description	Storey	Construction	Area (m ²)
Internal GF Ceiling	Lowest occupied	Plasterboard ceiling, carpeted chipboard floor	49.99

Description	Type	Storey Index	Construction	U-Value (W/m ² K)	Shelter Code	Shelter Factor	Kappa (kJ/m ² K)	Area (m ²)
Proposed Ground Floor	Ground Floor - Solid	Lowest occupied	Slab on ground, screed over insulation	0.14	None	0.00	110.00	141.42

Summary for Input Data



11.2 Internal Floors

Description	Storey Index	Construction	Kappa (kJ/m²K)	Area (m²)
Internal First Floor		Plasterboard ceiling, carpeted chipboard floor	18.00	49.99

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Proposed Window	Manufacturer	Window	Double glazed			0.49		0.70	1.40
Proposed Bi-fold Door	Manufacturer	Window	Double glazed			0.49		0.70	1.20
Proposed Front Door	Manufacturer	Half Glazed Door	Double glazed			0.49		0.70	1.20
Proposed Velux Glazing 67	Manufacturer	Roof Window	Double glazed			0.44		0.70	0.83
Proposed Rear Door	Manufacturer	Half Glazed Door	Double glazed			0.49		0.70	1.28
Rear Side Window	Manufacturer	Window	Double glazed			0.49		0.70	1.28
Proposed Atrium Glazing	Manufacturer	Window	Double glazed			0.49		0.70	1.20
Front Side Window	Manufacturer	Window	Double glazed			0.49		0.70	1.20

13.0 Openings

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
W 01	Proposed Window	External Walls	East	2.56	
W 02	Proposed Window	External Walls	East	1.42	
D 03	Proposed Front Door	External Walls	East	1.91	
W 04	Front Side Window	External Walls	East	1.77	
W 05	Proposed Window	External Walls	East	1.19	
RL 06	Proposed Velux Glazing 67	FF Sloping Roof	North	1.68	38
RL 07	Proposed Velux Glazing 67	FF Sloping Roof	North	1.68	38
RL 08	Proposed Velux Glazing 67	FF Sloping Roof	North	1.68	38
RL 09	Proposed Velux Glazing 67	FF Sloping Roof	North	1.68	38
W 10	Rear Side Window	External Walls	West	0.89	
D 11	Proposed Rear Door	External Walls	West	1.89	
D 12	Proposed Bi-fold Door	External Walls	West	11.27	
W 13	Proposed Atrium Glazing	External Walls	West	9.57	
RL 14	Proposed Velux Glazing 67	FF Sloping Roof	West	1.68	38
W 15	Proposed Window	External Walls	South	1.05	
RL 16	Proposed Velux Glazing 67	FF Sloping Roof	South	1.68	38
RL 17	Proposed Velux Glazing 67	FF Sloping Roof	South	1.68	38
RL 18	Proposed Velux Glazing 67	FF Sloping Roof	South	1.68	38

14.0 Conservatory

15.0 Draught Proofing

 %

16.0 Draught Lobby

17.0 Thermal Bridging

17.1 List of Bridges

Bridge Type	Source Type	Length	Psi	Adjusted Reference:	Imported
E2 Other lintels (including other steel lintels)	Non Gov Approved Schemes	21.66	0.02	0.02	No
E3 Sill	Non Gov Approved Schemes	12.36	0.02	0.02	No
E4 Jamb	Non Gov Approved Schemes	22.46	0.02	0.02	No
E5 Ground floor (normal)	Non Gov Approved Schemes	52.45	0.05	0.05	No
E11 Eaves (insulation at rafter level)	Non Gov Approved Schemes	22.10	0.02	0.02	No
E13 Gable (insulation at rafter level)	Non Gov Approved Schemes	27.42	0.04	0.04	No
E16 Corner (normal)	Non Gov Approved Schemes	17.92	0.04	0.04	No
E17 Corner (inverted – internal area greater than external area)	Non Gov Approved Schemes	7.68	-0.07	-0.07	No
R4 Ridge (vaulted ceiling)	Table K1 - Default	21.56	0.12	0.12	No
R5 Ridge (inverted)	Table K1 - Default	9.74	0.12	0.12	No
R8 Roof to wall (rafter)	Table K1 - Default	28.98	0.12	0.12	No
E6 Intermediate floor within a dwelling	Non Gov Approved Schemes	40.11	0.00	0.00	No
R1 Head of roof window	Table K1 - Default	7.20	0.24	0.24	No
R2 Sill of roof window	Table K1 - Default	7.20	0.24	0.24	No
R3 Jamb of roof window	Table K1 - Default	16.80	0.24	0.24	No

Y-value W/m²K

19.0 Mechanical Ventilation

Mechanical Ventilation

Mechanical Ventilation System Present

Mechanical Ventilation data Type

Type

MVHR System Location

20.0 Fans, Open Fireplaces, Flues

Number of open chimneys

Number of open flues

Number of chimneys/flues attached to closed fire

Number of flues attached to solid fuel boiler

Summary for Input Data

Number of flues attached to other heater	0
Number of blocked chimneys	0
Number of intermittent extract fans	0
Number of passive vents	0
Number of flueless gas fires	0

21.0 Fixed Cooling System	No
----------------------------------	---------------------------------

22.0 Pressure Testing	Yes	
Designed AP ₅₀	4.00	m ² /(h.m ²) @ 50 Pa
Test Method	Blower Door	

22.0 Lighting	No				
No Fixed Lighting	No				
	Name	Efficacy	Power	Capacity	Count
	GF Lighting	100.00	8.00	800.00	42
	FF Lighting	100.00	8.00	800.00	18

24.0 Main Heating 1	Database	
Percentage of Heat	100.00	%
Database Ref. No.	19088	
Fuel Type	Mains gas	
In Winter	88.90	
In Summer	100.00	
Model Name	818 SYSTEM 2	
Manufacturer	Baxi Heating UK Ltd	
System Type	Regular boiler	
Controls SAP Code	2110	
Delayed Start Stat	Yes	
Flue Type	Balanced	
Fan Assisted Flue	Yes	
Is MHS Pumped	Pump in heated space	
Heating Pump Age	2013 or later	
Heat Emitter	Radiators	
Flow Temperature	Enter value	
Flow Temperature Value	35.00	
Boiler Interlock	Yes	

25.0 Main Heating 2	None
----------------------------	-----------------------------------

26.0 Heat Networks	None
---------------------------	-----------------------------------

27.0 Secondary Heating	None
-------------------------------	-----------------------------------

28.0 Water Heating	Independent
Water Heating	Independent
SAP Code	903
Fuel Type	Electricity
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery Instantaneous System 1	No
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
Solar Panel	No
Water use <= 125 litres/person/day	No
Immersion Heater	Dual

Summary for Input Data

Cold Water Source

Bath Count

28.1 Showers

Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]	Connected	Connected To
Bed 1 Ensuite Shower	Combi boiler or unvented hot water system	11.00		No	
Bed 2 Ensuite Shower	Combi boiler or unvented hot water system	11.00		No	

28.3 Waste Water Heat Recovery System

29.0 Hot Water Cylinder

Cylinder In Heated Space

Insulation Type

Insulation Thickness Type

Cylinder Volume L

In Airing Cupboard

32.0 Photovoltaic Unit

Export Capable Meter?

Connected To Dwelling

Diverter

Battery Capacity [kWh]

PV Cells kWp	Orientation	Elevation	Overshading	FGHRS	MCS Certificate	Overshading Factor	MCS Certificate Reference	Panel Manufacturer
9.00	South	30°	None Or Little		No	1.00		

34.0 Small-scale Hydro

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

Typical Cost	Typical savings per year	Ratings after improvement	
		SAP rating	Environmental Impact
£4,000 - £7,000	£140	A 96	A 94
		0	0
		0	0