



Land to North of Eastlands lane, Cowfold

Energy Statement

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Revision Schedule

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1.0 Introduction

Hunter Development Holdings Limited have instructed impact Sustainability Ltd to prepare an energy statement for the proposed residential development on land to the North of Eastlands Lane, Cowfold.

The application site is a greenfield site composed of two sites located to the East and West of an access road that adjoins Eastlands Lane and extends to the North. The proposed development includes 9no plots in total, comprising 6no different house types. A total of 1no detached bungalow, 6no detached houses and 2no semi-detached houses are proposed.

As the development falls within the Horsham area, it is subject to Horsham District Council (HDC) planning policy. Under HDC's Planning Framework, Policy 36 stipulates that an energy statement must be submitted to demonstrate the application of the energy hierarchy:

Be lean: use less energy

Be clean: supply energy efficiently

Be green: use renewable energy

This report therefore assesses the performance of the proposed development in terms of energy efficiency measures, viability of district heating connection / on-site CHP and potential specification of Low and Zero Carbon (LZC) technologies.

This report has been completed by George Kent of Impact Sustainability Ltd, who is a registered Domestic Energy Assessor (DEA) and Non-Domestic Low Carbon Energy Assessor (LCEA) George has 18 years continuous experience in energy simulation and consultancy and is not professionally connected or affiliated with any LZC technology or manufacturer. George is therefore considered to be an 'Energy Specialist.'

2.0 Planning Policy

The site is located within the district of Horsham and so is subject to Horsham District Council's Planning Policies. Within the Horsham District Planning Framework (November 2015), Policy 36 Strategic Policy addresses 'Appropriate Energy Use.' Within this policy it is confirmed that all development will be required to contribute to clean, efficient energy in Horsham based on the following hierarchy:

Be lean: use less energy, e.g., through demand reduction

Be clean: supply energy efficiently – e.g., through heat networks

Be green: use renewable energy sources

Furthermore, developments within heat priority areas or strategic development locations will be expected to connect to district heat networks where they exist using the following hierarchy or be 'network ready' to allow for a future connection if one does not already exist.

- 1.Connection to existing (C)CHP distribution networks
- 2.Site wide renewable (C)CHP
- 3.Site wide gas-fired (C)CHP
- 4.Site wide renewable community heating/cooling
- 5.Site wide gas-fired community heating/cooling
- 6.Individual building renewable heating
- 7.Individual building heating, with the exception of electric heating

Compliance with the above must be demonstrated through the submission of an Energy Statement, which quantifies how the development will comply with the energy hierarchy. The aim of this energy statement is to therefore demonstrate compliance with HDC's Planning Framework (Nov 2025) Policy 36.

An excerpt from the Planning Framework document showing Policy 36 is provided in figure 2.1 below.

Policy 36

Strategic Policy: Appropriate Energy Use

Energy hierarchy

All development will be required to contribute to clean, efficient energy in Horsham based on the following hierarchy:

1. Lean – use less energy – e.g. through demand reduction
2. Clean – supply energy efficiently – e.g. through heat networks
3. Green – use renewable energy sources

District Heating and Cooling

Commercial and residential developments in Heat Priority Areas or the strategic development locations will be expected to connect to district heating networks where they exist using the following hierarchy, or incorporate the necessary infrastructure for connection to future network.

Development should demonstrate that the heating and cooling systems have been selected in accordance with the following heating and cooling hierarchy;

1. Connection to existing (C)CHP distribution networks
2. Site wide renewable (C)CHP
3. Site wide gas-fired (C)CHP
4. Site wide renewable community heating/cooling
5. Site wide gas-fired community heating/cooling
6. Individual building renewable heating
7. Individual building heating, with the exception of electric heating

All (C)CHP must be of a scale and operated to maximise the potential for carbon reduction. Where site-wide (C)CHP is proposed, consideration must be given to extending the network to adjacent sites.

Energy Statements

All applications for residential or commercial development must include an Energy Statement demonstrating and quantifying how the development will comply with the Energy Hierarchy.

Developments in Heat Priority Areas and strategic developments should demonstrate and quantify how the development will comply with the heating and cooling hierarchy. Horsham District Council will work proactively with applicants on major developments to ensure these requirements are met.

Renewable energy schemes

The Council will permit schemes for renewable energy (e.g. solar) where they do not have a significant adverse effect on landscape and townscape character, biodiversity, heritage or cultural assets or amenity value. Community initiatives which seek to deliver renewable and low carbon energy will be encouraged.

Figure 2.1 HDC's Planning Framework (Nov 2015) Policy 36

3.0 Baseline Assessment

3.1 Summary

To complete the energy assessment of the site a total of three plots were selected and an initial SAP assessment was completed upon each. The plot types assessed were:

- Plot 2 (HT-02) – A detached house
- Plot 7 (HT-03) – a Semi-detached house
- Plot 9 (HT-01) – A detached bungalow

The geometry data inputs to these calculations have been based upon the following planning issue site plan, plan and elevation drawings issued by Lloyd Harden Architecture:

- 2562-03 – Proposed Site Plan
- 2562-10 House Type 1 Floor Plans
- 2562-11 House Type 1 Elevations (1 of 2)
- 2562-12 House Type 1 Elevations (2 of 2)
- 2562-13 House Type 2 Floor Plans
- 2562-14 House Type 2 Elevations
- 2562-15 House Type 3 Floor Plans
- 2562-16 House Type 3 Elevations

These plot types were selected for analysis as they broadly represent the range of different plot types and levels of external exposure present on the site plan drawings provided.

As the SAP process reports regulated CO₂ emissions in kgCO₂/m²/yr the most appropriate plot type from the list above has been allocated to each plot on the site plan. The SAP results for each sample assessment were then multiplied by the total floor area of each plot to obtain an estimate of CO₂ emissions at each stage. The SAP process has then been repeated at each stage of the energy hierarchy.

3.2 Baseline Assessment Results

Table 3.1 below shows the CO₂ breakdown of the baseline compliance analysis. The baseline annual CO₂ emissions are 12,339 kgCO₂ per annum based upon the Target Emission Rates calculated from the Part L 2021 software results.

Plot Type	Total Floor Area m ²	Part L 2021 TER (kg/m ² /yr)	Total CO ₂ (kg/yr)
Plot 1	165.9	9.22	1,530
Plot 2	165.9	9.22	1,530
Plot 3	167.2	9.22	1,542
Plot 4	165.9	9.22	1,530
Plot 5	165.9	9.22	1,530
Plot 6	113.0	8.63	975
Plot 7	113.0	8.63	975
Plot 8	157.9	9.22	1,456
Plot 9	167.0	7.62	1,272
Site Wide Baseline CO ₂ emissions			12,339

Table 4.1 Annual Baseline Regulated CO₂ Emissions

4.0 'Be Lean' Assessment

4.1 Summary

The first step of the energy hierarchy is to improve a development's energy demand through the specification of thermally efficient building fabric and services. To reduce this energy demand from each of the plots, high performance thermal insulation will be specified to reduce envelope u-values below what is required for AD L1 2021 compliance. The details from a recognised thermal bridging scheme will also be followed, although at this stage it is assumed that thermal bridging details allow a narrow pass against building regulation standards only so as to avoid influencing the Dwelling Emission Rate as these are yet to be confirmed.

The building fabric construction details have been based upon initial discussions with the design team and similar project experience. These have been included within the assessment models as shown in table 4.1 below. The adventitious air permeability rate within each assessed plot is 4 m³/hr/m² at a pressure of 50 Pa, which is 50% reduction below the current Part L limiting value of 8 m³/hr/m² at a pressure of 50 Pa.

Building Element	U-Value W/m ² K	Part L 2021 U- Value W/m ² K
External walls	0.18	0.26
Ground floor	0.13	0.18
Pitched roofs, insulated at ceiling level	0.11	0.16
Flat roofs	0.11	0.16
Windows/ glazed doors	1.40	1.60
Solid doors	1.40	1.60
Air Permeability (m ³ /hr/m ²)	4.00	8.00

Table 4.1 Target Building Fabric U-Values and Air Permeability

To further reduce the energy demand and associated CO₂ emissions from the proposed development site the efficiency of the building services strategy must also be considered.

An Air Heat Source Heat Pump (ASHP) is proposed to deliver both space heating and hot water within each of the houses, which has a high efficiency (known as Coefficient Of Performance, or COP) compared to traditional gas-fired systems. This system will also utilise grid electricity, which has lower CO₂ emissions per kWh than mains gas. This heat pump utilises ambient air as a heat source and so technically can be considered as a renewable technology.

The ventilation strategy adopted will be natural with trickle vents and local extract fans to wet rooms and kitchens.

Lighting throughout will be low energy LED, with an efficacy of at least 85 lamp-lumens per circuit-watt.

The proposed services strategy is summarised within table 4.2 below.

System	System Details	Delivery Method / Controls
Heating	Air Source Heat Pump (assumed Grant Aerona in SAP calculation, ref nr 103764)	Underfloor heating
Ventilation	Natural ventilation with trickle vents on windows	Windows with trickle vents
	Local extract fans	Wet rooms and kitchens
Hot water	From main heating system	Storage vessel sized appropriately for no. bedrooms
Lighting	LED, assumed 85 lms/W	Manual control

Table 5.2 'Be Lean' stage Residential Building Services Systems & Performance Data

4.2 Be Lean' Assessment Results

The results of the 'Be Lean' assessment are shown in table 5.3 below. These demonstrate that the site has CO₂ emissions of 3,970 kg per annum. This is a reduction of 67.8% below the baseline figure.

Plot Type	Total Area m ²	Part L 2021 TER (kg/m ² /yr)	Part L 2021 DER (kg/m ² /yr)	Total CO ₂ (kg/yr)	Reduction below TER (%)
Plot 1	165.9	9.22	2.82	468	69.4%
Plot 2	165.9	9.22	2.82	468	69.4%
Plot 3	167.2	9.22	2.82	472	69.4%
Plot 4	165.9	9.22	2.82	468	69.4%
Plot 5	165.9	9.22	2.82	468	69.4%
Plot 6	113.0	8.63	2.96	334	65.7%
Plot 7	113.0	8.63	2.96	334	65.7%
Plot 8	157.9	9.22	2.82	445	69.4%
Plot 9	167.0	7.62	3.07	513	59.7%
Site Wide Be Lean CO ₂ emissions				3,970	
Site Wide Reduction below baseline				67.8%	

Table 5.3 Annual 'Be Lean' Regulated CO₂ Emissions

5.0 'Be Clean' Assessment

5.1 District Heat Networks

HDC Planning Framework Policy 36 stipulates a requirement for the viability of connection to district heating systems to be assessed. The 'West Sussex Sustainable Energy Study' was completed by the Centre for Sustainable Energy in October 2009, in which it is confirmed that the town of Horsham is considered to be a 'Heat Priority Area'. This is defined as an area *"in which conditions are likely to favour larger scale, more economic and effective forms of sustainable energy generation such as CHP with district heating (and/or cooling)."*

However, the proposed development site lies approximately 6 miles to the South-East of Horsham town centre. At the time of writing no current heat network exists within the village of Cowfold and there are no proposed future networks due to the rural location. Therefore, connection to a district heating system is not a viable option at this location.

In order to allow provision for connection to a district heating system in the future the heating system would need to be designed with future connection capability in mind. This would require the use of a centralised heating system across the whole development site, which would not be practical for individual dwellings with separate ownership and/or occupancy. A centralised heating strategy would also not be compatible with the efficient strategy discussed at the 'be lean' stage and so would make this unviable.

5.1 Combined Heat & Power

Combined heat and power (CHP), also known as cogeneration, is the simultaneous generation of thermal and electrical energy from a single stream of fuel. A CHP engine burns fuel to run a turbine, which in turn generates electricity. The 'waste' heat from the combustion process is then used to provide heating and hot water within the building. In this way electricity from conventional power stations is displaced and the substantial conversion, transmission and distribution losses are avoided.

Systems must be 'heat lead' for high efficiency, which best suits applications to situations where there is a significant demand for heat for long periods of time, such as hospitals, hotels and leisure centres. As the development is residential in nature the hot water usage profile is not well suited to CHP, as CHP engines require a continuous load to ensure they operate all the time and realise the potential carbon savings.

Furthermore, CHP does not perform particularly well against the new Part L2 2021 standard, as the gas used to generate the electricity within the unit actually has higher CO₂ emissions per kWh than grid supplied electricity. A CHP engine would therefore put the development at a disadvantage in terms of building regulations and planning policy compliance. It is also unknown whether there is mains gas available near to the site location. If not this system would require the use of LPG, which would not be cost effective.

A CHP-led system would require the use of a centralised heating system, which as discussed is not a feasible option for this development. It is also unlikely to offer any carbon reduction under the new Building Regulations. Therefore, a gas fired CHP engine is not considered to be an appropriate energy strategy and so no further reduction in emissions can be achieved from the 'be clean' stage of the analysis.

6.0 'Be Green' Assessment

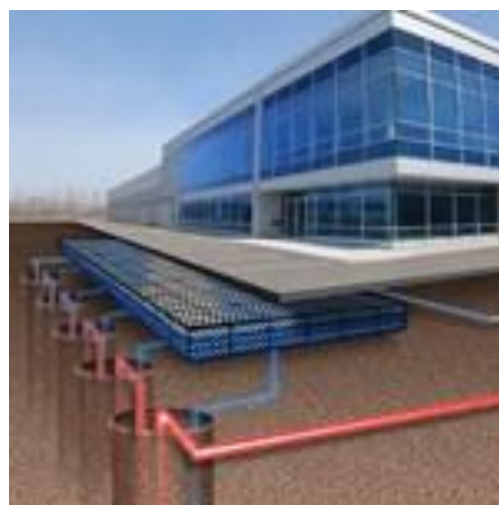
6.1 Summary

The commentary below provides an overview of the potential LZC technologies available for specification within the development and discusses the associated opportunities and constraints.

6.2 Ground Source Heat Pumps

A ground sourced heat pump (GSHP) is a system used to extract heat from the ground to provide space heating and domestic hot water within buildings. At a depth of 2m below the surface the ground remains at a relatively constant temperature throughout the year (approximately 10-12°C in England) and so this can be used as a heat source. A heat transfer fluid is circulated through a closed loop buried in the ground and passes through a heat exchanger in the heat pump that extracts heat from the fluid through a vapour compression cycle, similar to a refrigerator in reverse.

Sufficient area is available on site for either individual horizontal systems or vertical systems to each property. However, neither a vertical system nor a horizontal system is likely to be financially viable as individual systems (and boreholes if using a vertical loop) would be required for each property. A GSHP system would therefore only be practical if a central energy centre were considered, which as previously discussed is not considered to be a viable option. Therefore, a GSHP system is not considered to be a practical option for this project.



6.3 Air Source Heat Pumps

In a similar way to GHPSs, Air Source Heat Pumps (ASHPs) extract renewable heat from the outside air using an external condenser unit and vapour compression cycle. This is then transferred through refrigeration pipework to an indoor unit, which conveys that heat to the heating emitters and / or hot water cylinder. This system can provide 100% of heating within a building when sized correctly.

As discussed, the proposed plots will utilise ASHPs to provide both space heating and domestic hot water. With the lower emissions factor associated with grid supplied electricity in Part L 2021 and the high Co-Efficient of Performance (COP) of ASHPs this strategy will offer a low carbon solution to heating and domestic hot water provision.

However, as discussed within section 4.1, this has already been considered within the 'be lean' strategy and so cannot be considered again at this stage.



6.4 Biomass

Within a biomass system waste timber, in the form of wood chips and pellets, can be used as fuel in boilers to provide heating and hot water within buildings. Biomass generation is close to carbon neutral, meaning the CO₂ that is emitted by the combustion is comparable to the CO₂ that is removed from the atmosphere during the life of the tree. Wood chips and pellets present no risk if accidentally released into the environment and there are no harmful by-products. The flue gas is smoke-free and the ash content of between 0.5% and 3% by volume (depending on material), is minimal.

Biomass heating systems are typically sized to meet the majority of the building heating load, with gas condensing boilers providing the additional input required at peak times to reduce the amount of on/off cycling of the biomass boilers. A biomass boiler system would therefore need to be coupled with gas fired boilers to offer a bivalent heating solution.

It would not be practical to install individual biomass boilers with gas boiler back-up at each plot and so such a system would need to form part of a centralised energy network, which as discussed in section 5.1 is not a viable option for the proposed residential site. Concerns around security of fuel supply and the high level of maintenance required mean this system would not be suited to a residential development with individual ownership / occupancy of properties. Furthermore, the flue emissions from the boiler could affect local air quality and may not comply with Local Authority policy in this regard.

For these reasons, a biomass heating system is not considered to be viable for the development site.



6.5 Solar thermal

Solar thermal heating systems use renewable energy from the sun to heat water, most commonly in the UK for hot water needs. The systems use a heat collector, generally mounted on the roof in which a fluid is heated by the sun. This fluid is passed through a heat exchanger and used to heat up water, which is stored in either a separate hot water cylinder or a twin coil hot water cylinder inside the building. There are two types of collectors used for solar water heating applications - flat plate collectors and evacuated tube collectors. Evacuated tube collectors are generally more expensive due to a more complex manufacturing process (to achieve the vacuum) but offer a higher performance during winter months.



A solar thermal system would normally supply heat to a cylinder within the building in conjunction with a typical gas boiler arrangement. The solar thermal system would therefore need to feed into a central buffer vessel, which would then be 'topped up' by the primary heat generator.

A solar thermal system may be preferable than photovoltaics (PV) for use with a system that is gas-fired, since gas has a higher emissions factor than electricity in Part L 2021. However, as the proposed heating and hot water strategy is likely to be electrically powered this will not be a factor. Furthermore, once the stored domestic hot water reaches the set point

temperature any additional heat captured from the solar thermal system would have nowhere to go and would need 'dumped' to avoid the system overheating.

A solar thermal system would need to be installed on the roof of each plot. However, this would be in direct competition for roof space with photovoltaics (PV), which would offer a low maintenance method of offsetting emissions.

For these reasons, individual solar thermal hot water systems to each plot are not considered to be viable for this development.

6.6 Photovoltaics

Solar photovoltaic (PV) technology is a semi-conductor based technology that converts the energy in sunlight into electricity. The term describes a solid-state electronic cell that produces direct current electrical energy from the radiant energy of the sun. When sunlight strikes the surface of a PV cell, this electrical field provides momentum and direction to light-stimulated electrons, resulting in a flow of direct current when the solar cell is connected to an electrical load. The PV systems should be unshaded as shading, even over a small area of the panel, can significantly reduce performance. Excess energy can be exported to the grid, ensuring CO₂ savings can always be made.



A PV array could be installed on the roofs of each of the plots where required. The energy generated by a PV array would be used directly within the property, with any excess energy generated that is not used exported back to the grid for a small export tariff or stored in a battery for use outside of generating hours.

Individual PV arrays could be installed on the roofs to further reduce CO₂ emissions and this technology is therefore considered to be viable and preferable.

6.7 'Be Green' Strategy & Results

The above appraisal concludes that a PV array on each roof would be the most viable technology for consideration within the energy strategy.

At the 'be lean' stage of the assessment the SAP calculations (provided in Appendix 1) an ASHP system has been included to demonstrate compliance. Therefore, a roof mounted PV array has been included within the SAP assessments for each plot types at the 'Be Green' stage to further reduce carbon emissions.

It is proposed that 1.2kWp PV array comprising 3no 400Wp panels be installed upon the roof of each house. Within the 'Be Green' SAP assessments these have been included assuming an East or West orientation, since many of the plots are orientated in this way. However, in reality it will be possible to orient some of the arrays to face South, which will improve overall performance. The East / West orientation included within the 'Be Green' SAP assessments therefore represent the worst case in terms of electricity generated.

Applying the above to all relevant plots on site results in a site-wide PV requirement of 10.8 kWp, which is a total of 27no 400 Wp panels.

The results of the 'Be Green' assessment are shown in table 6.1 below. These demonstrate that the site achieves 'be green' emissions of 3,209 kgCO₂/annum, which is a reduction of 74.0% below the baseline figures.

Plot Type	Total Area m ²	Part L 2021 TER (kg/m ² /yr)	Part L 2021 DER (kg/m ² /yr)	Total CO ₂ (kg/yr)	Reduction below TER (%)
Plot 1	165.9	9.22	2.29	380	75.2%
Plot 2	165.9	9.22	2.29	380	75.2%
Plot 3	167.2	9.22	2.29	383	75.2%
Plot 4	165.9	9.22	2.29	380	75.2%
Plot 5	165.9	9.22	2.29	380	75.2%
Plot 6	113.0	8.63	2.34	264	72.9%
Plot 7	113.0	8.63	2.34	264	72.9%
Plot 8	157.9	9.22	2.29	362	75.2%
Plot 9	167.0	7.62	2.49	416	67.3%
Site Wide Be Green CO ₂ emissions				3,209	
Site Wide Reduction below baseline				74.0%	

Table 6.1 Annual 'Be Green' Regulated CO₂ Emissions

7.0 Proposed Energy and LZC Technology Strategy

7.1 Recommended Strategy

An energy strategy for the proposed residential development site North of Eastlands Lane, Cowfold has been assessed in accordance with Horsham District Council Planning Framework policy based upon the energy hierarchy:

Be Lean: use less energy

Be Clean: supply energy efficiently

Be Green: use renewable energy

Following this approach has resulted in an energy efficient scheme that has minimised CO₂ emissions associated with the use of regulated energy through improvements to the thermal performance of the building envelope and high efficiency building services strategy. These measures have resulted in a reduction in annual CO₂ emissions of 67.8% below the Part L 2021 baseline.

Connection to a district heat network is not a viable option as there are no existing networks in close vicinity of the site and no known networks are being considered. The residential development type and site layout is not well suited to a potential connection in the future and so a 'network ready' energy strategy is not deemed to be appropriate.

An LZC technology appraisal has been completed, which concludes that individual PV arrays to each plot would be the most suitable option for inclusion. As such a total of 10.8 kWp PV has been calculated as required across the site, which is a 1.2kWp array comprising 3no panels per plot. This technology would offer a further 6.2% reduction in CO₂ emissions below the 'Be Lean' assessment and a total of 74.0% overall reduction below the baseline emissions.

The results of the energy hierarchy analysis followed within this energy strategy are shown in table 7.1 and figure 7.1 below.

Measure	Site CO ₂ Emissions (kg/yr)	CO ₂ Reduction (kg/yr)	Reduction at each Stage (%)	Reduction from Baseline (%)
Part L1 2021 Baseline	12,339			
Be Lean	3,970	8,369	67.8%	67.8%
Be Green	3,209	9,130	6.2%	74.0%

Table 7.1 Results of energy hierarchy analysis against Part L 2021 baseline

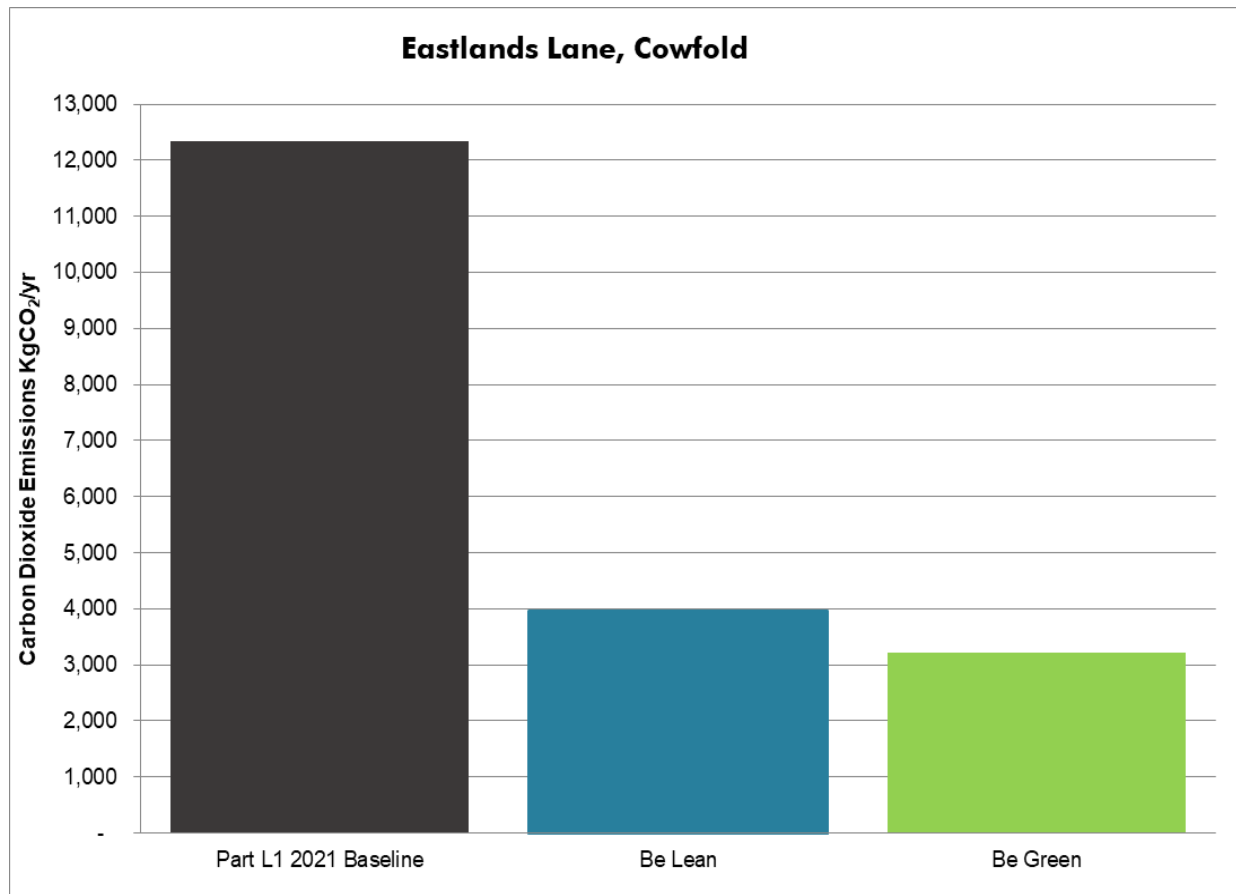


Figure 7.1 Graphical results of energy hierarchy analysis against Part L 2021 baseline



Appendix 1- SAP Reports

Summary for Input Data

Plot Reference	Plot 2	Issued on Date	14/01/2026
Assessment Reference	Be Lean	Plot Type Ref	Detached house
Plot Address		SAP Version	10.2

SAP Rating	86 B	DER	2.82	TER	9.22
Environmental	97 A	% DER < TER			69.41
CO ₂ Emissions (t/year)	0.43	DFEE	43.48	TFEE	43.53
Compliance Check	See BREL	% DFEE < TFEE			0.12
% DPER < TPER	39.57	DPER	29.36	TPER	48.58

Assessor Details	Mr. George Kent	Assessor ID	BQ97-0001
Client			

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

Orientation	South	
Property Tenture	ND	
Transaction Type	6	
Terrain Type	Rural	
1.0 Property Type	House, Detached	
2.0 Number of Storeys	2	
3.0 Date Built	2026	
4.0 Sheltered Sides	0	
5.0 Sunlight/Shade	Average or unknown	
6.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	227.07	kJ/m²K
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:	41.19 m	95.00 m ²	2.40 m
		35.80 m	72.64 m ²	2.50 m

8.0 Living Area	48.17	m ²
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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 Wall 1	Cavity Wall	Cavity wall : plasterboard on dabs, dense block, filled cavity, any outside structure	0.18	150.00	188.36	155.00	0.00	None	33.36	Calculate Wall Area

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Wall 1	Plasterboard on timber frame	9.00	175.81

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
Plane Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	72.64	72.64	None	0.00	Enter Gross Area	0.00
Flat Roof	External Flat Roof	Plasterboard, insulated flat roof	0.11	9.00	22.36	18.90	None	0.00	Enter Gross Area	3.46

Description	Storey	Construction	Kappa	Area (m ²)
Internal Ceiling 1	Lowest occupied	Plasterboard ceiling, carpeted chipboard floor	9.00	72.64

Description	Type	Storey Index	Construction	U-Value (W/m ² K)	Shelter Code	Shelter Factor	Kappa (kJ/m ² K)	Area (m ²)
Heatloss Floor 1	Ground Floor - Solid	Lowest occupied	Slab on ground, screed over insulation	0.13	None	0.00	110.00	95.00

11.2 Internal Floors

Summary for Input Data

Description	Storey Index	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Floor 1	+1	Plasterboard ceiling, carpeted chipboard floor	18.00	72.64

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Windows	Manufacturer	Window	Double glazed			0.60		0.70	1.40
Half glazed door	Manufacturer	Half Glazed Door	Double glazed			0.60		0.70	1.40
Solid door	Manufacturer	Solid Door				0.00			1.40
Roof light	Manufacturer	Roof Light	Double glazed			0.60		0.70	1.40

13.0 Openings

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
North	Windows	External Wall 1	North	13.69	
East	Windows	External Wall 1	East	5.25	
Rooflight	Roof light	Flat Roof	East	3.46	0
South	Windows	External Wall 1	South	9.98	
West	Windows	External Wall 1	West	2.33	
Half glazed door	Half glazed door	External Wall 1	East	2.11	

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)		24.75			Yes
E3 Sill		18.69			No
E4 Jamb		57.42			Yes
E5 Ground floor (normal)		41.19			Yes
E6 Intermediate floor within a dwelling		35.80			Yes
E16 Corner (normal)		20.64			No
R11 Upstands or kerbs of rooflights		10.84			Yes
E10 Eaves (insulation at ceiling level)		51.06			No
E12 Gable (insulation at ceiling level)		3.74			No
E14 Flat roof		12.85			No
E17 Corner (inverted – internal area greater than external area)		7.74			No
E24 Eaves (insulation at ceiling level - inverted)		8.64			No

Y-value W/m²K

Description

19.0 Mechanical Ventilation

Mechanical Ventilation

Mechanical Ventilation System Present

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

Number of flues attached to other heater

Number of blocked chimneys

Number of intermittent extract fans

Number of passive vents

Number of flueless gas fires

21.0 Fixed Cooling System

22.0 Pressure Testing

Designed AP₅₀ m³/(h.m²) @ 50 Pa

Test Method

22.0 Lighting

No Fixed Lighting

Name	Efficacy	Power	Capacity	Count
Lighting 1	85.00	8.00	680.00	21

Summary for Input Data

24.0 Main Heating 1

Database	Database	
Percentage of Heat	100.00	%
Database Ref. No.	103764	
Fuel Type	Electricity	
In Winter	427.95	
In Summer	315.70	
Model Name	AERONA3	
Manufacturer	Grant Engineering (UK) Ltd	
System Type	Heat Pump	
Controls SAP Code	2210	
Controls description	Programmer, room thermostat and TRVs	
Is MHS Pumped	Pump in heated space	
Heating Pump Age	2013 or later	
Heat Emitter	Underfloor	
Underfloor Heating	Yes - Pipes in thin screed	
Flow Temperature	Enter value	
Flow Temperature Value	35.00	

25.0 Main Heating 2

None

26.0 Heat Networks

None

27.0 Secondary Heating

None

28.0 Water Heating

Water Heating	Main Heating 1
SAP Code	901
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
Cold Water Source	From mains
Bath Count	1
Immersion Only Heating Hot Water	No

28.1 Showers

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

28.3 Waste Water Heat Recovery System

29.0 Hot Water Cylinder

Hot Water Cylinder	Hot Water Cylinder	
Cylinder Stat	No	
Cylinder In Heated Space	No	
Independent Time Control	No	
Insulation Type	Measured Loss	
Cylinder Volume	150.00	L
Loss	1.99	kWh/day
Pipes insulation	Fully insulated primary pipework	

31.0 Thermal Store

None

Recommendations

Lower cost measures

None
Further measures to achieve even higher standards
None

Summary for Input Data



Plot Reference	Plot 7	Issued on Date	14/01/2026
Assessment Reference	Be Lean	Plot Type Ref	Semi-detached house
Plot Address		SAP Version	10.2

SAP Rating	86 B	DER	2.96	TER	8.63
Environmental	97 A	% DER < TER			65.70
CO ₂ Emissions (t/year)	0.38	DFEE	37.60	TFEE	37.72
Compliance Check	See BREL	% DFEE < TFEE			0.30
% DPER < TPER	31.76	DPER	30.95	TPER	45.35

Assessor Details	Mr. George Kent	Assessor ID	BQ97-0001
Client			

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

Orientation	West
Property Tenture	ND
Transaction Type	6
Terrain Type	Rural
1.0 Property Type	House, Semi-Detached
2.0 Number of Storeys	2
3.0 Date Built	2026
4.0 Sheltered Sides	0
5.0 Sunlight/Shade	Average or unknown
6.0 Thermal Mass Parameter	Precise calculation
Thermal Mass	225.15 kJ/m ² K

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:	25.86 m	82.36 m ²	2.40 m
		21.86 m	59.50 m ²	2.50 m

8.0 Living Area	47.40 m ²
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9.0 External Walls	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 Wall 1	Cavity Wall	Cavity wall : plasterboard on dabs, dense block, filled cavity, any outside structure	0.18	150.00	116.71	95.81	0.00	None	20.90	Calculate Wall Area

9.1 Party Walls	Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)	Shelter Res	Shelter
	Party Wall 1	Solid Wall	Single plasterboard on dabs on both sides, dense blocks, cavity or cavity fill	0.00	70.00	59.68	0.00	None

9.2 Internal Walls	Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
	Internal Wall 1	Plasterboard on timber frame	9.00	222.01

10.0 External Roofs	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
	Plane Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	59.50	59.50	None	0.00	Enter Gross Area	0.00
	Flat Roof	External Flat Roof	Plasterboard, insulated flat roof	0.11	9.00	22.86	21.13	None	0.00	Enter Gross Area	1.73

10.2 Internal Ceilings	Description	Storey	Construction	Kappa	Area (m ²)
	Internal Ceiling 1	Lowest occupied	Plasterboard ceiling, carpeted chipboard floor	9.00	59.50

11.0 Heat Loss Floors

Summary for Input Data

Description	Type	Storey Index	Construction	U-Value (W/m²K)	Shelter Code	Shelter Factor	Kappa (kJ/m²K)	Area (m²)
Heatloss Floor 1	Ground Floor - Solid	Lowest occupied	Slab on ground, screed over insulation	0.13	None	0.00	110.00	82.36

11.2 Internal Floors

Description	Storey Index	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Floor 1	+1	Plasterboard ceiling, carpeted chipboard floor	18.00	59.50

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Windows	Manufacturer	Window	Double glazed			0.60		0.70	1.40
Half glazed door	Manufacturer	Half Glazed Door	Double glazed			0.60		0.70	1.40
Solid door	Manufacturer	Solid Door				0.00			1.40
Roof light	Manufacturer	Roof Light	Double glazed			0.60		0.70	1.40

13.0 Openings

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
East	Windows	External Wall 1	South	4.08	0
Rooflight	Roof light	Flat Roof	South	1.73	
South	Windows	External Wall 1	West	9.54	
West	Windows	External Wall 1	North	1.17	
Half glazed door	Half glazed door	External Wall 1	South	4.22	
Opening	Solid door	External Wall 1	West	1.89	

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)		13.60			Yes
E3 Sill		5.73			No
E4 Jamb		35.00			Yes
E5 Ground floor (normal)		25.86			Yes
E6 Intermediate floor within a dwelling		21.86			Yes
E16 Corner (normal)		9.80			No
R11 Upstands or kerbs of rooflights		5.42			Yes
E10 Eaves (insulation at ceiling level)		21.86			No
E18 Party wall between dwellings		9.80			No
P1 Party wall - Ground floor		14.22			No
P2 Party wall - Intermediate floor within a dwelling		10.22			No
P4 Party wall - Roof (insulation at ceiling level)		10.22			No

Y-value W/m²K

Description

19.0 Mechanical Ventilation

Mechanical Ventilation

Mechanical Ventilation System Present

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

21.0 Fixed Cooling System

22.0 Pressure Testing

Designed AP₅₀ m³/(h.m²) @ 50 Pa
Test Method

22.0 Lighting

No Fixed Lighting

Summary for Input Data

	Name Lighting 1	Efficacy 85.00	Power 8.00	Capacity 680.00	Count 21
24.0 Main Heating 1	Database				
Percentage of Heat	100.00			%	
Database Ref. No.	103764				
Fuel Type	Electricity				
In Winter	377.31				
In Summer	314.24				
Model Name	AERONA3				
Manufacturer	Grant Engineering (UK) Ltd				
System Type	Heat Pump				
Controls SAP Code	2210				
Controls description	Programmer, room thermostat and TRVs				
Is MHS Pumped	Pump in heated space				
Heating Pump Age	2013 or later				
Heat Emitter	Underfloor				
Underfloor Heating	Yes - Pipes in thin screed				
Flow Temperature	Enter value				
Flow Temperature Value	35.00				
25.0 Main Heating 2	None				
26.0 Heat Networks	None				
27.0 Secondary Heating	None				
28.0 Water Heating	Main Heating 1				
Water Heating	901				
SAP Code	No				
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				
Cold Water Source	From mains				
Bath Count	1				
Immersion Only Heating Hot Water	No				
28.1 Showers					
Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]	Connected	Connected To
Shower	Combi boiler or unvented hot water system	11.00		No	
28.3 Waste Water Heat Recovery System					
29.0 Hot Water Cylinder	Hot Water Cylinder				
Cylinder Stat	No				
Cylinder In Heated Space	No				
Independent Time Control	No				
Insulation Type	Measured Loss				
Cylinder Volume	150.00				
Loss	1.99				
Pipes insulation	Fully insulated primary pipework				
31.0 Thermal Store	None				

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

Summary for Input Data

Plot Reference	Plot 9	Issued on Date	14/01/2026
Assessment Reference	Be Lean	Plot Type Ref	Detached bungalow
Plot Address		SAP Version	10.2

SAP Rating	85 B	DER	3.07	TER	7.62
Environmental	97 A	% DER < TER			59.71
CO ₂ Emissions (t/year)	0.43	DFEE	46.90	TFEE	46.94
Compliance Check	See BREL	% DFEE < TFEE			0.09
% DPER < TPER	24.83	DPER	31.94	TPER	42.49

Assessor Details	Mr. George Kent	Assessor ID	BQ97-0001
Client			

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

Orientation	West	
Property Tenture	ND	
Transaction Type	6	
Terrain Type	Rural	
1.0 Property Type	Bungalow, Detached	
2.0 Number of Storeys	1	
3.0 Date Built	2026	
4.0 Sheltered Sides	0	
5.0 Sunlight/Shade	Average or unknown	
6.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	259.13	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
		58.48 m	154.05 m ²	2.58 m

8.0 Living Area	42.27	m ²
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9.0 External Walls	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 Wall 1	Cavity Wall	Cavity wall : plasterboard on dabs, dense block, filled cavity, any outside structure	0.18	150.00	150.88	126.06	0.00	None	24.82	Calculate Wall Area

9.2 Internal Walls	Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
	Internal Wall 1	Plasterboard on timber frame	9.00	297.63

10.0 External Roofs	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
	External Roof 1	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	154.05	154.05	None	0.00	Calculate Wall Area	0.00

11.0 Heat Loss Floors	Description	Type	Storey Index	Construction	U-Value (W/m ² K)	Shelter Code	Shelter Factor	Kappa (kJ/m ² K)	Area (m ²)
	Heatloss Floor 1	Ground Floor - Solid	Lowest occupied	Slab on ground, screed over insulation	0.13	None	0.00	110.00	154.05

12.0 Opening Types	Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m ² K)
	Windows	Manufacturer	Window	Double glazed			0.60		0.70	1.40

13.0 Openings	Name	Opening Type	Location	Orientation	Area (m ²)	Pitch
	North	Windows	External Wall 1	North	3.50	
	East	Windows	External Wall 1	East	9.88	

Summary for Input Data

South West	Windows Windows	External Wall 1 External Wall 1	South West	4.72 6.72
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14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	

17.0 Thermal Bridging	User Input
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17.1 List of Bridges						
Bridge Type	Source Type	Length	Psi	Adjusted Reference:	Imported	
E2 Other lintels (including other steel lintels)		14.10			No	
E3 Sill		18.68			Yes	
E4 Jamb		31.74			Yes	
E5 Ground floor (normal)		58.48			Yes	
E16 Corner (normal)		20.64			No	
E10 Eaves (insulation at ceiling level)		51.06			No	
E12 Gable (insulation at ceiling level)		3.74			No	
E17 Corner (inverted – internal area greater than external area)		7.74			No	

Y-value	0.03	W/m²K
Description	Estimate	

19.0 Mechanical Ventilation	
Mechanical Ventilation	
Mechanical Ventilation System Present	No

20.0 Fans, Open Fireplaces, Flues	
Number of open chimneys	0
Number of open flues	0
Number of chimneys/flues attached to closed fire	0
Number of flues attached to solid fuel boiler	0
Number of flues attached to other heater	0
Number of blocked chimneys	0
Number of intermittent extract fans	4
Number of passive vents	0
Number of flueless gas fires	0

21.0 Fixed Cooling System	No
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22.0 Pressure Testing	
	Yes
Designed AP ₅₀	4.00 m³/(h.m²) @ 50 Pa
Test Method	Blower Door

22.0 Lighting				
No Fixed Lighting	No			
Name	Efficacy	Power	Capacity	Count
Lighting 1	85.00	8.00	680.00	16

24.0 Main Heating 1	
	Database
Percentage of Heat	100.00 %
Database Ref. No.	103764
Fuel Type	Electricity
In Winter	419.01
In Summer	315.78
Model Name	AERONA3
Manufacturer	Grant Engineering (UK) Ltd
System Type	Heat Pump
Controls SAP Code	2210
Controls description	Programmer, room thermostat and TRVs
Is MHS Pumped	Pump in heated space

Summary for Input Data

Heating Pump Age	2013 or later
Heat Emitter	Underfloor
Underfloor Heating	Yes - Pipes in thin screed
Flow Temperature	Enter value
Flow Temperature Value	35.00

25.0 Main Heating 2	None
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26.0 Heat Networks	None
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27.0 Secondary Heating	None
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28.0 Water Heating	
Water Heating	Main Heating 1
SAP Code	901
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
Cold Water Source	From mains
Bath Count	1
Immersion Only Heating Hot Water	No

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

28.3 Waste Water Heat Recovery System

29.0 Hot Water Cylinder	Hot Water Cylinder				
Cylinder Stat	No				
Cylinder In Heated Space	No				
Independent Time Control	No				
Insulation Type	Measured Loss				
Cylinder Volume	150.00			L	
Loss	1.90			kWh/day	
Pipes insulation	Fully insulated primary pipework				

31.0 Thermal Store	None
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Recommendations	
Lower cost measures	None
Further measures to achieve even higher standards	None

Summary for Input Data

Plot Reference	Plot 2	Issued on Date	14/01/2026
Assessment Reference	Be Green	Plot Type Ref	Detached house
Plot Address		SAP Version	10.2

SAP Rating	88 B	DER	2.29	TER	9.22
Environmental	98 A	% DER < TER			75.16
CO ₂ Emissions (t/year)	0.33	DFEE	43.48	TFEE	43.53
Compliance Check	See BREL	% DFEE < TFEE			0.12
% DPER < TPER	49.36	DPER	24.60	TPER	48.58

Assessor Details	Mr. George Kent	Assessor ID	BQ97-0001
Client			

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

Orientation	South	
Property Tenture	ND	
Transaction Type	6	
Terrain Type	Rural	
1.0 Property Type	House, Detached	
2.0 Number of Storeys	2	
3.0 Date Built	2026	
4.0 Sheltered Sides	0	
5.0 Sunlight/Shade	Average or unknown	
6.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	227.07	kJ/m²K
7.0 Electricity Tariff	Standard	
Smart electricity meter fitted	No	
Smart gas meter fitted	No	

7.0 Measurements	Ground floor: 1st Storey:	Heat Loss Perimeter 41.19 m 35.80 m	Internal Floor Area 95.00 m² 72.64 m²	Average Storey Height 2.40 m 2.50 m
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8.0 Living Area	48.17	m²
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9.0 External Walls	Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area(m²)	Nett Area (m²)	Shelter Res	Shelter	Openings	Area Calculation Type
	External Wall 1	Cavity Wall	Cavity wall : plasterboard on dabs, dense block, filled cavity, any outside structure	0.18	150.00	188.36	155.00	0.00	None	33.36	Calculate Wall Area

9.2 Internal Walls	Description	Construction	Kappa (kJ/m²K)	Area (m²)
	Internal Wall 1	Plasterboard on timber frame	9.00	175.81

10.0 External Roofs	Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area(m²)	Nett Area (m²)	Shelter Code	Shelter Factor	Calculation Type	Openings
	Plane Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	72.64	72.64	None	0.00	Enter Gross Area	0.00
	Flat Roof	External Flat Roof	Plasterboard, insulated flat roof	0.11	9.00	22.36	18.90	None	0.00	Enter Gross Area	3.46

10.2 Internal Ceilings	Description	Storey	Construction	Kappa	Area (m²)
	Internal Ceiling 1	Lowest occupied	Plasterboard ceiling, carpeted chipboard floor	9.00	72.64

11.0 Heat Loss Floors	Description	Type	Storey Index	Construction	U-Value (W/m²K)	Shelter Code	Shelter Factor	Kappa (kJ/m²K)	Area (m²)
	Heatloss Floor 1	Ground Floor - Solid	Lowest occupied	Slab on ground, screed over insulation	0.13	None	0.00	110.00	95.00

11.2 Internal Floors

Summary for Input Data

Description	Storey Index	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Floor 1	+1	Plasterboard ceiling, carpeted chipboard floor	18.00	72.64

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Windows	Manufacturer	Window	Double glazed			0.60		0.70	1.40
Half glazed door	Manufacturer	Half Glazed Door	Double glazed			0.60		0.70	1.40
Solid door	Manufacturer	Solid Door				0.00			1.40
Roof light	Manufacturer	Roof Light	Double glazed			0.60		0.70	1.40

13.0 Openings

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
North	Windows	External Wall 1	North	13.69	
East	Windows	External Wall 1	East	5.25	
Rooflight	Roof light	Flat Roof	East	3.46	0
South	Windows	External Wall 1	South	9.98	
West	Windows	External Wall 1	West	2.33	
Half glazed door	Half glazed door	External Wall 1	East	2.11	

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)		24.75			Yes
E3 Sill		18.69			No
E4 Jamb		57.42			Yes
E5 Ground floor (normal)		41.19			Yes
E6 Intermediate floor within a dwelling		35.80			Yes
E16 Corner (normal)		20.64			No
R11 Upstands or kerbs of rooflights		10.84			Yes
E10 Eaves (insulation at ceiling level)		51.06			No
E12 Gable (insulation at ceiling level)		3.74			No
E14 Flat roof		12.85			No
E17 Corner (inverted – internal area greater than external area)		7.74			No
E24 Eaves (insulation at ceiling level - inverted)		8.64			No

Y-value W/m²K

Description

19.0 Mechanical Ventilation

Mechanical Ventilation
 Mechanical Ventilation System Present

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

Number of flues attached to other heater

Number of blocked chimneys

Number of intermittent extract fans

Number of passive vents

Number of flueless gas fires

21.0 Fixed Cooling System

22.0 Pressure Testing

Designed AP₅₀ m³/(h.m²) @ 50 Pa

Test Method

22.0 Lighting

No Fixed Lighting

Name	Efficacy	Power	Capacity	Count
Lighting 1	85.00	8.00	680.00	21

Summary for Input Data

24.0 Main Heating 1

Database	Database	
Percentage of Heat	100.00	%
Database Ref. No.	103764	
Fuel Type	Electricity	
In Winter	427.95	
In Summer	315.70	
Model Name	AERONA3	
Manufacturer	Grant Engineering (UK) Ltd	
System Type	Heat Pump	
Controls SAP Code	2210	
Controls description	Programmer, room thermostat and TRVs	
Is MHS Pumped	Pump in heated space	
Heating Pump Age	2013 or later	
Heat Emitter	Underfloor	
Underfloor Heating	Yes - Pipes in thin screed	
Flow Temperature	Enter value	
Flow Temperature Value	35.00	

25.0 Main Heating 2

None

26.0 Heat Networks

None

27.0 Secondary Heating

None

28.0 Water Heating

Water Heating	Main Heating 1
SAP Code	901
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
Cold Water Source	From mains
Bath Count	1
Immersion Only Heating Hot Water	No

28.1 Showers

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

28.3 Waste Water Heat Recovery System

29.0 Hot Water Cylinder

Hot Water Cylinder	Hot Water Cylinder	
Cylinder Stat	No	
Cylinder In Heated Space	No	
Independent Time Control	No	
Insulation Type	Measured Loss	
Cylinder Volume	150.00	L
Loss	1.99	kWh/day
Pipes insulation	Fully insulated primary pipework	

31.0 Thermal Store

None

32.0 Photovoltaic Unit

One Dwelling

Summary for Input Data



Export Capable Meter?	Yes
Connected To Dwelling	Yes
Diverter	No
Battery Capacity [kWh]	0.00

PV Cells kWp	Orientation	Elevation	Overshading	FGHRS	MCS Certificate	Overshading Factor	MCS Certificate Reference	Panel Manufacturer
1.20	East	30°	Modest		No	0.80		TB

34.0 Small-scale Hydro	None
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Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

Summary for Input Data

Plot Reference	Plot 7	Issued on Date	14/01/2026
Assessment Reference	Be Green	Plot Type Ref	Semi-detached house
Plot Address		SAP Version	10.2

SAP Rating	88 B	DER	2.34	TER	8.63
Environmental	98 A	% DER < TER			72.89
CO ₂ Emissions (t/year)	0.28	DFEE	37.60	TFEE	37.72
Compliance Check	See BREL	% DFEE < TFEE			0.30
% DPER < TPER	44.06	DPER	25.37	TPER	45.35

Assessor Details	Mr. George Kent	Assessor ID	BQ97-0001
Client			

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

Orientation	West
Property Tenture	ND
Transaction Type	6
Terrain Type	Rural
1.0 Property Type	House, Semi-Detached
2.0 Number of Storeys	2
3.0 Date Built	2026
4.0 Sheltered Sides	0
5.0 Sunlight/Shade	Average or unknown
6.0 Thermal Mass Parameter	Precise calculation
Thermal Mass	225.15 kJ/m ² K

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:	25.86 m	82.36 m ²	2.40 m
		21.86 m	59.50 m ²	2.50 m

8.0 Living Area	47.40 m ²
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9.0 External Walls	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 Wall 1	Cavity Wall	Cavity wall : plasterboard on dabs, dense block, filled cavity, any outside structure	0.18	150.00	116.71	95.81	0.00	None	20.90	Calculate Wall Area

9.1 Party Walls	Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)	Shelter Res	Shelter
	Party Wall 1	Solid Wall	Single plasterboard on dabs on both sides, dense blocks, cavity or cavity fill	0.00	70.00	59.68	0.00	None

9.2 Internal Walls	Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
	Internal Wall 1	Plasterboard on timber frame	9.00	222.01

10.0 External Roofs	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
	Plane Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	59.50	59.50	None	0.00	Enter Gross Area	0.00
	Flat Roof	External Flat Roof	Plasterboard, insulated flat roof	0.11	9.00	22.86	21.13	None	0.00	Enter Gross Area	1.73

10.2 Internal Ceilings	Description	Storey	Construction	Kappa	Area (m ²)
	Internal Ceiling 1	Lowest occupied	Plasterboard ceiling, carpeted chipboard floor	9.00	59.50

11.0 Heat Loss Floors

Summary for Input Data

Description	Type	Storey Index	Construction	U-Value (W/m²K)	Shelter Code	Shelter Factor	Kappa (kJ/m²K)	Area (m²)
Heatloss Floor 1	Ground Floor - Solid	Lowest occupied	Slab on ground, screed over insulation	0.13	None	0.00	110.00	82.36

11.2 Internal Floors

Description	Storey Index	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Floor 1	+1	Plasterboard ceiling, carpeted chipboard floor	18.00	59.50

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Windows	Manufacturer	Window	Double glazed			0.60		0.70	1.40
Half glazed door	Manufacturer	Half Glazed Door	Double glazed			0.60		0.70	1.40
Solid door	Manufacturer	Solid Door				0.00			1.40
Roof light	Manufacturer	Roof Light	Double glazed			0.60		0.70	1.40

13.0 Openings

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
East	Windows	External Wall 1	South	4.08	
Rooflight	Roof light	Flat Roof	South	1.73	0
South	Windows	External Wall 1	West	9.54	
West	Windows	External Wall 1	North	1.17	
Half glazed door	Half glazed door	External Wall 1	South	4.22	
Opening	Solid door	External Wall 1	West	1.89	

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)		13.60			Yes
E3 Sill		5.73			No
E4 Jamb		35.00			Yes
E5 Ground floor (normal)		25.86			Yes
E6 Intermediate floor within a dwelling		21.86			Yes
E16 Corner (normal)		9.80			No
R11 Upstands or kerbs of rooflights		5.42			Yes
E10 Eaves (insulation at ceiling level)		21.86			No
E18 Party wall between dwellings		9.80			No
P1 Party wall - Ground floor		14.22			No
P2 Party wall - Intermediate floor within a dwelling		10.22			No
P4 Party wall - Roof (insulation at ceiling level)		10.22			No

Y-value W/m²K

Description

19.0 Mechanical Ventilation

Mechanical Ventilation

Mechanical Ventilation System Present

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

21.0 Fixed Cooling System

22.0 Pressure Testing

Designed AP₅₀ m³/(h.m²) @ 50 Pa
Test Method

22.0 Lighting

No Fixed Lighting

Summary for Input Data

	Name Lighting 1	Efficacy 85.00	Power 8.00	Capacity 680.00	Count 21
24.0 Main Heating 1	Database				
Percentage of Heat	100.00			%	
Database Ref. No.	103764				
Fuel Type	Electricity				
In Winter	377.31				
In Summer	314.24				
Model Name	AERONA3				
Manufacturer	Grant Engineering (UK) Ltd				
System Type	Heat Pump				
Controls SAP Code	2210				
Controls description	Programmer, room thermostat and TRVs				
Is MHS Pumped	Pump in heated space				
Heating Pump Age	2013 or later				
Heat Emitter	Underfloor				
Underfloor Heating	Yes - Pipes in thin screed				
Flow Temperature	Enter value				
Flow Temperature Value	35.00				
25.0 Main Heating 2	None				
26.0 Heat Networks	None				
27.0 Secondary Heating	None				
28.0 Water Heating	Main Heating 1				
Water Heating	901				
SAP Code	No				
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				
Cold Water Source	From mains				
Bath Count	1				
Immersion Only Heating Hot Water	No				
28.1 Showers					
Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]	Connected	Connected To
Shower	Combi boiler or unvented hot water system	11.00		No	
28.3 Waste Water Heat Recovery System					
29.0 Hot Water Cylinder	Hot Water Cylinder				
Cylinder Stat	No				
Cylinder In Heated Space	No				
Independent Time Control	No				
Insulation Type	Measured Loss				
Cylinder Volume	150.00				
Loss	1.99				
Pipes insulation	Fully insulated primary pipework				
31.0 Thermal Store	None				

Summary for Input Data

32.0 Photovoltaic Unit

Export Capable Meter?	One Dwelling
Connected To Dwelling	Yes
Diverter	Yes
Battery Capacity [kWh]	No
	0.00

PV Cells kWp	Orientation	Elevation	Overshading	FGHRS	MCS Certificate	Overshading Factor	MCS Certificate Reference	Panel Manufacturer
1.20	East	30°	Modest		No	0.80		

34.0 Small-scale Hydro

None

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

Summary for Input Data



Plot Reference	Plot 9	Issued on Date	14/01/2026
Assessment Reference	Be Green	Plot Type Ref	Detached bungalow
Plot Address		SAP Version	10.2

SAP Rating	88 B	DER	2.49	TER	7.62
Environmental	97 A	% DER < TER			67.32
CO ₂ Emissions (t/year)	0.33	DFEE	46.90	TFEE	46.94
Compliance Check	See BREL	% DFEE < TFEE			0.09
% DPER < TPER	36.99	DPER	26.77	TPER	42.49

Assessor Details	Mr. George Kent	Assessor ID	BQ97-0001
Client			

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

Orientation	West
Property Tenture	ND
Transaction Type	6
Terrain Type	Rural
1.0 Property Type	Bungalow, Detached
2.0 Number of Storeys	1
3.0 Date Built	2026
4.0 Sheltered Sides	0
5.0 Sunlight/Shade	Average or unknown
6.0 Thermal Mass Parameter	Precise calculation
Thermal Mass	259.13 kJ/m ² K

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

7.0 Measurements				
	Ground floor:	Heat Loss Perimeter 58.48 m	Internal Floor Area 154.05 m ²	Average Storey Height 2.58 m

8.0 Living Area	42.27 m ²
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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 Wall 1	Cavity Wall	Cavity wall : plasterboard on dabs, dense block, filled cavity, any outside structure	0.18	150.00	150.88	126.06	0.00	None	24.82	Calculate Wall Area

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Wall 1	Plasterboard on timber frame	9.00	297.63

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
External Roof 1	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	154.05	154.05	None	0.00	Calculate Wall Area	0.00

Description	Type	Storey Index	Construction	U-Value (W/m ² K)	Shelter Code	Shelter Factor	Kappa (kJ/m ² K)	Area (m ²)
Heatloss Floor 1	Ground Floor - Solid	Lowest occupied	Slab on ground, screed over insulation	0.13	None	0.00	110.00	154.05

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m ² K)
Windows	Manufacturer	Window	Double glazed			0.60		0.70	1.40

Name	Opening Type	Location	Orientation	Area (m ²)	Pitch
North	Windows	External Wall 1	North	3.50	
East	Windows	External Wall 1	East	9.88	

Summary for Input Data

South West	Windows Windows	External Wall 1 External Wall 1	South West	4.72 6.72
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14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	

17.0 Thermal Bridging	User Input
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17.1 List of Bridges						
Bridge Type	Source Type	Length	Psi	Adjusted Reference:	Imported	
E2 Other lintels (including other steel lintels)		14.10			No	
E3 Sill		18.68			Yes	
E4 Jamb		31.74			Yes	
E5 Ground floor (normal)		58.48			Yes	
E16 Corner (normal)		20.64			No	
E10 Eaves (insulation at ceiling level)		51.06			No	
E12 Gable (insulation at ceiling level)		3.74			No	
E17 Corner (inverted – internal area greater than external area)		7.74			No	

Y-value	0.03	W/m²K
Description	Estimate	

19.0 Mechanical Ventilation	
Mechanical Ventilation	
Mechanical Ventilation System Present	No

20.0 Fans, Open Fireplaces, Flues	
Number of open chimneys	0
Number of open flues	0
Number of chimneys/flues attached to closed fire	0
Number of flues attached to solid fuel boiler	0
Number of flues attached to other heater	0
Number of blocked chimneys	0
Number of intermittent extract fans	4
Number of passive vents	0
Number of flueless gas fires	0

21.0 Fixed Cooling System	No
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22.0 Pressure Testing	
	Yes
Designed AP ₅₀	4.00 m³/(h.m²) @ 50 Pa
Test Method	Blower Door

22.0 Lighting				
No Fixed Lighting	No			
Name	Efficacy	Power	Capacity	Count
Lighting 1	85.00	8.00	680.00	16

24.0 Main Heating 1	
	Database
Percentage of Heat	100.00 %
Database Ref. No.	103764
Fuel Type	Electricity
In Winter	419.01
In Summer	315.78
Model Name	AERONA3
Manufacturer	Grant Engineering (UK) Ltd
System Type	Heat Pump
Controls SAP Code	2210
Controls description	Programmer, room thermostat and TRVs
Is MHS Pumped	Pump in heated space

Summary for Input Data

Heating Pump Age	2013 or later
Heat Emitter	Underfloor
Underfloor Heating	Yes - Pipes in thin screed
Flow Temperature	Enter value
Flow Temperature Value	35.00

25.0 Main Heating 2	None
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26.0 Heat Networks	None
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27.0 Secondary Heating	None
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28.0 Water Heating	
Water Heating	Main Heating 1
SAP Code	901
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
Cold Water Source	From mains
Bath Count	1
Immersion Only Heating Hot Water	No

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

28.3 Waste Water Heat Recovery System

29.0 Hot Water Cylinder	Hot Water Cylinder	
Cylinder Stat	No	
Cylinder In Heated Space	No	
Independent Time Control	No	
Insulation Type	Measured Loss	
Cylinder Volume	150.00	L
Loss	1.90	kWh/day
Pipes insulation	Fully insulated primary pipework	

31.0 Thermal Store	None
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32.0 Photovoltaic Unit	One Dwelling
Export Capable Meter?	Yes
Connected To Dwelling	Yes
Diverter	No
Battery Capacity [kWh]	0.00

PV Cells kWp	Orientation	Elevation	Overshading	FGHRS	MCS Certificate	Overshading Factor	MCS Certificate Reference	Panel Manufacturer
1.20	East	30°	Modest		No	0.80		

34.0 Small-scale Hydro	None
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Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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Recommendations
Lower cost measures
 None
Further measures to achieve even higher standards
 None