Sustainability & Energy Statement

Land West of Shoreham Road, Small Dole, Henfield

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Executive Summary

This Sustainability and Energy Statement has been prepared in support of an outline planning application for 45 dwellings (including affordable homes) with all matters reserved apart from access on land west of Shoreham Road, Small Dole, Henfield.

The Statement includes an energy demand assessment showing which selected energy efficiency, low-carbon and renewable energy measures have been considered and those that could be incorporated into the development.

For the purposes of estimating carbon emissions from the homes an indicative accommodation schedule has been assumed and by using an indicative construction specification the carbon emissions from the site can be estimated. The Statement demonstrates how the buildings will exceed the requirements of the Building Regulations Part L (2021) and the objectives of the planning policy.

The applicant is seeking to develop an exemplary scheme and it is proposed to achieve the Future Homes Standard (FHS) for the homes. The Government have announced this is likely to require a 75-80% improvement upon Part L 2013, which equates to a 64-71% improvement upon Part L 2021.

The carbon emissions from the site have been estimated by using SAP calculations prepared for homes on other developments which are of a similar scale, design and specification to those proposed. The results have been aggregated across similar unit types to provide an accurate assessment of the total site emissions.

The calculations have been based on the installation of exhaust air heat pumps to the apartments and air source heat pumps to the houses. In addition, the detailed layout of the homes will provide the opportunity for all units to benefit from photovoltaic panels. The calculations have been based on a minimum quantity being installed to all units, which is set out below.

All space heating and hot water will be provided to the buildings from renewable technologies. All systems are fuelled by mains electricity and therefore as the National Grid decarbonises so the homes will become net zero carbon. The homes are net zero carbon ready.

The Summary SAP Reports for the modelled homes are attached as Appendix 1

The total reduction in site carbon dioxide emissions from energy efficiency measures and low-carbon and renewable technologies can be summarised as follows:

	Total Emissions	% Reduction
	kg CO_2 per year	
Baseline (Building Regulations TER)	42,381	
Be Green - after energy efficiency, heat pumps & PV panels (DER)	12,141	**71.35%**

A (separate) Water Neutrality Statement has been prepared and accompanies the application. This sets out how the site will achieve water neutrality. The water consumption to be achieved by the homes will be 84.45 litres per person per day and the Water Neutrality Statement provide a water efficiency calculator and details of the appliances that can achieve the standard. Water Neutrality will be achieved either through offsetting or drawing from an onsite borehole.

The proposal meets the requirements of the adopted policy and the emerging policy.

The key sustainability findings can be summarised as:

- Reduction in carbon dioxide emissions compared to the maximum permissible by the Building Regulations (Part L - 2021) through energy efficiency measures;
- A total reduction in (TER) carbon dioxide emissions of at least **71%** from energy efficiency, low-carbon and renewable technologies will be achieved (based on Part L – 2021);
- The water use to each unit will achieve a standard of **84.45 litres per person per day**;
- The 'affordable' homes (Social Rented, Intermediate and First Homes) will be designed to be indistinguishable from other homes;
- Outdoor space in the form of private gardens and private communal spaces as well as public open space including Local Area for Play (LAP) and a Community Orchard;
- A Biodiversity Net Gain calculation has been carried out and accompanies the application. This concludes that the development will result is a **18.36%** increase in habitat units and **10.62%** in watercourse units;
- High standards of environmental construction with compliance to the Considerate Constructors Scheme, a Site Waste Management Plan and other construction management principles;
- Secured by Design principles will be followed;
- All dwellings will be built in accordance with Part M4(1) of the Building Regulations.

1.0 Introduction

This report has been commissioned by Wates Developments and provides a Sustainability and Energy Statement in support of an outline planning application for 45 dwellings (including affordable homes) with all matters reserved apart from access on land west of Shoreham Road, Small Dole, Henfield.

The Statement describes the methodology used in assessing the dwellings and the initiatives proposed.

The homes have been designed and will be constructed to reduce energy and water demand, as well as carbon dioxide emissions.

The objective has been to reduce the energy demand to an economic minimum by making investments in the parts of the buildings that have the greatest impact on energy demand and are the most difficult and costly to change in the future, namely the building fabric.

Once cost-effective structures have been designed, low-carbon and renewable technologies have been considered to provide space heating, hot water and electricity.

The following hierarchy has been followed:

- Lean reduce demand and consumption
- Clean increase energy efficiency
- Green provide low carbon renewable energy sources

The report has been prepared by Ivan Ball of Bluesky Unlimited who are sustainability consultants.

2.0 Planning Policy Context

National Policy

The UK Government published its sustainable development strategy in 1999 entitled "A better quality of life: A strategy for sustainable development in the UK". This sets out four main objectives for sustainable development in the UK:

- Social progress that recognises the needs of everyone.
- Effective protection of the environment.
- Prudent use of natural resources.
- Maintenance of high stable levels of economic growth and employment.

Sustainable Communities: Building for the Future, known colloquially as the Communities Plan was published in 2003. The Plan sets out a long-term programme of action for delivering sustainable communities in both urban and rural areas. It aims to tackle housing supply issues in parts of the country, low demand in other parts and the quality of our public spaces. The Communities Plan describes sustainable communities as: Active, inclusive and safe, well run, environmentally sensitive, well designed and built, well connected, thriving, well served and fair for everyone.

The most relevant national planning policy guidance on sustainability is set out in:

- National Planning Policy Framework – December 2024

Paragraph 161 states;

'The planning system should support the transition to net zero by 2050 and take full account of all climate impacts including overheating, water scarcity, storm and flood risks and coastal change. It should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure.'

Local Policy

The local planning policy is provided by the **Horsham District Planning Framework**, which was adopted in November 2015.

The following policies are relevant to this Statement and may have been edited for clarity and specific relevance.

Policy 35

Strategic Policy: Climate Change

Development will be supported where it makes a clear contribution to mitigating and adapting to the impacts of climate change and to meeting the district's carbon reduction targets as set out in the Council's Acting Together on Climate Change Strategy, 2009.
Measures, which should be used to mitigate the effects of climate change include;

1. *Reduced energy use in construction;*
2. *Improved energy efficiency in new developments, including influencing the behaviour of occupants to reduce energy use;*
3. *The use of decentralised, renewable and low carbon energy supply systems;*
4. *The use of patterns of development which reduce the need to travel, encourage walking and cycling and include good accessibility to public transport and other forms of sustainable transport; and*
5. *Measures, which reduce the amount of biodegradable waste sent to landfill.*

Development must be designed so that it can adapt to the impacts of climate change, reducing vulnerability, particularly in terms of flood risk, water supply and changes to the district's landscape. Developments should adapt to climate change using the following measures:

1. *Provision of appropriate flood storage capacity in new building development;*
2. *Use of green infrastructure and dual use SuDS to help absorb heat, reduce surface water runoff, provide flood storage capacity and assist habitat migration;*
3. *Use of measures, which promote the conservation of water and/or grey water recycling;*
4. *Use of site layout, design measures and construction techniques that provide resilience to climate change (opportunities for natural ventilation and solar gain).*

If it is not possible to incorporate the adaption and mitigation measures proposed, an explanation should be provided as to why this is the case.

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*

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.

Policy 37

Sustainable Construction

Proposals must seek to improve the sustainability of development. To deliver sustainable design, development should incorporate the following measures where appropriate according to the type of development and location:

1. *Maximise energy efficiency and integrate the use of decentralised, renewable and low carbon energy;*
2. *Limit water use to 110 litres/person/day;*
3. *Use design measures to minimise vulnerability to flooding and heatwave events;*
4. *Be designed to encourage the use of natural lighting and ventilation;*
5. *Be designed to encourage walking, cycling, cycle storage and accessibility to sustainable forms of transport;*
6. *Minimise construction and demolition waste and utilise recycled and low-impact materials;*
7. *Be flexible to allow future modification of use or layout, facilitating future adaptation, refurbishment and retrofitting;*
8. *Incorporate measures, which enhance the biodiversity value of development.*

All new development will be required to provide satisfactory arrangements for the storage of refuse and recyclable materials as an integral part of design.

Note: The Deregulation Act of 2015 withdrew the Code for Sustainable Homes and compliance with the scheme is no longer applicable.

The Council are in the process of preparing their new Local Plan and have published the **Horsham District Local Plan 2023-2040 Regulation 19** (January 2024).

The emerging policies include:

Strategic Policy 6: Climate Change - Carbon Reduction

1. *Development proposals will only be supported where they include measures which contribute to achieving net zero carbon emissions across the District by 2050 at the latest. The Council will be supportive of a range of measures to achieve this target, including but not limited to:*
   a) *Design which incorporates high standards of energy efficiency including optimal levels of thermal insulation, ventilation and cooling and passive solar design;*
   b) *The use of renewable and low carbon energy supply systems and connection to renewable and low carbon heat networks;*
   c) *The efficient use of natural resources used in new buildings to reduce the environmental impacts of construction;*
   d) *Design that influences the behaviour of occupants to reduce energy use;*
   e) *Using patterns of development and providing sustainable transport infrastructure which reduce the need to travel, encourage walking and cycling and include good accessibility to public transport and other forms of sustainable transport and ensure residents have access to services and facilities that are within walking distance;*
   f) *Reduce whole life carbon emissions by retaining and reusing existing buildings, components or materials, including on-site where possible.*

Climate Change Adaptation

2. *Development will only be supported if it includes site and building level measures to adapt to the future impacts of climate change and reduce vulnerability, particularly in terms of the comfort, health and wellbeing of current and future occupiers. Flood risk, water supply, overheating and changes to the District's landscape should also be considered. Measures should include but are not limited to:*
   a) *Use of site and interior building layout: new buildings should be orientated to maximise the opportunities for both natural heating and ventilation and to reduce the exposure to wind and other elements, and the potential for overheating;*
   b) *The conservation of water supplies to minimise the risk and impact of drought and flooding;*
   c) *The use of green/blue infrastructure and dual use Sustainable Drainage Systems (SuDS) to provide multifunctional benefits such as helping to absorb heat, reduce surface water runoff, provide flood storage capacity and assist habitat migration; and*
   d) *Moderating external temperatures through the use of green walls and roofs, tree planting or other nature-based solutions and landscaping for shade and drainage design.*

3. *Development will be supported providing it avoids responses to climate impacts which lead to increases in energy use and carbon dioxide emissions. In considering the likely impact of climate change over the lifetime of the development reference should be made to the most recent climate change projections.*

Sustainability Statement

4. *Development will be supported provided a Sustainability Statement is submitted which demonstrates how the development has taken measures to mitigate and adapt to the effects of climate change.*

Strategic Policy 7: Appropriate Energy Use

Energy Hierarchy

1. *Development will be supported provided that it contributes to clean, efficient energy in Horsham based on the following cascade:*
   a) ***Be Lean** – use less energy – for example, by minimising energy demand through energy efficiency measures such as fabric performance and passive design;*
   b) ***Be Clean** – supply energy efficiently and exploit local energy resources such as secondary heat and district energy networks where available. Preference must be given to technologies with greater efficiencies and fuels with lower carbon emissions to achieve the highest total lifecycle carbon emission savings, in accordance with Part 2 of this policy;*
   c) ***Be Green** – maximise the use of renewable energy sources.*
   d) ***Be Seen –** monitor, verify and report on energy performance.*

Zero and Low Carbon Heating

2. *Development proposals must demonstrate how they will provide zero and low carbon heating in accordance with the following hierarchy. Evidence must be provided that opportunities to meet each level of the hierarchy have been exhausted before cascading to the next level:*
   a) *Connect to local existing or planned heat networks*, in combination with on-site renewable energy generation;*
   b) *Maximise use of on-site renewable energy generation;*
   c) *Use of the optimum means of low or zero-carbon heat supply is demonstrated, based on the in order of preference below:*
      i. Use of waste heat sources;
      *ii. Electrically-driven ground, water or air source heat pumps;***
      *iii. Direct Electric Heating. ***

Energy Statements

3. *Residential or commercial development will be supported provided that it includes an Energy Statement, (which may be incorporated into the Sustainability Statement), demonstrating how compliance with this policy has been achieved.*

Renewable Energy Schemes

4. *Stand-alone renewable energy schemes will be supported where they do not conflict with other policies in this Plan. Renewable and low carbon energy generation developments that are led by, or meet the needs of, local communities will carry significant weight.*

**Where a local heat network is planned but not yet in existence or connection is not currently viable, but may become viable in the future, the development should be designed to allow for the cost-effective connection and supply at a later date. In this case the heat should be supplied according to steps 2b and 2c of the above hierarchy.*

***Electric heat pumps and direct electric heating are assumed to become zero-carbon when the national grid decarbonises.*

Strategic Policy 8: Sustainable Design and Construction

1. *Development will be supported where it is demonstrated that sustainable design, including its construction and operation, is integrated into the development from the design stage onwards. To deliver sustainable design, development will only be supported where it meets all of the following requirements that are relevant:*
   a) *New-build homes to deliver, as a minimum, carbon emissions reduction as set out in the 2021 Edition (or any future update) of the 2010 Building Regulations (Part L);*
   b) *New non-domestic buildings to achieve a BREEAM rating of 'Excellent', unless it can be demonstrated that this would make the scheme unviable;*
   c) *Incorporate a Fabric First Approach, maximising the performance of the components and materials that form the building fabric itself, before consideration of the use of mechanical or electrical building service systems;*
   d) *Minimise construction and demolition waste, utilise recycled and low-impact materials and incorporate measures that reduce the amount of biodegradable waste sent to landfill;*
   e) *Be designed flexibly to enable future modification of use or layout, facilitating future adaption, refurbishment and retrofitting;*
   f) *Include the provision of gigabit capable broadband access and enable provision of future communication technologies.*
2. *Where permission is required to retrofit energy efficiency measures into existing development, schemes will be supported in principle.*
3. *Development that involves the retrofitting of an existing historic building (heritage asset) will be supported provided that the following criteria are met:*
   a) *It does not result in detriment to the significance of the asset or damage to its fabric;*
   b) *A whole building approach to improving energy efficiency is taken as advocated by Historic England;*
   c) *Micro-renewable technologies do not result in harm to the heritage asset or their setting;*
   d) *Where the proposal involves major development, it is demonstrated that opportunities for the retention and retrofitting of existing historic buildings within the site boundary have been included within the scheme.*
4. *In order to demonstrate compliance, proposals should be accompanied by a Sustainability Statement to demonstrate how these measures will be incorporated into development design.*

3.0 Assessment Methodology and Targets

3.1 Methodology

The energy strategy uses a number of SAP calculations that have been prepared for homes on other developments, which are similar to those assumed in scale, design and specification.

The results have been aggregated across similar unit types using the indicative accommodation schedule in order to estimate the total site emissions and allow different low-carbon and renewable technologies to be tested.

Emission Factors

The CO_2 emission factors, where applicable, used throughout this report have been taken from the Building Regulation Approved Document L - 2021.

	kg CO_2/kWh
Natural gas	0.210
Grid supplied and displaced electricity	0.136

3.2 Targets

The following targets have been crafted to enable compliance with current Building Regulations as well as National and Local planning policy.

Description of Target	Target/Scope
Climate Change	
Ensure that peak run off rates are no greater for the developed site than it was for the pre-development site.	Whole Site
In appropriate areas the use of porous surfaces and minimal hard ground surfaces will be implemented. All additional surface water generated will be attenuated and treated using SuDS prior to discharge.	Whole Site

Details are provided in the Flood Risk Assessment and Drainage Strategy, which accompanies the application.

Description of Target	Target/ Scope
Community	
All new units will be built in accordance with Part M4(1) of the Building Regulations.	All dwellings
Secured by Design principles will be followed. This will involve consultation with the Architectural Liaison Officer/ Crime Prevention Officer at the detailed design stage.	Whole Site

Description of Target	Target/ Scope
Transport and Movement	
Information will be provided in Home Owners Guide, giving details of frequency and location of public transport services.	Whole site
All dwellings will be provided with cycle storage.	Whole Site
All dwellings will be provided with access to an EV charging point.	Whole Site
A Travel Plan will be developed which will be used to promote and encourage sustainable and active forms of transport.	Whole Site

Details are provided in the Transport Assessment, which accompanies the application.

Description of Target	Target/ Scope
Ecology and Landscaping	
Any significant ecological features shall be retained and protected in line with the requirements of BS5837.	Whole site
A suitably qualified ecologist has been appointed to provide recommendations for ecological enhancement and these will be included in the landscaping design.	Whole site
A suitably qualified ecologist will be appointed to confirm that applicable legislation is being followed and to prepare a long-term management plan for the site.	Whole site
The overall level of biodiversity within the boundaries of the project shall be greater after the project is completed than was assessed by the ecologist before the project commenced. A Biodiversity Net Gain calculation has been carried out and concludes the increase in habitat units will be 18.36% and the increase in watercourse units will be 10.62%.	Whole site

Details are provided in the Ecology Assessment, which accompanies the application.

Description of Target	Target/ Scope
Resources	
All materials in new buildings will be A+, A or B rated according to The Green Guide to Specification, unless deemed impractical or otherwise prescribed.	Whole Site
All timber for basic elements will be obtained from appropriately certified legal sources. In addition, 80% of building element timber will be procured from sustainably certified forests.	Whole Site
All kitchens will be fitted with internal recycling bins and dedicated external space (s) will be provided for recyclable storage accessible to all potential users.	Whole Site

Description of Target	Target/ Scope
Buildings	
Carbon dioxide emissions will be reduced by at least 71% to all homes through energy efficiency, low-carbon and renewable technologies.	All dwellings
All heating will be provided by renewable technologies and there will be no NO_x or CO_2 emissions from the site. All homes will be net zero carbon ready (when the National Grid decarbonises).	All dwellings
Photovoltaic panels will be installed to all units, The precise quantity will be determined at the detailed drawing stage.	All dwellings
EU Labelling Information for white goods will be provided to all dwellings and where white goods are to be provided, they will be energy and water efficient.	All dwellings
100% of domestic fixed internal lighting is to be energy efficient.	All dwellings
The completed building fabric is to achieve air leakage rates of no greater than 4.0 $m^3/hr/m^2$ for the homes.	4.0 $m^3/hr/m^2$ for all dwellings
Sanitary fittings will be selected that minimise the consumption of mains water and all dwellings will achieve a water efficiency target of 84.45 l/p/d.	All dwellings to use 84.45 l/p/d

Description of Target	Target/ Scope
Construction Process and Site Management	
Waste arising from site will be monitored and segregated into at least five waste streams for recycling throughout the construction period.	Construction Site
All temporary timber (site hoardings, formwork, and scaffold boards) will be from FSC, CSA, SFI or PEFC sources, or re-used timber.	Construction Site

4.0 Proposal

The planning application seeks outline consent and detailed design has not been completed for the unit types.

However, for the purposes for this Statement it has been assumed that the dwellings will be comprised of 1 and 2-bedroom apartments and 2, 3 and 4-bedroom terraced, semi-detached and detached houses.

The energy strategy has been based upon the following indicative mix of accommodation:

Unit Type	Number	Area	Area
		m^2	m^2
1-Bedroom Apartments	4	50.0	200.0
1-Bedroom Maisonette apartments	2	50.0	100.0
2-Bedroom Apartments	4	70.0	280.0
2-Bedroom Mid-terrace houses	2	79.0	158.0
2-Bedroom End-terrace/Semi-detached houses	10	79.0	790.0
3-Bedroom Semi-detached houses	13	93.0	1,209.0
3-Bedroom Semi-detached house	1	106.0	106.0
4-Bedroom Detached houses	8	139.4	1,115.2
4-Bedroom Detached houses	1	167.2	167.2
Total	**45**		**4,125.4**

5.0 Energy Efficiency

5.1 Demand Reduction (Be Lean and Be Clean)

Design

The energy performance of a building is affected by its design, construction and use and whilst occupant behaviour is beyond the remit of this statement, better design and construction methods can significantly reduce the life cycle emissions of a building and assist the occupant to reduce consumption.

Sustainable design is not just about incorporating renewable technologies; buildings should be designed at the outset to provide suitable environmental conditions for the occupants whilst also consuming as little energy as practical.

Passive Design Measures

The passive design measures proposed include:

(i) Passive Solar Gain

Passive measures include allowing for natural ventilation and exposed thermal mass coupled with high levels of insulation, air tightness and the control of solar gain.

The application is for outline consent and the arrangement of the dwellings has not yet been determined.

However, the Indicative Site Plan seeks to set out the majority of homes with either a south southwest/north northeast or west northwest/east southeast orientation. The design will seek to minimise the number of homes with a solely northerly aspect and maximise the homes with an orientation from southwest through to southeast.

(ii) Natural Daylighting

Whilst the building specifications have yet to be agreed, the design of the site will seek to maximise the standard of natural daylighting to all units. This will create a high-quality internal environment, which will reduce the need for artificial lighting.

(iii) Efficient Building Fabric

a. Building Envelope

U-values of the building envelope must meet Building Regulations Part L (2021) standards and further improvements to U-values will reduce the building's heating requirements.

The construction type is currently unknown but the development is equally suited to a traditional load bearing brick and block construction or a timber-framed or other system build technique.

For the purposes of this Statement the following U-values have been assumed for the building elements as the maximum:

Element	Part L Limiting U-values	Proposed U-values	Proposed Improvement
	W/m²K	W/m²K	
Ground Floors	**0.18**	**0.13**	**28%**
External Walls	**0.26**	**0.18**	**31%**
Roofs (cold)	**0.16**	**0.10**	**38%**
Flat Roofs, Sloping Roofs & Dormers	**0.16**	**0.15**	**6%**
Windows, Glazed Doors and Roof Windows	**1.60**	**1.40**	**13%**
External Doors	**1.60**	**1.20**	**25%**

'g' Value for Glazing	**0.50**

b. Air Leakage

Large amounts of heat are lost in winter through air leakage from a building (also referred to as infiltration or air permeability) often through poor sealing of joints and openings in the building.

The Building Regulations set a minimum standard for air permeability of 8 m^3 of air per hour per m^2 of envelope area, at 50Pa. The SAP modelling has been based on achieving a 50% improvement over Building Regulations and will target a permeability of 4.0 $m^3/hr/m^2$ for the homes.

c. Thermal Bridging

The significance of Thermal Bridging, as a potentially major source of fabric heat losses, is increasingly understood. Improving the U-values for the main building fabric without accurately addressing the Thermal Bridging is no longer an option and will not achieve the fabric energy efficiency and energy and CO_2 reduction targets set out in this strategy.

The thermal details for the buildings will be modelled at the detailed working drawing stage but for the purposes of this assessment the thermal details formulated by the Recognised Construction Details (RCDs) have been used. Any details not available on the RCD website will be modelled. These will enable the buildings to achieve the higher energy efficiency requirements of the Building Regulations.

The following table provides the values currently used within the modelled SAP calculations.

Reference	Location	PSI Value
		W/mK
E2	Other Lintels (including other steel lintels)	0.028
E3	Sill	0.024
E4	Jamb	0.019
E5	Ground Floor (Normal)	0.046
E6	Intermediate Floor	0.000
E7	Party Floor	0.036
E10	Eaves (Ceiling)	0.051
E12	Gable (Ceiling)	0.029
E16	Corner (normal)	0.037
E17	Corner (inverted)	-0.079
E18	Party Wall	0.041

d. Ventilation

As a result of increasing thermal efficiency and air tightness, Building Regulations Approved Document F was also revised in 2021 to address the possibility of overheating and poor air quality. The ventilation to the en-Suites and bathrooms will be comprised of continuous extract ventilation as per System 3 criteria. This will reduce the number of external penetrations required to the building envelope.

Active Design Measures will include;

(i) **Efficient Lighting and Controls**

Throughout the scheme natural lighting will be optimised.

Part L of the Building Regulations requires all light fitting to have lamps with a minimum luminous efficacy of 80 light source lumens per circuit-watt. It is assumed this standard will be achieved.

(ii) **Space Heating and Hot Water**

The SAP modelling has been based upon the installation of exhaust air heat pumps to the apartments (including Maisonettes) and air source heat pumps to the houses.

5.2 Low-Carbon and Renewable Technologies (Be Clean and Be Green)

The carbon dioxide emissions established above have been used to test the viability of various renewable and low-carbon technologies as follows.

The Government's Renewable Obligation defines renewable energy in the UK. The identified technologies are;

- Small hydro-electric
- Landfill and sewage gas
- Onshore and offshore wind
- Biomass
- Tidal and wave power
- Geothermal power
- Solar

The use of landfill or sewage gas, offshore wind or any form of hydroelectric power is not suitable for the site due to its location. The remaining technologies are considered below;

Wind

Wind turbines are available in various sizes from large rotors able to supply whole communities to small roof or wall-mounted units for individual dwellings.

The Government wind speed database predicts local wind speeds at Shoreham Road to be 4.5 m/s at 10m above ground level and 5.3 m/s at 25m above ground level. This is below the level generally required for commercial investment in large wind turbines. In addition the land take, potential for noise and signal interference make a large wind turbine unsuitable for this development.

Roof mounted turbines could be used at the development to generate small but valuable amounts of renewable electricity but the small output and contribution to total emissions means any investment would be small and purely tokenism. The use of wind turbines will also have a detrimental aesthetic impact on the appearance of the development.

The use of wind turbines is not proposed.

Combined Heat and Power and Community Heating

Combined heat and power (CHP) also called co-generation is a de-centralised method of producing electricity from a fuel and 'capturing' the heat generated for use in buildings. The plant is essentially a small-scale electrical power station. The production and transportation of electricity via the National Grid is very inefficient with over 65% of the energy produced at the power station being lost to the atmosphere and through transportation.

CHP units are generally gas fuelled and generate electricity with heat being a by-product. The heat is usually used to meet the hot water load, which is fairly consistent throughout the year.

Historically CO_2 savings have been achieved because gas has been used to generate electricity and gas has had a lower emissions factor than electricity, However, with the de-carbonisation of the electricity grid the benefit of CHP is negated.

CHP is not proposed.

Ground Source Heat Pumps

Sub soil temperatures are reasonably constant and predictable in the UK, providing a store of the sun's energy throughout the year. Below London the groundwater in the lower London aquifer is at a fairly constant temperature of 12º C. Ground source heat pumps (GSHP) extract this low-grade heat and convert it to usable heat for space heating.

GSHP operates on a similar principle to refrigerators, transferring heat from a cool place to a warmer place. They operate most efficiently when providing space heating at a low temperature, typically via under floor heating or with low temperature radiators.

The houses have insufficient ground area to sustain a horizontal collection system and the installations would require a bore hole to each. This would be cost prohibitive and therefore the use of ground source heat pumps is not proposed. The installation of GSHP to apartment applications is not appropriate.

Solar

(i) Solar Water Heating

Solar hot water panels use the suns energy to directly heat water circulating through panels or pipes. The technology is simple and easily understood by purchasers.

Solar hot water heating panels are based generally around two types, which are available being 'flat plate collectors' and 'evacuated tubes'. Flat plate collectors can achieve an output of up to 1,124 kWh/annum (Schuco) and evacuated tubes can achieve outputs up to 1,365 kWh/annum (Riomay).

Panels are traditionally roof mounted and for highest efficiencies should be mounted plus or minus 30 degrees of due south. Evacuated tubes can be laid horizontally on flat roofs but flat plate collectors are recommended for installation at an incline of 30 degrees.

The installation of exhaust air heat pumps and air source heat pumps reduces the emissions significantly and the installation of solar hot water heating panels would only increase the emissions reduction by a further 5-7%. Solar hot water panels could be used to reduce emissions but the incremental increase in reductions does not represent good value when compared with other technologies.

Solar hot water heating panels are not proposed.

(ii) Photovoltaics

Photovoltaic panels (PV) provide clean silent electricity. They generate electricity during most daylight conditions although they are most efficient when exposed to direct sunlight or are orientated to face plus or minus 30 degrees of due south.

PV panels can be integrated into many different aspects of a development including roofs, walls, shading devices or architectural panels. The panels typically have an electrical warranty of 20-25 years and an expected system lifespan of 25-40 years.

The design of the homes is not part of the planning application and therefore the capacity to sustain photovoltaic is currently unknown. However, photovoltaic panels are technically considered an appropriate technology and it is assumed the detailed site layout will be designed to allow all units to be fitted with photovoltaic panels. The attached SAP calculations have assumed the following installations on roofs orientated towards the southwest and inclined at 30 degrees:

	Assumed Photovoltaic Array
1-Bedroom Ground-floor apartment @ 50.0 m^2	1.50 kW
2-Bedroom Top-floor apartment @ 70.0 m^2	2.00 kW
2-Bedroom End-terrace @ 79.0 m^2	2.50 kW
3-Bedroom Semi-detached @ 93.0 m^2	3.00 kW
4-Bedroom Detached house @ 139.0 m^2	3.00 kW

Air Source Heat Pumps (ASHP)

Air sourced heat pumps operate using the same reverse refrigeration cycle as ground source heat pumps; however, the initial heat energy is extracted from the external air rather than the ground.

The system works by transferring heat absorbed from the outside air to an indoor space using a wet central heating system to heat radiators or underfloor heating and provide domestic hot water. Heat pumps work similarly to a refrigerator in that they absorb heat and transfer it to another medium.

ASHPs use electricity and through a condenser/ evaporator system put out somewhere between 3.0 and 3.3 times as much energy as they require to run. ASHPs work well with low temperature systems.

The SAP modelling has been based on the installation of exhaust air heat pumps into the apartments (including the two maisonettes) and air source heat pumps to the houses.

5.3 Establishing Carbon Dioxide Emissions

The following is based on the assumed accommodation schedule set out in 4.0 above.

SAP calculations have been prepared for units of a similar scale, design and specification in order to provide an accurate estimate of the total site emissions.

There are four, 1-bedroom apartments with a floor area of 50.0 m^2 and for the purposes of this assessment the emissions are assumed to be similar. SAP calculations have been used for a 1-bedroom ground-floor apartment at 50.0 m^2, which are proposed as representative of all 1-bedroom units. There are two, 1-bedroom maisonettes and for the purposes of this assessment their emissions are assumed to be similar to the modelled ground-floor apartment.

There are four, 2-bedroom apartments with a floor area of 70.0 m^2 and for the purposes of this assessment the emissions are assumed to be similar. SAP calculations have been used for a 2-bedroom top-floor apartment at 70.0 m^2, which are proposed as representative of all 2-bedroom units.

There are 12 houses at 79.0 m^2 with 10 no. assumed as end-terrace/semi-detached units and two units as mid-terrace units. SAP calculations have been used for a 2-bedroom end-terrace house at 79.0 m^2, which are proposed as representative of all 2-bedroom houses. The emissions from the two mid-terrace units are assumed to be similar to an end-terrace unit.

SAP calculations have been used for a 3-bedroom semi-detached house at 93.0 m^2, which are proposed as representative of all 13 no. semi-detached houses of this floor area and also for the single semi-detached unit at 106.0 m^2.

SAP calculations have been prepared for a detached unit at 139.0 m^2, which are proposed as representative of all the detached houses including the single detached unit at 167.2 m^2.

The Summary SAP Reports for the modelling units are attached as Appendix 1 but the TER and DER emissions can be summarised as follows;

	CO_2 TER	CO_2 DER
	kg CO_2 /m^2/yr	kg CO_2 /m^2/yr
1-Bedroom Ground-floor apartment @ 50.0 m^2	11.21	2.30
2-Bedroom Top-floor apartment @ 70.0 m^2	10.12	1.93
2-Bedroom End-terrace @ 79.0 m^2	11.69	3.37
3-Bedroom Semi-detached @ 93.0 m^2	10.38	3.02
4-Bedroom Detached house @ 139.0 m^2	8.93	2.92

Summary

Using the above results, the emissions can be aggregated across similar unit types to arrive at the total site emissions. The total emissions can be calculated as follows;

	Area	CO_2 TER	CO_2 DER
	m^2	kg/yr	kg/yr
1-Bedroom Apartments (inc. Maisonettes) (50.0 m^2)	300.0	3,363	690
2-Bed Apartments (70.0 m^2)	280.0	2,834	540
2-Bedroom Terrace houses (79.0 m^2)	948.0	11,082	3,195
3-Bedroom Semi-detached houses (93.0 & 106.0m^2)	1,315.0	13,650	3,971
4-Bedroom Detached houses (139.4 & 167.2 m^2)	1,282.4	11,452	3,745
Totals	**4,125.4**	**42,381**	**12,141**

The total emissions allowable through the Building Regulations (TER) are calculated as:

- **42,381 kg CO_2 per year**

With total actual site emissions (DER) assessed as:

- **12,141 kg CO_2 per year**

The site carbon dioxide emissions are reduced by 30,240 kg CO_2 per year as a result of the energy efficiency measures and renewable technologies, which equates to a reduction of 71.35% of the TER emissions and therefore meets the expected requirements of the Future Homes Standard.

5.4 Summary of Calculations and Proposals for Low-carbon and Renewable Technologies

The application seeks outline consent for the construction of 45 dwellings. The design and orientation of the units does not form part of the application and therefore the following analysis has to be considered in this context.

It is proposed to achieve the Future Homes Standard (FHS) for the homes. This is proposed as a 75-80% improvement upon Part L 2013, which equates to a 64-71% improvement upon Part L 2021.

SAP calculations, which have been prepared for homes of a similar scale and design and built to a similar specification homes on other developments have been used to estimate the emissions from this site. The results from the calculations have been aggregated across similar unit types to provide an assessment of the total site emissions. The SAP calculations have been based on Part L 2021.

Various technologies have been considered above and whilst wind turbines, combined heat and power, ground source heat pumps and solar hot water heating panels are not considered appropriate the use of photovoltaic panels and air source heat pumps are considered feasible.

Be Lean

The construction standards for the fabric of the buildings proposes U-values, which demonstrate good practice and improve upon those required by the Building Regulations. Air tightness standards are targeted at a 50% improvement upon the minimum required by the Building Regulations. In addition, it is proposed to install energy efficiency mechanical and electrical services.

Be Clean and Be Green

The specification has been formulated to achieve the FHS for the homes. This includes best practice standards for fabric specification of the homes, the installation of exhaust air heat pumps to the apartments and maisonettes and air source heat pumps to the houses and photovoltaic panels to all homes. The site layout is not yet fixed but it assumed that the site will be designed to allow photovoltaic panels to be installed to all units. The total emissions from the site based upon the maximum permissible by the Building Regulations (TER) are calculated as **42,381 kg CO_2 per year**, with actual (DER) emissions after energy efficiency measures and the installation of renewable technologies of **12,141 kg CO_2 per year**.

The emissions are reduced by a total of **30,240 kg CO_2 per year**, which equates to a reduction of **71.35%.**

All space heating and hot water will be provided to the homes from renewable technologies. All systems to the homes are fuelled by mains electricity and therefore as the National Grid decarbonises so the homes will become zero carbon. The homes are zero carbon ready.

There will be no mains gas connection to the site and there will be no on-site NOx or CO_2 emissions.

The proposal meets the requirements of the adopted policy and the emerging policy.

6.0 Climate change adaption and Water resources

A (separate) Water Neutrality Statement has been prepared and accompanies the application. The following therefore just provides an overview of the site conditions and initiatives to be proposed.

Sustainable Drainage Systems (SUDS)

The site lies within Flood Zone 1 and the risk of flooding is regarded as low. Further details of the flood risk and the proposals for the disposal of surface water is presented within the Flood Risk Assessment and Drainage Strategy, which accompanies the application.

Surface Water Management

Consideration has been given to the use of grey water recycling. However, customer's resistance to the appearance of the recycled water and the cost of the systems does not currently make them a viable option. They have therefore not been included in the proposals.

Water efficiency measures

In excess of 20% of the UK's water is used domestically with over 50% of this used for flushing WCs and washing (source: Environment Agency). The majority of this comes from drinking quality standard or potable water.

The water efficiency measures included will ensure that the water use target of 84.45 litres per person per day is achieved.

Water efficient devices have been evaluated and will be installed. The specification of such devices will be considered at detailed design stage and each will be subject to an evaluation based on technical performance, cost and market appeal, together with compliance with the water use regulations.

The following devices will be incorporated within the apartments and houses:

- water efficient taps;
- water efficient toilets;
- low output showers;
- flow restrictors to manage water pressures to achieve optimum levels and
- water meters.

7.0 Materials and Waste

The BRE Green Guide to Specification is a simple guide for design professionals. The guide provides environmental impact, cost and replacement interval information for a wide range of commonly used building specifications over a notional 60-year building life. The construction specification will prioritise materials within ratings A+, A or B.

Preference will be given to the use of local materials & suppliers where viable to reduce the transport distances and to support the local economy. A full evaluation of these suppliers will be undertaken at the next stage of design.

In addition, timber would be sourced, where practical, certified by PEFC or an equivalent approved certification body and all site timber used within the construction process would be recycled.

All insulation materials to will have a zero ozone depleting potential

Construction waste

Targets will be set to promote resource efficiency in accordance with guidance from WRAP, Envirowise, BRE and DEFRA.

The overarching principle of waste management is that waste should be treated or disposed of within the region where it is produced.

Construction operations generate waste materials as a result of general handling losses and surpluses. These wastes can be reduced through appropriate selection of the construction method, good site management practices and spotting opportunities to avoid creating unnecessary waste.

The Construction Strategy will explore these issues, some of which are set out below:

- Proper handling and storage of all materials to avoid damage.
- Efficient purchasing arrangements to minimise over ordering.
- Segregation of construction waste to maximise potential for reuse/recycling.
- Suppliers who collect and reuse/recycle packaging materials.

Appendix 1 – Summary SAP Reports for the Modelled Units

Summary for Input Data

elmhurst energy

Property Reference	Small Dole 1BF GND 50	**Issued on Date**	08/04/2025
Assessment Reference	Small Dole 1BF GND 50	**Prop Type Ref**	Small Dole 1BF GND 50
Property	Land at, Shoreham Road, Small Dole, West Sussex, BN5 9YQ		

SAP Rating	93 A	**DER**	2.30	**TER**	11.21
Environmental	98 A	**% DER < TER**			79.48
CO_2 Emissions (t/year)	0.1	**DFEE**	17.80	**TFEE**	18.08
Compliance Check	See BREL	**% DFEE < TFEE**			1.56
% DPER < TPER	60.34	**DPER**	23.52	**TPER**	59.30

Assessor Details	Mr. Ivan Ball	**Assessor ID**	DE88-0001
Client			

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

Orientation	Southeast	
Property Tenture	2	
Transaction Type	8	
Terrain Type	Suburban	
1.0 Property Type	Flat, Mid-Terrace	
Position of Flat	Ground-floor flat	
Which Floor	1	
2.0 Number of Storeys	1	
3.0 Date Built	2024	
4.0 Sheltered Sides	2	
5.0 Sunlight/Shade	Average or unknown	
6.0 Thermal Mass Parameter	Enter TMP value	
Thermal Mass	250.00	kJ/m²K
7.0 Electricity Tariff	Standard	
Smart electricity meter fitted	No	
Smart gas meter fitted	No	

7.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground floor:	6.93 m	50.00 m²	2.40 m

8.0 Living Area	23.23	m²

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	Cavity Wall	Cavity wall : plasterboard on dabs, dense block, filled cavity, any outside structure	0.18		16.63	11.56	0.00	None	5.07	Enter Gross Area

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)	Shelter Res	Shelter
Party Wall	Filled Cavity with Edge Sealing	Plasterboard on dabs mounted on cement render on both sides, AAC blocks, cavity	0.00		51.29		None

10.1 Party Ceilings

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Party Ceiling	Precast concrete plank floor (screed laid on rubber), carpeted	30.00	50.00

11.0 Heat Loss Floors

Description	Type	Storey Index	Construction	U-Value (W/m²K)	Shelter Code	Shelter Factor	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Solid	Lowest occupied	Suspended concrete floor, carpeted	0.13	None	0.00	75.00	50.00

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Windows & Glazed Doors	Manufacturer	Window	Double Low-E Soft 0.05			0.50		0.70	1.40

13.0 Openings

Summary for Input Data

elmhurst energy

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
Kitchen/Living/Dining	Windows & Glazed Doors	External Wall	South East	3.15	
Bedroom	Windows & Glazed Doors	External Wall	South East	1.92	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	

17.0 Thermal Bridging	Calculate Bridges	

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	2.70	0.03	0.03	No
E3 Sill	Non Gov Approved Schemes	1.20	0.02	0.02	No
E4 Jamb	Non Gov Approved Schemes	7.40	0.02	0.02	No
E5 Ground floor (normal)	Non Gov Approved Schemes	6.93	0.05	0.05	No
E18 Party wall between dwellings	Non Gov Approved Schemes	4.80	0.04	0.04	No

Y-value	0.01	W/m²K

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	1	
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	m³/(h.m²) @ 50 Pa
Test Method	Blower Door	
22.0 Lighting		
No Fixed Lighting	No	

Name	Efficacy	Power	Capacity	Count
Lighting	80.00	5.00	400.00	24

24.0 Main Heating 1	Database	
Percentage of Heat	100.00	%
Database Ref. No.	100392	
Fuel Type	Electricity	
In Winter	255.16	
In Summer	205.88	
Model Name	Fighter 470	
Manufacturer	NIBE Energy Systems Ltd	
System Type	Heat Pump	
Controls SAP Code	2208	
Is MHS Pumped	Pump in heated space	
Heating Pump Age	2013 or later	
Heat Emitter	Radiators	
Flow Temperature	Enter value	
Flow Temperature Value	45.00	

Summary for Input Data

elmhurst energy

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	Yes	
Cold Water Source	From mains	
Bath Count	1	
Immersion Only Heating Hot Water	No	
28.3 Waste Water Heat Recovery System		
29.0 Hot Water Cylinder	Internal Store	
Insulation Type	Measured Loss	
Cylinder Volume	170.00	L
Loss	1.56	kWh/day
In Airing Cupboard	No	
32.0 Photovoltaic Unit	One Dwelling	
Export Capable Meter?	No	
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
1.50	South West	30°	Modest		No	0.80		

34.0 Small-scale Hydro	None

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

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
			0	0
			0	0
			0	0

Summary for Input Data

elmhurst energy

Property Reference	Small Dole 2BF TOP 70	**Issued on Date**	08/04/2025
Assessment Reference	Small Dole 2BF TOP 70	**Prop Type Ref**	Small Dole 2BF TOP 70
Property	Land at, Shoreham Road, Small Dole, West Sussex, BN5 9YQ		

SAP Rating	93 A	**DER**	1.93	**TER**	10.12
Environmental	99 A	**% DER < TER**			80.93
CO_2 Emissions (t/year)	0.1	**DFEE**	22.69	**TFEE**	22.58
Compliance Check	See BREL	**% DFEE < TFEE**			-0.51
% DPER < TPER	63.11	**DPER**	19.53	**TPER**	52.93

Assessor Details	Mr. Ivan Ball	**Assessor ID**	DE88-0001
Client			

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

Orientation	Northeast	
Property Tenture	2	
Transaction Type	8	
Terrain Type	Suburban	
1.0 Property Type	Flat, End-Terrace	
Position of Flat	Top-floor flat	
Which Floor	3	
2.0 Number of Storeys	1	
3.0 Date Built	2024	
4.0 Sheltered Sides	2	
5.0 Sunlight/Shade	Average or unknown	
6.0 Thermal Mass Parameter	Enter TMP value	
Thermal Mass	250.00	kJ/m²K
7.0 Electricity Tariff	Standard	
Smart electricity meter fitted	No	
Smart gas meter fitted	No	

7.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground floor:	17.03 m	70.00 m²	2.40 m

8.0 Living Area	31.00	m²

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	Cavity Wall	Cavity wall : plasterboard on dabs, dense block, filled cavity, any outside structure	0.18		40.87	28.81	0.00	None	12.06	Enter Gross Area

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)	Shelter Res	Shelter
Party Wall	Filled Cavity with Edge Sealing	Plasterboard on dabs mounted on cement render on both sides, AAC blocks, cavity	0.00		40.87		None

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
Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.10	9.00	71.00	71.00	None	0.00	Enter Gross Area	0.00

11.1 Party Floors

Description	Storey Index	Construction	Kappa (kJ/m²K)	Area (m²)
Party Floor	Lowest occupied	Precast concrete plank floor (screed laid on rubber), carpeted	30.00	71.00

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)

Summary for Input Data

elmhurst energy

Windows & Glazed Doors	Manufacturer	Window	Double Low-E Soft 0.05	0.50	0.70	1.40

13.0 Openings

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
Kitchen/Dining	Windows & Glazed Doors	External Wall	South West	1.92	
Living	Windows & Glazed Doors	External Wall	South West	3.15	
Living	Windows & Glazed Doors	External Wall	South East	3.15	
Bedroom 1 & 2	Windows & Glazed Doors	External Wall	South East	3.84	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	
17.0 Thermal Bridging	Calculate Bridges	

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	6.60	0.03	0.03	No
E3 Sill	Non Gov Approved Schemes	3.60	0.02	0.02	No
E4 Jamb	Non Gov Approved Schemes	18.00	0.02	0.02	No
E18 Party wall between dwellings	Non Gov Approved Schemes	4.80	0.04	0.04	No
E16 Corner (normal)	Non Gov Approved Schemes	2.40	0.04	0.04	No
E7 Party floor between dwellings (in blocks of flats)	Non Gov Approved Schemes	17.03	0.04	0.04	No
E14 Flat roof	Non Gov Approved Schemes	17.03	0.04	0.04	No

Y-value	0.02	W/m²K

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	1	
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	m³/(h.m²) @ 50 Pa
Test Method	Blower Door	

22.0 Lighting

No Fixed Lighting	No				
	Name	**Efficacy**	**Power**	**Capacity**	**Count**
	Lighting	80.00	5.00	400.00	28

24.0 Main Heating 1	Database	
Percentage of Heat	100.00	%
Database Ref. No.	100392	
Fuel Type	Electricity	
In Winter	301.97	
In Summer	220.69	
Model Name	Fighter 470	
Manufacturer	NIBE Energy Systems Ltd	
System Type	Heat Pump	
Controls SAP Code	2208	
Is MHS Pumped	Pump in heated space	

Summary for Input Data

Heating Pump Age	2013 or later	
Heat Emitter	Radiators	
Flow Temperature	Enter value	
Flow Temperature Value	45.00	
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	Yes	
Cold Water Source	From mains	
Bath Count	1	
Immersion Only Heating Hot Water	No	
28.3 Waste Water Heat Recovery System		
29.0 Hot Water Cylinder	Internal Store	
Insulation Type	Measured Loss	
Cylinder Volume	170.00	L
Loss	1.56	kWh/day
In Airing Cupboard	No	
32.0 Photovoltaic Unit	One Dwelling	
Export Capable Meter?	No	
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
2.00	South West	30°	Modest		No	0.80		

34.0 Small-scale Hydro None

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

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
			0	0
			0	0
			0	0

Summary for Input Data

elmhurst energy

Property Reference	Small Dole 2BH END 79	**Issued on Date**	08/04/2025
Assessment Reference	Small Dole 2BH END 79	**Prop Type Ref**	Small Dole 2BH END 79
Property	Land at , Shoreham Road, Small Dole, West Sussex, BN5 9YQ		

SAP Rating	87 B	**DER**	3.37	**TER**	11.69
Environmental	97 A	**% DER < TER**			71.17
CO_2 Emissions (t/year)	0.22	**DFEE**	36.04	**TFEE**	36.76
Compliance Check	See BREL	**% DFEE < TFEE**			1.95
% DPER < TPER	43.19	**DPER**	34.69	**TPER**	61.07

Assessor Details	Mr. Ivan Ball	**Assessor ID**	DE88-0001
Client			

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

Orientation	Southwest	
Property Tenture	1	
Transaction Type	6	
Terrain Type	Suburban	
1.0 Property Type	House, Semi-Detached	
2.0 Number of Storeys	2	
3.0 Date Built	2024	
4.0 Sheltered Sides	2	
5.0 Sunlight/Shade	Average or unknown	
6.0 Thermal Mass Parameter	Enter TMP value	
Thermal Mass	250.00	kJ/m²K
7.0 Electricity Tariff	Standard	
Smart electricity meter fitted	No	
Smart gas meter fitted	No	

7.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground floor:	17.82 m	39.52 m²	2.40 m
1st Storey:	17.82 m	39.52 m²	2.40 m

8.0 Living Area 26.60 m²

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	Cavity Wall	Cavity wall : plasterboard on dabs, dense block, filled cavity, any outside structure	0.18		85.54	68.28	0.00	None	17.26	Enter Gross Area

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)	Shelter Res	Shelter
Party Wall	Filled Cavity with Edge Sealing	Plasterboard on dabs mounted on cement render on both sides, AAC blocks, cavity	0.00		39.94		None

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
External Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.10	9.00	39.52	39.52	None	0.00	Enter Gross Area	0.00

11.0 Heat Loss Floors

Description	Type	Storey Index	Construction	U-Value (W/m²K)	Shelter Code	Shelter Factor	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Solid	Lowest occupied	Suspended concrete floor, carpeted	0.13	None	0.00	75.00	39.52

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Windows & Glazed Doors	Manufacturer	Window	Double Low-E Soft 0.05			0.50		0.70	1.40
External Doors	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.50		0.70	1.20

13.0 Openings

Summary for Input Data

elmhurst energy

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
Kitchen/Breakfast	Windows & Glazed Doors	External Wall	North West	0.81	
Kitchen/Breakfast	Windows & Glazed Doors	External Wall	South West	2.84	
Kitchen/Breakfast	Windows & Glazed Doors	External Wall	South East	0.81	
Hall	External Doors	External Wall	South West	1.89	
WC	Windows & Glazed Doors	External Wall	South West	0.47	
Living	Windows & Glazed Doors	External Wall	North East	1.62	
Living	Windows & Glazed Doors	External Wall	North East	3.78	
Bed 1	External Doors	External Wall	South West	2.16	
Bed 2	Windows & Glazed Doors	External Wall	North East	2.88	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	

17.0 Thermal Bridging — Calculate Bridges

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	11.85	0.03	0.03	No
E3 Sill	Non Gov Approved Schemes	9.15	0.02	0.02	No
E4 Jamb	Non Gov Approved Schemes	28.50	0.02	0.02	No
E5 Ground floor (normal)	Non Gov Approved Schemes	17.82	0.05	0.05	No
E16 Corner (normal)	Non Gov Approved Schemes	9.60	0.04	0.04	No
E18 Party wall between dwellings	Non Gov Approved Schemes	9.60	0.04	0.04	No
E6 Intermediate floor within a dwelling	Non Gov Approved Schemes	17.82	0.00	0.00	No
E10 Eaves (insulation at ceiling level)	Non Gov Approved Schemes	9.50	0.05	0.05	No
E12 Gable (insulation at ceiling level)	Non Gov Approved Schemes	8.32	0.03	0.03	No

Y-value	0.02	W/m²K

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	2	
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	m³/(h.m²) @ 50 Pa
Test Method	Blower Door	

22.0 Lighting

No Fixed Lighting	No	

Name	Efficacy	Power	Capacity	Count
Lighting	80.00	5.00	400.00	40

24.0 Main Heating 1	Database	
Percentage of Heat	100.00	%
Database Ref. No.	102607	
Fuel Type	Electricity	
In Winter	265.04	
In Summer	163.62	
Model Name	aroTHERM 5kW	
Manufacturer	Vaillant Group UK Ltd	
System Type	Heat Pump	

Summary for Input Data

Controls SAP Code	2208	
Is MHS Pumped	Pump in heated space	
Heating Pump Age	2013 or later	
Heat Emitter	Radiators	
Flow Temperature	Enter value	
Flow Temperature Value	45.00	
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	Yes	
Cold Water Source	From mains	
Bath Count	1	
Immersion Only Heating Hot Water	No	
28.3 Waste Water Heat Recovery System		
29.0 Hot Water Cylinder	Hot Water Cylinder	
Cylinder Stat	Yes	
Cylinder In Heated Space	Yes	
Independent Time Control	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	200.00	L
Loss	1.68	kWh/day
Pipes insulation	All accessible pipework insulated	
In Airing Cupboard	No	
31.0 Thermal Store	None	
32.0 Photovoltaic Unit	One Dwelling	
Export Capable Meter?	No	
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
2.50	South West	30°	Modest		No	0.80		

34.0 Small-scale Hydro	None

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

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 - £6,000	£95	B 89 0 0	A 98 0 0

Summary for Input Data

elmhurst energy

Property Reference	Small Dole 3BH END 93	**Issued on Date**	08/04/2025
Assessment Reference	Small Dole 3BH END 93	**Prop Type Ref**	Small Dole 3BH END 93
Property	Land at, Shoreham Road, Small Dole, West Sussex, BN5 9YQ		

SAP Rating	88 B	**DER**	3.02	**TER**	10.38
Environmental	97 A	**% DER < TER**			70.91
CO_2 Emissions (t/year)	0.23	**DFEE**	34.05	**TFEE**	34.12
Compliance Check	See BREL	**% DFEE < TFEE**			0.21
% DPER < TPER	42.93	**DPER**	30.93	**TPER**	54.19

Assessor Details	Mr. Ivan Ball	**Assessor ID**	DE88-0001
Client			

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

Orientation	East	
Property Tenture	1	
Transaction Type	6	
Terrain Type	Suburban	
1.0 Property Type	House, End-Terrace	
2.0 Number of Storeys	2	
3.0 Date Built	2024	
4.0 Sheltered Sides	2	
5.0 Sunlight/Shade	Average or unknown	
6.0 Thermal Mass Parameter	Enter TMP value	
Thermal Mass	250.00	kJ/m²K
7.0 Electricity Tariff	Standard	
Smart electricity meter fitted	No	
Smart gas meter fitted	No	

7.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground floor:	19.38 m	46.60 m²	2.40 m
1st Storey:	19.38 m	46.60 m²	2.40 m

8.0 Living Area	14.50	m²

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	Cavity Wall	Cavity wall : plasterboard on dabs, dense block, filled cavity, any outside structure	0.18		93.02	77.95	0.00	None	15.08	Enter Gross Area

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)	Shelter Res	Shelter
Party Wall	Filled Cavity with Edge Sealing	Plasterboard on dabs mounted on cement render on both sides, AAC blocks, cavity	0.00		43.54		None

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
External Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.10	9.00	46.60	46.60	None	0.00	Enter Gross Area	0.00

11.0 Heat Loss Floors

Description	Type	Storey Index	Construction	U-Value (W/m²K)	Shelter Code	Shelter Factor	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Solid	Lowest occupied	Suspended concrete floor, carpeted	0.13	None	0.00	75.00	46.60

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Windows & Glazed Doors	Manufacturer	Window	Double Low-E Soft 0.05			0.50		0.70	1.40
External Doors	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.50		0.70	1.20

13.0 Openings

Summary for Input Data

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
Living	Windows & Glazed Doors	External Wall	East	1.62	
Hall	Windows & Glazed Doors	External Wall	East	0.63	
Hall	External Doors	External Wall	East	2.21	
Kitchen	External Doors	External Wall	West	1.26	
Dining	Windows & Glazed Doors	External Wall	West	3.78	
Bed 1	Windows & Glazed Doors	External Wall	East	1.44	
En Suite	Windows & Glazed Doors	External Wall	East	0.63	
Bathroom	External Doors	External Wall	South	0.63	
Bed 2 & 3	Windows & Glazed Doors	External Wall	West	2.88	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	

17.0 Thermal Bridging — Calculate Bridges

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	10.35	0.03	0.03	No
E3 Sill	Non Gov Approved Schemes	7.20	0.02	0.02	No
E4 Jamb	Non Gov Approved Schemes	24.60	0.02	0.02	No
E5 Ground floor (normal)	Non Gov Approved Schemes	19.38	0.05	0.05	No
E16 Corner (normal)	Non Gov Approved Schemes	9.60	0.04	0.04	No
E6 Intermediate floor within a dwelling	Non Gov Approved Schemes	19.38	0.00	0.00	No
E10 Eaves (insulation at ceiling level)	Non Gov Approved Schemes	19.38	0.05	0.05	No
E18 Party wall between dwellings	Non Gov Approved Schemes	9.60	0.04	0.04	No
P1 Party wall - Ground floor	Non Gov Approved Schemes	9.07	0.16	0.16	No
P4 Party wall - Roof (insulation at ceiling level)	Non Gov Approved Schemes	9.07	0.18	0.18	No

Y-value: 0.04 W/m²K

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	2
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 m³/(h.m²) @ 50 Pa

Test Method: Blower Door

22.0 Lighting

No Fixed Lighting: No

Name	Efficacy	Power	Capacity	Count
Lighting	80.00	5.00	400.00	40

24.0 Main Heating 1	Database	
Percentage of Heat	100.00	%
Database Ref. No.	102607	
Fuel Type	Electricity	
In Winter	263.95	
In Summer	163.62	
Model Name	aroTHERM 5kW	
Manufacturer	Vaillant Group UK Ltd	

Summary for Input Data

System Type	Heat Pump	
Controls SAP Code	2208	
Is MHS Pumped	Pump in heated space	
Heating Pump Age	2013 or later	
Heat Emitter	Radiators	
Flow Temperature	Enter value	
Flow Temperature Value	45.00	
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	Yes	
Cold Water Source	From mains	
Bath Count	1	
Immersion Only Heating Hot Water	No	
28.3 Waste Water Heat Recovery System		
29.0 Hot Water Cylinder	Hot Water Cylinder	
Cylinder Stat	Yes	
Cylinder In Heated Space	Yes	
Independent Time Control	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	200.00	L
Loss	1.68	kWh/day
Pipes insulation	All accessible pipework insulated	
In Airing Cupboard	No	
31.0 Thermal Store	None	
32.0 Photovoltaic Unit	One Dwelling	
Export Capable Meter?	No	
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
3.00	South West	30°	Modest		No	0.80		

34.0 Small-scale Hydro	None

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

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

Ratings after improvement

Summary for Input Data

Typical Cost	Typical savings per year	SAP rating	Environmental Impact
£4,000 - £6,000	£94	B 90	A 98
		0	0
		0	0

Summary for Input Data

Property Reference	Small Dole 4BH DET 139	**Issued on Date**	08/04/2025
Assessment Reference	Small Dole 3BH DET 139	**Prop Type Ref**	Small Dole 4BH DET 139
Property	Land at , Shoreham Road, Small Dole, West Sussex, BN5 9YQ		

SAP Rating	86 B	**DER**	2.92	**TER**	8.93
Environmental	97 A	**% DER < TER**			67.30
CO_2 Emissions (t/year)	0.39	**DFEE**	37.04	**TFEE**	37.80
Compliance Check	See BREL	**% DFEE < TFEE**			2.00
% DPER < TPER	36.13	**DPER**	29.91	**TPER**	46.82

Assessor Details	Mr. Ivan Ball	**Assessor ID**	DE88-0001
Client			

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

Orientation	Northwest	
Property Tenture	1	
Transaction Type	6	
Terrain Type	Suburban	
1.0 Property Type	House, Detached	
2.0 Number of Storeys	2	
3.0 Date Built	2024	
4.0 Sheltered Sides	2	
5.0 Sunlight/Shade	Average or unknown	
6.0 Thermal Mass Parameter	Enter TMP value	
Thermal Mass	250.00	kJ/m²K
7.0 Electricity Tariff	Standard	
Smart electricity meter fitted	No	
Smart gas meter fitted	No	

7.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground floor:	39.20 m	80.18 m²	2.40 m
1st Storey:	39.20 m	78.86 m²	2.40 m

8.0 Living Area 26.60 m²

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	Cavity Wall	Cavity wall : plasterboard on dabs, dense block, filled cavity, any outside structure	0.18		188.16	163.94	0.00	None	24.22	Enter Gross Area

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
External Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.10	9.00	80.20	80.20	None	0.00	Enter Gross Area	0.00

11.0 Heat Loss Floors

Description	Type	Storey Index	Construction	U-Value (W/m²K)	Shelter Code	Shelter Factor	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Solid	Lowest occupied	Suspended concrete floor, carpeted	0.13	None	0.00	75.00	80.20

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Windows & Glazed Doors	Manufacturer	Window	Double Low-E Soft 0.05			0.50		0.70	1.40
External Doors	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.50		0.70	1.20

13.0 Openings

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
Living Room	Windows & Glazed Doors	External Wall	North West	2.43	
Study	Windows & Glazed Doors	External Wall	North East	0.71	
Study & WC	Windows & Glazed Doors	External Wall	South West	1.43	
Hall	External Doors	External Wall	South West	1.89	
Dining	Windows & Glazed Doors	External Wall	South West	2.16	

Dining	Windows & Glazed Doors	External Wall	South East	2.16
Kitchen	Windows & Glazed Doors	External Wall	South West	1.89
Utility	External Doors	External Wall	South West	2.21
Bed 3	Windows & Glazed Doors	External Wall	North West	2.16
Bed 4	Windows & Glazed Doors	External Wall	South West	1.44
Ensuite	Windows & Glazed Doors	External Wall	South West	0.71
Master	Windows & Glazed Doors	External Wall	South West	2.16
Bed 2	Windows & Glazed Doors	External Wall	South East	2.16
Bath	Windows & Glazed Doors	External Wall	North East	0.71

14.0 Conservatory None

15.0 Draught Proofing 100 %

16.0 Draught Lobby No

17.0 Thermal Bridging Calculate Bridges

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	20.05	0.03	0.03	No
E3 Sill	Non Gov Approved Schemes	15.45	0.02	0.02	No
E4 Jamb	Non Gov Approved Schemes	39.90	0.02	0.02	No
E5 Ground floor (normal)	Non Gov Approved Schemes	39.20	0.05	0.05	No
E16 Corner (normal)	Non Gov Approved Schemes	28.80	0.04	0.04	No
E17 Corner (inverted – internal area greater than external area)	Non Gov Approved Schemes	9.60	-0.08	-0.08	No
E6 Intermediate floor within a dwelling	Non Gov Approved Schemes	39.20	0.00	0.00	No
E10 Eaves (insulation at ceiling level)	Non Gov Approved Schemes	30.70	0.05	0.05	No
E12 Gable (insulation at ceiling level)	Non Gov Approved Schemes	8.50	0.03	0.03	No

Y-value 0.02 W/m²K

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	3
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 m³/(h.m²) @ 50 Pa

Test Method: Blower Door

22.0 Lighting

No Fixed Lighting: No

Name	Efficacy	Power	Capacity	Count
Lighting	80.00	5.00	400.00	64

24.0 Main Heating 1 Database

Percentage of Heat	100.00 %
Database Ref. No.	102615
Fuel Type	Electricity
In Winter	279.66
In Summer	173.05
Model Name	aroTHERM 8kW
Manufacturer	Vaillant Group UK Ltd
System Type	Heat Pump

Summary for Input Data

elmhurst energy

Controls SAP Code	2208	
Is MHS Pumped	Pump in heated space	
Heating Pump Age	2013 or later	
Heat Emitter	Radiators	
Flow Temperature	Enter value	
Flow Temperature Value	45.00	
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	Yes	
Cold Water Source	From mains	
Bath Count	1	
Immersion Only Heating Hot Water	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	300.00	L
Loss	1.68	kWh/day
Pipes insulation	All accessible pipework insulated	
In Airing Cupboard	No	
31.0 Thermal Store	None	
32.0 Photovoltaic Unit	One Dwelling	
Export Capable Meter?	No	
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
3.00	South West	30°	Modest		No	0.80		

34.0 Small-scale Hydro	None

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

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 - £6,000	£85	B 87 0 0	A 97 0 0