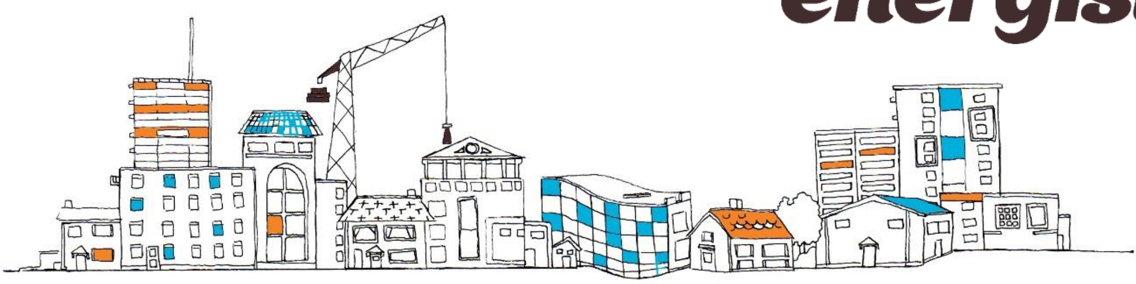
Energy Statement

Clifton Farm, Main Road

On behalf of HAE Workshop Ltd

Revision A

Date: 21st July 2021



REVISION HISTORY

Revision	Issue Date	Description	Issued By	Checked By
A	21/07/2021	Original Document	DS	RP
B	09/09/2021	Amendments	TW	

Calculations contained within this report have been produced based on information supplied by the Client and the design team. Any alterations to the technical specification on which this report is based will invalidate its findings.

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CONTENTS

1. EXECUTIVE SUMMARY

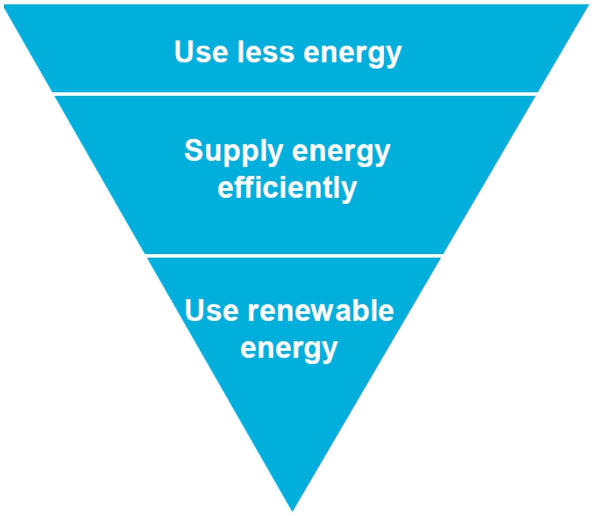
This Energy Statement has been produced by Energist UK on behalf of HAE Workshop Ltd (‘the Applicant’).

It will set out the measures planned by the Applicant to achieve energy reductions at the proposed development site: Clifton Farm, Main Road (‘the Development’) demonstrating compliance with:

i) National Planning Policy Framework.
ii) Approved Document Part L of the Building Regulations 2013.
iii) The local planning policy requirements for Sevenoaks District Council to meet:

- *An improvement in the overall sustainability, including the energy performance and water consumption of new development.*

The Energy Statement sets out how design measures will be incorporated as part of the Development, aligning with the principles of the energy hierarchy.



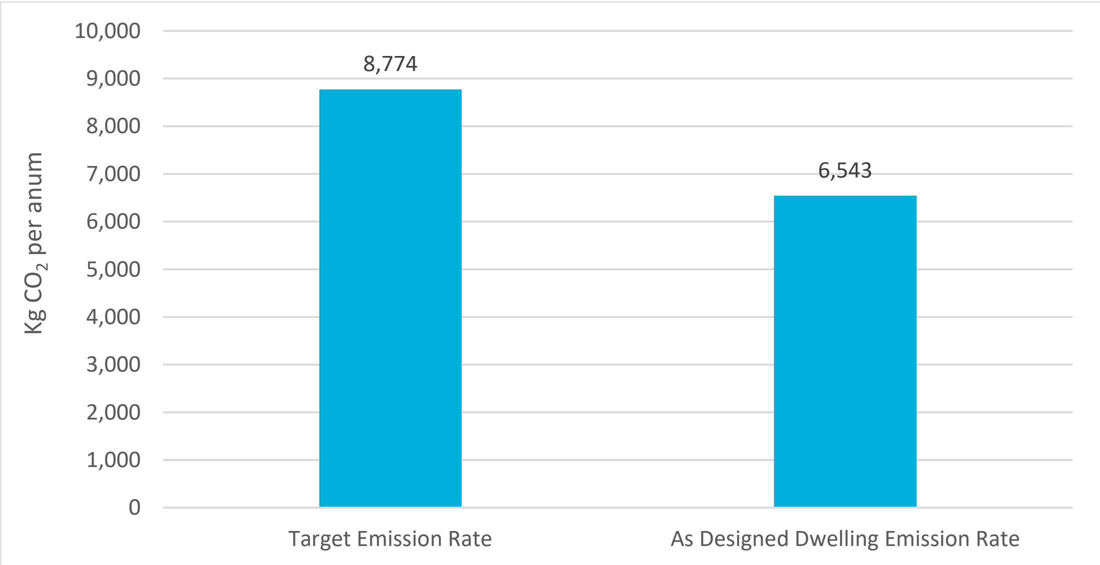
The Energy Statement concludes that the following combination of measures, summarised overleaf in Table 1, will be incorporated into the Development demonstrating how the energy standard will be delivered by the Applicant.

Table 1: Measures incorporated to deliver the energy standard.

Fabric first: Demand-reduction measures	▪ Energy-efficient building fabric and insulation to all heat loss floors, walls and roofs. ▪ High-efficiency double-glazed windows throughout. ▪ Quality of build will be confirmed by achieving good air-tightness results throughout. ▪ Efficient-building services including high-efficiency heating systems. ▪ Low-energy lighting throughout the building.
Renewable and low-carbon energy technologies	▪ The property will be served by an ASHP, the Mitsubishi ECODAN 8.5kW or a product with the same CoP.

The impact of these design measures in terms of how the Applicant delivers the energy standard is illustrated in Figure 1.

Figure 1: How the Development meets the energy standard.



The calculated reduction in CO_2 emissions and the percentage reduction in CO_2 over ADL 2013 is demonstrated in Table 2.

Table 2: CO_2 emissions and percentage reduction over ADL 2013.

	CO_2 emissions	
	Kg/CO_2 per annum	% reduction
Target Emission Rate: Compliant with ADL 2013	8,774	-
As Designed Dwelling Emission Rate	6,543	25.43%
Total savings	**2,231**	**25.43%**

2. INTRODUCTION

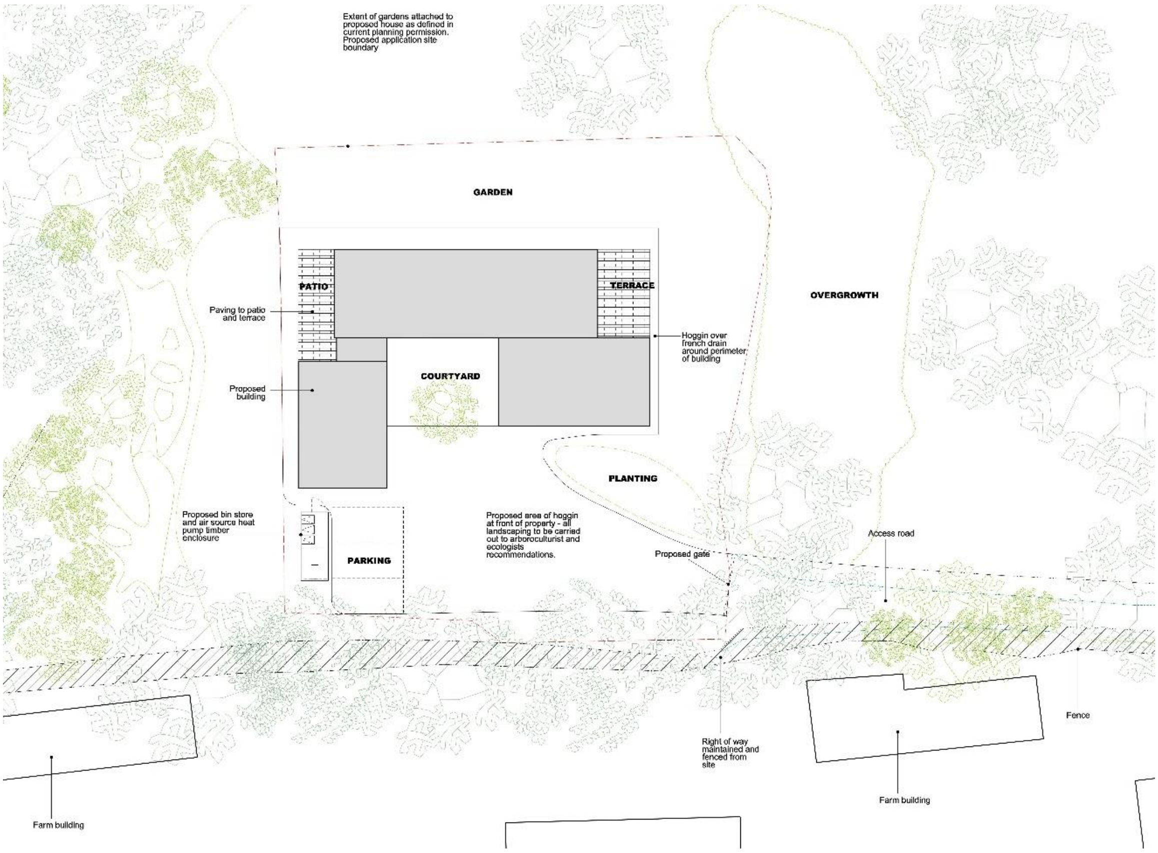
2.1 Site Description

This Energy Statement has been prepared for the residential development at Clifton Farm, Main Road. This falls under the jurisdiction of Sevenoaks District Council.

The Development consists of one new build, five bedroom detached property.

The Development is to be built on a site that has been granted a Certificate of Lawful Development.

Map 1: Site location for Clifton Farm, Main Road



Source: HAE Workshop, Drawing No. 001-00-101-PLAN-PO1

2.2 Purpose of the Energy Statement

This Statement sets out how the Applicant intends to meet:

i) National Planning Policy Framework.
ii) Approved Document Part L of the Building Regulations 2013.
iii) The local planning policy requirements for Sevenoaks District Council to meet:

- *An improvement in the overall sustainability, including the energy performance and water consumption of new development.*

For a detailed overview of the planning policy requirements specific to this development, refer to Appendix 2.

The way in which the Applicant meets the energy standard at Clifton Farm, Main Road will be set out in this Statement as follows:

- **Baseline energy demand**: The Development's Target Emission Rate (TER) will be calculated to establish the minimum on-site standard for compliance with ADL 2013.

- **Fabric first – reduced energy demand:** The Development's Dwelling Emission Rate (DER) will be calculated to explain how the Applicant's design specification will lead to a reduced energy demand and an improved fabric energy efficiency. The better the design of the building fabric in terms of, for example, insulation, air tightness and orientation to maximise solar gain, the less energy required to heat the dwelling and so the better the fabric energy efficiency.

- **Low-carbon and renewable energy:** Low-carbon and renewable energy technologies will be assessed for their suitability and viability in relation to the Development. Solutions will be put forward for the development and the resulting CO_2 emission savings presented.

2.3 Methods

Energist UK has used SAP 2012 methodology to calculate energy demand for the new dwelling.

3. BASELINE ENERGY DEMAND

3.1 Introduction

In order to measure the effectiveness of demand-reduction measures, it is first necessary to calculate the baseline energy demand and this has been done using SAP 2012 methodology. This can also be referred to as the Target Emission Rate (TER.)

The resulting ADL 2013 Baseline for Clifton Farm, Main Road has been calculated using Part L model designs which have been applied to the Applicant's Development details. The baseline energy demand, represents the maximum kWh energy permitted for the Development in order to comply with ADL 2013

3.2 The Development Baseline

The resulting TER, representing the total maximum CO_2 emissions permitted for the Development, has been calculated as 8,774 kg/CO_2 per annum. To ensure compliance with ADL 2013, CO_2 emissions should not exceed this figure.

Table 3. Baseline design specification for Clifton Farm, Main Road.

Element	Baseline Design Specification
Ground Floor U-Value (W/m^2.K)	0.13
External Wall U-Value (W/m^2.K)	0.18
Party Wall U-Value (W/m^2.K)	0 (fully filled and sealed)
Roof – insulated at ceiling U-Value (W/m^2.K)	0.13
Roof – insulated at slope U-Value (W/m^2.K)	0.13
Roof – flat, U-Value (W/m^2.K)	0.13
Glazing U-Value, including frame (W/m^2.K)	1.4
Door U-Value (W/m^2.K)	1.2
Design Air Permeability	5
Space Heating	Mains Gas
Heating Controls	Heating System Controls
Domestic Hot Water	Mains Gas
Ventilation	Natural ventilation with intermittent extract fans
Low Energy Lighting	100%
Thermal Bridging	Appendix R values

4. DEVELOPMENT SPECIFICATION

A combination of demand-reduction measures, energy-efficiency measures and low-carbon and renewable energy will deliver the Applicant's energy standard and target for on-site reduction in CO_2 emissions.

The following measures, summarised here in Table 4, are incorporated in the design of the Development.

Table 4: Measures incorporated to deliver the energy standard.

Fabric first: Demand-reduction measures	▪ Energy-efficient building fabric and insulation to all heat loss floors, walls and roofs. ▪ High-efficiency double-glazed windows throughout. ▪ Quality of build will be confirmed by achieving good air-tightness results throughout. ▪ Efficient-building services including high-efficiency heating systems. ▪ Low-energy lighting throughout the building.
Renewable and low-carbon energy technologies	▪ The property will be served by an ASHP, the Mitsubishi ECODAN 8.5kW or a product with the same CoP.

The Applicant's design specification and intended demand-reduction measures for the Development have been modelled using the same SAP 2012 methodology as before. This allows us to assess the effectiveness of demand-reduction measures as a percentage reduction in CO_2 emissions over the Baseline.

The total calculated CO_2 emissions for Clifton Farm, Main Road is 6,543 Kg/CO_2 per annum, which is a reduction of 25.43 % or 2,231 Kg/CO_2 per annum over the Baseline. Refer to Appendix 3 for SAP Results and Table 5 for the Development specification.

Table 5. The Development specification at Clifton Farm, Main Road.

Element	Fabric-First Design Specification
Ground Floor U-Value (W/m^2.K)	0.16
External Wall U-Value (W/m^2.K)	0.19
Party Wall U-Value (W/m^2.K)	N/A
Roof – insulated at ceiling U-Value (W/m^2.K)	0.13
Roof – insulated at slope U-Value (W/m^2.K)	0.13
Roof – Flat U-Value (W/m^2.K)	0.13
Glazing U-Value – including Frame (W/m^2.K)	1.4
Door U-Value (W/m^2.K)	1.0
Design Air Permeability	5.0
Space Heating	ASHP - Mitsubishi ECODAN 8.5kW or a product with the same CoP.
Heating Controls	Zone Controls
Domestic Hot Water	From ASHP – 200 L Cylinder 2.24 kWh/day.
Ventilation	MVHR with SFP of 1.0 or better.
Low Energy Lighting	100%
Thermal Bridging	Accredited Construction Details

5. LOW-CARBON AND RENEWABLE ENERGY

5.1 Introduction

The low-carbon and renewable energy solutions applicable to this development scheme have been assessed and potentially-viable solutions recorded.

Viability of the following low-carbon and renewable energy technologies have been considered:

- Wind
- Solar
- Aerothermal
- Geothermal
- Biomass

5.2 Wind	*The ability to generate electricity via a turbine or similar device which harnesses natural wind energy. This could be considered as an onsite solution to reducing carbon emissions (turbines included within the development), or offsite (investing financially into a nearby wind farm).*
Installation considerations	▪ Wind turbines come in a variety of sizes and shapes. Turbines of 1 Kw can be installed to single house and large-scale turbines of 1-2 MW can be installed on a development to generate electricity to multiple dwellings and other buildings. In both instances the electricity generated can be used on site or exported to the grid. Vertical- or horizontal-axis turbines are available. ▪ A roof-mounted 1 kW micro wind system costs up to £3,000. A 2.5 kW pole-mounted system costs between £9,900 and £19,000. A 6 kW pole-mounted system costs between £21,000 and £30,000 (taken from the Energy Saving Trust, TBC by supplier) ▪ Local average wind speed is a determining factor. A minimum average wind speed of 6 m/s is required. ▪ Noise considerations can be an issue dependent on density and build-up of the surrounding area. ▪ Buildings in the immediate area can disrupt wind speed and reduce performance of the system. ▪ Planning permission will be required along with suitable space to site the turbine, whether ground installed or roof mounted.
Advantages	▪ Generation of clean electricity which can be exported to the grid or used onsite. ▪ Can benefit from the Feed in Tariff, reducing payback costs.
Disadvantages	▪ Planning restrictions and local climate often limit installation opportunities. ▪ Annual maintenance required. ▪ High initial capital cost. It is usual for an investor to consider a series of turbines to make the investment financially sound.
Development feasibility	▪ Installing a large turbine in an area such as this is not considered to be appropriate due to its appearance and physical impact on the built-up environment. Residents' and neighbours' concerns may include the look of the turbine, the

hum of the generator and the possibility of stroboscopic shadowing from the blades on homes.

- Wind speed has been checked for the development scheme using the NOABL wind map: http://www.rensmart.com/Weather/BERR. The wind speed at ten metres for the development scheme is 6.4 metres per second (m/s) which is above the minimum of 5 m/s and threshold for technical viability.

- Typical payback times for a single turbine are expected to be greater than 15 years which means that the cost of installing and maintaining a single wind turbine is not considered a commercially-viable option.

5.3 Solar PV and Solar Thermal

The ability to generate energy (either electricity, hot water or a combination of the two) through harnessing natural solar energy. This could include the use of solar thermal panels, photovoltaic (PV) panels, or a combined solution. PV panels, similarly to turbines, can be considered both on and offsite.

Solar Photovoltaics convert solar radiation into electricity which can be used on site or exported to the national grid.

Solar Thermal generates domestic hot water from the sun's radiation. Glycol circulates within either flat plate or evacuated tube panels, absorbing heat from the sun, and transferring this energy to a water cylinder. A well designed solar thermal system will account for 50-60% of a dwelling's annual hot water demand. Sizing the system to meet a higher demand will lead to excess heat generation in the summer months, and overheating of the system.

Installation considerations

- Operate most efficiently on a south-facing sloping roof (between 30 and 45-degree pitch.)
- Shading must be minimal (one shaded panel can impact the output of the rest of the array.)
- Panels must not be laid horizontally on a flat roof as they will not self-clean. Panels will therefore need to be installed at an angle and with appropriate space between them, to avoid over-shading.
- Large arrays may require upgrades to substations if exporting electricity to the grid.

	▪ Local planning requirements may restrict installation of panels on certain elevations. ▪ Installation must take into account pitch and fall of the roof, along with any additional plant on the roof to ensure there is sufficient room. ▪ The average domestic solar PV system is 4kWp and costs £5,000 - £8,000 (including VAT at 5 per cent) - (taken from the Energy Saving Trust, TBC by supplier.)
Advantages	▪ Relatively straightforward installation, connection to landlord's supply and metering. ▪ Linear improvement in performance as more panels are installed. ▪ Maintenance free. ▪ Installation costs are continually reducing. ▪ Can benefit from the Feed in Tariff to improve financial payback.
Disadvantages	▪ Not appropriate for high-rise developments, due to lack of roof space in relation to total floor area. ▪ With Solar Thermal, performance is limited by the hot water demand of the building – system oversizing will lead to overheating.
Development feasibility ✓	▪ The suitability of Solar panels has been considered for this Development and are concluded as a technically-viable option. ▪ There may be some potential areas of roof space suitable for the positioning of unshaded Solar PV arrays. Although this may be limited due to over shading from trees on the site. ▪ The Development is not on land which is protected or listed, so it is considered that Solar panels would not have a negative impact on the local historical environment or the aesthetics of the area. ▪ If PV panels were to be used, the occupants may be entitled to claim the Feed-In-Tariff for any energy which is generated. If solar thermal panels were to be used, the occupants would see a reduction in hot water bills.

- The commercial viability of Solar PV or Solar Thermal would need to be fully explored if considered part of an Energy Strategy as the economical investment would need to be justified by the return on the Applicant's investment. The area of un shaded roof would also need to be looked into further.

5.4 Aerothermal

The transfer of latent heat in the atmosphere to a compressed refrigerant gas to warm the water in a heating system. This includes air to water heat pumps and air conditioning systems.

Air Source Heat Pumps (ASHPs) extract heat from the external air and condense this energy to heat a smaller space within a dwelling or non-domestic building. A pump circulates a refrigerant through a coil to absorb energy from the air. This refrigerant is then compressed to raise its temperature which can then be used for space heating and domestic hot water.

They can feed either low-temperature radiators or underfloor heating and often have electric immersion heater back-up for the winter months.

Installation Considerations

- ASHPs operate effectively in buildings with a low energy demand, as they emit low levels of energy suitable for maintaining rather than dramatically increasing internal temperatures. It is therefore vital that the dwelling has a low heating demand to ensure the system can provide appropriate space-heating capability.
- Underfloor heating will give the best performance but oversized radiators can also be used.
- Immersion heater back-up required to ensure appropriate Domestic Hot Water (DHW) temperature in winter months.
- Noise from the external unit can limit areas for installation.
- £7,000-£11,000 per dwelling (taken from the Energy Saving Trust, TBC by supplier.)

Advantages

- Air source systems are a good alternative solution to providing heating and hot water to well-insulated, low heat loss dwellings.
- They require additional space when compared to a gas boiler. Space for an external unit is needed, as is space for the hot water cylinder and internal pump.

	▪ Heat pumps are generally quiet to run, however if a collection of pumps were used, this could generate a noticeable hum while in operation. ▪ Running costs between heat pumps and modern gas boilers are comparable.
Disadvantages	▪ Residents need to be made aware of the most efficient way of using a heat pump; as the low flow rates used by such a system means that room temperature cannot be changed as reactively as a conventional gas or oil boiler system. ▪ Will not perform well in homes that are left unoccupied and unheated for a long period of time. ▪ Back-up immersion heating can drastically increase running costs. ▪ Noise and aesthetic considerations limit installation opportunities.
Development feasibility ✓	▪ ASHPs are considered a technically-viable option for this development scheme.

5.5 Geothermal

The transfer of latent heat from the ground to a compressed refrigerant gas to warm the water in a heating system. This includes ground source heat pumps. Heat can be collected through the use of either horizontally laid or vertically installed coils.

Ground Source Heat Pumps (GSHPs) operate on the same principle as an Air Source Heat Pump (ASHP) in that they extract heat from a source (in this instance the ground) and compress this energy to increase temperature for space heating and hot water. Pipework is installed into the ground, either through coils or in bore holes and piles, circulating a mix of water and antifreeze to extract energy from the ground, where the year-round temperature is

	relatively consistent (approx. 10℃ at 4 metres depth). This leads to a reliable source of heat for the building. Again, an electrically powered pump circulates the liquid and powers the compressor, however annual efficiencies for GSHPs tend to be higher than those of ASHPs.
Installation considerations	▪ Require appropriate ground conditions to sink piles/bore holes or excavate for coils (which also require a large area of land.) ▪ Decision between coils or piles can lead to significant extra cost. ▪ Need to consider whether low temperature output is fed through underfloor heating (most efficient) or oversized radiators. ▪ Similar to ASHPs, perform best in well-insulated buildings with a low heating demand. ▪ Electric immersion heater required for winter use. ▪ £11,000-£15,000 per dwelling dependent on the size of the system (taken from the Energy Saving Trust, TBC by supplier.)
Advantages	▪ Perform well in well-insulated buildings, with limited heating demand. ▪ More efficient than ASHPs.
Disadvantages	▪ The coils can be damaged by natural earthworks and by intensive gardening practices – occupants would need to be aware of the location of the coils for this system, and how to operate the system efficiently. Coils may also be damaged within the dwelling where the circuit is connected to the internal unit. ▪ Will not perform well in buildings that are left unoccupied and unheated for a long period of time. ▪ Back up immersion heating can drastically increase running costs. ▪ Large area of ground needed for coil installation.
Development feasibility	▪ GSHPs are considered a technically-viable option for this development scheme as there are no physical constraints in terms of ground conditions and area available for installation.

✗	▪ The capital installation cost would, however, be high which leads us to the conclusion that GSHPs would not be a commercially-viable option for this development scheme.
5.6 Biomass	*Providing a heating system fuelled by plant based materials such as wood, crops or food waste.* Biomass boilers generate heat for space heating and domestic hot water through the combustion of biofuels, such as woodchip, wood pellets or potentially biofuel or bio diesel. Biomass is considered to be virtually zero carbon. They can be used on an individual scale or for multiple dwellings as part of a district-heating network. A back-up heat source should be provided as consistent delivery of fuel is necessary for continued operation.
Installation considerations	▪ Biomass boilers are larger than conventional gas-fired boilers and also require what can be significant storage space for the fuel source. This needs to be considered at planning stage to ensure an appropriate plant room can be provided. ▪ Flue required to expel exhaust gases – design needs to be in line with the requirements of the Building Regulations. ▪ Need to consider whether fuel deliveries will be reliable and consistent to the location of the site (especially relevant in rural areas) and whether the plant room can be easily accessed by the delivery vehicle. ▪ £9,000-£21,000 per dwelling dependent on size (taken from Energy Saving Trust, TBC by Supplier).
Advantages	▪ Considerable reduction in CO_2 emissions.
Disadvantages	▪ Limited reduction in running costs compared to A-rated gas boilers, but at a substantially higher up-front cost. ▪ Plant room space required for boiler and storage. ▪ Dependent on consistent delivery of fuel. ▪ Ongoing maintenance costs (need to be cleaned regularly to remove ash.)

Development Feasibility ✗	▪ Biomass is considered a technically-viable option for this development scheme as there are no apparent physical constraints on site in terms of installing biomass boilers or storing a sufficient supply. ▪ There are, however, concerns regarding a sustainable supply of biomass to the site. ▪ The capital installation cost would, however, be high which leads us to the conclusion that biomass would not be a commercially-viable option for this development scheme.

5.7 Conclusion

The following low-carbon and renewable energy technologies, summarised here in Table 6, are considered potentially-viable options for the residential development scheme at Clifton Farm, Main Road.

Table 6: Summary of Feasibility for Clifton Farm, Main Road.

✓	▪ Solar PV ▪ Solar Thermal ▪ Aerothermal
✗	▪ Wind ▪ Geothermal ▪ Biomass

The property will be served by an ASHP, the Mitsubishi ECODAN 8.5kW or a product with the same CoP.

6. REDUCED WATER DEMAND

6.1 Introduction

The water consumption of a dwelling has a significant impact on not only direct operational running costs (i.e. water consumption charges), but also indirectly through additional energy usage and the heating of water for domestic use. This is, in part, reflected in SAP 2012 methodology which assumes reduced energy consumption should a dwelling be compliant with Approved Document Part G 2013.

The standard of 125 litres of water per person per day can be met using the following specification as set out in Table 7 below. A water-efficiency calculation, demonstrating how the Applicant can achieve compliance with the target for water efficiency, can be referred to in Appendix 4.

Table 7. Water-use specification for new dwellings at Clifton Farm, Main Road.

Element	Performance
Kitchen Taps flow rate	6 Litres per minute
Other basin Taps flow rate	5 Litres per minute
WCs Flush Volume	6/4 Litres
Shower Flow rate	8 to 11 Litres per minute
Bath Volume	185 & 200 Litres
Dishwasher water consumption	1.25 litres per place setting
Washing-machine water consumption	8.17 litres per Kg

7. CONCLUSIONS

The Applicant demonstrates commitment to delivering the energy standard at Clifton Farm, Main Road.as follows:

- The Development has been designed to generate a total reduction in CO_2 emissions of 25.4% over the TER ADL 2013.
- This energy standard is delivered through a fabric-first approach to design and low-carbon and renewable energy.
- A standard that is equivalent to Level 4 Code for Sustainable Homes will be achieved by the Applicant. This is demonstrated through a 19% reduction in CO_2 emissions over the ADL 2013.

A combination of demand-reduction measures, energy-efficiency measures and low-carbon and renewable energy will deliver the Applicant's target for on-site reduction in CO_2 emissions.

The following measures, summarised here in Table 8, are incorporated in the development proposals.

Table 8. Measures incorporated to deliver the energy standard.

Fabric first: Demand-reduction measures	▪ Energy-efficient building fabric and insulation to all heat loss floors, walls and roofs. ▪ High-efficiency double-glazed windows throughout. ▪ Quality of build will be confirmed by achieving good air-tightness results throughout. ▪ Efficient-building services including high-efficiency heating systems. ▪ Low-energy lighting throughout the building.
Renewable and low-carbon energy technologies	▪ The property will be served by an ASHP, the Mitsubishi ECODAN 8.5kW or a product with the same CoP.

The way in which these design measures deliver the Applicant's commitment to the energy standard is illustrated in Figure 3 and Table 9 overleaf.

Figure 3: How the Development delivers the energy standard.

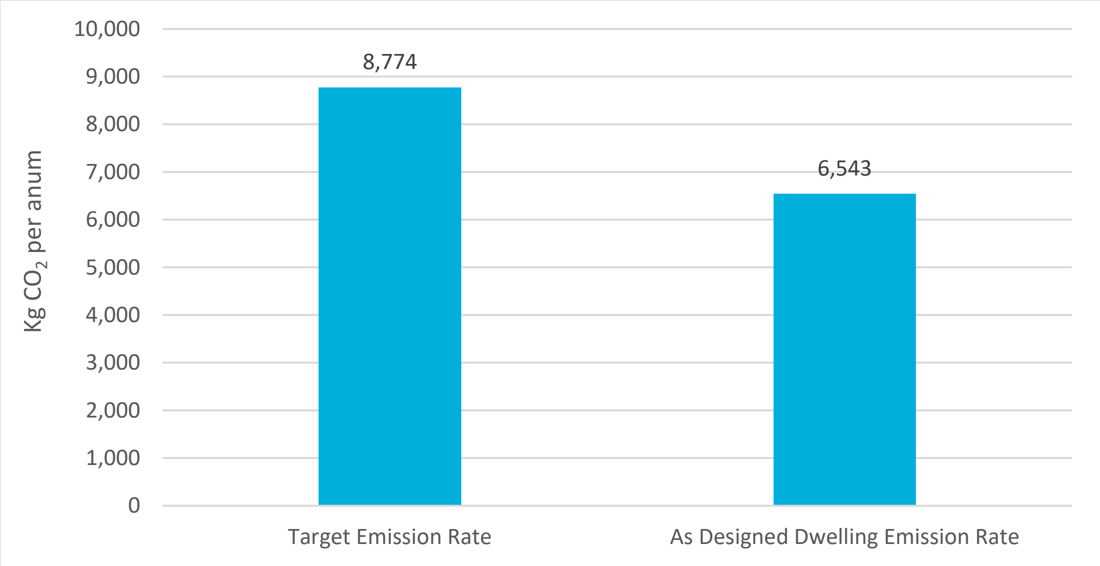


Table 9: How the Development reduces CO_2 emissions.

	CO_2 emissions	
	Kg/CO_2 per annum	% reduction
Target Emission Rate: Compliant with ADL 2013	8,774	-
As Designed Dwelling Emission Rate	6,543	25.43%
Total savings	**2,231**	**25.43%**

8. APPENDICES

APPENDIX 1: LIST OF ABBREVIATIONS

ADL 2013	Approved Document Part L of Buildings Regulations 2013
ASHP	Air Source Heat Pump
CHP	Combined Heat & Power
DER	Dwelling Emission Rate
DHN	District Heat Network
DHW	Domestic Hot Water
ESCO	Energy Services Company
GSHP	Ground Source Heat Pump
LPA	Local Planning Authority
PV	Photovoltaics
SAP	Standard Assessment Procedure
TER	Target Emission Rate

APPENDIX 2: PLANNING POLICY AND DESIGN GUIDANCE

The Climate Change Act (2008)

Passed in November 2008, the Climate Change Act mandated that the UK would reduce emissions of six key greenhouse gases, including Carbon Dioxide, by 80% by 2050.

As a consequence, the reduction of carbon dioxide emissions is at the forefront of National, Regional and Local Planning Policy, along with continuing step changes in performance introduced by the Building Regulations Approved Document L (2013).

Approved Document L (2013)

This development is subject to the requirements of Approved Document L (2013). ADL 2013 represented an approximate reduction of 6% in the Target Emission Rate (Kg/CO_2/sqm per annum) over the requirements of Approved Document L (2010) for residential development and an aggregate 9% reduction for non-residential development. ADL (2013) also sees the introduction of a Fabric Energy Efficiency Target, a measure of heating demand (kW hrs/sqm per annum) to ensure new-build dwellings with low-carbon heating systems still meet satisfactory energy-efficiency standards.

National Policy (2021)

The National Planning Policy Framework encourages Local Planning Authorities to '*support the transition to a low carbon future in a changing climate, taking full account of flood risk and costal change' (*NPPF paragraph 152), *'whilst taking a proactive approach to mitigating and adapting to client change, taking into account the long-term implication for flood risk, costal change, water supply, biodiversity and landscapes, and the risk of over shading from rising temperatures'.* (NPFF Paragraph 153).

Paragraph 155, upholds the requirement for Local Plans to: *'To help increase the use and supply of renewable and low carbon energy and heat, plans should: a) provide a positive strategy for energy from these sources, that maximises the potential for suitable development, while ensuring that adverse impacts are addressed satisfactorily (including cumulative landscape and visual impacts); b) consider identifying suitable areas of renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and c) identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for collocating potential heat customers and suppliers.'*

In paragraph 157, NPPF stipulates that local planning authorities should take account of the benefits of decentralised energy and passive design measures as a means of energy efficiency in new development: *'In determining planning applications, local planning*

authorities should expect new development to: a) comply with any development plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable; and b) take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.'
Core Strategy Adopted Feb 2011
Policy SP 1 ***Design of New Development and Conservation*** All new development should be designed to a high quality and should respond to the distinctive local character of the area in which it is situated. ***Policy SP2 Sustainable Development*** ***Sustainable Construction and Low -Carbon Energy Generation*** *The District will contribute to reducing the causes and effects of climate change by promoting best practice in sustainable design and construction to improve the energy and water efficiency of all new development and contribute to the goal of achieving zero carbon development as soon as possible.*
The Housing Standards Review and implications on Local Planning Policy
On March 25th 2015 the Government confirmed its policy to limit energy-efficiency targets that can be imposed on a development as a result of the Housing Standards Review. New developments should not be conditioned to achieve a reduction in Carbon Emissions exceeding a 19% improvement over the requirements of Approved Document L (2013) – the equivalent energy performance of a Code for Sustainable Homes Level 4 dwelling. In addition the Government confirmed that the Code for Sustainable Homes is no longer an applicable standard for planning permissions granted on or after March 26th 2015. If a Local Planning Authority has an existing policy requirement for the CSH it may still condition the Ene 1 and Wat 1 requirements for CSH Level 4, but cannot require assessment against the remaining categories and full CSH Certification. Sites with planning permission granted prior to March 25th 2015 can still be assessed and certified against the Code for Sustainable Homes, where there is a requirement to do so (known as legacy sites). A CSH requirement can also apply where a previously approved Outline Planning Permission has been granted prior to March 25th 2015.

APPENDIX 3: SAP RESULTS.

Dwelling Type	Total Target Emissions	As Designed Dwelling Emission Rate
Clifton Farm	8,774	6,543
Total Emissions	**8,774**	**6,543**

APPENDIX 4: WATER EFFICIENCY CALCULATIONS.

Water efficiency calculator for Clifton Farm, Main Road, knockholt, TN14 7NT (HA.MR.TN14)

This calculation complies with the methodology used under 'Part G (2015) Standard' for use in England.

Table A1: The water efficiency calculator

Installation type	Unit of measure	Capacity / Flow rate	Use factor	Fixed use litres/person/day	Litres per person per day
WC (single flush)	Flush volume (litres)	0.00	4.42	0	0.00
WC (dual flush)	Full flush volume (litres)	6.00	1.46	0	8.76
	Part flush volume (litres)	4.00	2.96	0	11.84
WCs (multiple fittings)	Average effective flushing volume (litres)	0.00	4.42	0	0.00
Taps (excluding kitchen / utility room taps)	Flow rate (litres per minute)	5.00	1.58	1.58	9.48
Bath (where shower also present)	Capacity to overflow (litres)	192.5	0.11	0	21.18
Shower (where bath also present)	Flow rate (litres per minute)	9.80	4.37	0	42.83
Bath only	Capacity to overflow (litres)	0.00	0.50	0	0.00
Shower only	Flow rate (litres per minute)	0.00	5.60	0	0.00
Kitchen / utility room sink taps	Flow rate (litres per minute)	6.00	0.44	10.36	13.00
Washing machine	Litres/kg of dry load	8.17	2.10	0	17.16
Dishwasher	Litres/place setting	1.25	3.60	0	4.50
Waste disposal unit	Litres/use	0.00	3.08	0	0.00
Water softener	Litres/person/day	0.00	1.00	0	0.00
				Total calculated use	128.74
		Contribution from greywater (litres/person/day) from Table 4.6			0.00
		Contribution from rainwater (litres/person/day) from Table 5.5			0.00
		Normalisation factor			0.91
		Total water consumption			117.15
		External water use			5.00
		Total water consumption (litres/person/day)			122.15
		Target			125.00

Assessed by Dominique Stockford in the Energist Technical Team on 20/7/2021.
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