



ENERGY STATEMENT

PROJECT: Streamside/Land at Harpers Road, Ash

CLIENT: Bourne Homes Limited

PROJECT REF: 0216-0122-01_03

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CONTENTS

1.0 Non-technical Summary

2.0 Appraisal of Energy Technologies

3.0 Energy Requirements

4.0 Energy Hierarchy

5.0 Methodology

6.0 Conclusion

1.0 – NON-TECHNICAL SUMMARY

The development consists of 24 new dwellings at Streamside and land at Harpers Road, Ash.

Guildford Borough Council's planning policy D2 (Climate change, sustainable design, construction and energy) considers the development to be a major development.

Since March 2023 LPSS Policy D2 criteria 5, 6, 7, 9 have been superseded by LPDMP Policy D16 Criteria 1, 2, 3, 4 respectively. Since the adoption of the latest Building Regulations Part L, LPDMP Policy 16 removes the requirement for new developments to achieve a 20% reduction in CO₂ emissions and use of low & zero-carbon energy.

These requirements are now achieved through compliance with Building Regulations Part L 2021, i.e., Policy D16 requires that new buildings must achieve a Dwelling Emission Rate that is no greater than the TER (Target Emission Rate), as set out in Building Regulations Part L.



DWELLING TYPES

The dwellings at the proposed development are split into the following dwelling types:

Plot	Description	Floor Area (m ²)	No. Bedrooms	Type (Used in SAP calculations)
1	Detached	125	3	G
2	Detached	125	3	G
3	Semi-Detached	98	3	C
4	Semi-Detached	96	3	D
5	Semi-Detached	96	3	C
6	Semi-Detached	96	3	C
7	Semi-Detached	95	3	C
8	Semi-Detached	95	3	C
9	Semi-Detached	95	3	C
10	Semi-Detached	95	3	C
11	Detached	112	3	G
12	Flat	52	1	A
13	Flat	61	1	A
14	Semi-Detached	80	2	D
15	Semi-Detached	81	2	D
16	Semi-Detached	79	2	D
17	Detached	117	3	G
18	Semi-Detached	91	2	B
19	Semi-Detached	96	3	C
20	Detached	114	4	E
21	Detached	114	4	E
22	Semi-Detached	105	3	C
23	Semi-Detached	105	3	C
24	Detached	162	4	F

SUMMARY OF HEAT NETWORK APPRAISAL

There are no CCHP or other heat distribution networks in the vicinity of the development.

SUMMARY OF LOW & ZERO CARBON ENERGY APPRAISAL

Solar PV and ASHP would both be suitable for the development to achieve compliance with Building Regulations Part L 2021, and to satisfy Policies D2 & D16.

2.0 – APPRAISAL OF ENERGY TECHNOLOGIES

Historically the UK has produced most of its energy needs from the burning of fossil fuels (coal, oil, natural gas). This has led to the depletion of these resources as well as to the production of vast quantities of greenhouse gases, created as these fuels are burnt to provide energy.

RENEWABLE TECHNOLOGIES

Renewable sources of energy are those which are continually available in the environment, producing no CO₂ emissions. Examples of renewable technologies used in residential developments include:

Solar photovoltaic (PV)

A cost-effective solution for residential schemes. A relatively low-cost Solar PV installation can have a large effect on the CO₂ emissions of a dwelling. Panels can generate decent amounts of energy when oriented East-South-West.

Solar thermal (SHW)

Used for heating hot water, Solar Thermal systems help reduce CO₂ emissions by up to 10%. This contribution will increase over time as building fabric becomes more efficient, as water heating in turn becomes a larger proportion of overall energy demand. These systems have largely been superseded by PV hot water diverter systems, which are a low-cost way to harvest PV-generated energy to directly heat hot water via immersion heater, without the need for the regular servicing and maintenance requirements of SHW.

Wind turbines

Only suitable for more rural locations where turbulence and noise are less of an issue.

Small scale hydro power

Useful where a stream or river nearby can provide a sustained power source. These systems are costly to install and manage, however. These could be considered where other technologies can't satisfy the energy demand requirement.

LOW & ZERO CARBON TECHNOLOGIES (LZCs)

LZCs, as the name suggests, produce lower CO₂ emissions. Examples are as follows:

Heat Pumps (Ground, Air, and Water source)

Using an electricity input, a heat pump can extract more than 3 times as much energy from its source in the form of heat. This heat is transferred into the dwelling via a heat exchanger to provide space and water heating.

Due to changes in the fuel factors in the latest Building Regulations Part L 2021 electricity is brought closer in line with the emissions of mains gas. This means that heat pumps will produce significantly lower CO₂ emissions than mains gas.

ASHP vs GSHP

The popularity of ASHP, along with associated investment in the technology in recent years, has enabled the efficiencies of ASHP units to almost match that of GSHP. This means that ASHP is a more attractive option for use in most developments due to its ease of installation and lower cost.

Biomass

Biomass is not 'renewable' in the true sense but is considered to be carbon neutral over its lifecycle. Usually in the form of individual woodburning stoves for residential schemes, providing useful secondary heating. Woodburning stoves cannot be used to satisfy Policy D16 however as there is no guarantee that they will be used, if they are for secondary heating.

Biomass boilers could be used to contribute to a CO₂ emissions reduction by providing space and water heating. Compared to gas or electricity however, fuel for biomass boilers (wood logs/wood pellets) is expensive, needs suitable storage and is generally inconvenient and undesirable for users in a non-rural setting.

Combined Heat and Power (CHP) systems

CHP systems provide power and heat from the burning of a fossil fuel (usually mains gas). Whilst more efficient than a gas boiler, CHP is only really a viable option for large-scale district heat & power networks, of which there are none close to this scheme.

District CHP schemes are also becoming less favourable under the new Building Regulations Part L 2021, as emissions factors change, making CHP systems less attractive as a solution to the de-carbonisation of UK housing stock.

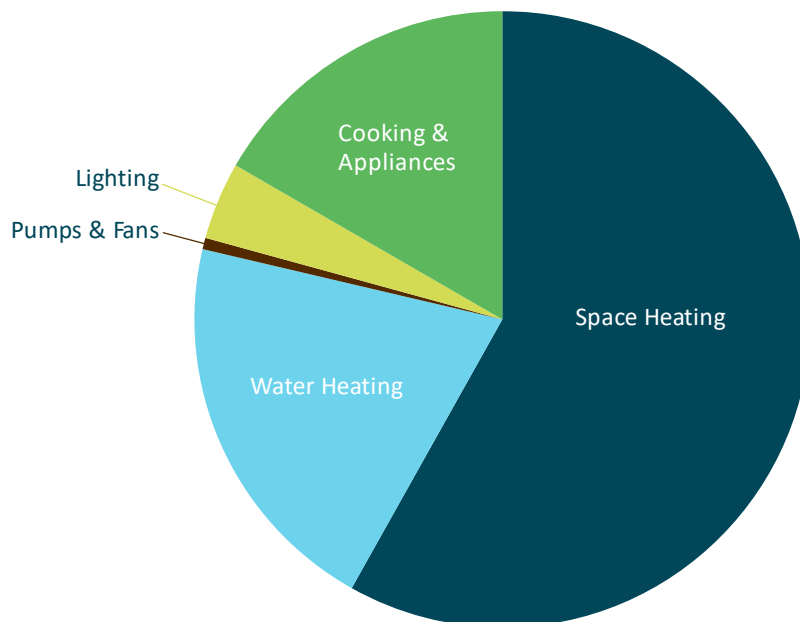
3.0 – ENERGY REQUIREMENTS

ENERGY EFFICIENCY FIRST

The largest proportion of energy demand in a typical dwelling built to current regulations is from space and water heating.

Figure 3.1 below shows the energy split of a typical dwelling built to comply with Building Regulations.

Figure 3.1



It is good practice therefore to reduce the overall energy demand of a dwelling by utilising a low energy design approach.

Using a fabric-first approach, the space heating demand of a dwelling is reduced due to the high levels of thermal insulation and air tightness.

Low energy design involves the consideration and implementation of measures to reduce the energy requirement of a dwelling further. This can be achieved by:

- Improving levels of insulation to reduce heat loss through the fabric of the building.
- Use of low-energy technologies, e.g., low-energy lighting, energy efficient boilers & appliances.
- Use of passive solar design.

4.0 – ENERGY HIERARCHY

Be Lean, Be Clean, Be Green.

When designing a building it is advisable to follow an Energy Hierarchy. The primary aim is to make the building as energy efficient as possible to reduce the demand for energy, and thus CO₂ emissions.

Building Regulations 2021 Part L aims to reduce CO₂ emissions from new buildings by 31% compared to those built to 2013 regulations. This can be achieved by making improvements to the fabric of the building by increasing levels of insulation, increasing air tightness and the use of efficient heating & appliances. CO₂ emissions can be further reduced by using renewable energy sources.

To reduce the regulated CO₂ emissions of the proposed development the principle is to follow the energy hierarchy:

1. **Use less energy – energy efficient building fabric, passive solar, low energy design.**
2. **Use renewable & low carbon energy sources.**

Use less energy.

Areas of consideration to improve the efficiency of the fabric of a building:

- Increased insulation to main elements (roof, walls, floor, glazing)
- Reduced thermal bridging.
- Improved air tightness

Other areas for improvement:

- Efficient heating & hot water systems
- Improved heating & lighting controls
- Controlled ventilation
- Energy efficient lighting
- Energy efficient appliances (cooker, washing machine, fridges, etc.)

1. Use less energy

The proposed minimum Building Fabric specification for the development will be as follows:

Element	Proposed u-value (W/m ² K)	Maximum required by Building Regulations Part L1A (W/m ² K)
Walls	0.18	0.26
Floor	0.12	0.8
Roof	0.11	0.16
Glazing	1.2	1.6
Air Tightness	4.0	8.0

Psi-value calculations will be used to reflect how the thermal bridging details will be a significant improvement over defaults.

2. Use renewable & low carbon energy sources

It is proposed that ASHP (Air Source Heat Pump) & Solar PV on suitable units be used across the development to achieve DER/TER pass for Building Regulations Part L 2021 compliance.

5.0 - METHODOLOGY

The latest Design SAP software (SAP 10) will be used to model the units for compliance with Building Regulations Part L 2021.

6.0 - CONCLUSION

Both Solar PV & ASHP technologies, along with an efficient building fabric, would provide a sufficient DER/TER improvement to satisfy Building Regulations Part L 2021, and thus meet the requirements of Planning Policies D2 (Climate Change, Sustainable Design, Construction & Energy) & D16 (Carbon Emissions from Buildings).

Either Solar PV or ASHP, or a mix of the 2 technologies across the development at Streamside/Land at Harpers Road, Ash could be used to satisfy Planning Policies D2 & D16.