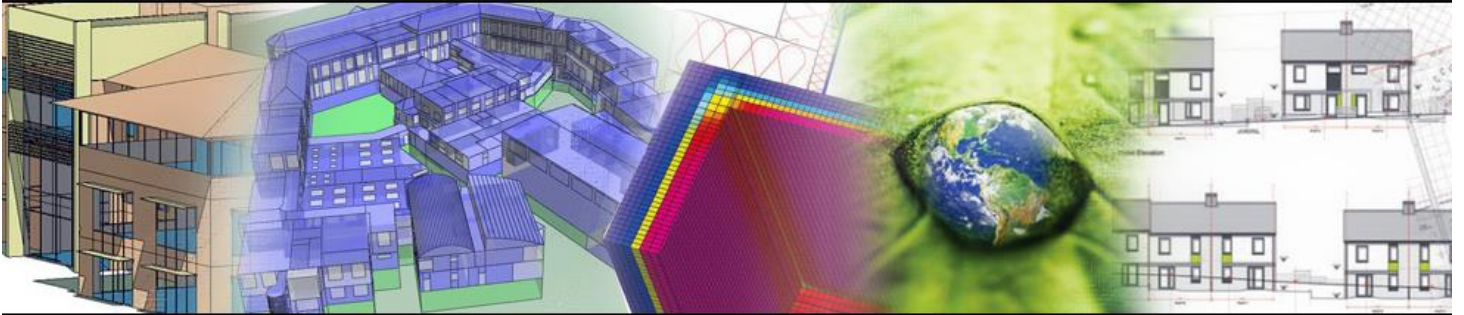




Energy and Sustainability Statement

Crompton Residential Development, Rochdale

Stroma Reference: 082112 ES1
Date: 21/04/2023
Prepared for: Lancet Homes

1. Executive Summary

This Energy and Sustainability Statement has been produced on behalf of Lancet Homes to support the planning submission for the proposed development of 18 homes at Crompton Avenue, Rochdale.

In accordance with Building Regulations Approved Document Part L1a 2021, predicted Carbon Dioxide (CO₂) emissions have been determined using Government approved SAP 10 software. This report addresses the Planning Application validation requirements of Rochdale Borough Council to submit an Energy and Sustainability Statement.

This statement has been based upon the energy hierarchy outlined within the Rochdale Core Strategy. As part of this statement, a calculation of predicted energy consumption and associated Carbon Dioxide (CO₂) emissions has been undertaken. The resulting strategy incorporates individual gas fired boilers to provide space and hot water heating to the dwellings.

The new build dwellings will result in good savings in carbon dioxide emissions when compared to the minimum level of compliance against current Building Regulation statutory requirements. The introduction of photovoltaics on the project helps achieve an overall 10.6% site wide reduction in carbon emissions in comparison to a 2021 Part L Building Regulations baseline.

Water consumption by occupants of each new dwelling does not exceed 110 litres per person per day.

1.1. Results Summary

	Regulated domestic carbon dioxide savings			
	Carbon dioxide emissions (Tonnes CO ₂ per annum)	Stage savings (Tonnes CO ₂ per annum)	Stage CO ₂ savings (%)	Cumulative savings (%)
Baseline: Part L 2021 of the Building Regulations Compliant Development	29.73	–	–	–
Site Wide CO2 Savings	26.59	3.14	10.6%	10.6%

Figure 1. Predicted regulated annual Carbon Emission Savings for Newly Built Dwellings

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2. Quality Management

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3. Introduction

Stroma Built Environment has been commissioned by Lancet Homes to prepare an Energy Statement in support of the planning application for the proposed development of 18 homes at Crompton Avenue Residential Development, Rochdale.

The proposed development is located within the Rochdale Borough Council area and has been assessed against the requirements of the Rochdale Borough Council: Core Strategy (Adopted October 2016), which outlines the sustainable design standards for the area.

The energy strategy for the proposed development is as follows:

1. Minimal heat loss through fabric, thermal bridging, and air infiltration.
2. Installation of energy efficient building services such as high efficiency gas condensing boilers and high efficacy lighting.
3. Consider the integration of decentralised energy.
4. Appropriate renewable energy technology to further reduce grid-energy demand and CO₂ emissions.

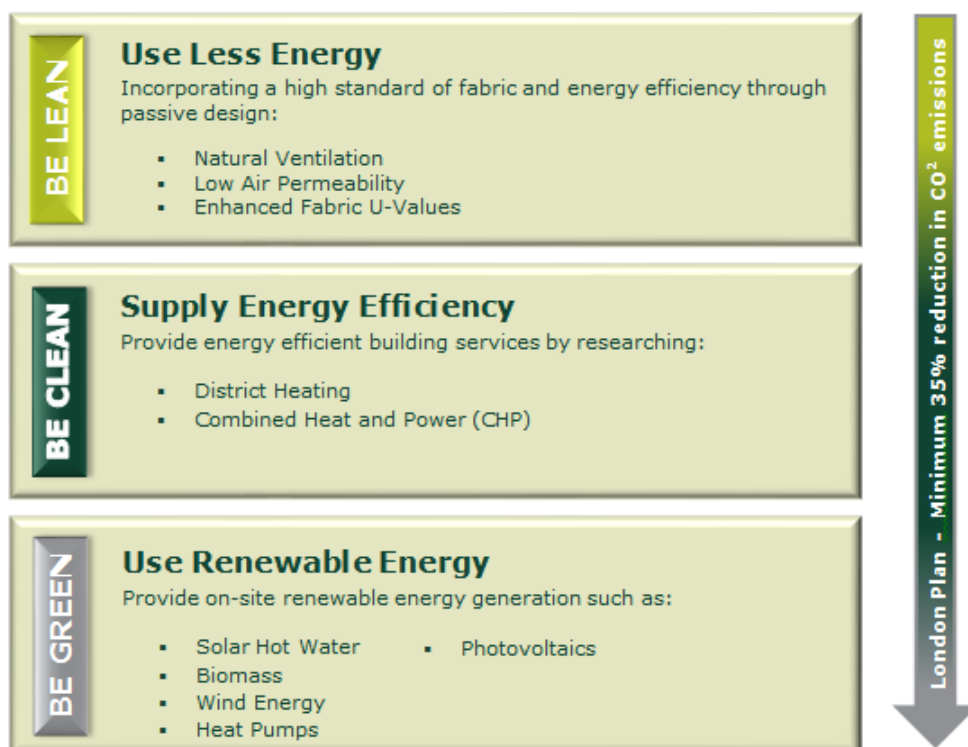


Figure 2. Energy Hierarchy

4. Development Site

The development site located in Rochdale off Crompton Avenue and Broad Lane in Rochdale. The proposals include the redevelopment of the site to provide a total of 18 detached houses.

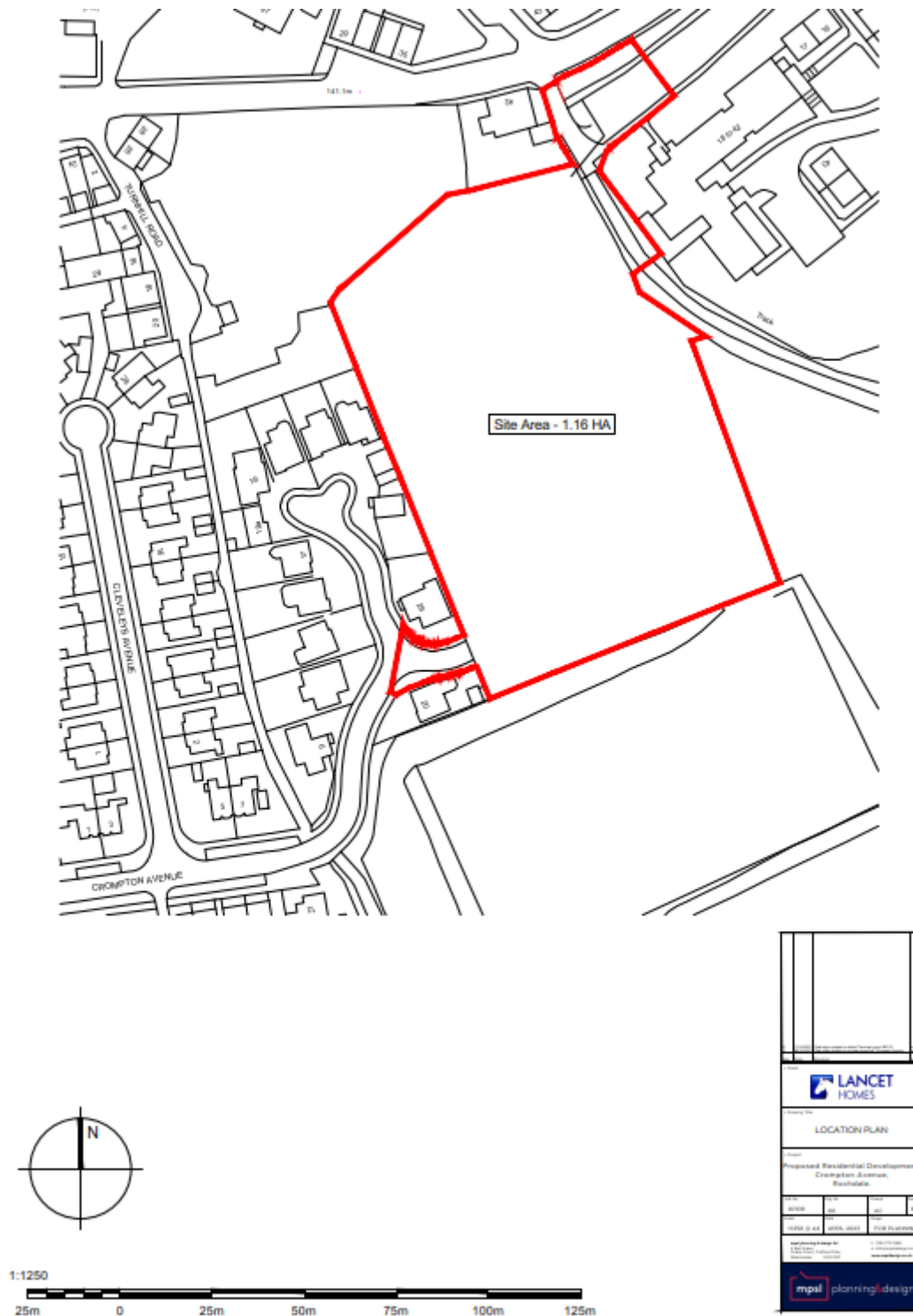


Figure 3.Site Location Plan



5. Planning Policy

5.1. National Policy - England

The Department for Communities and Local Government (DCLG) released the National Planning Policy Framework (NPPF) in March 2021. In revising this framework, the Government's objective is to streamline the process encouraging sustainable development and promoting the needs and priorities of local communities.

This framework is to be used as the base by councils to develop their own local policy. Section 14 of the framework addresses climate change, flooding and coastal change. Considerations include:

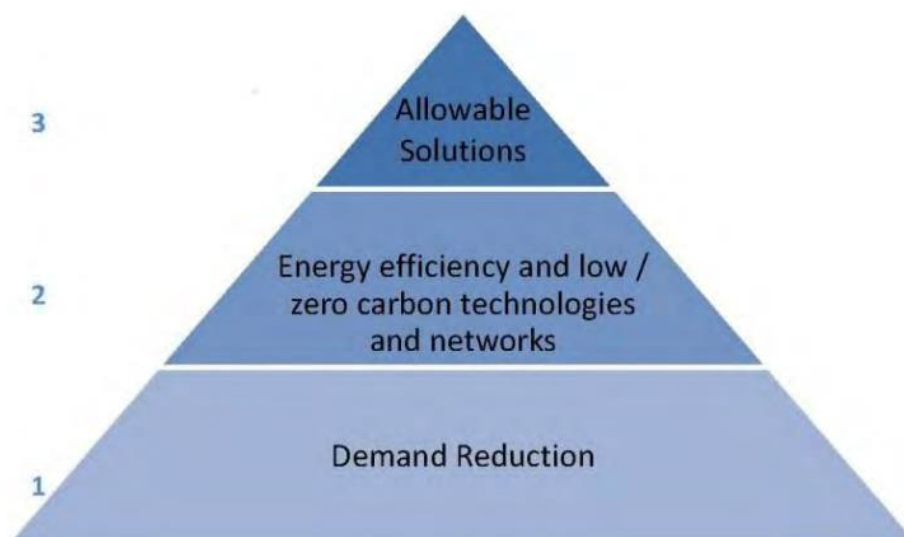
- Minimising CO₂ emissions.
- Vulnerability of fuel supply.
- A promotion of decentralised, low carbon and renewable energy sources wherever viable.

5.2. Regional Policy – Rochdale Borough Council

The Core Strategy for Rochdale Borough was adopted in October 2016. Policy G2: Energy and new development and Policy G3: Renewable and low carbon energy developments are relevant to this report:

G2 - Energy and new development

All new developments will be expected to adhere to the following energy hierarchy to the extent that policy G2 reflects national policy, targets, and requirements for that type of development:



Demand Reduction – Achieve the maximum possible reduction in demand for energy through building design (i.e. the use of passive systems). At the design stage of new developments, every effort should be made to ensure that buildings use as little energy as possible throughout their lifetimes, using siting, orientation, layout, construction, and landscaping to optimise use of natural passive systems such as solar gain and natural lighting, shading, ventilation and cooling to

minimise heating, cooling and lighting demands. Green roofs and green walls should be incorporated into developments wherever feasible.

Energy efficiency and low / zero carbon technologies and networks – Design to maximize energy efficiency and use on-site or linked low or zero carbon technologies or direct connection to a low or zero carbon heat source (not necessarily on-site).

‘Allowable solutions’ – use wider energy efficiency / CO2 reduction measures, which could include developer contributions, to compensate for ‘residual emissions’ not addressed by 1 or 2 above.

Policy G3: Renewable and low carbon energy developments

The Council will promote renewable, low and zero carbon energy generating developments, including wind power, biomass, Combined Heat and Power (CHP), hydro and heat pumps in order to help meet CO2 reduction targets and contribute towards energy security for Greater Manchester and the Northwest.

Any proposal and associated infrastructure must avoid harm to the health and safety of the public, including through nuisance or adverse impact on highway safety by conflict with or undue distraction to road users. Any harm to the following must be minimised and appropriately mitigated:

- The visual character and quality of the landscape or townscape and the physical record of the historic and cultural evolution of the landscape.
- The setting of heritage assets including Scheduled Ancient Monuments, Conservation Areas and Listed Buildings.
- Residents and their amenity.
- Biodiversity including protected species, statutory and locally designated sites and important habitats, and geodiversity.
- The value of the borough’s peatlands as an ecological and hydrological resource and as a carbon sink.
- The value of the surrounding area for relaxation and recreation.
- Water quality.
- Land which is used for water catchment purposes, and which is critical to the delivery of water supply.
- Highway safety.

Any proposal must demonstrate the best use of location, topography, siting, design, and colour to minimise it’s visual and other impacts, including any cumulative impacts. Any ancillary structures and access roads should employ sensitive design and the use of local materials to respect the character and appearance of the setting. The visual impact of infrastructure associated with renewable energy developments should be satisfactorily addressed, including by routing power lines underground wherever possible.

All proposals should seek to minimise the length of cable connection to reduce the visual impact of such structures when sited above ground. It must be demonstrated that the proposal will not result in electro-magnetic interference with local television reception and specialist radio communication networks.

All the above issues, where relevant, will have to be addressed in a detailed statement of environmental effects submitted with the application.

Planning permission will be subject to a condition that if a wind turbine generator, or other redundant plant or infrastructure, is not producing electricity for six months or more, it shall be removed, and the site fully restored to a use and condition appropriate to its surroundings in accordance with this plan.

6. Building Regulations - England

6.1. Approved Document L1A – Newly Built Dwellings

Approved document L1A – Conservation of Fuel and Power sets the standard for carbon emissions for new dwellings and was last revised in June 2022 (Part L: 2021). The properties will need to comply with the criteria set out in the document, as follows:

New Build Dwellings

1. The predicted Dwelling Emission Rate of CO₂ emissions from dwellings (DER) are not greater than the Target Emission Rate (TER).
2. The fabric energy efficiency rates for the building shall be no greater than the target fabric energy efficiency rate.
3. The primary energy rate for the building shall be no greater than the target primary energy rate.
4. That the performance of dwellings at As- Built stage comply with the DER values achieved, including site testing that the 'air permeability' rate achieved is as per that specified, or better.
5. The necessary provisions for energy efficient operation of dwellings are put in place, including operation and maintenance instructions aimed at achieving economy in the use of fuel and power in a way that householders can understand

7. Assessment Methodology

7.1. Domestic (SAP)

The Standard Assessment Procedure (SAP) is the Government's approved methodology for assessing the predicted energy consumption and carbon dioxide emissions of new buildings. Results are derived in respect of floor area and consider energy use (kWh/m²/yr) and associated CO₂ emissions (kg.CO₂/m²/yr) from the following:

- Space heating
- Domestic hot water
- Ventilation
- Lighting
- Ancillary pumps and fans
- Energy generating technology.

SAP is compliant with the EU Energy Performance of Buildings Directive and is carried out using approved software. A trained and accredited Stroma Energy Assessor has used Elmhurst Design SAP 10 to assess compliance and generate the necessary results data.

SAP calculations have been undertaken for a sample of the newly built dwellings and results have been used to determine the predicted energy consumption and CO₂ emissions for all newly built dwellings. A summary of the input data used in the calculations can be seen in the Appendix. Supporting SAP calculations are provided in the Appendix.

An indicative fabric and systems specification has been used.

Energy Hierarchy

Stage 1

BE LEAN

Use Less Energy

8. Be Lean

This section outlines the proposals for specifying building fabric and services beyond the requirements of Building Regulations (the baseline).

Fundamental to achieving energy efficiency in any new building is the specification of a thermally efficient building envelope. Passive design features such as high levels of insulation, designing to maximise solar gain and limiting heat loss through reduced air leakage and enhanced thermal bridging are all proven techniques to reduce energy consumption and emissions.

8.1. Building Fabric – New Build Dwellings

A fabric specification has been developed to meet the efficiency targets for Building Regulations 2021.

Compliance has been attained by targeting values closer to the notional u-values set out within Table 1.1: Summary of concurrent notional dwelling specification, Approved Document L1A. The Target Fabric Energy Efficiency (TFEE) has been achieved by incorporating a combination of Manufacturers Construction Details into the calculations to reduce heat losses via thermal bridging.

Table 4 shows the proposed building fabric specification applied to the SAP calculations with respect to the upper limits stipulated by Part L: 2021. The values represent a significant bettering of the mandatory requirements set out in the current Building Regulations.

Element	ADL1a: 2021 Limiting U-value	Proposed U-value	Improvement (%)
Ground Floor	0.18	0.09	50%
External walls	0.26	0.09	65.4%
Party walls	0.20	0.00	100%
Roof	0.16	0.09	43.7%
Windows/Roof lights	1.6	0.8	50%
y-value (thermal bridging)	0.2	0.07-0.05	65-75%
Air permeability (m³/h.m² @ 50 Pa)			
All dwellings (tested separately)	8.0	5	37.5%

Table 1. Building fabric specification (New Build)

8.2. Building Services

Newly Built Dwellings

Space heating and domestic hot water (DHW) will be provided by individual gas fired boilers. An Ideal Logic Combi ESP1 30 will be installed, and each dwelling will be naturally ventilated.

Element	Specification
Space Heating Source	Ideal Logic Combi ESP1 30
Heating emitter	Radiators
Heating control	Time and temperature zone control.
Domestic hot water	From main heating system.
Water consumption	≤110 litres/person/day
Internal fixed lighting	100% low energy LED lighting
Ventilation	Natural Ventilation
Thermal bridging	Manufacturers details
Thermal mass parameter	Calculated – (200-203 kJ/m ² .K).

Table 2. Building services specification

Energy Hierarchy Stage 2

BE CLEAN

Supply Energy Efficiently

9. Be Clean

This section outlines the suitability of clean energy supply solutions, including district heating and combined heat and power (CHP) within the proposed development.

9.1. District Heating

Where site location and development permits; the opportunity for connection to existing district heating networks or the creation of new district heating networks should be considered. District heating networks have the potential to offer significant energy, carbon, and cost savings over localised alternatives. District heating networks often utilise low-carbon energy generation/harnessing technologies such as Anaerobic Digestion (AD), Combined Heat and Power (CHP) and waste heat recovery. District networks also enable heat loads to be balanced between sites and therefore plant to operate more continuously and efficiently.



Figure 6. District heating pipework

Clearly, district energy networks are only generally feasible where there is a high density of heat demand. Capital costs and distribution losses must be relatively insignificant to support their viability. Where an opportunity exists, the network operator should be contacted to assess the viability and costs of current or, future connection.

There are no local district heating networks for the development to connect to.

Energy Hierarchy

Stage 1

BE Green

Use Renewable Energy

10. Be Green

10.1. Low and Zero Carbon Technologies

10.1.1. Micro Wind Turbines

Wind turbines utilise kinetic energy of the air to move propeller-like blades around a rotor. The rotor is connected to a main shaft which in turn spins a generator converting rotational energy into electricity. Depending upon local constraints, the rotor can be in the horizontal or vertical axis.

There are two main types of wind turbine; building mounted or, pole mounted. Building mounted turbines can be installed onto a roof where there is suitable wind resource and are generally smaller in size; typically, 1-2 kW. Pole mounted turbines are free standing and need to be erected in a suitably exposed position. Pole mounted systems are generally larger in size, typically 5-6 kW.

Turbines generate electricity at wind speeds between 5-25 m/s and should be in areas where surroundings will not lead to turbulence.



Figure 7. Horizontal axis, building-mounted turbines¹

Pros and Cons

- ✓ High efficiency, typically 70-85%.
- ✓ Long service life guarantees of 20+ years available.
- ✓ Excess generation can be exported to the National Grid.
- ✓ Eligible for the Government's Feed-in Tariff (now on hold).
- ✓ Complements other renewable technology.

- ✗ Output variable: weather dependent and full back-up required.
- ✗ Significant visual impact which can create planning problems.
- ✗ Clear unobstructed placement required.
- ✗ Building-mounted wind turbines have potential for structural, vibration and noise implications.
- ✗ Stable ground conditions with good access for machinery.
- ✗ Regular maintenance is required. Many moving parts.

Development Suitability



The development is in a densely populated area surrounded by residential properties and therefore there would be no room to install large-scale wind turbines.

¹ Photograph: Peter MacDiarmid/Getty Images

10.1.2. Ground Source Heat Pumps (GSHP)

Ground source heat pumps (GSHP) extract heat from a low temperature source via a reversed refrigeration cycle. Heat is absorbed into a collector loop buried either horizontally or vertically into the ground and then increased via compression. This useful heat is transferred to the building to provide space and/or water heating.

Although the system uses electricity, high Coefficient of Performances (COP) can be achieved resulting in overall CO₂ emissions and running costs below that of an efficient gas-fired boiler. The COP is a function of the difference between ground (source) temperature and output (flow) temperature.

Therefore, systems are most efficient when used in conjunction with low surface temperature emitters, e.g. underfloor heating, ceiling panels. Systems can be cascaded to generate domestic hot water at 60+°C though efficiencies are significantly reduced.



Figure 8. Horizontal ground loop collector²

Pros and Cons

- ✓ High efficiency, seasonal COPs of 3-4 achievable.
- ✓ Output and performance consistent over the year as ground temperature relatively constant.
- ✓ Low maintenance.
- ✓ Space and water heating can be generated.
- ✓ Eligible for the Government's Renewable Heat Incentive.
- ✓ Complements other renewable technology, i.e., solar PV.
- ✗ Initial ground investigations and preparation can be expensive and intrusive.
- ✗ Borehole option may invoke planning constraints.
- ✗ Low grade heat only suitable for certain emitters.

Development Suitability



The development site does not have the potential to install a horizontal ground collection loop owing to the limited availability of undeveloped open space surrounding the site, (which is required for placement of the heat exchanger). The development is in a densely populated area surrounded by residential properties and therefore there would be no space to install such technology.

² yougen 2014

10.1.3. Air Source Heat Pumps (ASHP)

Air source heat pumps (ASHP) extract heat from ambient air via a reversed refrigeration cycle. Heat is absorbed into an evaporator (outdoor unit) and increased via compression. This useful heat is transferred to the building via a refrigerant to provide space and/or water heating.

Although the system uses electricity, high Coefficient of Performance (COP) can be achieved resulting in overall CO₂ emissions and running costs below that of an efficient gas-fired boiler. The COP is a function of the difference between ambient air (source) temperature and output (flow) temperature.

Therefore, systems are most efficient when used in conjunction with low surface temperature emitters, e.g. underfloor heating, ceiling panels. Systems can be cascaded to generate domestic hot water at 60+°C though efficiencies are significantly reduced.



Figure 9. ASHP outdoor unit³

Pros and Cons

- ✓ High efficiency, seasonal COPs of 2-3 achievable.
- ✓ Low maintenance.
- ✓ Space and water heating can be generated.
- ✓ Complements other renewable technology, i.e. solar PV.
- ✓ Can provide an effective method of harnessing waste heat from a nearby process.

- ✗ Not eligible for the Government's Renewable Heat Incentive.
- ✗ Low grade heat only suitable for certain emitters.
- ✗ Compressor and fan within outdoor unit can generate high levels of noise and vibration.
- ✗ Not always considered to be a renewable energy technology, i.e. BREEAM 2011 Compliance Note

Development Suitability



Heat pumps provide a low carbon energy source with zero on site NO_x emissions. Given the high levels of noise and vibration, and given the proximity of the houses together, PV has been chosen as an alternative technology.

³ <http://www.pooleplumbingservices.co.uk/air-source-heat-pump-fitted-in-bournemouth>

10.1.4. Biofuels

Biofuel technology typically refers to the combustion of an organic product (solid, liquid or, gas) for heat generation in place of fossil fuels. Carbon dioxide released in combustion is taken to be recently fixated and then readily absorbed in the creation of the next fuel generation, e.g. tree plantation. Biofuels are therefore considered low carbon.

The most common biofuel is wood, usually utilised in chip or pellet form. This fuel is relatively energy-dense and is readily available in most parts of the UK. Boiler technology has been refined over a period of decades and is similar in appearance and installation (fuel supply excluded) to regular gas/oil-fired units.



Figure 10. Commercial biomass boiler⁴

Pros and Cons

- ✓ Established technology.
- ✓ High efficiencies achievable.
- ✓ Low CO₂ emissions.
- ✓ Relatively low cost fuel, which is less susceptible to price increases (compared with imported fossil fuels).
- ✓ Space and water heating can be generated.
- ✓ Eligible for the Government's Renewable Heat Incentive.
- ✗ Capital cost of plant high compared with fossil fuel alternative.
- ✗ Space and access required for fuel delivery and storage.
- ✗ Restrictions may apply due to particulate emissions. Alternatively, exhaust filtration is required.
- ✗ Regular specialist maintenance and cleaning is required.
- ✗ Full back-up system often required in tandem.
- ✗ High NO_x emissions without costly filtration systems.

Development Suitability



The development site is not located in a smoke control area and therefore permitted emissions are not restricted, however the burning of organic material for heating purposes will still produce particulate pollution and No_x emissions in the immediate local area and should be avoided where another cleaner technology is suitable.

⁴ <http://www.hamworthy-heating.com/Shared/Images>

10.1.5. Solar Photovoltaics

Solar Photovoltaic (PV) panels comprise of several inter-connected cells that utilise semi-conductor technology to convert solar energy into electricity. High voltage, direct current is converted to alternating current and phased into the mains supply via an inverter. PV panels are most effective where mounted on exposed, south-facing areas, at an inclination close to 30° from the horizontal.

The technology is well proven and requires little maintenance; most panels are designed to be self-cleaning when mounted at appropriate angles and the design life of a panel typically exceeds the likely pay-back period by a considerable margin. PV has the significant advantage of reducing energy use and costs on site for occupants whilst also reducing demand from the national grid and even contributing to grid energy. This can save significant carbon dioxide emissions by reducing the relatively inefficient and fossil-fuel heavy heat generation in the national infrastructure.



Figure 11. Solar panels installed to flat roof⁵

Pros and Cons

- ✓ Established technology.
- ✓ Low maintenance 'fit-and-forget' and self-cleaning (when pitched).
- ✓ Long service life, panels typically guaranteed for 20+ years (inverters are likely to need replacement during panel service life).
- ✓ No moving parts, silent operation.
- ✓ Displaces CO₂ intensive grid electricity.
- ✓ Excess generation can be exported to the National Grid.
- ✓ Eligible for the Government's Feed-in-Tariff (now on hold)
- ✓ Complements other renewable technology.

- ✗ Panel efficiencies relatively low; typically, 15-20%.
- ✗ Output variable; weather dependent.
- ✗ Generation extremely sensitive to panel over-shading.
- ✗ Additional loadings to building must be considered.

⁵ Go Go Green Roofing and Solar, 2014

Development Suitability



The development has many opportunities for PV to be installed on roof areas, which offer minimal over-shading. A solar PV array will be installed on the roof areas of the dwellings to provide a reduction in carbon emissions and energy usage.

10.1.6. Solar Thermal

Solar thermal technology uses energy from the sun to heat water. Systems typically comprise solar collectors (glazed flat-plate or evacuated tubes), a circulated glycol fluid and a thermal store.

Although water can be heated to a temperature high enough for domestic needs, output from solar thermal technology is typically used to pre-heat a vessel. The residual energy requirement is then met via an immersion heater or, coil fed by a boiler.

Solar thermal systems can provide a significant contribution towards the annual hot water demand of a building. Similarly, to PV, in the UK, panels generate their greatest output where mounted on exposed surfaces, within 45° of south and at an inclination close to 30°. As store units have a finite capacity, systems are most effective where hot water can be drawn off at several times during the day. Consideration should be given to the sun path and times of the day where a solar contribution would be most beneficial.



Figure 12. Evacuated tube solar collectors⁶

Pros and Cons

- ✓ Established technology.
- ✓ Panel efficiencies relatively high 50+%
- ✓ Low maintenance, circulation fluid requires a regular (usually annual) change
- ✓ Long service life, panels typically guaranteed for 10+ years
- ✓ Few moving parts, silent operation (excluding drain-back function).
- ✓ Eligible for the Government's Renewable Heat Incentive.

- ✗ Output variable; weather dependent and full back-up required.
- ✗ Excess generation cannot be exported.
- ✗ Panel overheating can occur where water use is irregular.

⁶ SEIA, 2014

- ⚠ Finite hot water demand of a building can lead to conflicts with other technology, e.g. CHP, Biomass.

Development Suitability



A substantial solar thermal system could be installed to provide hot water to a central buffer vessel. This could make a contribution towards the annual DHW demand and therefore reduction in annual CO₂ emissions.

11. Water Efficiency

Building Regulations Approved Document Part G: 2015 states that new dwellings must meet conservation targets by limiting projected water usage in a dwelling to 110 l/p/p/day including a 5 l/p/p/day allowance for external water use. This can be achieved by using water efficient fittings such as flow restrictors and water efficient appliances.

Water efficiency calculations have been appended to this report which demonstrates compliance using a standard specification (Table 5).

Type of fitting/appliance	Flow rate/Water Consumption
W/C	Dual flush - 6 litres (full)/ 3 litres (Part)
Taps (excluding kitchen)	5 litres/min
Bath	160 litres capacity (to overflow)
Shower	8 litres/min
Kitchen Taps	6 litres/min
Washing Machine	Default figure (8.17 litres/kg)
Dishwasher	Default figure (1.25 litres/place setting)
Water Softeners	None
Greywater Recycling	None
Rainwater Harvesting	None
Total Consumption	109.0 l/p/p/ day
(Building Regulations 17k Compliance)	Yes

Table 4. Standard sanitary specification

12. Sustainable Sourcing of Materials

12.1. Materials Life Cycle Impacts

Materials will be responsibly sourced by the Main Contractor and will be specified to have a low embodied impact. Materials with a low embodied impact as defined within the BRE Green Guide to Specification will be selected for use in the building design and construction.

The BRE Green Guide to Specification assesses each building element (such as walls, floors, roof and windows) and assigns an Environmental Impact Rating (from A+ to E). The following Green Guide Ratings should be targeted to ensure the development has a low embodied impact:

Element	Green Guide Rating
Roof	A+
External walls	A+
Internal walls	A
Ground and upper floors	A
Windows	A

Figure 13.Green Guide Ratings

The Main Contractor will source materials for key building elements from suppliers capable of demonstrating certification to high tier levels in the Chain of Custody certification process.

To achieve this, the major construction elements will be sought from suppliers that have been independently certified by the BRE Framework Standard for Responsible Sourcing (BES 6001). This is the highest level that can be attained as an independently certified scheme for responsible sourcing of materials available in the UK.

The construction industry is a major consumer of resources and has a large impact on the sustainability of the UK and the wider world. BRE Global has developed a framework standard for Responsible Sourcing (BES 6001) along with an associated independent third-party certification scheme. This standard and certification scheme will help organisations manage and reduce the impacts throughout the supply chain.

The scheme provides manufacturers with a means by which their products can be independently assessed and certified as a responsibly sourced material. The scheme is recognised by the BREEAM family of certification schemes and the Code for Sustainable Homes where credits can be awarded for construction products independently certified through BES 6001.

13. Conclusion and Energy Demand and Carbon Emissions Results

This Energy Statement has outlined the proposed specification for the development and the resulting savings against each stage of the energy hierarchy. A fabric-first approach provides considerable savings against the current Building Regulations baseline.

13.1. Be Lean – Energy Efficiency

A high-performance building envelope has been specified comprising of low U-values, thermally efficient construction details and low air permeability. Performance values demonstrate improvement against that of the 2021 Notional building used for comparison in compliance assessment.

Heating energy consumption will be further reduced through using energy efficient gas-fired boilers and time and temperature zone control.

13.2. Be Clean – Supply Energy Efficiently

There are no existing networks within the vicinity of the development site, no proposed networks, and no priority networks therefore no provisions need to be made to connect. The CHP development map confirms the heat density within the region to be low; therefore, connection to an existing network is not an option nor does the energy profile support development of a new network.

Integration of CHP to this development would not be technically or economically viable due to a low and infrequent heat demand and high relative distribution losses.

13.3. Be Green – Use Renewable Energy

Following a feasibility study into all suitable low and zero carbon technologies suitable for the site it has been concluded that Solar Photo Voltaic (PV) and Air source heat pumps (ASHP) are suitable for the site. The applicant has elected to use PV as the option to reduction carbon emissions and energy usage. It is estimated that 3.5kw_p will be required on each of the houses.

The introduction of PV to the newly built dwellings in the scheme results in a reduction in the CO₂ emissions of 10.6% when compared against a dwelling built to the baseline standards of Part L 2021 Building Regulations.

	Regulated domestic carbon dioxide savings			
	Carbon dioxide emissions (Tonnes CO ₂ per annum)	Stage savings (Tonnes CO ₂ per annum)	Stage CO ₂ savings (%)	Cumulative savings (%)
Baseline: Part L 2021 of the Building Regulations Compliant Development	29.73	–	–	–
Site Wide CO₂ Savings	26.59	3.14	10.6%	10.6%

Figure 14. Predicted regulated annual Carbon Emission Savings for Newly Built Dwellings

