

ENERGY STATEMENT:

83 Whitehill Road, Hitchin, Hertfordshire, SG4 9HP

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*83A & 83B Whitehill Road,
Hitchin,
Hertfordshire,
SG4 9HP*

Date: 08/07/2025
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REVISION	DATE	PREPARED BY	REVIEWED BY	COMMENTS
1	08/07/25	Atspace Ltd	Joe Dillon	

This statement outlines the opportunities for reducing carbon output/energy demand through optimizing fabric fit-out and using renewable energy.

It is not intended as detailed design advice, and is purely for the demonstration of the relevant reduction requirement.

As such data and information should only be treated as INDICATIVE at this stage of the process. Further investigation can be undertaken when more accurate and detailed information is required on specific measures.

1.0 Introduction

1.1 Introduction to Developments

ATSPACE Ltd has been instructed to prepare an Energy Statement for the residential new build project at 83 Whitehill Road.

This statement will demonstrate how the CO₂ emissions of the development have been reduced by at least 35% compared with a typical Building Regulations Part L compliant building and that the average energy demand for the whole site will be less than 60 kWh/m²/yr, as required by North Hertfordshire Local Plan.

The project is the erection of 2no 2-storey semi detached houses.

The site is located in a residential area of Hitchin, Hertfordshire.

1.2 Methodology

The methodology that has been applied in this report is as follows:

- 1.2.1 Prepare SAP calculations for the site based on construction specification provided by the developer.
- 1.2.2 From the SAP calculations, the energy demand for the development in kWh/year and baseline CO₂ emissions (TER) in kgCO₂/year/m² for the site can be established.
- 1.2.3 Reduction target CO₂ emission rates based on the reduction requirements can then be calculated from the baseline values.
- 1.2.4 A renewable energy feasibility study to ascertain which LZC technologies would be suitable for the development is carried out.
- 1.2.5 Where the actual dwelling emission rate (DER) does not meet the reduction target emission rate, feasibility of various options for improvement are discussed with the developer.
- 1.2.6 SAP calculations are modified with the agreed improvements. The reduced energy demand for the development in kWh/year and the predicted CO₂ emissions for the site can be established, and shown to achieve the reduction target.

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The following CO₂ related planning condition applies to this Energy Statement:

<i>Optimising Passive Design & Fabric Performance</i>			
	Bronze	Silver	Gold
Minor residential schemes less than 10 dwellings	✓ Achieve an EPC rating of at least C on all dwellings ✓ Submit a Sustainability & Energy Statement showing compliance with Policy and Building Regulations (this should include the Energy Use Intensity (EUI) & the total Space Heating Demand (SHD) calculations with recommendations on methods that could be investigated during technical design to improve performance)	✓ Achieve 80% EPC ratings of at least B and 20% rating of at least C ✓ Submit a Sustainability & Energy Statement showing: • maximisation of solar gain through site layout, orientation, and design (for the purpose of energy efficiency) • measures to prevent over-heating • lower carbon alternatives to gas boilers • on-site reductions of 35% (minimum) in CO₂ emissions over and above Building Regulations Part L (including at least 10% reductions through fabric first measures) (inclusive of MHVR) • EUI ≤ 60 kWh/m²/yr (inclusive of estimated unregulated energy) (RIBA 2025) • SHD ≤ 30 kWh/m²/yr (Passivhaus low energy building) or ≤ 40 kWh/m²/yr (AECB/ Energiesprong new build)	✓ Achieve an EPC rating of B on all dwellings ✓ Submit a Sustainability & Energy Statement showing: • on-site reductions of 50% (minimum) in CO₂ emissions over and above Building Regs Part L (including at least 10% reductions through fabric first measures) • commitment to achieve Passivhaus certification and site assessment at planning stage using Passive House Planning Package (PHPP) to confirm compliance against Passivhaus Classic, Plus or Premium. Or • assessment of the development using CIBSE TM54 or alternative operational energy modelling software and confirms compliance with LETI or RIBA 2030 standards: ○ EUI ≤ 35 kWh/m²/yr ○ SHD ≤ 15 kWh/m²/yr

The client has requested we explore the feasibility of achieving a Silver rating for this development.

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SAP calculations were prepared based on the construction specification shown in **Table 1** below:

Table 1: Specification Table

Aspect	
External Walls	0.16 W/m ² K
Plane roofs	0.10 W/m ² K
Ground Floors	0.12 W/m ² K
Glazing	1.2 W/m ² K
Solid Doors	1.4 W/m ² K
Thermal Bridging	Recognised Construction Details
Air Tightness	5.00 m ³ .h ⁻¹ .m ²
Ventilation	Intermittent Extracts
Main Heating System	Mitsubishi Ecodan ASHP
Heating Controls	Tim and Temperature Zone Control
Hot Water	From the main heating system
Renewable technologies:	See heating

The conducted SAP calculation shows that the baseline emission rate (TER) for proposed whole development is **16.92 kgCO₂/year/m²**. To satisfy the planning policies on CO₂ reduction, the developer has committed to reducing predicted site-wide CO₂ emissions by a minimum of 35% of this value. This equates to a reduction of **5.922 kgCO₂/year/m²**.

Therefore, a total site emission rate of **10.998 kgCO₂/year/m²** or lower, proves that the minimum 35% reduction has been met.

This can be seen in **Table 2** below.

Table 2: CO₂ Emission Rate Breakdown

CO ₂ Emission Rate Breakdown (kg CO ₂ /yr/m ²)			
	Baseline (Building regs max)	35% reduction Target	Reduction
	16.92	10.998	5.922

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3.0 Predicted Baseline Annual Energy Demand

Based on using the specification outlined in table 1 above, this would create an average predicted energy demand for the development of **42.04 kWh/m²/year**. The breakdown of this predicted energy demand can be seen in **Table 3** below. The figures quoted have been derived from the Design Stage SAP 10 Calculations for the development

Table 3: Baseline Predicated Annual Energy Demand

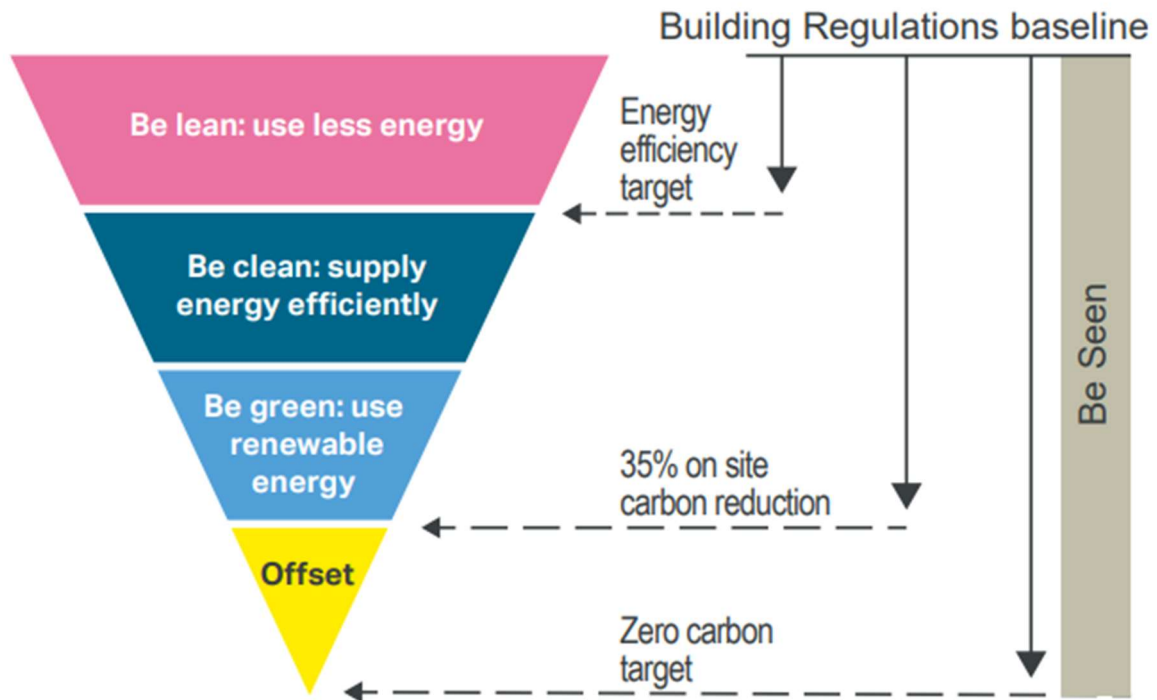
Plot No.	Space Heating Demand (kWh/ m ² /yr)	Total Predicted Energy Demand(kWh/m ² /yr)
83A	25.75	41.63
83B	26.57	42.45
Average	26.16	42.04

The development therefore meets the requirements of North Hertfordshire Council by having an average space heating demand of 30 kWh/m²/yr or below, and a total predicted energy demand of less than 60 kWh/m²/yr.

4.0 Reducing Carbon Emissions through Energy Reduction

The Energy Hierarchy sets out the most effective way to reduce a dwelling's CO₂ emissions. Firstly, by reducing energy demand, then by using energy efficiently, and lastly by incorporating LZC/Renewable technologies.

Figure 1: The Energy Hierarchy



Reducing the need for energy usage in the dwelling's design:

The first and most cost-beneficial action is to reduce the amount of energy needed by the occupants of the dwelling whilst still maintaining or even improving the comfort conditions. A lot can be achieved through passive design, improving the dwelling's external fabric, and following principles to reduce air infiltration.

The developer is attempting to reduce the energy demand and CO₂ emissions of the development by making the following fabric and energy efficiency improvements to their standard Part L 2021 building specification:

Energy reduction strategies include:

- Incorporating 100% energy-efficient lighting: with the Lumens per Circuit Watt exceeding 90
- All new windows will be double-glazed with Low-E Coatings
- ASHP
- Solar PV

5.0 Feasibility Study of Renewable Technologies

This section will assess the technical viability of the following renewable energy technologies for the site to rule out unfeasible options:

- Mast mounted wind turbines
- Roof-mounted wind turbines
- Solar PV (Photovoltaic) Panels
- Solar Thermal Panels
- ASHP (Air Source Heat Pump)
- GSHP (Ground Source Heat Pump)
- Biomass
- CHP

The following observations have been made concerning the technical feasibility of integrating renewable energy technologies into this development.

Table 4: Feasibility Study of Low Carbon Technologies

Renewable Technology	Feasible	Reasons
Mast Mounted Wind Turbine	No	- The site is situated in a suburban area. Surrounding properties are not far enough away to be unaffected by turbine noise, reflections, and shadow flicker, however, surrounding trees may create shadow flickering for the occupant or nearby residents - The site area is surrounded by trees and nearby dwellings that could cause uneven and turbulent wind patterns. Turbulent air conditions may reduce the lifespan of components. - Currently, the BWEA suggests a large wind turbine to be viable where wind speed is 7m/s or above. According to the NOABL database, the average wind speeds for the site are 5m/s at 10m, 5.8m/s at 25m, and 6.3m/s at 45m height for the property postcode (SG4 9HP). Therefore, the wind speeds are not sufficient for a mast-mounted wind turbine to be viable.

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Roof Mounted Wind Turbine	No	- There is sufficient roof space for a roof-mounted wind turbine to be installed on-site. - The site is situated in a suburban area. Surrounding properties are not far enough away to be unaffected by turbine noise, reflections, and shadow flicker, however, surrounding trees may create shadow flickering for the occupant or nearby residents - The site area is surrounded by trees and nearby dwellings that could cause uneven and turbulent wind patterns. Turbulent air conditions may reduce the lifespan of components. - Currently, the BWEA suggests a roof mounted wind turbine to be viable where wind speed is 7m/s or above. According to the NOABL database, the average wind speeds for the site are 5m/s at 10m, 5.8 m/s at 25m, and 6.3m/s at 45m height for the property postcode (SG4 9HP). Therefore, the wind speeds are not sufficient for a mast-mounted wind turbine to be viable.
Solar PV (Photovoltaic) Panels/Tiles	Yes	- The proposed development has a sufficient pitched roof area for solar panel accommodation. - Most of the roofs will be free from overshadowing for most of the day by other buildings, structures, or trees. - The site is located in a region with a high level of global horizontal irradiation (3027 kWh/m²/day)
Solar Thermal Collectors	No	- The proposed development has a insufficient pitched roof area that can accommodate solar thermal panels. - Most of the roofs will be free from overshadowing for most of the day by other buildings, structures, or trees. - The site is located in a region with a high level of global horizontal irradiation (3027 kWh/m²/day) - Solar thermal collectors would be compatible with the planned heating system. - There will be a year-round hot water demand
ASHP (Air Source Heat Pump)	Yes	- The proposed development could accommodate the space for a hot water cylinder and associated pipework - The buildings are suitable for a low-grade heat distribution system (e.g. underfloor water system, oversized radiators). - Condenser units can be noisy and also blow out colder air to the immediate environment causing a nuisance to the residents. However logistically there is availability on the site to position the systems away from neighboring residents - An external ASHP may have to be installed close to the bedrooms, causing noise issues.

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GSHP (Ground Source Heat Pump)	No	- It would not be possible to drill vertical boreholes or horizontal loops for a GSHP on the site. - The development can not accommodate a low-grade heat distribution system (e.g. underfloor water system, oversized radiators). - The site and neighborhood contain mature trees. Drilling boreholes on the site creates the risk of damaging their roots. - There is insufficient space inside the proposed dwelling for the heat pump equipment.
Biomass Boiler	No	- There is an established fuel supply chain for the area: https://www.biomass-energy.org.uk/pellets/wood - There is no space for a delivery vehicle (vehicular access to fuel storage, turning circle, etc). - There is not sufficient space in the proposed buildings for a wood-fuel boiler and associated auxiliary equipment. - There is not sufficient space for fuel storage to allow a reasonable number of deliveries. - Biomass systems are management intensive (fuel sourcing, transport, storage) and require adequate expertise from users.
CHP	No	- Given the proposed building use there won't be a high demand for heat for most of the year, therefore CHP won't be suitable. - A CHP unit only generates economic and environmental savings when it is running at least 4,500 hours per year. This equates to an average heat demand of about 17 hours a day for five days a week throughout the year. The proposed development energy and heat demand profile do not match this requirement due to low energy requirements because of fabric optimization. - CHP is typically utilized on buildings with high electricity and heating demand for most of the year such as local authority buildings, leisure centers, universities, hotels, and district heating schemes where CHP is used to provide electricity, space, and water heating. - CHP should be considered wherever there is a demand for electricity and an appropriate demand for heat in the near vicinity.

Based on the feasibility study in **Table 4** above, the following technologies have been identified as being feasible for the proposed development.

- Solar PV
- ASHP

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6.0 Options to achieve 35% Reduction

The developer is proposing to install the following technology within the building to achieve a 35% reduction in CO₂ output

- ASHP

The proposed installations generate the following CO₂ reductions in **Table 5** below:

Table 5: Associated CO₂ reductions of either technology:

CO ₂ Emission Rate Breakdown (kg CO ₂ /yr/m ²)				
No.	Improvement	Baseline emission rate (TER)	Reduction Target	Dwelling emission rate (DER)
Site-wide	10.6	16.92	5.992	6.32

With the addition of solar PV, the site surpasses the 35% CO₂ reduction target, achieving a site-wide reduction of 62.65%.

These improvements, therefore, achieve the zero carbon requirements set put by North Hertfordshire Council.

Table 6: Percentage reduction in CO₂ following the proposed Installation and improvements

Aspect	Associated Total CO ₂ (kgCO ₂ /yr/m ²)
TER Baseline	16.92
DER dwelling emissions	6.32
Reduction in CO ₂	10.6
% Reduction	62.65%

For any further questions regarding the Energy Statement please contact Joe Dillon on:

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