



Ashflame Properties Ltd

Land East of Calne Road, Lyneham

Energy & Sustainability Statement

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GENERAL NOTES

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1 INTRODUCTION

Nature Positive has been appointed by Ashflame Properties Ltd to prepare this Energy & Sustainability Statement in support of the Outline planning application (with all matters reserved except for access) for residential development up to 200 dwellings (Use Class C3), provision of public open space, and associated infrastructure on Land East of Calne Road, Lyneham. The report demonstrates how the proposals address environmental sustainability, with a focus on climate change mitigation and adaptation.

The recommendations provided are described in as much detail as is possible at this outline planning stage. Where specifics have not been possible, the overall approach and design standards have been laid out to ensure any subsequent Reserved Matters can utilise the principles established so that the sustainable quality of construction will be high throughout the lifetime of the development.

2 PLANNING POLICY REQUIREMENTS

2.1 National Planning Policy

2.1.1 National Planning Policy Framework (December 2024)

The Revised National Planning Policy Framework sets out the Government's planning policies for England and how these should be applied. The Framework continues to recognise that a central purpose of the planning system is to help deliver sustainable development.

Achieving sustainable development means the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives):

a) an economic objective - to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;

b) a social objective - to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering a well-designed and safe built environment, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and

c) an environmental objective - to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.

These objectives should be delivered through the preparation and implementation of plans and the application of the policies in this Framework; they are not criteria against which every decision can or should be judged. Planning policies and decisions should play an active role in guiding development towards sustainable solutions, but in doing so should take local circumstances into account, to reflect the character, needs and opportunities of each area.

2.2 Wiltshire Core Strategy Adopted January 2015

Core Policy 41 Sustainable construction and low-carbon energy

Climate change adaptation

New development, building conversions, refurbishments and extensions will be encouraged to incorporate design measures to reduce energy demand. Development will be well insulated and designed to take advantage of natural light and heat from the sun and use natural air movement for ventilation, whilst maximising cooling in the summer.

Sustainable construction

New homes (excluding extensions and conversions) will be required to achieve at least Level 4 (in full) of the Code for Sustainable Homes.

Conversions of property to residential use will not be permitted unless BREEAM's Homes "Very Good" standards are achieved.

All non-residential development will be required to achieve the relevant BREEAM "Very Good" standards, rising to the relevant BREEAM "Excellent" standards from 2019.

Renewable and low-carbon energy

All proposals for major development will be required to submit a Sustainable Energy Strategy alongside the planning application outlining the low-carbon strategy for the proposal.

2.3 Wiltshire Local Plan Pre-Submission Draft 2020-2038 September 2023

Policy 85

Sustainable construction and low carbon energy

New residential developments

New build residential development will achieve a zero-carbon in operation standard, by significantly reducing heat and power demand of the building through energy efficient design and/or modern methods of construction. The remaining energy demand should then be supplied through onsite renewables. Proposed new dwellings will demonstrate the following:

- space heating demand less than 30kWh/m²/annum;
- total energy use less than 40kWh/m²/annum;
- on site renewable energy generation to match the total energy use, with a preference for roof mounted solar PV, subject to building orientation and heritage considerations;
- connection to a district heating network where one is available.

2.4 Future Homes Standard

With the changes to the Building Regulations that came into force in July 2022, and the anticipated Future Homes Standard set for 2025, the climate emergency has never been more relevant and prevalent.

The Future Homes Standard (FHS), alongside the Future Buildings Standard for non-domestic buildings, is set to be introduced in England from 2025, in line with upcoming regulations. Its primary aim is to significantly enhance the energy efficiency of new homes and reduce carbon emissions, supporting the UK's broader strategy to achieve net zero by 2050.

Under the FHS, new homes built from 2025 must produce 75–80% fewer carbon emissions compared to those constructed under 2013 regulations. The Future Buildings Standard sets similar requirements for new non-domestic buildings.

Homes built to the FHS must also be 'zero-carbon ready' and designed so they won't require retrofitting to benefit from the decarbonisation of the electricity grid and the transition to electrified heating. The use of fossil fuel heating systems, such as gas and oil boilers, will not be allowed in new homes, with heating provided instead by low-carbon technologies such as heat pumps and heat networks.

2.5 **Summary**

This Energy & Sustainability statement sets out the methods that could be adopted to ensure that the development not only meets but exceeds the Building Regulations 2021 with regard to CO₂ emissions and overheating, but also the anticipated Future Homes Standard set for 2025. This is in line with national and local policy.

3 ENERGY PERFORMANCE

3.1 Introduction

The energy strategy seeks to ensure that each dwelling has an operational CO₂ emissions performance that meets or exceeds the requirements of 2021 Building regulations Part L

3.2 Site Layout - Orientation, Passive Solar Design and Daylighting

The orientation of properties, along with the size and location of the glazing and the extent of overshadowing, plays an important part in energy performance. Improving a building's orientation so that the main living spaces benefit from the heat and light of the Sun can reduce the requirement to use fuels to perform the same function. This reduces costs, energy use and associated carbon emissions.

Ideally buildings should have a southerly orientation, so that they benefit from the Sun during the middle portion of the day without suffering from potential overheating later in the afternoon. This also helps to ensure that the buildings still benefit as much as possible from sunlight during the winter when the Sun's path is shortened.

However, there is a balance to be struck between maximising solar gain and the risk of overheating. Section 6 of this Statement discusses approaches to addressing and managing this risk which align with the requirements of the new Approved Document O.

3.3 Energy Efficient Building Envelope

A 'fabric first' approach to building specification will be established, ensuring the property envelope will be highly energy efficient, minimising energy demand and increasing comfort. To facilitate this, the individual elements (wall, roof and floor) will be thermally efficient and there will be a focus on ensuring air-tightness through high quality construction. Thermal bridges will be minimised through the application of design details and products (such as insulated lintels) that provide continuous insulation.

3.4 Lighting

Further energy savings will be made by maximising the efficiency of appliances, lighting, fixtures and fittings.

All electric lighting will be energy efficient, and any spot lighting (for example within kitchens and bathrooms) will be provided using dedicated LED fittings.

3.5 Energy Efficiency

As this is an outline application, it is not possible to complete detailed Building Regulations calculations to accurately identify the thermal specifications for the property types, nor provide data in relation to DER performance.

Instead, indicative building performance targets for the proposed development are given in Table 1 below. This has been compiled by applying the good practice specification for

a dwelling built with a heat pump as described in Appendix D of the Approved Document L – Conservation of Fuel and Power Volume 1: Dwellings (December 2021):

Table 1: 'Energy Efficient Measures'

Element	Building Regulations 2021 Maximum (W/m ² K)	Indicative Target U-Value for Proposed Development (W/m ² K)
U values (W/m²K)		
Ground Floor	0.25	0.13
External wall	0.30	0.18
Roof/Sloping Roof	0.20	0.11
Glazing	1.60	1.20
Door	1.60	1.00
Air permeability (m³/m²/hr)	8	5
Thermal bridging (y value, W/m²k)	0.20	0.09

As shown in the table, the indicative specification for the proposed development exceeds the minimum performance standards of the Building Regulations 2021 and will therefore provide a reduction in carbon emissions against the current standard.

Smart meters will also be installed in each property in line with regulations and supplier requirements. High efficiency heat pumps will be specified at detailed design to align the energy strategy with policy 85 in the emerging Local Plan.

3.6 Renewable Energy Technology

A range of renewable and low carbon energy technologies have been considered for the development as detailed below.

3.6.1 Solar Photovoltaics (PV)

Solar photovoltaic (PV) panels generate clean electricity through photon-to-electron energy transfer. PV's can generate electricity even on overcast days, requiring daylight, rather than direct sunlight. This makes them viable even in the UK. They are relatively easy to integrate into new developments, have minimal planning and maintenance implications and are widely accepted by UK households as a proven and reliable technology.



Feasibility Summary – Photovoltaic Panels

Based on available plans showing orientation and available roof space, the provision of supplementary electricity through installation of PV panels is considered to be **feasible**.

Solar PV has been incorporated to form part of the energy strategy.

3.6.2 Solar Thermal

Solar thermal panels are typically used in order to provide supplementary heat for the purposes of space heating or domestic hot water (DHW). These systems consist of solar collectors, a pump, a control unit, hot water tank together with a conventional heat source (gas/ oil fired boiler). The collectors are usually roof mounted and heat a fluid in the pipes that is circulated between the panels and the water storage tank.



Installing solar thermal panels could reduce energy consumption and carbon impacts through reductions in gas/ oil supply.

Typically, solar collectors would produce approximately 5-600 kWh/m² of hot water. Evacuated tube systems are about 30% more efficient but have a corresponding increase in capital outlay. A collector area of 4 – 5 m² could save approximately 230kg of CO₂ emissions per year.

They have additional maintenance requirements over solar PV given the need to maintain antifreeze within the pipework to prevent damage from freezing up in winter.

Feasibility Summary – Solar Thermal Panels

Due to the complexity of the system and the ongoing maintenance requirements, the provision of supplementary DHW by installation of Solar Thermal is considered to be **not feasible**.

Due to an effective fabric first and energy saving approach, Solar Thermal has not been considered as part of the energy strategy.

3.6.3 Wind Energy

Wind turbines generate clean electricity from the wind, with onshore wind being the most cost-effective renewable energy technology in the UK. At the scale needed to be commercially viable a wind turbine near to this site would need to be sited where it will benefit from adequate supplies of wind and be free from turbulence and obstruction. Turbines do not necessarily need high wind speeds to operate, but to be efficient they do need to be located where there will be a relatively constant wind. Turbines have a cut-in (around 3 metres per second) and shut down (around 25 metres per second which equals approximately 56 miles per hour) wind speed, between which the turbine is able to generate power. The optimum output is at around 12–15 metres per second (approximately 26 mph). Such conditions may not be widespread in urban setting. For these reasons wind energy is not proposed at any scale.



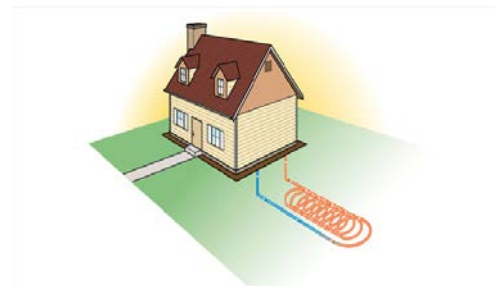
Feasibility Summary – Wind Energy

Due to the adverse environmental impacts, the provision and installation of wind turbines is considered to be **not feasible**.

Also, due to an effective fabric first and energy saving approach, Wind energy has not been considered as part of the energy strategy.

3.6.4 Ground Source Heat Pumps

Ground Source Heat Pumps (GSHP's) operate by the removal of residual heat from the ground by using various loops containing a water and glycol fluid mix. Heat from the ground is absorbed by the fluid and is pumped through a heat exchanger in the heat pump. Heat passes through a compressor and is concentrated into a higher temperature gas capable of heating water for DHW and central heating systems.



The heat yielded from GSHP's is relatively small collecting approximately 14 – 20Wth per metre of collector loop, therefore the efficiency of the heat exchanger is vital in ensuring greater heat transfer. The performance of a GSHP system is also dependent on the

ground conditions (depth of soil cover, type of soil or rock, ground temperature and thermal conductivity) which would need to be established by a ground survey.

Feasibility Summary – Ground Source Heat Pumps

Due to the complexity of the system and the ongoing maintenance requirements, the provision of GSHP's is considered to be **not feasible**.

Also, due to an effective fabric first and energy saving approach, GSHP's have not been considered as part of the energy strategy.

3.6.5 Air Source Heat Pumps

Air Source Heat Pumps (ASHP's) absorb heat from ambient air in order to provide heat for the purposes of space heating and domestic hot water. ASHP's work on a similar principle to a fridge, which extracts heat from its inside. An evaporator coil mounted outside absorbs the heat, a compressor then pumps the refrigerant through the heat pump and compresses it to the right level to suit the heat distribution system.



Finally, a heat exchanger transfers the heat from the refrigerant for use, depending on which of the two main types of system is installed:

- Air to air system – produces warm air which is circulated by fans to heat a home
- Air to water system – uses heat to warm water. Heat pumps heat water to a lower temperature than a standard boiler system, therefore, these systems are more suitable for underfloor heating systems than radiators.

The efficiency of ASHP's is measured by a coefficient of performance (CoP) i.e the amount of heat produced compared to the amount of electricity needed for them to operate. This methodology is also used with GSHP's although the use of air as a heat source instead of the earth results in ASHP's having a lower CoP than GSHP's with subsequently less carbon savings for a similar sized pump. ASHP's have a relatively low heat yield when compared to traditional boilers, therefore buildings must be well insulated and draught proofed to ensure that the heating system is effective.

ASHP's are often a more popular (and technically/ financially viable) alternative to GSHP's due to the lack of requirement for extensive excavation, requiring less space and ease of installation.

Feasibility Summary – Air Source Heat Pumps

Due to the current move away from traditional gas boilers and the availability of green energy the installation of ASHP's for this scheme is considered to be **feasible**.

Along with an effective fabric first and energy saving approach ASHP's have been incorporated as part of the energy strategy.

3.6.6 Combined Heat & Power (CHP)

Combined heat & power (CHP) or “co generation” engines combine the generation of electricity for general consumption with the recovery of exhausted heat energy which can be used to provide heat for domestic and industrial purposes. A CHP plant (typically 75% - 80% efficient) is more efficient than a typical oil/gas fired power station (35% - 45% efficient), even when used in combination with fossil fuels such as gas and diesel. Therefore, it is more efficient than obtaining energy from the National Grid.



They can be highly cost-effective to operate but do need to operate continually and are therefore best suited to meeting substantial base heating loads, for example from a large block of flats or leisure centre.

Feasibility Summary – Combined Heat & Power (CHP)

The relatively low density that is proposed means CHP is unlikely to be commercially viable and has therefore considered to be **not feasible**.

Also, due to an effective fabric first and energy saving approach, CHP has not been considered as part of the energy strategy.

3.6.7 Biomass Heating

Biomass boilers replace conventionally powered boilers with an almost carbon neutral fuel (such as wood pellets). The technology is better suited to non-continual operation than CHP for example in a school where heating start ups / shut downs are required several times over the school terms and although many biomass burners will meet Clean Air Act requirements, combustion of wood biomass releases higher quantities of Nox compared to a comparable system fuelled by natural gas. As a consequence, many Local Authorities, particularly in urban areas have concerns about the potential impact on air quality. The technology also requires significant space and servicing to regularly receive and store fuel deliveries and significant management and maintenance to ensure the system remains operational. For these reasons, biomass heating is discounted as a suitable energy technology.



Feasibility Summary – Biomass Heating

Due to the ongoing maintenance and storage requirements, the provision of Biomass Heating is considered to be **not feasible**.

Also, due to an effective fabric first and energy saving approach, Biomass has not been considered as part of the energy strategy.

3.7 Other Available Technologies

3.7.1 Wastewater Heat Recovery System

Typically, a wastewater heat recovery system works by extracting the heat from the water a shower or bath sends down the drain. This heat is used to warm the incoming mains water, reducing the strain on the system and the energy required to heat the water up to temperature. A system normally takes the form of a long coiled vertical copper pipe, where the warm water runs alongside the colder mains water to exchange the heat.

The devices are typically around 60% efficient, so they convert 60% of the potential energy in the waste water back into heat for the incoming water.

Feasibility Summary – Waste Water Heat Recovery System

Due to the ease of installation, minimal maintenance and predicted energy savings, installation of a WWHRS for this scheme is considered to be **feasible**. However due to the use of ASHP heating WWHRS are not included in the strategy.

3.8 Renewable Energy Summary

Table 2. Considered LZC Technology and inclusion at this development.

LZC Technology	Feasible	Included in this Strategy
Solar Photo-Voltaic	Yes	Yes
Solar Thermal	No	No
Wind Energy	No	No
Ground Source Heat Pumps	No	No
Air Source Heat Pumps	Yes	Yes
Combined Heat & Power	No	No
Biomass	No	No
Waste Water Heat Recovery	Yes	No

4 WATER EFFICIENCY

Water efficiency becomes increasingly important in a changing climate with diminishing water resources.

Water efficiency targets are also driven by the higher standards described within Approved Document G of the Building Regulations which pertain to sanitation, hot water safety and water efficiency.

Within a domestic setting, the requirement is to limit water use to either 125 litres per person per day (l/p/d) or, if required by the planning permission, an enhanced standard of 110 l/p/d.

Considerable savings can be made by specifying water efficient fixtures, fittings and appliances complemented by rainwater recycling (water butts) so that daily water use will not exceed the 110 l/p/d target. The following table is an illustrative list of specifications which typically achieve this standard:

Table 3. Illustrative Water Specifications

Measure	Unit	Specification
Showers	Litres per minute	10
Aerated Taps	Litres per minute	3
Kitchen Taps	Litres per minute	4
Bath	Litre capacity to overflow	140
WC	Litres per flush	4/2.6 (dual flush)

The final specification will be confirmed at detailed design stage, at which point the accredited calculation methodology for Approved Document G can be used to demonstrate that it will meet the required target.

5 ELECTRIC VEHICLE CHARGING

Increasingly, energy and transport systems are becoming interlinked as the nation transitions from the use of petrol and diesel vehicles to zero emission solutions based around electric charging.

Approved Document S of the Building Regulations sets out the comprehensive standards and detailed specifications required at new residential development from June 2022.

The Applicant will therefore design and manage the power network to provide the level of EV charging infrastructure required by Approved Document S. To this end, each dwelling with associated parking will have access to EV charging infrastructure:

- Houses (detached, semi detached or terrace) with associated parking will have one EV charge point installed per property. These should have a minimum nominal output of 7kW and be fitted with a universal socket;
- Apartments with associated parking will have EV charging points installed to reflect the number of dwellings within each of the apartment blocks. Where there are more than 10 parking spaces associated with an apartment block, the remaining spaces without access to an EV charge point should have cable routes installed;
- However, Approved Document S specifies that where the connection cost is greater than £3600 per EV charge point connection (on a site like this where multiple new dwellings are planned, an average connection cost may be used), the maximum number of EV charge points should be installed before the extra grid connection costs exceed £3600 per EV charge point connection. The remaining spaces that would have required EV charge points should have cable routes.

Approved Document S should be referred to for full details including installation requirements, the cost cap and standards for charging points and cable routes.

The actual charging provision to be installed on the proposed site will be investigated at Reserved Matters once the layout is fixed and prices for installation options can be fully explored, in line with Approved Document S.

6 CLIMATE RESILIENCE AND ADAPTATION

The ability of the development to adapt to anticipated future changes in the climate is an important aspect of its longevity, and ultimate habitability. The principle of adaptation applies to both the built and external environment, and indeed how they interact.

The risk of the overheating of living spaces is of increasing concern, given our knowledge of future climate. The new Approved Document O: Overheating, which came into effect in June 2022 details requirements for mitigating the risk of overheating and methods for demonstrating compliance including the use of a compliance checklist or the CIBSE Guide TM59 Design Methodology for the Assessment of Overheating Risk in Homes (CIBSE, June 2017).

When using the CIBSE model for homes which are predominantly naturally ventilated, compliance is based on passing both of the following two criteria:

- (a) For living rooms, kitchens and bedrooms: the number of hours during which ΔT is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 percent of occupied hours. (CIBSE TM52 Criterion 1: Hours of exceedance).
- b) For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of annual hours. (Note: 1% of the annual hours between 22:00 and 07:00 for bedrooms is 32 hours, so 33 or more hours above 26 °C will be recorded as a fail). The third criterion sets an absolute maximum daily temperature for a room, beyond which the level of overheating is unacceptable.

As the specification for this site is developed further, 'TM59 compliant' tests could be undertaken where necessary to ensure the risk of overheating is minimised. In order to provide a more robust analysis, and in the context of a changing climate, the use of a 'future weather' file may also help ensure that we can be more certain of the impact in the future, and the resulting efficacy of the solutions put forward where any overheating risk exists.

7 SUMMARY

This Energy & Sustainability Statement describes how the proposed residential development on land east of Calne Road, Lyneham will incorporate sustainable design and construction principles with a focus on climate change mitigation and adaptation. The following measures have been incorporated into the Energy Strategy in line with Wiltshire Councils current and emerging policies:

- Homes will be highly energy efficient, adopting a fabric first approach and with specifications above current Building Regulations for insulation detailing. They will be orientated to maximise solar gain where possible;
- Heating and hot water will be supplied using highly efficient systems, for example air source heat pumps. This will be reviewed and fixed later in the design process;
- Roof mounted Solar PV will be incorporated subject to building orientation considerations;

The following sustainable design and construction principles with a focus on climate change mitigation and adaptation have also been included:

- The development will employ a combination of highly efficient fixtures, fittings and appliances to reduce domestic water use to achieve a 110 l/p/d target;
- Electric vehicle charging points will be provided to every dwelling with associated parking in line with policy requirements;

In order to meet the 2021 changes in building regulations, as well as the Future Homes Standard, the proposals look to go beyond the current carbon reductions set by local policy and building regulations.

As the planning and development process progresses, and as the wider regulatory environment develops, the approach proposed will be kept under review. The final design solution and associated detail can be provided at the Reserved Matters stage.