



Figure 1: 5 Cambridge Road - Front Elevation

1. INTRODUCTION

This Sustainability and Energy Statement supports a full planning application for the demolition of the existing dwelling and the erection of a replacement single storey dwelling at 5 Cambridge Road, Barley. The property is to be a long-term home for my client and therefore they are keen to integrate renewable energy and low carbon technology into the proposed scheme.

2. ENERGY EFFICIENCY & PASSIVE DESIGN

- A fabric-first approach will be used, with building fabric exceeding the insulation and air permeability requirements of Building Regulations Part L (2021).
- The form and orientation of the new dwelling has been retained to relate to the existing layout and context of the site.
- Large format double glazed units and roof lights to provide passive light and warmth throughout the new property.
- Reduced glazing on the south facing elevation, to mitigate potential overheating.

- Cross-ventilation throughout the property to improve thermal comfort internally, which is achieved through glazing to all aspects, as well as roof lights to curtained vaulted ceiling areas, to allow for the expulsion of warmer air in summer months.
 - Retention of all but two existing trees to allow natural shading in summer months.
-

3. RENEWABLE & LOW CARBON ENERGY STRATEGY

The proposed replacement dwelling integrates several renewable and low-carbon technologies, including:

- A combination of solar thermal and solar PV panels, discretely located on the side roof slope (south-facing). To provide hot water and an additional electricity supply.
- Battery storage system to maximise usage of generated renewable energy onsite.
- An 'Air Source Heat Pump' (ASHP) providing heating and hot water, located to the rear of the dwelling in a discrete location.
- A 'Mechanical Heat Recovery and Ventilation' system (MVHR) to provide constant, filtered fresh air, reducing humidity and preventing mould.
- Electric vehicle charging points for two vehicles, situated within the new driveway area. Served by energy produced from the solar panels.
- Brand new energy efficient appliances to reduce demand on electricity.
- LED lighting throughout the property, some on passive timers, to reduce demand on electricity.

These various technologies aim to reduce reliance on grid-supplied energy and fossil fuels and significantly lower the dwelling's operational emissions.

4. ESTIMATED CARBON EMISSIONS

Detailed SAP calculations will follow at Building Regulations stage; the development is expected to achieve:

- A minimum 20% reduction in CO₂ emissions compared to the baseline Target Emission Rate (TER).
 - Compliance with the 'Silver' performance benchmark set out in the North Hertfordshire Sustainability SPD (2024) for minor residential development.
-

5. MATERIALS, LABOUR & EMBODIED CARBON

- Local and sustainable sourcing of building materials wherever possible.
- Re-use of existing timber and structural components where viable.
- Labour will be sourced locally, as well as suppliers, therefore reducing transport emissions and supporting the local economy.
- Consideration will be given to BRE's Green Guide to Specification, to ensure materials have a low environmental impact.
- Recycled and upcycled furniture where possible.

6. WATER & DRAINAGE

- Water-efficient fittings, such as dual flush toilets and appliances will be used to achieve a consumption rate of ≤ 110 litres per person per day, as per Building Regulations.
- Water butts will be installed at downpipes for garden irrigation.
- The new driveway will be of a permeable material, to promote natural drainage and improve ground permeability.
- A full SuDS strategy will be developed as part of the construction detailing.

7. SUSTAINABLE TRAVEL & SITE ACCESS

Barley is a rural location, however the site provides:

- Secure cycle storage within the proposed double garage.
- Electric vehicle charging (x2)
- Access to nearby towns and rail links via the A507 (~2.5 miles away)

The integration of EV charging powered by on-site PV makes the scheme highly sustainable in terms of transport.

8. SUMMARY OF MEASURES

Energy Efficiency - Fabric-first design exceeding Part L 2021

Renewable Energy - PV panels + ASHP + MVHR

Carbon Emissions - Targeting $\geq 20\%$ reduction beyond TER baseline

Water Use - ≤ 110 litres/person/day, water butts for irrigation

Materials & Embodied Carbon - Locally sourced, sustainable, reused where possible

Transport - EV charging x2, cycle storage, proximity to major routes

Overheating Mitigation - Reduced glazing to south, MVHR system.

9. CONCLUSION

The proposed replacement dwelling at 5 Cambridge Road, Barley, will deliver a high-performing, low-carbon home that exceeds the sustainability requirements set out in the North Hertfordshire Local Plan and accompanying SPD. It achieves reductions in energy use and CO₂ emissions, utilises renewable technologies, and responds sensitively to its rural location using passive and resource-efficient design.
