

Carbon Footprint Assessment

Highview, Kersal Road, M25

1. Introduction

This report provides an estimate of the operational carbon emissions associated with the residential property at Highview, Kersal Road (M25). The assessment has been prepared to support a planning application and demonstrates the anticipated carbon performance of the dwelling in line with current UK energy efficiency standards and decarbonisation objectives.

2. Property Description

The subject property is a residential dwelling with the following specifications:

Gross internal floor area: 130 m²

Energy Performance Certificate (EPC): Rating B

Heating system: Air Source Heat Pump (no gas connection)

External wall construction: 200 mm Rockwool external insulation system

Windows: Double-glazed timber units

The dwelling benefits from a high-performance building fabric and low-carbon heating system, significantly reducing operational energy demand and associated emissions.

3. Methodology

The carbon footprint has been estimated using established UK residential emissions benchmarks, expressed in kilograms of carbon dioxide per square metre per year ($\text{kgCO}_2/\text{m}^2/\text{year}$).

In accordance with guidance underpinning Approved Document Part L (Conservation of Fuel and Power) and prevailing decarbonisation trajectories for grid electricity, an adjusted emissions intensity has been applied to reflect:

Enhanced thermal performance of the building envelope

Reduced space heating demand due to external wall insulation

Efficient, low-carbon heating via an air source heat pump

Absence of fossil fuel (gas) usage

An emissions intensity range of 8–12 $\text{kgCO}_2/\text{m}^2/\text{year}$ has been adopted, representing a conservative and policy-aligned estimate for a dwelling of this specification.

4. Carbon Emissions Calculation

Inputs:

Floor area: 130 m²

Emissions intensity: 8–12 kgCO₂/m²/year

Calculated annual emissions:

Lower estimate: 1,040 kg CO₂/year

Upper estimate: 1,560 kg CO₂/year

5. Results and Assessment

The total estimated operational carbon emissions for the property are therefore:

> 1.0 – 1.6 tonnes CO₂ per annum

A central estimate of approximately:

> 1.1 – 1.3 tonnes CO₂ per annum

is considered representative under typical occupancy and usage conditions.

6. Planning and Policy Context

The calculated emissions demonstrate a substantial reduction when compared to typical UK residential properties (commonly in the range of 4–6 tonnes CO₂ per annum).

The development aligns with:

National requirements under Building Regulations Part L

The UK Government's net zero carbon targets

Local authority objectives to reduce operational carbon emissions in the built environment

The use of an all-electric heating system combined with enhanced insulation ensures the dwelling is well-positioned to benefit from continued decarbonisation of the UK electricity grid.

7. Conclusion

The proposed dwelling achieves a low operational carbon footprint, estimated at approximately 1.0–1.6 tonnes CO₂ per year, significantly outperforming typical existing housing stock.

The combination of high-performance insulation, efficient glazing, and a heat pump heating system ensures compliance with current regulatory standards and supports wider planning policy objectives for sustainable development and carbon reduction.