



FOXWOOD GARDEN VILLAGE PHASE 3, WHISTON, KNOWSLEY COUNCIL

ENERGY REPORT

Taylor
Wimpey

December 2025

Draft V. 1.0

Introduction

This Energy Report has been prepared by Award Energy Consultants in connection with the hybrid planning application for up to 190 dwellings (93 in detail) at Fox Wood Garden Village, Whiston. This report considers the issues surrounding sustainable construction with regards to the proposed residential development. In particular, it considers and evaluates the measures incorporated into the design of the development to reduce the predicted carbon emissions and water usage of the site as per Knowsley Council's development policies.

Policy Context

The following documents were considered:

Building Regulations Part L1 2021 - as newly constructed dwellings, Part L1 is of particular note. Part L1 sets minimum standards for fabric and energy efficiency for new dwellings. Whilst a proportion of the proposed dwellings will be built to Future Homes Standards, the consultation for its implementation has not yet been concluded and therefore this Report is grounded in Part L1 2021 which are the regulations in force at the time of writing

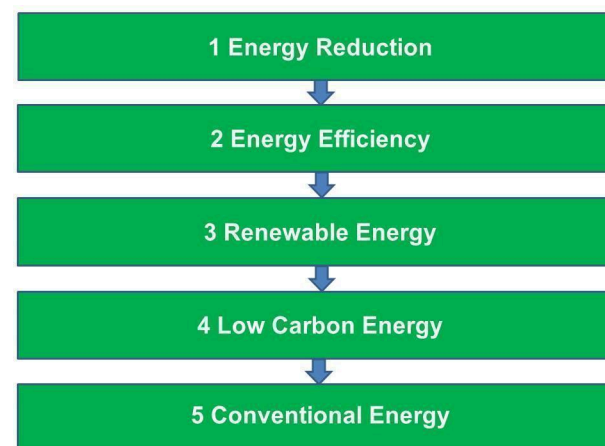
National Planning Policy Framework 2024 - strengthens the emphasis on sustainable development and requires new developments to secure the highest viable resource and energy efficiency and reduction in emissions by considering governmental and other national standards

Knowsley Council Local Plan Policy CS22: Sustainable and Low Carbon Development- emphasises the importance of new developments meeting high standards of sustainable design in order to minimise carbon emissions. This is done via incorporating high levels of insulation and the use of decentralised renewable energy where feasible

Knowsley Council Local Plan Policy CS23: Renewable and Low Carbon Infrastructure- states that the council will support proposals that will produce low carbon, renewable energy provided there are no adverse effects

Energy Hierarchy

Award Energy have been instructed to assess the potential energy efficiencies and carbon emission reductions that can be achieved through aligning with the Energy Hierarchy as encouraged by Knowsley Council's sustainability policies which reduce energy demand, increases efficiencies and incorporates renewables.



Taylor Wimpey is committed to achieving carbon emissions and energy demand reductions in excess of the requirements of Part L1 2021 and construction from 2028 onwards will adopt a net zero approach through efficient material selection, renewable energy supply and verified carbon assessment. Due to the lack of a nearby existing or proposed district heating network, the intention is to use a fabric-first approach meaning that sustainability is built into the development before considering the application of bolt-on technologies in the form of Photovoltaic panels. As the Future Homes Standards timetable is uncertain at this time, Air Source Heat Pumps have not been included for the purposes of this Report, however they will be installed in any plots falling into the requirements of the FHS at the relevant time.

Step 1 - Energy Reduction

The first step of the hierarchy requires developments to use less energy through passive design measures including the maximisation of solar heating and reducing heat loss and meeting the requirements to reduce energy consumption and introduce energy efficiency

- The development layout has been designed to maximise a north-south orientation where possible to allow for passive design whereby dual aspect dwellings enable views, good daylighting, solar gain and cross ventilation
- Internally, the accommodation has been laid out to maximise the internal space and light afforded, with primary habitable rooms benefitting from a southern orientation. Each of the principal living rooms will have sufficient glazing to allow natural light to penetrate the rooms, reducing the need for artificial lighting and enhancing solar gain
- The construction specification of every home will include high levels of insulation in the ground floor, external walls and roof spaces and all fabric elements will have u-values lower than those required by Part L 2021
- High levels of air tightness to be achieved within the construction of the dwelling to reduce unnecessary heat loss; all dwellings will be tested for air leakage
- All dwellings will meet the requirements of Approved Document Part O: Overheating, utilising an appropriate glazing specification and opening areas to minimise solar gain and allow purge ventilation.
- All houses will benefit from a garden or private space for recreation, thus allowing external space for recreation and clothes drying

Step 2 - Energy Efficiency

- Energy efficient lamps will be installed in every light fitting. Each entrance will be illuminated with an energy efficient external light with appropriate controls to avoid unnecessary use
- Highly efficient gas boilers will be installed in each house and will include appropriate controls to maximise the efficient use of the system.
- The design team propose using natural ventilation via background/trickle ventilation, opening windows and wet room extraction
- Electric Vehicle Charging Points or Bollards will be provided in line with AD Part S

Fabric Specification

In line with Steps 1 & 2 of the Energy Hierarchy, Taylor Wimpey proposes an enhanced construction specification as detailed in Table 1 below, with all elements surpassing the performance values required by Building Regulations. This aligns with Knowsley Council's policy to achieve high standards of insulation.

Table1

Element	Value required by AD Part L1 2021 (u-value)	Enhanced specification (u-value)
Walls (w/m ² k)	0.26	0.25
Party Walls (w/m ² k)	0.20	0.00
Roofs (w/m ² k)	0.16	0.11
Floors (w/m ² k)	0.18	0.15
Windows (w/m ² k)	1.6	0.86
Doors (w/m ² k)	1.6	1.2
Design air pressure test (m ³ /h/m ²)	8	4.5

Step 3 – Renewable Energy

Award Energy have analysed the different available forms of renewable energy technology for inclusion in the development and which will be most feasible for this development in accordance with Policy CS23, as detailed in Table 2 below. Table 3 details the amount of PV used for each dwelling type.

Table 2

Technology	Evaluation
Photovoltaics (PV)	Solar photovoltaic panels are technically feasible, easily understood by potential purchasers and provide significant occupier benefits. Therefore, Photovoltaic Panels will be considered during the design process and the approximate amounts shown in Table 3 have been included for the purposes of this Report
Combined Heat & Power	It is considered that the development infrastructure is not adequate to provide centralized heating and hot water from CHP across the site due the need for an energy centre and the corresponding space considerations
District Heating	There are no available District Heating Networks available for the development at this stage
Solar Hot Water	Solar Hot Water panels could not provide a sufficiently effective contribution to offset energy requirements for hot water within the dwellings due to the excellent efficiencies within the proposed heating systems.
Biomass Heating (including Biomass CHP)	Biomass boilers are not technically feasible due to lack of space for storage of pellets
Air Source Heat Pumps (ASHPs)	Air Source Heat Pumps will be considered for any plots that fall into the Future Homes Standards, though the M&E design has not yet been finalised and therefore have not been included in the calculations for this Report
Ground Source Heat Pumps (GSHPs)	GSHPs are not a suitable technology for due to lack of suitable ground space for the necessary horizontal coils
Wind Turbines	The national wind database for the site suggests that the average wind speed on the site will be 4.6 m/s at 10 m above the ground. To be technically feasible, local wind speeds need to be a minimum of 5 m/s therefore this site is not feasible for wind
Micro Hydro	There is no capacity for micro hydro on this site since there are no local watercourses available.

Table 3

Dwelling Type	Number	Photovoltaics Per Plot (approximate kWp)	Total PV (approximate kWp)
Mid Terrace	8	0.81	6.48
Semi-Detached/End Terrace	52	1.215	63.18
Detached	33	2.025	66.83
Total	93	—	136.49

Carbon Reduction Calculations

Award Energy has compared the specification that will achieve minimum compliance with Part L 2021 with the intended enhanced specification as shown in Table 1, including Photovoltaic panels in the amounts shown in Table 3. Table 4 below shows the predicted Carbon Emissions for the proposed dwelling types.

Table 4

Dwelling Type	Carbon Emissions (KgCO ₂ /Year/m ²) Baseline specification	Carbon Emissions (KgCO ₂ /Year/m ²) Enhanced specification	% Reduction in Carbon Emissions over Part L 2021
Mid Terrace	9.92	8.85	10.79
Semi-Detached/End Terrace	10.01	9.70	3.10
Detached	10.00	9.73	2.70

*calculated using SAP10 software. Award Energy can, upon request, provide reports from SAP10.

Table 5 below shows the predicted Carbon Emissions for each house type, weighted to accurately represent the mix on site. The predicted baseline weighted carbon emissions for the site are **10.00 KgCO₂/Year/m²** (with all properties meeting the minimum requirements of Part L1 2021). The average predicted carbon emissions with the design team's enhanced specification are **9.63 KgCO₂/Year/m²**, representing a **3.70%** reduction in site-wide carbon emissions over Part L1 2021.

Table 5

Dwelling Type	Number	Weighted Average Carbon Emissions (KgCO ₂ /Year/m ²) Baseline specification	Weighted Average Carbon Emissions (KgCO ₂ /Year/m ²) Enhanced specification
Mid Terrace	8	0.89	0.80
Semi-Detached/End Terrace	52	5.61	5.43
Detached	33	3.50	3.41
Total	93	10.00	9.63
Weighted Average Carbon Emission Reduction above Part L1 2021 = 3.70%			

*calculated using SAP10 software. Award Energy can, upon request, provide reports from SAP10.

Energy Demand Calculations

As laid out in Table 6 below, the energy demand was calculated from SAP10 for each house type, both with the enhanced specification then with the addition of the Photovoltaic panels in the amounts in Table 3.

Table 6

Dwelling Type	Energy Demand per dwelling type Enhanced Specification per dwelling type (kWh/Year)	Energy Demand per dwelling type With PV (kWh/Year)	% Reduction in Energy Demand through Renewables
Mid Terrace	3424.04	4012.33	14.66%
Semi-Detached/End Terrace	882.43	5102.57	14.74%
Detached	1470.72	5001.46	22.72%

*calculated using SAP10 software

Once weighted to reflect the house type mix on site, the site-wide Energy Demand with Taylor Wimpey's enhanced specification is predicted to be **5977.98 kWh per year**. Once approximately **136.49 kWp** of Photovoltaics are applied, the site-wide Energy Demand is predicted to reduce to **4916.12 kWh** per year, a **17.76%** reduction through the use of Photovoltaic panels.

Table 7

Dwelling Type	Number	Energy Demand per dwelling type Enhanced Specification (kWh/Year) Weighted	Energy Demand per dwelling type With PV (kWh/Year) Weighted
Mid Terrace	8	361.11	308.16
Semi-Detached/End Terrace	52	3351.60	2857.44
Detached	33	2265.27	1750.51
Total	93	5977.98	4916.12
Site-wide Reduction in Energy Demand through Renewables = 17.76%			

Water Efficiency

Approved Document G (2010) restricts new build dwellings to a maximum consumption of 125 litres per person per day. It is proposed that eco-sanitary ware and restricted flow rates will be introduced into the design of each dwelling to obtain an amount significantly lower than the appropriate level of water efficiency at **97 litres** per person per day, as shown in Table 8 below. These measures include low flow taps and showers along with dual flush toilets. This aligns with Knowsley Council's policy for the effective and sustainable use of water.

Table 8

Installation Type	Unit of Measurement	Capacity/Flow Rate	Use Factor	Fixed Use	Litres Per Person per day
WC (Dual Flush)	Full Flush (litres)	4	1.46	0.00	5.84
	Part Flush (litres)	2.6	2.96	0.00	7.7
Taps (excluding kitchen tap)	Flow rate (litres/minute)	5	1.58	1.58	9.48
Baths (where shower present)	Capacity to overflow (litres)	156	0.11	0.00	17.16
Showers (where bath present)	Flow rate (litres/minute)	6	4.37	0.00	26.22
Kitchen sink tap	Flow rate (litres/minute)	6	0.44	10.36	13.00
Washing Machine	Litres/kg dry load	8.17	2.1	0.00	17.16
Dishwasher	Litres/place setting	1.25	3.60	0.00	4.50
	TOTAL				101.06

Total Internal Water Consumption	101.06
Normalisation Factor (x 0.91)	91.96
External Use	5.00
Part G Water Consumption	97.00

Conclusion

This report demonstrates that the proposed enhanced fabric specification in combination with approximately **136.49 kWp** of Photovoltaic panels represents a significant enhancement in sustainability for the proposed new dwellings at Foxwood Garden Village, Whiston. The renewable technology in the form of Photovoltaic panels anticipated for the development is predicted to provide **17.76%** of the site wide energy demand and, along with the enhanced specification, reduces site-wide Carbon Emissions by **3.70%** over Part L1 2021. Knowsley Council can be assured that the development at Foxwood Garden Village, Whiston will exceed the requirements of Building Regulations standards in relation to carbon reduction and contribution from renewable energy and meet the intentions of the Council's Local Plan Sustainability policies designed to reduce both the extent and the impacts of climate change.

Caveat

This document has been prepared for the titled project, or named part thereof, and should not be relied upon or used for any other project or part as the case may be, without an independent check being made on it. Award Energy shall not be liable for the consequences of using this document other than for the purpose for which it was commissioned, and any user and any other person using or relying on this document for such other purpose, agrees and will be such use or reliance be taken to confirm this agreement to indemnify Award Energy for all loss of damage resulting therefrom.