London Plan Energy Statement

On Behalf of West London Composting Ltd

For the proposed Waste Transfer Station Building, 'Land off' New Year's Green Lane, Harefield, Uxbridge, Hillingdon UB9 6LX

Revision	Date	Description	Author
R00	14/07/2025	Initial Draft	TW
R02	16/07/2025	Amendments following comment	TW

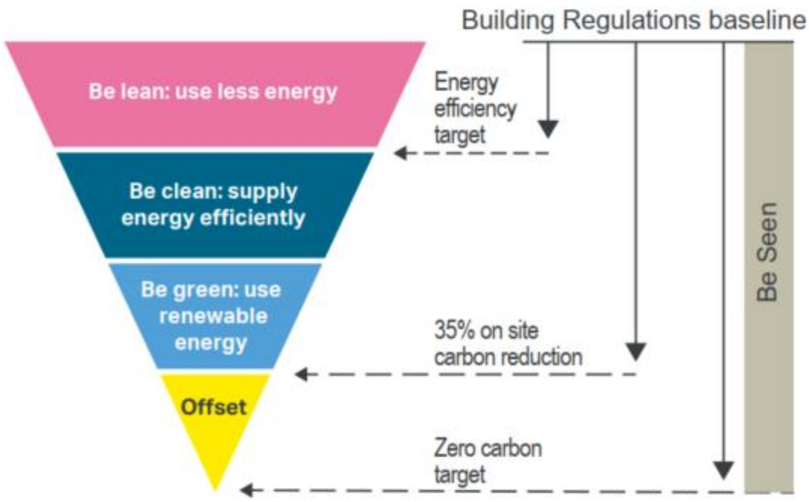
I. Executive Summary

This Energy Statement has been produced by NRG Zero Ltd on behalf of West London Composting Ltd ('the Applicant') and is written in support of the Planning Application for the proposed Waste Transfer Station Building, 'Land off' New Year's Green Lane, Harefield, Uxbridge, Hillingdon UB9 6LX.

It will set out the measures planned by the Applicant to achieve CO2 reductions at the proposed development site, demonstrating compliance with:

I. National Planning Policy Framework.
II. Approved Document Part L of the Building Regulations 2021.
III. The London Plan 2021
IV. The local planning policy requirements for Hillingdon Borough Council.

This Energy Statement sets out how design measures will be incorporated as part of the Development, aligning with the principles of the energy hierarchy.



Source: Greater London Authority

This Energy Statement concludes that the following combination of measures, summarised overleaf in Table 1, will be incorporated into the Development demonstrating how the energy standard will be delivered by the Applicant.

Table 1: Measures incorporated to deliver the energy standard.

Fabric first: Demand-reduction measures	• Low-energy lighting throughout the development.
Low-carbon & renewable energy	• PV array of 13kWp in order to reach the required minimum 35% reduction in CO^2 emissions.

The impact of these design measures in terms of how the Applicant delivers the energy standard is illustrated in Figure 1 and Table 2:

Figure 1: How the Development meets the energy standard ADL2021

Table 2: CO_2 emissions and percentage reduction over ADL2021

	CO_2 emissions	
	Kg/CO_2 per annum	% reduction
Target Emission Rate: Compliant with ADL 2021	1,635	-
Fabric-first & Low-carbon measures	1,365	16.5%
Heating Infrastructure	1,365	0.00%
Renewable energy	1,050	23.1%
Total savings	**585**	**35.8%**

2. Purpose of the Energy Statement

This Statement sets out how the Applicant intends to meet:

I. National Planning Policy Framework.
II. Approved Document Part L of the Building Regulations 2021.
III. The London Plan 2021
IV. The local planning policy requirements for Hillingdon Borough Council.

The way in which the Applicant meets the energy standard at the proposed Waste Transfer Station Building, will be set out in this Statement as follows:

- Baseline energy demand: The Development's Target Emission Rate (TER) will be calculated to establish the minimum on-site standard for compliance with ADL 2021.

- Be Lean: Fabric-First reduced energy demand: The Development's Dwelling Emission Rate (DER) will be calculated to explain how the Applicant's design specification will lead to a reduced energy demand and an improved fabric energy efficiency. The better the design of the building fabric in terms of, for example, insulation, air tightness and orientation to maximise solar gain, the less energy required to heat the dwelling and so the better the fabric energy efficiency.

- Be Green: Low-carbon and renewable energy: Low-carbon and renewable energy technologies will be assessed for their suitability and viability in relation to the Development. Solutions will be put forward for the development and the resulting CO2 emission savings presented.

Methods

NRG Zero Ltd has used iSBEM 6.1e methodology to calculate the energy demand for the proposed development.

3. Development Introduction

This Energy Statement has been prepared for the proposed non-residential storage development: Waste Transfer Station Building. This Development falls under the jurisdiction of London Borough of Hillingdon Council.

The proposed new build, single storey Development comprises a storage facility of 1500m².

Map 1: Site Layout Plan

Source: SLR Consulting Project No: 402.065523.00001

4. Baseline Energy Demand

Introduction

In order to measure the effectiveness of demand-reduction measures, it is first necessary to calculate the baseline energy demand, and this has been done using iSBEM 6.1e (non-residential) methodologies. This can also be referred to as the Target Emission Rate (TER).

The resulting ADL 2021 Baseline for the proposed Waste Transfer Station Building has been calculated using Part L model designs which have been applied to the Applicant's Development details. The baseline energy demand represents the maximum $kgCO^2$ emissions permitted for the Development in order to comply with ADL 2021.

The Development Baseline

The resulting TER for the proposed storage development, representing the total maximum CO2 emissions permitted for the Development, has been calculated as 1,635 kg/CO2 per annum. To ensure compliance with ADL2021, CO2 emissions should not exceed this figure.

5. Be Lean - Fabric-first Approach

Many Local Planning Authorities are now recognising the benefits of a fabric-first approach, where the lifetime energy consumption of a building takes precedence over the use of bolt-on renewable energy technologies.

It is clear that the fabric-first approach can create buildings with a very comfortable living and working environment. The internal temperature is consistent and fuel bills are kept to a minimum. One key advantage of a fabric-first approach is that it does not require changes to the behavioural patterns of the occupants and, as such, a building designed using a fabric-first approach will often perform more effectively once completed than a building that incorporates a low-carbon or renewable-energy technology that requires behavioural change (e.g., solar thermal). This becomes an increasingly important consideration as energy costs rise and the issue of fuel poverty becomes commonplace.

NRG Zero Ltd has considered a fabric-first approach as the priority solution for this Development as it can be shown that the energy standard required to achieve the Target Emission Rate of Approved Document L (2021) at this Waste Transfer Station Building development can be exceeded through the use of efficient building fabric and building services.

The Applicant will integrate the following design measures to reduce energy demand:

- Energy-efficient building fabric and insulation to all heat loss floors, walls and roofs.
- High-efficiency double-glazed windows throughout.
- Quality of build will be confirmed by achieving good air-tightness results throughout.
- Efficient-building services including high-efficiency heating systems.
- Low-energy lighting throughout the building.

The Applicant's design specification and intended demand-reduction measures for the Development have been modelled using the same iSBEM 6.1e methodologies as before.

The total calculated CO2 emissions for the proposed Waste Transfer Station Building is 1,365 Kg/CO2 per annum, which is a reduction of 16.5% over the Baseline by way of the installation of 10kWp Photovoltaic.

Table 3: Fabric Design Specification

Fabric Element	L1A Design Specification
Ground Floor U-Value (W/m²K)	Uninsulated
External Walls U-Value (W/m²K)	Uninsulated
Roof U-Value (W/m²K)	Uninsulated
Design Air Permeability	15 N/A
Space Heating	Unheated
Domestic Hot Water	No DHW
Low Energy Lighting	Throughout – 120l/cW

6. Low-carbon & Renewable Technologies

The Applicant adopts a fabric-first approach as the priority solution for this Development and steps have been taken to reduce energy demand through high-quality sustainable design. The planned integration of efficient building fabric and building services has been modelled and is predicted to lead to an enhancement over Part L of the Building Regulations 2021.

The low-carbon and renewable energy solutions applicable to this development scheme are assessed and potentially viable solutions recorded.

Viability of the following low-carbon and renewable energy technologies have been considered:

- Wind
- Solar
- Aerothermal
- Geothermal
- Biomass

Viable Technologies:

The following low-carbon and renewable energy technologies, summarised here in Table 4, are considered potentially viable options for the development scheme at the proposed Waste Transfer Station Building.

Table 4: Summary of Feasibility for Waste Transfer Station Building.

✓	Solar Thermal Solar PV
✗	Air Source Heat Pumps Wind Turbines Biomass Boilers Ground Source Heat Pumps

The Applicant has opted to install a total of 13kWp PV array in order to reach the required minimum 35% reduction in CO^2.

7.2 Wind	The ability to generate electricity via a turbine or similar device which harnesses natural wind energy. This could be considered as an onsite solution to reducing carbon emissions (turbines included within the development), or offsite (investing financially into a nearby wind farm).
Installation Considerations	▪ Wind turbines come in a variety of sizes and shapes. Turbines of 1 Kw can be installed to single house and large-scale turbines of 1-2 MW can be installed on a development to generate electricity to multiple dwellings and other buildings. In both instances the electricity generated can be used on site or exported to the grid. Vertical- or horizontal-axis turbines are available. ▪ A roof-mounted 1 kW micro wind system costs up to £3,000. A 2.5 kW pole-mounted system costs between £9,900 and £19,000. A 6 kW pole-mounted system costs between £21,000 and £30,000 (taken from the Energy Saving Trust, TBC by supplier) ▪ Local average wind speed is a determining factor. A minimum average wind speed of 6 m/s is required. ▪ Noise considerations can be an issue dependent on density and build-up of the surrounding area. ▪ Buildings in the immediate area can disrupt wind speed and reduce performance of the system. ▪ Planning permission will be required along with suitable space to site the turbine, whether ground installed, or roof mounted.
Advantages	▪ Generation of clean electricity which can be exported to the grid or used onsite. ▪ Can benefit from the Feed in Tariff, reducing payback costs.
Disadvantages	▪ Planning restrictions and local climate often limit installation opportunities. ▪ Annual maintenance required. ▪ High initial capital cost. It is usual for an investor to consider a series of turbines to make the investment financially sound.
Development Feasibility **X**	▪ Installing a large turbine in an area such as this is not considered to be appropriate due to its appearance and physical impact on the built-up environment. Residents' and neighbours' concerns may include the look of the turbine, the hum of the generator and the possibility of stroboscopic shadowing from the blades on homes. ▪ Wind speed has been checked for the development scheme using the NOABL wind map: http://www.rensmart.com/Weather/BERR. The wind speed at ten metres for the development scheme is 4.8 metres per second (m/s) which is (below) the minimum of 5 m/s and threshold for technical viability. ▪ Typical payback times for a single turbine are expected to be greater than 15 years which means that the cost of installing and maintaining a single wind turbine is not considered a commercially-viable option.

7.3 Solar PV & Solar Thermal	The ability to generate energy (either electricity, hot water, or a combination of the two) through harnessing natural solar energy. This could include the use of solar thermal panels, photovoltaic (PV) panels, or a combined solution. PV panels, similarly to turbines, can be considered both on and offsite. Solar Photovoltaics convert solar radiation into electricity which can be used on site or exported to the national grid. Solar Thermal generates domestic hot water from the sun's radiation. Glycol circulates within either flat plate or evacuated tube panels, absorbing heat from the sun, and transferring this energy to a water cylinder. A well designed solar thermal system will account for 50-60% of a dwelling's annual hot water demand. Sizing the system to meet a higher demand will lead to excess heat generation in the summer months and overheating of the system.
Installation Considerations	▪ Operate most efficiently on a south-facing sloping roof (between 30 and 45-degree pitch.) ▪ Shading must be minimal (one shaded panel can impact the output of the rest of the array.) ▪ Panels must not be laid horizontally on a flat roof as they will not self-clean. Panels will therefore need to be installed at an angle and with appropriate space between them, to avoid overshading. ▪ Large arrays may require upgrades to substations if exporting electricity to the grid. ▪ Local planning requirements may restrict installation of panels on certain elevations. ▪ Installation must consider pitch and fall of the roof, along with any additional plant on the roof to ensure there is sufficient room. ▪ The average domestic solar PV system is 4kWp and costs £5,000 - £8,000 (including VAT at 5 per cent) - (taken from the Energy Saving Trust, TBC by supplier.)
Advantages	▪ Relatively straightforward installation, connection to landlord's supply and metering. ▪ Linear improvement in performance as more panels are installed. ▪ Maintenance free. ▪ Installation costs are continually reducing. ▪ Can benefit from the Feed in Tariff to improve financial payback.
Disadvantages	▪ Not appropriate for high-rise developments, due to lack of roof space in relation to total floor area. ▪ With Solar Thermal, performance is limited by the hot water demand of the building – system oversizing will lead to overheating.
Development Feasibility ✓	▪ The suitability of solar panels has been considered for this Development and are concluded as not a technically-viable option. ▪ There are potential areas of roof space suitable for the positioning of unshaded solar PV arrays.

	▪ The Development is not on land, which is protected or listed, so it is considered that solar panels would not have a negative impact on the local historical environment or the aesthetics of the area. ▪ The commercial viability of Solar PV or Solar Thermal would need to be fully explored if considered part of an Energy Strategy as the economical investment would need to be justified by the return on the Applicant's investment.
7.4 Aerothermal	The transfer of latent heat in the atmosphere to a compressed refrigerant gas to warm the water in a heating system. This includes air to water heat pumps and air conditioning systems. Air Source Heat Pumps (ASHPs) extract heat from the external air and condense this energy to heat a smaller space within a dwelling or non-domestic building. A pump circulates a refrigerant through a coil to absorb energy from the air. This refrigerant is then compressed to raise its temperature which can then be used for space heating and domestic hot water. They can feed either low-temperature radiators or underfloor heating and often have electric immersion heater back-up for the winter months.
Installation Considerations	▪ ASHPs operate effectively in buildings with a low energy demand, as they emit low levels of energy suitable for maintaining rather than dramatically increasing internal temperatures. It is therefore vital that the dwelling has a low heating demand to ensure the system can provide appropriate space-heating capability. ▪ Underfloor heating will give the best performance, but oversized radiators can also be used. ▪ Immersion heater back-up required to ensure appropriate Domestic Hot Water (DHW) temperature in winter months. ▪ Noise from the external unit can limit areas for installation. ▪ £7,000-£11,000 per dwelling (taken from the Energy Saving Trust, TBC by supplier.)
Advantages	▪ Air source systems are a good alternative solution to providing heating and hot water to well-insulated, low heat loss dwellings. ▪ They require additional space when compared to a gas boiler. Space for an external unit is needed, as is space for the hot water cylinder and internal pump. ▪ Heat pumps are generally quiet to run. ▪ Running costs between heat pumps and modern gas boilers are comparable. ▪ Heat pumps are a low energy heating solution and are encouraged as part of the Future Homes Standard package of regulations changes which are being implemented in England over the next few years.
Disadvantages	▪ Residents need to be made aware of the most efficient way of using a heat pump, as the low flow rates used by such a system means that room temperature cannot be changed as reactively as a conventional gas or oil boiler system.

	▪ Will not perform well in homes that are left unoccupied and unheated for a long period of time. ▪ Back-up immersion heating can drastically increase running costs. ▪ Noise and aesthetic considerations limit installation opportunities.
Development Feasibility **X**	▪ ASHPs are considered a technically-viable option for this development scheme. ▪ The costs of installing an ASHP, compared to the costs of installing an A-rated boiler, are higher which means there is a capital-cost implication to consider. ▪ Additional space is required for larger internal units, incorporating hot water cylinders, and also outside to install the condenser unit. ▪ For this reason, ASHPs may not be considered viable on all plots, however the energy saving advantages of heat pumps mean the required sitewide reduction can be achieved without including ASHP to every plot.
7.5 Geothermal	The transfer of latent heat from the ground to a compressed refrigerant gas to warm the water in a heating system. This includes ground source heat pumps. Heat can be collected through the use of either horizontally laid or vertically installed coils. Ground Source Heat Pumps (GSHPs) operate on the same principle as an Air Source Heat Pump (ASHP) in that they extract heat from a source (in this instance the ground) and compress this energy to increase temperature for space heating and hot water. Pipework is installed into the ground, either through coils or in bore holes and piles, circulating a mix of water and antifreeze to extract energy from the ground, where the year-round temperature is relatively consistent (approx. 10°C at 4 metres depth). This leads to a reliable source of heat for the building. Again, an electrically powered pump circulates the liquid and powers the compressor, however annual efficiencies for GSHPs tend to be higher than those of ASHPs.
Installation Considerations	▪ Require appropriate ground conditions to sink piles/bore holes or excavate for coils (which also require a large area of land.) ▪ Decision between coils or piles can lead to significant extra cost. ▪ Need to consider whether low temperature output is fed through underfloor heating (most efficient) or oversized radiators. ▪ Similar to ASHPs, perform best in well-insulated buildings with a low heating demand. ▪ Electric immersion heater required for winter use. ▪ £11,000-£15,000 per dwelling dependent on the size of the system (taken from the Energy Saving Trust, TBC by supplier.)
Advantages	▪ Perform well in well-insulated buildings, with limited heating demand. ▪ More efficient than ASHPs

Disadvantages	▪ The coils can be damaged by natural earthworks and by intensive gardening practices – occupants would need to be aware of the location of the coils for this system, and how to operate the system efficiently. Coils may also be damaged within the dwelling where the circuit is connected to the internal unit. ▪ Will not perform well in buildings that are left unoccupied and unheated for a long period of time. ▪ Back up immersion heating can drastically increase running costs. ▪ Large area of ground needed for coil installation
Development Feasibility **X**	▪ GSHPs are considered a technically-viable option for this development scheme as there are no physical constraints in terms of ground conditions and area available for installation. ▪ The capital installation cost would, however, be high which leads us to the conclusion that GSHPs would not be a commercially-viable option for this development scheme.
7.6 Biomass	Providing a heating system fuelled by plant-based materials such as wood, crops, or food waste. Biomass boilers generate heat for space heating and domestic hot water through the combustion of biofuels, such as woodchip, wood pellets or potentially biofuel or bio diesel. Biomass is considered to be virtually zero carbon. They can be used on an individual scale or for multiple dwellings as part of a district-heating network. A back-up heat source should be provided as consistent delivery of fuel is necessary for continued operation.
Installation Considerations	▪ Biomass boilers are larger than conventional gas-fired boilers and also require what can be significant storage space for the fuel source. This needs to be considered at planning stage to ensure an appropriate plant room can be provided. ▪ Flue required to expel exhaust gases – design needs to be in line with the requirements of the Building Regulations. ▪ Need to consider whether fuel deliveries will be reliable and consistent to the location of the site (especially relevant in rural areas) and whether the plant room can be easily accessed by the delivery vehicle. ▪ £9,000-£21,000 per dwelling dependent on size (taken from Energy Saving Trust, TBC by Supplier).
Advantages	▪ Considerable reduction in CO_2 emissions.
Disadvantages	▪ Limited reduction in running costs compared to A-rated gas boilers, but at a substantially higher up-front cost. ▪ Plant room space required for boiler and storage. ▪ Dependent on consistent delivery of fuel. ▪ Ongoing maintenance costs (need to be cleaned regularly to remove ash.)

Development Feasibility **X**	▪ Biomass is considered a technically-viable option for this development scheme as there are no apparent physical constraints on site in terms of installing biomass boilers or storing a sufficient supply. ▪ There are, however, concerns regarding a sustainable supply of biomass to the site. ▪ The capital installation cost would, however, be high which leads us to the conclusion that biomass would not be a commercially-viable option for this development scheme.

7. Conclusion

The Applicant demonstrates commitment to delivering the energy standard at the proposed Waste Transfer Station Building:

- This energy standard is delivered through renewable energy.
- The proposed Development has been designed to achieve a total reduction in CO2 emissions of 35.8% compared to the TER ADL 2021.

Table 5: Measures incorporated to deliver the energy standard.

Fabric first: Demand-reduction measures	• Low-energy lighting throughout the development.
Low-carbon & renewable energy	• PV array of 13kWp in order to reach the required minimum 35% reduction in CO^2 emissions.

The impact of these design measures in terms of how the Applicant delivers the energy standard is illustrated in Figure 3 and Table 6:

Figure 3: How the Development meets the energy standard ADL2021

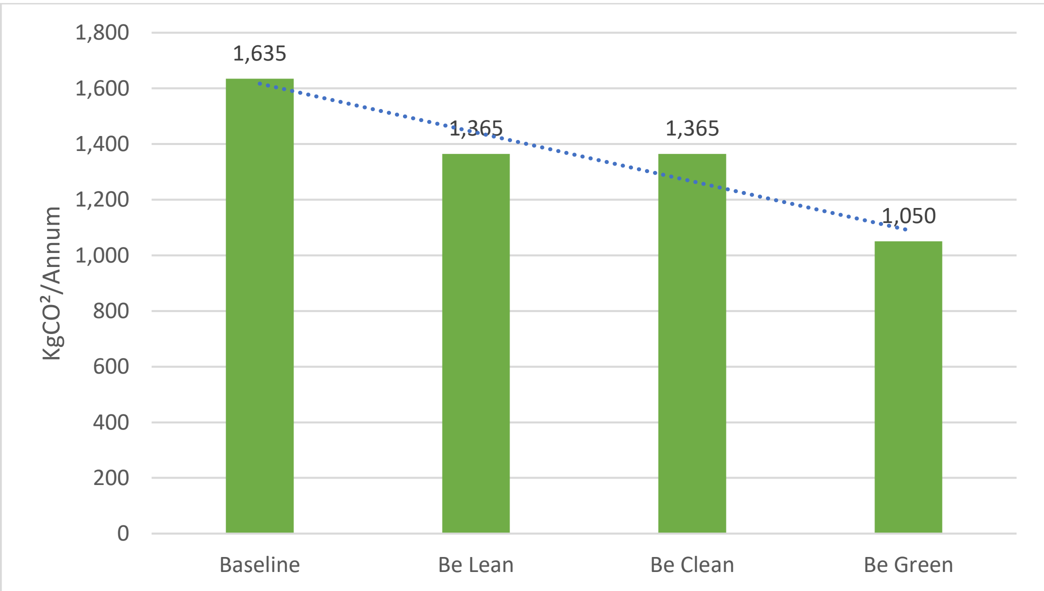


Table 6: CO_2 emissions and percentage reduction over ADL2021

	CO_2 emissions	
	Kg/CO_2 per annum	% reduction
Target Emission Rate: Compliant with ADL 2021	1,635	-
Fabric-first & Low-carbon measures	1,365	16.5%
Heating Infrastructure	1,365	0.00%
Renewable energy	1,050	23.1%
Total savings	**585**	**35.8%**

The development achieves the zero-carbon target through a carbon-offset payment which offsets the shortfall in regulated CO2-emissions reduction. The total CO2 emissions to offset have been calculated as 0.58 t.CO2/yr. Based on a carbon price of £95 t.CO2/yr over a 30-year period, this is equivalent to a cash-in-lieu contribution of: £1,653.

8. Appendices

Appendix 1: List of Abbreviations

ADL2013	Approved Document Part L of Buildings Regulations 2013
ADL2021	Approved Document Part L of Buildings Regulations 2021
ASHP	Air Source Heat Pump
CHP	Combined Heat & Power
BER	Building Emission Rate
DHN	District Heat Network
DHW	Domestic Hot Water
GSHP	Ground Source Heat Pump
LPA	Local Planning Authority
PV	Photovoltaic
TER	Target Emission Rate
WWHR	Waste Water Heat Recovery

Appendix 2: Planning Policy & Design Guidance

Approved Document Part L (2021)
This development is subject to the requirements of Approved Document L (2021). ADL 2013 represented an approximate reduction of 6% in the Target Emission Rate (Kg/CO2/sqm per annum) over the requirements of Approved Document L (2010) for residential development and an aggregate 9% reduction for non-residential development. ADL (2021) has seen a further 31% improvement over these targets. It also sees the introduction of a Primary Energy Target, a measure of heating demand (kW hrs/sqm per annum) to ensure new-build dwellings with low-carbon heating systems still meet satisfactory energy-efficiency standards.
National Planning Policy Framework (2021)
The National Planning Policy Framework encourages Local Planning Authorities to 'support the transition to a low carbon future in a changing climate, taking full account of flood risk and costal change' (NPPF paragraph 162), 'whilst taking a proactive approach to mitigating and adapting to climate change, taking into account the long-term implication for flood risk, costal change, water supply, biodiversity and landscapes, and the risk of over shading from rising temperatures'. (NPFF Paragraph 162). Paragraph 165, upholds the requirement for Local Plans to: 'To help increase the use and supply of renewable and low carbon energy and heat, plans should: a) provide a positive strategy for energy from these sources, that maximises the potential for suitable development, while ensuring that adverse impacts are addressed satisfactorily (including cumulative landscape and visual impacts); b) consider identifying suitable areas of renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and c) identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for collocating potential heat customers and suppliers.' In paragraph 166, NPPF stipulates that local planning authorities should take account of the benefits of decentralised energy and passive design measures as a means of energy efficiency in new development: 'In determining planning applications, local planning authorities should expect new development to: a) comply with any development plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable; and b) take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.'
London Plan (2021)
Policy SI 2 Minimising greenhouse gas emissions A Major development should be net zero-carbon. This means reducing greenhouse gas emissions in operation and minimising both annual and peak energy demand in accordance with the following energy hierarchy: 1) be lean: use less energy and manage demand during operation 2) be clean: exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly 3) be green: maximise opportunities for renewable energy by producing, storing and using renewable energy on-site 4) be seen: monitor, verify and report on energy performance.

B Major development proposals should include a detailed energy strategy to demonstrate how the zero-carbon target will be met within the framework of the energy hierarchy.
C A minimum on-site reduction of at least 35 per cent beyond Building Regulations is required for major development. Residential development should achieve 10 per cent, and non-residential development should achieve 15 per cent through energy efficiency measures. Where it is clearly demonstrated that the zero-carbon target cannot be fully achieved on-site, any shortfall should be provided, in agreement with the borough, either:
1) through a cash in lieu contribution to the borough's carbon offset fund, or
2) off-site provided that an alternative proposal is identified and delivery is certain.
D Boroughs must establish and administer a carbon offset fund. Offset fund payments must be ring-fenced to implement projects that deliver carbon reductions. The operation of offset funds should be monitored and reported on annually. E Major development proposals should calculate and minimise carbon emissions from any other part of the development, including plant or equipment, that are not covered by Building Regulations, i.e. unregulated emissions.
F Development proposals referable to the Mayor should calculate whole lifecycle carbon emissions through a nationally recognised Whole Life-Cycle carbon Assessment and demonstrate actions taken to reduce life-cycle carbon emissions.

Policy SI 3 Energy infrastructure
A Boroughs and developers should engage at an early stage with relevant energy companies and bodies to establish the future energy and infrastructure requirements arising from large-scale development proposals such as Opportunity Areas, Town Centres, other growth areas or clusters of significant new development.
B Energy masterplans should be developed for large-scale development locations (such as those outlined in Part A and other opportunities) which establish the most effective energy supply options. Energy masterplans should identify:
1) major heat loads (including anchor heat loads, with particular reference to sites such as universities, hospitals and social housing)
2) heat loads from existing buildings that can be connected to future phases of a heat network
3) major heat supply plant including opportunities to utilise heat from energy from waste plants
4) secondary heat sources, including both environmental and waste heat
5) opportunities for low and ambient temperature heat networks
6) possible land for energy centres and/or energy storage
7) possible heating and cooling network routes
8) opportunities for futureproofing utility infrastructure networks to minimise the impact from road works
9) infrastructure and land requirements for electricity and gas supplies
10) implementation options for delivering feasible projects, considering issues of procurement, funding and risk, and the role of the public sector
11) opportunities to maximise renewable electricity generation and incorporate demand-side response measures.
C Development Plans should:
1) identify the need for, and suitable sites for, any necessary energy infrastructure requirements including energy centres, energy storage and upgrades to existing infrastructure 2) identify existing heating and cooling networks, identify proposed locations for future heating and cooling networks and identify opportunities for expanding and inter-connecting existing networks as well as establishing new networks.

D Major development proposals within Heat Network Priority Areas should have a communal low-temperature heating system:
1) the heat source for the communal heating system should be selected in accordance with the following heating hierarchy:
a) connect to local existing or planned heat networks
b) use zero-emission or local secondary heat sources (in conjunction with heat pump, if required)
c) use low-emission combined heat and power (CHP) (only where there is a case for CHP to enable the delivery of an area-wide heat network, meet the development's electricity demand and provide demand response to the local electricity network)
d) use ultra-low NOx gas boilers
2) CHP and ultra-low NOx gas boiler communal or district heating systems should be designed to ensure that they meet the requirements in Part B of Policy SI 1 Improving air quality
3) where a heat network is planned but not yet in existence the development should be designed to allow for the cost-effective connection at a later date.
E Heat networks should achieve good practice design and specification standards for primary, secondary and tertiary systems comparable to those set out in the CIBSE/ADE Code of Practice CP1 or equivalent.

Appendix 3: BRUKL Reports

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Highview Farm - Lean

As designed

Date: Mon Jul 14 13:54:17 2025

Administrative information

Building Details

Address: 'Land off' New Year's Green Lane, Harefield, Uxbridge, Hillingdon, UB9 6LX

Certifier details

Name: Tracey Walsh

Telephone number: 07814667574

Address: NRG Zero Ltd, 371 Stone Road, Stafford, ST16 1LD

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.1

Interface to calculation engine: iSBEM

Interface to calculation engine version: v6.1.e

BRUKL compliance module version: v6.1.e.0

Foundation area [m²]: 1

The CO_2 emission and primary energy rates of the building must not exceed the targets

Target CO_2 emission rate (TER), $kgCO_2/m^2annum$	1.09	
Building CO_2 emission rate (BER), $kgCO_2/m^2annum$	0.91	
Target primary energy rate (TPER), kWh_{PE}/m^2annum	11.72	
Building primary energy rate (BPER), kWh_{PE}/m^2annum	9.51	
Do the building's emission and primary energy rates exceed the targets?	BER =< TER	BPER =< TPER

The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	$U_{a-Limit}$	U_{a-Calc}	U_{i-Calc}	First surface with maximum value
Walls*	0.26	-	-	No heat loss walls
Floors	0.18	-	-	No heat loss floors
Pitched roofs	0.16	-	-	No heat loss pitched roofs
Flat roofs	0.18	-	-	No heat loss flat roofs
Windows** and roof windows	1.6	-	-	No external windows/roof-windows
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	-	-	No external personnel doors
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

$U_{a-Limit}$ = Limiting area-weighted average U-values [W/(m²K)]
U_{a-Calc} = Calculated area-weighted average U-values [W/(m²K)]
U_{i-Calc} = Calculated maximum individual element U-values [W/(m²K)]

* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.
** Display windows and similar glazing are excluded from the U-value check.
*** Values for rooflights refer to the horizontal position.
^ For fire doors, limiting U-value is 1.8 W/m²K
NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air permeability	Limiting standard	This building
$m^3/(h.m^2)$ at 50 Pa	8	15

Page 1 of 4

Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	<0.9

"No HVAC systems in project"

1- Direct Electric

	Water heating efficiency	**Storage loss factor [kWh/litre per day]**
This building	1	-
Standard value	1	N/A

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

General lighting and display lighting	**General luminaire**	**Display light source**	
Zone name	**Efficacy [lm/W]**	**Efficacy [lm/W]**	**Power density [W/m²]**
Standard value	95	80	0.3
ZO/01 - Storage	120	-	-

The spaces in the building should have appropriate passive control measures to limit solar gains in summer

Zone	**Solar gain limit exceeded? (%)**	**Internal blinds used?**
ZO/01 - Storage	N/A	N/A

Regulation 25A: Consideration of high efficiency alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	YES
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m²]	1500	1500
External area [m²]	4700	4700
Weather	LON	LON
Infiltration [m³/hm²@ 50Pa]	15	5
Average conductance [W/K]	1047.08	1536.13
Average U-value [W/m²K]	0.22	0.33
Alpha value* [%]	7.83	24.39

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Building Use

% Area	Building Type
	Retail/Financial and Professional Services
	Restaurants and Cafes/Drinking Establishments/Takeaways
	Offices and Workshop Businesses
	General Industrial and Special Industrial Groups
100	**Storage or Distribution**
	Hotels
	Residential Institutions: Hospitals and Care Homes
	Residential Institutions: Residential Schools
	Residential Institutions: Universities and Colleges
	Secure Residential Institutions
	Residential Spaces
	Non-residential Institutions: Community/Day Centre
	Non-residential Institutions: Libraries, Museums, and Galleries
	Non-residential Institutions: Education
	Non-residential Institutions: Primary Health Care Building
	Non-residential Institutions: Crown and County Courts
	General Assembly and Leisure, Night Clubs, and Theatres
	Others: Passenger Terminals
	Others: Emergency Services
	Others: Miscellaneous 24hr Activities
	Others: Car Parks 24 hrs
	Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	0	0
Cooling	0	0
Auxiliary	0	0
Lighting	7.38	3.7
Hot water	4.24	4.24
Equipment*	29.87	29.87
TOTAL**	**11.62**	**7.94**

* Energy used by equipment does not count towards the total for consumption or calculating emissions.
** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	5.5	0.04
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*5.5*	*0.04*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	265.53	300.57
Primary energy [kWh_{PE}/m²]	9.51	11.72
Total emissions [kg/m²]	0.91	1.09

HVAC Systems Performance

System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] No Heating or Cooling										
	Actual	223.5	42	0	0	0	0	0	0	0
	Notional	217.8	82.8	0	0	0	0	0	----	----

Key to terms

Heat dem [MJ/m2]	= Heating energy demand
Cool dem [MJ/m2]	= Cooling energy demand
Heat con [kWh/m2]	= Heating energy consumption
Cool con [kWh/m2]	= Cooling energy consumption
Aux con [kWh/m2]	= Auxiliary energy consumption
Heat SSEFF	= Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER	= Cooling system seasonal energy efficiency ratio
Heat gen SSEFF	= Heating generator seasonal efficiency
Cool gen SSEER	= Cooling generator seasonal energy efficiency ratio
ST	= System type
HS	= Heat source
HFT	= Heating fuel type
CFT	= Cooling fuel type

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Highview Farm - Proposed

As designed

Date: Mon Jul 14 13:53:05 2025

Administrative information

Building Details

Address: 'Land off' New Year's Green Lane, Harefield, Uxbridge, Hillingdon, UB9 6LX

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.1

Interface to calculation engine: iSBEM

Interface to calculation engine version: v6.1.e

BRUKL compliance module version: v6.1.e.0

Certifier details

Name: Tracey Walsh

Telephone number: 07814667574

Address: NRG Zero Ltd, 371 Stone Road, Stafford, ST16 1LD

Foundation area [m²]: 1

The CO_2 emission and primary energy rates of the building must not exceed the targets

Target CO_2 emission rate (TER), $kgCO_2/m^2annum$	1.09	
Building CO_2 emission rate (BER), $kgCO_2/m^2annum$	0.7	
Target primary energy rate (TPER), kWh_{PE}/m^2annum	11.72	
Building primary energy rate (BPER), kWh_{PE}/m^2annum	7.09	
Do the building's emission and primary energy rates exceed the targets?	BER =< TER	BPER =< TPER

The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	$U_{a-Limit}$	U_{a-Calc}	U_{i-Calc}	First surface with maximum value
Walls*	0.26	-	-	No heat loss walls
Floors	0.18	-	-	No heat loss floors
Pitched roofs	0.16	-	-	No heat loss pitched roofs
Flat roofs	0.18	-	-	No heat loss flat roofs
Windows** and roof windows	1.6	-	-	No external windows/roof-windows
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	-	-	No external personnel doors
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

$U_{a-Limit}$ = Limiting area-weighted average U-values [W/(m²K)]
U_{a-Calc} = Calculated area-weighted average U-values [W/(m²K)]
U_{i-Calc} = Calculated maximum individual element U-values [W/(m²K)]

* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

** Display windows and similar glazing are excluded from the U-value check.

*** Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m²K

NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air permeability	Limiting standard	This building
$m^3/(h.m^2)$ at 50 Pa	8	15

Page 1 of 4

Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	<0.9

"No HVAC systems in project"

1- Direct Electric

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	-
Standard value	1	N/A

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

General lighting and display lighting	General luminaire	Display light source	
Zone name	**Efficacy [lm/W]**	**Efficacy [lm/W]**	**Power density [W/m²]**
Standard value	95	80	0.3
ZO/01 - Storage	120	-	-

The spaces in the building should have appropriate passive control measures to limit solar gains in summer

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
ZO/01 - Storage	N/A	N/A

Regulation 25A: Consideration of high efficiency alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	YES
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m²]	1500	1500
External area [m²]	4700	4700
Weather	LON	LON
Infiltration [m³/hm²@ 50Pa]	15	5
Average conductance [W/K]	1047.08	1536.13
Average U-value [W/m²K]	0.22	0.33
Alpha value* [%]	7.83	24.39

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Building Use

% Area	Building Type
	Retail/Financial and Professional Services
	Restaurants and Cafes/Drinking Establishments/Takeaways
	Offices and Workshop Businesses
	General Industrial and Special Industrial Groups
100	**Storage or Distribution**
	Hotels
	Residential Institutions: Hospitals and Care Homes
	Residential Institutions: Residential Schools
	Residential Institutions: Universities and Colleges
	Secure Residential Institutions
	Residential Spaces
	Non-residential Institutions: Community/Day Centre
	Non-residential Institutions: Libraries, Museums, and Galleries
	Non-residential Institutions: Education
	Non-residential Institutions: Primary Health Care Building
	Non-residential Institutions: Crown and County Courts
	General Assembly and Leisure, Night Clubs, and Theatres
	Others: Passenger Terminals
	Others: Emergency Services
	Others: Miscellaneous 24hr Activities
	Others: Car Parks 24 hrs
	Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	0	0
Cooling	0	0
Auxiliary	0	0
Lighting	7.38	3.7
Hot water	4.24	4.24
Equipment*	29.87	29.87
TOTAL**	**11.62**	**7.94**

* Energy used by equipment does not count towards the total for consumption or calculating emissions.
** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	7.15	0.04
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*7.15*	*0.04*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	265.53	300.57
Primary energy [kWh_{PE}/m^2]	7.09	11.72
Total emissions [kg/m²]	0.7	1.09

HVAC Systems Performance

System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] No Heating or Cooling										
	Actual	223.5	42	0	0	0	0	0	0	0
	Notional	217.8	82.8	0	0	0	0	0	----	----

Key to terms

Heat dem [MJ/m2] = Heating energy demand
Cool dem [MJ/m2] = Cooling energy demand
Heat con [kWh/m2] = Heating energy consumption
Cool con [kWh/m2] = Cooling energy consumption
Aux con [kWh/m2] = Auxiliary energy consumption
Heat SSEFF = Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER = Cooling system seasonal energy efficiency ratio
Heat gen SSEFF = Heating generator seasonal efficiency
Cool gen SSEER = Cooling generator seasonal energy efficiency ratio
ST = System type
HS = Heat source
HFT = Heating fuel type
CFT = Cooling fuel type