Energy Statement

Mead House, Mead House Lane, Hayes End, Hayes, UB4 8EW

For Reliant Care Ltd

May 2025

ecolytik

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Contents

Project number	997
Report status	Draft
Revision number	-
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Checked by	Sherleen Pang

1 Executive Summary

This Energy Statement presents the key measures proposed to meet the London Plan's carbon reduction targets in support of the planning application for Mead House in Hayes, in the London Borough of Hillingdon.

The proposed development includes the alterations and refurbishment of the existing building to create a specialist living hub for people with learning disabilities and mental health issues, including 23no. co-living units across ground, first and second floors. Communal kitchen, dining and living rooms, alongside other support functions, are proposed at ground floor level.

The energy strategy for the project has been developed in line with the London Plan (2021) Policies SI2, SI3 and SI4, and the GLA's Guidance on Energy Assessments 2022). The CO_2 emissions for the development have been assessed using the Simplified Building Energy Model (SBEM).

Proposed energy measures for the development includes:

- **Be Lean**: Passive design with a fabric first approach such as enhanced u-values. Low energy lighting and energy efficient extract ventilation are also proposed.
- **Be Clean**: The proposed development is not in close proximity to a District Heating Network (DHN). Its small scale and refurbishment nature prevent it from benefiting from a communal heating system.
- **Be Green**: PV is proposed on suitable areas of the roof to work in conjunction with the hot water system.

Overall, the proposed development is anticipated to achieve a 3% improvement in regulated CO_2 emissions over the notional specification for existing buildings set out by the GLA and 38% improvement in carbon emissions over the existing building baseline. This is a notable achievement for a development of this scale and nature.

Carbon savings have been maximised on site as far as feasible in line with policy and guidance for minor scale refurbishment schemes. Further reductions in regulated CO_2 emissions are not deemed technically feasible.

2 Introduction

2.1 Site

The proposed development includes the alterations and refurbishment of the existing building to create a specialist living hub for people with learning disabilities and mental health issues, including 23no. co-living units across ground, first and second floors. Communal kitchen, dining and living rooms, alongside other support functions, are proposed at ground floor level.

The site location is presented in Figure 1.

2.2 Planning policies

A review of the applicable policies for the proposed development has been undertaken. A full summary of the relevant Greater London Authority (GLA) and London Borough of Hillingdon policies are presented in Appendices C and D. The proposed development has been designed to meet and exceed (where feasible) the following main policy drivers.

2.2.1 London Plan (2021)

Energy and carbon:

- Follow the Energy Hierarchy and achieve the greatest possible reduction in carbon emissions for refurbishment projects where feasible.

2.2.2 Hillingdon Local Plan (2012)

Energy and carbon:

- Follow the London Plan energy hierarchy and reduce carbon emissions as far as possible.
- Ensure development meets the highest possible design standards.
- Promote the use of decentralised energy within large scale development.
- Target areas with high carbon emissions for additional reductions through low carbon strategies.
- Promote new development to contribute to the upgrading of existing housing stock where appropriate.
- Include passive design measures.

The Energy Strategy is presented in the following chapter.

Figure 1. Approximate site location of Mead House.

3 Energy Strategy

The Energy Strategy for the proposed development at Mead House has been developed in line with the Energy Hierarchy set out in Policy SI 2 of the London Plan:

1. Be Lean: use less energy.
2. Be Clean: supply energy efficiently.
3. Be Green: access low or zero carbon (LZC) energy sources.
4. Be Seen: monitor and report operational energy.

Approved Document Part L (2021) states that "*Dwellings are self-contained units. Rooms for residential purposes and buildings that contain only rooms for residential purposes are not dwellings; Approved Document L, Volume 2: Buildings other than dwellings applies*.".

Although the GLA Energy Guidance (2021, Para 6.29) suggests that "*Developments comprising co-living spaces will be treated as residential uses for the purposes of complying with London Plan Policy H 16. Applicants should ensure that the appropriate volume of the Part L Approved Documents is used…*", this is not in line with the current Part L methodology where Part L1 2021 for residential buildings are only relevant to dwellings that are self-contained (with standalone kitchens).

The proposed co-living development at Mead House contains only rooms for residential purposes and includes communal kitchen, living areas and laundry for use by residents. The energy and carbon assessment has therefore been undertaken in line with Part L2 2021 using the Simplified Building Energy Model (SBEM) method.

The CO_2 emissions at each stage of the Hierarchy are compared to a Building Regulations Part L2 2021 compliant baseline. It should be noted that the estimations presented within this statement are based on the Part L calculation methodology and the associated standard assumptions regarding occupancy, space/system usage and climatic conditions; and should not be considered as a predictive assessment of the likely in-use energy requirements for the development.

The following sections present the measures adopted at each stage of the Energy Hierarchy at the proposed development.

3.2 Be Lean

A range of energy efficiency measures has been applied to the design of the building fabric and building services systems to minimise energy demand and CO_2 emissions at the Be Lean stage.

3.2.1 Passive design

There are inherent constraints to implementing significant passive design measures for refurbishment projects. The design team have aimed to optimise the performance of the fabric and services as far as technically feasible.

3.2.2 Fabric specification

The fabric's energy efficiency will be significantly improved from the existing building and will go beyond the specifications set out within GLA's Energy Assessment guidance (2022) for refurbishment projects for some of the fabric elements.

Insulation is proposed to be installed to all building elements including external walls and roof. The external walls will be insulated as far as possible with consideration to potential space loss in line with guidance set out with Part L 2021 of Building Regulations. The ground floor slab of the building already includes insulation in line with Part L 2010 based on information provided by the team. No further insulation could be added to the existing floor due to threshold levels. Approximately 40% of the existing windows will also be upgraded to high specification double-glazing.

Whilst not directly relevant to heat loss elements, the proposals include the installation of acoustic insulation to internal walls and the first-floor slab which will further promote heat retention within the habitable spaces.

Key proposed specifications are presented in Table 1. Significant improvements to u-values are proposed compared to the existing building.

Further technical details regarding the proposals are presented in Appendix A.

3.2.3 Efficient lighting

All light fittings within the proposed development will be specified as low energy lighting with an average efficacy of 95 lm/W.

3.2.4 Controls and Energy Monitoring

Lighting and space conditioning controls are proposed to be incorporated, where appropriate. Energy meters will be in place for the building to enable future users to monitor their energy use.

Table 1. Proposed specifications at Mead House.

Element	Existing building baseline	GLA Appendix 3 notional existing building	Proposed specification
External walls u-value	1.7 W/m².K.	0.30 W/m².K.	0.40 W/m².K.
Roof u-value	2.4 W/m².K.	0.16 W/m².K.	0.10 W/m².K.
Floor u-value	0.25 W/m².K.	0.25 W/m².K.	0.25 W/m².K.
Windows u-value	2.9 W/m².K.	1.4 W/m².K.	2.9 W/m².K. 1.2 W/m².K. (to 40% of glazing)

3.3 Be Clean

Policy SI 3 of the London Plan stipulates that major development proposals within Heat Network Priority Areas should have a communal heating system connected to local existing or planned heat networks, or to low/zero emission local heat sources.

A review of the London Heat Map (Figure 2) shows that there are no existing and proposed district heating network in proximity to the site. The proposed development is located within a Heat Network Priority Area.

Given the nature of the development which is a minor scale refurbishment, communal heating system is not feasible to implement. Electrically driven heating systems are proposed and the scheme would not rely on fossil fuels for producing heating and hot water.

No carbon savings are achievable at this stage of the hierarchy.

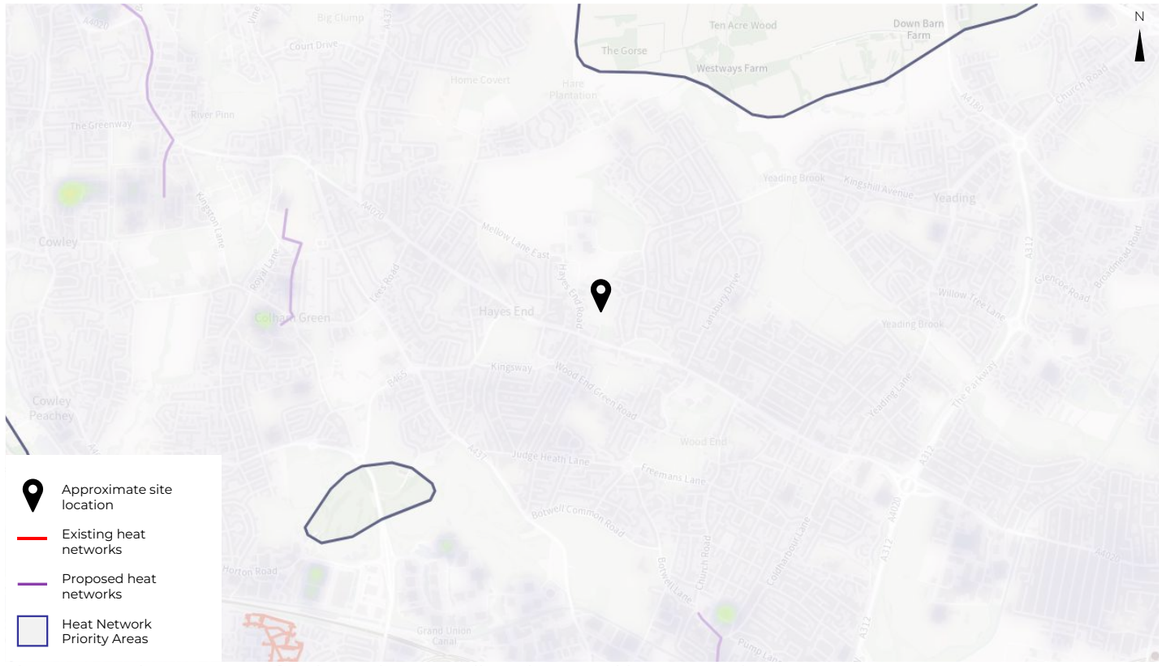


Figure 2. London Heat Map for site and surroundings (accessed in May 2025).

3.4 Be Green

The opportunity for producing and utilising renewable energy onsite will be maximised for the proposed development, in line with Policy SI 2 of the London Plan.

An outline feasibility study has been undertaken (see Table 2) and has identified photovoltaics as the most suitable technology for the site.

A circa 3.6 kWp PV array is proposed as shown in Figure 3.

Table 2. Outline LZC feasibility

LZC Technology	Feasibility
Photovoltaics (adopted)	The scheme has a flat roof area where it is proposed to incorporate PV. The technology will work in conjunction with the electrically driven hot water system.
Solar thermal (not adopted)	The technology requires additional plumbing and thermal stores which make its application challenging for this site. Solar thermal do not also provide hot water consistently across the year. PV is prioritised due to higher carbon savings.
Wind turbines (not adopted)	The installation of wind turbines at the proposed building will have a notable visual impact. Wind turbines do not often perform well at the built-up context due to low wind speeds.
Ground source heat pump (GSHP) (not adopted)	Ground source heat pump is not deemed suitable for the refurbishment scheme due to cost, complexity and challenges with installing significant services infrastructure within an existing building.
Air source heat pump (ASHP) (not adopted)	Air source heat pump is not deemed suitable for the refurbishment scheme due to cost, complexity and challenges with installing significant services infrastructure within an existing building.
Biomass (not adopted)	Biomass systems emit high NOx levels and are not supported within urban or sub-urban areas. There is also no suitable space onsite for the storage of biomass.

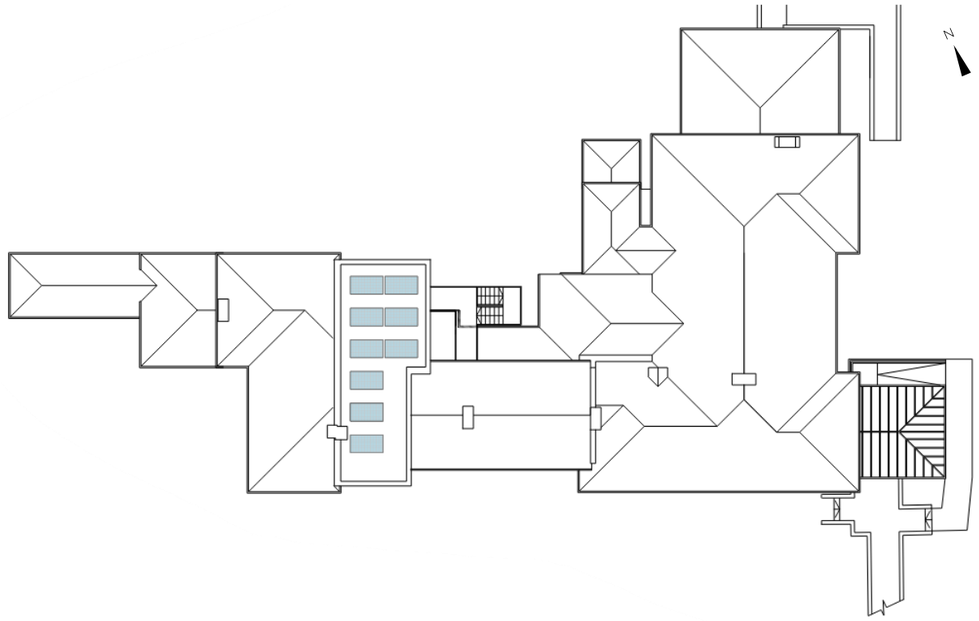


Figure 3. Proposed indicative PV panels on the flat roof of the building.

3.5 Results

Through the measures outlined for each stage of the Energy Hierarchy, it is anticipated the proposed development can achieve a 3% reduction in regulated CO_2 emissions over the GLA's notional existing building baseline and 38% improvement over the existing building.

Carbon savings have been maximised as far as technically feasible on site with improvements to fabric and incorporation of renewable technologies in line with policy.

Due to the refurbishment nature of the development, carbon offset payments are not applicable for this scheme.

Table 3, Table 4 and Figure 4 present the anticipated CO_2 emissions and savings at each stage of the Energy Hierarchy.

Table 3. Carbon emissions after each stage of the Energy Hierarchy for Mead House.

	Carbon Dioxide Emissions (tCO_2/yr)	
	Regulated	**Unregulated**
Baseline: Existing Building Baseline	52.5	4.4
Baseline: GLA Existing Notional Baseline	33.6	4.4
After energy demand reduction (be lean)	33.1	4.4
After heat network connection (be clean)	33.1	4.4
After renewable energy (be green)	32.7	4.4

Table 4. Regulated carbon savings from each stage of the Energy Hierarchy for Mead House.

	Regulated carbon dioxide savings			
	tCO_2 per annum over GLA baseline	**Improvement over GLA baseline (%)**	**tCO_2 per annum over Existing building**	**Improvement over Existing Building (%)**
Be lean: Savings from energy demand reduction	0.5	2%	19.4	37%
Be clean: Savings from heat network	0.0	0%	0.0	0%
Be green: Savings from renewable energy	0.4	1%	0.4	1%
Cumulative on-site savings	**0.9**	**3%**	**19.8**	**38%**

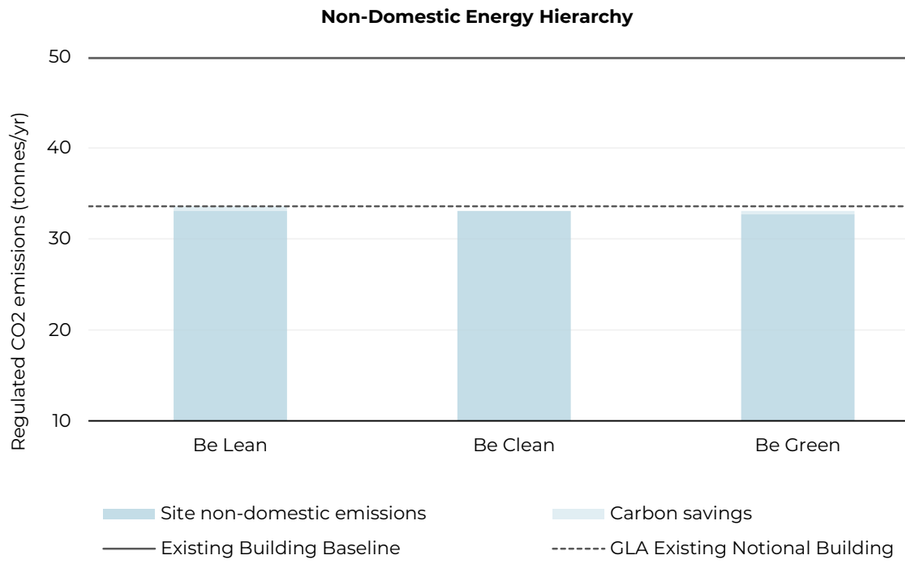


Figure 4. Regulated carbon emissions at each stage of the Energy Hierarchy.

4 Conclusions

Through the adoption of the sustainability strategies presented in this report, the client and design team demonstrated that the proposed development would fulfil the relevant policy requirements stipulated by the London Plan, and by Hillingdon Council within their Local Plan as far as technically feasible.

The proposal will positively contribute to sustainable development at the site and its surroundings.

Appendix A – Energy calculation assumptions

The items listed below are assumptions only, based on a combination of best judgement at planning stage and information from the design team where appropriate. Throughout the design and construction stages the fabric and system requirements (including provisions of renewable technologies) may change whilst the building designs are being progressed. All information detailed in this summary sheet is preliminary recommendation at the Planning Stage. It should be noted that this document is not exhaustive and the design and construction teams should allow for flexibility on site where necessary.

Building fabric parameter	GLA Appendix 3 existing baseline	Proposed specification	Unit	Note
Floor				
Ground floors	0.25	0.25	W/m²K	1
Walls				
External walls	0.30	0.40	W/m²K	1
Roofs				
Roof	0.16	0.10	W/m²K	1
Air permeability				
Assumed as per guidance	25	25	m³/m².h	1
Openings				
Windows - pane and frame	1.4	2.9 (retained) 1.2 (40% new glazing)	W/m²K	1
Windows transmittance factor (g-value)	0.4	0.7		1
Windows frame factor	0.1	0.1		1

Building Services Systems	Proposed specification	Unit	Note
Ventilation			
Type	Extract ventilation		1, 2
Specific fan power	<0.2	W/l.s	1, 2
System modelled	Enviro vent MEV 160 or similar		1, 2
Heating and cooling			
HVAC system type	Other local room heater - unfanned		1, 2
Efficiency	100	%	1, 2
Fuel type	Electricity		1, 2
System	Infra-Red Ceiling Heating by infraredgroup or similar		
Hot Water			
Hot water generation type	Stand-alone water heater		1, 2
Efficiency	100	%	
Hot water storage	600	Litres	
Lighting			
Lighting efficacy	95	lm/cW	1, 2
Photoelectric and occupancy controls	Yes, where applicable		1, 2
Photovoltaics			
Number of panels	9	no	1, 2
Panel capacity	400	W/ panel	1, 2
Total installation capacity	3.6	kWp	1, 2
Orientation	South		1, 2
Tilt	10° from horizontal		

Notes	
1	Planning stage assumption to achieve planning policy or Building Regulations targets
2	Subject to MEP Design

NB. Please refer to Approved Document L2 2021 for all requirements to comply with Building Regulations Part L.

Appendix B – Planning stage SBEM output

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Existing Building

As designed

Date: Wed May 21 14:23:18 2025

Administrative information

Building Details

Address: Mead House Lane, Hayes End, Hayes, London, UB4 8EW

Certifier details

Name: Ecolytik

Telephone number: 0203 835 4114

Address: 86-90 Paul Street, London, EC2A 4NE

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.2

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.28

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

Foundation area [m^2]: 351.23

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

The building does not comply with England Building Regulations Part L 2021

Target CO_2 emission rate (TER), $kgCO_2/m^2$.annum	17.01	
Building CO_2 emission rate (BER), $kgCO_2/m^2$.annum	48.65	
Target primary energy rate (TPER), kWh_{PE}/m^2.annum	180.26	
Building primary energy rate (BPER), kWh_{PE}/m^2.annum	506.86	
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	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	1.69	1.69	0F000008_W1
Floors	0.18	0.25	0.25	0F000011_F
Pitched roofs	0.16	-	2.44	0F000010_C
Flat roofs	0.18	2.44	2.44	0F000013_C
Windows** and roof windows	1.6	1.92	2.86	0F000014_W3_O0
Rooflights***	2.2	2.3	2.3	0F000010_C_O0
Personnel doors^	1.6	2.2	2.2	0F000008_W1_O0
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [$W/(m^2K)$] $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [$W/(m^2K)$]

$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [$W/(m^2K)$]

* 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/m^2K

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	25

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

1- Direct electric

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	1	-	-	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system	NO				

1- SYST0000-DHW

	Water heating efficiency	**Storage loss factor [kWh/litre per day]**
This building	1	0.001
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

ID	**System type in the Approved Documents**
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter
NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.	

Zone name	**SFP [W/(l/s)]**									**HR efficiency**	
ID of system type	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	**Zone**	**Standard**
0F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
0F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
0F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
1F Staff WC	0.4	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.4	-	-	-	-	-	-	-	-	-	N/A

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
2F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
2F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
2F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
2F WC	0.4	-	-	-	-	-	-	-	-	-	N/A

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
0F Circulation	60	-	-
0F Circulation	60	-	-
0F Circulation	60	-	-
0F Communal	60	15	9
0F Laundry	60	-	-
0F Office	60	-	-
0F Plant	60	-	-
0F Plant	60	-	-
0F R1	60	-	-
0F R2	60	-	-
0F R3	60	-	-
0F R4	60	-	-
0F R5	60	-	-
0F R6	60	-	-
0F R7	60	-	-
0F Store	60	-	-
0F Store	60	-	-
0F Therapy	60	-	-
0F WC	60	-	-
0F WC	60	-	-
0F WC	60	-	-
1F Circulation	60	-	-
1F Laundry	60	-	-
1F Office	60	-	-
1F R6	60	-	-
1F R9	60	-	-
1F R10	60	-	-
1F R11	60	-	-
1F R12	60	-	-
1F R13	60	-	-
1F R14	60	-	-
1F R15	60	-	-
1F R16	60	-	-
1F R17	60	-	-
1F R18	60	-	-

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
1F R19	60	-	-
1F Store	60	-	-
1F WC	60	-	-
1F WC	60	-	-
1F WC	60	-	-
1F WC	60	-	-
1F WC	60	-	-
1F WC	60	-	-
1F WC	60	-	-
1F WC	60	-	-
1F WC	60	-	-
1F WC	60	-	-
1F WC	60	-	-
1F WC	60	-	-
1F Staff WC	60	-	-
1F WC	60	-	-
2F Circulation	60	-	-
2F R20	60	-	-
2F R21	60	-	-
2F R22	60	-	-
2F R23	60	-	-
2F Store	60	-	-
2F WC	60	-	-
2F WC	60	-	-
2F WC	60	-	-
2F WC	60	-	-
0F Kitchen	60	-	-
0F Dining	60	-	-
0F Circulation	60	-	-
0F Reception	60	15	9

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?
0F Communal	YES (+22.6%)	NO
0F R1	YES (+44.5%)	NO
0F R2	YES (+43%)	NO
0F R3	YES (+73.8%)	NO
0F R4	NO (-22.5%)	NO
0F R5	YES (+96.7%)	NO
0F R6	NO (-53.2%)	NO
0F R7	NO (-62%)	NO
0F Therapy	NO (-20.6%)	NO
1F R6	NO (-51.2%)	NO
1F R9	NO (-45.6%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
1F R10	NO (-7.6%)	NO
1F R11	NO (-44.9%)	NO
1F R12	YES (+21.9%)	NO
1F R13	YES (+21.4%)	NO
1F R14	YES (+0.2%)	NO
1F R15	NO (-52.5%)	NO
1F R16	NO (-39.8%)	NO
1F R17	NO (-63.2%)	NO
1F R18	NO (-69.2%)	NO
1F R19	NO (-47.8%)	NO
1F Staff WC	N/A	N/A
2F R20	NO (-35.7%)	NO
2F R21	NO (-16.4%)	NO
2F R22	NO (-61.5%)	NO
2F R23	NO (-62.1%)	NO
0F Dining	NO (-26.2%)	NO
0F Reception	YES (+190%)	NO

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?	YES
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m^2]	1053.7	1053.7
External area [m^2]	2074.8	2074.8
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	25	3
Average conductance [W/K]	3181.88	782.58
Average U-value [W/m^2K]	1.53	0.38
Alpha value* [%]	9.6	33.63

* 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
	Storage or Distribution
	Hotels
100	**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/m^2]

	Actual	Notional
Heating	221.23	39.7
Cooling	0	0
Auxiliary	0.19	0.19
Lighting	23.17	10.58
Hot water	82.25	81.27
Equipment*	30.96	30.96
TOTAL**	**326.84**	**131.74**

* 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/m^2]

	Actual	Notional
Photovoltaic systems	0	11.12
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*0*	*11.12*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	873.01	331.85
Primary energy [kWh_{PE}/m^2]	506.86	180.26
Total emissions [kg/m^2]	48.65	17.01

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
	Actual	637.1	235.9	221.2	0	0.2	0.8	0	1	0
	Notional	191.5	140.3	39.7	0	0.2	1.34	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

GLA baseline

As designed

Date: Wed May 14 16:12:56 2025

Administrative information

Building Details

Address: Mead House Lane, Hayes End, Hayes, London, UB4 8EW

Certifier details

Name: Ecolytik

Telephone number: 0203 835 4114

Address: 86-90 Paul Street, London, EC2A 4NE

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.2

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.28

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

Foundation area [m^2]: 351.23

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

The building does not comply with England Building Regulations Part L 2021

Target CO_2 emission rate (TER), $kgCO_2/m^2$.annum	17.01	
Building CO_2 emission rate (BER), $kgCO_2/m^2$.annum	31.86	
Target primary energy rate (TPER), kWh_{PE}/m^2.annum	180.26	
Building primary energy rate (BPER), kWh_{PE}/m^2.annum	335.21	
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	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.3	0.3	0F000008_W1
Floors	0.18	0.25	0.25	0F000011_F
Pitched roofs	0.16	-	0.16	0F000010_C
Flat roofs	0.18	0.16	0.16	0F000013_C
Windows** and roof windows	1.6	1.4	1.4	0F000013_W1_O0
Rooflights***	2.2	1.4	1.4	0F000010_C_O0
Personnel doors^	1.6	2.2	2.2	0F000008_W1_O0
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [$W/(m^2K)$]

$U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [$W/(m^2K)$]

$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [$W/(m^2K)$]

* 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/m^2K

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	25

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

1- Direct electric

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	-	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

1- SYST0000-DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.001
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter
NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.	

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	**Zone**	**Standard**
0F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
0F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
0F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
1F Staff WC	0.4	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.4	-	-	-	-	-	-	-	-	-	N/A

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
2F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
2F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
2F WC	0.4	-	-	-	-	-	-	-	-	-	N/A
2F WC	0.4	-	-	-	-	-	-	-	-	-	N/A

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
0F Circulation	60	-	-
0F Circulation	60	-	-
0F Circulation	60	-	-
0F Communal	60	15	9
0F Laundry	60	-	-
0F Office	60	-	-
0F Plant	60	-	-
0F Plant	60	-	-
0F R1	60	-	-
0F R2	60	-	-
0F R3	60	-	-
0F R4	60	-	-
0F R5	60	-	-
0F R6	60	-	-
0F R7	60	-	-
0F Store	60	-	-
0F Store	60	-	-
0F Therapy	60	-	-
0F WC	60	-	-
0F WC	60	-	-
0F WC	60	-	-
1F Circulation	60	-	-
1F Laundry	60	-	-
1F Office	60	-	-
1F R6	60	-	-
1F R9	60	-	-
1F R10	60	-	-
1F R11	60	-	-
1F R12	60	-	-
1F R13	60	-	-
1F R14	60	-	-
1F R15	60	-	-
1F R16	60	-	-
1F R17	60	-	-
1F R18	60	-	-

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
1F R19	60	-	-
1F Store	60	-	-
1F WC	60	-	-
1F WC	60	-	-
1F WC	60	-	-
1F WC	60	-	-
1F WC	60	-	-
1F WC	60	-	-
1F WC	60	-	-
1F WC	60	-	-
1F WC	60	-	-
1F WC	60	-	-
1F WC	60	-	-
1F WC	60	-	-
1F Staff WC	60	-	-
1F WC	60	-	-
2F Circulation	60	-	-
2F R20	60	-	-
2F R21	60	-	-
2F R22	60	-	-
2F R23	60	-	-
2F Store	60	-	-
2F WC	60	-	-
2F WC	60	-	-
2F WC	60	-	-
2F WC	60	-	-
0F Kitchen	60	-	-
0F Dining	60	-	-
0F Circulation	60	-	-
0F Reception	60	15	9

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?
0F Communal	NO (-31.3%)	NO
0F R1	NO (-19%)	NO
0F R2	NO (-21%)	NO
0F R3	NO (-4.1%)	NO
0F R4	NO (-57.2%)	NO
0F R5	YES (+8.6%)	NO
0F R6	NO (-73.8%)	NO
0F R7	NO (-78.7%)	NO
0F Therapy	NO (-55.5%)	NO
1F R6	NO (-72.7%)	NO
1F R9	NO (-69.5%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
1F R10	NO (-48.2%)	NO
1F R11	NO (-69.1%)	NO
1F R12	NO (-32.7%)	NO
1F R13	NO (-33%)	NO
1F R14	NO (-44.7%)	NO
1F R15	NO (-73.8%)	NO
1F R16	NO (-66.8%)	NO
1F R17	NO (-79.7%)	NO
1F R18	NO (-82.7%)	NO
1F R19	NO (-70.7%)	NO
1F Staff WC	N/A	N/A
2F R20	NO (-64.5%)	NO
2F R21	NO (-53.9%)	NO
2F R22	NO (-78.8%)	NO
2F R23	NO (-78.7%)	NO
0F Dining	NO (-58.6%)	NO
0F Reception	YES (+69.2%)	NO

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?	YES
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m^2]	1053.7	1053.7
External area [m^2]	2074.8	2074.8
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	25	3
Average conductance [W/K]	751.9	782.58
Average U-value [W/m^2K]	0.36	0.38
Alpha value* [%]	40.18	33.63

* 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
	Storage or Distribution
	Hotels
100	**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/m^2]

	Actual	Notional
Heating	111.74	39.7
Cooling	0	0
Auxiliary	0.19	0.19
Lighting	23.17	10.58
Hot water	82.25	81.27
Equipment*	30.96	30.96
TOTAL**	**217.36**	**131.74**

* 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/m^2]

	Actual	Notional
Photovoltaic systems	0	11.12
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*0*	*11.12*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	446.13	331.85
Primary energy [kWh_{PE}/m^2]	335.21	180.26
Total emissions [kg/m^2]	31.86	17.01

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
	Actual	321.8	124.3	111.7	0	0.2	0.8	0	1	0
	Notional	191.5	140.3	39.7	0	0.2	1.34	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

Be Lean

As designed

Date: Wed May 21 11:39:14 2025

Administrative information

Building Details

Address: Mead House Lane, Hayes End, Hayes, London, UB4 8EW

Certifier details

Name: Ecolytik

Telephone number: 0203 835 4114

Address: 86-90 Paul Street, London, EC2A 4NE

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.2

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.28

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

Foundation area [m^2]: 351.23

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

The building does not comply with England Building Regulations Part L 2021

Target CO_2 emission rate (TER), $kgCO_2/m^2$.annum	17.01	
Building CO_2 emission rate (BER), $kgCO_2/m^2$.annum	31.4	
Target primary energy rate (TPER), kWh_{PE}/m^2.annum	180.26	
Building primary energy rate (BPER), kWh_{PE}/m^2.annum	329.86	
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	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.39	0.39	0F000008_W1
Floors	0.18	0.25	0.25	0F000011_F
Pitched roofs	0.16	-	0.1	0F000010_C
Flat roofs	0.18	0.1	0.1	0F000013_C
Windows** and roof windows	1.6	1.92	2.86	0F000014_W3_O0
Rooflights***	2.2	2.3	2.3	0F000010_C_O0
Personnel doors^	1.6	2.2	2.2	0F000008_W1_O0
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [$W/(m^2K)$] $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [$W/(m^2K)$]

$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [$W/(m^2K)$]

* 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/m^2K

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	25

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

1- Direct electric

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	-	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

1- SYST0000-DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.001
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter
NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.	

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	**Zone**	**Standard**
0F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
0F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
0F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
1F Staff WC	0.2	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.2	-	-	-	-	-	-	-	-	-	N/A

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
2F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
2F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
2F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
2F WC	0.2	-	-	-	-	-	-	-	-	-	N/A

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
0F Circulation	95	-	-
0F Circulation	95	-	-
0F Circulation	95	-	-
0F Communal	95	100	1.35
0F Laundry	95	-	-
0F Office	95	-	-
0F Plant	95	-	-
0F Plant	95	-	-
0F R1	95	-	-
0F R2	95	-	-
0F R3	95	-	-
0F R4	95	-	-
0F R5	95	-	-
0F R6	95	-	-
0F R7	95	-	-
0F Store	95	-	-
0F Store	95	-	-
0F Therapy	95	-	-
0F WC	95	-	-
0F WC	95	-	-
0F WC	95	-	-
1F Circulation	95	-	-
1F Laundry	95	-	-
1F Office	95	-	-
1F R6	95	-	-
1F R9	95	-	-
1F R10	95	-	-
1F R11	95	-	-
1F R12	95	-	-
1F R13	95	-	-
1F R14	95	-	-
1F R15	95	-	-
1F R16	95	-	-
1F R17	95	-	-
1F R18	95	-	-

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
1F R19	95	-	-
1F Store	95	-	-
1F WC	95	-	-
1F WC	95	-	-
1F WC	95	-	-
1F WC	95	-	-
1F WC	95	-	-
1F WC	95	-	-
1F WC	95	-	-
1F WC	95	-	-
1F WC	95	-	-
1F WC	95	-	-
1F WC	95	-	-
1F Staff WC	95	-	-
1F WC	95	-	-
2F Circulation	95	-	-
2F R20	95	-	-
2F R21	95	-	-
2F R22	95	-	-
2F R23	95	-	-
2F Store	95	-	-
2F WC	95	-	-
2F WC	95	-	-
2F WC	95	-	-
2F WC	95	-	-
0F Kitchen	95	-	-
0F Dining	95	-	-
0F Circulation	95	-	-
0F Reception	95	100	1.35

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?
0F Communal	YES (+22.6%)	NO
0F R1	YES (+44.5%)	NO
0F R2	YES (+43%)	NO
0F R3	YES (+73.8%)	NO
0F R4	NO (-22.5%)	NO
0F R5	YES (+96.7%)	NO
0F R6	NO (-53.2%)	NO
0F R7	NO (-62%)	NO
0F Therapy	NO (-20.6%)	NO
1F R6	NO (-51.2%)	NO
1F R9	NO (-45.6%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
1F R10	NO (-7.6%)	NO
1F R11	NO (-44.9%)	NO
1F R12	YES (+21.9%)	NO
1F R13	YES (+21.4%)	NO
1F R14	YES (+0.2%)	NO
1F R15	NO (-52.5%)	NO
1F R16	NO (-39.8%)	NO
1F R17	NO (-63.2%)	NO
1F R18	NO (-69.2%)	NO
1F R19	NO (-47.8%)	NO
1F Staff WC	N/A	N/A
2F R20	NO (-35.7%)	NO
2F R21	NO (-16.4%)	NO
2F R22	NO (-61.5%)	NO
2F R23	NO (-62.1%)	NO
0F Dining	NO (-26.2%)	NO
0F Reception	YES (+190%)	NO

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?	YES
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m^2]	1053.7	1053.7
External area [m^2]	2074.8	2074.8
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	25	3
Average conductance [W/K]	899.39	782.58
Average U-value [W/m^2K]	0.43	0.38
Alpha value* [%]	33.97	33.63

* 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
	Storage or Distribution
	Hotels
100	**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/m^2]

	Actual	Notional
Heating	117.9	39.7
Cooling	0	0
Auxiliary	0.1	0.19
Lighting	13.45	10.58
Hot water	82.25	81.27
Equipment*	30.96	30.96
TOTAL**	**213.69**	**131.74**

* 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/m^2]

	Actual	Notional
Photovoltaic systems	0	11.12
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*0*	*11.12*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	507.19	331.85
Primary energy [kWh_{PE}/m^2]	329.86	180.26
Total emissions [kg/m^2]	31.4	17.01

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
	Actual	339.5	167.7	117.9	0	0.1	0.8	0	1	0
	Notional	191.5	140.3	39.7	0	0.2	1.34	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

Be Green

As designed

Date: Wed May 21 12:03:49 2025

Administrative information

Building Details

Address: Mead House Lane, Hayes End, Hayes, London, UB4 8EW

Certifier details

Name: Ecolytik

Telephone number: 0203 835 4114

Address: 86-90 Paul Street, London, EC2A 4NE

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.2

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.28

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

Foundation area [m^2]: 351.23

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

The building does not comply with England Building Regulations Part L 2021

Target CO_2 emission rate (TER), $kgCO_2/m^2$.annum	17.01	
Building CO_2 emission rate (BER), $kgCO_2/m^2$.annum	31.06	
Target primary energy rate (TPER), kWh_{PE}/m^2.annum	180.26	
Building primary energy rate (BPER), kWh_{PE}/m^2.annum	325.95	
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	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.39	0.39	0F000008_W1
Floors	0.18	0.25	0.25	0F000011_F
Pitched roofs	0.16	-	0.1	0F000010_C
Flat roofs	0.18	0.1	0.1	0F000013_C
Windows** and roof windows	1.6	1.92	2.86	0F000014_W3_O0
Rooflights***	2.2	2.3	2.3	0F000010_C_O0
Personnel doors^	1.6	2.2	2.2	0F000008_W1_O0
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [$W/(m^2K)$] $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [$W/(m^2K)$]

$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [$W/(m^2K)$]

* 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/m^2K

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	25

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

1- Direct electric

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	-	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

1- SYST0000-DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.001
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter
NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.	

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	**Zone**	**Standard**
0F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
0F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
0F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
1F Staff WC	0.2	-	-	-	-	-	-	-	-	-	N/A
1F WC	0.2	-	-	-	-	-	-	-	-	-	N/A

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
2F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
2F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
2F WC	0.2	-	-	-	-	-	-	-	-	-	N/A
2F WC	0.2	-	-	-	-	-	-	-	-	-	N/A

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
0F Circulation	95	-	-
0F Circulation	95	-	-
0F Circulation	95	-	-
0F Communal	95	95	1.421
0F Laundry	95	-	-
0F Office	95	-	-
0F Plant	95	-	-
0F Plant	95	-	-
0F R1	95	-	-
0F R2	95	-	-
0F R3	95	-	-
0F R4	95	-	-
0F R5	95	-	-
0F R6	95	-	-
0F R7	95	-	-
0F Store	95	-	-
0F Store	95	-	-
0F Therapy	95	-	-
0F WC	95	-	-
0F WC	95	-	-
0F WC	95	-	-
1F Circulation	95	-	-
1F Laundry	95	-	-
1F Office	95	-	-
1F R6	95	-	-
1F R9	95	-	-
1F R10	95	-	-
1F R11	95	-	-
1F R12	95	-	-
1F R13	95	-	-
1F R14	95	-	-
1F R15	95	-	-
1F R16	95	-	-
1F R17	95	-	-
1F R18	95	-	-

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
1F R19	95	-	-
1F Store	95	-	-
1F WC	95	-	-
1F WC	95	-	-
1F WC	95	-	-
1F WC	95	-	-
1F WC	95	-	-
1F WC	95	-	-
1F WC	95	-	-
1F WC	95	-	-
1F WC	95	-	-
1F WC	95	-	-
1F WC	95	-	-
1F WC	95	-	-
1F Staff WC	95	-	-
1F WC	95	-	-
2F Circulation	95	-	-
2F R20	95	-	-
2F R21	95	-	-
2F R22	95	-	-
2F R23	95	-	-
2F Store	95	-	-
2F WC	95	-	-
2F WC	95	-	-
2F WC	95	-	-
2F WC	95	-	-
0F Kitchen	95	-	-
0F Dining	95	-	-
0F Circulation	95	-	-
0F Reception	95	95	1.421

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?
0F Communal	YES (+22.6%)	NO
0F R1	YES (+44.5%)	NO
0F R2	YES (+43%)	NO
0F R3	YES (+73.8%)	NO
0F R4	NO (-22.5%)	NO
0F R5	YES (+96.7%)	NO
0F R6	NO (-53.2%)	NO
0F R7	NO (-62%)	NO
0F Therapy	NO (-20.6%)	NO
1F R6	NO (-51.2%)	NO
1F R9	NO (-45.6%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
1F R10	NO (-7.6%)	NO
1F R11	NO (-44.9%)	NO
1F R12	YES (+21.9%)	NO
1F R13	YES (+21.4%)	NO
1F R14	YES (+0.2%)	NO
1F R15	NO (-52.5%)	NO
1F R16	NO (-39.8%)	NO
1F R17	NO (-63.2%)	NO
1F R18	NO (-69.2%)	NO
1F R19	NO (-47.8%)	NO
1F Staff WC	N/A	N/A
2F R20	NO (-35.7%)	NO
2F R21	NO (-16.4%)	NO
2F R22	NO (-61.5%)	NO
2F R23	NO (-62.1%)	NO
0F Dining	NO (-26.2%)	NO
0F Reception	YES (+190%)	NO

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?	YES
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m^2]	1053.7	1053.7
External area [m^2]	2074.8	2074.8
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	25	3
Average conductance [W/K]	899.39	782.58
Average U-value [W/m^2K]	0.43	0.38
Alpha value* [%]	33.97	33.63

* 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
	Storage or Distribution
	Hotels
100	**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/m^2]

	Actual	Notional
Heating	117.89	39.7
Cooling	0	0
Auxiliary	0.1	0.19
Lighting	13.47	10.58
Hot water	82.25	81.27
Equipment*	30.96	30.96
TOTAL**	**213.71**	**131.74**

* 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/m^2]

	Actual	Notional
Photovoltaic systems	2.68	11.12
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*2.68*	*11.12*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	507.22	331.85
Primary energy [kWh_{PE}/m^2]	325.95	180.26
Total emissions [kg/m^2]	31.06	17.01

HVAC Systems Performance

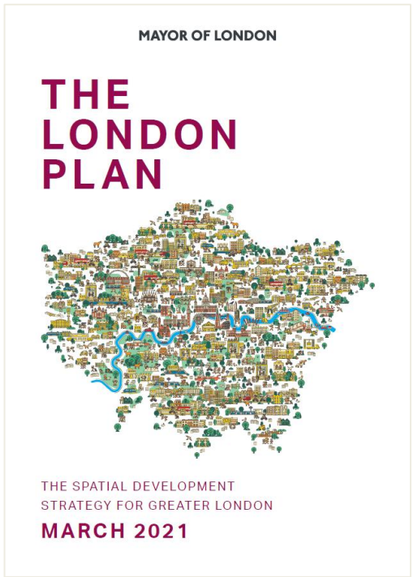
System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
	Actual	339.5	167.7	117.9	0	0.1	0.8	0	1	0
	Notional	191.5	140.3	39.7	0	0.2	1.34	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

Appendix C – GLA policies

London Plan (March 2021)



The London Plan is part of the statutory development plan for London and sets out a framework for how for how the city will develop sustainably over the next 20-25 years.

The energy and sustainability policies within the London Plan relevant to the proposed development at Mead House are summarised below.

Policy SI2 Minimising greenhouse gas emissions

- 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.
- 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.
- 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:
    - through a cash in lieu contribution to the borough's carbon offset fund, or
    - off-site provided that an alternative proposal is identified and delivery is certain.
- 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.

Policy SI3 Energy infrastructure

- identify the need for, and suitable sites for, any necessary energy infrastructure requirements including energy centres, energy storage and upgrades to existing infrastructure. 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.
- 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.

Policy SI4 Managing heat risk

- minimise adverse impacts on the urban heat island through design, layout, orientation, materials and the incorporation of green infrastructure.
- Major development proposals should demonstrate through an energy strategy how they will reduce the potential for internal overheating and reliance on air conditioning systems in accordance with the cooling hierarchy.

Energy Assessment Guidance (June 2022)

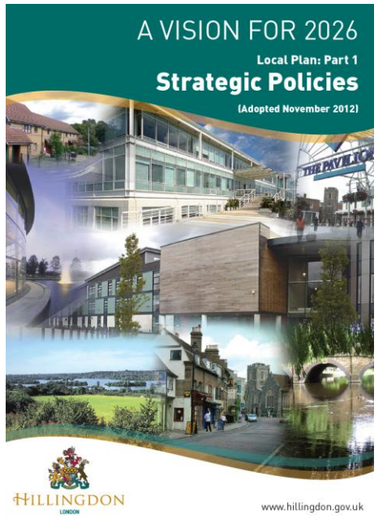
This document provides guidance on how to prepare energy statements that meets London Plan Policy SI2 for GLA referable projects. It is also useful reference for Major Developments (>10no. dwellings or >1,000m^2 non-domestic space) proposed for within Greater London.

The following considerations from the guidance have been considered for Mead House:

- Refurbishment projects should aim for the greatest possible reduction in carbon emissions where feasible.

Appendix D – Hillingdon policies

Hillingdon Local Plan (2012)



Hillingdon's Local Plan sets out policies and guidance for the development of the borough over the plan period to 2026. It sets out the Council's proposed vision, objectives and spatial strategy.

The energy and carbon related policies within the Hillingdon Local Plan relevant to the proposed development at Mead House are summarised as follows:

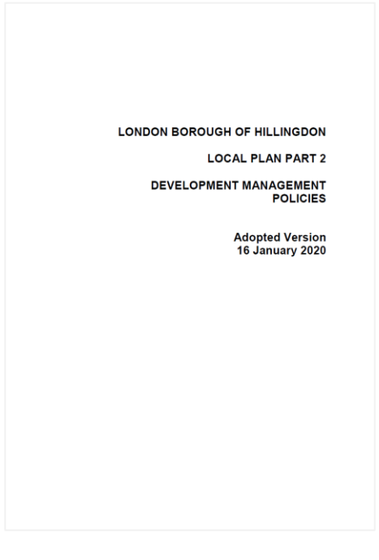
Climate Change Adaptation and Mitigation

- SO11: Address the impacts of climate change and minimise emissions of carbon and local air quality pollutants from new development and transport.

Policy EM1

- Ensure development meets the highest possible design standards.
- Promote the use of decentralised energy within large scale development.
- Target areas with high carbon emissions for additional reductions through low carbon strategies.
- Install renewable energy for all new development in meeting the carbon reduction targets savings set out in the London Plan.
- Promote new development to contribute to the upgrading of existing housing stock where appropriate.
- Include passive design measures.

Hillingdon Local Plan Part 2 (2020)


LONDON BOROUGH OF HILLINGDON

LOCAL PLAN PART 2

DEVELOPMENT MANAGEMENT POLICIES

Adopted Version
16 January 2020

This is the Hillingdon latest document with more detailed policies. Relevant energy and carbon related policies applicable to the proposed development at Mead House are summarised below. It should be noted that the policies below are more applicable to new-build developments and not refurbishment schemes such as Mead House. The principle of these policies has been adhered to as far as technically possible on site.

Policy DME2 Reducing carbon emissions

- All developments should make the fullest contribution to minimising carbon dioxide emissions in accordance with the London Plan

Policy DME3 Decentralise energy

- All major developments (>10no. dwellings or over 1,000m^2 of floor area) should be designed to be able to connect to District Energy Networks (DEN).

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