

ENERGY STATEMENT

Proposed development at:
27-31 Garman Road, London, N17 0YU



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Contents

1.	Executive Summary.....	3
2.	Introduction	4
2.1.	Overview of the proposed development.....	4
3.	Policies and Drivers	5
3.1.	National and International Policy	5
3.2.	Regional Policy: London Plan	6
3.2.1.	Policy SI 2 Minimising greenhouse gas emissions	6
3.2.2.	Policy SI 3 Energy infrastructure	7
3.2.3.	Policy SI 4 Managing heat risk.....	7
3.2.4.	Local Policy: Haringey Council.....	8
3.2.5.	Project policy.....	8
4.	Energy hierarchy	8
5.	Establishing the baseline.....	9
6.	Energy efficient design measures (<i>"be lean"</i>).....	9
7.	Energy efficient systems (<i>"be clean"</i>)	10
7.1.	Combined heat and power	10
7.2.	District heating networks.....	10
8.	Low and zero carbon energy sources (<i>"be green"</i>).....	11
8.1.	Photovoltaics.....	11
8.2.	Heat Pumps.....	11
8.3.	Solar thermal.....	12
8.4.	Wind turbines	12
8.5.	Biomass	13
8.6.	Proposed low and zero carbon energy sources	13
9.	Results: Calculated CO ₂ savings	14
9.1.	Regulated CO ₂ savings.....	14
11.	Appendix A: BRUKL Report	15
12.	Appendix B: part_I_2021_gla_carbon_emission_reporting_spreadsheet_v1.2_beta.xls.....	15

1. Executive Summary

This Energy Statement has been prepared by Achieve Green in support of a full planning application for a newly constructed warehouse / light industrial building at 27-31 Garman Road, London, N17 0YU

The design has been developed to address the energy performance policy requirements of The London Plan 2021. A target CO₂ reduction has therefore been set at 35% relative to the Building Regulations 2021, through the application of the energy hierarchy. Results have been calculated using Government approved SBEM software (using SAP 10 carbon emission factors).

A base case has been developed, against which potential savings can be assessed. This base case is the notional building developed for the Building Regulations (2021) assessment and is quantified in terms of CO₂ emissions as the Target Emission Rate (TER) for the building(s).

This proposed development features improved insulation and air tightness standards, when compared against the compliance requirements of Approved Document L2 2021 of the Building Regulations. In addition, this proposed development will incorporate a mechanical and electrical specification that surpasses the requirements of Approved Document L2 2021. These combined energy efficiency measures lead to a reduction in CO₂ emissions equivalent to 25% of the base case. This surpasses the target reduction of 15%, as required by the London Plan.

Having minimised energy consumption in the first instance, the efficient delivery of the remaining energy demands has been considered with reference to the heating and cooling hierarchy in the London Plan. Using the London Heat Map as reference it is evident this proposed development is neither within the coverage of an existing district heating network, nor is there an expectation that a district heating network will be developed at this site in the near future.

Due to its size, this development is not suitable for combined heat and power.

An assessment has been carried out to determine the potential for renewable energy systems to reduce CO₂ emissions further. There is potential for a photovoltaic array to be installed in order to meet the expectations of the Local Planning Authority. The installation of a **21 kWp photovoltaic array** will lead to a reduction in CO₂ emissions equivalent to 97% of the base case.

The total reduction in emissions resulting from energy efficiency measures and the installation of renewable technology is 122% compared to the regulated emissions from a building designed to just meet Building Regulations (2021) Part L2. This surpasses the target reduction of 35%, as required by the London Plan. As the building will achieve a 100% reduction in CO₂

emissions on site, a cash in lieu payment² to the London Borough of Haringey will not be required.

2. Introduction

Energy use in buildings is a significant contributor to global CO₂ emissions and global warming. Designing energy efficient buildings and incorporating low and zero carbon energy generation is a vital part of ensuring this development incorporates sustainability as a core part of its design.

This report is produced in line with the requirements of the document “Energy Assessment Guidance - Greater London Authority guidance on preparing energy assessments as part of planning applications (June 2022)”.

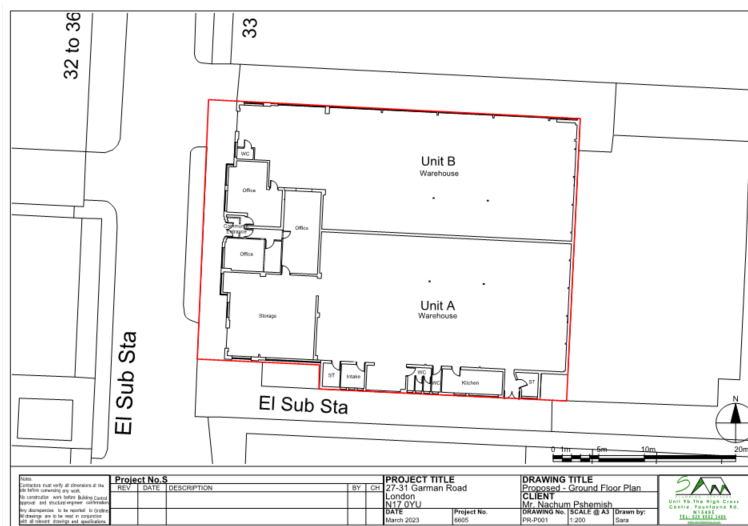
The purpose of the report is to assist evaluating parties to understand the energy consumption and performance of the proposed development and consider its performance against the “lean, clean, green” performance standard.

This application seeks by its design to surpass the CO₂ emission target of the baseline by 35% of the regulated energy consumption.

2.1. Overview of the proposed development

The proposed development consists of a newly constructed warehouse / light industrial building. The proposed development is located within the London borough of Haringey and within the Greater London area.

Proposed ground floor plan:



² Calculated based on a Carbon Offset Price of £95 per tonne for 30 years.

3. Policies and Drivers

3.1. National and International Policy

The Climate Change Act (2008) sets a legally binding target for reducing UK carbon dioxide (CO₂) emissions to zero by 2050. It also provides for a Committee on Climate Change, which sets out carbon budgets binding on the Government for 5-year periods.

The National Planning Policy Framework (NPPF) 2021, reflects the requirements of the Climate Change Act 2008 in paragraphs 153 and 155 as follows:

"Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures. Policies should support appropriate measures to ensure the future resilience of communities and infrastructure to climate change impacts, such as providing space for physical protection measures, or making provision for the possible future relocation of vulnerable development and infrastructure."

"New development should be planned for in ways that:

- a) avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure; and
- b) can help to reduce greenhouse gas emissions, such as through its location, orientation and design. Any local requirements for the sustainability of buildings should reflect the Government's policy for national technical standards."

"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 for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and

identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for co-locating potential heat customers and suppliers."

3.2. Regional Policy: London Plan

The GLA London Plan requires new major developments to reduce their carbon emissions by 100% compared to Part L 2021 Building Regulations standard, with a minimum on-site target reduction of 35%, and an option for any shortfall to net-zero carbon to be offset through a carbon offset payment.

The London Plan is the overall strategic plan for London. It sets out a fully integrated economic, environmental, transport and social framework for the development of the capital to 2041. It forms part of the development plan for Greater London. London boroughs' local plans need to be in general conformity with the London Plan, and its policies guide decisions on planning applications by councils and the Mayor.

The key London Plan policies which are relevant to this energy strategy are summarised below:

- Policy SI 2 Minimising greenhouse gas emissions
- Policy SI 3 Energy infrastructure
- Policy SI 4 Managing heat risk

3.2.1. Policy SI 2 Minimising greenhouse gas emissions

Development proposals should make the fullest contribution to minimising carbon dioxide emissions in accordance with the following energy hierarchy:

- i. Be lean: use less energy and manage demand during operation.
- ii. Be clean: exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly.
- iii. Be green: maximise opportunities for renewable energy by producing, storing and using renewable energy on-site.
- iv. 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% beyond Building Regulations is required for major development. Residential development should achieve 10%, and non-residential development should achieve 15% 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.

3.2.2. Policy SI 3 Energy infrastructure

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.

3.2.3. Policy SI 4 Managing heat risk

This policy states that 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 following cooling hierarchy:

1. reduce the amount of heat entering a building through orientation, shading, high albedo materials, fenestration, insulation and the provision of green infrastructure
2. minimise internal heat generation through energy efficient design
3. manage the heat within the building through exposed internal thermal mass and high ceilings
4. provide passive ventilation
5. provide mechanical ventilation
6. provide active cooling systems.

3.2.4. Local Policy: Haringey Council

The London Plan is key to Haringey Council planning policy and should be considered with every planning application.

3.2.5. Project policy

Planning policy leads to an on-site target reduction equal to:

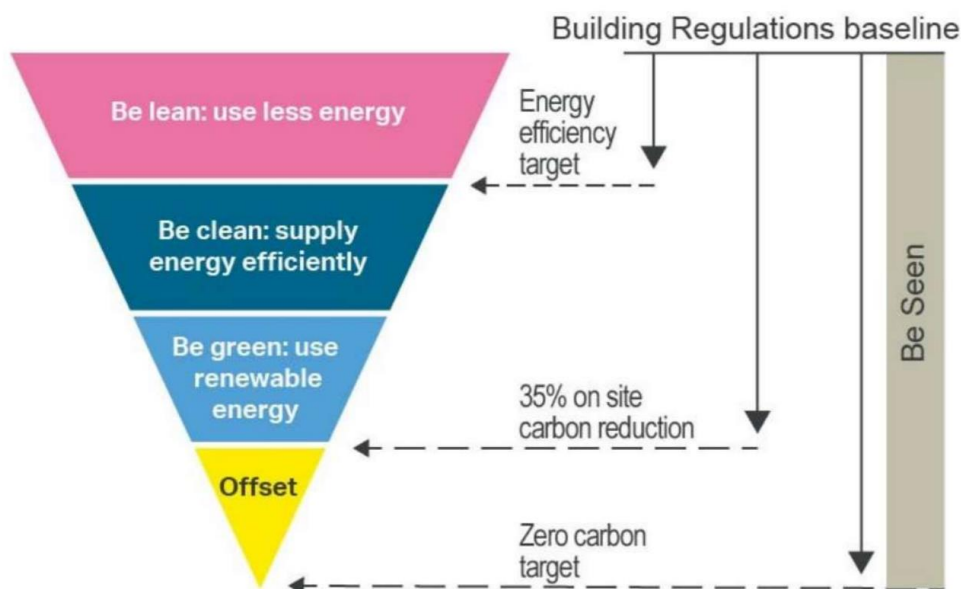
- 15% below those of a development compliant with Part L 2021 of the Building Regulations through energy efficiency measures alone ("Be Lean" stage); and
- 35% of the Regulated CO₂ emissions compared to the baseline through the application of the Energy Hierarchy.

Where it is clearly demonstrated that the specific targets cannot be fully achieved on-site, any shortfall (including to net-zero carbon, where applicable) will be provided off-site or through a cash in lieu contribution to the relevant borough.

4. Energy hierarchy

In line with best practice the proposed energy strategy for this development will follow the principals of the energy hierarchy.

The energy hierarchy has three priorities, seeking to reduce energy use before meeting remaining demand by the cleanest means possible:



- 1) Be lean – use less energy: Optimise the building fabric, glazing, and structure to minimise energy consumption in the first instance by using low U-values and good air tightness, and ensure that active systems run as energy efficiently as possible.
- 2) Be clean – supply energy efficiently: Further reduce carbon emissions through the use of decentralised energy where feasible, such as combined heat and power (CHP).
- 3) Be green – use renewable energy: When the above design elements have been reasonably exhausted, supply energy through renewable sources where practical.

5. Establishing the baseline

For non-domestic buildings that are wholly new in construction, the baseline is the Target CO₂ Emission Rate (TER) from Approved Document L2.

The baseline calculations are based on buildings that are the same size and shape as the proposed buildings and have the same exposed facades.

6. Energy efficient design measures (“be lean”)

Enhancing the thermal performance of the building envelope helps to future-proof the structure and also yields the greatest CO₂ savings. Adding renewable technology will then yield maximum carbon reductions with lower long-term costs for the developer.

The proposed non-domestic development will achieve compliance with Approved Document L2 2021 without reliance on the contribution of renewable technology³.

The following energy-efficient design measures are proposed:

	Proposed development	L2 2021 requirements
Ground floor U-value (W/m ² K)	0.10	0.18
External wall U-value (W/m ² K)	0.24 (average)	0.26
Pitched roof U-value (W/m ² K)	0.16	0.16
Flat roof U-value (W/m ² K)	0.15	0.18
Window U-value (W/m ² K)	1.40	1.60
Vehicle access door U-value (W/m ² K)	1.30	1.30
Air permeability	3.0 m ³ /h.m ²	8 m ³ /h.m ²

Having reduced energy demand through improvements to the fabric, this development shall seek to reduce energy consumption further through the specification of mechanical and

³ Under Approved Document L2 2021, the notional building specification that is used to calculate the TER can include on-site renewable generation from PV. For the purpose of estimating savings from “Be Lean” measures only, the BER calculation for this stage of the energy hierarchy includes PV savings matched to the notional building.

electrical systems with efficiencies that surpass the requirements of Approved Document L2 2021:

	Proposed development	L2 2021 requirements
Lighting efficacy	145 lm/W	95 lm/W
ASHP heating and cooling (offices)	SCOP / SEER: 4.35 / 5.50	SCOP / SEER: 2.50 / 5.00

7. Energy efficient systems (“be clean”)

7.1. Combined heat and power

Combined heat and power (CHP) systems use relatively cheap and clean fuels (such as natural gas) to generate heat and electricity on site. A typical CHP system uses combustion of natural gas to drive a turbine that produces electricity. The heat generated is captured and used to produce hot water.

As losses are minimised the carbon footprint of the energy generated is very low. However this is dependent on there being sufficient year-round local heat demand to fully utilise the heat generated by the CHP plant. An example would be developments of at least 500 dwellings, universities or hospitals.

The feasibility of a gas-fired CHP for the site has been considered, however, in this case the base load is insufficient to make CHP feasible. CHP is therefore not considered to be feasible or desirable for this project, due to the scale of the development.

7.2. District heating networks

In a district heating network heat is supplied from one or more central energy centres to multiple buildings within the network. Supply to multiple buildings guarantees high year-round local heat demand which in turn allows the use of low carbon technologies within the energy centre, such as combined heat and power systems. Large plant and aggregated demand allows systems within the energy centre to run more efficiently.

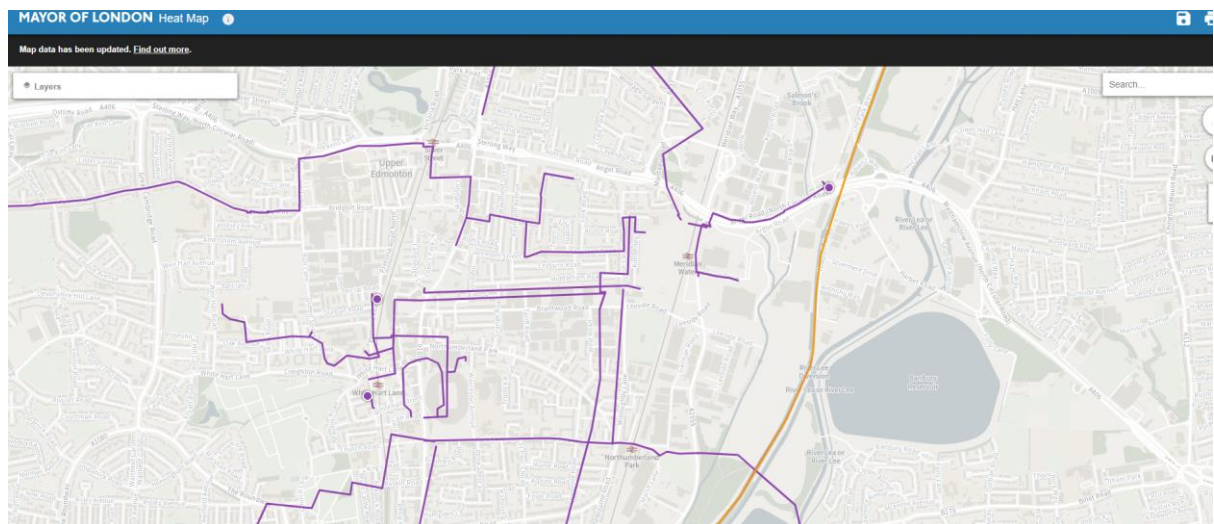
Hot water is distributed within the network via highly insulated pipes. To connect to the network individual boilers are replaced with separately metered heat exchangers.

London Plan Policy 5.6 requires new developments to connect to an existing district heating network if one is available. Where there is no existing network, but potential for a future network has been identified, major developments should incorporate the infrastructure required to connect to the network. This may include installing centralised heating plant connected to individual heat exchangers within each dwelling.

Having reviewed the London Heat Map it is evident this proposed development is neither within the coverage of an existing district heating network, nor is it within the coverage of a

proposed future district heating network. Connection to a district heating network in the short term is therefore not feasible.

London Heat Map showing existing and proposed district heating networks, energy centres, proposed transmission routes and the Heat Network Priority Area:



Due to its size and location, this development is not suitable for district heating.

8. Low and zero carbon energy sources (“be green”)

8.1. Photovoltaics

Solar photovoltaics (PV) capture the sun's energy using photovoltaic cells. The cells convert sunlight into electricity, which can be utilised on site or transferred into the National Grid. PV cells are made from layers of semi-conducting material, usually silicon. When light shines on the cell it creates an electric field across the layers. The stronger the sunshine, the more electricity is produced. Groups of cells are mounted together in panels or modules that can be mounted on a roof.

The power of a PV cell is measured in kilowatts peak (kWp). This is the rate at which the cell generates energy at peak performance in full direct sunlight.

Photovoltaics offer high CO₂ savings, are simple to install and suitable for most buildings. The only limiting factor for PV is the availability of suitable roof space.

Feasibility assessment: Feasible and appropriate. There is sufficient unshaded roofspace available for a photovoltaic installation.

8.2. Heat Pumps

Heat pumps collect low temperature heat from renewable sources (such as the air or ground) and concentrate the heat to a usable temperature via a reverse refrigeration cycle. Useable

heat is transferred to the building via a heat exchanger and can be used for low temperature heating and Domestic Hot Water, though an immersion top-up may be required for DHW.

Heat pumps have some impact on the environment as they generally use grid supplied electricity to run the pumps. It is common for heat pumps to have a coefficient of performance of three, meaning that for every 1kWh of electricity used, over 3kWh of heat can be generated. The renewable component of the output is therefore taken as the difference between the output energy and the input energy, in this scenario the heat pump will be deemed to have delivered 2kWh of renewable energy.

Ground source heat pumps require external horizontal ground loops, or as is more likely in built-up environments, vertical loops fed into bore holes. The application of ground source heat pumps is therefore constrained by site ground conditions and available space.

Air source heat pumps have a slightly lower seasonal efficiency than ground source heat pumps, but require less space. Noise and space considerations should be assessed when determining an appropriate site for external condensing units.

Feasibility assessment: Feasible and appropriate for primary heating within office space.

8.3. Solar thermal

Solar thermal systems, use free heat from the sun to warm Domestic Hot Water. A conventional boiler or immersion heater can be used to make the water hotter, or to provide hot water when solar energy is unavailable.

Solar thermal systems are most appropriate for buildings with high year-round Domestic Hot Water demand.

Many solar thermal systems will use electricity to run pumps within the system. This means the resultant CO₂ and cost savings in a building with a gas boiler will be relatively low.

Feasibility assessment: Feasible but inappropriate. There is sufficient unshaded roofspace available for a solar thermal installation but low levels of Domestic Hot Water demand.

8.4. Wind turbines

Wind turbines use blades to catch the wind. When the wind blows, the blades are forced round, driving a turbine which generates electricity. The stronger the wind, the more electricity produced.

There are two types of domestic-sized wind turbine: Pole mounted and building mounted. Pole mounted turbines are free standing and are erected in a suitably exposed position, and are often about 5kW to 6kW in size. Building mounted turbines are smaller and can be installed on the roof of a home where there is a suitable wind resource. Often these are around 1kW to 2kW in size.

Large scale turbines, in exposed locations offer one of the best financial returns of all renewable energy systems as the payback of the system increases dramatically with the size of the turbine. However small-scale systems offer much lower levels of performance and recent studies have questioned the viability and output from such systems, particularly in urban environments.

Feasibility assessment: Potentially feasible and appropriate. Further investigation required.

8.5. Biomass

Biomass heating systems, burn wood pellets, chips or logs to provide warmth in a single room or to power central heating and hot water boilers. The carbon dioxide emitted when wood is burned is the same amount that was absorbed over the months and years that the plant was growing. The process is sustainable as long as new plants continue to grow in place of those used for fuel. There are some carbon emissions caused by the cultivation, manufacture and transportation of the fuel, but as long as the fuel is sourced locally, these are much lower than the emissions from fossil fuels.

When specifying biomass heating systems is important to consider the potential technical issues surrounding delivery and storage of fuel.

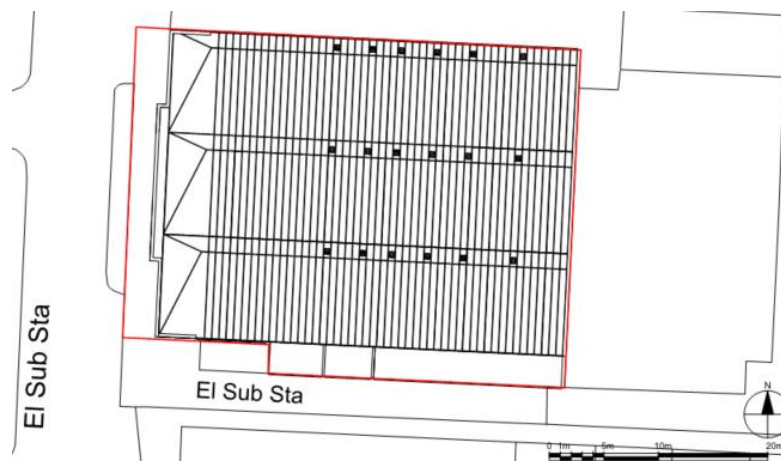
Although the CO₂ savings from biomass are substantial, the high levels of NO_x emissions can make biomass systems unsuitable for urban environments.

Feasibility assessment: Feasible but inappropriate in this urban setting.

8.6. Proposed low and zero carbon energy sources

With CO₂ emissions within the building already reduced through an enhanced fabric and energy efficient systems, it is proposed that further reduction will be achieved through the installation of a **21 kWp photovoltaic system** on the roof of the building.

Roof plan showing available area for photovoltaic installation:



9. Results: Calculated CO₂ savings

9.1. Regulated CO₂ savings

Table 1: Carbon Dioxide Emissions after each stage of the Energy Hierarchy for non-domestic buildings

	Carbon dioxide emissions for non-domestic buildings (Tonnes CO ₂ per annum)
Baseline: Part L 2021 of the Building Regulations Compliant Development	0.8
After energy demand reduction (be lean)	0.6
After heat network connection (be clean)	0.6
After renewable energy (be green)	-0.2

Table 2: Regulated carbon dioxide savings from each stage of the Energy Hierarchy for non-domestic buildings

	Regulated non-residential carbon dioxide savings	
	(Tonnes CO ₂ per annum)	(%)
Be lean: savings from energy demand reduction	0.2	25%
Be clean: savings from heat network	0.0	0%
Be green: savings from renewable energy	0.8	97%
Total Cumulative Savings	1.0	122%
Annual savings from off-set payment	0	-
	(Tonnes CO ₂)	
Cumulative savings for off-set payment	0	-
Cash in-lieu contribution (£)	0	



11. Appendix A: BRUKL Report

12. Appendix B:

part I 2021 gla carbon emission reporting spreadsheet v1.2 beta.xls

RESIDENTIAL ENERGY CONSUMPTION AND CO₂ ANALYSIS (PART L1)

NON-RESIDENTIAL ENERGY CONSUMPTION AND CO₂ ANALYSIS (PART L2)

Bidding Use	Model Area (m ²)	Number of Units represented by model (m ²)	Validation Check	Regulated Energy Consumption by End Use (kBtu/yr p.a.) TER - Source: BRULG OUTPUT	Regulated CO ₂ Emissions by Fuel Type (kgCO ₂ /yr p.a.) TER - Source: SIMULGY FILE

SITE-WIDE ENERGY CONSUMPTION AND CQ ANALYSIS

Calculated											CO ₂ EMISSIONS
							Electricity		Electricity		

The applicant should complete all the light blue cells including information on the 'be lean' energy consumption figures, the 'be lean' DER, the DFEE and the regulated energy demand of the 'be lean' scenario.

RESIDENTIAL ENERGY CONSUMPTION AND CO ₂ ANALYSIS (PART L1)		REGULATED ENERGY CONSUMPTION PER UNIT (kWh p.a.) - 'BE LEAN' SAP DER WORKSHEET																REGULATED CO ₂ EMISSIONS PER UNIT (kgCO ₂ p.a.)										Fabric Energy Efficiency (FEE)						
Unit identifier (e.g. plot number, dwelling Model, total floor area etc.)				Validation Check Calculated DER (kgCO ₂ / m ²) DER Worksheet (kgCO ₂ / m ²)		Space Heating (Heat Source 1)	Fuel type Space Heating	Domestic Hot Water (Heat Source 1)	Fuel type Domestic Hot Water	Space Heating (Heat source 2)	Fuel type Space Heating	Domestic Hot Water (Heat source 2)	Fuel type Domestic Hot Water	Space and Domestic Hot Water from CHP	Fuel type CHP	Total Electricity generated by CHP (t)	Fuel factors for electricity generated by CHP	Secondary Heating system	Fuel type Secondary Heating	Lighting	Auxiliary	Cooling	Space Heating	Domestic Hot Water	Space Heating and DHW from CHP	Electricity generated by CHP	Lighting	Auxiliary	Cooling	Electricity generated by renewable technology (notional building) (t)	Part L 2021 CO ₂ emissions (kgCO ₂ p.a.)	Dwelling Fabric Energy Efficiency (DFEE) (kWh/m ²)		
Total area represented by model (m ²)				DER Sheet (Row 384)	DER Sheet (Row 385 + (Row 387b x 0.01))	Select fuel type	DER Sheet (Row 318b + (Row 387b x 0.01))	Select fuel type	If applicable DER Sheet (Row 387c + (Row 387c x 0.01))	Select fuel type	If applicable DER Sheet (Row 318c + (Row 387c x 0.01))	Select fuel type	If applicable DER Sheet (Row 387d + (Row 387d x 0.01))	Select fuel type	If applicable DER Sheet (Row 318d + (Row 387d x 0.01))	Select fuel type	If applicable DER Sheet (Row 387e + (Row 387e x 0.01))	DER Sheet (Row 309)	Select fuel type	DER Sheet (Row 332)	DER Sheet (Row 313 + 331)	DER Sheet (Row 315)	If applicable	If applicable	If applicable	If applicable	If applicable	If applicable						
Sum				0	0	0.0	-	0	N/A	0	N/A	0	N/A	0	N/A	0	0	0	0	N/A	0	0	0	0	0	0	0	0	0	0	0	0.00		
NON-RESIDENTIAL ENERGY CONSUMPTION AND CO ₂ ANALYSIS (PART L2)		REGULATED ENERGY CONSUMPTION BY END USE (kWh/m ² p.a.) - 'BE LEAN' BER - SOURCE: 'BIM.CSV FILE																REGULATED CO ₂ EMISSIONS BY FUEL TYPE (kgCO ₂ /m ² p.a.) - BER BRUKL - SOURCE: 'BIM.CSV FILE																
Building Use				Validation Check Calculated BER (kgCO ₂ / m ²) BRUKL BER (kgCO ₂ / m ²)		Space Heating (kWh/m ² p.a.)	Fuel type Space Heating	Domestic Hot Water (kWh/m ² p.a.)	Fuel type Domestic Hot Water											Lighting (kWh/m ² p.a.)	Auxiliary (kWh/m ² p.a.)	Cooling (kWh/m ² p.a.)	Natural Gas	Grid Electricity	Bespoke DH Factor	Enter Carbon Factor 1	Enter Carbon Factor 2	Enter Carbon Factor 3	Electricity generated by renewable technology (notional building) (t)	Part L 2021 CO ₂ emissions (kgCO ₂ p.a.)				
Unit A and B	1,106.37	1	1,106.37	1.8		2.5803	Grid Electricity	3.58076	Grid Electricity											6.90339	0.003498	0.002333	2								-1.3712	624		
Sum				1	1,106	1.8	-	2.862	N/A	3.549	N/A											7.021	73	955	0	1,993	0	0	0	0	0	-1,369	624	
SITE-WIDE ENERGY CONSUMPTION AND CO ₂ ANALYSIS		REGULATED ENERGY CONSUMPTION																REGULATED CO ₂ EMISSIONS																
Total Area (m ²)				Calculated BER (kgCO ₂ / m ²)	Space Heating (kWh p.a.)	N/A	Domestic Hot Water (kWh p.a.)	N/A	Space and Domestic Hot Water from CHP (kWh p.a.)	N/A	Secondary Heating System (kWh p.a.)	N/A	N/A	N/A	Electricity generated by CHP (kWh p.a.)	N/A	N/A	N/A	Lighting (kWh p.a.)	Auxiliary (kWh p.a.)	Cooling (kWh p.a.)											Part L 2021 CO ₂ emissions (kgCO ₂ p.a.)		
Sum				1,106	1.8	-	2.862		3.549		0		0		0				7.021	73	955											624		

RESIDENTIAL ENERGY CONSUMPTION AND CO₂ ANALYSIS (PART L1)

NON-RESIDENTIAL ENERGY CONSUMPTION AND CO₂ ANALYSIS (PART L2)

Total area			VALIDATION CHECK		REGULATED ENERGY CONSUMPTION BY END USE (kWh/m ² a.a.) 'BE CLEAN' BER - SOURCE: BRUKL OUTPUT		REGULATED CO ₂ -EMISSIONS BY FUEL TYPE (kgCO ₂ /m ² a.a.) BER BRUKL - SOURCE: 'SIM.CSV FILE	
Building Use	Model Area (m ²)	Number of units represented by						

SITE-WIDE ENERGY CONSUMPTION AND CO₂ ANALYSIS[illegible]

The applicant should complete all the light blue cells including information on the 'be green' energy consumption figures and the 'be green' DER.																																																																																																																																																																																																																																																																																																																																								
RESIDENTIAL ENERGY CONSUMPTION AND CO ₂ ANALYSIS (PART L1)																																																																																																																																																																																																																																																																																																																																								
Unit identifier (B-g, plot number, dwelling type etc.)	Total area represented by type etc.)	VALIDATION CHECK		REGULATED ENERGY CONSUMPTION PER UNIT (kWh p.a.) - 'BE GREEN' GAP DER WORKSHEET																REGULATED CO ₂ EMISSIONS PER UNIT (kgCO ₂ p.a.)								Part L 2021 CO ₂ emissions (kgCO ₂ p.a.)																																																																																																																																																																																																																																																																																																												
		Calculated DER (kgCO ₂ / m ²)	DER Worksheet DER (kgCO ₂ / m ²)	Space Heating (Heat Source 1)	Fuel type Space Heating	Domestic Hot Water (Heat Source 1)	Fuel type Domestic Hot Water	Space Heating (Heat source 2)	Fuel type Space Heating	Domestic Hot Water (Heat source 2)	Fuel type Domestic Hot Water	Space and Domestic Hot Water from CHP	Fuel type CHP	Total Electricity generated by CHP (t)	Fuel factors for electricity generated by CHP	Secondary Heating system	Fuel type Secondary Heating	Electricity generated by renewable (t)	Lighting	Auxiliary	Cooling	Space Heating Domestic Hot Water	Space Heating and DHW from CHP	Electricity generated by CHP	Lighting	Auxiliary	Cooling		Electricity generated by renewable																																																																																																																																																																																																																																																																																																											
		DER Sheet (Row 344)	DER Sheet (Row 345 + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345b + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345c + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345d + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345e + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345f + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345g + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345h + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345i + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345j + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345k + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345l + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345m + (Row 347a + 0.01)		Select fuel type	DER Sheet (Row 345n + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345o + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345p + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345q + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345r + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345s + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345t + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345u + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345v + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345w + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345x + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345y + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345z + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345aa + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345ab + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345ac + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345ad + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345ae + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345af + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345ag + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345ah + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345ai + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345aj + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345ak + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345al + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345am + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345an + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345ao + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345ap + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345aq + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345ar + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345as + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345at + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345au + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345av + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345aw + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345ax + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345ay + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345az + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345ba + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345bb + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345bc + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345bd + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345be + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345bf + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345bg + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345bh + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345bi + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345bj + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345bk + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345bl + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345bm + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345bn + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345bo + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345bp + (Row 347a + 0.01)	Select fuel type	DER Sheet (Row 345bq + (Row 347a + 0.01)	Select fuel type	DER 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Part L 2021 Performance

Residential

Table 1: Carbon Dioxide Emissions after each stage of the Energy Hierarchy for residential buildings

	Carbon Dioxide Emissions for residential buildings (Tonnes CO ₂ per annum)	
	Regulated	Unregulated
Baseline: Part L 2021 of the Building Regulations Compliant Development	0.0	
After energy demand reduction (be lean)	0.0	
After heat network connection (be clean)	0.0	
After renewable energy (be green)	0.0	

Table 2: Regulated Carbon Dioxide savings from each stage of the Energy Hierarchy for residential buildings

	Regulated residential carbon dioxide savings	
	(Tonnes CO ₂ per annum)	(%)
Be lean: savings from energy demand reduction	0.0	0%
Be clean: savings from heat network	0.0	0%
Be green: savings from renewable energy	0.0	0%
Cumulative on site savings	0.0	0%
Annual savings from off-set payment	0.0	-
	(Tonnes CO ₂)	
Cumulative savings for off-set payment	0	-
Cash in-lieu contribution (£)	0	

*carbon price is based on GLA recommended price of £95 per tonne of carbon dioxide unless Local Planning Authority price is inputted in the 'Development Information' tab

Non-residential

Table 3: Carbon Dioxide Emissions after each stage of the Energy Hierarchy for non-residential buildings

	Carbon Dioxide Emissions for non-residential buildings (Tonnes CO ₂ per annum)	
	Regulated	Unregulated
Baseline: Part L 2021 of the Building Regulations Compliant Development	0.8	
After energy demand reduction (be lean)	0.6	
After heat network connection (be clean)	0.6	
After renewable energy (be green)	-0.2	

Table 4: Regulated Carbon Dioxide savings from each stage of the Energy Hierarchy for non-residential buildings

	Regulated non-residential carbon dioxide savings	
	(Tonnes CO ₂ per annum)	(%)
Be lean: savings from energy demand reduction	0.2	25%
Be clean: savings from heat network	0.0	0%
Be green: savings from renewable energy	0.8	97%
Total Cumulative Savings	1.0	122%
Annual savings from off-set payment	-0.2	-
	(Tonnes CO ₂)	
Cumulative savings for off-set payment	-6	-
Cash in-lieu contribution (£)	-523	

*carbon price is based on GLA recommended price of £95 per tonne of carbon dioxide unless Local Planning Authority price is inputted in the 'Development Information' tab

SITE-WIDE

	Total regulated emissions (Tonnes CO ₂ / year)	CO ₂ savings (Tonnes CO ₂ / year)	Percentage savings (%)
Part L 2021 baseline	0.8		
Be lean	0.6	0.2	25%
Be clean	0.6	0.0	0%
Be green	-0.2	0.8	97%
Total Savings	-	1.0	122%
	-	CO ₂ savings off-set (Tonnes CO ₂)	-
Off-set	-	-5.5	-

	Target Fabric Energy Efficiency (kWh/m ²)	Dwelling Fabric Energy Efficiency (kWh/m ²)	Improvement (%)
Development total	0.00	0.00	

	Area weighted non-residential cooling demand (MJ/m ²)	Total area weighted non-residential cooling demand (MJ/year)
Actual		
Notional		

EUI & space heating demand (predicted energy use)

Building type	EUI (kWh/m ² /year) (excluding renewable energy)	Space heating demand (kWh/m ² /year) (excluding renewable energy)	EUI value from Table 4 of the guidance (kWh/m ² /year) (excluding renewable energy)	Space heating demand from Table 4 of the guidance(kWh/m ² /year) (excluding renewable energy)	Methodology used (e.g. 'be seen' methodology or an alternative predictive energy modelling methodology)	Explanatory notes (if expected performance differs from the Table 4 values in the guidance)
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