Energy and Sustainability Strategy

Site: 94a Christchurch Road
Client: Haywood Group
June 2026

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1. Executive Summary

Future Energy Assessors have been appointed to prepare an Energy and Sustainability Statement in support of a proposed residential development at Rear of 94 Christchurch Road, London, SW2. The proposal comprises the erection of a detached single-storey dwelling (Use Class C3), together with associated refuse and cycle storage, access arrangements, landscaping, and ancillary works. The application has been submitted to Lambeth Council under reference 24/03080/FUL and is currently under determination.

This statement has been prepared to demonstrate compliance with the energy and carbon performance requirements of Building Regulations Part L (2021) and the relevant energy policies of the London Plan. The assessment follows the established energy hierarchy approach, focusing on reducing energy demand, supplying energy efficiently, and incorporating low-carbon technologies where appropriate.

Energy demand is minimised through a fabric-first approach, with enhanced thermal performance across the building envelope, high-performance glazing, and the incorporation of mechanical ventilation with heat recovery to reduce space heating demand. These measures form the basis of the "Be Lean" stage of the energy strategy.

A review of decentralised energy options has been undertaken in accordance with London Plan Policy SI 3. Individual air source heat pump technology has been identified as the most appropriate solution for the scale and nature of the development, providing efficient, all-electric space heating and hot water while avoiding reliance on fossil fuels. This approach satisfies the "Be Clean" stage of the energy hierarchy.

The use of low-carbon heating technology enables the scheme to achieve a significant reduction in regulated carbon emissions compared to the Part L 2021 baseline. The proposed strategy results in a reduction of approximately 51% in regulated CO_2 emissions relative to the notional building, exceeding the minimum policy requirements.

CO_2 Emissions (Tonnes per Annum)	
	Residential
Baseline: Part L 2021	0.8
Be Lean: Use Less Energy	0.7
Be Clean: Supply Energy Efficiently	0.7
Be Green: Use Renewable Energy	**0.4**
CO_2 Savings at Be Green over Part L 2021	**51%**

Table: Regulated Carbon Emissions Summary

Overall, the proposed energy strategy demonstrates that the development achieves full compliance with current Building Regulations and relevant planning policy, while delivering a robust, future-proofed and policy-aligned solution appropriate to the scale of the proposal.

On this basis, the proposed energy strategy is considered compliant with all applicable national and local planning policy and the requirements of Approved Document Part L (2021).

1.1 Site Location and Description

The proposed development is located at Rear of 94 Christchurch Road, London, SW2, within the administrative boundary of the London Borough of Lambeth. The site lies within an established residential area characterised by low-rise housing and local residential streets, with good access to public transport and local amenities.

The site comprises a backland plot located to the rear of an existing residential property and is previously developed land. Surrounding uses are predominantly residential in nature, with no identified heritage or ecological designations constraining the site.

The urban context, constrained site arrangement and residential surroundings have informed the proposed energy and sustainability strategy, with an emphasis on compact built form, high fabric performance, all-electric building services and mitigation of overheating risk through passive design measures

2. Policy Framework

This section sets out the national, regional, and local planning policy context relevant to the proposed development at Rear of 94 Christchurch Road, London, SW2. The policies outlined below establish the regulatory and planning baseline against which the Energy Strategy has been developed and assessed.

The proposed development is classified as a **minor residential development** and has therefore been considered in a proportionate manner, consistent with the scale and nature of the scheme.

2.1 National Planning Policy Framework (NPPF) (2023)

The National Planning Policy Framework (NPPF), updated in September 2023, provides the overarching planning policy context for sustainable development in England.

The NPPF defines sustainable development through three interdependent objectives:

- **Economic objective** – supporting the delivery of development that contributes to a strong and competitive economy.
- **Social objective** – promoting healthy, inclusive, and safe communities with access to high-quality homes.
- **Environmental objective** – protecting and enhancing the natural and built environment, using resources efficiently, minimising pollution, and addressing climate change through mitigation and adaptation measures.

In relation to energy and climate change, the NPPF requires development to contribute to the transition towards a low-carbon future. This includes reducing greenhouse gas emissions, improving energy efficiency through good design, and avoiding high-carbon infrastructure that may become obsolete over the lifetime of the development.

The NPPF also establishes a **presumption in favour of sustainable development**, whereby planning decisions should proactively support development that aligns with environmental objectives, mitigates climate change impacts, and makes effective use of land within urban areas.

The proposed all-electric energy strategy responds directly to these objectives by prioritising energy demand reduction, removing reliance on fossil fuel heating, and supporting long-term carbon reduction in line with national policy direction.

2.2 Regional Policy – The London Plan (2021)

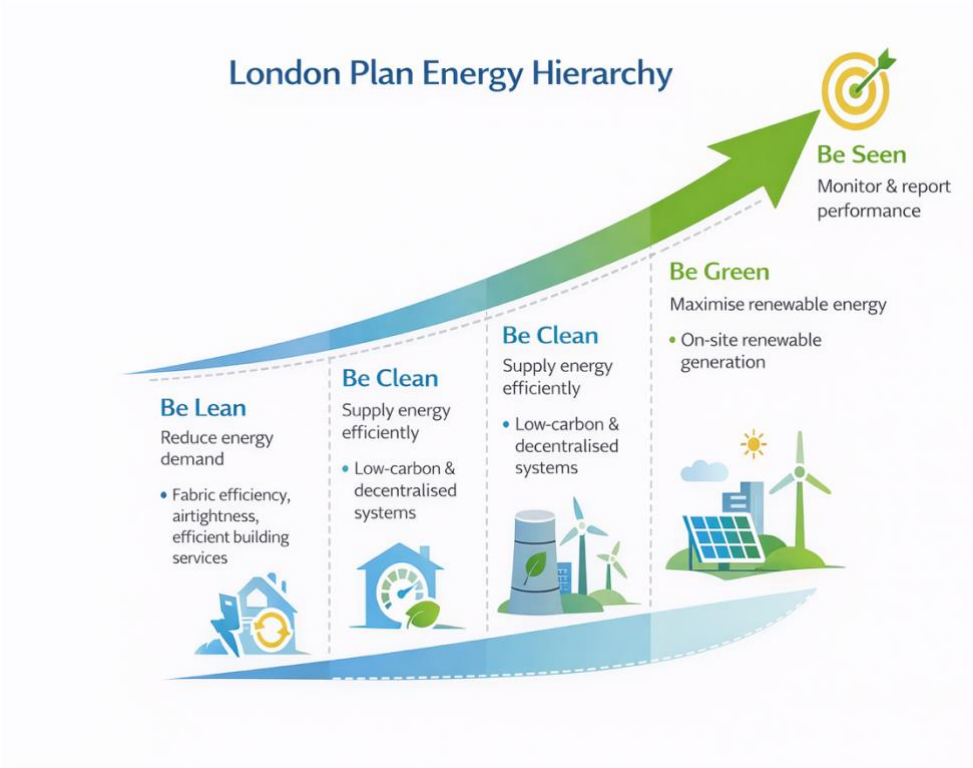
The London Plan (March 2021) sets out the strategic planning framework for development across Greater London and establishes a clear pathway towards a net-zero-carbon city.

The proposed development is located within Greater London and is therefore subject to the energy and carbon requirements of the London Plan (March 2021) and the Greater London Authority (GLA) Energy Assessment Guidance (June 2022).

The London Plan sets out a clear policy direction for new development to minimise greenhouse gas emissions and to support London's transition to a net zero-carbon city. Policy SI 2 requires development proposals to follow the energy hierarchy and to demonstrate that carbon emissions have been reduced as far as reasonably practicable through on-site measures.

Policy SI 3 requires applicants to prioritise energy efficiency and low-carbon heating solutions, with a strong presumption against the use of new fossil fuel infrastructure where lower-carbon alternatives are viable. The policy also requires that opportunities for decentralised and renewable energy generation are fully explored and justified.

The GLA Energy Assessment Guidance (June 2022), issued alongside the implementation of Approved Document Part L (2021) and SAP 10.2, confirms that major residential developments are expected to achieve a minimum on-site carbon reduction of 35 per cent beyond the Part L 2021 baseline. The guidance clarifies that this target remains unchanged from previous guidance and must be achieved through the application of the energy hierarchy.



Planning applicants are expected to demonstrate that carbon reductions have been maximised at each stage of the hierarchy, with any residual emissions only addressed through offsetting once on-site measures have been exhausted.

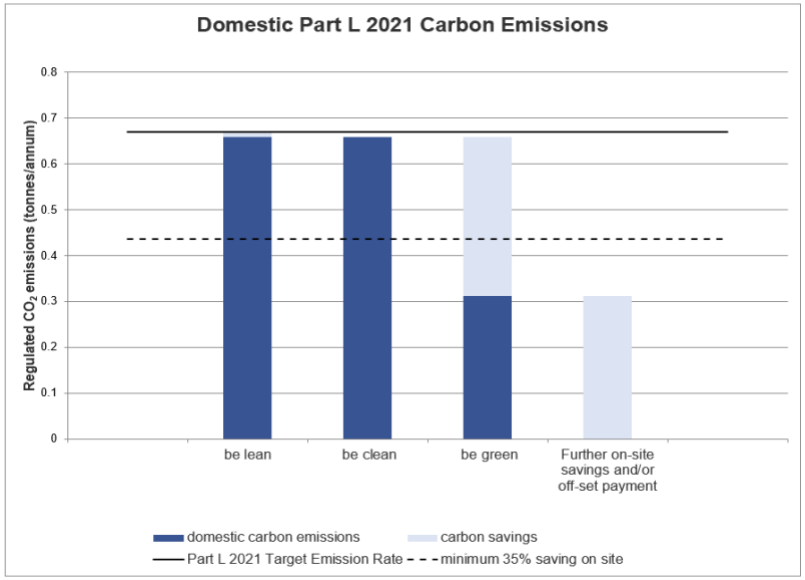
The proposed energy strategy has been developed in direct response to these requirements and applies the energy hierarchy in a proportionate manner appropriate to the scale and nature of the development.

Given the minor scale of the proposed development, the Energy Strategy applies the energy hierarchy in a proportionate manner, focusing on fabric performance, efficient building services, and low-carbon heating solutions rather than large-scale energy infrastructure.

Accordingly, the proposed strategy is considered to align with the requirements of the London Plan and the GLA Energy Assessment Guidance.

2.3 Local Planning Policy Context

The site is located within the administrative boundary of the London Borough of Lambeth and is subject to the adopted local planning policy framework, alongside the strategic policies of the London Plan. Local planning policy seeks to support sustainable development that reduces carbon emissions, improves energy efficiency, and contributes to London-wide objectives for climate change mitigation and the transition to a low-carbon built environment.



Lambeth's local policies promote high standards of sustainable design and construction, including the reduction of energy demand through improved building fabric, the use of efficient building services, and the incorporation of low-carbon and renewable energy technologies where viable. In line with both local and strategic policy direction, there is an increasing emphasis on avoiding new fossil fuel infrastructure and supporting all-electric development that is compatible with long-term decarbonisation of the electricity grid.

The proposed Energy Strategy has been developed in response to this policy context. The strategy prioritises energy demand reduction through a fabric-first approach, supported by high levels of insulation, improved thermal continuity, and energy-efficient glazing. Space heating and domestic hot water are provided via an all-electric air source heat pump system, avoiding the installation of gas infrastructure and supporting local objectives for reduced operational carbon emissions.

Mechanical ventilation with heat recovery is proposed to further reduce space-heating demand while maintaining good internal air quality. Taken together, the proposed measures ensure that the development aligns with Lambeth's local planning policy objectives and supports the delivery of a low-carbon, energy-efficient dwelling that is consistent with both borough-level and London-wide sustainability goals.

Accordingly, the proposed Energy Strategy is considered to be fully compliant with the relevant local planning policy requirements.

2.4 Local Policy – Lambeth Local Plan

Policy EN4: Sustainable design and construction

A. Lambeth will follow the approach set out in London Plan policies SI1 Improving air quality, SI2 Minimising greenhouse gas emissions, SI4 Managing heat risk, SI5 C and E Water infrastructure.

B. All development, including construction of the public realm, highways and other physical infrastructure, will be required to meet high standards of sustainable design and construction feasible, relating to the scale, nature and form of the proposal.

C. In addition to the requirements for zero-carbon in major new developments in London Plan policy SI2:

   i. All new non-residential development and non-self-contained residential accommodation, must meet at least BREEAM 'Excellent'.

   ii. All major non-residential refurbishment of existing buildings and conversions over 500m² floorspace (gross) must meet at least BREEAM Non-Domestic Refurbishment 'Excellent'.

   iii. Minor new-build residential developments of between one and nine units, including proposals that involve extensions or change of use to provide dwellings, must achieve a minimum on-site reduction in regulated carbon emissions of at least 19 per cent beyond Part L of the Building Regulations, unless it can be demonstrated that such provision is not feasible.

D. Proposals should demonstrate in a supporting statement that sustainable design standards are integral to the design, construction and operation of the development. New build residential development are encouraged to use the Home Quality Mark and Passivhaus design standards. Planning applications for non-residential developments should be accompanied by a pre-assessment, demonstrating how the BREEAM standards, or any future replacement standards, will be met.

E. Development will be required to be resilient to climate change by including appropriate climate change adaptation measures.

F. Adequate remedial treatment of any contaminated land will be required before development can commence.

2.5 Part L of the Building Regulations

Approved Document Part L of the Building Regulations sets the minimum energy and carbon performance standards for new dwellings in England. The 2021 update to Part L represents a significant step towards the Government's wider net zero ambitions and forms an interim uplift ahead of the Future Homes Standard.

In July 2018, the then Department for Business, Energy and Industrial Strategy (BEIS) published proposals to update SAP 9.92, which underpinned Part L 2013. This work culminated in the release of SAP 10 and the introduction of Part L 2021, which came into force in June 2022. Under Part L 2021, new homes are required to achieve a minimum reduction of 31 per cent in regulated carbon emissions when compared against the Part L 2013 baseline.

A key change introduced under Part L 2021 is the significant reduction in the carbon factor applied to grid electricity within SAP 10.2. This change reflects the continued decarbonisation of the national electricity grid and has materially altered the relative performance of different heating technologies, strongly favouring electrically led solutions over fossil fuel systems.

Fuel	Part L 2013 ($kgCO_2/kWh$)	Part L 2021 ($kgCO_2/kWh$)	Part L 2025 ($kgCO_2/kWh$)	Percentage Reduction
Electricity	0.519	0.233	0.086	73.8%

Part L 2021 also introduced a revised compliance framework based on three performance targets, all of which must be met for regulatory compliance to be achieved. These are:

- Target Emission Rate (TER), which limits regulated CO_2 emissions
- Target Primary Energy Rate (TPER), which controls overall energy demand and system efficiency
- Target Fabric Energy Efficiency (TFEE), which ensures a minimum standard of fabric performance

This multi-metric approach places greater emphasis on fabric efficiency, building services performance, and overall system integration, rather than relying solely on carbon emissions. Compliance is demonstrated through

SAP 10.2 calculations, with the Dwelling Emission Rate, Dwelling Primary Energy Rate, and Dwelling Fabric Energy Efficiency required to be equal to or better than their respective targets.

The Energy Strategy for the proposed development has been prepared with full regard to the requirements of Part L 2021. The adoption of a fabric-first approach, combined with efficient all-electric heating, hot water, and ventilation systems, ensures that the development is capable of achieving compliance with all three Part L performance metrics.

Accordingly, the proposed Energy Strategy is considered to be compliant with the requirements of Approved Document Part L 2021.

2.6 The Future Homes Standard

In October 2019, the then Ministry of Housing, Communities and Local Government issued a consultation on proposed changes to Part L of the Building Regulations, known as the Future Homes Standard. The objective of the Future Homes Standard is to ensure that new dwellings are delivered with low-carbon heating and significantly improved energy efficiency, supporting the UK Government's commitment to achieving net zero carbon emissions by 2050.

The Future Homes Standard is intended to take effect from 2025 and will fundamentally change the approach to heating and energy provision in new residential developments. Its introduction reflects a clear policy direction away from fossil fuel–based systems and towards electrically led, low-carbon solutions.

On 13 December 2023, further consultation documents were published by the Department for Levelling Up, Housing and Communities in relation to the Future Homes and Buildings Standard. Although the proposals remain subject to consultation, the documents provide a clear indication of how future regulatory requirements are expected to evolve and how new dwellings will be required to be "net-zero ready".

The consultation confirms several key principles that are directly relevant to the proposed development, including:

- The removal of gas boilers from the notional dwelling specification
- A prohibition on the installation of fossil fuel–powered boilers in new buildings from 2025

- Further reductions in the carbon factor applied to grid electricity, reflecting continued grid decarbonisation
- Confirmation that hybrid and hydrogen-ready boilers will not meet the proposed standards
- No fundamental change to fabric or building services performance requirements beyond those introduced under Part L 2021

In parallel, a separate consultation has been issued proposing the withdrawal of the Standard Assessment Procedure (SAP) and its replacement with a new Home Energy Model. While the timing and final scope of this transition remain under development, it reinforces the direction of travel towards more robust assessment of operational energy use and carbon performance.

The proposed all-electric energy strategy aligns strongly with the principles of the Future Homes and Buildings Standard, avoiding reliance on fossil fuel infrastructure and reducing the risk of early obsolescence. As a result, the development is well positioned to meet both current regulatory requirements and anticipated future policy changes.

Accordingly, the proposed energy strategy aligns with the principles of the Future Homes and Buildings Standard and reflects the anticipated direction of future regulatory requirements.

3 Energy Calculations

3.1 SAP Modelling and Emissions Assessment

To estimate regulated carbon emissions for the proposed development, SAP calculations have been undertaken by an accredited OCDEA Domestic Energy Assessor using Design SAP 10.2.

Carbon performance is assessed against Building Regulations Part L 2021 using the following metrics:

- Target Emission Rate (TER)
- Dwelling Emission Rate (DER)

These are expressed in kilograms of CO_2 per square metre per annum ($kgCO_2/m^2 \cdot yr$). For reporting purposes, emissions have been aggregated to tonnes of CO_2 per annum based on dwelling floor area.

The assessment includes regulated emissions associated with:

- Space heating (and cooling, where applicable)
- Domestic hot water
- Fixed internal lighting
- Auxiliary energy (fans and pumps)

3.2 Passive Energy Efficiency Measures

A fabric-first approach has been adopted to minimise energy demand and reduce reliance on building services. Passive measures incorporated within the design include:

- Enhanced levels of insulation exceeding Part L 2021 notional values
- Improved thermal continuity to limit heat losses
- Low air permeability achieved through good detailing and construction quality
- High-performance glazing to reduce heat demand while optimising solar gains
- Building orientation and layout designed to reduce energy demand where feasible
- Provision of cross-ventilation to support summer comfort

These measures collectively reduce space-heating demand and form the primary component of the Be Lean stage of the energy hierarchy.

Building Element	**Construction**	**Proposed U-value (W/m^{2}K)**
External Walls	Insulated timber frame construction	**0.18**
Ground Floor	Insulated ground bearing floor slab	**0.18**
Roof	Insulated pitched roof construction	**0.13**
Windows	Double glazed, low-emissivity, argon-filled units	**1.20**
External Doors	Insulated external doors	**1.00**
Air Permeability	Design air permeability	**2.5 m^3/(h·m^2) @ 50 Pa**
Thermal Bridging	Accredited/Calculated junction details in accordance with SAP 10.2	Yvalue 0.025

3.3 Active Building Services Strategy

Efficient, low-carbon building services are proposed to complement the fabric-first approach and further limit regulated carbon emissions. The development will incorporate a zero-NOx heating solution, smart metering, and energy-efficient systems as summarised below.

Proposed Mechanical and Electrical Systems

System	Proposed Specification
Ventilation	Mechanical Ventilation with Heat Recovery (MVHR)
Ventilation performance	Approx. 90% heat recovery efficiency, SFP 0.55 W/l/s
Space heating	Air Source Heat Pump
Heat distribution	Underfloor heating
Heating controls	Time and temperature zone controls
Domestic hot water	Hot water cylinder (approx. 170 litres)
Lighting	High-efficiency LED throughout

Table: Summary of proposed mechanical and electrical systems

3.3.1 Flexibility and Peak Energy Demand

Table 9 – Site-wide peak demand, capacity and flexibility potential

Item	Proposed Development
Estimated peak electrical demand	0.01 MW
Electrical energy storage	None (0 kWh)
Thermal energy storage	Domestic hot water cylinder (0.15 kWh equivalent as reported in GLA assessment)

Item	Proposed Development
Flexibility potential	The air source heat pump can be operated using smart controls to shift demand outside peak periods. Roof-mounted photovoltaic panels reduce grid demand during daylight hours.

Table 10 – Interventions for achieving flexibility

Intervention	Proposed
Air source heat pump	✓
Smart heating controls	✓
Roof-mounted photovoltaic panels	✓
Electrical battery storage	✗
Thermal battery	✗
Vehicle-to-grid	✗

Owing to the scale of the development, no dedicated electrical or thermal battery storage is proposed. Operational flexibility is achieved through the use of an air source heat pump with smart controls and on-site photovoltaic generation.

3.4 Be Lean Compliance

The regulated carbon emissions achieved at the Be Lean stage are summarised below.

Scenario	CO_2 Emissions (tCO_2/year)
Part L 2021 Baseline	**0.7**
Be Lean – Use Less Energy	**0.7**
Carbon Saving	**2%**

Whilst the Be Lean stage does not achieve the aspirational 10% reduction identified within the London Plan energy hierarchy, the proposed dwelling exceeds the Part L 2021 fabric efficiency requirement, achieving a Dwelling Fabric Energy Efficiency (DFEE) of **49.06 kWh/m^2/year** compared with a Target Fabric Energy Efficiency (TFEE) of **50.65 kWh/m^2/year**.

The overall carbon reduction strategy is achieved through the combined application of a fabric-first approach, a high-efficiency air source heat pump and roof-mounted photovoltaic panels, resulting in an overall regulated carbon reduction of **53%** compared with the Part L 2021 notional dwelling.

3.5 Lighting Strategy

All residential lighting within the proposed development will utilise high-efficiency Light Emitting Diodes (LEDs). The lighting design achieves a minimum luminous efficacy of **95 lumens per circuit watt**, significantly reducing electrical demand and internal heat gains compared to traditional lighting technologies.

The use of LED lighting contributes to reduced regulated energy consumption, lower operational carbon emissions, and improved long-term running costs for occupants, while also supporting overheating mitigation by limiting waste heat generation.

3.6 Unregulated Energy Use (Residential)

Unregulated energy use refers to energy consumption that is not included within SAP calculations for the purposes of Part L compliance, as it is largely dependent on occupant behaviour and appliance specification rather than fixed building services.

For the proposed residential units, unregulated energy use is anticipated to arise from:

- Small power and plug-in equipment
- Cooking activities
- External lighting
- Domestic appliances and white goods

As buildings become more energy efficient, unregulated energy use represents an increasing proportion of total energy demand. This is particularly relevant for low-energy dwellings where space heating and hot water demands have been significantly reduced through fabric-first design and efficient services.

To mitigate unregulated energy consumption, it is recommended that appliances and white goods are specified with the highest available energy efficiency ratings. Following the update to appliance energy labelling in March 2021, products are now rated on an A–G scale, with comparatively few appliances currently achieving an A rating. Selection of the most efficient appliances available at the time of procurement will assist in minimising overall energy use and reducing overheating risk from internal heat gains.

3.7 Space Heating Demand and Energy Use Intensity (EUI)

In accordance with the GLA Energy Assessment Guidance, the Energy Use Intensity (EUI) and operational space heating demand of the proposed dwelling have been assessed using the SAP 10.2 methodology. These metrics provide an indication of the expected operational energy performance of the development.

The calculated values are summarised below and compared against the benchmark values contained within the GLA guidance.

EUI & space heating demand (predicted energy use)

Residential

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)
Residential	41.51153846	34.975	35	15	Part L1 - SAP 10.2 & none dwellings / & Landlord Circulation	SAP 10.2 regulated energy plus Appendix L appliance and cooking estimates &

The proposed dwelling does not achieve the aspirational operational energy benchmarks published within the GLA Energy Assessment Guidance. This is principally due to the detached single-storey form of the dwelling and the fabric specification adopted for the scheme. Nevertheless, the development complies with the energy efficiency requirements of Part L 2021 and incorporates a fabric-first approach together with an air source heat pump and roof-mounted photovoltaic panels, resulting in an overall regulated carbon reduction of approximately **53%** compared with the Part L 2021 notional dwelling.

3.8 Carbon Savings at Be Lean Stage

At the Be Lean stage of the energy hierarchy, the scheme does not achieve the policy target reduction in carbon emissions from fabric and energy efficiency measures alone. This outcome reflects the increased stringency of Part L 2021, alongside the inclusion of technologies such as waste water heat recovery systems and photovoltaic generation within the notional dwelling specification.

Notwithstanding this, the proposed development incorporates a range of enhanced efficiency measures, including:

- U-values that exceed the Part L 2021 notional dwelling requirements
- Mechanical ventilation with heat recovery
- Improved thermal bridging performance
- Low air permeability targets

The calculated regulated carbon emissions at the Be Lean stage are summarised below:

Scenario	CO_2 Emissions (t/annum)
Part L 2021 Baseline	0.8
Be Lean – Use Less Energy	0.7
Carbon Saving	7%

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	0.7	0.4
After energy demand reduction (be lean)	0.7	0.4
After heat network connection (be clean)	0.7	0.4
After renewable energy (be green)	0.3	0.4

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	2%
Be clean: savings from heat network	0.0	0%
Be green: savings from renewable energy	0.3	52%
Cumulative on site savings	**0.4**	**53%**
Annual savings from off-set payment	0.3	-
	(Tonnes CO_2)	
Cumulative savings for off-set payment	**9**	-
Cash in-lieu contribution (£)	**888**	

*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

	Total regulated emissions (Tonnes CO_2 / year)	CO_2 savings (Tonnes CO_2 / year)	Percentage savings (%)
Part L 2021 baseline	0.7		
Be lean	0.7	0.0	2%
Be clean	0.7	0.0	0%
Be green	0.3	0.3	52%
Total Savings	-	0.4	53%
	-	**CO_2 savings off-set (Tonnes CO_2)**	-
Off-set	-	**9.3**	-

3.9 Rainwater and Greywater Harvesting Feasibility

The feasibility of rainwater and greywater harvesting systems has been reviewed in accordance with:

- CIRIA C539 – *Rainwater and Greywater Use in Buildings*
- BS 8515:2009 – *Rainwater Harvesting Systems*

While such systems can provide sustainability benefits in appropriate contexts, their installation requires dedicated space for storage and plant, alongside ongoing maintenance to ensure operational safety and hygiene. For the proposed development, spatial constraints, maintenance requirements, and long payback periods present challenges that outweigh the potential water savings.

The additional operational costs and long-term management responsibilities associated with these systems further reduce their suitability for this scheme. On this basis, rainwater and greywater harvesting systems are not considered a viable or proportionate addition to the development.

3.10 Overheating Strategy

The development will be designed to comply with **Part O of the Building Regulations**, with a full dynamic overheating assessment to be undertaken at **RIBA Stage 4**.Overheating risk has been considered from the early design stages, with the cooling hierarchy applied to prioritise passive and low-energy mitigation measures. Key design strategies include:

- Individual heating systems, avoiding communal heat distribution
- Openable windows to all dwellings to support purge ventilation
- Mechanical ventilation with heat recovery incorporating a summer bypass mod

The following measures have been incorporated in accordance with the cooling hierarchy:

Reduce heat gains

- Optimised building orientation where possible
- High-performance fabric in line with Part L 2021
- Use of high albedo materials where practicable

Minimise internal heat generation

- Energy-efficient LED lighting
- Individual dwelling heating systems

Manage heat within the building

- Maximised exposed thermal mass where feasible
- Floor-to-ceiling heights compliant with National Space Standards

Provide passive ventilation

- Openable windows to all dwellings
- Cross-ventilation provided where layout allows

Provide mechanical ventilation

- MVHR systems with summer bypass to prevent heat recovery during warmer periods

This integrated approach ensures that overheating risk is mitigated through passive design and efficient services, with no reliance on active cooling systems.

4 Decentralised Energy – Be Clean

Within the context of the London Plan, decentralised energy refers to low- and zero-carbon energy generated and distributed at a local or site-wide level. This can include on-site energy centres, communal heat networks, or connection to wider district heat networks where viable and appropriate.

The London Heat Map has been reviewed to identify existing and proposed heat networks within proximity to the site, including operational schemes and designated Heat Network Priority Areas.

4.1 Connection to Existing or Future Heat Networks

A review of the London Heat Map and relevant local authority information has been undertaken to assess the feasibility of connecting the proposed development to an existing or future district heat network.

The nearest identified district heat network is the South East London Combined Heat and Power (SELCHP) network, located approximately 4.5 km from the site and currently operational.

Having regard to:

- the distance between the site and the nearest viable district heat network,
- the adoption of on-site low-carbon heating via renewable technologies, and
- the small scale of the proposed development,
- the projected reduction in carbon emissions as the national electricity grid continues to decarbonise,

It is not considered appropriate or proportionate for the development to connect to an existing or future off-site heat network. Provision for a future connection is therefore not proposed.

This approach is consistent with London Plan Policy SI 3, which requires connection to heat networks only where feasible and viable, and recognises that individual low-carbon solutions may be more appropriate for smaller-scale developments.

Closest Identified Heat Network (for reference):

- Network: SELCHP
- Distance from site: approx. 4.5 km
- Operational status: Operational

Figure: London Heat Map

5 Renewable Energy – Be Green

Renewable energy is defined as energy derived from sources that are naturally replenished, including solar, wind, hydroelectric, geothermal and aerothermal technologies. In line with the Renewable Energy Directive (2018/2001/EU), aerothermal and hydrothermal systems are formally recognised as renewable energy sources.

The feasibility of renewable and low-carbon technologies for the proposed development has been assessed with regard to:

- Practicality of installation
- Energy demand profile
- Environmental and land-use impacts
- Economic feasibility and payback
- Planning and regulatory constraints
- Noise and visual considerations

In addition, due to ongoing electricity grid decarbonisation, factors such as long-term energy security, operational efficiency, and running cost reduction are considered of equal or greater importance than carbon offset alone.

Based on recent legislation, including the Clean Air Act and the Future Homes and Buildings Standard consultation, the following technologies have been discounted and are not considered further:

- Wind turbines
- Hydropower or wave technologies
- Biomass, biogas or biofuel systems
- Hydrogen-based systems
- Hybrid heat pump systems

5.1 Photovoltaic Panels

Photovoltaic (PV) systems were considered but are not proposed for this scheme.

While PV technology has historically delivered financial benefits and carbon offset improvements, its role has evolved. Under Part L 2021 and forthcoming regulatory changes, the carbon benefit of PV is reducing as grid electricity continues to decarbonise. Under Part L 2025, the projected carbon offset from PV is anticipated to be approximately 36.8 per cent lower than under Part L 2021.

For small residential schemes, particularly apartments or constrained sites, PV systems often provide limited benefit relative to their installation cost. Where PV is apportioned across multiple dwellings, payback periods are extended beyond the operational lifespan of the system. Landlord-supplied systems typically deliver minimal direct benefit to residents and limited carbon savings.

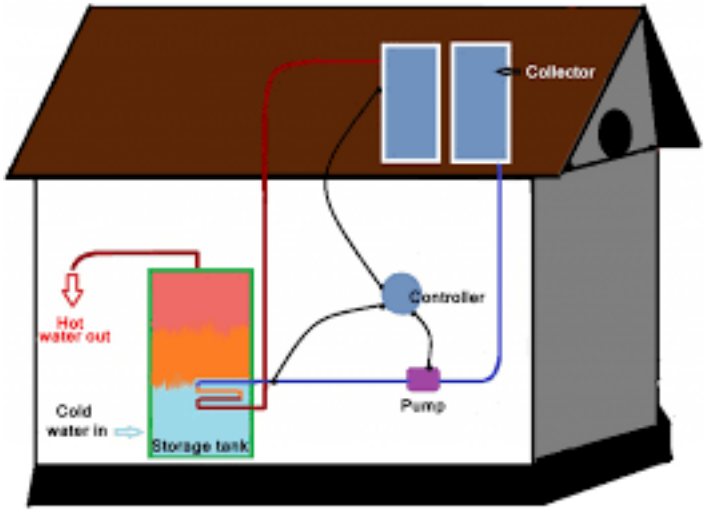
For this development, additional constraints include:

- limited roof area due to the presence of rooflights,
- the visual and amenity value of the proposed green roof,
- potential overlooking impacts, and
- marginal carbon benefit relative to system cost.

As a result, PV panels have not been specified.

5.2 Solar Hot Water

Solar thermal hot water systems were also assessed but are not proposed.



Solar hot water systems are most effective where there is a consistently high domestic hot water demand and where they are not duplicating renewable provision already supplied by other technologies. In this case, hot water is provided by an air source heat pump, which significantly reduces the additional benefit of solar thermal due to overlapping provision.

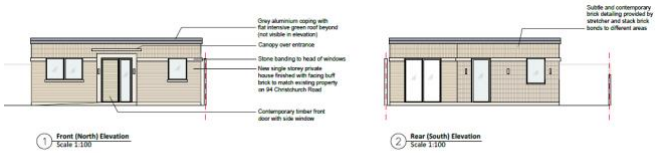
In addition, solar hot water systems require:

- dedicated or dual hot water cylinders,
- short pipe runs to minimise heat losses, and
- sufficient internal space for associated equipment.

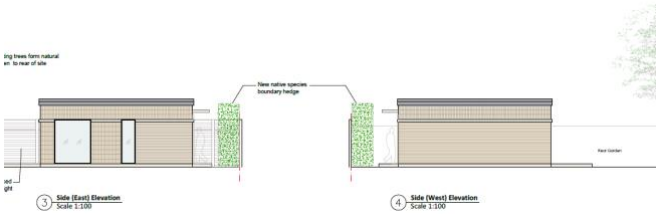
Given space constraints and the efficiency of the proposed air source heat pump system, solar hot water is not considered a proportionate or efficient solution for this development.

5.3 Ground Source Heat Pumps – Not Feasible

Ground Source Heat Pumps (GSHPs) extract heat from the ground rather than ambient air and can, in principle, achieve marginally higher efficiencies than Air Source Heat Pumps (ASHPs. However, the performance gap between GSHP and ASHP systems has reduced significantly as ASHP technology has matured.



The installation of GSHP systems would require either extensive horizontal ground loops or deep vertical boreholes installed during the piling phase of construction. Given the scale of the development, ground conditions, and construction constraints, this would introduce significant complexity, cost, and programme risk.



In addition, GSHP systems typically require greater site area and upfront capital investment compared with ASHP systems, resulting in longer payback periods. As ASHP systems offer a simpler, quieter, and more visually discreet solution with proven performance, GSHPs have not been progressed for this scheme.

5.4 Air Source Heat Pumps – Feasible and Selected

Air Source Heat Pumps (ASHPs) represent a well-established and rapidly advancing low-carbon heating technology and are a central component of national policy to achieve net zero carbon emissions by 2050.

ASHP System Details	
Number of Heat Pumps	1
Size of Heat Pumps	Circa 7 kW
Provides	Space Heating and Hot Water
Make and Model	Vaillant aroTHERM plus (for SAP modelling purposes)
SCOP	TBC depending on model but in excess of 3 (300%)
External Unit Location	Rear Garden

Table: Proposed ASHP Specification

ASHPs typically deliver approximately three units of heat for every unit of electricity consumed, offering a substantial improvement in efficiency compared to direct electric heating. Recent technological developments have resulted in lower noise levels, improved cold-weather performance, enhanced aesthetics, and integration with smart controls, making ASHPs suitable for residential applications in both urban and suburban contexts.

Many modern domestic ASHP systems operate within permitted development noise limits and can be sensitively integrated within the site. Based on their efficiency, practicality, policy alignment, and proven deliverability, ASHPs are considered the most appropriate renewable heating technology for the development and have been adopted within the proposed energy strategy.

5.5 Hot Water Heat Pumps – Not Feasible

Hot Water Heat Pumps (HWHPs) are compact systems that integrate a small heat pump within a hot water cylinder to improve hot water efficiency relative to standard electric cylinders. These systems are most effective where domestic hot water demand is high relative to space-heating demand and are typically suited to small apartments or developments with limited external space.

For this scheme, the dwellings have space-heating demands that exceed the practical output capability of HWHP systems. As HWHPs do not contribute to space heating, their use would necessitate additional heating systems, increasing complexity without delivering proportional performance benefits.

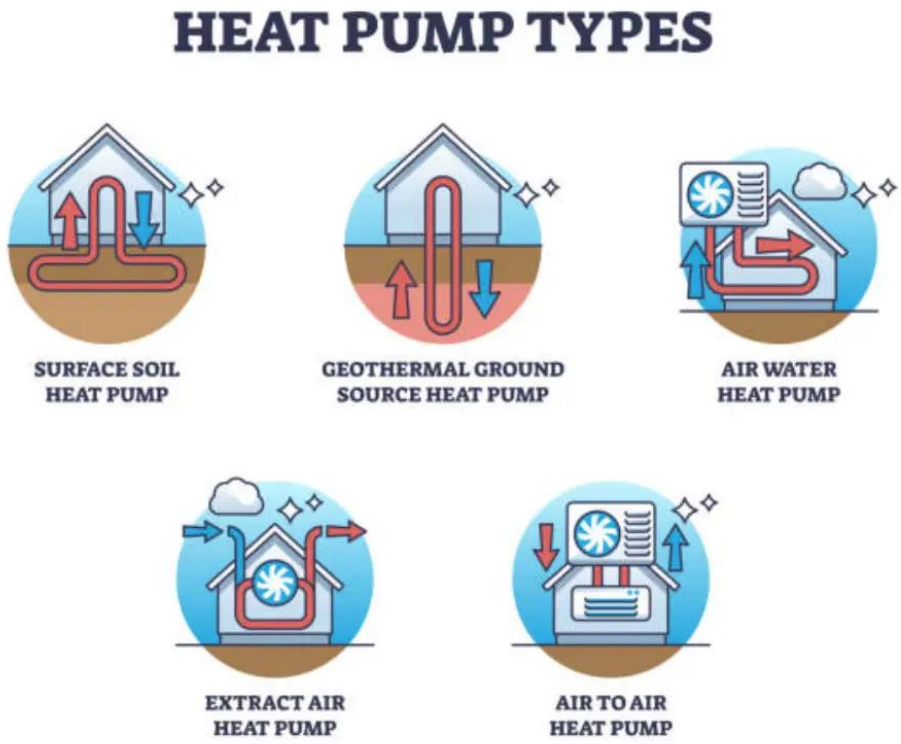
Accordingly, HWHPs are not considered suitable for the proposed development.

5.6 Summary of Selected Technologies

Following a review of available renewable and low-carbon technologies, the following system has been incorporated into the scheme:

• Air Source Heat Pumps for space heating and domestic hot water provision

This approach provides a robust, policy-compliant, and future-proofed solution aligned with national and local decarbonisation objectives.



6 Water Consumption Summary

Water Efficiency

The scheme prioritises **water conservation** to maximize efficiency and ensure a water consumption rate of no more than **110 litres** per person per day (pppd).

≤110 Litres per person per day.

+5 litres for external use

Water Conservation Targets

- **Mandatory** water efficiency target of **110 litres** per person per day for internal consumption
- Total water consumption not to exceed **115 litres** per person per day, including allowance for external use.

Target aligned with Local Plan policy and optional higher standard in Building Regulations Part G

Sanitaryware & Appliance Specification

Type	Capacity/Flow Rate	Fixed Use	Litres/Person/Day)
WC (Dual flush)	Dual flush 6./3 litre (flush volume	19.19	17.6
Basin Taps	Grohe ESt StƆOO10 Basin Mixer Push	5.90	30.80
Kitchen Sink Taps	Eco 110 Hand100 Shower Handset	12.96	33.30
Shower	Vado Elan Pro Twld Kitchen Sink Mixer	12.96	12.96
Bath	Hoover Dynamic Next WDXAA103:001U46	8.17 (Default value)	8.57
Washing Machine	Hoover Dynamic Next WDXAA193.061D4g	8.17 (Default value)	3.5

Water Usage Calculation (Based on 3 persons)

Total internal water use	109.7	Roca Dual flush WC; OV Dual Push Plate
Allowance for external use	5	Grohe Esil Sale Action Mono Basin Mixer Push Wate (5801100)
Total calculated water consumption	114.7	Vado Elan Pro Twnch Kitchen Sink Mixer Tap twrist-kitchen dR)
Maximum allowed water use (Buiding Regulations Part G)	115	Hoover Dynamic Next WDXA193-80 (default-value)

The proposed specification is fully compliant with the Local Plan water efficiency requirements.

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The proposed specification results in a total internal water consumption of **109.7 litres per person per day**, excluding the external allowance. When combined with the 5 litres per person per day allowance for external use, the scheme remains fully compliant with both Local Plan policy and the optional Part G water efficiency target.

Accordingly, the proposed development is considered to meet the applicable water efficiency requirements.

7 Sustainability

7.1 Materials

The environmental impact of construction materials has been considered with regard to their performance over the full lifecycle, including manufacture, transportation, installation, use, and end-of-life. Where practicable, materials with lower embodied environmental impacts and improved durability have been prioritised.

The BRE Green Guide to Specification provides a recognised framework for assessing the environmental performance of key building elements, including roofs, external walls, internal walls, floors, and windows. The rating system assesses elements from A+ to E across a range of environmental indicators, and the proposed material strategy seeks to achieve high-performing ratings wherever feasible.

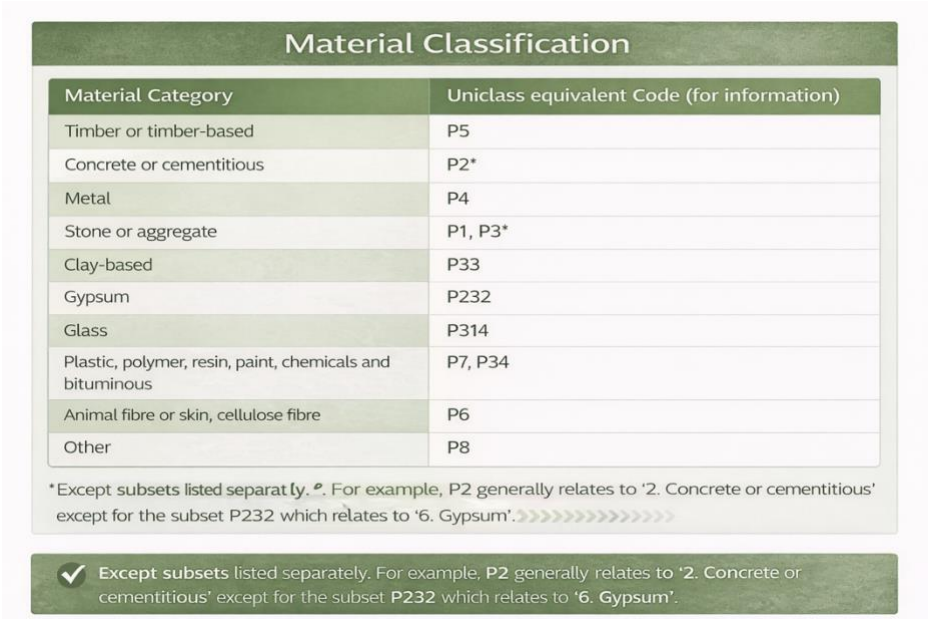
All timber products used on the project, including structural, joinery, and site timber, will be legally harvested and responsibly sourced. Timber and timber-based products will be procured from suppliers able to demonstrate full Chain of Custody certification. Acceptable certification schemes include the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC).

All internal finishing materials will be selected to ensure low or zero volatile organic compound (VOC) content. VOCs are present in a wide range of construction products and can adversely affect indoor air quality and occupant health. The use of low-VOC finishes supports improved indoor environmental quality and is particularly beneficial for occupants with respiratory sensitivities.

7.2 Insulation

Thermal insulation within the scheme has been generally specified as mineral wool or equivalent mineral-based products. This form of insulation has been selected due to the following benefits:

- Continuously improving thermal conductivity performance as product technology develops
- A+ rating under the BRE Green Guide and certification by the British Board of Agrément (BBA)
- Manufacture by suppliers compliant with ISO 14001 and BES 6001 standards
- Zero ozone depletion potential (ODP) and zero global warming potential (GWP)



Material Classification

Material Category	Uniclass equivalent Code (for information)
Timber or timber-based	P5
Concrete or cementitious	P2*
Metal	P4
Stone or aggregate	P1, P3*
Clay-based	P33
Gypsum	P232
Glass	P314
Plastic, polymer, resin, paint, chemicals and bituminous	P7, P34
Animal fibre or skin, cellulose fibre	P6
Other	P8

*Except subsets listed separately. For example, P2 generally relates to '2. Concrete or cementitious' except for the subset P232 which relates to '6. Gypsum'.

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Environmental Product Declarations

Wherever practicable, construction materials will be selected with independently verified Environmental Product Declarations (EPDs). These will be provided in accordance with ISO 14025 (Type III environmental labels), allowing transparent comparison of environmental impacts and supporting responsible material selection.

Local Sourcing

Due to the scale and location of the development, materials will be sourced locally wherever feasible to reduce transportation impacts and vehicle movements. A number of builders' merchants, including Travis Perkins, Selco and Hitchcock & King, are located in close proximity to the site, which provides opportunities to minimise delivery distances and associated carbon emissions.

Material Durability

Durable materials will be prioritised across the development to extend the service life of the building fabric and finishes. Improving durability reduces the frequency of repair and replacement, thereby lowering the long-term embodied carbon associated with material manufacture, transportation and installation.

Material Re-Use

The appointed contractor will review opportunities for the re-use of materials where feasible and appropriate, in line with current circular economy principles. This approach supports waste reduction and resource efficiency without compromising performance or safety requirements.

7.3 Circular Economy Principles & Waste Management

Embodied Carbon

Embodied carbon refers to the emissions associated with the manufacture, transport, installation, maintenance and disposal of building materials. The design approach for this development aligns with the embodied carbon hierarchy promoted by the London Energy Transformation Initiative (LETI), which prioritises design-led measures to reduce emissions at source.

Where possible, the earliest stages of the hierarchy have been applied. Although the development does not include extensive retained structures, the design minimises unnecessary material use and promotes efficient construction techniques to reduce overall embodied carbon.

Construction Waste Management

A Site Waste Management Plan (SWMP) will be implemented by the appointed contractor. The SWMP will seek to minimise waste generation during construction and target diversion of up to 95% of non-hazardous construction waste from landfill.

Measures to be adopted in line with the WRAP *Halving Waste to Landfill* initiative include:

- Reducing packaging through supplier engagement
- Implementing just-in-time material deliveries
- Prioritising prefabricated and pre-assembled components
- Careful material quantity planning to avoid over-ordering
- Segregation of waste at source where practicable
- Clearly labelled and colour-coded waste skips to reduce contamination

In addition, the contractor will be encouraged to engage with local recycling facilities and reuse networks where practical, ensuring that materials are recovered and reused locally wherever possible. Ongoing monitoring of waste streams during construction will allow waste performance to be reviewed and improved over time, supporting best-practice construction management and alignment with circular economy principles

These measures support both waste reduction and improved site efficiency.

7.4 Operational Waste

Each dwelling will be provided with dedicated refuse and recycling storage in accordance with the London Borough of Lambeth's *Waste & Recycling Storage and Collection Requirements* (March 2023).

Provision includes:

- 140 litre refuse bins
- 110 litre dry recycling bins

Bin locations and access arrangements are shown on the submitted drawings and have been designed to support effective household waste separation and collection.

7.5 Circular Economy

Circular economy principles are embedded within the London Plan (2021) under Policy SI 7 and supported by the London Plan Guidance (March 2022). The development responds proportionately to these requirements through a focus on durability, adaptability and responsible material selection.

Key circular economy commitments include:

- Specification of durable building components designed for long service life
- Local sourcing of materials where practicable to reduce transport impacts
- Opportunities for reuse and recycling during construction
- Provision of a Household Recycling Policy to support long-term waste reduction and resident engagement

Although there are no existing structures on site suitable for reuse, the development has been designed to support circular economy outcomes over its operational life.

7.6 Transport

The proposed development is car-free and does not provide on-site parking. This approach supports sustainable travel objectives and reduces transport-related emissions.

Cycle storage will be provided in accordance with the London Cycling Design Standards (LCDS). The site benefits from a Public Transport Accessibility Level (PTAL) of 5 (on the edge of 6a), indicating excellent access to public transport services.

7.7 Air Quality, Health & Wellbeing

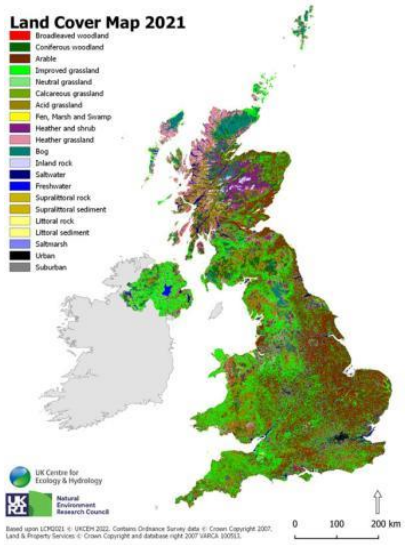
Air Quality

The site lies within the London Borough of Lambeth, which is designated as an Air Quality Management Area (AQMA) for nitrogen dioxide (NO_2) and particulate matter (PM_{10}). Background pollutant concentrations have been derived from Defra's 2023 mapped datasets.

Pollutant	**Concentration (µg/m^3)**
NO_2	25.95
NOx	18.06
$PM_{2.5}$	8.34
PM_{10}	14.12

All values are below relevant air quality objectives.

The development proposes a zero-NOx heating strategy and does not include car parking. As such, it is considered Air Quality Neutral in line with the Air Quality Neutral Assessment prepared in support of Planning Condition 17.



7.7 Landscape Design & Ecology

The site is a previously developed brownfield location with no known archaeological constraints. No contamination issues have been identified.

A green roof is proposed as part of the development, contributing to biodiversity, surface water management and urban cooling.

Biodiversity Net Gain

The scheme achieves a minimum 10% Biodiversity Net Gain through the provision of hedgerow planting. The site's baseline habitat value was assessed as zero, and the proposed enhancements therefore deliver a measurable net improvement in accordance with current guidance.

7.8 Sustainable Drainage Systems (SuDS) & Flood Risk

The Environment Agency Flood Risk Maps confirm that the site lies within Flood Zone 1, indicating a low probability of flooding from rivers or the sea.

Surface water management will be addressed through SuDS measures integrated within the landscape design, supporting attenuation and controlled discharge while improving site resilience to climate change.

8 Conclusion

An Energy and Sustainability Assessment has been undertaken for the proposed development in accordance with the London Plan energy hierarchy and the requirements of Building Regulations Part L (2021). The assessment demonstrates that the scheme has been designed to minimise energy demand, reduce regulated carbon emissions, and deliver a robust, future-proofed, all-electric solution that aligns with local and regional policy objectives.

At the **Be Lean** stage, the development adopts a fabric-first approach to reduce energy demand. Enhanced thermal performance is achieved through insulation levels exceeding the Part L 2021 notional dwelling standards, high-performance glazing, improved thermal continuity, and a low air permeability target of 2.5 $m^3/(h \cdot m^2)$ at 50 Pa. Energy demand is further reduced through the use of high-efficacy LED lighting throughout the dwelling, minimising both operational energy use and internal heat gains.

At the **Be Clean** stage, decentralised energy options have been reviewed in relation to the scale and nature of the development. Individual heating has been identified as the most appropriate solution, avoiding the need for communal heat infrastructure while providing efficient, controllable heating at dwelling level.

At the **Be Green** stage, a feasibility review of renewable and low-carbon technologies has been undertaken. An Air Source Heat Pump has been selected as the preferred technology, providing low-carbon space heating and hot water while supporting the transition away from fossil fuel systems.

The combined effect of the proposed measures results in a significant reduction in regulated carbon emissions compared with the Part L 2021 baseline. SAP modelling confirms that the development achieves an overall on-site CO_2 reduction of approximately **51 per cent** at the Be Green stage.

The proposed development therefore represents a highly sustainable and low-carbon form of development. The Energy Strategy demonstrates compliance with the requirements of Building Regulations Part L (2021), the London Plan, and relevant Local Planning Authority policies, and is considered acceptable in energy and carbon terms.

Appendix A – GLA Carbon Emissions Reporting

The completed Greater London Authority Carbon Emissions Reporting Spreadsheet accompanies this report and should be read in conjunction with the Energy Strategy.

The following key outputs from the completed spreadsheet are reproduced within this report:

- Carbon Emissions after each stage of the Energy Hierarchy
- Regulated Carbon Savings
- Site-wide Carbon Summary
- Energy Use Intensity (EUI) and Space Heating Demand
- Peak Demand and Flexibility Assessment
- Flexibility Measures

Appendix B – SAP 10.2 Design Stage Assessment

The SAP 10.2 Design Stage Assessment accompanies this report and demonstrates compliance with Part L 2021 of the Building Regulations.

The assessment includes:

- SAP Worksheet
- Part L 2021 Compliance Summary
- BRUKL Output
- Supporting SAP Calculations
