TPS.
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BUILDING SERVICES CONSULTANTS

Camden

50-51 Russell Square, London, WC1B 4JU

Energy & Sustainability Statement

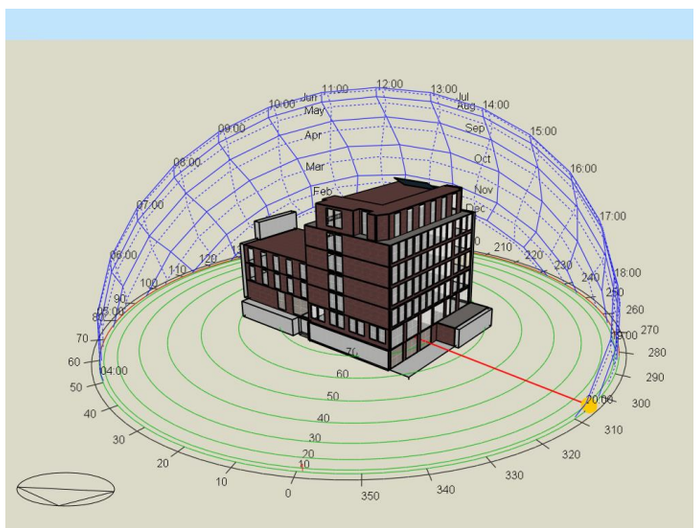
Rev C - December 2023

Executive Summary

The following energy brief is for the proposed development at 50-51 Russell Square, Camden, London. The development sees the redevelopment of the existing building including New façade treatment to main building; enlarged roof extension, reopening of lightwell to front; demolition of two storey outrigger and replacement with three storey plus plant enclosure, single storey infill extension to existing car park, erection of full height stair core extension to rear and reconfiguration of entrance steps and ramp and the installation of a new HVAC system.

The proposed energy efficient systems and passive design features resulted in the whole building achieving a 66.96% improvement in carbon saving against the existing condition, when compared against the Building Regulations Part L2 2021 notional figures and other local and national technical guidance has been reviewed to ensure the project has energy efficiency, future proofing and biodiversity at its heart. A reduction of 22.49% has been achieved at the Be Green stage through the implementation of on-site renewables which include air source heat pumps and photovoltaics. This exceeds the 20% reduction set out in the Camden local plan by 2.49% and therefore meets this requirement.

The refurbishment project at 50-51 Russell Square will also be assessed against BREEAM Refurbishment and fit-out and is expected to achieve an ‘Excellent’ rating.



The Energy and Sustainability Statement outlines the sustainability and energy strategies for meeting the sustainability targets set out by London Borough of Camden and the GLA.

Excellent sustainability measures have been incorporated within the design, including:

1. Excellent building fabric values, as per Building Regulation Part L 2021 standards, therefore substantially reducing the buildings heat losses, compared to the existing fabric
2. The development will have new mechanical ventilation with heat recovery throughout, thereby substantially reducing the building’s heat losses compared to the existing fabric. Heat generation with be non-carbon and will rely on air-source heat pumps.
3. Natural day lighting will improve occupancy comfort and reduce the requirement for lighting
4. Lighting will be low energy and highly efficient
5. The air tightness of the building will be improved to reduce air permeability below $8m^2/hr/m^3$. This will be met through improved fabric detailing and draught proofing.

Sustainable Measures

A number of sustainable measures have been proposed for the development, including:

1. Sustainably and locally sourced materials will be used where possible, to reduce transport pollution and support the local economy
2. Materials will be reused where possible, reducing the embodied carbon footprint
3. Recycling facilities will be provided on site for construction and operational waste;
4. Water use will be minimised by the specification of water efficient taps, shower heads, dual flush toilets and low water use appliances.
5. Water metering will be installed to monitor and minimise wastage.
6. A Site Waste Management Plan (SWMP) will be produced for the works;
7. A green roof is proposed, increasing the biodiversity of the site.
8. To comply with the Camden Air Quality Plan Action Plan, an all-electric scheme is to be implemented.

Local & National Policies

National Planning Policy Framework (2021):

The National Planning Policy Framework (NPPF) sets out the governments planning policies for England and how these are expected to be applied. The purpose of the framework is to aid in the achievement of a sustainable development by providing guidance on three overarching objectives: economic, social and environmental. Relevant key information to take note of includes:

- Local planning polices and decisions should exploit any opportunity to make the location sustainable.
- Policies should plan for future challenges such as climate change, flooding and coastal change.
- Policies and decisions should prioritise the conservation and enhancement of natural environment.
- Promote the use if sustainable materials at all stages of development.
- Promote sufficient provision fir health infrastructure, promoting and maximising sustainable transport solutions and related air quality and public health improvements, making effective use of land, achieving well-designed places that function well for their lifetime and promote wellbeing.

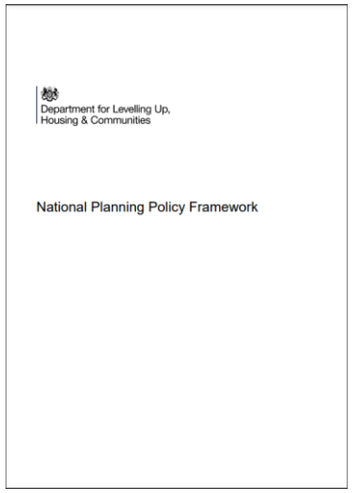
Key Policies to note include:

Paragraph 152 States the planning system should support the transition to a low carbon future in a changing climate and should help shape places in ways which aid in radical reductions in greenhouse gas emissions; minimise vulnerability and improve resilience; encourage reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure.

Paragraph 153 goes on to state that local planning authorities are required to adopt a proactive approach to mitigate and adapt to climate change.

Paragraph 134 notes that when determining applications, significant weight should be given to outstanding or innovative designs which promote high levels of sustainability, so long as they fit in with the overall form and layout of the surroundings.

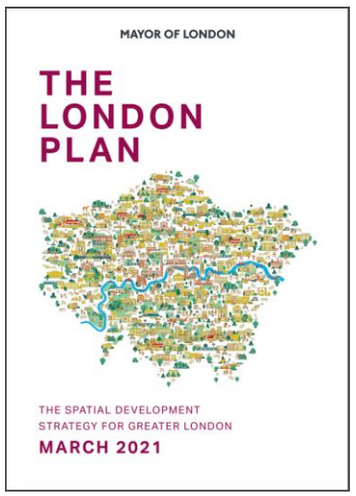
Paragraph 157 states that new development should comply with adopted local policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that is not feasible or viable. New development should take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.



The London Plan

The London Plan provides the overall strategic plan for London setting out an integrated economic, environmental, transport and social framework for the development of London over the next 20-25 years and the Mayor's vision for Good Growth.

The plan is part of the statutory development plan for London and therefore the policies outlined within the plan must be in general conformity with the London Borough's Local Plan and should inform decisions for planning application across the capital.

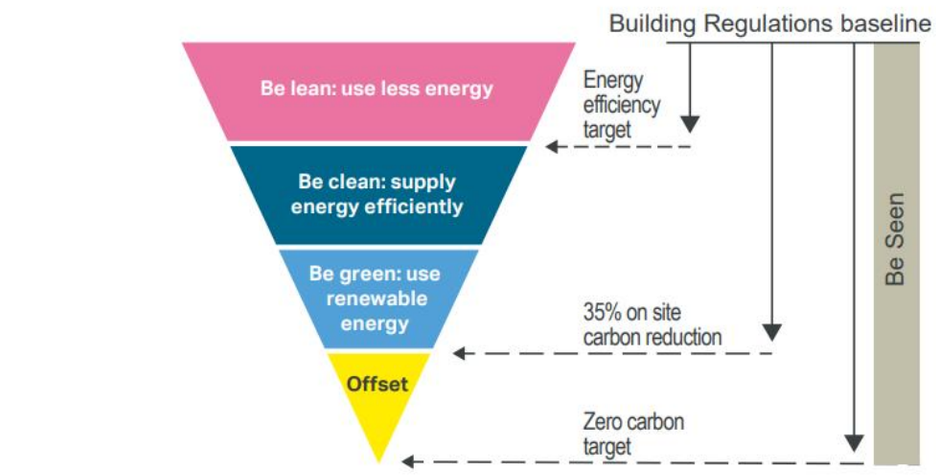


Local & National Policies

The London Plan

It should be noted that many of the targets and polices proposed within this document are mainly aimed at major developments. As 50-51 Russell Square is considered as a minor development, these targets do not need to be met. However, the targets along with the polices relating to major developments should be kept in mind.

Policy SI 2 - Within The London Plan it is noted that major developments should be net-zero carbon and carbon and energy operation should be minimised in accordance with the following energy hierarchy:

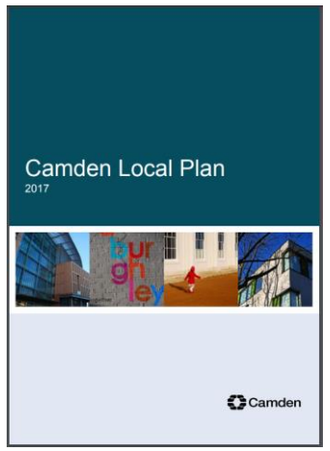


Source: Greater London Authority

Camden Local Plan

Camden's Adopted Local Plan is the key strategic document in Camden's development plan and replaces the Core Strategy and Development Policies planning documents, covering the period form 2016-2031.

Camden council aims to tackle the causes of climate change within the borough by ensuring that developments use less energy and assess the feasibility of decentralised energy and renewable technologies



The council will expect developments of more than 500 sqm of any gross internal floorspace to achieve a 20% reduction in carbon dioxide emissions from on-site renewables energy generation (which can include sources of suite related decentralised renewable energy),unless it can be demonstrated that provision is not feasible.

Policy CC 1 Climate Change Mitigation:

The council will require all development to minimise the effects of climate change and encourage all developments to meet the highest feasible environmental standards that are financially viable during construction and occupation.

Policy CC 2 Adapting to Climate Change:

The council will require development to be resilient to climate change with all developments adopting appropriate climate change adaption measured such as:

The protection of existing green spaces and promoting new appropriate green infrastructure;

1. Not increasing, and wherever possible reducing, surface water runoff through increasing permeable surfaces and use of Sustainable Drainage Systems.
2. Incorporating bio-diverse roofs, combination green and blue roofs and green walls where appropriate; and
3. Measures to reduce the impact of urban and dwelling overheating, including application of the cooling hierarchy.

BREEAM

BREEAM is a globally recognised standard and sets out the standard for best practice in sustainable building design, construction and operation. BREEAM assessment uses recognised measures of performance to evaluate a buildings specification, design construction and use across: Energy and water use; Internal environment (health & wellbeing); Management processes; Pollution; Transport; Materials; Waste; and Ecology.

Credits are awarded in the section noted above and added together to give a final rating ranging from Unclassified to Outstanding.

The refurbishment project at 50-51 Russell Square is expected to be awarded an **'Excellent'** Rating.

Be Lean: Use Less Energy

For all developments a balance will need to be reached between the need to retain heat, the heat generated within a development and the need to remove excess heat. As the building fabric will form a major part in the overall energy assessment and performance of the building, an upgraded thermal strategy is recommended, with the improvement of the Part L2 limiting fabric parameters where feasibly possible. The following table shows the limiting fabric parameters contained within ADL.

Thermal Element	Baseline Figures	Existing Refurbished	New Element (2021 Part L)
External Walls	1.60 W/m²K	0.55W/m²K	0.26W/m²K
Ground Floor	0.58 W/m²K	0.25W/m²K	0.18W/m²K
Roof	1.40 W/m²K	0.18W/m²K	0.18W/m²K
Windows	4.755 W/m²K	1.6W/m²K	1.4 W/m²K
Doors	3.0 W/m²K	3.0W/m²K	1.6W/m²K
Air Tightness	25.00 m³/hr.m² @ 50Pa	NA	8 m³/hr.m² @ 50Pa
Energy Efficient Lighting	100%	100%	100%

Energy Efficient Design Measures

- Optimally sized windows that achieve good daylight levels but avoid excessive solar gain in summer and heat loss in winter.
- Excellent building fabric.
- A design air leakage rate of 8-9 (m3/(h.m2)@50Pa) to all floors.
- Careful design to reduce the effect of non-repeating thermal bridges including the use of high-performance thermal breaks where feasible.
- All lighting, in most of the area will use lamps with a luminous efficacy of at least 45 lamp-lumens/watt (equivalent to an "A" rating).
- Areas will have lighting which will have automatic controls with occupancy and daylight sensors.
- Mechanical ventilation systems with heat recovery will be installed in every floor.

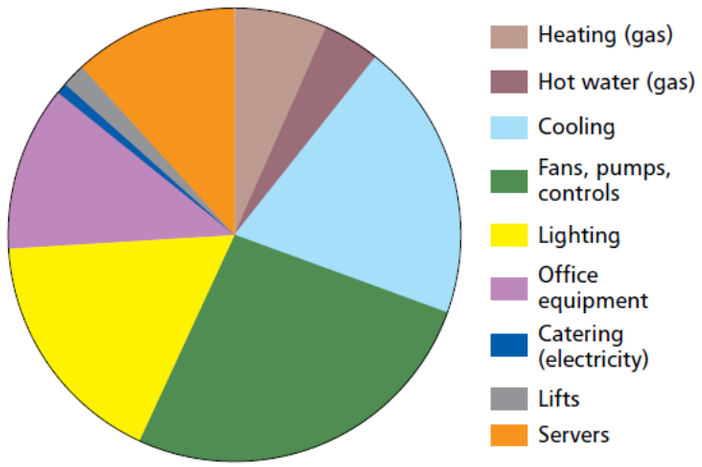
Energy Comparison EPC 'B' Targeted

Data	Existing	Be Lean	Be Green	Total Reduction
Target Emission Rate(TER) kg.CO2/m2.yr	21.61	1.1	1.6	-
Reference Building kg.CO2/m2.yr	11.8	4.4	12	-
Building Emission Rate (BER) kg.CO2/m2.yr	21.61	12	7.14	-
Building Energy Consumption kWh/m2.yr	125.23	88.27	53.98	-
Rating	D 92	C 58	B 30	-
Area (m2)	1,794.00	2,255.00	2,255.00	-
% Energy Saving	-	-29.51%	-56.90%	-86.41%
%Carbon Saving	-	-44.47%	-22.49%	-66.96%

Be Clean: Use Energy Efficiently

The Be Clean section looks into using energy efficiently, by adopting energy saving methods when supplying the services to the building (heating, hot water, ventilation). For the development, the following strategy is proposed:

Heating and Hot Water	Ventilation
Highly efficient heat pump technology, which will provide heating and cooling to the new units. This technology will ensure future proofing and mitigation of fossil fuel generation and residual emission risks in the area.	To minimise unnecessary heat loss through ventilation, it is proposed that a Mechanical Ventilation Heat Recovery (MVHR) system is utilised, achieving high thermal efficiency of minimum 80% while maintaining a low energy consumption with Specific Fan Power (SFP) not exceeding 1.9W/l/s (Part L 2021). All ductwork shall be insulated where necessary to prevent unwanted heat gain / loss.
Hot Water Supplied with Electric point of use.	
Time and Temperature Zone Control; Delayed Start Thermostat.	



Average Energy Use Breakdown On An Office Building (CIBSE TM 54)

Be Green: Use Renewable Energy

The Be Green section reviews each of the technologies that are to be considered on a new development in line with The London Renewable Toolkit, with the most feasible method being selected. The following renewable technologies have been considered to assess their potential to meet the renewable targets for the development but the feasibility of their installation and suitability will need to be explored further.

Technology	Viable	Reasoning
Solar (Photovoltaic)		There is space to potentially add a photovoltaic array on the top floor. The system will provide renewable energy
Solar Thermal (Hot Water)		As with the PV panels, there is potential to install a small solar thermal array to the roof, to provide renewable hot water to office areas. However, due to the offices small predicted domestic hot water load roof areas would be much better utilised by photovoltaics.
Wind Turbine		Due to the location the uneven and turbulent wind patterns that can be expected to occur near buildings, the effective operational time is likely to be limited. Additionally due to noise, vibration, reflected light and shadow flicker it is not best practice to locate in close proximity to office areas.
Biomass		Biomass technology could potentially offer a solution to satisfying heating and hot water loads to the project. However, it has been discounted as there is no space allocation for the pellets on site. There is also an increased fire risk where combustible materials are going to be stored
Combined Heat and Power		A small, centralised CHP could provide a good level of CO2 reduction. However, initial studies found an inadequate heating and electrical demand within scheme, to justify a CHP system.
Air Source Heat Pump (Cooling)		Air Source Heat Pumps could be installed to future proof the units and provide efficient cooling. The system will need to be A rated and should have a COP of no less than 3.5. Condensers to be installed in a second-floor side extension roof enclosure.
Ground Source Heat Pump		The use of horizontal ground source heat pumps is inhibited because of the areas required for the horizontal ground loop system. The site would also be difficult to accommodate both a vertical borehole system or plateau setup, in regards to safe working area and lack of open available space. Ground Source Heat Pumps have therefore been discounted based on these potential constraints.

Sustainable Measures

All timber used for basic or finishing building elements in the scheme will be sourced from responsibly managed and sustainable forests or plantations. Such timber products are the only truly renewable construction material in common use and growing trees also absorb and fix CO2. Forests can also provide the habitat for a wide variety of plant and animal life, preserving important ecology and promoting biodiversity.

Local Sourcing

A building that is truly sustainable must be constructed using locally sourced, sustainable materials i.e. materials that can be supplied without any adverse effect on the environment. Therefore, where practical, materials should be sourced from local suppliers, reducing the environmental impacts and CO2 emissions associated with transportation to the site.

Reuse & Recycling

Scope for increased recycling will be incorporated by specifying recycled materials where possible and ensuring that even where new materials are used, as much as possible can be recycled at the end of the buildings' life.

Any material not required from the original building can be recycled and used as aggregate.

Specifying materials with a high-recycled content is also another method of saving processing or manufacturing energy. The recycled content of a material can be described as either post-consumer or post-industrial to indicate at what point in the life cycle a material is reclaimed.

Lifecycle Assessment

A Life Cycle Assessment (LCA) - is a tool that can be used to assess the environmental impacts of a product, process or service from design to disposal i.e. across its entire lifecycle. This process will be carried out during technical design stage.

Adaptation to Climate Change

The new building will be assessed under the CIBSE TM52; Design Methodology for the Assessment of Overheating Risk in European Building and will enable the design team to assess the risk of overheating and allows a future adaptation to climate change strategy

Mitigation of Climate Change

The development will be an all-electric scheme and will ensure future proofing and mitigation of climate change through the use of low carbon technologies. Technologies such as heat pumps/MVHR/renewable technologies will be utilised.

Enhancement of Bio-Diversity

It is intended that a bio-diverse green roof will be installed and will enhance the urban green ratio of the site. The roof will not only provide green spaces, it will also enhance the thermal mass and therefore protect the units from overheating (natural heatsink). The roof will allow for a natural sustainable drainage treatment, diverting the first amount of rainfall from flowing immediately into the main drainage system. This will also reduce the flood risk.

Planters along the façade will improve the appearance and provide a space for users to potentially grow food.