Sustainability and Energy Statement

20 Red Lion Street

Client: BNP Paribas as Trustees of Mayfair Capital Commercial Property Trust
Project: 20 Red Lion Street, London, WC1R 4PQ

GDM PARTNERSHIP
Sustainable Engineering

Revision	Date	Description	Prepared by	Checked
N1	21.09.16	Draft stage 2 report	AE	AJ
N2	29.09.16	Final Issue	AE	AJ

GDM Partnership Building Services Consultants Limited
St. Johns House
37 – 41 Spital Street
Dartford
Kent
DA1 2DR

Tel: 01322 225242

Email: gdm@gdmp.co.uk
www.gdmpartnership.com

twitter: @GDMPartnership

GDM PARTNERSHIP
Sustainable Engineering

CONTENTS

1 INTRODUCTION

GDM Partnership Building Services Consultants Limited have been appointed by BNP Paribas as Trustees of Mayfair Capital Commercial Property Trust to undertake the Sustainability and Energy Statement for proposed works associated with the rear extensions from Ground floor to fifth floor level and new 6th floor level at 20, Red Lion Street, London

As part of this remit a detailed, design stage energy assessment has been undertaken for submission for planning approval from Camden Council.

The purpose of the report is to detail the investigations and options considered and to provide a conclusion via the use of TAS thermal modelling as to the predicted energy demand for the building and the comparison of such against a 2013 Part L compliant building.

It should be noted that BREEAM 'very good' is being sought for this proposed scheme and a tracking document is published under a separate report.

2 EXECUTIVE SUMMARY

This energy statement has been prepared by GDM Partnership on behalf of BNP Paribas as Trustees of Mayfair Capital Commercial Property Trust to provide a commentary on the sustainability energy issues for the proposed rear extensions from ground floor to fifth floor level and new 6th floor level at 20, Red Lion Street, London. It sets out the energy efficiency and carbon reduction measures that will be incorporated into the development. The assessment includes analysis of baseline carbon emissions of the development and the measures proposed to reduce the carbon emissions, using a lean, clean, green approach.

Energy efficiency measures will be implemented to provide carbon savings of approximately **29.9 %** in comparison to a baseline building that is fully compliant with the standard set by Part L 2013.

The energy efficiency measures contained within this proposal include: improved fabric insulation; improved air tightness; high efficiency fans; high efficiency heating and cooling plant, heat recovery on ventilation systems and high efficiency lighting with daylight control/occupancy control of the lighting.

The London Heat Map has been utilised to check if the development can connect into an existing distribution network. However, currently there are no existing or proposed heat distribution networks in the vicinity and as such this option has been disregarded.

Combined heat and power engines are not viable for developments of this nature due to the low annual heating demand and there being no significant background heat demand during the summer. As such we do not propose to utilise CHP. This combined with the lack of a district heating scheme means that the clean measures for this development are not viable. It should therefore be noted that the carbon emissions at the end of the 'be clean' stage are identical to those being at the end of the 'be lean' with no further improvements achieved.

Photovoltaic collectors are compatible with the proposed building services solution. However, the roof of this building is been used for ancillary services, as a result this technology has been excluded from proposals.

A VRF system is proposed for heating and cooling the extension, which in heating mode operates as an Air Source Heat Pump. This will provide heating to the extensions. The improvements are analysed under 'Be Green' measures.

The following GLA tables show the savings in carbon dioxide achieved by the three steps.

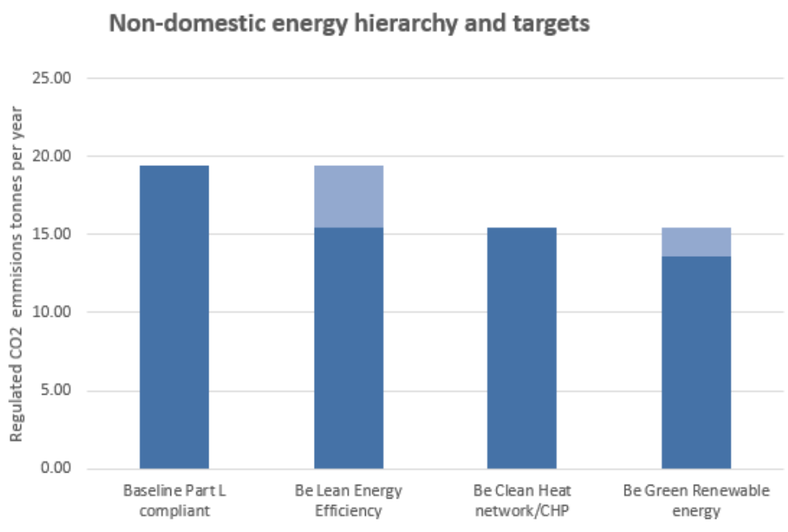
GLA Table 3: Carbon Dioxide Emissions after each stage of the Energy Hierarchy		
20, Red Lion Street Extension	Carbon dioxide emissions for non-domestic buildings (Tonnes CO_2 per annum)	
	Regulated	Unregulated
Baseline: Part L 2013 of the Building Regulations compliant development	19.44	16.29
After Energy Demand Reduction	15.43	16.29
After heat network/CHP	15.43	16.29
After Renewable energy (ASHP)	13.63	16.29

Carbon Dioxide Emissions and savings from each stage of the Energy Hierarchy

GLA Table 4: Regulated non-domestic carbon dioxide savings		
20, Red Lion Street Extension	(Tonnes CO2 per annum)	(%)
Savings from Energy demand reduction	4.00	20.6%
Savings from heat network/CHP	0.00	0.0%
Savings from renewable energy(ASHP)	1.80	9.3%
Total cumulative savings	5.81	29.9%

The total regulated carbon savings for the extension beyond Part L 2013 Building Regulations compared to a baseline model is **29.9 %.**

Chart1 : Regulated Energy Emmisions and Carbon Savings



3 BACKGROUND

This Energy Statement has been prepared by GDM Partnership on behalf of Mayfair Capital Investment Management Ltd to provide a commentary on the sustainability energy issues for the proposed extension at 20 Red Lion Street, London. It sets out the energy efficiency and carbon reduction measures that will be incorporated into the development.

3.1 The Building

For a detailed building description, please refer to information issued by Orms.

The total internal floor area (NIA) of this study in relation with rear extensions from ground floor up to fifth floor and new sixth floor level is approximately 798 m².

3.1.1 General Arrangement Drawings

The internal layout of the proposed office and other areas has been used to analyse future energy consumption. Reference should be made to section 10 of this report for those layout drawings.

3.2 Planning Policy

3.2.1 Background

The Camden council's climate change policies are aligned with those set out in the London Plan. The London Plan states that developments should demonstrate that they have minimised on-site CO_2 emissions by using less energy through maximising, supplying energy efficiently and using onsite renewable energy generation.

This has been incorporated in to Camden Core Strategy Policy CS13 which expects developments or alterations to existing buildings to include proportionate measures to be taken to improve their environmental sustainability, where possible.

Further it requires non-domestic developments of 500sqm of floor space or more are required to submit an energy statement which demonstrates how carbon dioxide emissions will be reduced in line with the energy hierarchy.

London Borough of Camden Planning Guidance Sustainability CPG 3 Chapter 6 states that all developments are to target at least a 20% reduction in carbon dioxide emissions through the installation of on-site renewable energy technologies.

This energy statement is prepared in line with all of the above policies and analyses how this proposed scheme meets the requirements.

A baseline energy model has been prepared, after establishing the energy demand and profile for the site, to meet ADL2A 2013. The strategy for the assessment will follow Energy Planning, Greater London Authority guidance on preparing energy assessments (March 2016) in appraising appropriate measures to reduce carbon emissions and other climate impacts from the development:

The Energy Assessment is based on dynamic simulation modelling using software approved for the use in Building Regulations Energy Performance Calculations.

The Energy Hierarchy

Maximise Energy Efficiency

- Reduce use through behavior change
- Highest possible standards of thermal insulation and air tightness
- Incorporate passive heating and cooling
- Install energy efficient lighting and appliances

Supply Energy Efficiently

- Use CHP and community heating and/or cooling
- Cut transmission losses though local generation

Use Renewable Energy

- Install renewables on site

3.3 Structure of the Energy Assessment

This statement is structured to respond to this Energy Hierarchy. The statement includes:

- An assessment of the baseline carbon emissions based on the target emission rate.
- A review of the energy efficient features incorporated into the design.

- An assessment of the feasibility of connecting to a district heating network or incorporating a combined heat and power system.
- A review of renewable energy technologies and their application for this development.
- Recommendations and commitments.

4 BASELINE ENERGY CONSUMPTION AND CARBON EMISSIONS

Before energy efficiency measures are investigated, it is necessary to establish the baseline energy consumption of the scheme, for comparison and evaluation of the proposed carbon reduction measures.

The baseline case against which carbon savings are assessed is a new development designed to achieve the target emission rate calculated in accordance with ADL2A (2013) of the Building Regulations. This baseline case represents a typical new build arrangement; where electricity for the development is imported from the grid and space and heating water are provided by fossil fuel sources.

The on-site energy consumption associated with non-regulated uses (e.g. lifts, small power and information technology) is included in the baseline carbon emission analysis.

The following 'regulated' energy uses are considered in the baseline energy analysis.

- Space Heating/Cooling
- Water Heating
- Ventilation
- Fans, Pumps and Controls
- Lighting (internal)

4.1.1 Baseline fabric characteristics

The table below identifies fabric characteristics for each thermal element against ADL2A.

Element/ Characteristic	20 Red Lion Street Extension - Baseline Scheme (W/m²K)	Criterion 2 - Limits on design flexibility Part L2A (Non Domestic)
Exterior Wall - U value (W/m²K)	0.2	0.35
Exposed Floor - U value (W/m²K)	0.2	0.25
Roof - U value (W/m²K)	0.13	0.25
Windows Glazing - U value (W/m²K)	1.5	2.2
Design Air Permeability (m³/hr/m² @50Pa)	10	10

4.1.4 Regulated Loads

CO_2 Emissions related to regulated energy use in the commercial element of the scheme have been established by a dynamic thermal model using EDSL TAS.

A model of the proposed development has been constructed and the following assumptions made with regard to the baseline heating and cooling system:

Heating and cooling	Fan coil units using gas fired boilers and central air cooled chillers
Ventilation	Central air handling unit providing minimum fresh air to the office areas. Central extract for WCs.
Domestic hot water	Gas fired boilers

4.1.5 Non-Regulated Loads

Emissions associated with non-regulated energy consumption (e.g. small power use and equipment) have been calculated by the TAS thermal model.

4.1.6 Baseline BRUKL

The emission rate of the baseline building is 24.5 $kgCO_2/m^2/yr$.

Reference should be made to section 9.1 for the baseline BRUCKL document output.

5 BE LEAN - MAXIMISE ENERGY EFFICIENCY

This section outlines how energy consumption will be reduced through the design of the building.

This is achieved by passive measures and the introduction of more energy efficient plant and services. Any improvement achieved at this stage will affect the extent of measures or size of the plant needed to address the subsequent 'be clean' and 'be green' stages.

The building will be constructed to exceed the limiting requirements of the Building Regulations. The offices will be fitted out to provide mechanical ventilation, heating and cooling.

5.1 Physical Form and Orientation of the Building

The orientation of the building is firmly fixed due to the size of the existing site and the roads closely surrounding the site.

Passive solar design involves adapting the building massing, layout and glazing to best respond to the local climate and annual sun path, with the aim of reducing energy demands and improving occupant comfort through limiting the solar gain. The orientation of the building is such that the facades with glazing face east, west and north.

In addition to the orientation solar control glass with a g-value of 0.4 will be used to limit the solar gain. The solar gain limit is not exceeded in any zones under criterion 3 of the Part L of the Building Regulations, and helps to reduce the annual energy consumption by reducing the annual cooling demand.

Good levels of natural daylight will be achieved using glazing with more than 70% light transmission factor; an average daylight factor better than 2% throughout the perimeter area. This will reduce reliance on artificial lighting with a corresponding reduction in energy consumption.

5.2 Building Fabric

The thermal transmittance of the building fabric will be better than the limiting requirements of Part L of the Building Regulations and in align with London Borough of Camden Planning Guidance Sustainability CPG 3 paragraph 3.22.

Details regarding the target U-values for the development are listed in the following table.

As the rear extension is an open plan office space with existing building, design stage air permeability of 10 m³/hr/m² @50Pa is used for calculations.

Element/ Characteristic	20 Red Lion Street Extension Proposed Scheme (W/m²K)	Criterion 2 - Limits on design flexibility Part L2A (Non Domestic)
Exterior Wall - U value (W/m²K)	0.2	0.35
Exposed Floor - U value (W/m²K)	0.2	0.25
Roof - U value (W/m²K)	0.13	0.25
Windows average - U value (W/m²K)	1.5	2.2
Design Air Permeability (m³/hr/m² @50Pa)	10	10

The benefit from further improvements to the U-values was investigated as part of the 'be lean' assessment and it was found that reducing the U-values of all solid elements by further 25% did not change the building emission rate.

5.3 Lighting

It is proposed to install new lighting and an intelligent lighting control system throughout the building. The new luminaires shall be controlled via an intelligent lighting control system consisting of lighting control modules, area control units, presence/solar detectors, scene setting switches, etc. The new luminaires shall be electrically supported from the new local tenants and landlord's distribution boards.

The zoning arrangement of the daylight sensors will be no more than 5m from the façade to ensure that the potential for energy savings is optimised. The dimming system will work to maintain the design illuminance on the working plane, so will also preventing over-lighting.

- Lighting energy consumption – 70 luminaire lumens per circuit watt.

5.4 Ventilation

Fresh air is delivered directly to the ground to 6th floors from a central roof mounted AHU and ducted ventilation system. The air handling unit is provided with a heating coil and is designed to operate with high efficiency fans and a specific fan power of less than 1.6 Watts per litre per second. The air handling unit extracts the air from the offices and incorporates a heat exchanger in order to recover the energy from the exhaust air, thereby reducing the space heating demand.

5.5 Domestic Hot Water

Domestic hot water services are provided by central direct gas fired water heaters.

5.5.1 Conclusion

Based on the proposed systems the building emission rate is around 20.6 % lower than the baseline target emission rate.

The improvement results are only due to the improvement of proposed fabric characteristics. All other systems are remained unchanged from Part L compliant building.

5.6 Carbon Emissions at End of 'Be Lean' Stage

GLA Table 3: Carbon Dioxide Emissions after each stage of the Energy Hierarchy		
20, Red Lion Street Extension	Carbon dioxide emissions for non-domestic buildings (Tonnes CO_2 per annum)	
	Regulated	Unregulated
Baseline: Part L 2013 of the Building Regulations compliant development	19.44	16.29
After Energy Demand Reduction	15.43	16.29

GLA Table 4: Regulated non-domestic carbon dioxide savings		
20, Red Lion Street Extension	(Tonnes CO2 per annum)	(%)
Savings from Energy demand reduction	4.00	20.6%

Total saving with Lean measures applied is approximately **20.6%.**

6 BE CLEAN – SUPPLY ENERGY EFFICIENTLY

The next step in the Energy Hierarchy is the 'Be Clean' strategy of supplying the required energy as efficiently as possible.

Potential approaches include, connecting the scheme to existing low carbon or CHP-led district energy networks, or if no existing schemes exist, investigating whether such networks are planned in the area and designing systems with the flexibility to connect to these in the future. With or without a district energy system, the feasibility of CHP (combined heat and power). For larger developments the use of a site wide communal heating system should be provided if considered viable.

6.1 District Energy Networks

The London Heat Map and Borough's Local plan map have been utilised to check if the development can connect into an existing distribution network. However, currently there are no existing or proposed heat distribution networks in the close vicinity and as such this option has been disregarded.

Figure 4. Developments within 1km radius of an existing or emerging network.

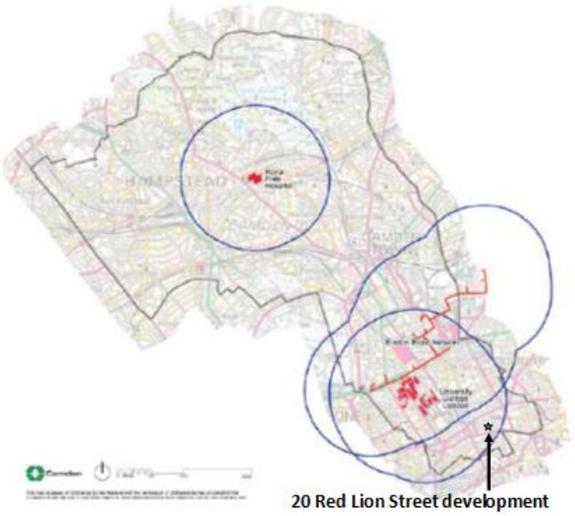


Figure 5. Developments within 500m radius of a potential network

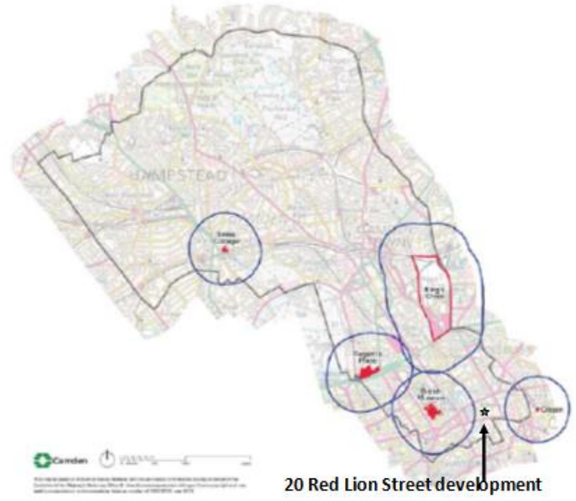


Figure 1 Proposed site location on the Camden decentralised energy map with potential for future District heating networks.

Figure 1 above identifies the proposed site location on the Camden decentralised energy map with potential for future District heating networks. Although it situated within 1km radius of existing network, it is outside the radius of 500m of a potential network to plan a connection. With the above in mind it is proposed that space is allocated within the basement area for future connections to be made, should a district energy network become viable for this development.

6.1.1 CHP

Combined heat and power engines are not viable for developments of this nature due to the low annual heating demand and there being no significant background domestic hot water demand during the summer and as such this technology has not been incorporated into the proposed scheme.

6.1.2 Conclusion

The development will not be connected to a district heating network or be provided with a CHP engine and as such these clean measures have not been adopted as part of GDM's proposals.

The carbon emissions at the end of the 'be clean' stage are identical to those at the end of the 'be lean' as indicate within tables below.

6.2 Carbon Emissions at End of 'Be Clean' Stage

GLA Table 3: Carbon Dioxide Emissions after each stage of the Energy Hierarchy		
20, Red Lion Street Extension	Carbon dioxide emissions for non-domestic buildings (Tonnes CO_2 per annum)	
	Regulated	Unregulated
Baseline: Part L 2013 of the Building Regulations compliant development	19.44	16.29
After Energy Demand Reduction	15.43	16.29
After heat network/CHP	15.43	16.29

GLA Table 4: Regulated non-domestic carbon dioxide savings		
20, Red Lion Street Extension	(Tonnes CO2 per annum)	(%)
Savings from Energy demand reduction	4.00	20.6%
Savings from heat network/CHP	0.00	0.0%

Total saving with Lean and Clean measures applied is approximately **20.6%.**

7 BE GREEN – RENEWABLE ENERGY

The third and final stage of the energy hierarchy - 'Be Green' is to review the potential of a range of renewable energy systems to serve the energy requirements of the site and thereby offset CO_2 emissions.

The following renewable energy technologies have been considered for the development:

- Solar Water Heating
- Wind Power
- Biomass Heating
- Heat Pumps
- Photovoltaics
- Air Source Heat Pump

7.1 Solar Water Heating

Solar thermal domestic hot water consumption is technically viable for this development. However, installing a solar thermal system to serve the toilets will not make a significant carbon saving as the domestic hot water demand is very low. This combined with the limited available space at roof level has resulted in this technology being excluded from the final design proposals.

7.2 Wind Power

It is recognised that wind generators are often associated with unacceptable visual and noise implications. Wind technology as a renewable energy source is not considered appropriate for this site as it is felt that the wind turbines would not be visually appropriate for this development and this technology being excluded from the final design proposals.

7.3 Biomass Heating

Biomass heating is not considered to be a suitable technology for urban locations. With local boilers in each unit biomass boilers are not a viable solution due to fuel distribution problems on the site. In addition, the boilers are often un-used due to maintenance issues, fuel supply issues, and operating costs as such this technology being excluded from the final design proposals.

7.4 Photovoltaics

Photovoltaic collectors are compatible with the proposed building services solution, However, the roof of this building is been used for ancillary services, as a result this technology has been excluded from proposals.

7.5 Air Source Heat Pump

Air source heat pump technology is found to be suitable for this development and included within this proposal.

Through a refrigeration cycle, external ambient air can be used as a heating or cooling medium. Air source heat pumps recover or reject heat from outside air and can deliver heating or cooling, or both to an occupied space. Air source heat pumps can also have the facility to generate domestic hot water.

High seasonal efficiencies allow significant energy savings when compared to heat generation from fossil fuels, for instance three kilowatt output can be generated from a single kilowatt of input electrical energy.

The air source heat pumps are also capable of providing comfort cooling where market trends demand a higher specification.

Heat pumps are generally located externally, indoor heat pump units are available; however, they have a requirement for high rates of ventilation.

Although electrically driven, in a heating only scenario the energy savings achieved by this solution are classified as renewable once the electricity consumed by the units is taken into account. This has been recognised within the current London Plan.

Where cooling is required, an argument can be made that heating only heat pumps would need to be supplemented by an additional external comfort cooling plant, thereby maintaining the renewable heating energy generated by "heating only" air source heat pumps. This has a detrimental impact in terms of cost, and increased noise from an external plant, when compared to the opportunity for utilising a common system.

Heating and cooling is provided by roof mounted air source heat pump units. The proposed plant's seasonal efficiencies are as follows:

Heating SCOP	4.0
Cooling SEER	5.0

7.6 Carbon Emissions at End of 'Be Green' Stage

GLA Table 3: Carbon Dioxide Emissions after each stage of the Energy Hierarchy		
20, Red Lion Street Extension	Carbon dioxide emissions for non-domestic buildings (Tonnes CO_2 per annum)	
	Regulated	Unregulated
Baseline: Part L 2013 of the Building Regulations compliant development	19.44	16.29
After Energy Demand Reduction	15.43	16.29
After heat network/CHP	15.43	16.29
After Renewable energy (ASHP)	13.63	16.29

GLA Table 4: Regulated non-domestic carbon dioxide savings		
20, Red Lion Street Extension	(Tonnes CO2 per annum)	(%)
Savings from Energy demand reduction	4.00	20.6%
Savings from heat network/CHP	0.00	0.0%
Savings from renewable energy(ASHP)	1.80	9.3%
Total cumulative savings	5.81	29.9%

The carbon savings achieved at the end of Green measures is approximately **29.9 %.**

8 CONCLUSIONS

Energy efficiency measures and green technologies will be implemented to provide total carbon savings of 29.9 % in comparison to a baseline building that is fully compliant with the standard set by Part L 2013. The energy efficiency measures include: improved fabric insulation; improved air tightness; high efficiency fans; high efficiency heat recovery heating, cooling and domestic hot water plant, heat recovery on ventilation systems and high efficiency lighting with right controls. This will ensure the development achieves part L 2013 compliance through energy efficiency and green measures.

The London Heat Map has been utilised to check if the development can connect into an existing distribution network. Currently there are no existing or proposed heat distribution networks in the vicinity. Space however will be made available within the basement for future connection to a district energy scheme should this be viable in the future.

Combined heat and power engines are not viable for developments of this nature due to the low annual heating demand and there being no significant background heat demand during the summer. The carbon emissions at the end of the 'be clean' stage are identical to those at the end of the 'be lean' stage.

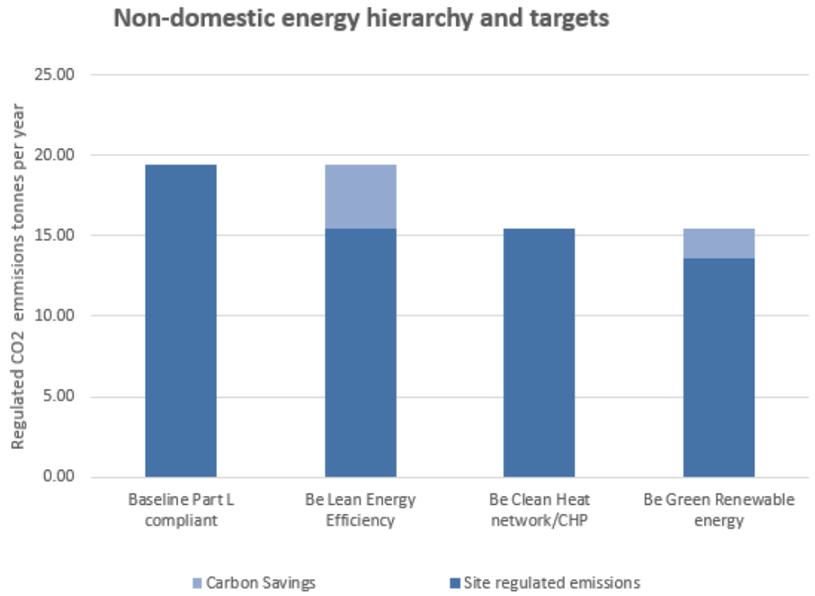
Air source heat pumps are compatible with the proposed building services solution and included within the proposal.

GLA tables 1 and 2 show the savings in carbon dioxide achieved by the three steps. The total site wide regulated carbon saving through the combination of an energy efficient design and renewable technologies is **29.9 %.**

The following GLA tables show the savings in carbon dioxide achieved by the three steps.

GLA Table 3: Carbon Dioxide Emissions after each stage of the Energy Hierarchy		
20, Red Lion Street Extension	Carbon dioxide emissions for non-domestic buildings (Tonnes CO_2 per annum)	
	Regulated	Unregulated
Baseline: Part L 2013 of the Building Regulations compliant development	19.44	16.29
After Energy Demand Reduction	15.43	16.29
After heat network/CHP	15.43	16.29
After Renewable energy (ASHP)	13.63	16.29

GLA Table 4: Regulated non-domestic carbon dioxide savings		
20, Red Lion Street Extension	(Tonnes CO2 per annum)	(%)
Savings from Energy demand reduction	4.00	20.6%
Savings from heat network/CHP	0.00	0.0%
Savings from renewable energy(ASHP)	1.80	9.3%
Total cumulative savings	5.81	29.9%



9 BRUKL REPORT

This chapter shows the Criterion 1 & 2 of the BRUKL outputs of energy assessments carried out and full BRUKL outputs would be available if required.

9.1 Baseline BRUKL Document

BRUKL Output Document — HM Government
Compliance with England Building Regulations Part L 2013

Project name

20 Red Lion Street; Baseline — As designed

Date: Mon Sep 19 11:40:23 2016

Administrative information

Building Details
Address: 20 Red Lion Street, London, WC1R 4PQ

Certification tool
Calculation engine: TAS
Calculation engine version: "v9.3.3"
Interface to calculation engine: TAS
Interface to calculation engine version: v9.3.3
BRUKL compliance check version: v5.2.g.3

Owner Details
Name:
Telephone number:
Address: , ,

Certifier details
Name: Antonette Easwaranathan
Telephone number: +44(0)1322 299594
Address: 37-41 Spital Street, Dartford, DA1 2DR

Criterion 1: The calculated CO_2 emission rate for the building should not exceed the target

CO_2 emission rate from the notional building, $kgCO_2/m^2.annum$	24.5
Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	24.5
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	24.4
Are emissions from the building less than or equal to the target?	BER =< TER
Are as built details the same as used in the BER calculations?	Separate submission

Criterion 2: The performance of the building fabric and the building services should achieve reasonable overall standards of energy efficiency

Values not achieving standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red.

Building fabric

Element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	Surface where the maximum value occurs*
Wall**	0.35	0.2	0.2	New External wall
Floor	0.25	0.2	0.2	Exposed Floor
Roof	0.25	0.13	0.13	New Roof
Windows***, roof windows, and rooflights	2.2	1.51	1.51	G0 new window
Personnel doors	2.2	1.51	1.51	Door
Vehicle access & similar large doors	1.5	-	-	No vehicle doors in project
High usage entrance doors	3.5	-	-	No high usage entrance doors in project

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

* There might be more than one surface where the maximum U-value occurs.
** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.
*** Display windows and similar glazing are excluded from the U-value check.
N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air Permeability	Worst acceptable standard	This building
$m^3/(h.m^2)$ at 50 Pa	10	10

9.2 BRUKL following Lean Measures

BRUKL Output Document — HM Government
Compliance with England Building Regulations Part L 2013

Project name

20 Red Lion Street; Be Lean — As designed

Date: Thu Sep 29 14:44:06 2016

Administrative information

Building Details
Address: 20 Red Lion Street, London, WC1R 4PQ

Certification tool
Calculation engine: TAS
Calculation engine version: "v9.3.3"
Interface to calculation engine: TAS
Interface to calculation engine version: v9.3.3
BRUKL compliance check version: v5.2.g.3

Owner Details
Name:
Telephone number:
Address: , ,

Certifier details
Name: Antonette Easwaranathan
Telephone number: +44(0)1322 299594
Address: 37-41 Spital Street, Dartford, DA1 2DR

Criterion 1: The calculated CO_2 emission rate for the building should not exceed the target

CO_2 emission rate from the notional building, $kgCO_2/m^2.annum$	19.5
Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	19.5
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	19.4
Are emissions from the building less than or equal to the target?	BER =< TER
Are as built details the same as used in the BER calculations?	Separate submission

Criterion 2: The performance of the building fabric and the building services should achieve reasonable overall standards of energy efficiency

Values not achieving standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red.

Building fabric

Element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	Surface where the maximum value occurs*
Wall**	0.35	0.2	0.2	New External wall
Floor	0.25	0.2	0.2	Exposed Floor
Roof	0.25	0.13	0.13	New Roof
Windows***, roof windows, and rooflights	2.2	1.51	1.51	G0 new window
Personnel doors	2.2	1.51	1.51	Door
Vehicle access & similar large doors	1.5	-	-	No vehicle doors in project
High usage entrance doors	3.5	-	-	No high usage entrance doors in project

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

* There might be more than one surface where the maximum U-value occurs.
** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.
*** Display windows and similar glazing are excluded from the U-value check.
N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air Permeability	Worst acceptable standard	This building
$m^3/(h.m^2)$ at 50 Pa	10	10

Page 1 of 7

9.3 Final BRUKL Document Representing Design Proposal

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2013

Project name

20 Red Lion Street; Proposed — As designed

Date: Thu Sep 29 13:56:48 2016

Administrative information

Building Details

Address: 20 Red Lion Street, London, WC1R 4PQ

Certification tool

Calculation engine: TAS
Calculation engine version: "v9.3.3"
Interface to calculation engine: TAS
Interface to calculation engine version: v9.3.3
BRUKL compliance check version: v5.2.g.3

Owner Details

Name:
Telephone number:
Address: , ,

Certifier details

Name: Antonette Easwaranathan
Telephone number: +44(0)1322 299594
Address: 37-41 Spital Street, Dartford, DA1 2DR

Criterion 1: The calculated CO_2 emission rate for the building should not exceed the target

CO_2 emission rate from the notional building, $kgCO_2/m^2.annum$	19.1
Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	19.1
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	17.1
Are emissions from the building less than or equal to the target?	BER =< TER
Are as built details the same as used in the BER calculations?	Separate submission

Criterion 2: The performance of the building fabric and the building services should achieve reasonable overall standards of energy efficiency

Values not achieving standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red.

Building fabric

Element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	Surface where the maximum value occurs*
Wall**	0.35	0.2	0.2	New External wall
Floor	0.25	0.2	0.2	Exposed Floor
Roof	0.25	0.13	0.13	New Roof
Windows***, roof windows, and rooflights	2.2	1.51	1.51	G0 new window
Personnel doors	2.2	1.51	1.51	Door
Vehicle access & similar large doors	1.5	-	-	No vehicle doors in project
High usage entrance doors	3.5	-	-	No high usage entrance doors in project

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

* There might be more than one surface where the maximum U-value occurs.
** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.
*** Display windows and similar glazing are excluded from the U-value check.
N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air Permeability	Worst acceptable standard	This building
$m^3/(h.m^2)$ at 50 Pa	10	10

Energy Performance Certificate

HM Government

Non-Domestic Building

20 Red Lion Street
London
WC1R 4PQ

Certificate Reference Number:
0592-9618-3731-4409-1623

This certificate shows the energy rating of this building. It indicates the energy efficiency of the building fabric and the heating, ventilation, cooling and lighting systems. The rating is compared to two benchmarks for this type of building: one appropriate for new buildings and one appropriate for existing buildings. There is more advice on how to interpret this information on the Government's website www.communities.gov.uk/epbd.

Energy Performance Asset Rating

More energy efficient

A+

Net zero CO_2 emissions

A 0-25
B 26-50
C 51-75
D 76-100
E 101-125
F 126-150
G Over 150

24 This is how energy efficient the building is.

Less energy efficient

Technical information

Main heating fuel:	Other
Building environment:	Air Conditioning
Total useful floor area (m^2):	798
Building complexity (NOS level):	5
Building emission rate ($kgCO_2/m^2$):	17.09

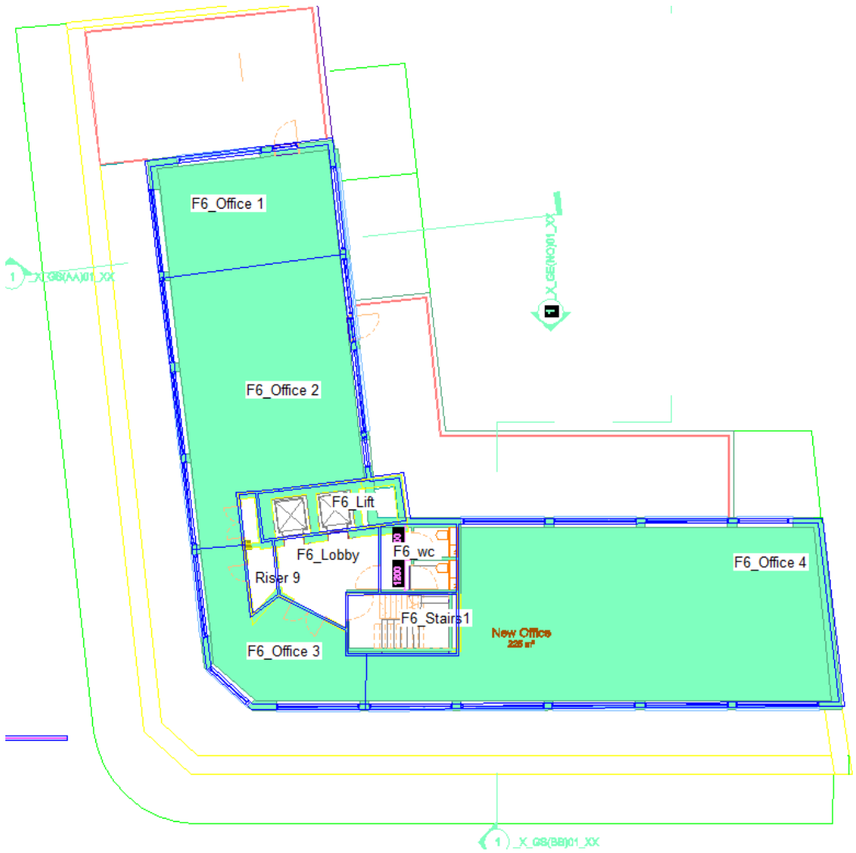
Benchmarks

Buildings similar to this one could have ratings as follows:

27 If newly built
78 If typical of the existing stock

10 LAYOUT DRAWINGS

10.1 Proposed Extension Plan – New Sixth Floor level



10.2 Proposed Extension Plan – Typical rear extension ground to fifth floor levels.

This layout identifying the typical additional area included within this energy study created by extending rear façade.