Appendix 1 Policy background and example carbon offsetting calculations

1) Policy Background

1.1 London Plan

The carbon targets to which offsetting applies derive from the London Plan 2016

London Plan Policy 5.2 - Minimising carbon dioxide emissions

Planning decisions

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

1. Be lean: use less energy
2. Be clean: supply energy efficiently
3. Be green: use renewable energy

B. The Mayor will work with boroughs and developers to ensure that major developments meet the following targets for carbon dioxide emissions reduction in buildings. These targets are expressed as minimum improvements over the Target Emission Rate (TER) outlined in the national Building Regulations leading to zero carbon residential buildings from 2016 and zero carbon non-domestic buildings from 2019

Residential buildings:

Year	Improvement on 2010 Building Regulations
2010 – 2013	25 per cent (Code for Sustainable Homes level 4)
2013 – 2016	40 per cent
2016 – 2031	Zero carbon

Non-domestic buildings:

Year	Improvement on 2010 Building Regulations
2010 – 2013	25 per cent
2013 – 2016	40 per cent
2016 – 2019	As per building regulations requirements
2019 – 2031	Zero carbon

C. Major development proposals should include a detailed energy assessment to demonstrate how the targets for carbon dioxide emissions reduction outlined above are to be met within the framework of the energy hierarchy

D. As a minimum, energy assessments should include the following details:

a) calculation of the energy demand and carbon dioxide emissions covered by the Building Regulations and, separately, the energy demand and carbon dioxide emissions from any other part of the development, including plant or equipment, that are not covered by the Building Regulations (see paragraph 5.22) at each stage of the energy hierarchy

b) proposals to reduce carbon dioxide emissions through the energy efficient design of the site, buildings and services

c) proposals to further reduce carbon dioxide emissions through the use of decentralised energy where feasible, such as district heating and cooling and combined heat and power (CHP)

d) proposals to further reduce carbon dioxide emissions through the use of on-site renewable energy technologies.

E. The carbon dioxide reduction targets should be met on-site. Where it is clearly demonstrated that the specific targets cannot be fully achieved on-site, any shortfall may be provided off-site or through a cash in lieu contribution to the relevant borough to be ring fenced to secure delivery of carbon dioxide savings elsewhere.

These targets are enforced through planning obligations, on a borough by borough basis, and the most common clause in the City's present S106 agreements is the 35% improvement on the 2013 Part L Building Regulations (which is broadly equivalent to a 40% reduction on the 2010 Part L Building Regulations – see Mayor's Sustainable Design & Construction SPG).

The London Plan is under review with the draft New London Plan Policy SI2 *Minimising Greenhouse Gas Emissions* continuing with the requirement for all major development to be zero carbon.

1.2 City of London Local Plan 2015

The City Local Plan reiterates the requirement to offset carbon emissions where carbon targets cannot be met on site.

Policy DM 15.2 Energy and CO_2 emissions assessments

1. Development design must take account of location, building orientation, internal layouts and landscaping to reduce likely energy consumption.
2. For all major development energy assessments must be submitted with the application demonstrating:

- energy efficiency – showing the maximum improvement over current Building Regulations to achieve the required Fabric Energy Efficiency Standards;
- carbon compliance levels required to meet national targets for zero carbon development using low and zero carbon technologies, where feasible;
- where on-site carbon emission reduction is unviable, offsetting of residual CO_2 emissions through 'allowable solutions' for the lifetime of the building to achieve national targets for zero-carbon homes and non-domestic buildings. Achievement of zero carbon buildings in advance of national target dates will be encouraged;
- anticipated residual power loads and routes for supply.

2) Example Carbon Offsetting S106 agreement

Where carbon offsetting is required this is secured through S106 agreement. An example S106 carbon offsetting clause is included below:

CARBON OFF-SETTING

1 The Developer shall:

1.1 pay the Carbon Off-set Contribution (as specified in paragraph 1.2 of this Schedule 3) calculated in accordance with the following formula:

Carbon Off-set Contribution = (T – R) x Y x Z

Where T is the target reduction ("the Target Reduction") in the amount of carbon dioxide (expressed in tonnes) which reflects 35% of the New Build / Development's annual carbon dioxide emissions if constructed in accordance with the 2013 Building Regulations

R is the reduction in the amount of carbon dioxide (expressed in tonnes) which reflects the reduction in the Development's annual carbon dioxide emissions (when compared to the annual carbon dioxide emissions if constructed in accordance with the Building Regulations) which it is calculated will be achieved by the implementation of carbon reduction measures as determined by reference to the Energy Statement submitted to the City Corporation pursuant to the Application OR (in the event that a subsequent revised assessment of carbon dioxide emissions of the completed New Build / Development is provided pursuant to paragraph 1.2) by reference to that subsequent revised assessment

Y is the number of years for which the contribution is payable, being 30 years

Z is the cost of carbon per tonne taken from the Mayor's draft Sustainable Design & Construction SPG (paragraph 2.4.39) being £60 per tonne of carbon dioxide

and provided that the Carbon Off-set Contribution may be zero (or if negative shall be deemed to be zero).

1.2 Following the Completion Date but prior to Occupation the Developer shall confirm that the Energy Statement has been implemented and submit to the City Corporation an assessment of the carbon dioxide emissions of the completed Development so as to calculate the reduction in the amount of carbon dioxide (expressed in tonnes) which reflects the Development's annual carbon dioxide emissions which it is calculated will be achieved by the implementation of carbon reduction measures ("R" in the formula in paragraph 1.1).

1.3 In the event of a shortfall in the Target Reduction, the Developer will calculate the amount of Carbon Off-set Contribution referable to the said shortfall in accordance with the formula in paragraph 1.2 and shall pay the Carbon Off Set Contribution as follows:

1.4 to the City Corporation to be paid into the City of London Carbon Off-set Scheme no later than eight (8) weeks following Completion of the Development (as notified to the City Corporation pursuant to clause 17.5); or

11.5 evidence that the payment has been made shall be provided to the City Corporation within eight (8) weeks of the payment being made.

3) Example Calculation of the Carbon Offsetting contribution

The City Corporation has set up a carbon offsetting payment calculator to use a BRUKL report, submitted on completion of the development, to discharge the carbon offsetting obligation. This is the easiest and most straightforward way to check how much carbon is required to be offset.

	A	B	C	D
1	**Carbon Offsetting Payment Calculator**			
2	**BRUKL Report:**			
3	Application Ref:			
4	Date of report (as designed):			
5	Date of report (as constructed):			
6				
7	**Actual Area (m2)**			
8	**Target CO2 emission rate (TER) kgCO2/m2.annum**			
9	**Building CO2 emission rate(BER) kgCO2/m2. annum)**			
10	**Target Reduction**	**35%**		
11				
12	**Emissions Baseline as per Part L 2013 Building Regulations**	-	tonnes CO2 per annum	
13	**Target Emissions Reduction**	-	tonnes CO2 per annum	
14	**Acutal Emissions Reduction**	-	tonnes CO2 per annum	
15	**Carbon Surplus/Shortfall**	-	tonnes CO2 per annum	
16	**Overall Reduction**	#DIV/0!		
17	**Shortfall/surplus**	#DIV/0!		
18	**Carbon Offsetting Contribution**	**£ -**		
19				

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2013

Project name

15 Bishopsgate — As designed

Date: Mon Dec 08 21:25:11 2014

Administrative information

Building Details
Address: ,

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

Owner Details
Name:
Telephone number:
Address: , ,

Certifier details
Name: Mautasimuddin Altamash Mohammed
Telephone number:
Address: , ,

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

CO_2 emission rate from the notional building, $kgCO_2/m^2.annum$	23.6
Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	23.6
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	16.3
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

The floor area (m2) can be found in the technical data section of the BRUKL report.

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m²]	8326	8326
External area [m²]	6443	6443
Weather	LON	LON
Infiltration [m³/hm²@ 50Pa]	5	3
Average conductance [W/K]	3230	2789
Average U-value [W/m²K]	0.5	0.43
Alpha value* [%]	6.62	6.62

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Building Use

% Area	Building Type
8	**A1/A2 Retail/Financial and Professional services**
	A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
92	**B1 Offices and Workshop businesses**
	B2 to B7 General Industrial and Special Industrial Groups
	B8 Storage or Distribution
	C1 Hotels
	C2 Residential Inst.: Hospitals and Care Homes
	C2 Residential Inst.: Residential schools
	C2 Residential Inst.: Universities and colleges
	C2A Secure Residential Inst.
	Residential spaces
	D1 Non-residential Inst.: Community/Day Centre
	D1 Non-residential Inst.: Libraries, Museums, and Galleries
	D1 Non-residential Inst.: Education
	D1 Non-residential Inst.: Primary Health Care Building
	D1 Non-residential Inst.: Crown and County Courts
	D2 General Assembly and Leisure, Night Clubs and Theatres
	Others: Passenger terminals
	Others: Emergency services
	Others: Miscellaneous 24hr activities
	Others: Car Parks 24 hrs
	Others - Stand alone utility block

When these values have been entered – the carbon calculator will work out the charge, and how much carbon shortfall/surplus there is.

	A	B	C	D	E
1	**Carbon Offsetting Payment Calculator**				
2	**BRUKL Report:**	15 Bishopsgate			
3	Application Ref:	14/01251/FULMAJ			
4	Date of report (as designed):	Dec 8th 2014			
5	Date of report (as constructed):				
6					
7	**Actual Area (m2)**	8,326.00			
8	**Target CO2 emission rate (TER) kgCO2/m2.annum**	23.60			
9	**Building CO2 emission rate(BER) kgCO2/m2. annum)**	16.30			
10	**Target Reduction**	**35%**			
11					
12	**Emissions Baseline as per Part L 2013 Building Regulations**	196.49	tonnes CO2 per annum		
13	**Target Emissions Reduction**	68.77	tonnes CO2 per annum		
14	**Acutal Emissions Reduction**	60.78	tonnes CO2 per annum		
15	**Carbon Surplus/Shortfall**	7.99	tonnes CO2 per annum		
16	**Overall Reduction**	30.93%			
17	**Shortfall/surplus**	4.07%			
18	**Carbon Offsetting Contribution**	**£ 14,382.00**			
19					