GLA Carbon Emissions Reporting Spreadsheet

BACKGROUND AND PURPOSE

From **January 2023** planning applicants for new and refurbishments schemes are required to use this spreadsheet to report the anticipated carbon performance of a development. It should be used for both domestic and non-domestic uses. This spreadsheet ensures a consistent and transparent process for presenting Part L 2021 CO_2 emission performance. The GLA will not accept the use of alternative methodologies or tools. This is to ensure consistency and to minimise the need for clarifications during the planning application determination period.

Planning applicants should use Part L 2021 BRUKL and SAP outputs to fill in this spreadsheet which serves as a the final step in reporting the carbon emission performance of the proposed energy strategy. **It is solely for the purpose of reporting compliance with the London Plan to the GLA and does not replace Part L calculations submitted for Building Regulations approval.**

The spreadsheet has been developed to fit as wide a range of policy compliant approaches for schemes as possible. Any planning applicants with a policy compliant approach that the spreadsheet does not serve should contact the GLA at: **ZeroCarbonPlanning@london.gov.uk**. Applicants must not amend or alter the spreadsheet to suit non-policy compliant strategies. Any unauthorised amendment to the spreadsheet will invalidate the CO_2 emission calculations.

Applicants should note that we will update the spreadsheet from time to time to ensure it remains fit for purpose. Applicants are expected to use the latest version at the time of the planning submission.

Any feedback on this spreadsheet should be sent to: ZeroCarbonPlanning@london.gov.uk.

METHODOLOGY

Applicants are required to complete **all** light blue input cells in the applicable tabs prior to submission ('Development Information', 'Part L Outputs', 'EUI & space heating demand' and 'GLA Summary Tables').

Input Data
For all applications, the input data required includes:
'Development information' tab
• Table 1. Application Completeness Check
• Table 2. Development Details
• Table 3. Bespoke District Heating Carbon Factors (if applicable)
• Table 4. Distribution loss factor (if applicable)
• Table 5. SCoP Calculation Methodology (if applicable)

'Part L Output' tab

• Type of units modelled
• Area of units modelled (m^2)
• Number of units modelled
• Total area represented by model (m^2)
• TER, DER and BER figures ($kgCO_2/m^2$ p.a.)
• Notional building Energy saving/generation technologies (-) for residential ($kgCO_2$ p.a.)
• Notional building Displaced electricity (-) for non-residential (kWh//m^2 p.a.)
• TFEE and DFEE figures for residential (kWh//m^2 p.a.)

'GLA Summary tables' tab
• Unregulated figures (tCO_2 p.a.)
• Actual and notional building cooling demand (MJ/m^2)

Note: The total carbon emissions figures in the 'GLA Summary tables' tab are now calculated based on the area input for 'Total area represented by model (m^2)'. This input requirement has been added to ensure that the carbon emission figures align with the development area schedule (included within the DAS) rather than the number of representative models.

'EUI & Space Heating Demand' tab
• Confirmation of building type
• Gross Internal Area (GIA) in m^2
• Energy Use Intensity (EUI) per fuel type (kWh p.a.)
• Space heating demand (kWh p.a.)
• Confirmation that both regulated and unregulated energy use has been included
• Confirmation of predicted energy use methodology, including modelling software
• Notes on the assessment, including justification if expected performance differs from Table 4

Note: Applicants can use the 'be seen' methodology or an alternative predictive energy modelling methodology to fill in the required EUI & space heating demand information.
Where 'be seen' reporting is used the reported EUI and space heating demand should align with energy consumption data reported in the planning stage submission for the 'be seen' policy, submitted via the online webform.

Required Part L Outputs for the GLA spreadsheet
Domestic Part L Outputs:
For the domestic conversion applicants are required to use the outputs from the SAP TER and DER worksheets. To assist in the process the required SAP worksheet rows have been referenced in each input cell. Note: The SAP worksheet rows are based on a communal heating system in line with GLA policy and guidance. Applicants proposing individual systems must first seek confirmation from the GLA as to whether the approach will be acceptable.

Non-domestic Part L Outputs:

Regarding the non-domestic uses, the applicant can determine whether each individual unit will be modelled independently and apportioned to the entire scheme or whether a single model will be generated for the entire development. The applicant should, however, include the results from all BRUKL outputs generated for the proposed development under the "NON-RESIDENTIAL CO_2 ANALYSIS" sections. Applicants are generally encouraged to model each individual typology independently.

Validation Check
Applicants must ensure that the calculated TER/DER/BER in this spreadsheet matches the actual values from the Part L 2021 BRUKL and SAP worksheets. The Part L 2021 BRUKL and SAP sheet must accompany the energy assessment so that results can be validated.

TABLE 1. APPLICATION COMPLETENESS CHECK	
Development information tab (Tables 1-4) completed and included in appendix of energy strategy?	
Part L outputs tab completed	
EUI & space heating demand completed	
Confirmation that the planning stage webform will be completed at planning application submission and that the Be Seen process and reporting responsibilities are fully understood, including the requirement for as-built and in-use stage reporting to be undertaken (or where the legal owner changes from one reporting stage to another that the responsible party will be notified).	

TABLE 2. DEVELOPMENT DETAILS		Further notes	Response	Supporting comments (or signpost sections in the energy assessment)
Application details	Date of Application	Please provide the date the application was submitted to the Local Planning Authority.		
	Local Planning Authority	Please indicate the Local Planning Authority determining the application.		
	Confirmed carbon offset price (£/tonne of carbon dioxide)	Please confirm the agreed carbon offset price for the Local Planning Authority. If no value is entered then the GLA's recommend price of £95 per tonne of carbon dioxide will be used.		
	Evidence of communication on the carbon offset price included in the energy assessment (Y/N).			
	Residential units number (Part L1)			
	Non-residential floor area in m^2 (Part L2)			
Heat risk	CIBSE TM59 undertaken for residential development (Y/N)			
	CIBSE TM52 undertaken for non-residential development (Y/N)			
	All sample units meet CIBSE criteria with DSY1 weather file (Y/N)			
	DSY2 and DSY3 included in overheating assessments (Y/N)			
	Residential g-value			
	% Glazing Ratio over façade			
	External shading proposed (Y/N)			
Energy efficiency measures	Target Fabric Energy Efficiency met (Y/N)			
	Mechanical Ventilation with Heat Recovery included (Y/N)			
	Waste Water Heat Recovery (Y/N)			
	Low energy lighting (Y/N)			
District heating connection	Development in a Heat Network Priority Area (HNPA) (Y/N)			
	District Heating Network connection (Y/N)			
	Name of District Heating Network			
	Carbon factor ($kgCO_2$/ kWh)			
	Borough energy officer and Heat Network Operator contacted and evidence of correspondence included in the energy strategy (Y/N)	Applicable to all applications.		
	Development future proofed for DHN connection (Y/N)	Note that individual heating systems would not be appropriate for developments in HNPAs.		

Site heating distribution configuration	Drawings of communal system provided (Y/N)	Applicants should provide a drawings of the energy centre, on-site communal network with all building uses connected and future proofing arrangements detailed, including single point of connection.		
	Distribution type			
	Flow temperature (°C)			
	Return temperature (°C)			
	Distribution losses modelled (%)	See table 4 below for details.		
Heating system performance	Heat Pump (Y/N)			
	Heat Pump source			
	Centralised Heat Pump capacity (kWth)			
	Heat Pump Seasonal Heating Efficiency (SCoP)			
	Heat Pump SCoP calculation includes heat source and heat distribution temperature and seasonal performance factor (Y/N)	See table 5 below for details.		
	Fraction of heat supplied by heat pump (only for hybrid systems with boilers) (%)			
	Low-emission on-site CHP enabling an area-wide heat network (Y/N)	Only low-emission CHP is suitable and only where it is facilitating an area-wide heat network. Therefore, new gas engine CHP is not suitable for any other purpose for new developments.		
	CHP (kWe)			
	Estimated end user cost (pence/kWh)			
	Energy assessment includes consideration of occupant running costs (Y/N)	Applicants should consider the estimated costs to occupants of the energy assessment and outline how they are committed to protecting the consumer from high prices.		
Solar technologies	Solar PV included (Y/N)			
	Roof layout demonstrating solar PV technologies have been maximised included in energy strategy (Y/N)			
	kWh generated			
	kWp			
	Total PV panel area (m^2) installed			
	Solar Thermal included (Y/N)			
	Solar Thermal panel area (m^2) installed			
Flexibility and peak energy demand	Site-wide peak demand, capacity and flexibility potential included in energy assessment (Y/N)	Table 9 in the energy assessment guidance to be completed.		
	Interventions for achieving flexibility included in energy assessment (Y/N)	Table 10 in the energy assessment guidance to be completed.		
	Estimated peak demand (MW)			
	Electrical energy storage (kWh) capacity			
	Heat energy storage (kWh) capacity			
Other technologies	System type (e.g. wind turbine)			
	Capacity (kW)			
Cooling	Cooling proposed - Residential (Y/N)	It is not expected that 'active cooling' will be proposed for any residential developments. It will be expected that applicants can fully demonstrate that all passive design measures have been thoroughly investigated before considering 'active cooling'.		
	Cooling proposed - Non-residential (Y/N)			
	Residential Cooling consumption (kWh p.a.)	See note in cell C60.		
	Commercial Cooling consumption (MJ p.a.)			

TABLE 3. BESPOKE DH CARBON FACTOR CALCULATION METHODOLOGY

Please provide below details of the calculation methodology followed to establish the bespoke carbon factor, if applicable.

TABLE 4. DISTRIBUTION LOSSES				COMMENTS
Primary network (buried pipe)	Total pipe length (m)			
	Average heat loss rate (W/m)			
Secondary network (buried pipe)	Total pipe length (m)			
	Average heat loss rate (W/m)			
Total losses (MWh/year)				
Total heat supplied (MWh/year)				
Distribution Loss Factor (DLF)				
Calculation included in energy statement (yes/no)				

TABLE 5. SEASONAL COEFFICIENT OF PERFORMANCE (SCOP) CALCULATION METHODOLOGY

Details of the Seasonal Coefficient of Performance (SCOP), the Seasonal Performance Factor (SFP) and Seasonal Energy Efficiency ratio (SEER), which should be used in the energy modelling. This should be based on a dynamic calculation of the system boundaries over the course of a year i.e. incorporating variations in source temperatures and the design sink temperatures (for space heat and hot water). Details of the assumptions should be included in the energy assessment, including manufacturer datasheets showing performance under test conditions for the specific source and sink temperatures of the proposed development and assumptions for hours spent under changing source temperatures.

The applicant should complete all the light blue cells including information on the modelled units, the area per unit, the number of units, the TER/DER/BER and the TFEE/DFEE.

RESIDENTIAL CO_2 ANALYSIS (PART L1)

				Baseline		'Be Lean'	'Be Clean'	'Be Green'	Fabric Energy Efficiency (FEE)		Baseline		'Be Lean'			'Be Clean'			'Be Green'	
Unit identifier (e.g. plot number, dwelling type etc.)	Model total floor area	Number of units	Total area represented by model	TER	Energy saving/generation technologies (-)	DER	DER	DER	Target Fabric Energy Efficiency	Dwelling Fabric Energy Efficiency	Part L 2021 CO_2 emissions	Energy saving/generation technologies	Part L 2021 CO_2 emissions	Part L 2021 CO_2 emissions with Notional PV savings included	'Be Lean' savings	Part L 2021 CO_2 emissions	Part L 2021 CO_2 emissions with Notional PV savings included	'Be Clean' savings	Part L 2021 CO_2 emissions	'Be Green' savings
	(m^2) (Row 4)		(m^2)	($kgCO_2$ / m^2) (Row 273)	($kgCO_2$ p.a.) (Row 269)	($kgCO_2$ / m^2) (Row 273 or 384)	($kgCO_2$ / m^2) (Row 273 or 384)	($kgCO_2$ / m^2) (Row 273 or 384)	(kWh/m^2)	(kWh/m^2)	($kgCO_2$ p.a.)	($kgCO_2$ p.a.)	($kgCO_2$ p.a.)	($kgCO_2$ p.a.)	($kgCO_2$ p.a.)	($kgCO_2$ p.a.)	($kgCO_2$ p.a.)	($kgCO_2$ p.a.)	($kgCO_2$ p.a.)	($kgCO_2$ p.a.)
Sum		0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

NON-RESIDENTIAL CO_2 ANALYSIS (PART L2)

				Baseline		'Be Lean'	'Be Clean'	'Be Green'			Baseline		'Be Lean'			'Be Clean'			'Be Green'	
Building Use	Model Area (m^2)	Number of units	Total area represented by model (m^2)	BRUKL TER ($kgCO_2$ / m^2)	BRUKL Displaced electricity (-) (kWh / m^2)	BRUKL BER ($kgCO_2$ / m^2)	BRUKL BER ($kgCO_2$ / m^2)	BRUKL BER ($kgCO_2$ / m^2)			Part L 2021 CO_2 emissions ($kgCO_2$ p.a.)	Energy saving/generation technologies ($kgCO_2$ p.a.)	Part L 2021 CO_2 emissions ($kgCO_2$ p.a.)	Part L 2021 CO_2 emissions with Notional PV savings included ($kgCO_2$ p.a.)	'Be Lean' savings ($kgCO_2$ p.a.)	Part L 2021 CO_2 emissions ($kgCO_2$ p.a.)	Part L 2021 CO_2 emissions with Notional PV savings included ($kgCO_2$ p.a.)	'Be Clean' savings ($kgCO_2$ p.a.)	Part L 2021 CO_2 emissions ($kgCO_2$ p.a.)	'Be Green' savings ($kgCO_2$ p.a.)
Hotel	*8155.6*	*1*	*8155.6*	60.38		54.35	54.35	15.91			492,435	0.00	443,256.86	443,257	49,178	443,257	443,257	0	129,756	313,501
Sum		1	8,156	60.4	0.0	54.4	54.4	15.9			*492,435*	*0*	*443,257*	*443,257*	*49,178*	*443,257*	*443,257*	*0*	*129,756*	*313,501*
SITE-WIDE ENERGY CONSUMPTION AND CO_2 ANALYSIS																				
Total Sum			8,156	-	-	-	-	-			*492,435*	*0*	*443,257*	*443,257*	*49,178*	*443,257*	*443,257*	*0*	*129,756*	*313,501*

Applicants can use the 'be seen' methodology or an alternative predictive energy modelling methodology to fill in this tab.
Where 'be seen' reporting is used the reported EUI and space heating demand should align with energy consumption data reported in the planning stage submission for the 'be seen' policy, submitted via the online webform.

Residential predicted energy use

Building type	GIA (m^2)	EUI & space heating demand (kWh/year)									Has the following energy use been included?		Results		Table 4 of the guidance comparison		Methodology used		
		Space heating demand	Annual Electricity Use	Annual Gas Use	Annual Oil Use	Annual Biomass Use	Annual District Htg Use	Annual District Clg Use	Elec Generation, Gross	Solar Thermal Generation	Regulated	Unregulated	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)	Software	Operational energy use assessment	notes (if expected performance differs from the Table 4 values in the guidance or other software used)
					if applicable	if applicable	if applicable	if applicable	if applicable	if applicable									
Residential use (total)																			
Landlord Circulation (in Residential Blocks)																			
Total	0	0	0	0	0	0	0	0	0	0									

Non-residential predicted energy use

Building type	GIA (m^2)	EUI & space heating demand (kWh/year)									Has the following energy use been included?		Results		Table 4 of the guidance comparison		Methodology used		
		Space heating demand	Annual Electricity Use	Annual Gas Use	Annual Oil Use	Annual Biomass Use	Annual District Htg Use	Annual District Clg Use	Elec Generation, Gross	Solar Thermal Generation	Regulated	Unregulated	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)	Software	Operational energy use assessment	notes (if expected performance differs from the Table 4 values in the guidance or other software used)
					if applicable	if applicable	if applicable	if applicable	if applicable	if applicable									
Total	0	0	0	0	0	0	0	0	0	0									

Part L 2021 Performance

Residential

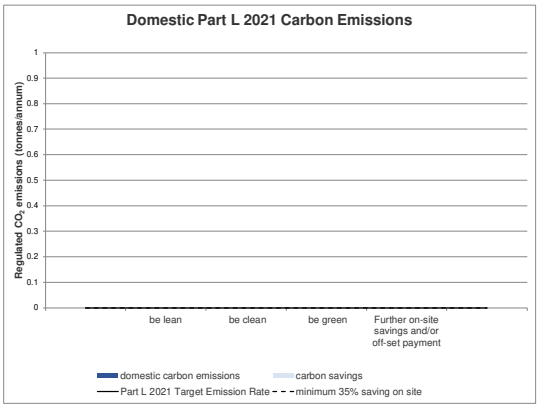
Table 1: Carbon Dioxide Emissions after each stage of the Energy Hierarchy for residential buildings

	Carbon Dioxide Emissions for residential buildings (Tonnes CO_2 per annum)	
	Regulated	Unregulated
Baseline: Part L 2021 of the Building Regulations Compliant Development	0.0	
After energy demand reduction (be lean)	0.0	
After heat network connection (be clean)	0.0	
After renewable energy (be green)	0.0	

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

	Regulated residential carbon dioxide savings	
	(Tonnes CO_2 per annum)	(%)
Be lean: savings from energy demand reduction	0.0	0%
Be clean: savings from heat network	0.0	0%
Be green: savings from renewable energy	0.0	0%
Cumulative on site savings	**0.0**	**0%**
Annual savings from off-set payment	0.0	-
	(Tonnes CO_2)	
Cumulative savings for off-set payment	**0**	-
Cash in-lieu contribution (£)	**0**	

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



Non-residential

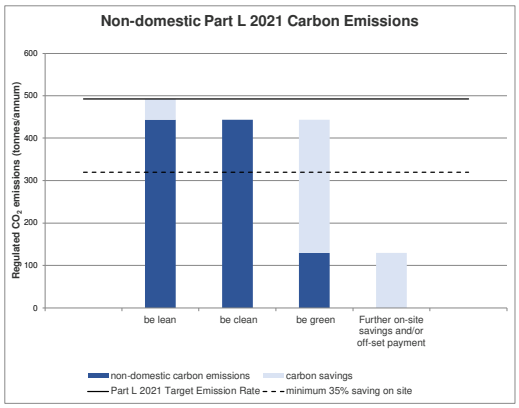
Table 3: Carbon Dioxide Emissions after each stage of the Energy Hierarchy for non-residential buildings

	Carbon Dioxide Emissions for non-residential buildings (Tonnes CO_2 per annum)	
	Regulated	Unregulated
Baseline: Part L 2021 of the Building Regulations Compliant Development	492.4	
After energy demand reduction (be lean)	443.3	
After heat network connection (be clean)	443.3	
After renewable energy (be green)	129.8	

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

	Regulated non-residential carbon dioxide savings	
	(Tonnes CO_2 per annum)	(%)
Be lean: savings from energy demand reduction	49.2	10%
Be clean: savings from heat network	0.0	0%
Be green: savings from renewable energy	313.5	64%
Total Cumulative Savings	**362.7**	**74%**
Annual savings from off-set payment	129.8	-
	(Tonnes CO_2)	
Cumulative savings for off-set payment	**3,893**	-
Cash in-lieu contribution (£)	**369,803**	

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



SITE-WIDE

	Total regulated emissions (Tonnes CO_2 / year)	CO_2 savings (Tonnes CO_2 / year)	Percentage savings (%)
Part L 2021 baseline	492.4		
Be lean	443.3	49.2	10%
Be clean	443.3	0.0	0%
Be green	129.8	313.5	64%
Total Savings	-	362.7	74%
	-	**CO_2 savings off-set (Tonnes CO_2)**	-
Off-set	-	**3,892.7**	-

	Target Fabric Energy Efficiency (kWh/m²)	Dwelling Fabric Energy Efficiency (kWh/m²)	Improvement (%)
Development total	0.00	0.00	

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

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)

Non-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)