GLA Carbon Emissions Reporting Sprea

BACKGROUND AND PURPOSE

From **January 2023** planning applicants for new and refurbishments schemes are required to use this spre
used for both domestic and non-domestic uses. This spreadsheet ensures a consistent and transparent pr
use of alternative methodologies or tools. This is to ensure consistency and to minimise the need for clarifi
Planning applicants should use Part L 2021 BRUKL and SAP outputs to fill in this spreadsheet which serv
energy strategy. **It is solely for the purpose of reporting compliance with the London Plan to the GLA**
approval.
The spreadsheet has been developed to fit as wide a range of policy compliant approaches for schemes a
does not serve should contact the GLA at: **ZeroCarbonPlanning@london.gov.uk**. Applicants must not ar
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 pu
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 ('Dev
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 (m²)
• Number of units modelled
• Total area represented by model (m²)
• TER, DER and BER figures (kgCO_2/m² p.a.)
• Notional building Energy saving/generation technologies (-) for residential (kgCO_2 p.a.)
• Notional building Displaced electricity (-) for non-residential (kWh//m² p.a.)
• TFEE and DFEE figures for residential (kWh//m² p.a.)

'GLA Summary tables' tab
• Unregulated figures (tCO_2 p.a.)
• Actual and notional building cooling demand (MJ/m²)

Note: The total carbon emissions figures in the 'GLA Summary tables' tab are now calculated based on the
added to ensure that the carbon emission figures align with the development area schedule (included with

'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 methodc
Where 'be seen' reporting is used the reported EUI and space heating demand should align with energy c
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 works
in each input cell. Note: The SAP worksheet rows are based on a communal heating system in line with G
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 modell
generated for the entire development. The applicant should, however, include the results from all BRUKL c
ANALYSIS" sections. Applicants are generally encouraged to model each individual typology independent

Validation Check
Applicants must ensure that the calculated TER/DER/BER in this spreadsheet matches the actual values f
sheet must accompany the energy assessment so that results can be validated.

dsheet

eadsheet to report the anticipated carbon performance of a development. It should be
rocess for presenting Part L 2021 CO_2 emission performance. The GLA will not accept the
ications during the planning application determination period.
es as a the final step in reporting the carbon emission performance of the proposed
A and does not replace Part L calculations submitted for Building Regulations

is possible. Any planning applicants with a policy compliant approach that the spreadsheet
mend or alter the spreadsheet to suit non-policy compliant strategies. Any unauthorised

rpose. Applicants are expected to use the latest version at the time of the planning

velopment Information', 'Part L

e area input for 'Total area represented by model (m²)'. This input requirement has been
in the DAS) rather than the number of representative models.

ology to fill in the required EUI & space heating demand information.
onsumption data reported in the planning stage submission for the ‘be seen’ policy,

sheets. To assist in the process the required SAP worksheet rows have been referenced
LA policy and guidance. Applicants proposing individual systems must first seek

ed independently and apportioned to the entire scheme or whether a single model will be
outputs generated for the proposed development under the "NON-RESIDENTIAL CO_2
ly.

from the Part L 2021 BRUKL and SAP worksheets. The Part L 2021 BRUKL and SAP

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	
Application details	Date of Application
	Local Planning Authority
	Confirmed carbon offset price (£/tonne of carbon dioxide)
	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)
Site heating distribution configuration	Development future proofed for DHN connection (Y/N)
	Drawings of communal system provided (Y/N)
	Distribution type
	Flow temperature (°C)
	Return temperature (°C)
	Distribution losses modelled (%)
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)
	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)
	CHP (kWe)
	Estimated end user cost (pence/kWh)
	Energy assessment includes consideration of occupant running costs (Y/N)
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)
	Interventions for achieving flexibility included in energy assessment (Y/N)
	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)
	Cooling proposed - Non-residential (Y/N)
	Residential Cooling consumption (kWh p.a.)
	Commercial Cooling consumption (MJ p.a.)

TABLE 3. BESPOKE DH CARBON FACTOR CALCULATION METHODOLOGY

Please provide below details of the calculation m

TABLE 4. DISTRIBUTION LOSSES

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 Seasc
system boundaries over the course of a year i.e. incorporating variations in source temperatures and the desig
manufacturer datasheets showing performance under test conditions for the specific source and

yes
yes
yes

Further notes	Response
Please provide the date the application was submitted to the Local Planning Authority.	
Please indicate the Local Planning Authority determining the application.	*Kingston upon Thames*
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.	*95.00*
	Y
	13
	N
	N
	Y
	N
	N
	Y
	Y

Applicable to all applications.	
Note that individual heating systems would not be appropriate for developments in HNPAs.	*Y*
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.	
See table 4 below for details.	
	Y
	air
	50.00
	320.00
See table 5 below for details.	
	100.00
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.	*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.	
	Y
	Y
	3456.00
	5.72
	23.00
	N
Table 9 in the energy assessment guidance to be completed.	
Table 10 in the energy assessment guidance to be completed.	

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’.	*N*
See note in cell C60.	

ıethodology followed to establish the bespoke carbon factor, if applicable.

onal Energy Efficiency ratio (SEER), which should be used in the energy modelling. T
n sink temperatures (for space heat and hot water). Details of the assumptions shou
sink temperatures of the proposed development and assumptions for hours spent u

Supporting comments (or signpost sections in the energy assessment)

COMMENTS

This should be based on a dynamic calculation of the
uld be included in the energy assessment, including
under changing source temperatures.

The appli

				Baseline
Unit identifier (e.g. plot number, dwelling type etc.)	Model total floor area (m²) (Row 4)	Number of units	Total area represented by model (m²)	TER ($kgCO_2 / m^2$) (Row 273)
EXTENSION	*141.32*	*1*	*141.32*	**21.98**

Sum		**1**	**141**	**22.0**

				Baseline
Building Use	**Model Area** (m²)	**Number of units**	**Total area represented by model** (m²)	**BRUKL TER** ($kgCO_2 / m^2$)
Commercial	*439.8*	*1*	*439.8*	**2.99**

Sum	**1**	**440**	**3.0**
SITE-WIDE ENERGY CONSUMPTION AND CO_2 ANALYSIS			
Total Sum		**581**	**-**

cant should complete all the light blue cells including information on

RESIDEN

	'Be Lean'	'Be Clean'	'Be Green'	Fabric Energy Efficie
Energy saving/generation technologies (-)	DER	DER	DER	Target Fabric Energy Efficiency
($kgCO_2$ 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/m²)
0.00	11.06	11.06	-3.98	77.80

0.0	11.1	11.1	-4.0	77.8
				NON-RESID
	'Be Lean'	'Be Clean'	'Be Green'	
BRUKL Displaced electricity (-) (kWh / m^2)	BRUKL BER ($kgCO_2$ / m^2)	BRUKL BER ($kgCO_2$ / m^2)	BRUKL BER ($kgCO_2$ / m^2)	
	2.75	2.75	2.58	

0.0	2.8	2.8	2.6	
-	-	-	-	

ı the modelled units, the area per unit, the number of units, the TER/D

TIAL CO_2 ANALYSIS (PART L1)

ency (FEE)	Baseline		'Be Lean'	
Dwelling Fabric Energy Efficiency (kWh/m²)	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.)
39.50	**3,106**	**0**	**1,563**	**1,563**

39.5	*3,106*	*0*	*1,563*	*1,563*

ENTIAL CO_2 ANALYSIS (PART L2)

	Baseline		'Be Lean'	
	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.)
	1,315	0.00	1,209.45	1,209

	1,315	0	1,209	1,209
	4,421	0	2,772	2,772

DER/BER and the TFEE/DFEE.

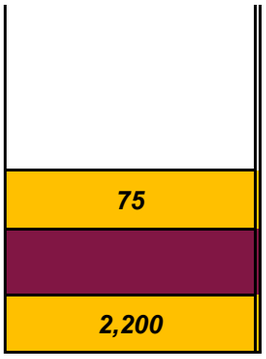
	'Be Clean'			'Be G
'Be Lean' savings (kgCO_2 p.a.)	Part L 2021 CO_2 emissions (kgCO_2 p.a.)	Part L 2021 CO_2 emissions with Notional PV savings included (kgCO_2 p.a.)	'Be Clean' savings (kgCO_2 p.a.)	Part L 2021 CO_2 emissions (kgCO_2 p.a.)
1,543	1,563	1,563	0	-562

1,543	*1,563*	*1,563*	*0*	*-562*
	'Be Clean'			'Be G
'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.)
106	1,209	1,209	0	1,135

106	***1,209***	***1,209***	***0***	***1,135***
1,649	***2,772***	***2,772***	***0***	***572***

ıreen'
'Be Green' savings (kgCO_2 p.a.)
2,125

2,125
reen'
'Be Green' savings
(kgCO_2 p.a.)
75


75
2,200

Where

Residential predicted energy use

Building type	GIA (m^2)	EUI & space			
		Space heating demand	Annual Electricity Use	Annual Gas Use	Annual Oil Use if applicable
Residential use (total)	141.32	1463.83	2957.12		
Landlord Circulation (in Residential Blocks)					
Total	141.32	1463.83	2957.12	0	0

Non-residential predicted energy use

Building type	GIA (m^2)	EUI & space			
		Space heating demand	Annual Electricity Use	Annual Gas Use	Annual Oil Use if applicable
Office	439.8	2168.21	21699.73		

Total	439.8	2168.21	21699.73	0	0

Applicants can use the ‘be seen’ methodology or an alternative
‘be seen’ reporting is used the reported EUI and space heating demand should align with energy consumpt

heating demand (kWh/year)					Has the following energy use been included?	
Annual Biomass Use	Annual District Htg Use	Annual District Clg Use	Elec Generation, Gross	Solar Thermal Generation	Regulated	Unregulated
if applicable	if applicable	if applicable	if applicable	if applicable		
					Yes	Yes
0	0	0	0	0		

heating demand (kWh/year)					Has the following energy use been included?	
Annual Biomass Use	Annual District Htg Use	Annual District Clg Use	Elec Generation, Gross	Solar Thermal Generation	Regulated	Unregulated
if applicable	if applicable	if applicable	if applicable	if applicable		
					Yes	Yes

0	0	0	0	0		

predictive energy modelling methodology to fill in this tab.
tion data reported in the planning stage submission for the 'be seen' policy, submitted via the online webf

Results		Table 4 of the guidance comparison	
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)
20.92499292	10.35826493	35	15

Results		Table 4 of the guidance comparison	
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)
49.33999545	4.929990905	55	15

orm.

Methodology used		
Software	**Operational energy use assessment**	**notes (if expected performance differs from the Table 4 values in the guidance or other software used)**
Part L1 - SAP 10.2	none	

Methodology used		
Software	**Operational energy use assessment**	**notes (if expected performance differs from the Table 4 values in the guidance or other software used)**

Residential

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

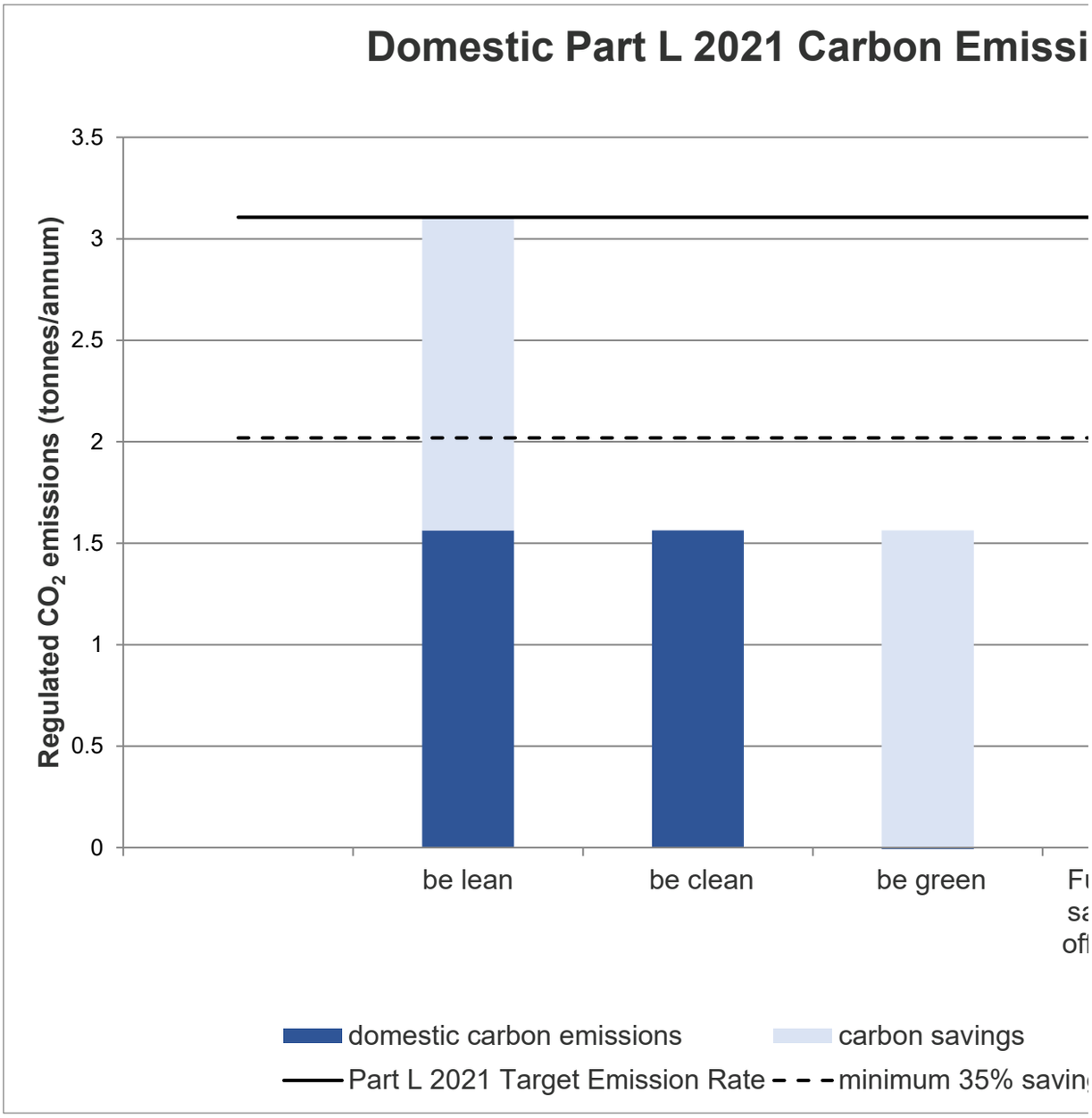
	Carbon Dioxide Emissions for residential buildings (Tonnes CO_2 per annum)	
	Regulated	**Unregulated**
Baseline: Part L 2021 of the Building Regulations Compliant Development	3.1	0.5
After energy demand reduction (be lean)	1.6	0.5
After heat network connection (be clean)	1.6	0.5
After renewable energy (be green)	-0.6	0.5

Table 2: Regulated Carbon Dioxide savings from each stage of the Energy Hierarchy fo

	Regulated residential carbon dioxide savings	
	(Tonnes CO_2 per annum)	**(%)**
Be lean: savings from energy demand reduction	1.5	50%
Be clean: savings from heat network	0.0	0%
Be green: savings from renewable energy	2.1	68%
Cumulative on site savings	**3.7**	**118%**
Annual savings from off-set payment	-0.6	-

	(Tonnes CO_2)	
Cumulative savings for off-set payment	**-17**	**-**
Cash in-lieu contribution (£)	**-1,603**	

*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)
Part L 2021 baseline	4.4	
Be lean	2.8	1.6
Be clean	2.8	0.0
Be green	0.6	2.2
Total Savings	-	3.8
	-	**CO_2 savings off-set (Tonnes CO_2)**
Off-set	-	**17.2**

EUI & space heating demand (predicted energy u

Residential

Building type	EUI ($kWh/m^2/year$) (excluding renewable energy)	Space heating demand ($kWh/m^2/year$) (excluding renewable energy)
Residential	20.92499292	10.35826493

Non-residential

Building type	EUI (kWh/m^2/year) (excluding renewable energy)	Space heating demand (kWh/m^2/year) (excluding renewable energy)
Office	49.33999545	4.929990905

Part L 2021 Performance

Non-residential

tial buildings

Table 3: Carbon Dioxide Emi

Baseline: Part L 2021 of the Building Regulations Compliant Development
After energy demand reduction (be lean)
After heat network connection (be clean)
After renewable energy (be green)

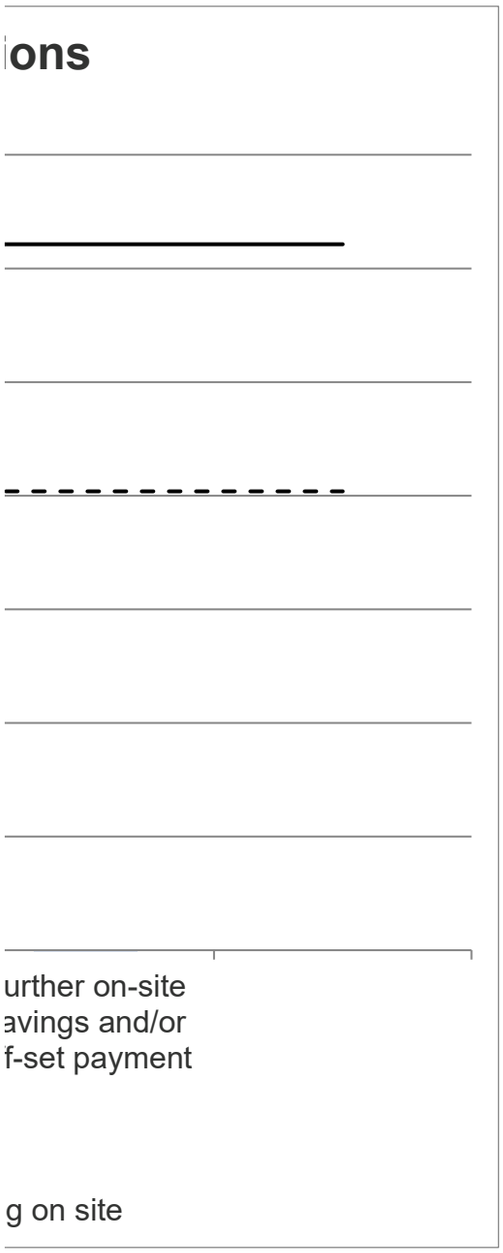
r residential buildings

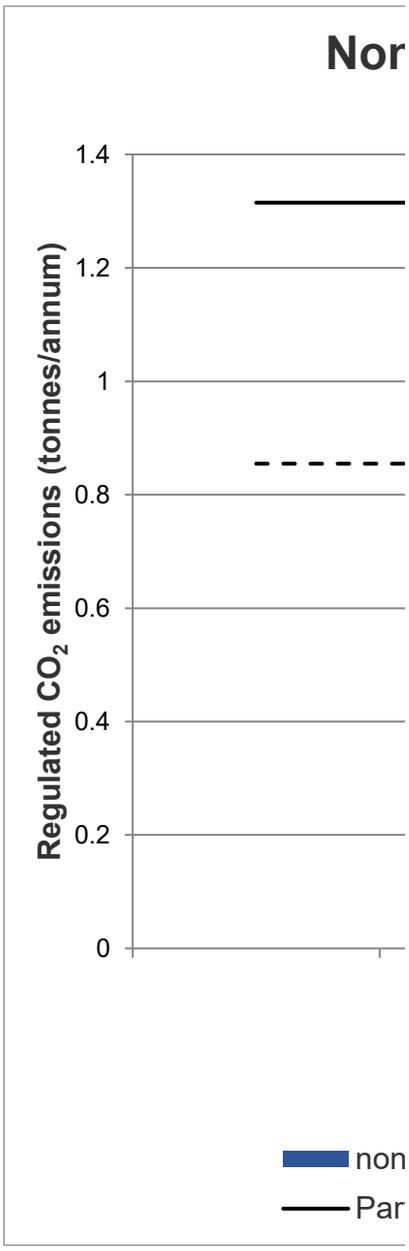
Table 4: Regulated Carbon D

Be lean: savings from energy demand reduction
Be clean: savings from heat network
Be green: savings from renewable energy
Total Cumulative Savings
Annual savings from off-set payment

Cumulative savings for off-set payment
Cash in-lieu contribution (£)

*carbon price is based on GL
unless Local Planning Autho





Percentage savings (%)
37%
0%
50%
87%
-
-

Development total

Actual
Notional

se)

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)
35	15	Part L1 - SAP 10.2 & none dwellings / & Landlord Circulation

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)
55	15	&

ssions after each stage of the Energy Hierarchy for non-residential buildings

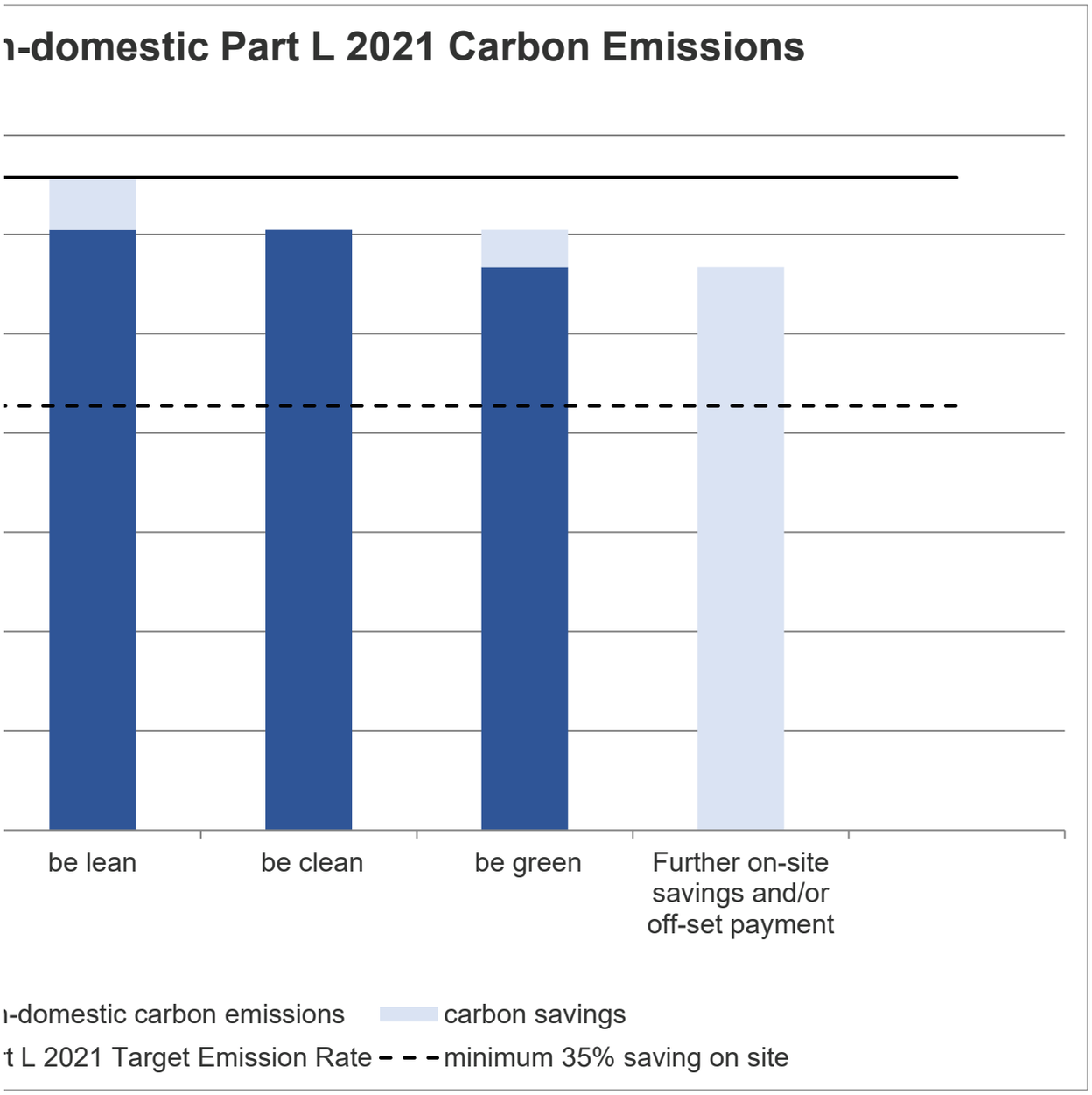
Carbon Dioxide Emissions for non-residential buildings (Tonnes CO_2 per annum)	
Regulated	**Unregulated**
1.3	1.9
1.2	1.9
1.2	1.9
1.1	1.9

Dioxide savings from each stage of the Energy Hierarchy for non-residential buildings

Regulated non-residential carbon dioxide savings	
(Tonnes CO_2 per annum)	**(%)**
0.1	8%
0.0	0%
0.1	6%
0.2	**14%**
1.1	-

(Tonnes CO_2)	
34	**-**
3,234	

ᴚA recommended price of £95 per tonne of carbon dioxide
ɔrity price is inputted in the 'Development Information' tab



Target Fabric Energy Efficiency (kWh/m²)	Dwelling Fabric Energy Efficiency (kWh/m²)	Improvement (%)
77.80	39.50	49%

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

Explanatory notes (if expected performance differs from the Table 4 values in the guidance)

Explanatory notes (if expected performance differs from the Table 4 values in the guidance)