

# GLA Carbon Emission Reporting Spreadsheet

## BACKGROUND AND PURPOSE

The GLA has decided that from **January 2019** and until central Government updates Part L with the latest applicants are encouraged to use the SAP 10 emission factors for **referable applications** when estimating London Plan policies. This is a new approach being taken by the GLA to reflect the decarbonisation of the taken into account by Part L of Building Regulations. This approach will remain in place until Government updated emission factors.

This GLA Carbon Emission Reporting Spreadsheet facilitates the use of the SAP 10 emission factors and process for updating Part L 2013 CO<sub>2</sub> emission performance. In particular, the approach has been developed still be validated against supporting Part L 2013 BRUKL and SAP outputs.

From **January 2019** all GLA referable applications (including refurbishments) are expected to use this spreadsheet to report carbon performance of a development. This includes planning applicants who are continuing to use SAP 10. SAP 10 will need to be supported by sufficient justification in line with the Energy Assessment Guidance. Applicants must use the spreadsheet to the GLA alongside the energy assessment. It should be used for both domestic and non-domestic. The use of alternative methodologies or tools. This is to ensure consistency and to minimise the need for a reporting period.

Planning applicants should use Part L 2013 BRUKL and SAP outputs to fill in this spreadsheet which serves to report carbon emission performance of the proposed energy strategy. **It is solely for the purpose of reporting L calculations submitted for Building Regulations approval.**

The spreadsheet has been developed to fit as wide a range of policy compliant approaches for referable applications as possible. Applicants with a policy compliant approach that the spreadsheet does not serve should contact the GLA at [redacted]. Applicants must not amend or alter the spreadsheet to suit non-policy compliant strategies. Any unauthorised changes will invalidate the CO<sub>2</sub> emission calculations.

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

**Any feedback on this spreadsheet should be sent to: [environment@london.gov.uk](mailto:environment@london.gov.uk).**

## METHODOLOGY

Applicants are required to complete all light blue input cells in the applicable tabs ('Carbon Factors', 'Basel Green' and 'GLA Summary Tables').

### Input Data

For all applications, the input data required includes:

- Bespoke Carbon Factors (if applicable)
- Type of units modelled
- Area of units modelled (m<sup>2</sup>)
- Number of units modelled
- Total area represented by model (m<sup>2</sup>)
- Regulated energy consumption by end use (kWh p.a. for residential and kWh/m<sup>2</sup> p.a. for non-residential)
- Regulated energy consumption by fuel type (kWh/m<sup>2</sup> p.a. for non-residential)
- TER, DER and BER figures (kgCO<sub>2</sub>/m<sup>2</sup> p.a.)
- TFEE and DFEE figures for residential (kWh/m<sup>2</sup> p.a.)
- Regulated energy demand figures (kWh p.a. for both residential and non-residential)

- Unregulated gas and electricity consumption figures (kWh p.a. for both residential and non-residential) [I
- Actual and notional building cooling demand (MJ/m<sup>2</sup>) [In the 'GLA Summary tables' tab only]

Applicants should update the highlighted cells with the type, area and number of modelled units. The cons and kWh/m<sup>2</sup> p.a. for non-domestic) from the Part L modelling output reports should be reported and used stage of the Energy Hierarchy. The TER, DER and BER figures from the Part L 2013 modelling output she reference purposes. The applicant should ensure that the manually calculated TER, DER and BER figures the output sheets. TFEF and DFEF information should also be provided as well as unregulated uses cons cooling demand performance.

The total carbon emissions figures in the 'GLA Summary tables' tab are now calculated based on the area model (m<sup>2</sup>). This input requirement has been added to ensure that the carbon emission figures align with (included within the DAS) rather than the number of representative models.

### **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 work process the required SAP worksheet rows have been referenced in each input cell. For Space Heating a manually convert the SAP energy requirements to energy consumption by fuel type, the appropriate SAP listed. **Note.** The SAP worksheet rows are based on a communal heating system, which is an expectation proposing individual systems must first seek confirmation from the GLA as to whether the approach will be

#### Non-domestic Part L Outputs:

The required Part L outputs from non-domestic modelling will be energy consumption by **fuel type** (e.g. gr consumption by end use (e.g. heating, hot water, cooling etc.) included in the BRUKL documents are no l performance with SAP 10 emission factors in this spreadsheet. This decision has been taken as the const may include a mixture of fuel types, for instance heating may include energy consumption from gas boilers required data can be found in:

- SBEM software: the required data is included in the output file ending "\*\*sim.csv"
- Government approved software (such as IES and TAS): the required data is included in the output file er

The above output files should be appended to the energy assessment document

Regarding the non-domestic uses, the applicant can determine whether each individual unit will be modell entire scheme or whether a single model will be generated for the entire development. The applicant shou BRUKL outputs generated for the proposed development under the "NON-DOMESTIC ENERGY CONSUMI

**Note:** GLA are aware that the Part L outputs for grid supplied electricity consumption does not account for factor correction is present applicants may be required to amend the electricity consumption by the appro correction is found in Table 1 of the Government's Approved Document L2A (ADL2A). Applicants should r factor correction has been applied.

### **Carbon Factors**

The carbon factors for SAP 2012 and SAP 10 scenarios have been provided in the 'Carbon Factors' tab. T grid electricity and gas factors. Additional space has been included for alternative fuel factors that are incl SAP 10 methodology document. For applications with non-domestic buildings connecting to external heat to be introduced, the applicant should provide the full calculation behind the introduced bespoke carbon fa

### **Validation Check**

A validation check is required for each model entered to ensure that the conversion is robust. Applicants I TER/DER/BER in this spreadsheet matches the actual values from the Part L 2013 BRUKL and SAP work

# sheet



t carbon emission factors, planning  
g CO<sub>2</sub> emission performance against  
electricity grid, which is not currently  
adopts new Building Regulations with

ensures a consistent and transparent  
ped to ensure that SAP 10 results can

eadsheet to report the anticipated  
2012 emission factors; although doing so  
ts are required to submit this  
omestic uses. The GLA will not accept  
larifications during the determination

es as a the final step in reporting the  
**to the GLA and does not replace Part**

chemes as possible. Any planning  
at: [environment@london.gov.uk](mailto:environment@london.gov.uk).  
sed amendment to the spreadsheet will

rpose. Applicants are expected to use



line', 'Be Lean', 'Be Clean', 'Be



**in the 'GLA Summary tables' tab only]**

consumption figures (kWh p.a. for domestic  
to estimate the CO<sub>2</sub> emissions for each  
assets should also be reported for cross-  
are equal to the figures reported within  
consumption, energy demand figures and

input for 'Total area represented by  
the development area schedule

sheets. To assist in the conversion  
of Hot Water applicants will be required to  
rows for this calculation have also been  
for GLA referable schemes. Applicants  
acceptable.

of electricity, natural gas). The energy  
consumption used to estimate the CO<sub>2</sub> emission  
consumption figures provided in the BRUKL  
and electrically driven heat pumps. The

ending in "\*BRUKL.inp"

ed independently and apportioned to the  
Id, however, include the results from all  
EMPTION AND CO<sub>2</sub> ANALYSIS" sections.

power factor correction. Where power  
appropriate adjustment factor. The power factor  
note in the appropriate cells where power

The table has been pre-populated with  
detailed in Table 12 of the SAP 2012 and  
networks a bespoke carbon factor needs  
factor.

must ensure that the calculated  
sheets.





















































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































































Table 1. CARBON (CO <sub>2</sub> ) FACTORS		
Fuel type	Fuel Carbon Factor (kgCO <sub>2</sub> /kWh)	
	SAP 2012	SAP 10
Natural Gas	0.216	0.210
Grid Electricity	0.519	0.233
Enter Carbon Factor 1		
Enter Carbon Factor 2		
Enter Carbon Factor 3		
Enter Carbon Factor 4		
Bespoke DH Factor		

Table 2. BESPOKE DH CARBON FACTOR CALCULATION METHODOLOGY
<p>Please provide below details of the calculation methodology.</p>

## Notes

SAP 2012 and SAP 10 carbon emission factors (Table 12).

Fuel type should be updated and referenced in Column A when additional carbon factor values have been added.

This should only be used for non-domestic buildings that are connecting to District Heating (DH) networks. The network carbon factor should be calculated in line with Part L requirements and a separate factors should be provided using SAP 2012 and SAP 10 fuel factors. Assumptions and workings should be shown below in Table 4.

Calculation methodology followed to establish the bespoke carbon factor, if applicable.

The applicant should complete all the light blue cells including information on the modelled units, the

## DOMESTIC ENERGY CONSUMPTION AND CO<sub>2</sub> ANALYSIS

Unit identifier (e.g. plot number, dwelling type etc.)	Model total floor area (m <sup>2</sup> )	Number of units	Total area represented by model (m <sup>2</sup> )	VALIDATION CHECK	
				Calculated TER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )	TER Worksheet TER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )
<b>TER Worksheet (Row 4)</b>				<b>TER Worksheet (Row 273)</b>	
Unit 1	55.6	1	55.6	22.0	32.4
Unit 2	55.6	1	55.6	22.0	32.4
Unit 3	50.5	1	50.5	19.9	29.1
Unit 4	50.5	1	50.5	19.9	29.1
Unit 5	48.4	1	48.4	20.2	29.6
Unit 6	48.4	1	48.4	20.2	29.6
Unit 7	48.4	1	48.4	20.8	30.4
Unit 8	48.4	1	48.4	20.8	30.4
Unit 9	62.9	1	62.9	21.9	32.3
Unit 10	62.9	1	62.9	20.3	29.8
Unit 11	62.9	1	62.9	20.3	29.8
Unit 12	85.4	1	85.4	18.2	26.8
Unit 13	85.4	1	85.4	18.2	26.8

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<b>Sum</b>	<b>765</b>	<b>13</b>	<b>765</b>	<b>20.2</b>	<b>-</b>
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**NON-DOMESTIC ENERGY CONSUMPTION AND CO<sub>2</sub> ANALYSIS**

Building Use	Area per unit (m <sup>2</sup> )	Number of units	Total area represented by model (m <sup>2</sup> )	VALIDATION CHECK	
				Calculated TER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )	BRUKL TER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )

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<b>Sum</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>SITE-WIDE ENERGY CONSUMPTION AND CO<sub>2</sub> ANALYSIS</b>			
<b>Use</b>	<b>Total Area (m<sup>2</sup>)</b>	<b>Calculated TER 2012 (kgCO<sub>2</sub> / m<sup>2</sup>)</b>	<b>-</b>
<b>Sum</b>	<b>765</b>	<b>20.2</b>	<b>-</b>

area per unit, the number of units, the baseline energy consumption figures, the TER and the TFEF.



**REGULATED ENERGY CONSUMPTION PER UNIT (kWh p.a.) - TER WORKSHEET**

Space Heating	Fuel type Space Heating	Domestic Hot Water	Fuel type Domestic Hot Water	Lighting	Auxiliary
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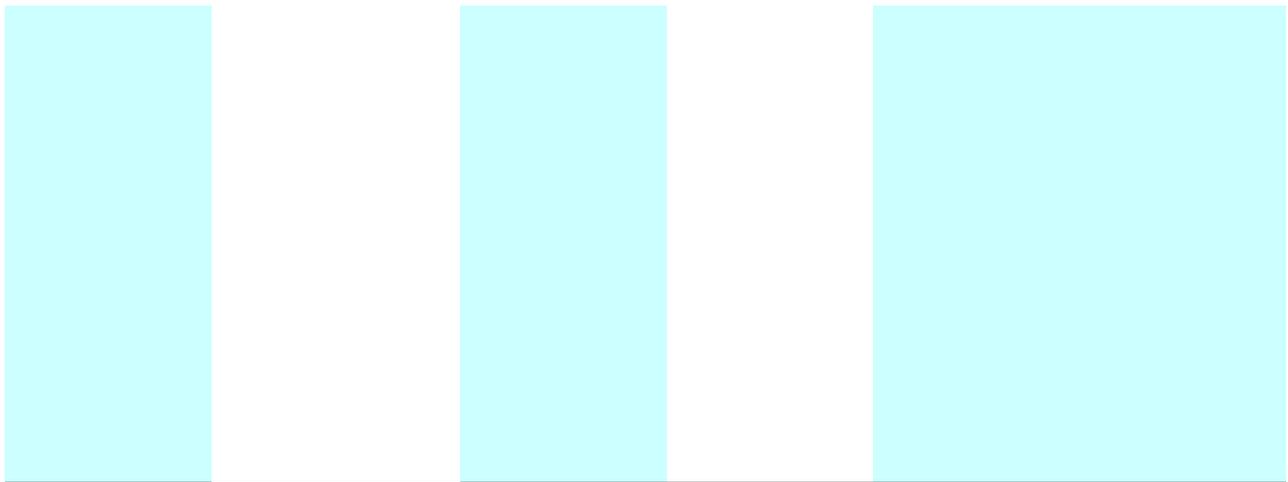
**TER Worksheet  
(Row 211)**

**TER Worksheet  
(Row 219)**

**TER Worksheet  
(Row 232)**

**TER Worksheet  
(Row 231)**

2755.583	Natural Gas	2112.6109	Natural Gas	254.6333	75
2755.583	Natural Gas	2112.6109	Natural Gas	254.6333	75
1853.0235	Natural Gas	2063.2682	Natural Gas	233.854	75
1853.0235	Natural Gas	2063.2682	Natural Gas	233.854	75
1773.9743	Natural Gas	2037.0814	Natural Gas	225.2685	75
1773.9743	Natural Gas	2037.0814	Natural Gas	225.2685	75
1898.0161	Natural Gas	2033.7879	Natural Gas	225.2685	75
1898.0161	Natural Gas	2033.7879	Natural Gas	225.2685	75
3255.3582	Natural Gas	2260.626	Natural Gas	283.7077	75
2778.883	Natural Gas	2268.8562	Natural Gas	283.7077	75
2778.883	Natural Gas	2268.8562	Natural Gas	283.7077	75
3682.0136	Natural Gas	2479.262	Natural Gas	362.6954	75
3682.0136	Natural Gas	2479.262	Natural Gas	362.6954	75



32,738

N/A

28,250

N/A

3,455

975

**REGULATED ENERGY CONSUMPTION BY END USE (kWh/m<sup>2</sup> p.a.) TER - SOURCE: BRUKL OUTPUT**

Space Heating	Fuel type Space Heating	Domestic Hot Water	Fuel type Domestic Hot Water	Lighting	Auxiliary
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0

0

0

0

0

0

**REGULATED ENERGY CONSUMPTION**

Space Heating (kWh p.a.)	N/A	Domestic Hot Water (kWh p.a.)	N/A	Lighting (kWh p.a.)	Auxiliary (kWh p.a.)
32,738		28,250		3,455	975

**SAP 2012 CO2 PERFORMANCE**

<b>REGULATED CO2 EMISSIONS PER UNIT (kgCO2 p.a.)</b>					
<b>Cooling</b>	<b>Space Heating</b>	<b>Domestic Hot Water</b>	<b>Lighting</b>	<b>Auxiliary</b>	<b>Cooling</b>
<b>N / A</b>					
	<b>595</b>	<b>456</b>	<b>132</b>	<b>39</b>	
	<b>595</b>	<b>456</b>	<b>132</b>	<b>39</b>	
	<b>400</b>	<b>446</b>	<b>121</b>	<b>39</b>	
	<b>400</b>	<b>446</b>	<b>121</b>	<b>39</b>	
	<b>383</b>	<b>440</b>	<b>117</b>	<b>39</b>	
	<b>383</b>	<b>440</b>	<b>117</b>	<b>39</b>	
	<b>410</b>	<b>439</b>	<b>117</b>	<b>39</b>	
	<b>410</b>	<b>439</b>	<b>117</b>	<b>39</b>	
	<b>703</b>	<b>488</b>	<b>147</b>	<b>39</b>	
	<b>600</b>	<b>490</b>	<b>147</b>	<b>39</b>	
	<b>600</b>	<b>490</b>	<b>147</b>	<b>39</b>	
	<b>795</b>	<b>536</b>	<b>188</b>	<b>39</b>	
	<b>795</b>	<b>536</b>	<b>188</b>	<b>39</b>	

0	7,071	6,102	1,793	506	0



**REGULATED ENERGY CONSUMPTION BY FUEL TYPE (kWh/m<sup>2</sup> p.a.) TER - SOURCE: BRUKL.INF**

Cooling	Natural Gas	Grid Electricity	
	#####	#####	

0	0	0	N/A	N/A	N/A
Cooling (kWh p.a.)					
0					

SAP10 CO2 PERFORMANCE

REGULATED CO2 EMISSIONS PER UNIT

2012 CO2 emissions (kgCO2 p.a.)	Space Heating	Domestic Hot Water	Lighting	Auxiliary	Cooling
1,223	579	444	59	17	
1,223	579	444	59	17	
1,006	389	433	54	17	
1,006	389	433	54	17	
979	373	428	52	17	
979	373	428	52	17	
1,005	399	427	52	17	
1,005	399	427	52	17	
1,378	684	475	66	17	
1,276	584	476	66	17	
1,276	584	476	66	17	
1,558	773	521	85	17	
1,558	773	521	85	17	



<b>0</b>	<b>0</b>	<b>0</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
<b>REGULATED CO2 EMISSIONS</b>					
<b>2012 CO2 emissions (kgCO2 p.a.)</b>					
<b>15,473</b>					

**DEMAND**

<b>SAP10 CO2 emissions (kgCO2 p.a.)</b>	<b>Calculated TER SAP10 (kgCO2 / m2)</b>	<b>Fabric Energy Efficiency (FEE) Target Fabric Energy Efficiency (TFEE) (kWh/m²)</b>
1,099	19.8	63.77
1,099	19.8	63.77
894	17.7	50.63
894	17.7	50.63
870	18.0	50.91
870	18.0	50.91
896	18.5	53.68
896	18.5	53.68
1,242	19.7	66.09
1,144	18.2	57.82
1,144	18.2	57.82
1,396	16.3	54.81
1,396	16.3	54.81

<b>13,840</b>	<b>18.1</b>	<b>56.35</b>



**REGULATED CO2 EMISSIONS**

<b>SAP10 CO2 emissions (kgCO2 p.a.)</b>	<b>BRUKL TER SAP10 (kgCO2 / m2)</b>
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<b>0</b>	<b>#DIV/0!</b>
<b>REGULATED CO2 EMISSIONS PER UNIT</b>	
<b>SAP10 CO2 emissions (kgCO2 p.a.)</b>	<b>Calculated TER SAP10 (kgCO2 / m2)</b>
<b>13,840</b>	<b>18.1</b>

The applicant should complete all the light blue cells including information on the 'be lean' energy con:

## DOMESTIC ENERGY CONSUMPTION AND CO<sub>2</sub> ANALYSIS

Unit identifier (e.g. plot number, dwelling type etc.)	Model total floor area (m <sup>2</sup> )	Number of units	Total area represented by model (m <sup>2</sup> )	VALIDATION CHECK	
				Calculated DER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )	DER Worksheet DER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )
				<b>DER Sheet (Row 384)</b>	
<b>Unit 1</b>	55.6	1	55.6	<b>13.3</b>	<b>29.0</b>
<b>Unit 2</b>	55.6	1	55.6	<b>13.3</b>	<b>29.0</b>
<b>Unit 3</b>	50.5	1	50.5	<b>10.9</b>	<b>25.3</b>
<b>Unit 4</b>	50.5	1	50.5	<b>10.9</b>	<b>25.3</b>
<b>Unit 5</b>	48.4	1	48.4	<b>11.7</b>	<b>25.0</b>
<b>Unit 6</b>	48.4	1	48.4	<b>11.7</b>	<b>25.0</b>
<b>Unit 7</b>	48.4	1	48.4	<b>12.1</b>	<b>26.0</b>
<b>Unit 8</b>	48.4	1	48.4	<b>12.1</b>	<b>26.0</b>
<b>Unit 9</b>	62.9	1	62.9	<b>12.4</b>	<b>27.7</b>
<b>Unit 10</b>	62.9	1	62.9	<b>12.9</b>	<b>28.7</b>
<b>Unit 11</b>	62.9	1	62.9	<b>12.9</b>	<b>28.7</b>
<b>Unit 12</b>	85.4	1	85.4	<b>9.5</b>	<b>22.7</b>
<b>Unit 13</b>	85.4	1	85.4	<b>10.4</b>	<b>22.7</b>

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<b>Sum</b>	<b>765</b>	<b>13</b>	<b>765</b>	<b>11.7</b>	<b>-</b>
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**NON-DOMESTIC ENERGY CONSUMPTION AND CO<sub>2</sub> ANALYSIS**

Building Use	Area per unit (m <sup>2</sup> )	Number of units	Total area represented by model (m <sup>2</sup> )	VALIDATION CHECK	
				Calculated BER 2012 (kgCO <sub>2</sub> / m2)	BRUKL BER 2012 (kgCO <sub>2</sub> / m2)

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<b>Sum</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>#DIV/0!</b>	<b>-</b>
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**SITE-WIDE ENERGY CONSUMPTION AND CO<sub>2</sub> ANALYSIS**

<b>Use</b>	<b>Total Area (m<sup>2</sup>)</b>	<b>Calculated BER 2012 (kgCO<sub>2</sub> / m<sup>2</sup>)</b>	<b>-</b>
<b>Sum</b>	<b>765</b>	<b>11.7</b>	<b>-</b>

sumption figures, the 'be lean' DER, the DFEE and the regulated energy demand of the 'be lean' scenario.

REGULATED ENERGY CONSUMPTION PER UNIT (kWh p.a.) - 'BE LEAN' SAP DER WORKSHEET

Space Heating	Fuel type Space Heating	Domestic Hot Water	Fuel type Domestic Hot Water	Lighting	Auxiliary
DER Sheet [(Row 307a) ÷ (Row 367a x 0.01)]	Select fuel type	DER Sheet [(Row 310a) ÷ (Row 367a x 0.01)]	Select fuel type	DER Sheet Row 332	DER Sheet (Row 313 + 331)
1115.567118	Natural Gas	1259.750176	Natural Gas	254.6333	177.8076
1115.567118	Natural Gas	1259.750176	Natural Gas	254.6333	177.8076
404.2778235	Natural Gas	1221.550118	Natural Gas	233.854	147.7786
404.2778235	Natural Gas	1221.550118	Natural Gas	233.854	147.7786
532.047	Natural Gas	1205.842	Natural Gas	225.2685	144.6877
532.047	Natural Gas	1205.842	Natural Gas	225.2685	144.6877
655.8091765	Natural Gas	1205.842	Natural Gas	225.2685	127.6011
655.8091765	Natural Gas	1205.842	Natural Gas	225.2685	127.6011
1279.374059	Natural Gas	1220.993353	Natural Gas	283.7077	179.9331
1240.433176	Natural Gas	1395.421	Natural Gas	283.7077	182.2364
1240.433176	Natural Gas	1395.421	Natural Gas	283.7077	182.2364
1240.433176	Natural Gas	1395.421	Natural Gas	283.7077	182.2364
1336.010647	Natural Gas	1335.253	Natural Gas	362.6954	232.4406



11,752

N/A

16,528

N/A

3,376

2,155



**REGULATED ENERGY CONSUMPTION BY END USE (kWh/m<sup>2</sup> p.a.) 'BE LEAN' BER - SOURCE: BRUKL OUT**

<b>Space Heating (kWh/m<sup>2</sup> p.a.)</b>	<b>Fuel type Space Heating</b>	<b>Domestic Hot Water (kWh/m<sup>2</sup> p.a.)</b>	<b>Fuel type Domestic Hot Water</b>	<b>Lighting (kWh/m<sup>2</sup> p.a.)</b>	<b>Auxiliary (kWh/m<sup>2</sup> p.a.)</b>
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0	N/A	0	N/A	0	0
---	-----	---	-----	---	---

**REGULATED ENERGY CONSUMPTION**

Space Heating (kWh p.a.)	N/A	Domestic Hot Water (kWh p.a.)	N/A	Lighting (kWh p.a.)	Auxiliary (kWh p.a.)
11,752		16,528		3,376	2,155

SAP 2012 CO2 PERFORMANCE

REGULATED CO2 EMISSIONS PER UNIT (kgCO2 p.a.)

Cooling	Space Heating	Domestic Hot Water	Lighting	Auxiliary	Cooling
DER Sheet Row 315					
0	241	272	132	92	0
0	241	272	132	92	0
0	87	264	121	77	0
0	87	264	121	77	0
0	115	260	117	75	0
0	115	260	117	75	0
0	142	260	117	66	0
0	142	260	117	66	0
0	276	264	147	93	0
0	268	301	147	95	0
0	268	301	147	95	0
0	268	301	147	95	0
0	289	288	188	121	0

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0	2,538	3,570	1,752	1,118	0
---	-------	-------	-------	-------	---



PUT **ESTIMATED ENERGY CONSUMPTION BY FUEL TYPE (kWh/m<sup>2</sup> p.a.) 'BE LEAN' BER - SOURCE: BRU**

Cooling (kWh/m <sup>2</sup> p.a.)	Natural Gas	Grid Electricity	
	#####	#####	

0	0	0	N/A	N/A	N/A
Cooling (kWh p.a.)					
0					

**SAP10 CO2 PERFORMANCE**

**REGULATED CO2 EMISSIONS PER UNIT**

<b>2012 CO2 emissions (kgCO2 p.a.)</b>	<b>Space Heating CO2 emissions (kgCO2 p.a.)</b>	<b>Domestic Hot Water CO2 emissions (kgCO2 p.a.)</b>	<b>Lighting CO2 emissions (kgCO2 p.a.)</b>	<b>Auxiliary CO2 emissions (kgCO2 p.a.)</b>	<b>Cooling CO2 emissions (kgCO2 p.a.)</b>
738	234	265	59	41	0
738	234	265	59	41	0
549	85	257	54	34	0
549	85	257	54	34	0
567	112	253	52	34	0
567	112	253	52	34	0
585	138	253	52	30	0
585	138	253	52	30	0
781	269	256	66	42	0
811	260	293	66	42	0
811	260	293	66	42	0
811	260	293	66	42	0
886	281	280	85	54	0

<b>8,979</b>	2,468	3,471	787	502	0
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<L.INP or \*SIM.CSV

**REGULATED CO2 EMISSIONS PER UNIT**

2012 CO2 emissions (kgCO2 p.a.)	Natural Gas	Grid Electricity			
	#####	#####			

<i>0</i>	0	0	
<b>REGULATED CO2 EMISSIONS</b>			
2012 CO2 emissions (kgCO2 p.a.)			
<i>8,979</i>			

## DOMESTIC ENERGY DEMAND D

		Fabric Energy Efficiency (FEE)	REGULATED ENERGY DEMAND PER UNIT F		
SAP10 CO2 emissions (kgCO2 p.a.)	Calculated DER SAP10 (kgCO2 / m2)	Dwelling Fabric Energy Efficiency (DFEE) (kWh/m²)	Space Heating (kWh p.a.)	Domestic Hot Water (kWh p.a.)	Lighting (kWh p.a.)
600	10.8	62.24	2,756	2,113	2,113
600	10.8	62.24	2,756	2,113	2,113
430	8.5	49.17	1,853	2,063	2,063
430	8.5	49.17	1,853	2,063	2,063
451	9.3	47.62	1,774	2,037	2,037
451	9.3	47.62	1,774	2,037	2,037
473	9.8	49.01	1,898	2,034	2,034
473	9.8	49.01	1,898	2,034	2,034
633	10.1	61.48	3,255	2,261	2,261
662	10.5	54.76	2,779	2,269	2,269
662	10.5	54.76	2,779	2,269	2,269
662	7.8	51.53	3,682	2,479	2,479
700	8.2	51.53	3,682	2,479	2,479

7,228	9.4	53.31	32,738	28,250	28,250

**NON-DOMESTIC ENERGY DEMAND**

**REGULATED ENERGY DEMAND PER UNIT F**

SAP10 CO2 emissions (kgCO2 p.a.)	BRUKL BER SAP10 (kgCO2 / m2)		Space Heating (kWh p.a.)	Domestic Hot Water (kWh p.a.)	Lighting (kWh p.a.)
		N/A			

<b>0</b>	<b>#DIV/0!</b>		<b>0</b>	<b>0</b>	<b>0</b>
<b>REGULATED CO2 EMISSIONS</b>		<b>N/A</b>	<b>REGULATED ENERGY DEMAND PER UNIT F</b>		
<b>SAP10 CO2 emissions (kgCO2 p.a.)</b>	<b>Calculated BER SAP10 (kgCO2 / m2)</b>		<b>Space Heating (kWh p.a.)</b>	<b>Domestic Hot Water (kWh p.a.)</b>	<b>Lighting (kWh p.a.)</b>
<b>7,228</b>	<b>9.4</b>		<b>32,738</b>	<b>28,250</b>	<b>28,250</b>





975

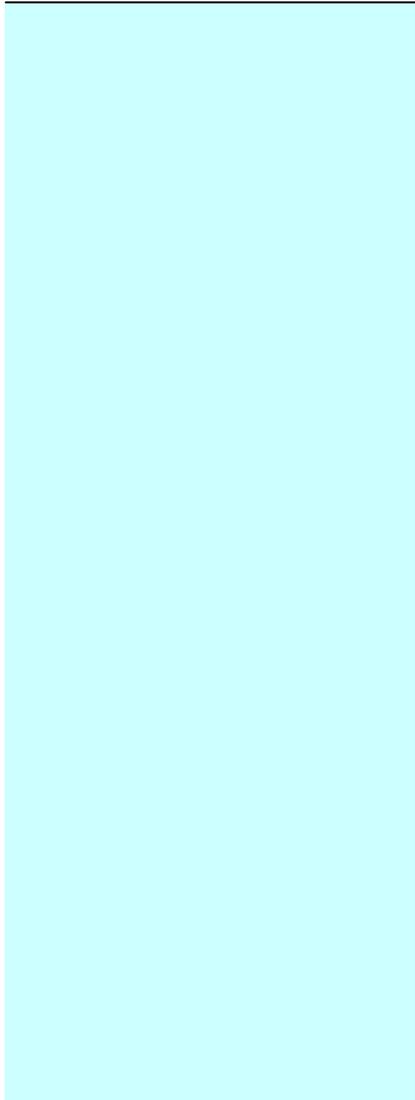
0

**AND**

PER ANNUM (kWh p.a.)

**Auxiliary  
(kWh p.a.)**

**Cooling  
(kWh p.a.)**



0	0
PER ANNUM (kWh p.a.)	
Auxiliary (kWh p.a.)	Cooling (kWh p.a.)
975	0

The applicant should complete all the light blue cells including information on the 'be clean' energy co

## DOMESTIC ENERGY CONSUMPTION AND CO<sub>2</sub> ANALYSIS

Unit identifier (e.g. plot number, dwelling type etc.)	Model total floor area (m <sup>2</sup> )	Number of units	Total area represented by model (m <sup>2</sup> )	VALIDATION CHECK	
				Calculated DER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )	DER Worksheet DER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )
				<b>DER Sheet (Row 384)</b>	
<b>Unit 1</b>	55.6	1	55.6	<b>13.3</b>	<b>29.0</b>
<b>Unit 2</b>	55.6	1	55.6	<b>13.3</b>	<b>29.0</b>
<b>Unit 3</b>	50.5	1	50.5	<b>10.9</b>	<b>25.3</b>
<b>Unit 4</b>	50.5	1	50.5	<b>10.9</b>	<b>25.3</b>
<b>Unit 5</b>	48.4	1	48.4	<b>11.7</b>	<b>25.0</b>
<b>Unit 6</b>	48.4	1	48.4	<b>11.7</b>	<b>25.0</b>
<b>Unit 7</b>	48.4	1	48.4	<b>12.1</b>	<b>26.0</b>
<b>Unit 8</b>	48.4	1	48.4	<b>12.1</b>	<b>26.0</b>
<b>Unit 9</b>	62.9	1	62.9	<b>12.4</b>	<b>27.7</b>
<b>Unit 10</b>	62.9	1	62.9	<b>12.9</b>	<b>28.7</b>
<b>Unit 11</b>	62.9	1	62.9	<b>12.9</b>	<b>28.7</b>
<b>Unit 12</b>	85.4	1	85.4	<b>9.5</b>	<b>22.7</b>
<b>Unit 13</b>	85.4	1	85.4	<b>10.4</b>	<b>22.7</b>

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<b>Sum</b>	<b>765</b>	<b>13</b>	<b>765</b>	<b>11.7</b>	<b>-</b>
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**NON-DOMESTIC ENERGY CONSUMPTION AND CO<sub>2</sub> ANALYSIS**

Building Use	Area per unit (m <sup>2</sup> )	Number of units	Total area represented by model (m <sup>2</sup> )	VALIDATION CHECK	
				Calculated BER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )	BRUKL BER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )

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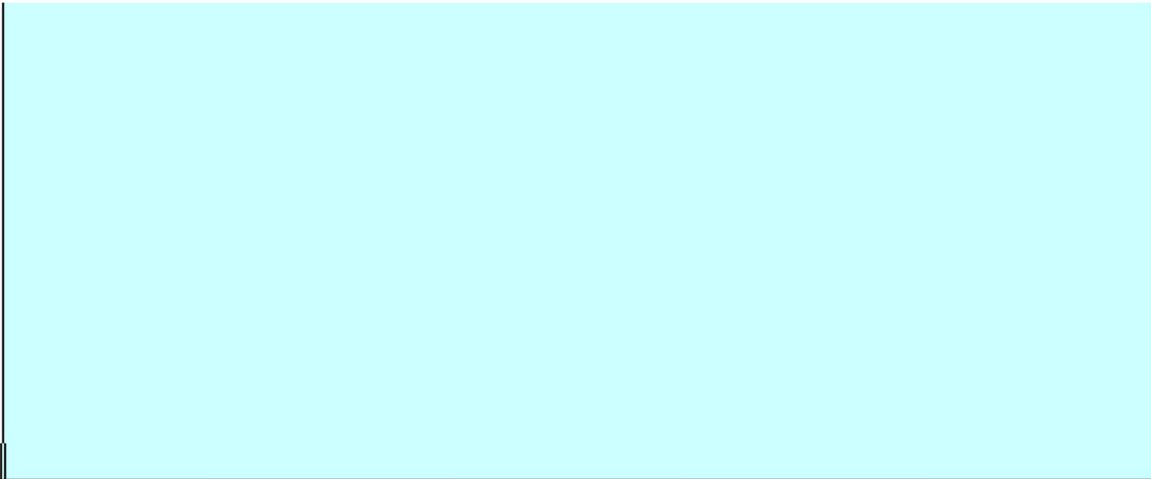
<b>Sum</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>#DIV/0!</b>	<b>-</b>
<b>SITE-WIDE ENERGY CONSUMPTION AND CO<sub>2</sub> ANALYSIS</b>					
<b>Use</b>	<b>Total Area (m<sup>2</sup>)</b>			<b>Calculated BER 2012 (kgCO<sub>2</sub> / m<sup>2</sup>)</b>	<b>-</b>
<b>Sum</b>	<b>765</b>			<b>11.7</b>	<b>-</b>

Consumption figures and the 'be clean' DER.



REGULATED ENERGY CONSUMPTION PER UNIT (k

Space Heating (Heat Source 1)	Fuel type Space Heating	Domestic Hot Water (Heat Source 1)	Fuel type Domestic Hot Water	Space and Domestic Hot Water from CHP  if applicable
DER Sheet [Row 307b ÷ (Row 367b x 0.01)]	Select fuel type	DER Sheet [Row 310b ÷ (Row 367b x 0.01)]	Select fuel type	DER Sheet [(Row 307a + 310a) ÷ (Row 362 x 0.01)]
1115.567118	Natural Gas	1259.750176	Natural Gas	
1115.567118	Natural Gas	1259.750176	Natural Gas	
404.2778235	Natural Gas	1221.550118	Natural Gas	
404.2778235	Natural Gas	1221.550118	Natural Gas	
532.047	Natural Gas	1205.842	Natural Gas	
532.047	Natural Gas	1205.842	Natural Gas	
655.8091765	Natural Gas	1205.842	Natural Gas	
655.8091765	Natural Gas	1205.842	Natural Gas	
1279.374059	Natural Gas	1220.993353	Natural Gas	
1240.433176	Natural Gas	1395.421	Natural Gas	
1240.433176	Natural Gas	1395.421	Natural Gas	
1240.433176	Natural Gas	1395.421	Natural Gas	
1336.010647	Natural Gas	1335.253	Natural Gas	



11,752

N/A

16,528

N/A

0



**REGULATED ENERGY CONSUMPTION BY END USE (kWh/**

<b>Space Heating</b>	<b>Fuel type Space Heating</b>	<b>Domestic Hot Water</b>	<b>Fuel type Domestic Hot Water</b>	
				N/A

0	N/A	0	N/A	
<b>REGULATED ENERGY</b>				
Space Heating (kWh p.a.)	N/A	Domestic Hot Water (kWh p.a.)	N/A	Space and Domestic Hot Water from CHP (kWh p.a.)
11,752		16,528		0

Wh p.a.) - 'BE CLEAN' SAP DER WORKSHEET

Fuel type CHP	Total Electricity generated by CHP (-)	Lighting	Auxiliary	Cooling	Space Heating
<i>if applicable</i>	<i>if applicable</i>				
Select fuel type	DER Sheet [(Row 307a + 310a) × (Row 361 ÷ 362)]	DER Sheet Row 332	DER Sheet (Row 313 + 331)	DER Sheet Row 315	
		254.6333	177.8076	0	241
		254.6333	177.8076	0	241
		233.854	147.7786	0	87
		233.854	147.7786	0	87
		225.2685	144.6877	0	115
		225.2685	144.6877	0	115
		225.2685	127.6011	0	142
		225.2685	127.6011	0	142
		283.7077	179.9331	0	276
		283.7077	182.2364	0	268
		283.7077	182.2364	0	268
		283.7077	182.2364	0	268
		362.6954	232.4406	0	289

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N/A	0	3,376	2,155	0	2,538
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m <sup>2</sup> p.a.) 'BE CLEAN' BER - SOURCE: BRUKL OUTPUT					REGU
--	--	--	--	--	------

	Total Electricity generated by CHP (-)	Lighting	Auxiliary	Cooling	Natural Gas
	if applicable				#####

--	--	--	--	--	--

N/A

	0	0	0	0	0



**CONSUMPTION**

N/A	<b>Electricity generated by CHP (kWh p.a.)</b> <i>if applicable</i>	<b>Lighting (kWh p.a.)</b>	<b>Auxiliary (kWh p.a.)</b>	<b>Cooling (kWh p.a.)</b>	
	0	3,376	2,155	0	

**SAP 2012 CO2 PERFORMANCE**

**REGULATED CO2 EMISSIONS PER UNIT (kgCO2 p.a.)**

<b>Domestic Hot Water</b>	<b>Space Heating and DHW from CHP</b>	<b>Electricity generated by CHP</b>	<b>Lighting</b>	<b>Auxiliary</b>	<b>Cooling</b>
	<b>if applicable</b>	<b>if applicable</b>			
272			132	92	0
272			132	92	0
264			121	77	0
264			121	77	0
260			117	75	0
260			117	75	0
260			117	66	0
260			117	66	0
264			147	93	0
301			147	95	0
301			147	95	0
301			147	95	0
288			188	121	0

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3,570

0

0

1,752

1,118

0

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ILATED ENERGY CONSUMPTION BY FUEL TYPE (kWh/m<sup>2</sup> p.a.) 'BE CLEAN' BER - SOURCE: BRUKL.INP or \*SIM.CSV

Grid Electricity	Bespoke DH Factor	Electricity generated by CHP (-) <i>if applicable</i>	
#####	#####	#####	



0

0

0



## REGULATED CO2 EMISSIONS PER

2012 CO2 emissions (kgCO2 p.a.)	Space Heating	Domestic Hot Water	Space Heating and DHW from CHP	Electricity generated by CHP	Lighting
			if applicable	if applicable	
738	234	265			59
738	234	265			59
549	85	257			54
549	85	257			54
567	112	253			52
567	112	253			52
585	138	253			52
585	138	253			52
781	269	256			66
811	260	293			66
811	260	293			66
811	260	293			66
886	281	280			85

<b>8,979</b>	<b>2,468</b>	<b>3,471</b>	<b>0</b>	<b>0</b>	<b>787</b>



**/ FILE** **REGULATED CO2 EMISSIONS PER UNIT**

2012 CO2 emissions (kgCO2 p.a.)	Natural Gas	Grid Electricity	Bespoke DH Factor	Electricity generated by CHP (-) if applicable
	#####	#####	#####	#####

--	--	--	--	--

<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
<b>REGULATED CO2 EMISSIONS</b>						
<b>2012 CO2 emissions (kgCO2 p.a.)</b>						
<b>8,979</b>						

ANCE

UNIT (kgCO2 p.a.)

Auxiliary	Cooling	SAP10 CO2 emissions (kgCO2 p.a.)	Calculated DER SAP10 (kgCO2 / m2)
41	0	600	10.8
41	0	600	10.8
34	0	430	8.5
34	0	430	8.5
34	0	451	9.3
34	0	451	9.3
30	0	473	9.8
30	0	473	9.8
42	0	633	10.1
42	0	662	10.5
42	0	662	10.5
42	0	662	7.8
54	0	700	8.2

502	0	7,228	9.4
		<b>SAP 10 CO2 emissions (kgCO2 p.a.)</b>	<b>BRUKL BER SAP10 (kgCO2 / m2)</b>

	0	#DIV/0!
	REGULATED CO2 EMISSIONS PER UNIT	
	SAP 10 CO2 emissions (kgCO2 p.a.)	Calculated BER SAP10 (kgCO2 / m2)
	7,228	9.4

The applicant should complete all the light blue cells including information on the 'be green' energy consumption figures and the 'be green' DER.

## DOMESTIC ENERGY CONSUMPTION AND CO<sub>2</sub> ANALYSIS

Unit identifier (e.g. plot number, dwelling type etc.)	Model total floor area (m <sup>2</sup> )	Number of units	Total area represented by model (m <sup>2</sup> )	VALIDATION CHECK		Space Heating (Heat Source 1)	Fuel type Space Heating	Domestic Hot Water (Heat Source 1)
				Calculated DER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )	DER Worksheet DER 2012 (kgCO <sub>2</sub> / m <sup>2</sup> )			
					<b>DER Sheet (Row 384)</b>	<b>DER Sheet [Row 307b ÷ (Row 367b x 0.01)]</b>	<b>Select fuel type</b>	<b>DER Sheet [Row 310b ÷ (Row 367b x 0.01)]</b>
Unit 1	55.6	1	55.6	4.0	19.5	689.6233	Grid Electricity	778.7546667
Unit 2	55.6	1	55.6	4.0	19.5	689.6233	Grid Electricity	778.7546667
Unit 3	50.5	1	50.5	4.0	17.2	390.6491	Grid Electricity	755.1400667
Unit 4	50.5	1	50.5	4.0	17.2	390.6491	Grid Electricity	755.1400667
Unit 5	48.4	1	48.4	4.0	17.8	351.8636	Grid Electricity	782.7010667
Unit 6	48.4	1	48.4	4.0	17.8	351.8636	Grid Electricity	782.7010667
Unit 7	48.4	1	48.4	3.8	17.6	405.4093	Grid Electricity	745.4296
Unit 8	48.4	1	48.4	3.8	17.6	405.4093	Grid Electricity	745.4296
Unit 9	62.9	1	62.9	3.8	9.9	570.8493176	Grid Electricity	544.8001837
Unit 10	62.9	1	62.9	3.8	9.0	484.2898425	Grid Electricity	544.8001837
Unit 11	62.9	1	62.9	3.8	9.0	484.2898425	Grid Electricity	544.8001837
Unit 12	85.4	1	85.4	2.8	3.3	484.2898425	Grid Electricity	544.8001837
Unit 13	85.4	1	85.4	3.6	3.3	596.1202362	Grid Electricity	595.7821785

<b>Sum</b>	<b>765</b>	<b>13</b>	<b>765</b>	<b>3.8</b>	<b>-</b>	<b>6,295</b>	<b>N/A</b>	<b>8,899</b>

**NON-DOMESTIC ENERGY CONSUMPTION AND CO<sub>2</sub> ANALYSIS**



Sum	0	0	0	#DIV/0!	-	0	N/A	0
<b>SITE-WIDE ENERGY CONSUMPTION AND CO<sub>2</sub> ANALYSIS</b>								
Use	Total Area (m <sup>2</sup> )	Calculated BER 2012 (kgCO <sub>2</sub> / m2)	-	Space Heating (kWh p.a.)	N/A	Domestic Hot Water (kWh p.a.)		
Sum	765	0.0	-	6,295		8,899		







N/A	0	N/A	0	N/A	0	N/A	0
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REGULATED ENERGY CONSUMPTION BY END USE (kWh/m<sup>2</sup> p.a.) 'BE GREEN' BER - SOURCE: BRUKL OUTPUT

Fuel type Domestic Hot Water							Electricity generated by CHP (-)  if applicable
	N/A	N/A	N/A	N/A	N/A	N/A	

N/A			0

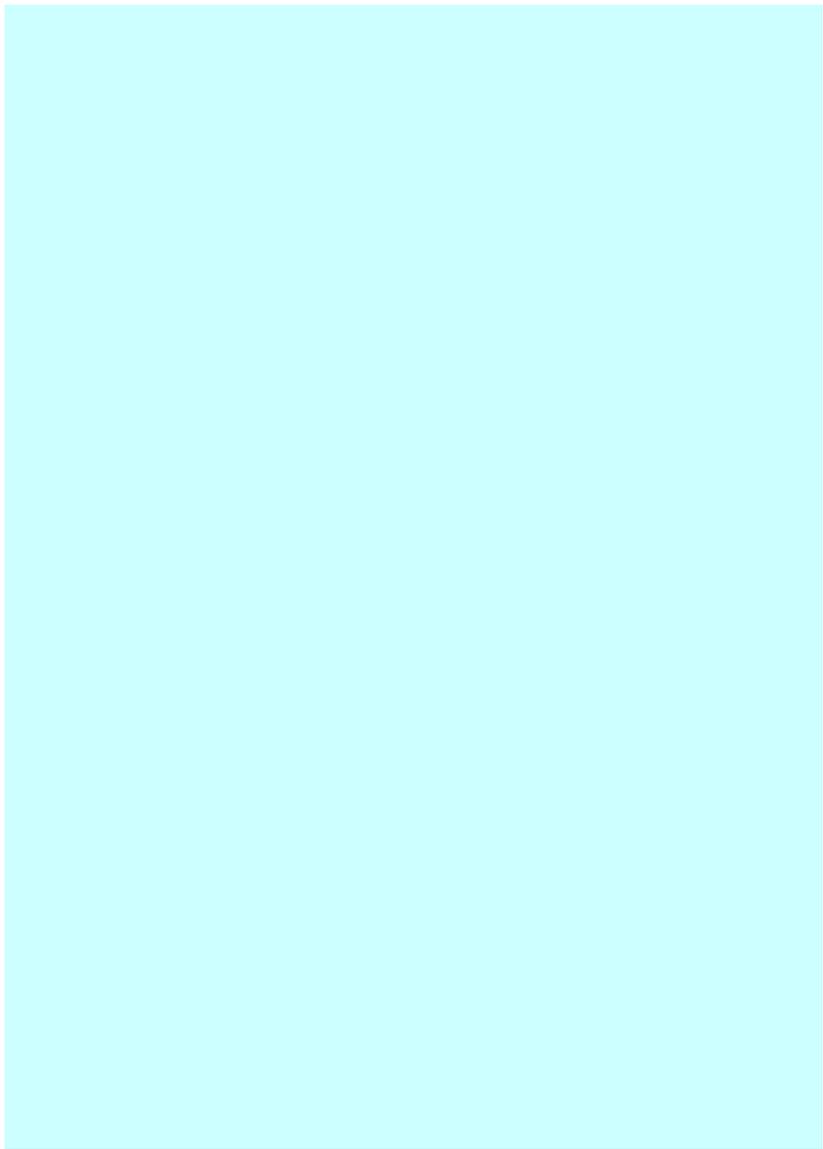


**REGULATED CO2 EMISSIONS**

N/A	Space Heating (kWh p.a.)	N/A	Domestic Hot Water (kWh p.a.)	N/A	Space and Domestic Hot Water from CHP (kWh p.a.)	N/A	Electricity generated by CHP (kWh p.a.) <i>if applicable</i>
	0		0		0		0



				REGULATED CO2 EMISSIONS PER U				
Electricity generated by renewable (-)	Lighting	Auxiliary	Cooling	Space Heating	Domestic Hot Water	Space Heating and DHW from CHP	Electricity generated by CHP	Electricity generated by renewable
<i>if applicable</i>						<i>if applicable</i>	<i>if applicable</i>	<i>if applicable</i>
DER Sheet Row 380	DER Sheet Row 332	DER Sheet (Row 313 + 331)	DER Sheet Row 315					
	254.6333	176.3237	0					
	254.6333	176.3237	0					
	233.854	154.5132	0					
	233.854	154.5132	0					
	225.2685	149.1805	0					
	225.2685	149.1805	0					
	225.2685	130.4782	0					
	225.2685	130.4782	0					
	283.7077	179.9331	0					
	283.7077	176.6352	0					
	283.7077	176.6352	0					
	283.7077	176.6352	0					
	362.6954	232.4406	0					



0

3,376

2,163

0

0

0

0

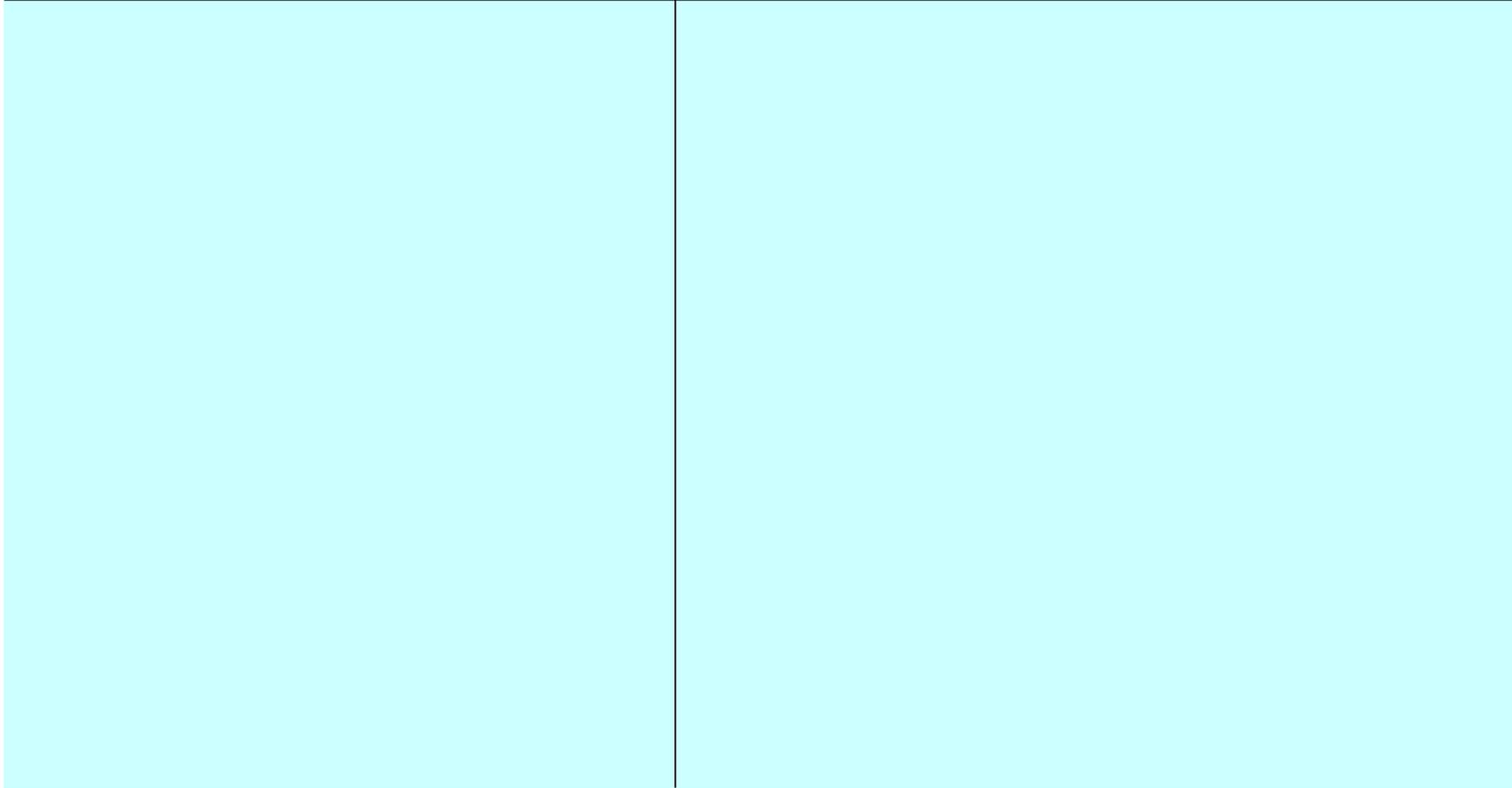
0

0



REGULATED ENERGY CONSUMPTION BY FUEL TYPE (kWh/m<sup>2</sup> p.a.) 'BE

Electricity generated by renewable technology (-) <i>if applicable</i>	Lighting	Auxiliary	Cooling	Natural Gas	Grid Electricity	Bespoke DH Factor	Electricity generated by CHP (-) <i>if applicable</i>	Electricity generated by renewable technology (-) <i>if applicable</i>
				#####	#####	#####	#####	#####



0	0	0	0	0	0	0	0	0
				<b>REGULATED CO2 EMISSIONS</b>				
<b>Electricity generated by renewable (kWh p.a.)</b> <i>if applicable</i>	<b>Lighting (kWh p.a.)</b>	<b>Auxiliary (kWh p.a.)</b>	<b>Cooling (kWh p.a.)</b>	<b>Space Heating CO2 emissions</b>	<b>Domestic Hot Water CO2 emissions</b>	<b>Space Heating and DHW from CHP CO2 emissions</b> if applicable	<b>Electricity generated by CHP CO2 savings</b> if applicable	<b>Electricity generated by renewable CO2 savings</b> if applicable
0	3,376	2,163	0	0	0	0	0	0



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SAP10 CO2 I

NIT (kgCO2 p.a.)

REGULATED CO2 I

Lighting	Auxiliary	Cooling	2012 CO2 emissions (kgCO2 p.a.)	Space Heating	Domestic Hot Water	Space Heating and DHW from CHP	Electricity generated by CHP	Electricity generated by renewable
						if applicable	if applicable	if applicable
132	92	0	224					
132	92	0	224					
121	80	0	202					
121	80	0	202					
117	77	0	194					
117	77	0	194					
117	68	0	185					
117	68	0	185					
147	93	0	241					
147	92	0	239					
147	92	0	239					
147	92	0	239					
188	121	0	309					

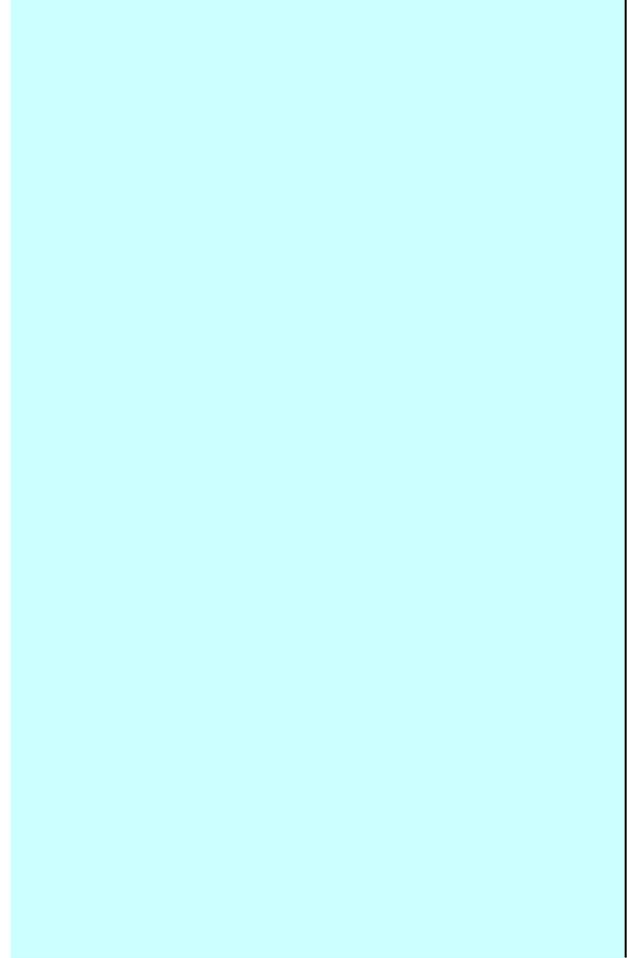
1,752	1,123	0	2,875	0	0	0	0	0
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GREEN' BER - SOURCE: BRUKL.INP or \*SIM.CSV FILE

REGULATED CO2 I

Enter Carbon Factor 1	Enter Carbon Factor 2	Enter Carbon Factor 3	2012 CO2 emissions (kgCO2 p.a.)	Natural Gas	Grid Electricity	Bespoke DH Factor	Electricity generated by CHP (-) if applicable	Electricity generated by renewable technology (-) if applicable
#####	#####	#####		#####	#####	#####	#####	#####



0	0	0	0	0	0	0	0	0
				<b>REGULATED CO2 E</b>				
<b>Lighting CO2 emissions</b>	<b>Auxiliary CO2 emissions</b>	<b>Cooling CO2 emissions</b>	<b>2012 CO2 emissions</b>	<b>Space Heating CO2 emissions</b>	<b>Domestic Hot Water CO2 emissions</b>	<b>Space Heating and DHW from CHP CO2 emissions if applicable</b>	<b>Electricity generated by CHP CO2 savings if applicable</b>	<b>Electricity generated by renewable CO2 savings if applicable</b>
1,752	1,123	0	2,875	0	0	0	0	0



**PERFORMANCE**

**EMISSIONS PER UNIT**

Lighting	Auxiliary	Cooling	SAP10 CO2 emissions (kgCO2 p.a.)	Calculated DER SAP10 (kgCO2 / m2)
59	41	0	100	1.8
59	41	0	100	1.8
54	36	0	90	1.8
54	36	0	90	1.8
52	35	0	87	1.8
52	35	0	87	1.8
52	30	0	83	1.7
52	30	0	83	1.7
66	42	0	108	1.7
66	41	0	107	1.7
66	41	0	107	1.7
66	41	0	107	1.3
85	54	0	139	1.6

787	504	0	1,291	1.7
[Redacted]				

EMISSIONS PER UNIT

Enter Carbon Factor 1	Enter Carbon Factor 2	Enter Carbon Factor 3	SAP10 CO2 emissions	BRUKL BER SAP10 (kgCO2 / m2)
#####	#####	#####		

0	0	0	0	#DIV/0!
<b>EMISSIONS PER UNIT</b>				
<b>Lighting CO2 emissions</b>	<b>Auxiliary CO2 emissions</b>	<b>Cooling CO2 emissions</b>	<b>SAP10 CO2 emissions</b>	<b>Calculated BER SAP10 (kgCO2 / m2)</b>
787	504	0	1,291	1.7



# SAP 2012 PERFORMANCE

## DOMESTIC

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

	Carbon Dioxide Emissions for domestic buildings (Tonnes CO <sub>2</sub> per annum)	
	Regulated	Unregulated
Baseline: Part L 2013 of the Building Regulations Compliant Development	15	
After energy demand reduction	9	
After heat network / CHP	9	
After renewable energy	3	

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

	Regulated domestic carbon dioxide savings	
	(Tonnes CO <sub>2</sub> per annum)	(%)
Savings from energy demand reduction	6	42%
Savings from heat network / CHP	0	0%
Savings from renewable energy	6	39%
<b>Cumulative on site savings</b>	<b>13</b>	<b>81%</b>
Annual savings from off-set payment	3	-
	<b>(Tonnes CO<sub>2</sub>)</b>	
<b>Cumulative savings for off-set payment</b>	<b>86</b>	-

Cash in-lieu contribution (£)	5,174	
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## NON-DOMESTIC

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

	Carbon Dioxide Emissions for non-domestic buildings (Tonnes CO <sub>2</sub> per annum)	
	Regulated	Unregulated
Baseline: Part L 2013 of the Building Regulations Compliant Development	0	
After energy demand reduction	0	
After heat network / CHP	0	
After renewable energy	0	

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

	Regulated non-domestic carbon dioxide savings	
	(Tonnes CO <sub>2</sub> per annum)	(%)
Savings from energy demand reduction	0	#DIV/0!
Savings from heat network / CHP	0	#DIV/0!
Savings from renewable energy	0	#DIV/0!
<b>Total Cumulative Savings</b>	<b>0</b>	<b>#DIV/0!</b>

**Table 5: Shortfall in regulated carbon dioxide savings**

	Annual Shortfall (Tonnes CO <sub>2</sub> )	Cumulative Shortfall (Tonnes CO <sub>2</sub> )
<b>Total Target Savings</b>	<b>0</b>	-
Shortfall	0	0
<b>Cash in-lieu contribution (£)</b>	<b>0</b>	-

## SITE-WIDE

	Total regulated emissions (Tonnes CO <sub>2</sub> / year)	CO <sub>2</sub> savings (Tonnes CO <sub>2</sub> / year)
Part L 2013 baseline	15	
Be lean	9	6
Be clean	9	0
Be green	3	6
	-	<b>CO<sub>2</sub> savings off-set (Tonnes CO<sub>2</sub>)</b>
Off-set	-	<b>86</b>

Building use		
	Space Heating	Hot Water
Domestic	33	28
Non-domestic	0	0

	Target Fabric Energy Efficiency (kWh/m <sup>2</sup> )	Dwelling Fabric Energy Efficiency (kWh/m <sup>2</sup> )
<b>Development total</b>	<b>56.35</b>	<b>53.31</b>

	Area weighted average non-domestic cooling demand (MJ/m <sup>2</sup> )	Total area weighted non-domestic cooling demand (MJ/year)
<b>Actual</b>		
<b>Notional</b>		



**Table 1: Carbon Dioxide Emissions af**

Baseline: Part L 2013 of the Building Regulations Compliant Development
After energy demand reduction
After heat network / CHP
After renewable energy

**Table 2: Regulated Carbon Dioxide sa**

Savings from energy demand reduction
Savings from heat network / CHP
Savings from renewable energy
<b>Cumulative on site savings</b>
Annual savings from off-set payment
<b>Cumulative savings for off-set payment</b>

Cash in-lieu contribution (£)

**Table 3: Carbon Dioxide Emissions aft**

Baseline: Part L 2013 of the Building Regulations Compliant Development
After energy demand reduction
After heat network / CHP
After renewable energy

**Table 4: Regulated Carbon Dioxide sa**

Savings from energy demand reduction
Savings from heat network / CHP
Savings from renewable energy
<b>Total Cumulative Savings</b>

**Table 5: Shortfall in regulated carbon**

Total Target Savings
Shortfall
<b>Cash in-lieu contribution (£)</b>

**Energy efficiency measures**

Percentage savings (%)
42%
0%
39%
-
-

Part L 2013 baseline
Be lean
Be clean
Be green
Off-set

Energy demand following energy efficiency measures (MWh/year)			
Lighting	Auxiliary	Cooling	Unregulated electricity
28	1	0	
0	0	0	

Improvement (%)
5%



# SAP10 PERFORMANCE

per each stage of the Energy Hierarchy for domestic buildings

Carbon Dioxide Emissions for domestic buildings (Tonnes CO <sub>2</sub> per annum)	
Regulated	Unregulated
14	
7	
7	
1	

savings from each stage of the Energy Hierarchy for domestic buildings

Regulated domestic carbon dioxide savings	
(Tonnes CO <sub>2</sub> per annum)	(%)
7	48%
0	0%
6	43%
<b>13</b>	<b>91%</b>
1	-
<b>(Tonnes CO<sub>2</sub>)</b>	
<b>39</b>	-

2,323	
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ter each stage of the Energy Hierarchy for non-domestic buildings

Carbon Dioxide Emissions for non-domestic buildings (Tonnes CO2 per annum)	
Regulated	Unregulated
0	
0	
0	
0	

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

Regulated non-domestic carbon dioxide savings	
(Tonnes CO <sub>2</sub> per annum)	(%)
0	#DIV/0!

dioxide savings

Annual Shortfall (Tonnes CO <sub>2</sub> )	Cumulative Shortfall (Tonnes CO <sub>2</sub> )
0	-
0	0
<b>0</b>	-



Total regulated emissions (Tonnes CO <sub>2</sub> / year)	CO <sub>2</sub> savings (Tonnes CO <sub>2</sub> / year)	Percentage savings (%)
14		
7	7	48%
7	0	0%
1	6	43%
-	<b>CO<sub>2</sub> savings off-set (Tonnes CO<sub>2</sub>)</b>	-
-	<b>39</b>	-

Unregulated gas











<b>Issue</b>	1.1
<b>Date</b>	10/01/2019
<b>Author</b>	Greater London Authority

<b>Update Location</b>	<b>Description of changes made to GLA Carbon Emission Reporting Spreadsheet</b>
Introduction / Version Control	<p>Additional explanatory wording has been included in the 'Background and Purpose' and 'Methodology' sections to further assist applicants with the reporting process</p> <p>A version control tab has been added to list all changes made to the spreadsheet under s versions</p>
Baseline, be lean, be clean & be green tabs	<p><b>Domestic</b> SAP worksheet row reference numbers have been included in the input tabs</p> <p><del>Non-domestic</del> Non-domestic calculation is now based on 'energy consumption by fuel type' instead of th consumption figures in the BRUKL tab to enable the accurate calculation of the TER/BER This data is available in the output file ending in "**BRUKL.inp" for government approved s and output file ending "**sim.csv" for SBEM. Where these files are used they should be ap to the Energy Statement.</p> <p>'number of units'. This is to ensure that the total model area aligns with the development s schedule.</p> <p>Rows with void formulas have now been fixed</p> <p>Formula for CHP/Renewable contribution now fixed in SAP 10 calculation</p> <p>Extra input rows have been added to account for larger schemes</p> <p>Columns used to calculate the carbon emissions using SAP10 carbon factors have been to allow for greater transparency in the calculation methodology</p> <p>Validation check moved to be more prominent</p> <p>Additional heat source has been added into the calculation</p> <p>Reporting of electricity generated by CHP or renewable technologies has been changed; should now be inputted as a negative value (-)</p>
Be Green tab	Additional heat source has been added into the calculation in the 'be green' tabs to accou multiple heating systems, if present
Carbon factors tab	<p>The carbon emission factor table has been updated and clarification has been provided o they should be used</p> <p>A typo in the carbon factor unit has been corrected (kgCO<sub>2</sub>/kWh)</p>

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