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User Manual

for

Crossrail Construction Carbon Model

Learning Legacy Document

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Introduction

Crossrail Carbon Model is a excel based tool that has been developed to forecast and monitor the ongoing construction carbon footprint (Scopes 1 & 2) to enable the project to determine if it is on target to achieve its target reduction. This guide aims to provide users of Crossrail Carbon Model with a clear instruction on how to enter the required information in the model.

Structure of the model

The excel file contains a series of tabs with various functionalities. Some of the tabs are mainly informative which gives instruction to the user and reports the results of the calculations and some other tabs are associated with different initiatives for reducing carbon emissions. There are also some hidden tabs which are used to do the background calculations and must only be accessed by the model maintainer and not users. Following sections will introduce all of the tabs. They include:

- Instructions
- Report
- Saving Calculator
- Fuel Equipment
- Efficient Site Office
- Lighting
- Behaviours
- Additional Initiatives
- Scope 3 Transport
- Scope 3 Embodied
- Data Entry Fuel
- Data Entry Electricity
- Reference Evidence

NOTE: This model is designed to be flexible and can be customised to accommodate all of the project specific requirements. Therefore, it is not protected and can be edited by anyone. To prevent accidental damage to the model the user **must always** follow the following rules:

- Only GREY cells should be edited by the user.
- Never deleted or insert any column or row.
- Never edit any formula from the background tabs.
- When pasting data, always use "PASTE VALUE" option.
- For any changes contact the admin or maintainer of the model.

The following sections will explain each tab in detail.

Instructions tab

User Guide: Crossrail Energy and Carbon Model

1

Checklist of Information Needed:	
<i>Electricity and Fuel Data</i>	This needs to be accurate and to match up with what has been reported in RIVO.
<i>Details of Energy Saving Initiatives</i>	Please try and quantify all energy saving initiatives you have stated in your Quarterly Environmental Report.
<i>Project Details</i>	Including start and finish dates and a progress statement.

2

What you need to fill in:	
<i>Report</i>	Fill in all grey boxes, the dates are important for reporting the correct current and end of project savings in the graphs. The descriptive
<i>Savings Calculator</i>	The Savings Calculator tab shows the energy graph, which details actual carbon footprint and the energy savings. There is a checklist table that shows the overall progress of data input. Once all data has been entered into the relevant sections the
<i>Fuel Equipment</i>	This initiative documents the energy saving of a contractor using an efficient piece of equipment compared to using a standard/inefficient piece of equipment. This initiative calculates the fuel saved by using efficient machinery by estimating the fuel used by efficient equipment and by standard equipment and working out the difference between the two - the difference is your saving. There are several different
<i>Lighting</i>	Reduced Power Lighting: This initiative enables the contractor to claim energy savings from using lights on site/office that have a reduced power compared to standard lights (an example of standard lighting includes fluorescent lights) PIR Sensors: This initiative calculates the energy saved from having equipment that would normally be on when its not being used, connected to a PIR sensor reducing the time that it is on for. Hybrid Lighting Towers: This enables the energy (carbon) saved whilst using a VT Hybrid Lighting Tower to be calculated compared to a standard non hybrid lighting tower. If you know the savings from a different hybrid lighting tower please unhide the 'Hybrid Lighting Calculator' tab and change the savings data (which is the assumed carbon saving).
<i>Behaviour Initiatives</i>	Office Lighting: This calculates the average energy (carbon) saved from running a 'Switch It Off Campaign' ensuring lights were turned off at the end of a day/when not in use. Computers and Monitors: This calculates the average energy (carbon) saved from everyone switching off their computers at night and not leaving them on standby. Paper Recycling: This is the average carbon saved from encouraging employees to print double sided & two page per sheet of paper Water Saving Initiatives: This initiative enables the carbon savings from collecting/saving water on site to be quantified and included in this model.
<i>Procuring Electric Equipment</i>	This initiative quantifies the reduction in carbon from procuring electric equipment rather than standard fuel powered equipment for the same job. Please note, no savings will be awarded if the site is not connected to the national grid or there is no standard piece of fuel equipment.
<i>Additional Initiatives</i>	This tab enables the contractor to quantify any additional savings that is not documented in the other initiatives. Savings can be input as fuel, electric or carbon for convenience. This must be referenced for the savings to be accepted.
<i>Data entry - Electricity</i>	Enter your electricity data into the 'Data entry - electricity' tab, for the correct electricity type.
<i>Data Entry - Fuel</i>	Enter your fuel data into the 'Data entry - electricity' tab, for the correct fuel type.
<i>Scope 3 - VMPS Transport</i>	Please download your vehicle movements from the Crossrail Logistics software (VMPS - E3 Emissions download) and copy and paste the results into this tab. Please
<i>Scope 3 - Embodied Emissions</i>	Either use the Environment Agency Tool for calculating embodied emissions and copy and paste the results on the report tab into this spreadsheet or copy your own calculations into the grey total embodied emissions box.

3

Names of Individuals who are:	
Section Author (person completing the specific section)	Referee (person referred to for data for the section)

The purpose of the Instruction tab is to provide a quick reference guide on using the model. It consists of 3 main sections as shown above.

- 1- This is a quick checklist for the user to make sure all of the required data is provided.
- 2- A more detailed explanation of each tab and the required data.
- 3- This section asks for the name of the authors of the model. Remember these are grey cells which means data should be provided in them.

Report tab

ENERGY EMISSIONS PERFORMANCE REPORT											
Dates											
Quarter covered by this report (i.e. 2013/H-Q4)											
State the contract start period, current period and contract end period. These dates should align with the dates set for the energy baseline and energy percentage reduction. If the dates are not aligned, state both the energy baseline and reduction start and end periods and the contract start and end periods.	Start:	2010/H-P02	1								
	Current:	2015/H-P03									
	End:	2016/H-P13									
% Energy Reduction											
Cumulative current & end of contract % energy reduction	Current:	0.000%	End:	0.000%							
Total CO2e emissions (kg)	Cumulative Current with Savings	-	Cumulative Current without Savings	3							
Include a list of energy reduction initiatives either implemented or to be implemented here											
Progress statement											
Include a progress statement on meeting or not meeting the % energy reduction. Include actions taken in the current quarter and actions to be taken in next quarter											
State the reason for any significant changes in emissions since previous reporting period (for example scope change, data correction, added/subtracted savings)											
State exclusions from the emissions scope (fuel, electricity & vehicle movements) and provide justification.											
CO2e emissions											
Fuel emissions type	Unit	Emission factors									
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Diesel (average biofuel blend)	kg CO2e per litre	2.967	2.967	2.977	2.984	2.801	2.802	2.884	2.819	2.819	2.819
Diesel (100% mineral diesel)	kg CO2e per litre	2.894	2.894	2.899	2.877	2.871	2.859	2.816	2.802	2.802	2.802
Gas oil (aka Red diesel)	kg CO2e per litre	3.104	3.104	3.056	3.021	2.934	2.926	2.909	2.840	2.840	2.840
Petrol (average biofuel blend)	kg CO2e per litre	2.232	2.232	2.267	2.242	2.214	2.191	2.194	2.152	2.152	2.152
Natural Gas	kg CO2e per litre	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
LPG	kg CO2e per litre	1.955	1.955	1.940	1.933	1.933	1.932	1.939	1.971	1.971	1.971
Bioethanol 100%	kg CO2e per litre	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Biodiesel 100%	kg CO2e per litre	0.015	0.015	0.017	0.018	0.019	0.020	0.020	0.022	0.023	0.023
Biomethane 100%	kg CO2e per kg	0.004	0.004	0.005	0.005	0.006	0.006	0.006	0.007	0.007	0.007
UK electricity generated (Scope 2)	kg CO2e per kWh	0.494	0.495	0.452	0.460	0.445	0.494	0.452	0.455	0.455	0.455
UK electricity - transmission & distribution (Scope 3)	kg CO2e per kWh	0.039	0.039	0.039	0.038	0.038	0.043	0.039	0.041	0.041	0.041
Water	kg CO2e per m ³	0.344	0.344	0.344	0.344	0.344	0.344	0.344	0.344	0.344	0.344
Green Tariff Electricity - EDF	kg CO2e per kWh	0.259	0.259	0.259	0.259	0.259	0.259	0.259	0.259	0.259	0.259
Green Tariff Electricity - npower	kg CO2e per kWh	0.494	0.485	0.452	0.460	0.445	0.494	0.452	0.455	0.455	0.455
Green Tariff Electricity - Ecominity	kg CO2e per kWh	0.494	0.485	0.452	0.460	0.445	0.494	0.452	0.455	0.455	0.455
Green Tariff Electricity - Good Energy	kg CO2e per kWh	0.494	0.485	0.452	0.460	0.445	0.494	0.452	0.455	0.455	0.455
Green Tariff Electricity - UPL/Haven Power	kg CO2e per kWh	0.494	0.485	0.452	0.460	0.445	0.494	0.452	0.455	0.455	0.455

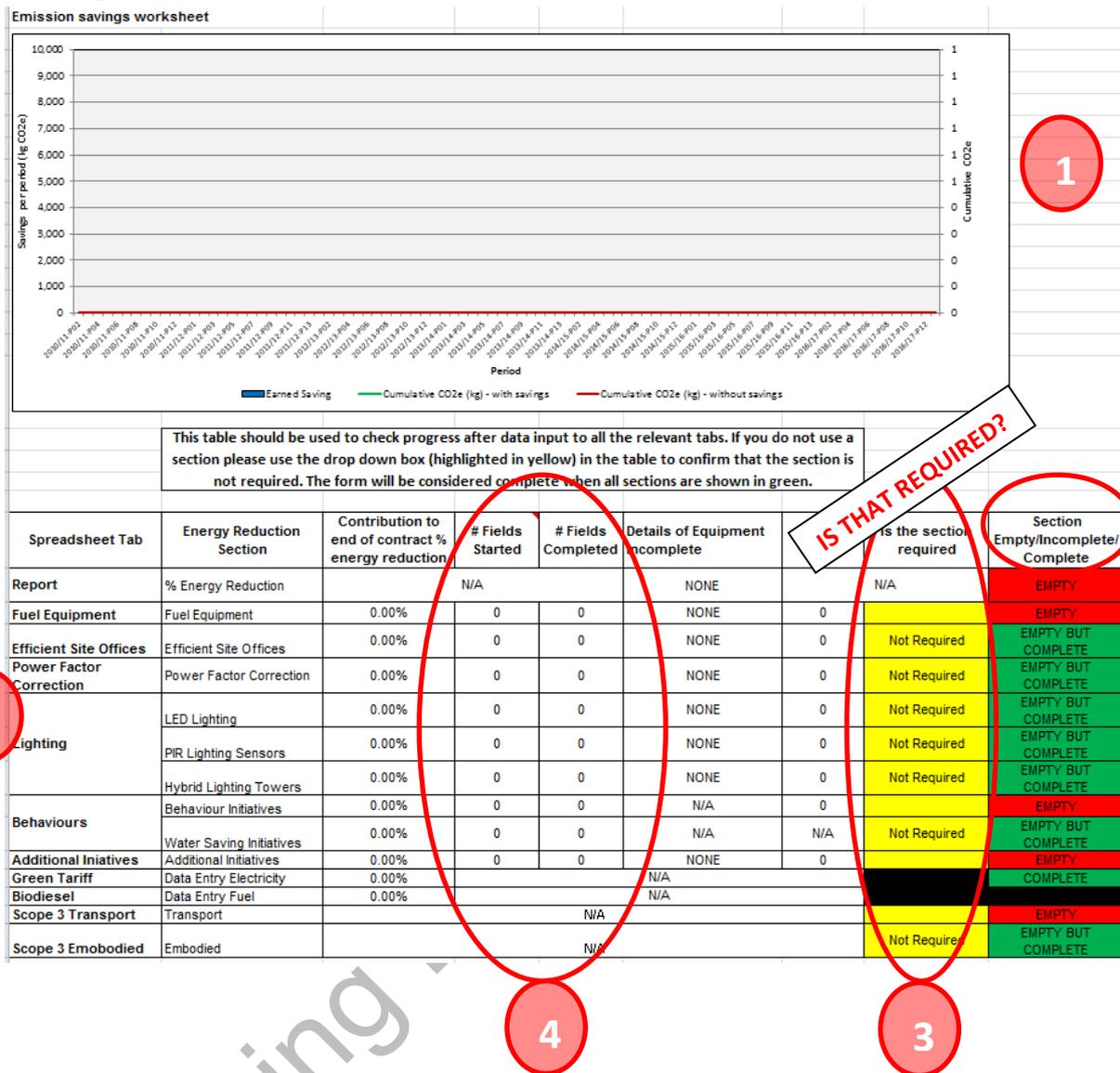
NOTE: Figures change on 31st of May the year after. Eg. 2014 figures expire on 31/05/2015

This tab takes generic information about the project.

- 1- In Part 1 the duration of the project is defined. Crossrail reports the carbon footprint every quarter. However the data is collected and calculated on a periodic basis. Therefore the following 4 items are required in this section. (All of the following must be selected from the dropdown menu provided.)
 - a. The quarter that this report is generated for.
 - b. Start date of the project
 - c. Current period
 - d. End date of the project
- 2- This is where the carbon emission saving from the beginning of the project up to the current period is displayed. This section is populated automatically when all of the required information provided in the model. (Remember only grey areas need to be filled by the user)
- 3- This is where an estimation of carbon saving up to the end of the project is displayed.
- 4- In this section you should write a few sentences on the progress of their work and provide details of any changes since last report.
- 5- These are the yearly carbon values obtained from [DEFRA database](#). Each year the conversion factors are published on 31st of May and therefore the relevant figures must be updated by the admin of the model. Black figures are from statistical data, Red figures are estimations and green numbers are grid specific carbon intensity for companies who provide green tariffs to their customers.

At the bottom of this tab, as the project is progressed, some graphs are generated to show the trend of carbon emissions during the lifespan of the project.

Saving Calculator tab



This tab is mainly used for verification purposes to make sure the model is correctly set up. It also provides a breakdown of the saving percentages from each initiative.

1. This graph develops through the lifespan of the project and shows the trend of carbon footprint per period.
2. This table shows the breakdown of the initiatives and if the relevant sections are complete.
3. This column is used to specify what sections of the model are applicable to the project. **If there is a type of initiative that is not used on the project, please select "Not Required" from the dropdown menu otherwise, leave it blank.**
4. Looking at these columns it can be confirmed if all of the necessary fields are complete. It shows how many fields was attempted to be filled and how many of which is completed. These two should be equal.
5. All of the items on this column should be green upon completion of the model. Any red cell indicates an error in the data entry process.

Fuel Equipment tab

This tab is used to introduce fuel equipment used on site which are more efficient than the baseline or the average similar equipment on the market. In this way the amount of carbon saved as a result of using a more efficient equipment can be calculated. There are a number of columns that can be used for introducing different equipment.

NOTE: Only efficient equipment must be listed NOT all of the equipment used on site.

NOTE: Each column should be assigned for one equipment.

NOTE: If there are two identical equipment with similar working conditions, instead of using two columns, adjust the quantity of one column.

1. This area will be repeated on top of each section and is used for general information about the tab. Author and Referee names should be selected from dropdown menus. The items shown in the dropdown menu are captured from the AUTHOR section in the Report tab as was explained above.

	0		
Author for section			This equ e exc
Referee for section			
2nd Referee (if applicable)			
Date (DD/MM/YY)		1	
Do you have an external fuel tank on site?			
External fuel tank size on site (l)			

DATA ENTRY FOR FUEL EQUIPMENT

Type of equipment being used			
Manufacturer & Model			
Tonne/Length/Kva of equipment being used			
Start period	2010/11-P01	2010/11-P01	20
End period	2010/11-P01	2010/11-P01	20
Quantity of equipment			
Hours used per day			
Average number of days equipment was used each period (out of the 28 total days in the period)			
Fuel type	Diesel (average biofuel blend)	Diesel (average biofuel blend)	Dies bio
Fuel Usage of Efficient Equipment on Site			
Option 1		2	
Make & model (if same as above)			
Please select the loading if available			
Option 2		OR	
Fuel consumption of equipment (litres/hour)			
Option 3	OR	OR	
Fuel tank size of equipment (litres)			
Number of refills of tank per period			
Option 4	OR	OR	
Fuel used by equipment each period (litres)			
Fuel Usage of Standard Site Equipment			
Calculated reduction in fuel consumption (%)	0.00%	0.00%	
OR	OR	OR	
Improvement that the equipment is compared to a standard piece of fuel equipment (%)			
If required have you provided references?			

VALIDATION FOR FUEL EQUIPMENT

Number of hours equipment is on per period	0	0
Fuel Consumption (Efficient/Held On Site)	0.0000	0.0000
Fuel Consumption (Standard/Baseline) (CALCULATIONS)	0.0000	0.0000
Percentage Contribution to End Energy Reduction	0.00%	0.00%

2. This area is used to enter the working condition and characteristics of the fuel equipment. Most of the cells are populated using dropdown menus. There are 5 options for calculating the savings from the equipment. As soon as data entered for one option the rest of them will be blacked out. Start and end dates of using the equipment and the fuel type are essential for making the calculations.
3. This area shows the overall saving percentage for each equipment. This forms a part of the end of contract saving percentage.

NOTE: The “Start Period” and “End Period” refer to the first period and the last period that the specific equipment has been used on site.

Efficient Site Office

Author for section	0				
Referee for section					
2nd Referee (if applicable)					
Date (DD/MM/YY)					
Efficient Site Cabins					
Name of site office					
Start period	2010/11-P01	2013/14-P05	2013/14-P05	2013/14-P05	2013/14-P05
End period	2018/19-P13	2013/14-P09	2013/14-P09	2013/14-P09	2013/14-P09
Site office efficiency rating (from EPC) Please select the exact value of rating (from EPC)	1				
Have you provided a scan/picture of EPC?					
Office Electricity Usage					
Green Tariff?					
Option 1					
% of total electricity consumption consumed by site office					
Option 2	OR	OR	OR	OR	OR
	Please only use this option when you have been monitoring the meter for the individual office cabins (kWh)				
2010/11-P01					
2010/11-P02					
2010/11-P03					
2010/11-P04					

Efficient site office tab is used when there are temporary site offices used on site which are more efficient than the baseline.

1. EPC rating of the site office is important for understanding the efficiency of it. The EPC certificate should be provided by the contractor. If the site office is connected to a green tariff electricity supply, it needs to be specified here.
2. There are 2 options for registering the energy consumption of the office in this section. The percentage of total electricity consumed on site is one way of doing this or alternatively, if the site is metered separately, the periodic electricity consumption of the office in kWh can be entered.

Lighting tab

Reduced Power Lighting					
Location					
Green Tariff?					
Start Period	2010/11-P01	2010/11-P07	2010/11-P01	2010/11-P01	2010/11-P01
End Period	2018/19-P08	2018/19-P08	2010/11-P01	2010/11-P01	2010/11-P01
Number of bulbs					
Efficient lights power (W)	1				
Please give details of efficient lights (type and model)					
Standard lights power (W)					
Please give details of standard lights (type and model)					
Number of hours per day lights are on					
Days per period lights are on (out of 28)					
VALIDATION FOR REDUCED POWER LIGHTING					
Percentage Contribution to End Energy Reduction	0.00%	0.00%	0.00%	0.00%	0.00%
PIR Lighting Sensors					
Location					
Green Tariff?				No	
Start Period	2010/11-P01	2010/11-P01	2010/11-P01	2010/11-P01	2010/11-P01
End Period	2011/12-P06	2011/12-P06	2010/11-P01	2010/11-P01	2010/11-P01
Average hours saved due to sensors per day	2				
Total power (kW) of lights connected to PIR Sensor					
Number of days PIR sensors operate each period (out of 28)					
VALIDATION FOR PIR SENSORS					
Percentage Contribution to End Energy Reduction	0.00%	0.00%	0.00%	0.00%	0.00%
Hybrid Lighting Towers					
Name of unit					
Name of unit (if not listed)					
Start Period	2012/13-P11	2012/13-P11	2010/11-P01	2010/11-P01	2010/11-P01
End Period	2014/15-P11	2014/15-P11	2010/11-P01	2010/11-P01	2010/11-P01
Fuel type	Diesel (100% mineral diesel)				
Quantity of equipment					
Hours used per day	3				
Average number of days equipment was used each period (out of the 28 total days in the period)					
Fuel saved per hour compared to standard lighting tower					
Has this figure above been referenced in the referencing tab?					
VALIDATION FOR HYBRID LIGHTING					
Percentage Contribution to End Energy Reduction	0.00%	0.00%	0.00%	0.00%	0.00%

In this tab savings from efficient lighting solutions will be captured.

- 1- If any efficient light bulb is used on site or office then the savings from them would be captured in this section. These lights should be compared to the conventional baseline light bulbs with similar light outputs. E.g. a 6W LED light bulb with 400 lumens output is comparable to a 40W normal light bulb with the same 300 Lumens output.
- 2- In this section details of PIR sensors that are used during construction should be entered.
- 3- If there are efficient lighting towers used on site then the savings can be calculated by entering the relevant data in this section. It is very important to select the right fuel type used by the light towers.

Behaviours tab

Promoting the culture of environment friendly living results in a reduction in carbon emissions. Examples of that are encouraging people to switch off unnecessary lights, switch off computers when not in use and printing double sided. Carbon Trust Group published estimated emission factors that can be used to calculate these types of savings. The “Behaviour” tab in Crossrail carbon model is designed to capture these savings.

BEHAVIOUR INITIATIVES			
Initiative Type	Office Lighting		
Start (year)	2012/13-P11	2010/11-P02	2010/11-P03
End (year)	2018/19-P02	2010/11-P02	2010/11-P03
Number of employees on site			
Initiative Type	Computers and monitors		
Start (year)	2012/13-P11	2010/11-P02	2010/11-P03
End (year)	2018/19-P02	2010/11-P02	2010/11-P03
Number of employees on site			
Initiative Type	Printing & Paper		
Start (year)	2012/13-P11	2010/11-P02	2010/11-P03
End (year)	2018/19-P02	2010/11-P02	2010/11-P03
Number of employees on site			

The following information is required for calculating the savings:

1. Start date
2. End date
3. Number of people working on site.

For example if there have been 100 people working from period 1 to period 5 and then increased to 150 people from period 6 to 8 and then reduced to 70 people from period 9 to 11 then this tab should be completed as follows:

Initiative Type	Office Lighting		
Start (year)	2012/13-P01	2012/13-P06	2012/13-P09
End (year)	2012/13-P05	2012/13-P08	2012/13-P11
Number of employees on site	100	150	70

Other Initiatives tab

Since each project is different in nature, the carbon model should be as flexible as possible to accommodate all of the specific requirements of the projects. Therefore, this tab is provided to enable users calculate the carbon savings from any other initiative that were not covered in the previous tabs.

Additional Initiatives	
1 Initiative Type	
2 Scope	
3 Initiative Referencing (where/what calculations have been done)	
4 Please specify what is being recorded below	
5 Unit of measure for data entry	
6 2010/11-P01	
7 2010/11-P02	
8 2010/11-P03	
9 2010/11-P04	
0 2010/11-P05	

- 1- A title for the initiative should be typed in this area.
- 2- Please select scope 1 or scope 2 from the dropdown menu provided here.
- 3- A quick reference to the background calculations for the initiative.
- 4- Using this dropdown menu the type of information provided is specified. It is absolutely necessary to select the right option here. Information can generally be provided in the form of equivalent carbon dioxide, fuel or electricity. For example if a specific type of fuel is selected in the next section the amount of that fuel which has been saved should be entered.
- 5- This section will be populated automatically based on your selection in section 4. This will specify the unit of the numbers that should be entered in section 6. For example if it shows "kWh" it means you the number of kWh's saved by this initiative should be recorded below.
- 6- This is where the savings per period should be recorded. Make sure the unit of the numbers entered in this space matches the unit shown in section 5.

Data Entry Fuel tab

This tab is designed to capture the actual fuel consumption on site. It is the real amount of fuel that has been purchased and used on site. The fuel consumption should be recorded on a periodic basis. Therefore to fill in this section simply enter the amount of fuel consumed in the relevant period under the relevant fuel.

NOTE: For entering biodiesel consumption data, it is important to specify what percentage of biodiesel is in the blend used. This can be specified as a percentage in the space provided on top of the biodiesel column. Also shown on the photo below:

Fuel consumption (litres)											
Period	Diesel (average biofuel blend)	Diesel (100% mineral diesel)	Gas oil (aka Red diesel)	Petrol (average biofuel blend)	Natural Gas	LPG	Bioethanol 100%	Biodiesel	Biomethane 100%	Other fuel value	Other fuel value 2
2010/11-P01											
2010/11-P02											
2010/11-P03											
2010/11-P04											
2010/11-P05											
2010/11-P06											
2010/11-P07											
2010/11-P08											

If you want to report on a specific biodiesel blend of Z%, please enter the Z% here.
 Then conversion factor is calculated as follows:
 M = 100% mineral diesel conversion factor
 B = 100% biodiesel conversion factor
 Z% biodiesel blend conversion factor = $[Z\% \times B] + [(1-Z\%) \times M]$

Biodiesel Percentage

Data Entry Electricity tab

In this tab the actual electricity used on site should be recorded on a periodic basis. If a green tariff for electricity is used, then the data should be entered in the second column. Make sure that the provider company is selected in the space provided on top of the "Green Tariff" column.

Electricity consumption (kWh)					
Period	normal grid mix	GreenTariff (Select your Provider)	onsite renewables	quality CHP	Total (KWH)
2010/11-P01					0
2010/11-P02					0
2010/11-P03					0

- 1- Normal electricity consumption record to be entered in this column
- 2- The provider company to be selected here
- 3- Electricity consumptions to be entered here

Reference tabs:

These 2 tabs can freely be used from providing back ground information. This can include calculation methods, reference to external sources etc.

Appendix A

Additional administration information

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Background calculation tabs

This section includes important information on the background calculation tabs:

Actual-CO2 Calculations

This sheet calculates all of the savings based on the green tariff energy usage (if applicable) and yearly carbon factor values.

- Columns marked in green are new columns relating to green calculations.
- Columns S to AD show a breakdown of savings per period
- Column AE shows the amount of savings associated with green tariff.
- Column AK to BC are the data ready to be extracted for reporting purposes.
- The Start of contract period will automatically turn **Amber**
- The current period will automatically turn **Yellow**
- The end of contract period will automatically turn **Blue**
- Column AG, AH & AI are purely used for Vlookups across the whole model to return the correct yearly carbon factor from the table in the Report tab

How to enter carbon factor for energy providers other than EDF

A) The company is already included in the report tab:

All of the carbon factors for green companies (except EDF) are now equal to normal UK average value. If you have a grid mix specific value for one of them simply change the value to the correct figure in the Report tab. Make sure you change all of the cells from column C to L. The exception is made for EDF on the basis that it has a fully certified and suited green tariff with an attributed lower carbon factor.

B) The company is not included in the table:

NOTE: Please follow this procedure very carefully and precisely, otherwise you will get wrong output caused by broken formulas. i.e. when it says "Drag" you must only drag..! DO NOT cut or copy and paste..!

Data Entry Electricity tab

- 1) Select cells I4:I15 and change the text colour to black to unhide the text.
- 2) Select the last company before "Other" and a few more cell below that. i.e. cells I8:I16
- 3) Drag and move your selected cells one step down to make a gap for your new company.
- 4) Enter the new company's name in the gap.
- 5) Change the text colour back to white to hide it.

Report tab:

- 1) Right Click on the left hand side row number of the row 34 and click on Insert Row
- 2) The company name is populated by a formula. Therefore you need to select the company name above the gap you just created and then drag the formula down to fill the gap. (It must show then new company's name if you have done everything right. If not STOP and check everything again)
- 3) Fill the relevant data in the new row added to the table.

Additional Initiatives tab:

- 1) In additional initiative tab select K14:V49 and change the text colour from white to black to see the carbon factor table there
- 2) To open up a space for the new company Select the last row of the carbon factor table plus the rest of the unhidden table below that (currently K32:V49) and drag it one row down.

Fuel emissions type	Unit	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Equivalent Carbon Dioxide	kg	1	1	1	1	1	1	1	1	1	1
Diesel (average biofuel blend)	l	2.5672167	2.5672	2.5767	2.5835	2.6008	2.6024	2.6113	2.6194	2.6194	2.6194167
Diesel (100% mineral diesel)	l	2.6838158	2.6838	2.6799	2.6769	2.6705	2.6691	2.6657	2.6624	2.6624	2.6623333
Gas oil (aka Red diesel)	l	3.1037512	3.1038	3.056	3.0213	2.9343	2.9258	2.8808	2.8399	2.8399	2.8399075
Petrol (average biofuel blend)	l	2.2923833	2.2924	2.2669	2.2423	2.2144	2.1914	2.1736	2.1518	2.1518	2.1518024
Natural Gas	l	0.0020268	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.0020307
LPG	l	1.5547722	1.5548	1.5396	1.5326	1.4929	1.5023	1.484	1.471	1.471	1.4709551
Bioethanol 100%	l	0.0061667	0.006	0.0059	0.0057	0.0056	0.0054	0.0053	0.0051	0.005	0.0048167
Biodiesel 100%	l	1.3431912	1.3497	1.3483	1.3472	1.3446	1.3443	1.3431	1.342	1.3425	1.34298
Biomethane 100%	kg	0.0038333	0.0043	0.0047	0.0052	0.0056	0.0061	0.0065	0.007	0.0074	0.0078833
UK electricity generated (Scope 2)	kWh	0.49381	0.4853	0.4521	0.46	0.4455	0.4943	0.4938	0.4853	0.4853	0.48531
UK electricity - transmission & distribution (Scope 3)	kWh	0.0391	0.0391	0.0366	0.0363	0.0381	0.0432	0.0406	0.041	0.041	0.041049
Water	m3	0.3441	0.3441	0.3441	0.3441	0.3441	0.3441	0.3441	0.3441	0.3441	0.3441
Green Tariff Electricity - EDF	kWh	0.259	0.259	0.259	0.259	0.259	0.259	0.259	0.259	0.259	0.259
Green Tariff Electricity - npower	kWh	0.49381	0.4853	0.4521	0.46	0.4455	0.4943	0.4938	0.4853	0.4853	0.48531
Green Tariff Electricity - Ecotricity	kWh	0.49381	0.4853	0.4521	0.46	0.4455	0.4943	0.4938	0.4853	0.4853	0.48531
Green Tariff Electricity - Good Energy	kWh	0.49381	0.4853	0.4521	0.46	0.4455	0.4943	0.4938	0.4853	0.4853	0.48531
Green Tariff Electricity - UPL/Haven Power	kWh	0.49381	0.4853	0.4521	0.46	0.4455	0.4943	0.4938	0.4853	0.4853	0.48531
Scope 1											
Scope 2											
Descending	Assending										
5	1 Scope 1	Generator			10						
3	3 Scope 2	led			21						
4	2 Scope 1	hydroger			12						
2	4 Scope 2	solar			23						
1	5 Scope 2	wind			24						
1	Scope 1	Generator			Scope 2	wind					
2	Scope 1	hydrogen			Scope 2	solar					
3	Scope 2	led			Scope 2	led					
4	Scope 2	solar			Scope 1	hydrogen					
5	Scope 2	wind			Scope 1	Generator					

Fuel emissions type	Unit	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Equivalent Carbon Dioxide	kg	1	1	1	1	1	1	1	1	1	1
Diesel (average biofuel blend)	l	2.5672167	2.5672	2.5767	2.5835	2.6008	2.6024	2.6113	2.6194	2.6194	2.6194167
Diesel (100% mineral diesel)	l	2.6838158	2.6838	2.6799	2.6769	2.6705	2.6691	2.6657	2.6624	2.6624	2.6623933
Gas oil (aka Red diesel)	l	3.1037512	3.1038	3.056	3.0213	2.9343	2.9258	2.8808	2.8399	2.8399	2.8399075
Petrol (average biofuel blend)	l	2.2923833	2.2924	2.2669	2.2423	2.2144	2.1914	2.1736	2.1518	2.1518	2.1518024
Natural Gas	l	0.0020268	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.0020307
LPG	l	1.5547722	1.5548	1.5396	1.5326	1.4929	1.5023	1.494	1.471	1.471	1.4709551
Bioethanol 100%	l	0.0061667	0.006	0.0059	0.0057	0.0056	0.0054	0.0053	0.0051	0.005	0.0048167
Biodiesel 100%	l	1.3491912	1.3497	1.3483	1.3472	1.3446	1.3443	1.3431	1.342	1.3425	1.34298
Biomethane 100%	kg	0.0038333	0.0043	0.0047	0.0052	0.0056	0.0061	0.0065	0.007	0.0074	0.0078833
UK electricity generated (Scope 2)	kWh	0.49381	0.4853	0.4521	0.46	0.4455	0.4943	0.4938	0.4853	0.4853	0.48531
UK electricity - transmission & distribution (Scope 3)	kWh	0.0391	0.0391	0.0386	0.0363	0.0381	0.0432	0.0406	0.041	0.041	0.041049
Water	m3	0.3441	0.3441	0.3441	0.3441	0.3441	0.3441	0.3441	0.3441	0.3441	0.3441
Green Tariff Electricity - EDF	kWh	0.259	0.259	0.259	0.259	0.259	0.259	0.259	0.259	0.259	0.259
Green Tariff Electricity - npower	kWh	0.49381	0.4853	0.4521	0.46	0.4455	0.4943	0.4938	0.4853	0.4853	0.48531
Green Tariff Electricity - Ecotricity	kWh	0.49381	0.4853	0.4521	0.46	0.4455	0.4943	0.4938	0.4853	0.4853	0.48531
Green Tariff Electricity - Good Energy	kWh	0.49381	0.4853	0.4521	0.46	0.4455	0.4943	0.4938	0.4853	0.4853	0.48531
Green Tariff Electricity - UPLiHaven Power	kWh	0.49381	0.4853	0.4521	0.46	0.4455	0.4943	0.4938	0.4853	0.4853	0.48531
Scope 1											
Scope 2											
Descending	Assending										
	5	1 Scope 1	Generator	10							
	3	3 Scope 2	led	21							
	4	2 Scope 1	hydrogen	12							
	2	4 Scope 2	solar	23							
	1	5 Scope 2	wind	24							
	1 Scope 1	Generator	Scope 2 wind								
	2 Scope 1	hydrogen	Scope 2 solar								
	3 Scope 2	led	Scope 2 led								
	4 Scope 2	solar	Scope 1 hydrogen								
	5 Scope 2	wind	Scope 1 Generator								

- 3) Select the row above the blank one and copy all of the formulas down to fill the last **TWO** rows.
- 4) Make sure the data is correctly shown on the table
- 5) Select the whole box again and change the text colour into white.