A TSA GUIDE

TO

THE CARBON TRUST

CARBON FOOTPRINT CALCULATOR

APRIL 2008

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1. Introduction

The ability of an organisation to calculate its carbon footprint allows it to determine which of its activities is having the greatest impact and enable it to put in place a prioritized programme to reduce greenhouse gas emissions. It will be able to track its progress over time.

There are many calculators available on the internet. The Technical and Standards Committee of the TSA recommends the Carbon Trust Calculator. The Carbon Trust was created by the UK government to help businesses and public organisations to reduce their emissions of carbon dioxide into the atmosphere, through improved energy efficiency and development of low carbon technology. It is easy to access through its website www.carbontrust.co.uk and has a large selection of publications which TSA members may find useful. It is also the portal for access to government loans which are intended to help businesses move to low carbon technology.

The Calculator focuses on key emission sources from the use of fossil fuels, electricity and transport. However, it does NOT cover the wider greenhouse emissions your organization may be responsible for through its supply chain, production of waste and other activities. If you want to accurately quantify these impacts you will need to undertake a Life-Cycle Analysis, usually with the help of a trained consultant.

If you wish your carbon footprint calculations to be independently assessed there are consultants who will act as third party verifiers to check the accuracy of your results.

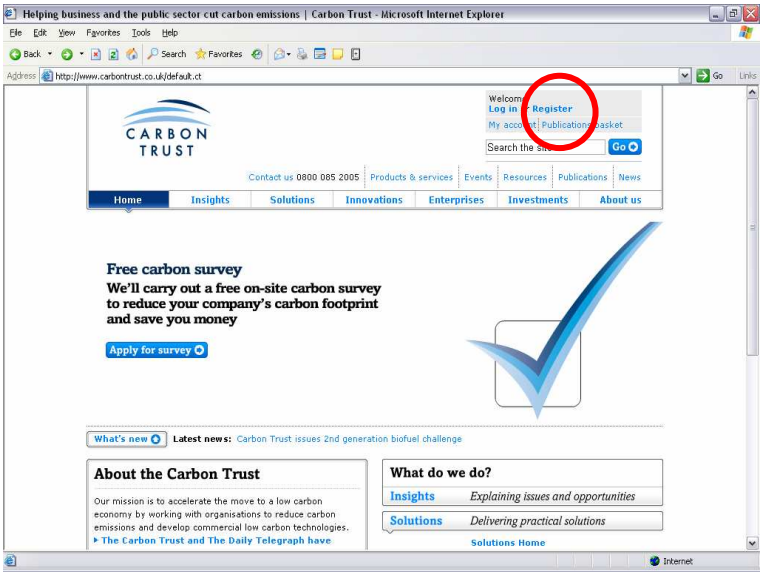
Although there is a 'calculator help' document on the Carbon Trust website it is generic. Using this as a starting point we have written this guide specifically for the textile services industry. This guide will tell you what information you will need to gather, it will help you convert this information into the correct 'units' for the Calculator and it will take you through a worked example that uses information from a real laundry.

Annex A contains a glossary of terms which are used on the Carbon Trust website. You should familiarize yourself with them before looking through the site.

2. Access to the Carbon Trust Calculator

The Carbon Trust website contains a Carbon Footprint Indicator tool which allows you to carry out a rough estimate of your carbon footprint based on your electricity and gas consumption only. If you want access to the more rigorous Carbon Trust Calculator you will need to register with the Carbon Trust.

This is easy to do by clicking the 'Register' button on www.carbontrust.co.uk. You will be asked for some basic details and to provide a password. Your registration will be confirmed by email.



3. Some decisions before you start

Before you start you need to decide:

1. The time period to be covered. Generally carbon footprint calculators are used to calculate the carbon footprint of a full year. In which case you need to decide the start year and month e.g. January 2007 or you may chose a date that coincides with the organizations financial year e.g. April 2006.

2. The footprint organizational boundary. If you are a laundry which operates out of a single site then your boundary will cover all of your activities. If you are an organization with multiple sites e.g. several laundries and a distribution centre, then you must decide what to include, for example

    a) You may decide to calculate the footprint of a single laundry without including emissions due to the transport of goods.
    b) Or you may decide to calculate the footprint of that laundry plus the emissions due to the vehicles which are normally based at that site.
    c) Or you may use a carbon footprint calculation to determine the environmental impact of using a distribution centre versus direct deliveries from laundry to end-user.

The larger and the more complex your organization the more care you will need to take when deciding your organizational boundary. You will also need to take more care when gathering information to ensure there is no undercounting or double counting.

4. Overview of the Calculator

The Calculator will take you through five steps:

These steps will take you through a number of screens into which you will need to enter data on the following:

Direct emissions - Scope 1

Direct emissions are from the use of fossil fuels and emissions from vehicles that the organization owns. Scope 1 emissions can only ever be reported by a single organization.

Indirect emissions - Scope 2

Indirect (imported utilities) emissions include emissions from the generation of electricity, heat or steam which the organization imports onto its site.

Other indirect emissions - Scope 3

Other indirect emissions include emissions which an organization indirectly causes e.g. through its purchase of goods or services (including water), its creation of waste or through the use of transport which it does not own. Scope 2 and scope 3 emissions reported by one organization will be the scope 1 emissions of a different organization. For example an organization using electricity has scope 2 emissions but the emissions from the generation of the electricity are also the scope 1 emissions of the electricity generating company.

5. Information you will need to gather

Below is a list of the information you will need to gather for the time period you have chosen. Conversion factors you may need to use in order to put the data in the Calculator are also provided below.

5.1 Fuel usage (Scope 1 direct emissions)

This includes all natural gas, oil or fossil fuels used onsite. The data you have on these different types of fuel may be quoted in a variety of units. See the table below.

Type of Fuel	Unit options
Burning oil	kWh / tonnes / litres
Coal	kWh / tonnes
Coking coal	kWh / tonnes
Diesel	kWh/ tonnes / litres
Petrol (motor spirit)	kWh/ tonnes / litres
Fuel oil	kWh / tonnes
Gas (natural)	Therms / kWh
Gas oil	kWh / tonnes / litres
LPG	Therms / kWh / litres

You may also find the following conversion table helpful.

	By weight		By volume
Solid Fuels	litres / tonne	**kWh / tonne**	**kWh / litre**
Coal	-	**7,417**	-
Coke	-	**8,445**	-
Liquid Fuels	litres / tonne	**kWh / tonne**	**kWh / litre**
Liquefied petroleum gas	1,850	**13,721**	**7.4**
Gas / diesel oil	1,187	**12,668**	**10.7**
Petrol (motor spirit)	1,362	**13.087**	**9.6**
Fuel oil	1,031	**12,087**	**11.7**
Gaseous fuels	litres / tonne	kWh / tonne	**kWh / cubic metre**
Natural gas	-	-	**11.00**

5.2 Owned road transport (Scope 1 direct emissions)

This is only needed if the organisation owns cars, vans, trucks or buses. To make the Calculator easy to use you should aggregate details of similar vehicles that you own. For example if you own 12 medium sized cars you should calculate the total distance travelled by all these cars in the 12 month period being assessed.

The Calculator groups vehicles by fuel type and by vehicle size. These determine the units used to enter data into the Calculator. See table below.

Fuel type	Vehicle type	Unit options
Diesel	Lorry	Litres fuel
	Bus	Total miles / total km / litres fuel
	Van	Litres fuel
	Large car > 2 litres	Total miles / total km / litres fuel
	Medium car 1.7 – 2 litres	Total miles / total km / litres fuel
	Small car < 1.7 litres	Total miles / total km / litres fuel
Hybrid (petrol)	Large car	Total miles / total km / litres fuel
	Medium car	Total miles / total km / litres fuel
LPG	Car	Litres fuel
Petrol	Van	Litres fuel
	Large car > 2 litres	Total miles / total km / litres fuel
	Medium car 1.4 – 2 litres	Total miles / total km / litres fuel
	Small car < 1.4 litres	Total miles / total km / litres fuel
	Large motorbike > 500cc	Total miles / total km / litres fuel
	Medium motorbike 125 – 500cc	Total miles / total km / litres fuel
	Small motorbike < 125cc	Total miles / total km / litres fuel

5.3 Owned ships or airplanes (Scope 1 direct emissions)

This is only needed if the organisation owns ships or airplanes. The data you have on the different types of fuel used may be quoted in a variety of units. See the table below.

Type of Fuel	Unit options
Aviation spirit	kWh / tonnes / litres
Aviation turbine fuel	kWh / tonnes / litres
Coal	kWh / tonnes
Diesel	kWh/ tonnes / litres
Fuel oil	kWh / tonnes
Petrol	kWh / tonnes / litres

5.4 Process emissions (Scope 1 direct emissions)

It is highly unlikely that the activities of a member of the TSA will give rise to any of the following process or fugitive emissions. In the unlikely event that you do you will be asked if

you know what volumes of emissions your organisation creates. If you do not know the volumes you will be able to enter unknown in the calculator.

Mineral product manufacturing eg cement
Chemicals manufacturing eg ammonia
Metal production eg steel
Energy industry – fuel production eg coal mining
Halocarbon production
Halocarbon of SF6 use
Organic waste management

5.5 Biofuels or biomass as a fuel source (Scope 1 direct emissions)

Although these are considered carbon neutral at point of use their production can lead to significant emissions. If you have details of these emissions they should be listed under 'other emissions.

5.6 Electricity (Scope 2 indirect emissions)

You need to calculate the total amount of electricity used over the 12 month period in kWh. Electricity usage is reported in kWh on your electricity bill.

If you generate electricity onsite you should not enter it as a Scope 2 emission (unless you sell the electricity to a supplier and purchase it back from them). Any fuel used to generate electricity on site that is not sold to a supplier should be entered under Scope 1 emissions.

Usage should be calculated separately for electricity from Grid, Renewables or CHP as defined in the glossary below.

5.7 Heat or steam (Scope 2 indirect emissions)

The Carbon Trust Calculator cannot currently calculate values from these emission sources. If you import steam or heat you should list them as unquantified in the final part of the Calculator.

5.8 Business travel (Scope 3 other indirect emissions)

In the Calculator the details of employees business travel in vehicles not owned by the company are aggregated by road, rail and air transport. (Note that employee travel to and from work may also be included in the calculation by including it in this section.)

For employee travel in vehicles the Calculator groups vehicles by fuel type and by vehicle size. These determine the units used to enter data into the Calculator. See table below.

Fuel type	Vehicle type	Unit options
Diesel	Lorry	Litres fuel
	Bus	Total miles / total km / litres fuel
	Van	Litres fuel
	Large car > 2 litres	Total miles / total km / litres fuel
	Medium car 1.7 – 2 litres	Total miles / total km / litres fuel
	Small car < 1.7 litres	Total miles / total km / litres fuel
Hybrid (petrol)	Large car	Total miles / total km / litres fuel
	Medium car	Total miles / total km / litres fuel
LPG	Car	Litres fuel
Petrol	Van	Litres fuel
	Large car > 2 litres	Total miles / total km / litres fuel
	Medium car 1.4 – 2 litres	Total miles / total km / litres fuel
	Small car < 1.4 litres	Total miles / total km / litres fuel
	Large motorbike > 500cc	Total miles / total km / litres fuel
	Medium motorbike 125 – 500cc	Total miles / total km / litres fuel
	Small motorbike < 125cc	Total miles / total km / litres fuel

For employee travel by air the Calculator groups data by domestic, short haul and long haul.

For employee travel by train or tube the Calculator groups data by national, light and underground.

All distances for air and rail travel are in total passenger kilometres, which is the sum of the distance travelled by each individual.

5.9 Other Emissions (Scope 3 other indirect emissions e.g. water, waste)

The Carbon Trust Calculator cannot currently calculate emissions associated with the purchase of water or the disposal of waste. However, it does allow you to enter values for these emissions if you have obtained them from other sources under the 'other emissions' section.

TSA has researched the following data:

1000m^3 water = 0.30 tonnes of carbon (e)
1 tonne general waste* = 5.4 tonnes of carbon (e)
1 tonne recycled paper = 4.0 tonnes of carbon (e)
1 tonne recycled card = 1.35 tonnes of carbon (e)

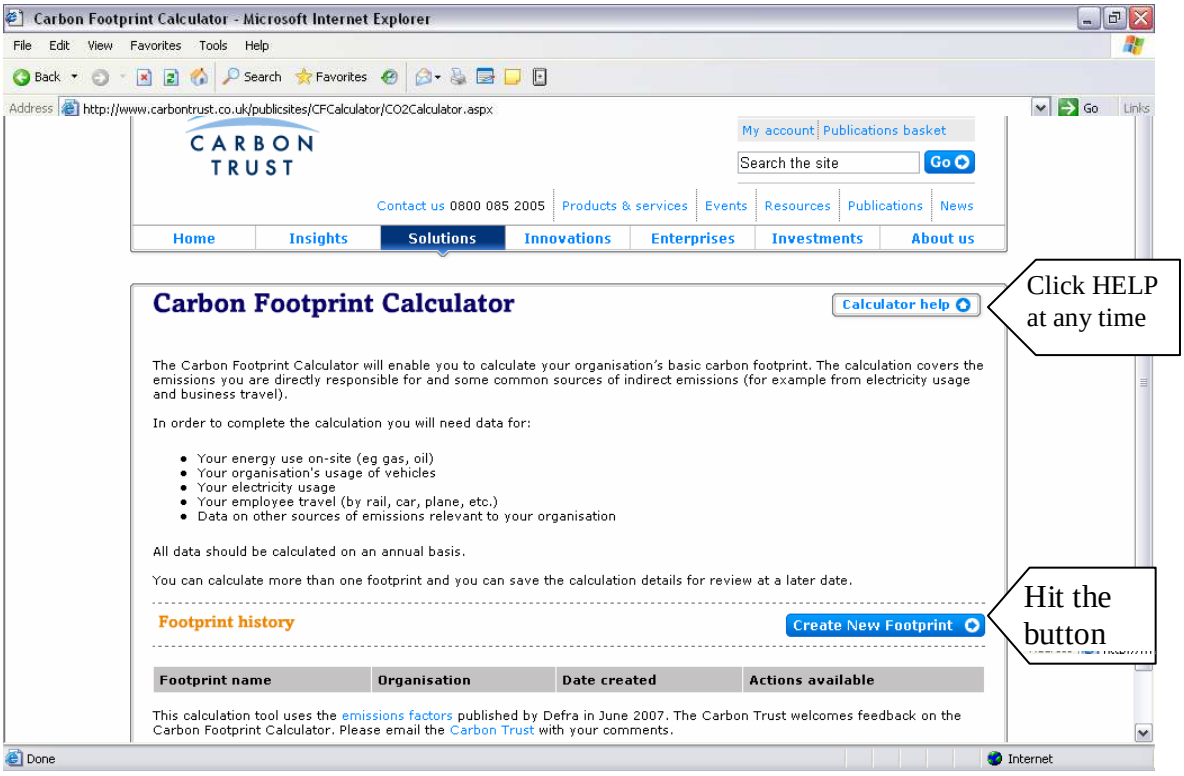
* based on 'office waste' = 40% paper, 25% card, 17.5% plastic, 17.5% aluminium cans

6. Using the Calculator / Worked Example

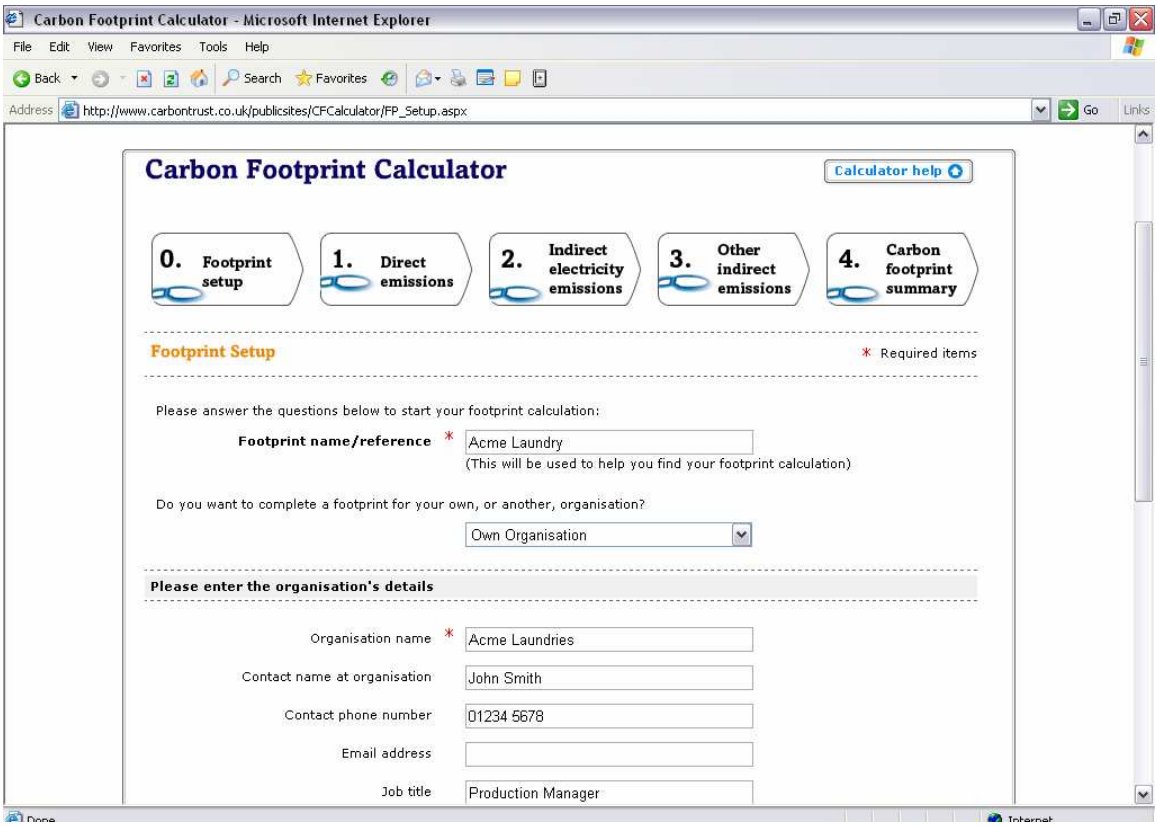
The registration screen for the CT was shown above on page 1. After registration you can enter the site-proper and begin to fill in the screens as presented with the data you have collected in preparation.

You will be shown the FIVE steps for the completion of the Calculator:

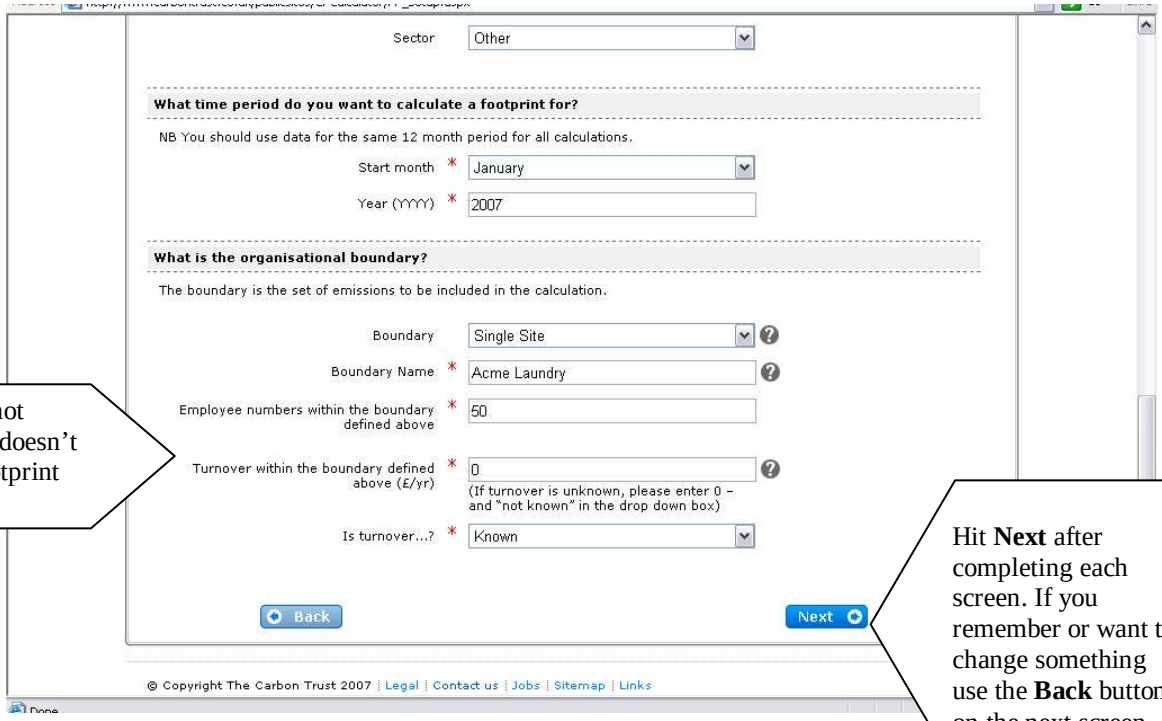
First page…Creating a new footprint



Page 2…Your details



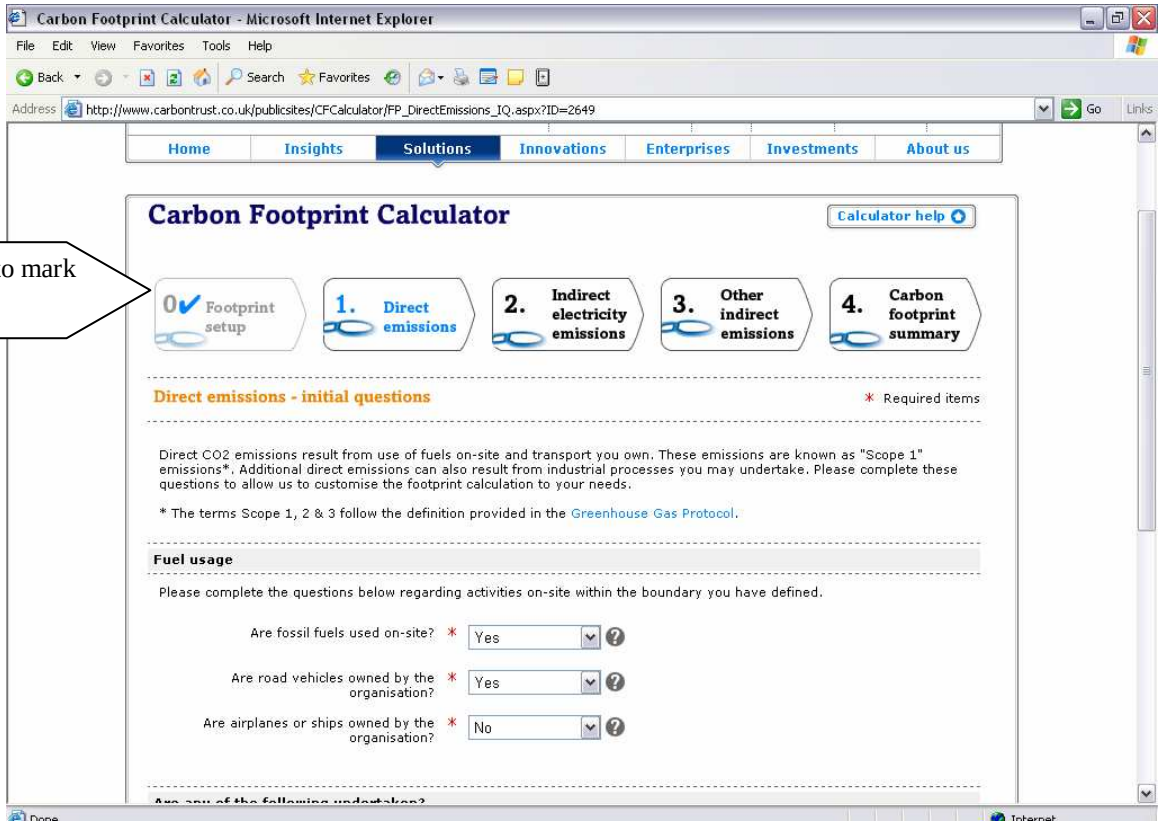
Scroll down….



Turnover is not necessary; it doesn't affect the footprint calculation

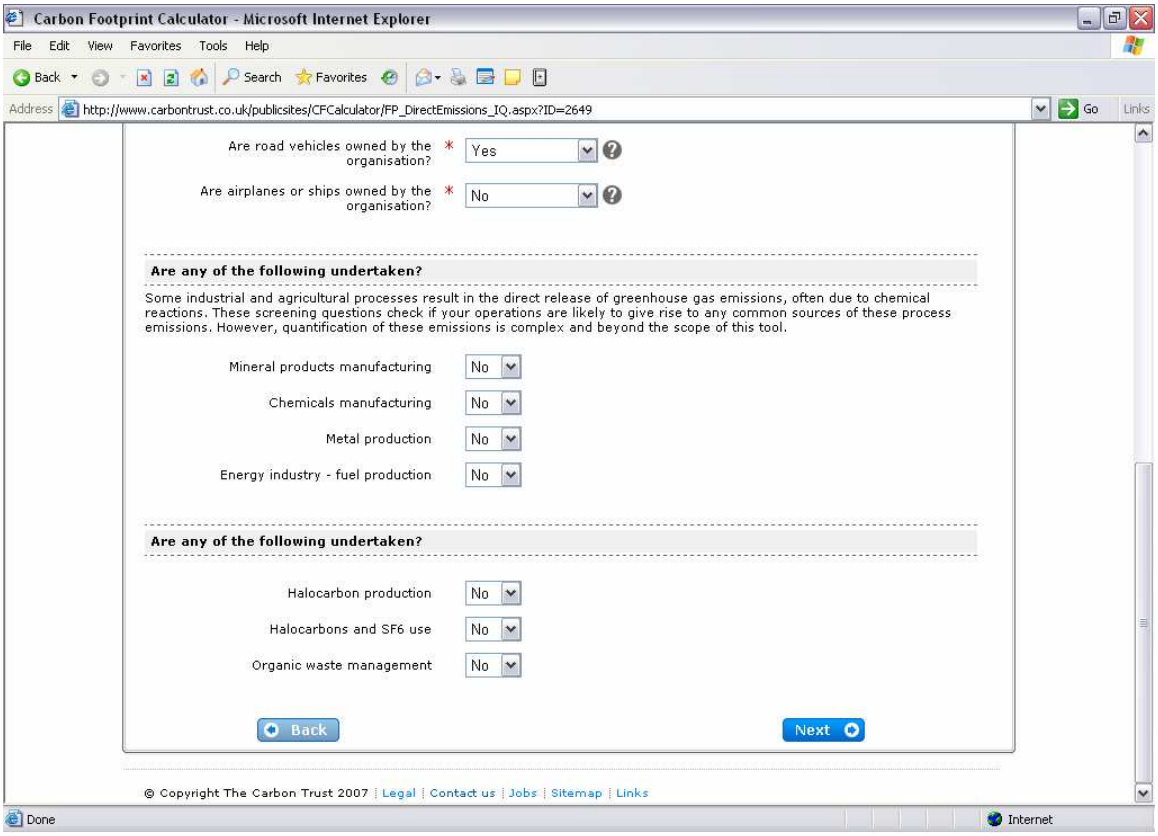
Hit **Next** after completing each screen. If you remember or want to change something use the **Back** button on the next screen

Page 3… setting up Direct emissions entry

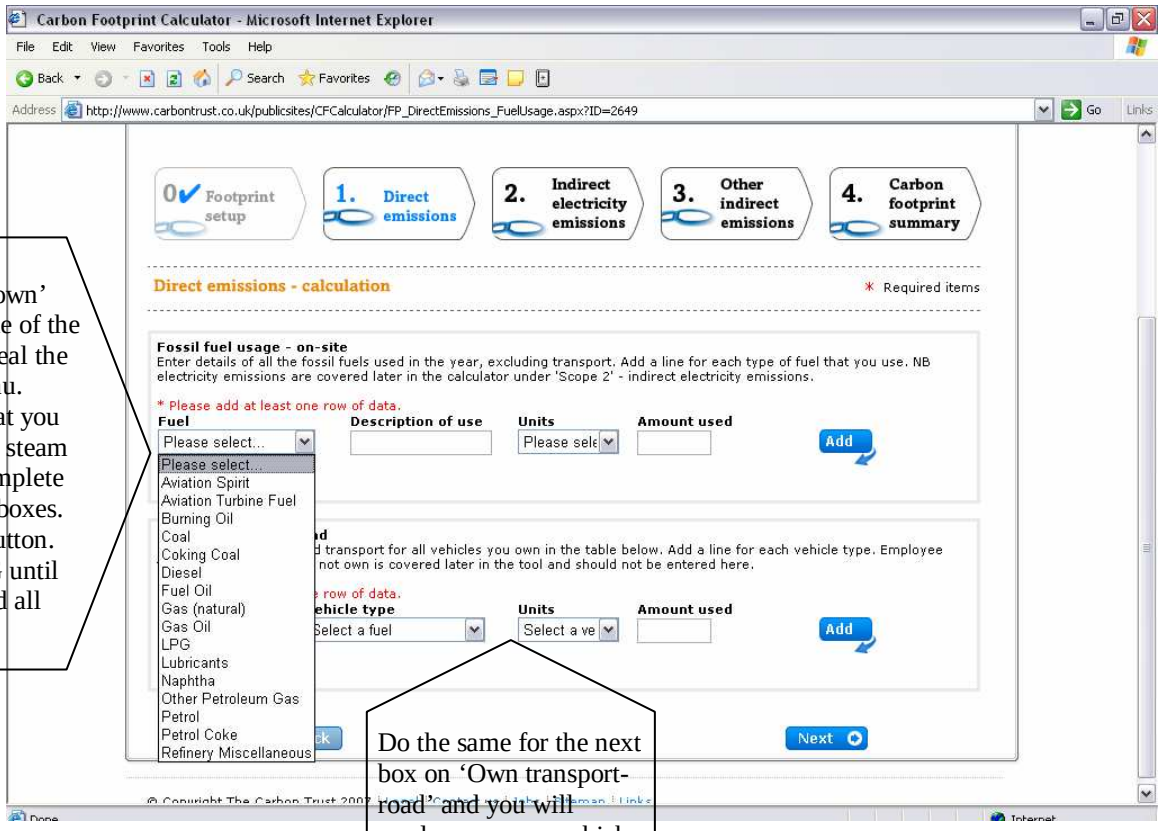


You got a tick to mark your progress!

Scroll down…



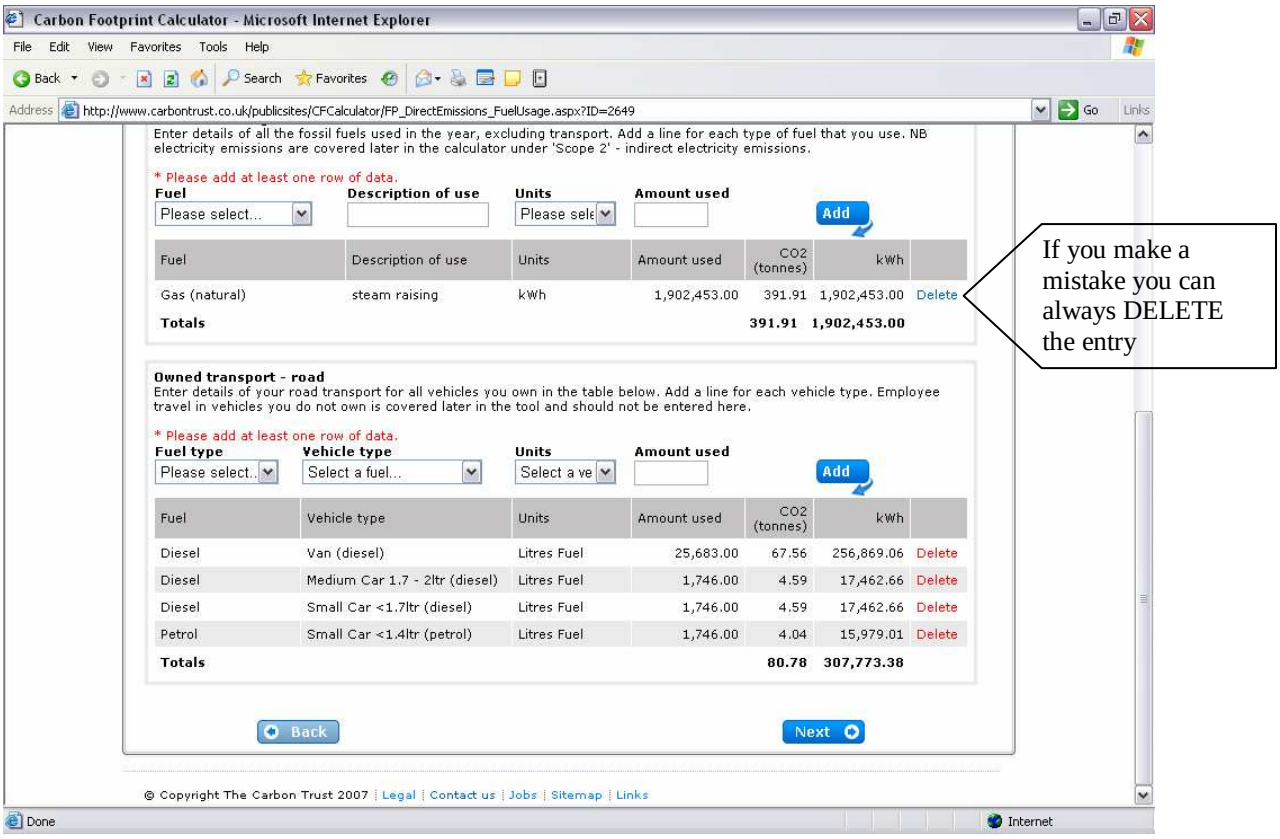
Page 4…



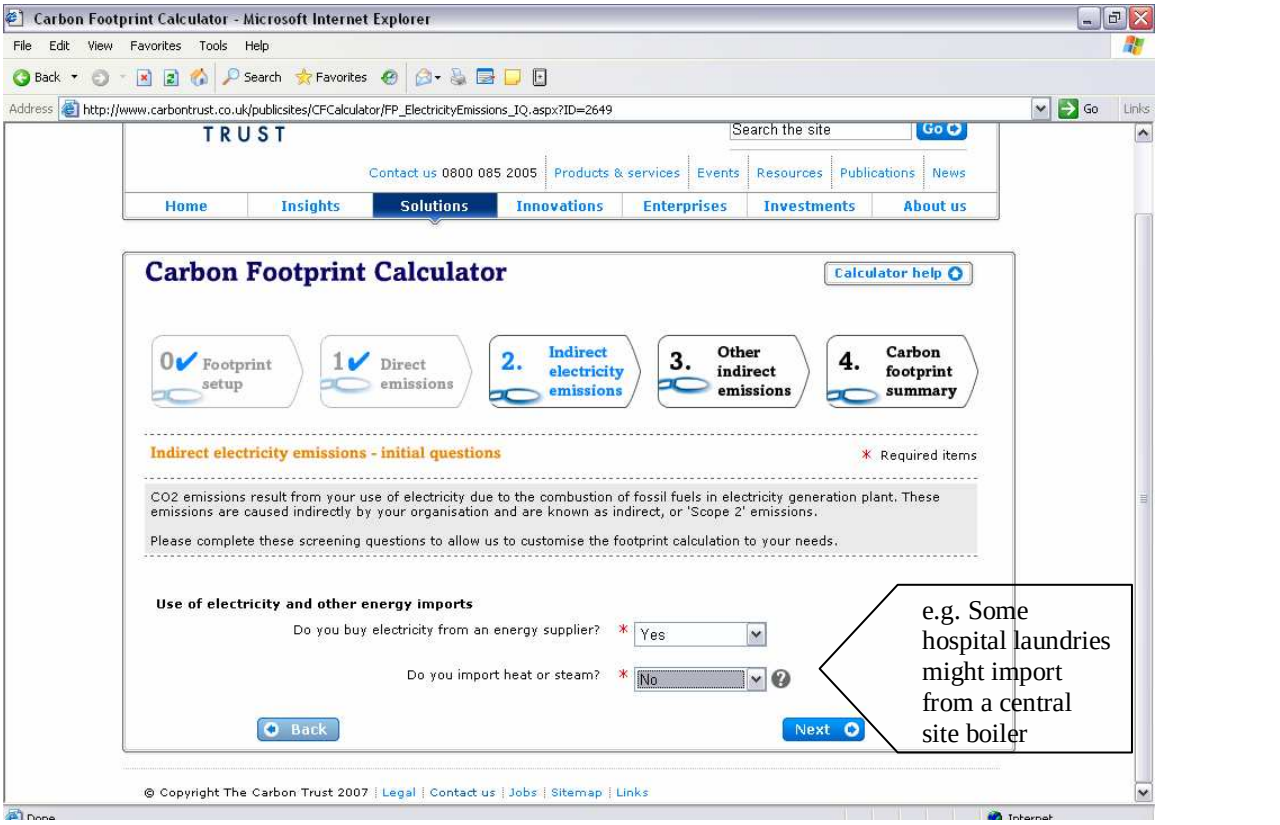
Hit the little 'down' arrow at the side of the Fuel box to reveal the drop down menu. Select a fuel that you use, usually for steam raising, and complete the other three boxes. Hit the ADD button. Keep ADDING until you've included all your fuels

Do the same for the next box on 'Own transport-road' and you will produce a screen which looks something like the one below

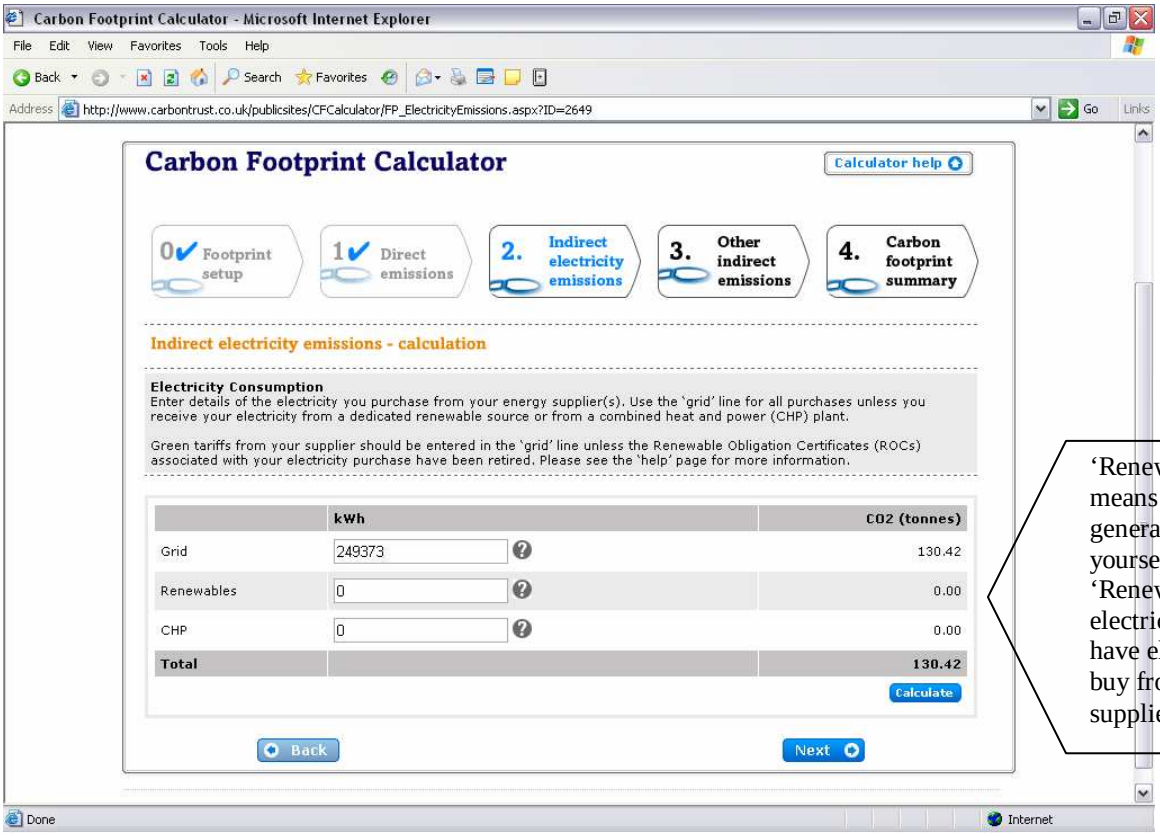
Scroll down



Page 5… setting up Indirect electricity emissions

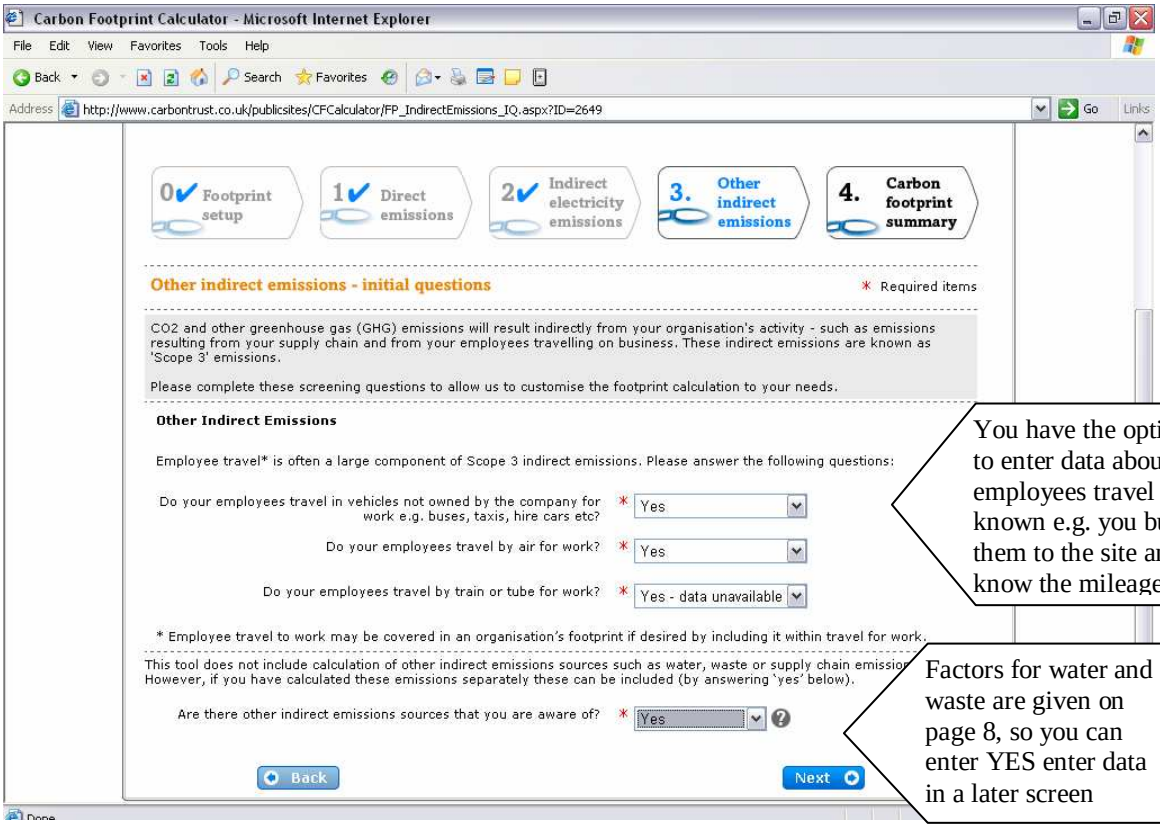


Page 6… Electricity



'Renewables' means electricity generated yourself - NOT 'Renewable' electricity you have elected to buy from a supplier

Page 7… setting up Other indirect emissions



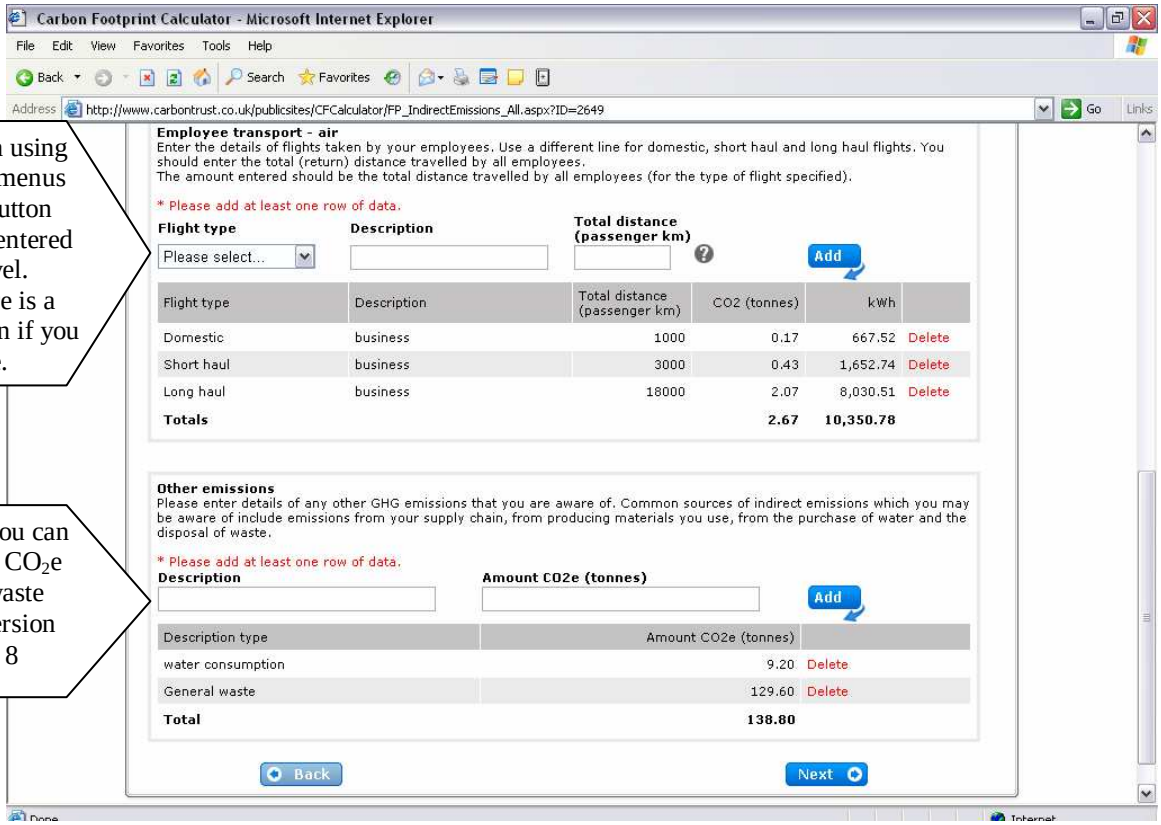
You have the option to enter data about employees travel if known e.g. you bus them to the site and know the mileage

Factors for water and waste are given on page 8, so you can enter YES enter data in a later screen

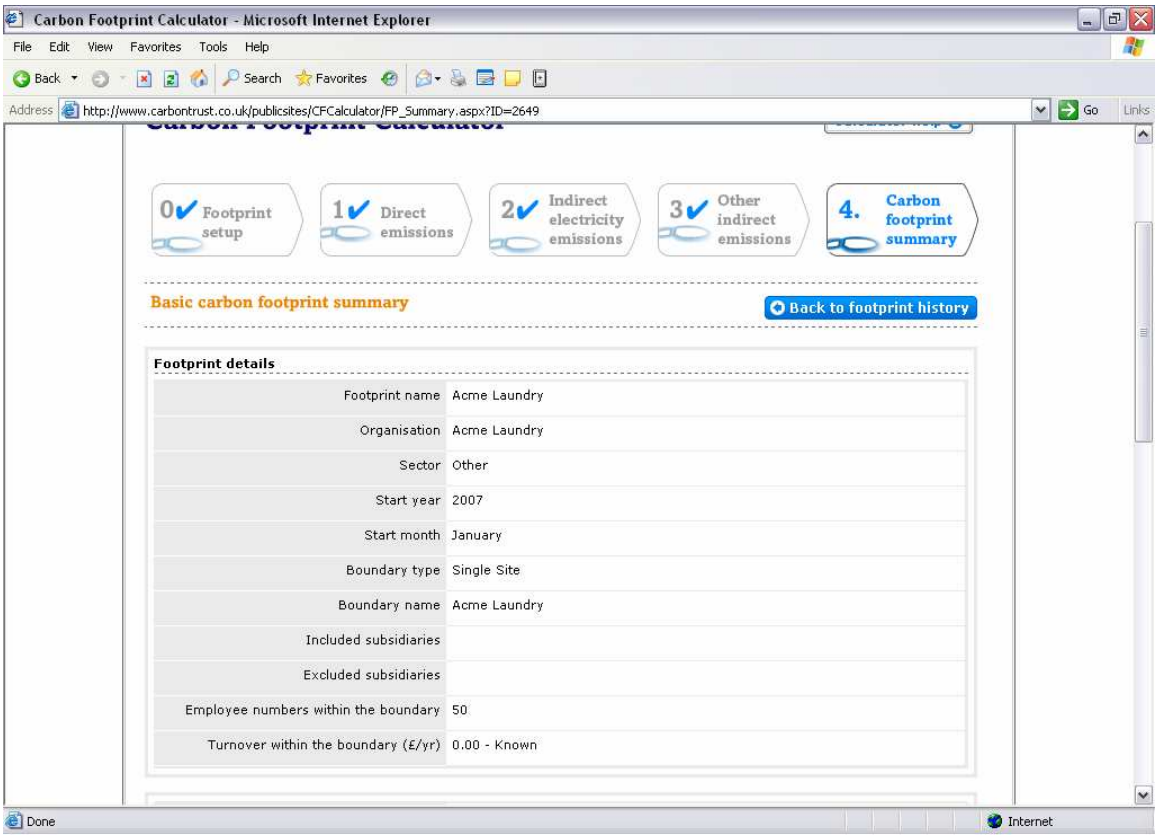
Moving to the air travel screen… page 9

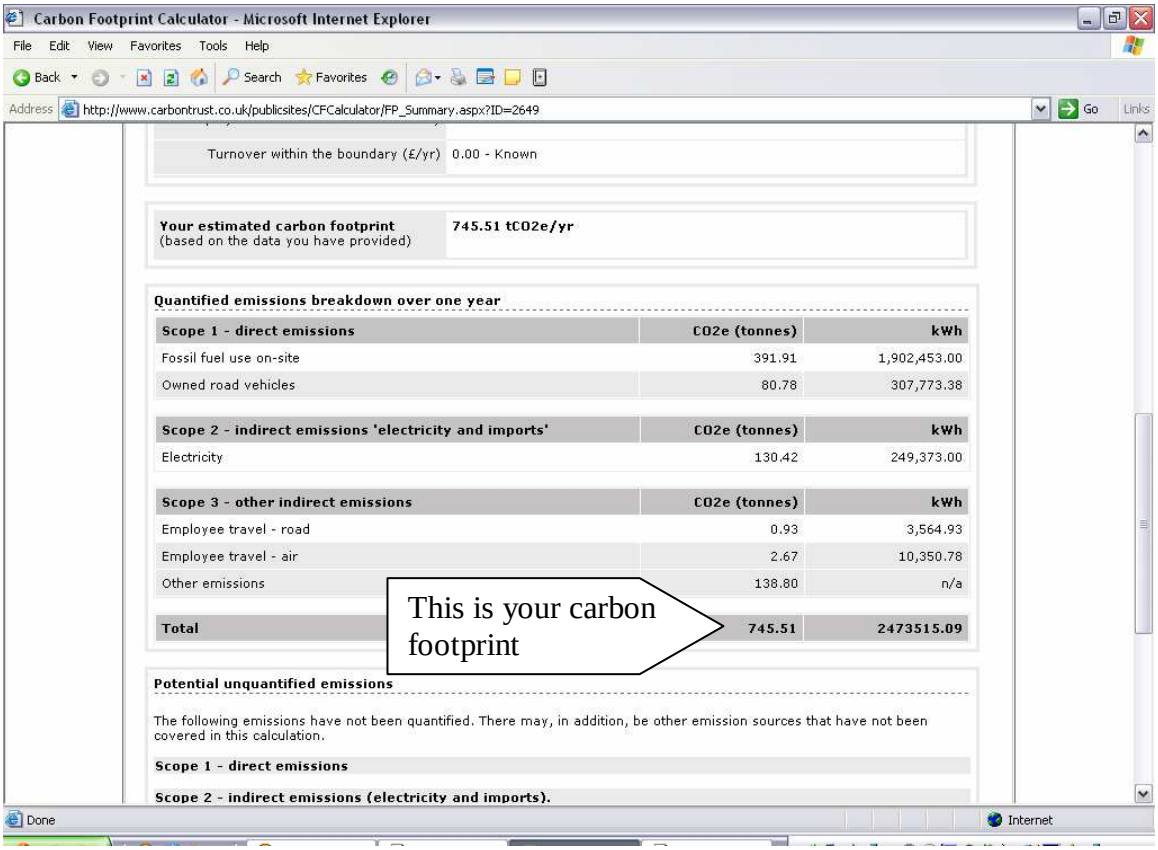
Complete again using the drop down menus and the ADD button until you have entered all relevant travel. Remember there is a DELETE button if you make a mistake.

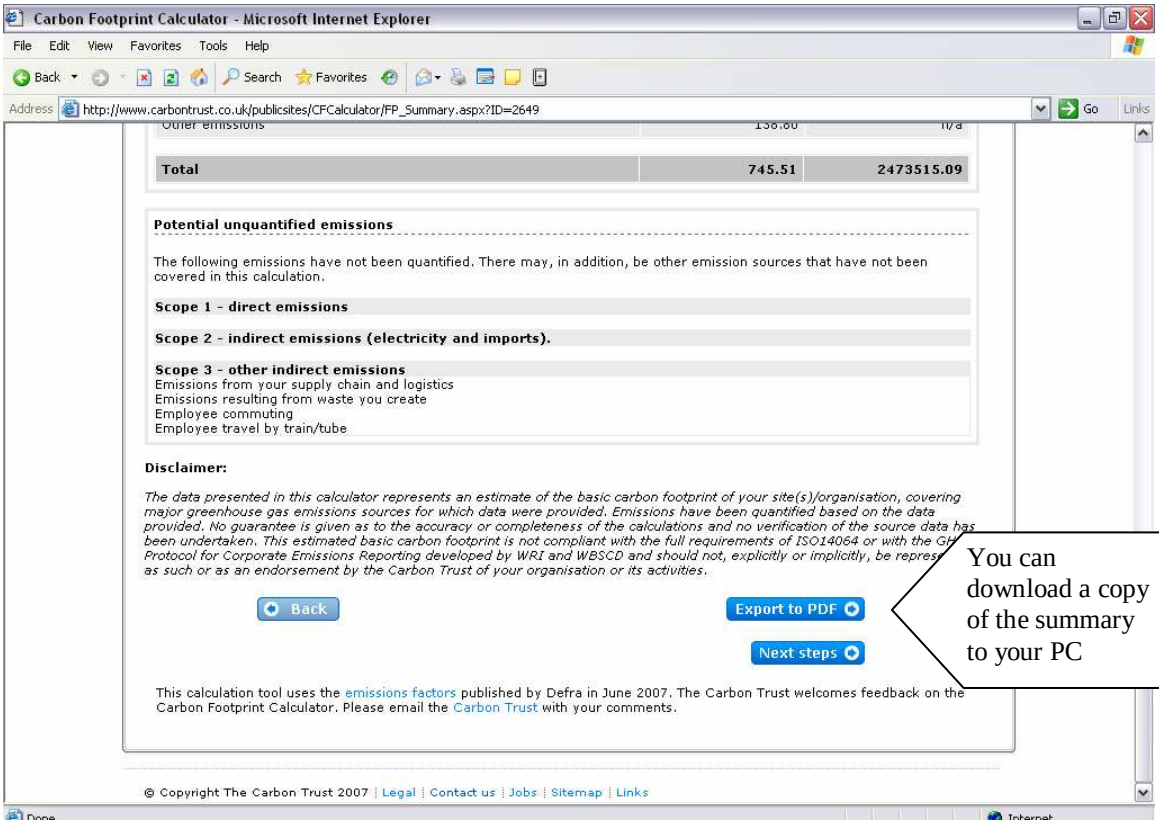
This is where you can ADD tonnes of CO_2e for water and waste using the conversion factors on page 8



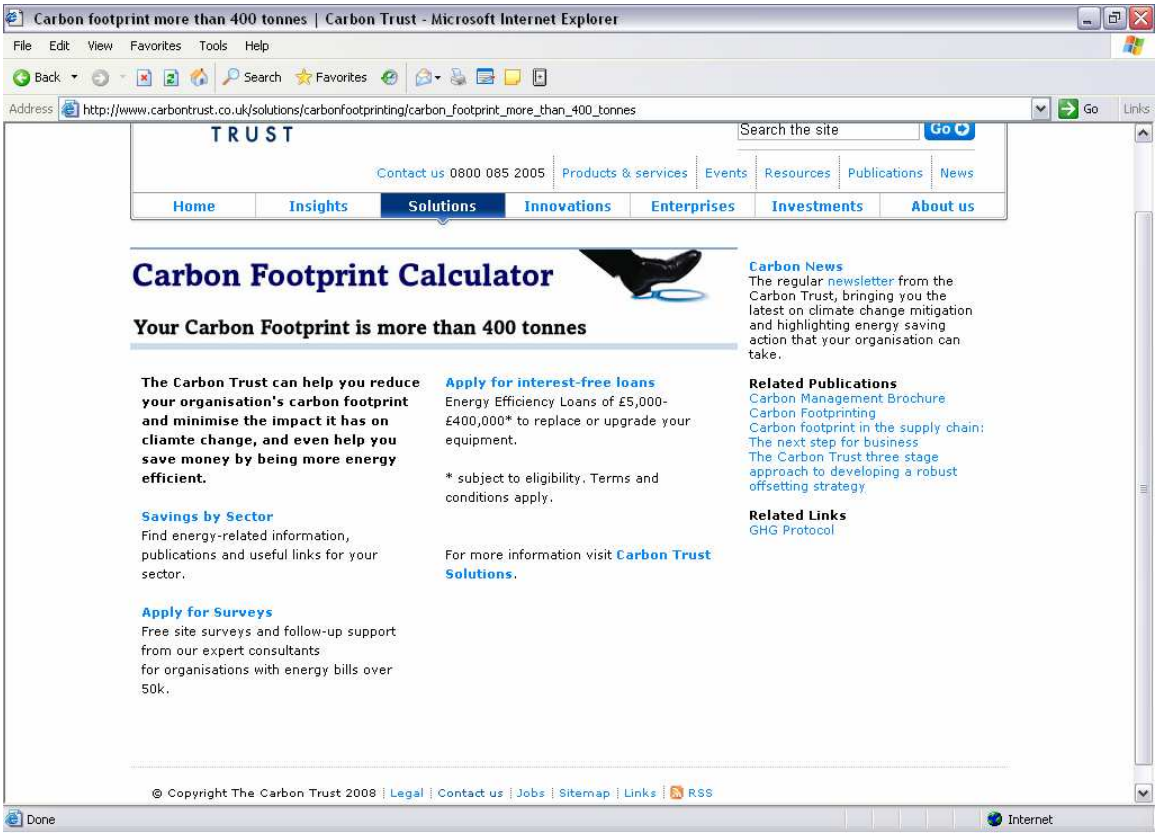
By scrolling down the next screen you see a summary of your carbon footprint and which activities cause the most emissions.







Hit the 'Next steps' button to find out how the Carbon Trust can assist to reduce your carbon footprint.



7. Acknowledgements

This document has taken text from the Carbon Trust Calculator Help document.

Guidelines to DEFRA's GHG conversion factors for company reporting (annexes updated June 2007)

The following companies contributed staff time and effort to the preparation of this document:

Carrington Career and Workwear Ltd
Isa Lea Ltd
Milliken Walk Off Mats
Spring Grove Services
Technical matters…

Annex A

Glossary of terms contained in the Calculator

Assurance
The process of an independent third party checking the methodology, data and calculation processes to ensure they are robust.

Carbon neutral
Commonly accepted terminology for something having net zero emissions (for example, an organisation or product). As the organisation or product will typically have caused some greenhouse gas emissions, it is usually necessary to use carbon offsets to achieve neutrality. Carbon offsets are emissions reductions that have been made elsewhere and which are then sold to the entity that seeks to reduce its impact. In order to become carbon neutral it is important to have a very accurate calculation of the amount of emissions which need to be offset – requiring calculation of a carbon footprint.

Carbon dioxide (CO_2)
The most important greenhouse gas. CO_2 emissions result from the combustion of fuel, from land use changes and from some industrial processes. CO_2 emissions are limited by the Kyoto protocol.

Carbon dioxide equivalent (CO_2e)
There are six main greenhouse gases which cause climate change and are limited by the Kyoto protocol. Each gas has a different global warming potential. For simplicity of reporting, the mass of each gas emitted is commonly translated into a carbon dioxide equivalent (CO_2e) amount so that the total impact from all sources can be summed to one figure.

Carbon footprint
The total set of greenhouse gas emissions caused by an individual or organisation, event or product. It should be expressed in tonnes of carbon dioxide equivalent (tCO_2e).

Electricity types

All the electricity used by an organisation is classified as ‘grid’ unless it meets the criteria the Renewables or CHP (Combined Heat and Power).

Electricity can only be described as Renewable if you have purchased it from a dedicated renewable energy source such as a wid turbine or photo voltaic system where the generator either has retired any ROCs (Renewable Obligation Certificates) that have been issued from the market so that they cannot be used to meet obligations under the Renewables Obligation or where the generator has not claimed and ROCs for the generation in the first place. Most ‘green tariffs’ do not meet this requirement so should be classified as standard ‘grid’ electricity.

An organisation that has a CHP plant onsite should include the details of the fuel consumed by the CHP plant as scope 1 emissions in its footprint. An organisation that purchases electricity from a CHP plant should include this electricity in its scope 2 emissions.

Emissions conversion factor
When calculating emissions from energy use it is common to know what quantity of energy was used, either in kWh or by volume or mass of input material. Emissions factors enable a conversion to be made from the input measure of energy to the amount of carbon dioxide emissions that will result. UK conversion factors for energy to CO_2 are published by Defra and are also available from the Carbon Trust.

Greenhouse gases (GHG)
Greenhouse gases are those which contribute to the greenhouse effect when present in the atmosphere. Six greenhouse gases are regulated by the Kyoto Protocol, as they are emitted in significant quantities by human activities and contribute to climate change. The six regulated gases are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O),

hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6).

Emissions of greenhouse gases are commonly converted into carbon dioxide equivalent (CO_2e) based on their 100 year global warming potential. This allows a single figure for the total impact of all emissions sources to be produced in one standard unit. Conversion factors of greenhouse gas to CO_2e are calculated by the IPCC and Defra publish guidance on which set of conversion factors to use.

The Greenhouse Gas (GHG) Protocol
A widely used standard for emissions reporting. The protocol covers project emissions reporting and corporate emissions reporting. The corporate emissions reporting standard provides a methodology for calculation of a carbon footprint. The protocol was developed by the World Resources Institute and the World Business Council for Sustainable Development. The Carbon Trust Calculator methodology is a simplification of the GHG Protocol.

ISO 14064
ISO 14064 is an international standard for corporate emissions reporting. It builds on the approach outlined in the Greenhouse Gas Protocol. See the ISO website for more information.

Offset
An emissions reduction, commonly resulting from a project undertaken in the developing world, which has been sold to compensate for emissions elsewhere. Offsets are commonly used to net off corporate emissions so that an organisation can claim to be carbon neutral.

Organisational Boundary

The organisational boundary of a carbon footprint refers to which part of an organisation is included within the calculation. In particular an organisation should decide if any subsidary companies are included or excluded from the boundary. The GHG Protocol contains more information about approaches to boundary definition.

Scope 1 emissions

These are direct emissions and include emissions from the use of fossil fuels and emissions from vehicles that the organisation owns. Scope 1 emissions can only ever be reported by a single organisation.

Scope 2 emissions

These are indirect (imported utilities) emissions and include emissions from the generation of electricity, heat or steam which the organisation imports onto its site.

Scope 3 emissions

These are other indirect emissions and include emissions which an organisation indirectly causes e.g. through its purchase of goods or services, its creation of waste or through the use of transport which it does not own. Scope 2 and scope 3 emissions reported by one organisation will be the scope 1 emissions of a different organisation. For example an organisation using electricity has scope 2 emissions but the emissions from the generation of the electricity are also the scope 1 emissions of the electricity generating company.

Verification
The process of independent third party checking of a carbon footprint calculation and statement by the third party that the results are accurate.