

CARBON  
ACCOUNTING FOR  
SMALLER  
ENTITIES

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## INTRODUCTION

“The movement towards environmentally conscious business practices now has such momentum that no business can afford to ignore it.”

This has been the preface to countless reports, books and guidelines since the mass environmental damage was first exposed by Rachel Carson in her book *Silent Spring*. Whilst media attention to environmental issues such as pollution, habitat destruction and over exploitation has ebbed and waned, the underlying environmental destruction has continued.

Perhaps now, more than at other times in recent history, media and public awareness of the environment is inextricably escalating. The cause of this persistent interest is climate change. Scientists, politicians and leaders of large businesses now accept climate change is happening, is destructive, is manmade and is (just) still containable. The media and public are not far behind in reaching the same conclusions.

In order to prosper smaller organisations have to “get with the times”. Old fashioned approaches to business are soon found out by fickle public and hardnosed business customer. If ever the time was right for thinking about the environment, now is that time.

Small organisations account for 50% of UK GDP and 58% of the private sector workforce. This amount of economic activity has inevitable impacts on the environment. Small organisations are collectively responsible for 20% of UK emissions of carbon dioxide (large business accounts for 40% and private consumption 40%).

There are many ways in which small businesses and other organisations can improve their environmental performance. By taking simple and consistent reporting measures, setting targets and reducing impacts small entities can “go green” without the tag of green wash. Smaller entities considering the environment will benefit themselves, their stakeholders and the wider environment. A real win-win.

Use of the Carbon Accounting for Smaller Entities system provides a simple, consistent and relevant entry point for small businesses to start to consider the environment.

David Wilsdon FCCA  
Green Accountancy

## OBJECTIVES

Green Accountancy has developed this Carbon Accounting for Smaller Entities methodology. It is envisaged this will help and encourage small entities to reduce their environmental impacts. This document provides a single introductory entry point for small entities and their advisers into Carbon Accounting.

The objective of the Carbon Accounting for Smaller Entities is to enable small entities to prepare simple, robust and consistent environmental reports. We recommend use of this procedure for all small entities with turnover up to £6.5M. This includes companies of all types, charities, partnerships and sole traders.

Chapter 1 explains the drivers for preparing environmental reports. This will help owners, managers and advisers of small entities to understand the reasons for Carbon Accounting. This will inform the process and help get the most out of preparing an Environmental Statement.

Chapter 2 sets guidance for measuring environmental impacts. This will enable consistency for entities in year on year reporting. Also this will enable small business to benchmark their results against comparable entities.

Chapter 3 gives a suggested layout for an environmental report. This will give consistency of reporting, and will also ensure simplicity and conclusion of the process.

Appendices add to the guidance in specific areas.

No prior knowledge or actions are required. Many entities will already make more detailed measurements, actions and reporting than is outlined. We encourage those entities to take up use of these procedures and report using the formats described.

## CHAPTER 1 DRIVERS FOR SMALLER ENTITIES TO PREPARE ENVIRONMENTAL REPORTS

### 1.1 Protecting Our Environment

Our environment is the only one we have.  
We need clean air, water, soils and resources.  
It's our legacy for future generations.  
Nature is fun, exciting & gives us real experiences.  
Climate change, pollution and habitat destruction.  
UK heat waves, flooding and reduction of nature.  
It's not too late, there are no excuses.

### 1.2 Business Growth

Expanded market for your goods and services.  
Public attitudes are changing.  
64% are more likely to use a business that claims to have a low carbon footprint.  
Affects your business even if you do not supply directly to the public.  
Procurement policies require suppliers to have an environmental policy.  
Assessment of ability to deliver your promise.  
Modern ethical, responsible and well managed.

### 1.3 Cost Savings

Rising costs of gas, electricity, fuel and water.  
Reducing consumption and reusing items saves £s  
Think Environment = Think Business Efficiency.  
Paperless systems give quick access to information.  
Train journeys give vital reading and thinking time.  
Avoid expensive down time, installation and training.

### 1.4 Happy Stakeholders

Employees are keen to take part and promote environmental activities.  
Staff recruitment, motivation and retention are vital to successful organisations.  
Team building events can only dream of the effect that taking up the environmental challenge has.  
Banks and external shareholders for example want to invest in sound organisations.  
Insurers, property landlords and even HM Revenue & Customs will view your business in new light.

## CHAPTER 2 MEASURING ENVIRONMENTAL IMPACTS

### 2.1 Energy: Electricity

Entities should take a meter reading at the start and end of each period. If this has not been done then an estimate can be made by interpolating electricity bills readings. A list of all electricity bills showing date of reading and meter reading in kWh.

To calculate the carbon dioxide emissions associated with electricity supplies simply multiply electricity used (recorded in kWh) by a conversion factor (currently 0.575 CO<sub>2</sub> kg / kWh).

Electricity supplied with as certified under the independent certification scheme based on OFGEM's green supply guidelines count as a reduction similar to a carbon offset. Your supplier will be able to tell you the percentage of renewable energy used.

### 2.2 Energy: Heating (non-electricity)

Any heating provided by electricity will be included in the emissions as calculated for electricity.

Gas use will be measured by recording meter readings at the start and end of each reporting period. Interpolation of figures on gas bills can be used to estimate historical readings. Gas meters may give gas usage in Therms, cubic meters or cubic feet. These must be translated to kWh using the factors given in the translation tables in the appendix. The translation factor of 0.209 CO<sub>2</sub> kg / kWh can then be applied to gas usage.

Use of all other common fuel sources is translated into carbon dioxide emissions in a similar way. Actual use is multiplied by translation factors given in the translation table.

If wood from a renewable source is burnt the emissions are offset by the fact that the wood has recently been grown (when compared to fossil fuel). Wood can be viewed as a store of solar energy (renewable) and therefore is less damaging than fossil fuel. This is reflected in the much lower carbon to heat ratio used to calculate the carbon emissions associated with wood heat.

### 2.3 Business travel by public transport

Business travel is any travel related to the business but excluding commuting. Commuting is discussed at 2.5 below.

Carbon emissions of public transport is based on typical emissions per passenger. You should record the total miles relating to the business, for example two people travelling by train between London to Newcastle return counts as 996 miles (distance 249 x 2 for return journey x 2 for two people).

To find distances for rail journeys use:

<http://www.co2balance.com/calculators/rail.php>

Flights within Europe are generally short haul, outside of Europe are long haul  
To find distances between cities go to <http://www.mapcrow.info/>

### 2.4 Car and van travel

Car emissions will be accurately calculated if the amount of petrol or diesel used in the period is recorded. This will give a result that reflects all factors including type of car, engine wear and driving style. The litres of petrol or diesel are converted to CO<sub>2</sub> kg using a factor.

If the amount of fuel used is not know then the miles travelled and emissions rate (CO<sub>2</sub>g/km) can be used. Mileage may be from expense claims or from separate recording of business mileage.

The emissions rate will be on the vehicle registration certificate or can be found at these websites:

For new cars go to <http://carfueldata.direct.gov.uk/>

For older cars go to <http://www.parkers.co.uk/cars/reviews/> , select car make and model, click the technical data tab, select the particular car

To find distances between locations go to

[http://www.theaa.com/travelwatch/planner\\_main.jsp](http://www.theaa.com/travelwatch/planner_main.jsp)

### 2.5 Commuting

DEFRA guidelines indicate that employee commuting (travel from home to work) should be included in the carbon emissions of a business. This is good practice as it is within the control of employers to encourage lower or zero emission forms of transport for commuting.

Travel to and from work should be recorded in a similar way to business travel. It may be helpful to estimate the journey distances for each employee and multiply by the normal days worked during the period.

### 2.6 Water usage

The amount of water used per person is a good indicator that can be addressed over time. This is separate from the carbon emission calculator. Targets vary, depending on the type of building you are operating from and the line of business. One published best practice target is 4.1 litres of water per person per day.

The total amount of water used should be recorded from meter readings at the beginning and end of the reporting period. This will give total water used in the period measured in litres. The carbon emissions associated with the water usage can be calculated by use of a factor, which is currently 0.300 kg CO<sub>2</sub>e per m<sup>3</sup>.

One additional factor to consider is that tap water is perfectly drinkable in the UK. Bottled water, regardless of size of bottles, creates considerable additional resource and energy use.

### 2.7 Paper

There are significant emissions associated with the production and transportation of paper. One ream of paper (500 sheets) equates to 3.6kg CO<sub>2</sub>e. This is similar to travelling 25 miles in a small car.

Paper is used by almost all businesses, sometimes in large quantities. It is therefore good practice to include carbon emissions associated with paper in your carbon account.

It is acceptable to base this on paper purchased rather than paper used.



### 2.8 Carbon offsetting and green tariff electricity

Carbon offsetting is surrounded by some level of confusion and controversy. It is fair to say that carbon offsetting is not as good as reducing emissions but, providing offsetting is not used as an excuse to do nothing, it is better than doing nothing.

Purchasing green tariff (renewable source) electricity is effectively a form of offsetting.

Carbon offsets and carbon saving of buying green tariff electricity should be shown as a deduction from the total carbon emissions for a period.

### 2.9 Recording, normalisation and targets

In order to calculate all of the above figures it is first necessary to record the underlying data. In summary, a record of use is needed for the following:

- 1 Electricity
- 2 Gas
- 3 Public transport journeys
- 4 Petrol or diesel used
- 5 Commuting journeys
- 6 Water
- 7 Paper

This record should show dates, amounts used and units being recorded. It is then straightforward to convert this data into a quarterly carbon emissions figure.

In order to record fair figure allowing for business size it is necessary to normalise the emission figures. This allows you to compare your emissions over time, regardless of business growth. To do this the total carbon emissions is divided by turnover to give KG CO<sub>2</sub>e per £1,000 turnover (or, equivalently, Tonnes CO<sub>2</sub>e per £1M turnover).

Once a quarterly carbon emissions figure per £1000 turnover has been established actions can be taken to reduce this. This may involve setting overall and activity specific targets.

Actions that can have a radical reduction on carbon emissions including changing to renewable source electricity (or self generating by solar pv); using wood for heat; never flying; using waste vegetable oil to fuel cars or vans; buying recycled and harvesting rain water.

## CARBON ACCOUNTING FOR SMALLER ENTITIES

### CHAPTER 3 LAYOUT OF ENVIRONMENTAL STATEMENT

**Test Company Limited**

**Environmental Statement**

**For the year ended 31 December 2014**

**Carbon dioxide emissions (all CO<sub>2</sub>e kg per £1,000 turnover)**

<b>1</b>	<b>Electricity</b>	<b>20.64</b>
<b>2</b>	<b>Heating (non-electricity)</b>	<b>5.80</b>
<b>3</b>	<b>Business travel by public transport</b>	<b>3.64</b>
<b>4</b>	<b>Business travel by cars and vans</b>	<b>0.68</b>
<b>5</b>	<b>Commuting</b>	<b>7.67</b>
<b>6</b>	<b>Water</b>	<b>0.05</b>
<b>7</b>	<b>Paper use</b>	<b>1.68</b>
<b>Gross</b>	<b>Total emissions (CO<sub>2</sub>e kg per £1,000 turnover)</b>	<b>40.15</b>
<b>8</b>	<b>Green Tariff (CO<sub>2</sub>e per £1,000 turnover)</b>	<b>5.80</b>
<b>9</b>	<b>Carbon offsetting expenditure (CO<sub>2</sub>e per £1,000 turnover)</b>	<b>0.00</b>
<b>Net</b>	<b>Total emissions (CO<sub>2</sub>e kg per £1,000 turnover)</b>	<b>34.35</b>

# CARBON ACCOUNTING FOR SMALLER ENTITIES

## Appendix

### Translation Factors

Type	Factor used in calculations	Units
Electricity	0.575	CO2 kg / kWh
Natural Gas	0.209	CO2 kg / kWh
Burning Oil	2.532	CO2 kg / litre
Coal	3.065	CO2 kg / kg
Wood	0.106	CO2 kg / kg
Diesel	2.676	CO2 kg / litre
Petrol	2.300	CO2 kg / litre
LPG	1.682	CO2 kg / litre
Air travel long haul	0.220	CO2 kg / km
Air travel short haul	0.188	CO2 kg / km
Train	0.053	CO2 kg / km
Coach	0.036	CO2 kg / km
Local bus	0.122	CO2 kg / km
Underground	0.065	CO2 kg / km
Taxi (Black cab)	0.266	CO2 kg / km
Water	1.052	CO2 kg / m <sup>3</sup>
Paper	3.573	CO2 kg / ream (500 sheets or 2.5kg paper)

#### Sources of factors

Guidelines to DEFRA's GHG conversion factors for company reporting Annexes updated August 2010.

#### Translations

Mile	1.61	km
kWh	1.00	kWh
Therms	29.31	kWh
Cubic m	10.67	kWh
1 kg Butane =	1.74	litres
1 kg Propane =	1.95	litres
1 Gallon =	4.55	litres

### Appendix

#### Climate Change

The IPCC have stated:

Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level.

Eleven of the last ten years (2005 -2014) rank among the ten warmest years in the instrumental record of global surface temperature (since 1850).

Global atmospheric concentrations of carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O) have increased markedly as a result of human activities since 1750 and now far exceed pre-industrial values determined from ice cores spanning many thousands of years.

Atmospheric concentrations of CO<sub>2</sub> (379ppm) and CH<sub>4</sub> (1774 ppb) in 2005 exceed by far the natural range over the last 650,000 years.

Global increases in CO<sub>2</sub> concentrations are due primarily to fossil fuel use, with land-use change providing another significant but smaller contribution. It is very likely that the observed increase in CH<sub>4</sub> concentration is predominantly due to agriculture and fossil fuel use. Methane growth rates have declined since the early 1990s, consistent with total emissions (sum of anthropogenic and natural sources) being nearly constant during this period. The increase in N<sub>2</sub>O concentration is primarily due to agriculture.

Most of the observed increase in globally-averaged temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations.

Global emissions are currently approximately 15 billion tonnes CO<sub>2</sub> pa which equates to 2.2 tonnes per person. Total UK emissions are currently 562 million tonnes pa which equates to about 10 tonnes CO<sub>2</sub> per person.

## Appendix

### Tax incentives

Cars emissions <50g CO<sub>2</sub> / km are least polluting mainstream cars, cheapest to run.

From April 2015 Businesses can claim 100% first year allowances on cars with <75g CO<sub>2</sub> / km (95g CO<sub>2</sub> / km if purchased prior to April 2015).

Low emissions cars attract lower benefit in kind, for example for 2015-16:

CO <sub>2</sub> g/km	%BIK Rate	
	Petrol	Diesel
1-50	5	n/a
51-75	9	n/a
76-94	13	16
120-124	19	22

There is no Road Fund Licence (tax disk) cost for cars with emissions of 100g CO<sub>2</sub> / km or less (registered on or after 1 March 2001).

It may be beneficial to have the car within a limited company as the tax relief can outweigh the tax on the benefit in kind. This should always be calculated before the car is purchased.

Interest free loans to employees that are used to purchase season tickets for public transport.

Salary sacrifice schemes for bus travel saving tax and national insurance on the costs.

No tax charge on providing cycles for commuting.

Enhanced capital allowances are available on energy saving and water saving devices. See <https://www.gov.uk/energy-technology-list> .

The climate change levy is a tax paid by business unless you use 100% renewable source electricity.

Landfill tax is charged at £80 per tonne of waste. Reduce your waste and recycle everything.

Tax relief if you donate to charity.