

Carbon Management Guidance for Small and Medium Sized Enterprises

Part 1: Measuring your Carbon Footprint

Project Partners	This guidance is based on a research project carried out by Aaron Reeves whilst at the School of Civil Engineering and the Environment at the University of Southampton, in partnership with the Sustainable Business Partnership and each Chamber of Commerce in Hampshire and the Isle of Wight.
Aaron Reeves MEnvSci AIEMA	Aaron Reeves MEnvSci AIEMA is an independent environmental consultant with a Masters Degree in Environmental Science and expertise in environmental and carbon management in small and medium sized Enterprises. Please email areeves@carbonguidance.co.uk : <ul style="list-style-type: none">• If you would like to receive the next guidance document “Part 2: Managing and Reducing your Carbon Footprint”• If you have any queries relating this guidance• Should you require further consultancy advice and assistance with carbon and environmental management within your organisation
Hampshire and Isle of Wight Sustainable Business Partnership	The Hampshire & Isle of Wight Sustainable Business Partnership (SBP) exists to encourage all businesses, but particularly SMEs, to adopt sustainable business practices. A ‘sustainable business’ is one which continuously improves its productivity by taking action on the environmental, social and economic impacts of its operation.
Hampshire Chambers of Commerce	Hampshire Chambers is jointly owned by the three main Chambers of Commerce in Hampshire, namely: North Hampshire, Portsmouth & South East Hampshire and Southampton & Fareham Chambers of Commerce. This partnership draws on the collaborative synergy of its member Chambers, and provides one point of contact with which to engage some 2500+ members throughout Hampshire.

Disclaimer:

While every effort has been taken to ensure the quality of the information contained within this report is accurate and up to date, information may be incomplete, inaccurate or may have become out of date. Therefore, the project partners (Aaron Reeves, the Hampshire and Isle of Wight Sustainable Business Partnership and the Hampshire Chambers of Commerce), their agents and contractors and subcontractors, to the maximum extent permitted by law, accept no liability or responsibility including, for direct, indirect or consequential loss, business interruption, loss of profits, production, goodwill or contracts, or anticipated savings as a result of following the recommendations included within this report or the content or the outputs from external links, tools, resources and agencies suggested.

Section 1: Guidance Background

1.1 Guidance Aim

This guidance has been produced to provide a framework for Small and Medium-sized Enterprises (SMEs), assisting with the measurement and management of an organisation's 'carbon footprint'. The document aims to:

- Provide an overview of the steps involved
- At each step – allow you to select the actions appropriate your organisation
- Direct you to relevant guidance documents, tools and support

Through selection of appropriate actions at each stage of the carbon management process, this guidance will enable you to engage in carbon management and attain the associated benefits, without the need to invest in overly-complex and costly solutions.

1.2 Guidance Background

This guidance is based on a research project carried out by Aaron Reeves AIEMA MEnvSci whilst at the School of Civil Engineering and the Environment at the University of Southampton, in partnership with the Sustainable Business Partnership and each Chamber of Commerce in Hampshire and the Isle of Wight.

The project included a review of carbon management tools and techniques appropriate for SMEs, supported by an

online survey and practical carbon management assessments undertaken in 'case-study organisations'. As a result, this guidance has both solid academic and practical grounding.

1.3 Guidance Scope

This guidance has been tailored to the needs of private sector SMEs, specifically those enterprises with less than 250 employees. Despite this focus, the guidance will still be of use to public sector and larger organisations, although legal requirements and other reporting requirements may not be covered (i.e. such as the UK's Carbon Reduction Commitment (CRC)).

Footprinting/accounting of specific products and services is outside the scope of this guidance (i.e. in line with the new British Standard – Publically Available Specification (PAS) for assessing the life cycle greenhouse gas emissions of goods and services).

1.4 No Prior Knowledge Required

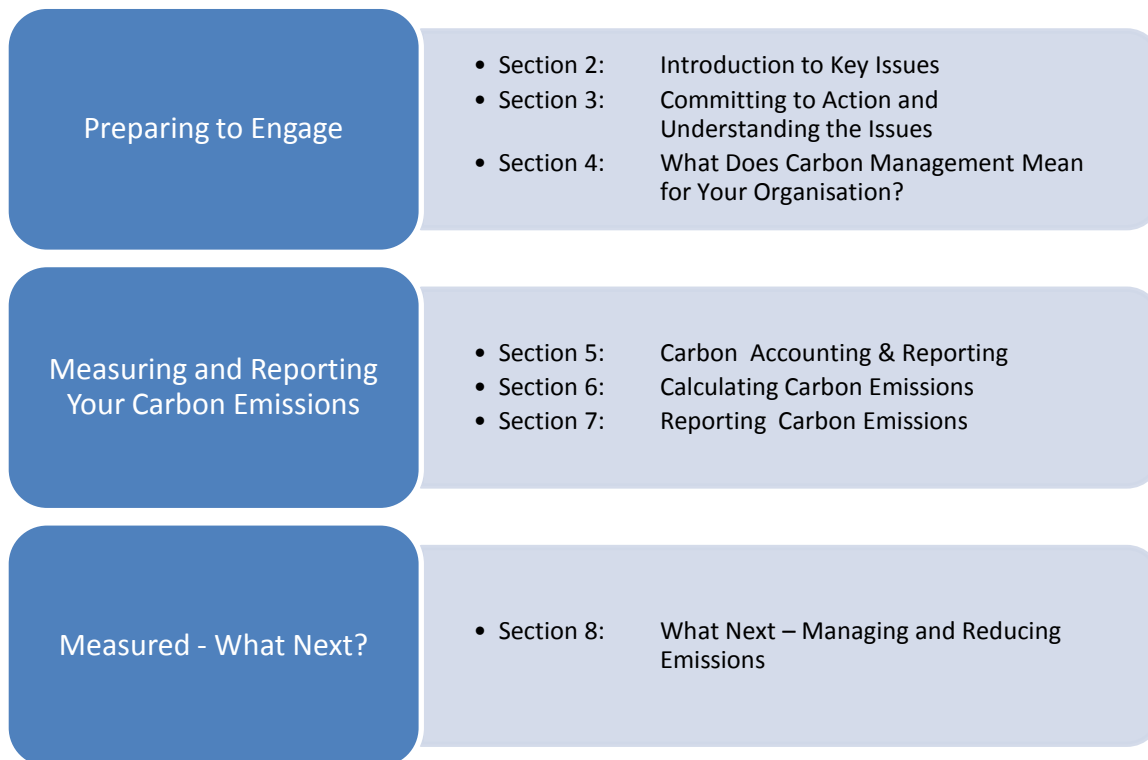
This guidance document has been designed for those with no or limited knowledge of the carbon management process. It has been designed as a practical tool which will link you to the information and resources you will need to measure and manage your carbon footprint.

1.5 Structure of the Guidance

1.5.1 Sections of the Document

In this guidance document, the carbon management process has been split into the following sections (see Figure 1).

Figure 1: Steps in the Carbon Management Process



1.5.2 Content of Each Section

Each section of this guidance document describes what each stage of the carbon management process involves, and suggests management options (each of which will require varied skills, resources and capital to implement). This will allow you to build up an idea of what the process will involve and plan a strategy for measuring and managing your carbon footprint. In addition, the guidance will direct you to appropriate resources (see Section 1.4.3 & [Appendix 1](#)), providing you with the information and tools required to carry out suggested management options at each stage.

1.5.3 Links to Further Information and Resources ([Appendix 1](#))

For each section of this guidance document, Appendix 1 contains links to relevant guidance documents, tools and resources. These links are designed to help you implement the recommendations.

Section 2: Introduction to Key Issues

2.1 Introduction to ‘Climate Change’

Concern for the impacts that business and development are having on the natural environment has grown rapidly over the last half century. More recently, a greater understanding of the very real threats posed by resultant emissions has developed and become a central focus for society, on both a local and global scale.

In response to increasing pressure from customers, stakeholders, the public and government (via legislation, such as the Climate Change Act), businesses are becoming increasingly accountable for their activities that impact the environment, and are progressively recognising a need to improve environmental performance, reduce their impact on climate change and address the wider issue of sustainability.

See Box 1 for more information regarding climate change.

2.2 Introduction to ‘Carbon Footprinting’

To improve performance and communicate improvements to stakeholders, it is necessary to measure and report information on environmental performance. Therefore, increased focus on climate change has led to voluntary and legislated measuring, reporting and management of organisations’ ‘carbon footprint’.

A carbon footprint can be measured for an organisation, product, service or event. Despite the name, a carbon footprint does not only refer to emissions of carbon dioxide (CO₂); it also refers to emissions of other key greenhouse gases (see Box 1 – ‘Key Greenhouse Gases (GHGs)’ measured in tonnes of carbon dioxide equivalent (CO₂e), as these also contribute to climate change. International GHG accounting standards have been developed to allow this information to be measured and reported in standardised, verifiable and comparable ways (see Table 1).

Note: Both the terms ‘carbon’ and ‘GHG’ are used interchangeably within this document and in other resources.

An organisation may have their GHG footprint verified to these standards to communicate to stakeholders the quality of accounting practices. In addition, an organisation may work towards certification of standards which recognise commitment to GHG measurement, management and reduction; these include the ‘Carbon Trust Standard’, the international standard for Environmental Management Systems ‘ISO14001’ and ‘pledges’ made to Business in the Community’s ‘May Day Network’.

Table 1. Key GHG Accounting Standards

Type of Standard	Description	Examples
Corporate GHG Accounting	These standards are designed to measure the GHG emissions resulting from the activities of an organisation. Both ISO14064 and the GHG Protocol are based on similar principles.	<ul style="list-style-type: none"> ISO 14064-1: Greenhouse gases – Part 1: Specification with guidance at organisation level for quantification and reporting of greenhouse gas emissions and removals The GHG Protocol – A Corporate Accounting and Reporting Standard (Revised Addition)
Product/Service GHG Accounting	These standards allow an organisation to measure the specific GHG emissions of a product (or service) over its life cycle.	<ul style="list-style-type: none"> Publicly Available Standard - PAS2050:2008 - Specification for the assessment of the life cycle greenhouse gas emissions of goods and services

Box 1. The Issue of Climate Change

Cause of Climate Change:

Anthropogenic (caused by humans) climate change is mainly caused by emissions of *greenhouse gases (GHGs)* (please note, this does not refer to carbon emissions exclusively – see section 2.2 for further information) from the combustion of fossil fuels. Fossil fuels may be used directly by an organisation (e.g. in the use of a gas boiler or private car) or indirectly as a result of their activities (e.g. as a result of the consumption of electricity or buying a product). Industrial and agricultural processes also release GHGs.

Science of Climate Change:

Put simply, GHGs are emitted into the atmosphere and act as ‘insulation’ around our earth, causing our climate to warm and change.

In recent years, there has been international consensus concerning the science underpinning the mechanisms behind climate change, as well as the extent/cost of the global impacts it will cause; this has prompted action at international and national levels.

Key Greenhouse Gases (GHGs):

Carbon dioxide (CO₂) is the least potent GHG yet it is the most widely recognised. This is due to the fact that CO₂ is released in vastly higher quantities than others and its contribution to climate change is therefore considered the most significant. The other key GHGs are: methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆).

Section 3: Committing to Action and Understanding the Issues

3.1 Commitment Required

Effective engagement in carbon management requires dedication of resources, changes in procedures, communication and engagement with staff. Achieving engagement requires commitment (or buy-in) from your organisation as a whole, most importantly top management such as: the business owner, managing director, directors, board and/or shareholders.

3.2 Understanding Drivers and Opportunities

To gain commitment and support, it is vital to understand and communicate the issues, drivers and opportunities presented by managing your carbon emissions, including:

- What climate change is and what it means to business
- Understanding the key elements of the Carbon Footprinting and Management process
- Potential drivers and opportunities which may influence your decision to manage:
 - Cost savings (e.g. reduction in utility consumption and reduced exposure to rising/fluctuating energy costs)
 - Legal compliance and reduction of associated risk (e.g. penalties associated with breaches of legislation)
 - Customer/client pressure (in customer preferences or private/public sector procurement criteria)
 - Reputational advantage (improving your overall brand image)
 - Improved staff morale and retention.
 - Opportunity to demonstrate responsible practice to the local community
- Whether reporting your carbon footprint and/or attaining standards and certifications may be appropriate for your organisation

3.3 Committing to Carbon Management

Understanding and effectively communicating the afore stated issues within your organisation (3.2) will allow you to justify the time and other resources required to investigate exactly what carbon management will mean for your business, and what options are available to you.

Section 4: What does Carbon Management Mean for Your Organisation?

4.1 Where do GHG Emissions Come From?

As introduced in [Section 2](#), carbon management is concerned with measuring and managing GHG emissions resulting from your organisation's activities. The main sources of GHGs are:

- Burning of fossil fuels to generate electricity (within the UK this is typically coal or gas)
- Burning of fossil fuels for heat/cooling and industrial processes
- Burning of fossil fuels for transportation
- Direct release or leaks of emissions from agricultural, industrial and miscellaneous activities.

4.2 Identifying Your GHG Emission Sources

Identifying your GHG emission sources (see Box 2 for definition and examples) will allow you to gain an overview of the issues your organisation could potentially measure and manage to reduce its carbon footprint (as well as associated costs).

Box 2. What is an Emission Source?

An Emission Source is:

- An activity or process which release GHGs into the atmosphere

Examples include:

- Use of gas boiler for space heating
- Use of private vehicles for business travel
- Disposal of waste
- Use of products or materials

The best way to identify your emissions sources is to categorise them into the three emissions scopes defined in the internationally recognised [GHG Protocol](#), see Table 2.

4.3 Understand your Drivers

Next, assess how **you** will be affected by the drivers referred to in [Section 3.2](#) in relation to your business activities and emission sources. This will help determine how important carbon management will be for your organisation now and in the future and the amount of time, resources and investment which will be available for the process.

You could consider: costs and risks of rising/fluctuating costs in the future, current and future legislative exposure, customer preferences and requirements, action taken by your competitors, employee concern and social responsibility motivations, for example. Ensure that you establish what your motivations for management and objectives for carbon management are.

This assessment could be short and informal, however if you take the time to document your findings you will be able to review this information in the future to assess if anything has changed.

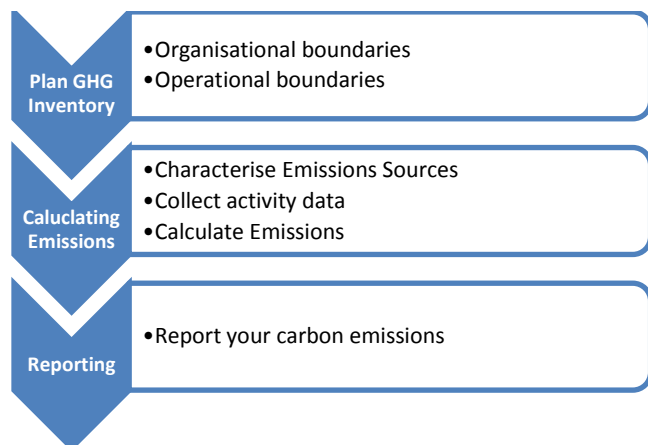
Table 2. Types of emissions sources as identified in the GHG Protocol.

Emissions Scope	Description
Scope 1 Direct emissions	Emissions resulting from activities your business controls. Sources include emissions resulting from combustion in owned/controlled boilers, furnaces or vehicles. Also included are emissions from production processes, and leakage from pipes and equipment. This includes emissions from leased equipment (e.g. company vehicles) if your business pays for the fuel used.
Scope 2 Indirect emissions	Emissions resulting from activities which use purchased electricity, heat, steam and cooling. These indirect emissions are the result of an organisation's activities (such as lighting, heating and process machinery) but occur at source that you do not control (e.g. at the power station). Sources include emissions resulting from the consumption of electricity, heat or steam in activities your business controls.
Scope 3 Other indirect emissions	Scope 3 is an optional reporting category that allows for the treatment of all other indirect emissions. These emissions are the result of the activities of the organisation, but occur from sources not owned or controlled by the company. Sources include emissions from transport related activities (e.g. business travel, staff commuting in private vehicles), waste disposal and procurement of goods and services (supply chain).

Section 5: Carbon Accounting & Reporting

5.1 Measuring Your GHG Emissions

Measuring GHG emissions provides you with the information required to begin managing and reducing them. The process consists of the following steps:



5.2 Defining Your Boundaries

Defining the boundaries of your GHG inventory is vital to make clear to your organisation and any external parties what is being measured.

5.2.1 Your 'Organisational Boundary'

Setting an 'Organisational Boundary' defines the facilities/entities which will be included in your GHG inventory. This is a relatively easy step for a small business with a single site; however, if your organisation has a complex organisational structure with multiple sites, owned subsidiaries or joint ventures, then the future guidance should be consulted ([see Appendix 1, Section 5](#)).

5.2.2 Your 'Operational Boundary'

GHG emissions result from a variety of your organisation's activities. Setting an 'Operational Boundary' defines the emission sources which will be included in your GHG inventory, for example a simple footprint could include only onsite energy consumption (e.g. gas and electricity).

The boundary should be set using the three 'emission scopes' defined by the GHG Protocol:

- Scope 1: Direct emissions
- Scope 2: Indirect emissions (purchased electricity, heat, steam and cooling)
- Scope 3: Other Indirect emissions

The boundary you choose depends on your organisation's emissions sources, pressures to manage and willingness to commit time and resources. While the boundary you set is up to you, you should consult relevant guidance if you wish to report your footprint externally (see [Section 7](#)).

The boundary you set should be clearly defined to ensure that it is clear what is being measured. Emissions from relevant sources included will be measured, then managed and reduced. It is important to select a boundary which is large enough to maximise opportunities for improvement (and cost savings), while remaining small enough to be manageable for your organisation.

5.3 Identifying Emission Sources

Once emissions inventory boundaries have been set, you should identify all the emissions sources which will be covered. Creating a list of emission sources which will be included will give you a starting point for measuring and calculating these emissions.

5.4 Reviewing Footprint Boundaries

Whatever boundary is chosen, it is advisable to consider whether it still meets your needs in each subsequent year you calculate your footprint, providing you with an opportunity to 'upgrade' in the future; for example, expanding to cover multiple sites or more emission sources.

Table 3. Example Operational Boundaries

Approach	Description
Simple Inventory	Onsite gas consumption (Basic Scope 1) Onsite electricity consumption (Basic Scope 2)
Basic Inventory	As above + <ul style="list-style-type: none">• Fuel consumption owned/leased transport (Scope 1)
Standard Practise Inventory	As above + <ul style="list-style-type: none">• Process emissions and fugitive emission if applicable (Scope 1)
Best Practice Inventory	As above + <ul style="list-style-type: none">• Scope 3 emissions which are significant to your organisation• Examples: transport (business travel and commuting in private vehicles), waste disposal, supply chain emissions, and leased assets, franchising and outsourcing

Section 6: Calculating Carbon Emissions

6.1 How to Calculate GHG Emissions

The most common approach for calculating GHG emissions is to apply documented **emission factors** to **business activity data**.

Activity Data x Emission Factor = GHG Emissions

Activity Data: Examples include: miles driven, litres of fuel consumed, kWh of electricity consumed. Most activity data can be easily obtained on invoices, bills and expenses claims.

GHG Emission Factors: Pre-calculated ratio values used to calculate emissions per unit of activity. These are used when direct monitoring of emissions is unavailable or prohibitively costly.

GHG emissions may be calculated using more than one source of activity data; for example, to calculate emissions from business travel, litres of fuel consumed or miles driven are both valid form of activity data. The selection of activity data may depend on the:

- Easy of access/collection
- The calculation approach selected (see below)
- Availability of appropriate emission factors
- Level of accuracy required

You may need to source relevant GHG emission factors depending on the calculation approach you select.

6.2 Selecting a Calculation Approach

There are various calculation options available to your organisation; the key options (outlined in full in [Appendix 2](#)) are shown in Table 4.

It is advisable that organisations beginning their carbon management select a carbon calculator (the [Carbon Trust - Footprint Calculator](#) is recommended, see [Appendix 2](#)). This will allow you to gain experience with the carbon management process before investing higher levels of time and resources.

Note: Carbon calculators are a useful tool. However, they are not designed to cover the whole process and therefore do not cover key issues such as planning an emission inventory and reporting measured emissions.

Table 4. Outline of Key Calculation Approaches

Approach	Costs
Using online carbon calculators	Usually freely available.
Using GHG emissions factors (to calculate emission in house e.g. in spreadsheets)	Requires in-house knowledge and resources.
Using Carbon Accounting Software	Software/implementation/training and maintenance costs.

6.3 Collecting Activity Data

To calculate emissions, relevant activity data must be collected and input into the selected calculation approach.

Note: Also collecting relevant financial information will be useful when indentifying where savings can be made.

6.4 Summarising Emissions

The GHG emissions from each emissions source may be collated to calculate your organisations total GHG emissions (see Table 5 for an example).

Table5. Example Total GHG Emissions

Emission Scope	Emission Source	Total Emissions
Scope 1	Space Heating	INSERT TONNES CO ₂ e
Subtotal		INSERT TONNES CO ₂ e
Scope 2	Purchased Electricity	INSERT TONNES CO ₂ e
Subtotal		INSERT TONNES CO ₂ e
Scope 3	Business Travel	INSERT TONNES CO ₂ e
Subtotal		INSERT TONNES CO ₂ e
Total		INSERT TONNES CO ₂ e

6.5 Reviewing Your Calculation Approach

Whatever approach chosen, it can be 'upgraded' in the future. It is advisable to consider whether the selected approach still meets your needs in each subsequent footprint calculation years.

Section 7: Reporting Carbon Emissions

7.1 What Does a Report Contain?

Producing an emissions inventory report allows an organisation to document the emissions information calculated (see [Section 6.4](#)), as well as key information regarding how the organisation arrived at this calculation, including:

- The methodology used and reporting period covered
- The boundary conditions set (emissions included and excluded)
- The data collection techniques (e.g. tools used)
- Whether results have been verified by independent third parties

7.2 Why Produce a GHG Report?

Completing a GHG emissions report is firstly a tool for the GHG emissions reduction individual or team. This information, along with the information collected throughout the GHG measurement process, should be used to help inform management and reduction of emissions, setting of targets and planning emissions reduction

projects. In addition, the responsible individual or team may also wish to report the organisation’s GHG emissions to:

- Management
- Employees
- Customers
- Shareholders/Owners/Partner

7.3 Why Report?

Reporting could benefit your organisation by:

- Informing employees that action is being taken, encouraging participation in GHG management and reduction projects
- Improving understanding of emissions sources within the organisation
- Publicly demonstrating a commitment to carbon management and reduction
- Improving your reputation and aiding marketing/sales campaigns
- Transparent environmental reporting can give your claimed ‘green credentials’ substance

Table 6. Reporting Approaches and Suggested Timescales for Consideration

Approach	Description	Short Term	Medium Term
Internal Reporting - Management	Reporting emissions information to management will allow the GHG emissions reduction individual/team to report progress and help management understand the project and issues the organisation faces.	✓	
Internal Reporting - Employees	Reporting emissions information to employees can encourage employee engagement in GHG emission reduction and increase staff morale and retention.	✓	
Voluntary Reporting Services: May Day Network	The May Day Network (an initiative by Business in the Community – one of the ‘Prince’s charities) gives organisations recognition for their carbon measurement and reduction efforts. Those organisations which pledge to “measure and report carbon emissions publicly or to Business in the Community” and “manage carbon emissions, develop a carbon action plan, and set an absolute carbon reduction target” and report this information to the May Day Network, are entitled to use the Prince’s May Day Network 2009 logo. This logo communicates that a business has taken the preliminary step on a journey which can lead it on to reducing its carbon emissions.	✓	
Benchmarking Services	Benchmarking services (such as CO2Benchmark.com) offer free or charged services which allow an organisation to submit their emissions and company information and have this compared with other organisations within their sector.		✓
Reporting Directly to Customers/Public	Report emissions information via annual reports, website or advertising material.		✓
External Verification	The steps highlighted in this guidance are based on the GHG Protocol and ISO14064. If an organisation chooses to comply with this standard in full, the organisation may seek verification (from a third party) to the international standard ISO14064 (note the GHG Protocol is a guidance standard- not a verification standard).		✓

Section 8: What Next – Managing and Reducing Emissions

8.1 What Information has been Collected?

Having completed the steps in this guidance document your organisation will have:

- An understanding of **Climate Change** ([Section 1](#)),
- An understanding of the drivers and opportunities to engage in GHG management/reduction ([Section 3.2 & 4.3](#)) and the potential GHG emission sources resulting from the organisation's activities ([Section 4.2](#))
- Planned an emissions inventory ([Section 5](#)), collected activity data ([Section 6.3](#)) and calculated a carbon footprint ([Section 6.4](#))
- Reported GHG emission information to relevant parties ([Section 7](#))

8.2 Using Your Carbon Footprint to Manage & Reduce Your Emissions

To achieve the benefits associated with carbon management you must be taking actions to manage and reduce your emissions. This process, the data gathered related to your emission sources and the final carbon footprint calculated, will provide you with the information required to begin actively and effectively managing and reducing your carbon emissions, giving you the ability to:

- Effectively plan your efforts to reduce emissions, ensuring that the most effective actions chosen
- Measure your emission reduction achievements
- Communicate your action/results to relevant parties.

8.3 Management and Reduction

To manage and reduce your emissions you will need to:

- Prioritise emission sources for management
- Set measureable objects and targets for reducing emissions
- Create a carbon reduction and/or environmental 'Policy Document' to communicate objectives
- Develop/implement emissions reduction 'Action Plans'
- Regularly monitor your performance and progress
- Periodically review the management systems and procedures in place to manage your emissions.

You may choose to manage your organisation's carbon emissions by developing a formalised Environmental Management System (EMS), either by applying the principles of standards (such as ISO14001) or gaining certification to them. In addition, achieving the [Carbon Trust Standard](#) allows your organisation to demonstrate effective measurement and management systems as well as consistent emissions reductions over time.

Managing and Reducing your Carbon Emissions – Future Information

There are many actions which can be taken to reduce your emissions, from simple measures such as switching off appliances, to alternative fuels, renewable energy sources and carbon offsets. In addition, the procedures and systems you put in place are vital to ensure you continue to manage in the long term, especially once the simple and/or low cost measures have been implemented.

To give these issues proper attention they will be addressed a further guidance document:

Carbon Management Guidance for Small and Medium Sized Enterprises Part 2: Managing and Reducing your Carbon Footprint

This second guidance document will be published in late November 2009 and will be made available free of charge to Chambers of Commerce and Sustainable Business Partnership members in Hampshire and Isle of Wight. It will cover:

- Prioritisation of emission sources
- Setting objects and targets
- Carbon Reduction and Environmental Policy
- Developing 'Action Plans'
- Monitoring your performance
- Review and improving your carbon management
- Link to reduction options

Please email areeves@carbonguidance.co.uk:

- If you would like to have the next guidance document emailed to you directly
- If you have any queries relating this guidance document
- Should you require further consultancy advice or assistance with carbon and environmental management within your organisation

Appendix 1: Support and Further Information

Introduction

This appendix contains links to further information, tools and resources that will effectively assist your organisation with carbon management and reduction.

Tables have been produced containing links to:

- Key Resources covering the whole measurement process
- Resources relating to each section of the guidance document

Each row of the tables contains:

- The title of the website, documents or tool being referred to (click on this title to be directed to the resource)
- A brief description of the document and how it will be helpful
- The level of detail the document goes into (basic, intermediate and advanced) allowing you to pick the type of link appropriate for your needs

Key Resources for Management of Emissions

Relevant Tool/Guidance	Description	Level of Detail
Working 9 to 5 on Climate Change: An Office Guide	Simple step-by-step guide based on the Greenhouse Gas Protocol	Basic
Business in the Community – The May Day Journey	An online resource which contains a range of information for each stage of the carbon management process, including: <ul style="list-style-type: none">• An explanation of each step in the process• Guidance on how to carry out each step• Links to other resources, guidance fact sheets and case studies	Basic
The Carbon Trust	The Carbon Trust's mission is to accelerate the move to a low carbon economy, by working with organisations to reduce carbon emissions now and develop commercial low carbon technologies for the future. See the organisation's website for a range of guidance and tools relating to measuring and managing GHG emissions.	Basic to Advanced
DEFRA – Guidance on how to measure and report your greenhouse gas emissions	Guidance produced by the Department of Energy and Climate Change (DECC) and the Department for Environment Food and Rural Affairs (DEFRA) – designed to help organisations measure and report their carbon footprint.	Intermediate
The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)	Helps companies and other organisations to identify, calculate, and report GHG emissions by outlining a standard for accurate, complete, consistent, relevant and transparent accounting and reporting by companies and organisations.	Intermediate

Section 2: Introduction to Key Issues

Management Area	Relevant Tool/Guidance	Description	Level of Detail
Understanding the Science of Climate Change	BITC – May Day Journey – Climate Change, Issue and Science and BITC – May Day Journey – What are Carbon Emissions	Simple explanations of the science of climate change.	Basic
	The Climate Change Challenge (Carbon Trust)	Explains the fundamental science and the accumulating evidence that climate change is real and needs to be addressed.	Basic
	Met Office - Your guide to climate change and Met Office - Climate science	Key facts and visual information relating to the science of climate change.	Intermediate
	Royal Society - Facts and fictions about climate change	Examines twelve misleading arguments put forward by the opponents of action on climate change and highlights the scientific evidence that exposes their flaws.	Intermediate
	Stern Review (full report)	The economic case for tackling climate change. Aimed at governments and policy makers rather than businesses (follow links to full report or executive summaries).	Advanced
What is a Carbon Footprint?	Carbon Trust – Carbon Footprinting	Provides an explanation of key footprinting concepts, a definition of the term ‘carbon footprint’ and an overview of the key issues in calculating an organisation’s carbon impact, and an introduction to established corporate emissions reporting approaches, such as the GHG Protocol, produced by WRI and WBCSD.	Basic
	BITC – May Day Journey – What is Measuring	Briefly introduces the concept of Carbon Footprinting (otherwise known as GHG Accounting).	Basic
	ACCA – Carbon Jigsaw Briefing: The Stern Review: A World of Carbon Business	Document summarises: <ul style="list-style-type: none"> • Carbon Footprinting • Carbon Offsetting • Emissions Trading 	Intermediate
Climate Change Policy & Legislation	ACCA – Carbon Jigsaw Briefing Carbon Law	Summarises the international framework for carbon reduction targets and trading. Briefly describes UK legislation including the Climate Change Act, Carbon Reduction Commitment.	Intermediate
	Defra - Climate Change Act 2008	This section of the Defra Website provides information and links explaining the Climate Change Act 2008 and its key provisions.	Advanced

Section 3: Committing to Action and Understanding the Issues

Management Area	Relevant Tool/Guidance	Description	Level of Detail
Securing Organisational Support	Working 9 to 5 on Climate Change: An Office Guide	Step 1: Secure Organisational Support (See pages 7 – 10) <ul style="list-style-type: none"> A brief overview 	Basic
	Carbon Trust – Making the business case for a carbon reduction project: How to win over the board and influence people (CTV039)	This guide is aimed at helping gain support for individual carbon/energy management project; however key themes are relevant to gaining support for GHG management in general.	Basic
Identifying Your Drivers	Climate change: It's never been more important - briefing note	Contains an outline of the short and longer term opportunities of climate change (for businesses), as well as case studies of best practice.	Basic
	Director's Guide to Climate change	Gives clear analysis of what the implications of climate change for business and offers expert insights into how to address the issue. Key topics include: <ul style="list-style-type: none"> Realising opportunities and minimising burdens Best practice for large companies and SMEs Carbon emissions trading Innovative technologies and renewable energy sources 	Intermediate

Section 5: GHG Accounting & Reporting

Management Area	Relevant Tool/Guidance	Description	Level of Detail
Setting Your Organisational Boundary	Working 9 to 5 on Climate Change: An Office Guide	Step 2: Plan your CO₂ Inventory (See page 11) <ul style="list-style-type: none"> A brief overview 	Basic
	BITC – The May Day Journey	See ' Measure and Report ' <ul style="list-style-type: none"> Overview of the process of setting organisations and operational boundaries 	Basic
	DEFRA – Guidance on how to measure and report your greenhouse gas emissions	Part 3: Do I report on all parts of my organisation? <ul style="list-style-type: none"> Provides an overview of the main approaches to including emissions from business activities and ventures where you own less than 100% of the operations (Based on the GHG Protocol) Also see Annex D: Which of my businesses do I include?	Intermediate
	The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)	Chapter 3 : Setting Organisational Boundaries <ul style="list-style-type: none"> Provides detailed explanation and examples of the main approaches for including emissions from business activities and ventures where you own less than 100% of the operations. 	Advanced
Setting Your Operational Boundary	Working 9 to 5 on Climate Change: An Office Guide	Step 2: Plan your CO₂ Inventory (See page 12) <ul style="list-style-type: none"> A brief overview 	Basic
	BITC – The May Day Journey	See ' Measure and Report ' <ul style="list-style-type: none"> Overview of the process of setting organisational and operational boundaries 	Basic
	DEFRA – Guidance on how to measure and report your greenhouse gas emissions	Part 4: Which activities in my organisation release greenhouse gas emissions? <ul style="list-style-type: none"> Provides an overview of the 'emission scopes' and examples (based on the GHG Protocol) 	Intermediate
	The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)	Chapter 4 : Setting Operational Boundaries <ul style="list-style-type: none"> Provides detailed explanation and examples of 'emission scopes' including leased assets, outsourcing and franchises 	Intermediate
Identifying Emission	Working 9 to 5 on Climate Change: An Office Guide	Step 2: Plan your CO₂ Inventory (See page 12-13) <ul style="list-style-type: none"> A brief overview 	Basic

Management Area	Relevant Tool/Guidance	Description	Level of Detail
Sources	The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)	Chapter 6 : Identifying and Calculating GHG Emissions <ul style="list-style-type: none"> The section 'Identify GHG Emissions Sources' provides information on identifying and categorising emissions sources. 	Intermediate
Advanced: Dealing with leased assets	DEFRA – Guidance on how to measure and report your greenhouse gas emissions	Annex E: Do I include leased assets and activities I have outsourced? <ul style="list-style-type: none"> Guidance for dealing with leased assets 	Advanced+
	GHG Protocol Categorizing GHG Emissions Associated with Leased Assets	Guidance for dealing with leased assets	Advanced+

Section 6: Calculating GHG Emissions

Management Area	Relevant Tool/Guidance	Description	Level of Detail
Carbon Accounting Process	The Carbon Trust - Carbon Footprinting	See pages 4 – 5 for an overview of the carbon footprinting Process.	Basic
	BITC – The May Day Journey	See ' Measure & Report - How ' <ul style="list-style-type: none"> See sections 3 (collecting data) and 4 (converting data) for a basic overview of these processes. 	Basic
	Working 9 to 5 on Climate Change: An Office Guide	Step 3: Gather Data & Step 4 Calculate Emissions <ul style="list-style-type: none"> A brief overview 	Basic
	DEFRA – Guidance on how to measure and report your greenhouse gas emissions	Part 6: What information should I collect to calculate my greenhouse gas emission? <ul style="list-style-type: none"> Provides an summary of activity data collection Part 7: How do I calculate my greenhouse gas emissions? <ul style="list-style-type: none"> Provides web links to a range of excel spreadsheets (containing pre-defined formulas and some populated with emission factors) for key emission sources. Consult this guidance if you intend to set up your own calculations in-house	Intermediate
Calculation Approach & Tools	The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)	Chapter 6 : Identifying and Calculating GHG Emissions <ul style="list-style-type: none"> Provides in depth information relating to the Identification of emissions sources, selection of a calculation approach, collation of activity data and application of calculation tools. 	Intermediate
	BITC – The May Day Journey See ' Measure & Report - Support '	See ' Measure & Report - Support ' <ul style="list-style-type: none"> Contains links to a range of calculations tools and guidance 	Basic
	Working 9 to 5 on Climate Change: An Office Guide	See Appendices: <ul style="list-style-type: none"> Appendix I: Unit Conversion Factors (for converting between different measures of weights volumes etc) Appendix II: Emissions Factors 	Basic
	Appendix 2: Carbon Calculation Options	Details the main GHG calculation approaches: <ul style="list-style-type: none"> Online carbon calculators GHG emissions factors Carbon Accounting Software 	Basic
The Green house Gas Protocol Initiative: Calculation Tools, Sector Toolsets, Service Sector	Downloads: <ul style="list-style-type: none"> Provides web links to a range of excel spreadsheets (containing pre-defined formulas) for key emission sources. Note: will require regional emission factors 	Intermediate	

Management Area	Relevant Tool/Guidance	Description	Level of Detail
	DEFRA – Greenhouse gas (GHG) conversion factors	Conversion Factors produced by the Department of Energy and Climate Change (DECC) and the Department for Environment Food and Rural Affairs (DEFRA). These greenhouse gas conversion factors to convert activity data into carbon emissions. Note: These are the key source of emission factor information for the UK and are updated annually.	Intermediate - Advanced

7: Reporting Emissions

Management Area	Relevant Tool/Guidance	Description	Level of Detail
Reporting Emissions	Working 9 to 5 on Climate Change: An Office Guide	Step 7: Report Your CO₂ Inventory <ul style="list-style-type: none"> A brief overview 	Basic
	BITC – The May Day Journey	See ‘Measure & Report - How <ul style="list-style-type: none"> See Sections 5 and 6 for an overview of the advantages of, and requirement to, report. 	Basic
	DEFRA – Guidance on how to measure and report your greenhouse gas emissions	Part 8: What do I need to report? <ul style="list-style-type: none"> Guidance on what elements of your footprint you should report, including recommendations for best practice. 	Intermediate
	The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)	Chapter 9: Reporting GHG Emissions <ul style="list-style-type: none"> Defines the required and optional elements of your GHG footprint that you should report. 	Intermediate
Verification	The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)	Chapter 10: Verification of GHG Emissions Guidance on achieving verification of your GHG measurement and reporting	Intermediate

Section 8: What Next – Managing and Reducing Emissions

Management Area	Relevant Tool/Guidance	Description	Level of Detail
Investigate the activities contributing to each emission source	Energy Walk-round Survey	Guidance for conducting an ‘Energy Walk-round Survey’. This will allow you to identify any energy that is being wasted, and focus on the key areas in which savings can be made. Also see: Walk around checklist - Office based businesses Assessing the energy use at your industrial site fact sheet (CTL002) Assessing the energy use in your building (CTL003)	Basic
	Better business - management guide	Guide shows how to identify areas where energy and cost savings can be easily made with little or no cost.	Basic
	Office based companies sector overview	Covers the main energy consuming areas within office based companies including lighting, heating, ventilation and air conditioning, office equipment and building fabric. It outlines the key low and no-cost solutions to current operating practice and suggests ways to improve energy efficiency when purchasing new equipment.	Intermediate
	Energy management priorities – a self-assessment tool	This guide provides a set of simple tools in the form of matrices to help technical and non-technical staff set priorities for energy management.	Intermediate /Advanced

Management Area	Relevant Tool/Guidance	Description	Level of Detail
	Energy use in offices	Primarily written for technical specialists and facilities managers, this Guide describes the energy performance of four generic types of office building.	Advanced
	External Assessment/Audit	Your organisation may choose to arrange for a third party to undertake an investigation of activities contributing to emissions sources. While such a service often has a cost, there are national and regionally funded services which may be available, for example a free Carbon Trust Survey .	NA
Emission Monitoring, Targeting and Benchmarking	How to monitor your energy use (GIL157)	This leaflet will show you how to record information on your business' energy use, and outline some simple techniques to help you to use that data to spot money saving opportunities.	Basic
	Monitoring and targeting - In-depth management guide	This technology guide explores monitoring and targeting techniques, and shows how organisations can adopt an appropriate level of monitoring and targeting to help save energy and cut costs.	Advanced
	Benchmarking Services	Benchmarking services offer free or charged services which allow an organisation to submit their emissions and company information and have this compared with other organisations within their sector. See: <ul style="list-style-type: none"> Carbon Trust Benchmarking Tools co2benchmark.com 	Intermediate
Setting Organisation-wide Emission Reduction Targets	Working 9 to 5 on Climate Change: An Office Guide	Step 5: Establish Emission Reduction Target <ul style="list-style-type: none"> A brief overview 	Basic
	DEFRA – Guidance on how to measure and report your greenhouse gas emissions	Part 11: Should I set an emission reduction target?	Intermediate
	The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)	Chapter 11: Setting GHG Targets	Intermediate
Carbon or Environmental Policy	BusinessLink - How to write an environmental policy	Basic business guidance for formulating an Environmental Policy	Basic
	Envirowise -How To Develop An Environmental Policy: A Guide For Small Printing Companies (N322)	This leaflet explains how developing and implementing an effective environmental policy can help small companies boost their business performance (example based on printing company).	Basic
	Carbon Trust –Energy Management Guidance – Energy Policy	Basic business guidance for formulating an Energy Policy	Basic
Managing Emissions and Developing Action Plans	BITC – The May Day Journey	See ' Manage - How ' <ul style="list-style-type: none"> Describes the key elements of Carbon/GHG Management 	Basic
	Carbon Trust Action Plan Tool	Interactive tool which will help you select and plan appropriate actions to reduce emissions.	Basic
	Energy Management Priorities - a self assessment tool	This guide provides a set of simple tools in the form of matrices to help technical and non-technical staff set priorities for energy management.	Intermediate /Advanced
	Strategic energy management overview	This publication introduces energy management at a strategic level, and puts it in a business context.	Intermediate
	Project planning tool	Interactive tool which will help you plan carbon reduction projects, including making the business case and procurement of solutions.	Intermediate

Management Area	Relevant Tool/Guidance	Description	Level of Detail
	Environmental Management Systems (EMS)	An EMS provides an organisation with a structured framework from which to manage the elements of its activities which result in significant environmental impacts. Implementing and maintaining an EMS to the international standard ISO14001 will demonstrate the organisation's commitment to environmental management to its stakeholders. See: <ul style="list-style-type: none"> • Business Link Environment Management Systems • Environmental Management Systems (EMS) 	Intermediate
	Carbon saving advice for your organisation- Savings by sector	Interactive tool find information on reducing your energy bills and carbon emissions, and details of Carbon Trust products and services for your organisation.	Intermediate
Communication, Training Awareness and Engagement	Carbon Trust – Making the business case for a carbon reduction project: How to win over the board and influence people (CTV039)	This guide will help you gain support within the organisation for carbon/energy management projects.	Intermediate
	Employee awareness posters and stickers	The Carbon Trust provides a range of posters and stickers to assist with raising awareness of energy efficiency and encourage employees to adopt simple energy efficient actions in the workplace.	Basic
	BITC – The May Day Journey	See ' Engage ' <ul style="list-style-type: none"> • Links to tools and resources for engaging with employees and other stakeholders (e.g. suppliers and customers) 	Basic
	Carbon Trust - Creating an awareness campaign pack	This guide provides ideas and resources to motivate every individual within your organisation to save energy.	Intermediate
	Carbon Trust - Workshops and training events	The Carbon Trust offers a variety of events ranging from introductions to our services to technical energy efficiency training, all of which are free to attend.	Intermediate

Appendix 2: Carbon Calculation Options

Calculating GHG Emissions using Online Carbon Calculators

Online carbon calculators are tools which have built in GHG emission factors and formulas to convert your activity data into GHG emissions. They will often output a short report detailing emissions from each source and a total carbon footprint.

A range of calculators can be found online, these may be independent or government backed/funded.

Independent:

Many private organisations make available free calculators on the internet. These tools, their calculation methodologies and emissions factors have been found to be of varied quality. In addition, tools link to the sale of carbon offsets or other services may be at risk of bias calculations. If an independent calculator is used then you should make ensure you are satisfied with its quality.

Government Funded:

The Carbon Trust a government funded organisation and provides the free [Carbon Trust - Footprint Calculator](#). If a carbon calculator is selected then it is recommended that this tool is used; it is based on international standards for GHG management (GHG Protocol and ISO14001) and is updated annually with government emission factors (published by DEFRA). It has no inbuilt bias and includes online guidance information.

This tool is capable of dealing with many key emissions sources (see below); however, more complex Scope 3 emissions are not covered.

Emission Scope	Emission Sources Included in tool
Scope 1	On-Site Fuel Use, Owned Road Vehicles
Scope 2	Electricity Consumption (Grid, Renewables, CHP)
Scope 3	Travel (Road, Rail and Air). Other scope 3 emissions are not handled by the tool but can be manually if known

Calculating GHG Emissions using Emissions Factors

You can calculate your emissions yourself using your activity data and relevant emissions factors, using the formula:

$$\text{Activity Data} \times \text{Emission Factor} = \text{GHG Emissions}$$

To do this you must source relevant emission factors (available from [DEFRA](#) free of charge) and create a calculation process (for example a spreadsheet which you can input your activity data and emissions factors to output your GHG emissions). There are various free calculation tools (see below) available which you can use, adapt or used as a model for creating your own calculation spreadsheet.

Calculating your emissions in-house only requires basic IT skills and gives you control over the process. However, this approach will require more in-house knowledge and resources.

Resources:

- [DEFRA greenhouse gas \(GHG\) conversion factors](#)
 - Locates the current conversion factors to be linked to an annually updated spreadsheet of emission factors for organisations operating in the UK.
- [GHG Protocol Initiative - on-line calculation tools and guidance](#)
 - The GHG Protocol Initiative's tools will help you develop a comprehensive and reliable calculation approach. Each tool consists of an Excel workbook and a PDF guidance document. This provides step-by-step guidance on the use of a tool and should be consulted first. You may need to apply more than one tool to cover their emissions. [The tools for Offices and the service-sector companies should apply in most organisations.](#) *Note: UK Emission factors may need to be applied.*
- Other sector specific toolsets
 - Various general and sector specific toolsets can be found online. For example the [Legal Sector Alliance Carbon Footprint Protocol, calculator & guidance](#)

Carbon Accounting Software

A range of software and online tools are emerging which provide GHG emission calculation and other services. These accounting tools may be integrated/partnered with other services (such as consultancy services or accountancy software) or standalone. These tools may include a range of features (depending on the complexity and the price of the solution) above and beyond those offered by a carbon calculator. However, these tools are likely to involve higher purchase or running costs and therefore are likely to be suitable for more advanced carbon management strategies.

Additional capabilities may include:

More in-depth data capture, integration with financial data and accounting, capable of dealing with a wider range of emission sources, more powerful analysis of data, scenario and planning and target setting, benchmarking and reporting capabilities.