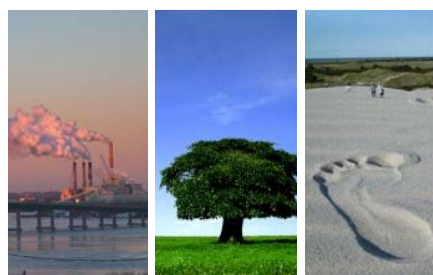




CarbonFree™ Product Certification

Carbon Footprint Protocol



Developed by the Edinburgh Centre for Carbon Management in conjunction with the Carbonfund.org Foundation.

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CONTENTS

1.	Background to this document.....	3
2.	Key objectives	3
3.	Relevant publications	3
4.	Glossary.....	3
5.	Emissions to be included.....	4
6.	Product life-cycle analysis emissions boundaries	4
7.	Data sources and transparency of data quality	5
8.	Linkage with corporate GHG reporting	8
9.	Emission reduction plans.....	8
10.	Updating the Protocol	8

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Purpose of this document:

The purpose of this protocol is to provide a standard approach and guidelines for determining the carbon footprint of certified CarbonFree™ products.

1. Background to this document

Companies are increasingly interested in quantifying, reducing and offsetting the greenhouse gas emissions associated with the lifecycle of products that they manufacture or supply. As demand accelerates, there is greater need for consistency in practice across the board. The science of carbon footprint analysis is young and evolving. No specific international standards currently exist on how to create a carbon footprint for a product. Consumers require transparent information about the assumptions and boundaries that have been used to estimate the emissions associated with these products.

Carbonfund.org is a non-profit organization leading the fight against climate change by providing practical and affordable solutions and actions for individuals and businesses and through our carbon offset programs aimed at maximizing carbon reductions and market transformation. Carbonfund.org works with over 700 companies and organizations on business, shipping, product and event offsetting. The CarbonFree™ product certification label is aimed at increasing awareness of products and companies that are compensating for their carbon footprint while helping to hasten a market transformation.

2. Key objectives

The main objective of this protocol is to provide a clear, transparent and practical method that can be consistently applied across a broad range of industries, products, and services by qualified consulting firms.

3. Relevant publications

This document should be used in conjunction with other standards and guidelines on lifecycle assessment and GHG reporting, including:

- ISO Standard 14044 for lifecycle assessment
- WBCSD-WRI Greenhouse Gas Protocol for corporate GHG reporting
- Carbon Trust (2007) Carbon Footprint Measurement Methodology
- PAS 2050 (DEFRA, UK)
- Le Bilan Carbone™ par L'ACEME (France)

Additionally, products that meet the Greenhouse Friendly™ standard developed by the Australian Government will automatically be eligible to meet the CarbonFree™ product certification program.

4. Glossary and acronyms

- ACLCA – American Council for Life Cycle Assessment
- *Product Carbon Footprint* – an estimate of the main GHG emissions produced in the lifecycle of a product (may exclude specific stages).
- CH₄- Methane
- CO₂– Carbon Dioxide

- *CO₂e* – Carbon dioxide equivalent
- *GHG* – Greenhouse Gas
- *HFC* – Hydroflourocarbon
- *LCA* – Life Cycle Assessment
- *NO_x* – Nitrous Oxides, Nitrogen Dioxide
- *PFC* – Perflourocarbon
- *SF₆* – Sulphur Hexafluoride
- *TAG* – Technical Advisory Group
- *CarbonFree™ products* – products whose major lifecycle GHG footprints have been certified and offset by Carbonfund.org.

5. Emissions to be included

The protocol is designed to calculate the GHG emissions in the life-cycle assessment of the product. Carbon Dioxide must always be included in the LCA. The following greenhouse gases should be included in the assessment: CO₂, CH₄, N₂O, SF₆, HFCs and PFCs and biomass CO₂ emissions. Gases may be excluded from an assessment if it can be shown that they constitute less than 5% of the total GHG footprint.

6. Product life cycle analysis emissions boundaries

The sources of GHG emissions to be included in the product carbon footprint estimation are shown in Figure 1.

The following sources of GHG emissions are well-documented and should always be included in the footprint:

- Extraction or primary production of raw materials (mineral extraction, fossil fuel extraction, purification and refining);
- Agricultural production, including energy used to manufacture fertilisers and other agrochemicals; emissions of nitrous oxide and methane from soils; methane emissions from livestock and manure;
- Manufacture of product;
- Extraction and primary processing of raw materials for packaging;
- Manufacture and processing of packaging materials;
- Transportation of raw materials to manufacturing sites;
- Manufacturing processes and manufacture of chemicals used in processing;
- Transportation of finished products to retail outlets;
- Refrigeration and refrigerants used up to the retail outlet.

In addition, other purchases and activities may be sources of emissions and may be included in the footprint analysis on a voluntary basis. These may include, but are not limited to:

- Manufacture of physical infrastructure or machinery used in manufacture and delivery of products (e.g. embodied energy in factory equipment and vehicles) unless these are already considered in existing LCA studies;
- Management operations / offices not directly involved in manufacturing processes or logistics;
- Storage of products in retail outlets.

Table 1 lists the categories of products for which product use emissions should always be included.

Table 2 lists the categories of material for which disposal of waste material should be included. This section will be added to over time.

Table 3 lists well documented sources of data for GHG emissions to reference as a starting point for estimates.

Allocation of emissions to co-products

Where a manufacturing process produces two or more co-products, such as fly ash, as outputs GHG emissions incurred up to this point may be allocated to each output on one of the following bases:

1. **On basis of market value:** each co-product is allocated GHG emissions in proportion to its relative market value. This basis is preferred when the market values of co-products are stable.
2. **On basis of substitution:** the amount of GHG that would be emitted to the atmosphere in the production of a substitute unit of co-product. This basis is preferred when the substituted emissions are known and where markets are sufficiently reliable to make this assumption.
3. **On basis of mass or thermal energy content:** each co-product is allocated GHG emissions in proportion to its energy content. This method is to be used when methods 1 or 2 are not feasible. Energy content is preferred when co-product value is directly related to energy content.

7. Data sources and transparency of data quality

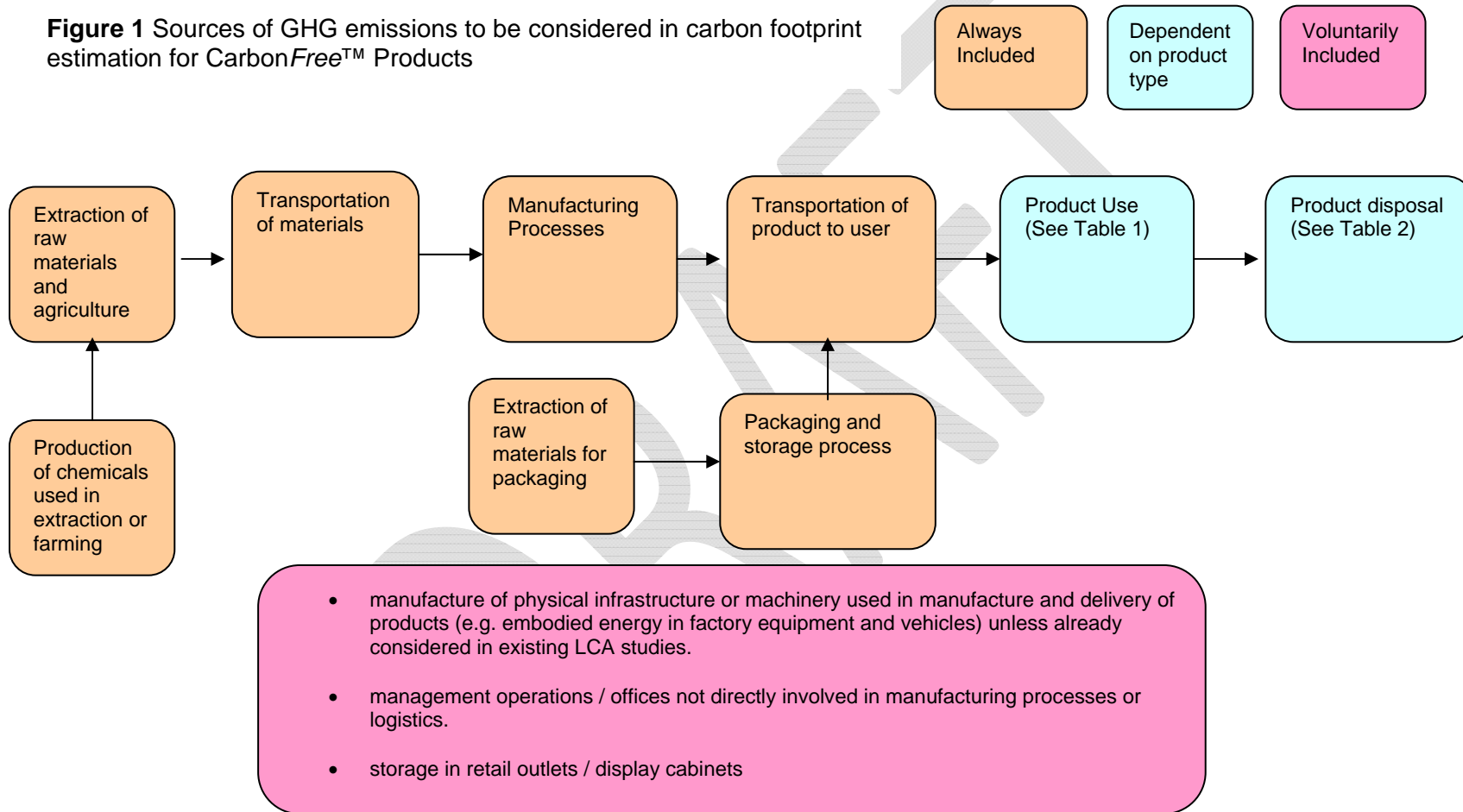
Product carbon footprint estimates should use direct process data where this is available and considered to be reliable. Where direct process data is not available carbon footprint assessments may be based upon secondary sources, such as previous LCA studies or LCA databases.

Estimates based on secondary sources should seek to identify and use “best available published evidence.” Assessment of best available evidence should take into account:

- product / process relevance
- geographical relevance
- time relevance (recent)
- objectivity

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Figure 1 Sources of GHG emissions to be considered in carbon footprint estimation for CarbonFree™ Products



(Continued from page 5)

- peer review
- transparency
- number of scientific citations

All data sources, assumptions and sources of evidence should be clearly stated in an assessment report.

8. Linkage with corporate GHG reporting

Wherever possible, product carbon footprint estimates should show where product lifecycle emissions overlap with corporate GHG emission boundaries of producers, suppliers and processors within the supply chain.

This information can be presented in a diagrammatic format.

9. Emission reduction plans

Product carbon footprint estimates should be used to help identify and target GHG savings in the product supply chain. Carbonfund.org requires product partners to annually report on emissions reduction plans for CarbonFree™ products.

10. Transparency of data and disclosure requirements

Companies participating in the product certification program are not required to disclose the footprint of their product, but are encouraged to do so. Carbonfund.org must retain a copy of the data for its records.

11. Audits, Auditors and Life Cycle Assessment Consultants

Carbonfund.org will periodically audit the life cycle assessments of the participating companies to ensure that they are designed to the specifications referenced in this protocol. Auditors will be selected through an auditing approval process, detailed in a forthcoming document. Life cycle assessment consultants will be required to meet the ACLCA guidelines when they are released in Fall 2008.

12. Updating the protocol

Carbonfund.org is establishing a Technical Advisory Group of carbon consultants, academics and the public to provide comments and recommendations for improving the protocol over time. A 21-day public comment period will be initiated to revise the protocol annually for at least the first three years of the program. After review by the TAG, comments will be incorporated into the document and posted to the website for common use.

Please send comments and suggestions to:

Carbonfund.org Foundation
1320 Fenwick Lane – Suite 206
Silver Spring, MD 20910
Or by e-mail to products@carbonfund.org

Table 1. Recommended and default usage assumptions

Examples of Products for which “use” emissions should be included in carbon footprint, and default assumptions on usage to be applied where manufacturer does not have specific information.

Product type	Recommended Usage Assumptions
Computers (servers)	Always on (24*7) 3 years
Computers (PCs / laptops)	8 hrs /day * 220 days * 2 years
Washing machines	1 heavy duty cycle / day * 3 years
Driers	1 heavy duty load / day * 3 years
Fridges	Always on at 4°C * 5 years; 20°C ambient
Brown goods (TVs, VCRs, Stereo)	Constant standby + 4hrs / day * 3 years
Small rechargeable electronic goods	Daily recharge * 2 years
Cars	100,000 miles
<i>(will be added to over time)</i>	

Table 2. Waste disposal

Categories of product material to be considered under product disposal emissions.

Materials to include	Default Waste Assumption
Packaging materials	For international products: To landfill with national % methane capture (Source: ECCM waste model) For US products: The US EPA MSW Facts and Figures provides national average data on percentage of various postconsumer products and packaging recovered for recycling, combusted with energy recovery, and landfilled. (http://www.epa.gov/msw/msw99.htm)
Non-food waste materials	
Landfilled products that do not decompose	
Carbon based materials such as paper or other bio based materials <i>(will be added to over time)</i>	

Table 3. Suggested Links

Source	For