



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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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. 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 200 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 eliminating their carbon footprint while hastening our market transformation goals.

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 wide range of manufactured products by a wide range of 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 14040 and 14041 for lifecycle assessment
- WBCSD-WRI Greenhouse Gas Protocol for corporate GHG reporting
- Carbon Trust (2007) Carbon Footprint Measurement Methodology

4. Glossary

- *Product Carbon Footprint* – an estimate of the main GHG emissions produced in the lifecycle of a product (may exclude specific stages).
- *CO₂* – Carbon Dioxide
- *CO₂e* – Carbon dioxide equivalent
- *GHG* – Greenhouse Gas
- *HFC* – Hydroflourocarbon

- *LCA* – Lifecycle Assessment
- *PFC* – Perfluorocarbon
- *TAG* – Technical Advisory Group
- *CarbonFree™ products* – products whose major lifecycle GHG footprints have been certified 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. Additional greenhouse gases must be included if it is demonstrated they contribute greater than 10% of the total GHG footprint (based on CO₂e).

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 also include emissions sources 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.

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

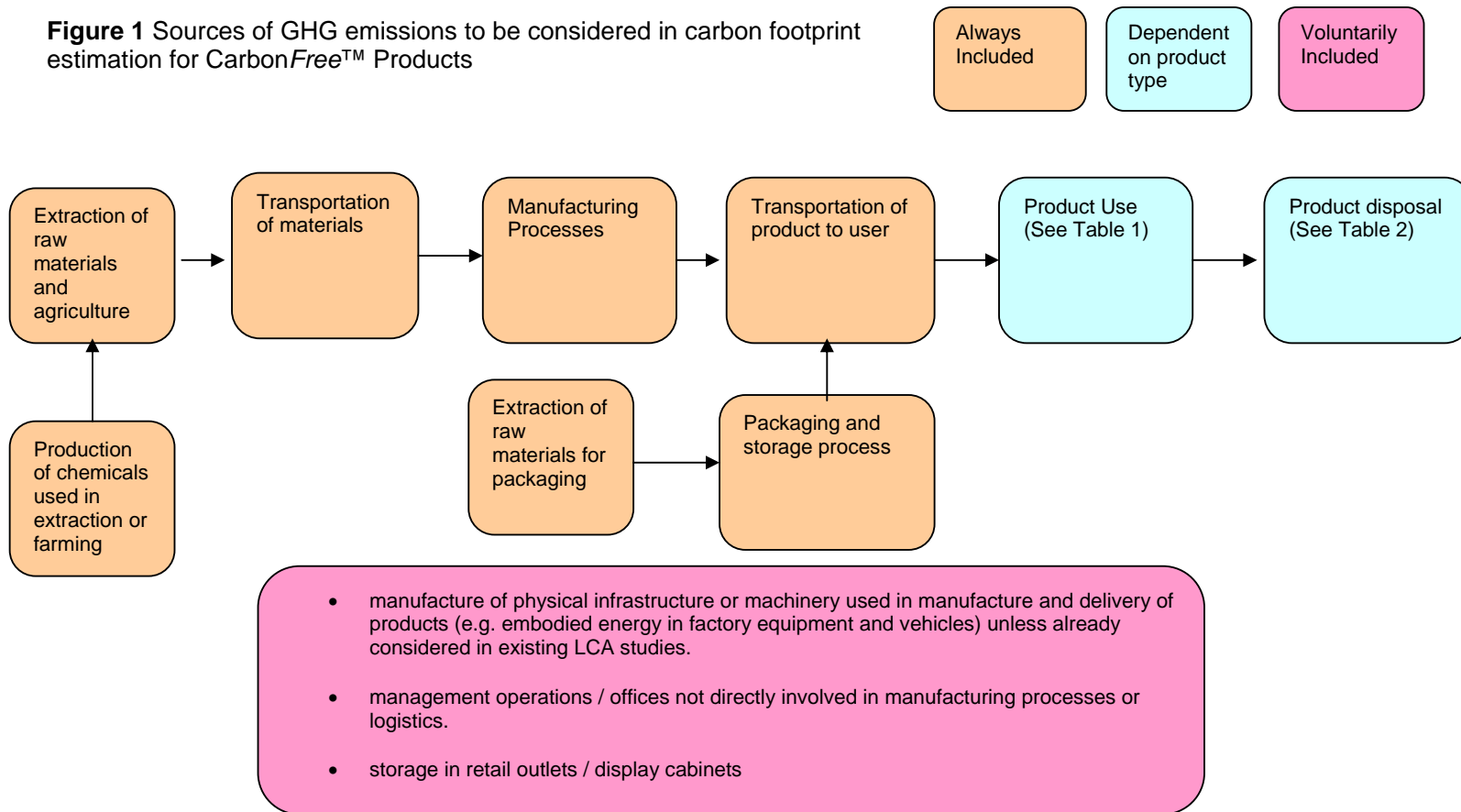


Table 1. Recommended and default usage assumptions

Types 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 * 320 days * 2 years |
| Washing machines | 1 heavy duty cycle / day * 3 years |
| Driers | 1 heavy duty load / day * 3 years |
| Fridges | Always on at 4degC * 5 years; 20deg 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 | To landfill with national % methane capture (Source: ECCM waste model) |
| Non-food waste materials | |
| <i>(will be added to over time)</i> | |

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 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.
2. On basis of market value: each co-product is allocated GHG emissions in proportion to its relative market value. This basis is preferred where the market values of co-products are stable.
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 possible. Energy content is preferred when co-product value is 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.

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

- product / process relevance
- geographical relevance
- time relevance (recent)
- objectivity
- 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. Updating the protocol

Carbonfund.org is establishing a Technical Advisory Group of carbon consultants, manufacturers and the public to provide comments and recommendations for improving the protocol over time. The TAG is chaired by Dr. Scott Matthews, Research Director, Green Design Institute, Carnegie Mellon University. Please send comments and suggestions to:

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