Carbon*Free*® Product Certification

Carbon Footprint Protocol

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

Version: 3.0

The Carbon*Free*® Product Certification label is aimed at increasing awareness of product emissions and recognizing companies that are taking responsibility for their carbon footprint while helping to hasten a market transformation to a clean energy and low-carbon future. The labelling program was started by Carbonfund.org in March 2007.

Authors

The first version of the Carbon*Free*® Product Certification Carbon Footprint Protocol was written jointly by the staff at the Edinburgh Centre for Carbon Management and staff at Carbonfund.org. It was first published in 2007.

The second version of the Carbon*Free*® Product Certification Carbon Footprint Protocol was jointly reviewed and updated using the first version by the staff at the Edinburgh Centre for Carbon Management, the staff at Carbonfund.org and the volunteer members of the Technical Advisory Group. Comments were collected during a public comment period that took place from June 6, 2008- July 6, 2008.

The third version of the Carbon*Free*® Product Certification Carbon Footprint Protocol was jointly reviewed and updated using the second version by the staff at Carbonfund.org and the volunteer members of the Technical Advisory Group. Comments were collected during a public comment period that took place from November X, 2009 – December X 2009.

The second and third versions were created after months of public and internal review. Comments were solicited from many members of the life cycle assessment and greenhouse gas community during the public comment period.

Acknowledgments

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Purpose of this document

The purpose of this protocol is to provide the guidelines and boundaries for determining the carbon footprint of Carbon*Free*® certified products.

1. Background

Driven by corporate responsibility, public relations, and potential government regulation, companies are increasingly interested in quantifying, reducing and offsetting the greenhouse gas (GHG) emissions associated with their company and the products they manufacture and/or supply. This, along with the growing market for eco-friendly products and consumer demand for transparent, credible and readily-accessible information at the point of purchase, has made carbon content labelling increasingly popular and a viable educational tool for the consumer.

Carbonfund.org, a leading non-profit provider of climate solutions for individuals and businesses, has developed the Carbon*Free*® Product Certification as a carbon label. By determining a product's carbon footprint, reducing that footprint where possible, and offsetting the remaining carbon emissions associated with the product, Carbonfund.org has created a meaningful, credible, and environmentally beneficial way for businesses to provide carbon-neutral products to their customers.

Carbon footprint analysis, or life cycle assessments (LCAs), and carbon-labelling are young and evolving. This document is intended to expand on the expertise in the industry by providing a standard approach and framework for the program participants and affiliates to follow when conducting an LCA.

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. Required Methodology

To assure consistency in the Life Cycle Assessments of Carbon*Free*® Products, this document shall be used in conjunction with one of the following standards:

- WBCSD-WRI Greenhouse Gas Protocol for corporate GHG reporting
- PAS 2050:2008
- ISO Standard 14044 for life cycle assessment
- LeBilan Carbone™ par L'ACEME (France)

Additionally, products that have received the Carbon Trust's Carbon Reduction label or meet the Greenhouse Friendly™ standard developed by the Australian Government may automatically qualify for the Carbon*Free*® product certification program.

It is the LCA consultant's responsibility to apply conservative standards to assure that the full carbon footprint of their product is captured.

For short descriptions of the standards above, please see appendix.

4. Glossary and acronyms

- *ACLCA* – American Center for Life Cycle Assessment
- *Product Carbon Footprint* – an estimate of the main GHG emissions produced in the life cycle of a product (may exclude specific stages).
- *CH_4*- Methane
- *CO_2* – Carbon Dioxide
- *CO_2e* – Carbon dioxide equivalent
- *GHG* – Greenhouse Gas
- *HFC* – Hydrofluorocarbon
- *LCA* – Life Cycle Assessment
- *NxOx* – Nitrous Oxides, Nitrogen Dioxide
- *PFC* – Perfluorocarbon
- SF_6 – Sulphur Hexafluoride
- *TAG* – Technical Advisory Group
- Carbon*Free*® *products* – products whose major life cycle GHG footprints have been certified and offset as part of the Carbon*Free*® Product Certification Program.

5. Emissions to be included

The protocol is designed to calculate the GHG emissions over the life cycle of a product. CO_2 shall always be included in the LCA. The following greenhouse gases shall also be included, when applicable, in the assessment and converted to CO_2 equivalents:

- CH_4, N_2O, SF_6
- Hydrofluorcarbons (HFCs)
- Perfluorocarbons (PFCs)
- Biomass CO_2 emissions

If a product process does not produce one of the compounds listed above that compound may be omitted from the GHG calculations, but an explanation of that omission must be included in the LCA. If it can be shown that the process creates a negligible amount (less than 5%) of *total* non- CO_2 equivalent GHGs they may also be excluded from the assessment, with an explanation.

6. Product life cycle analysis emissions boundaries

The GHG emissions resulting from processes listed below shall **always** be included in the assessment.

Raw Materials

- Extraction or primary production of raw materials (mineral extraction, fossil fuel extraction, purification and refining);
- Extraction and primary processing of raw materials for packaging.

Agriculture

- Energy used to manufacture fertilizers and other agrochemicals;
- Emissions of nitrous oxide and methane from soil;
- Methane emissions from livestock and manure.

Manufacturing

- Manufacturing processes and chemicals used in processing;
- Manufacturing of the product;
- Manufacturing and processing of packaging materials;

Transportation and Storage

- Raw materials to manufacturing sites;
- Transportation of product and materials between manufacturing sites;
- Finished products to retail outlets;
- Refrigeration and refrigerants used up to the retail outlet;
- Transportation of packaging goods.

Use Phase*

- Emissions arising from the use or life of the product.

Disposal and Recycling

- Disposal and recycling of product.

* *The product use phase must be included unless written consent is given by Carbonfund.org to exclude it from the assessment. It is, however, highly recommended that the use phase be included. This determination will be made on a case-by-case basis and at the discretion of Carbonfund.org.*

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:

- Manufacturing 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.

7. Data sources and transparency of data quality

Product carbon footprint estimates shall use direct process data where it is available and considered to be reliable. Every effort shall be made to use this primary data. 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
- Peer review
- Transparency
- Number of scientific citations

All data sources, assumptions and sources of evidence shall be clearly stated in the assessment report.

8. Linkage with corporate GHG reporting

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

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 Carbon*Free*® products. Details of how to submit information to the annual review will be provided by your contact at Carbonfund.org.

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 will retain a copy of the data for its records.

The boundaries of the assessment and emission sources included (i.e. raw material extraction, manufacturing, transportation, use, disposal and recycling) shall be clearly stated on all packaging and materials referencing the certification and label.

When the footprint of the product is disclosed the results shall be clearly shown in metric tons of carbon dioxide per unit of product.

11. Audits, auditors and Life Cycle Assessment consultants

Carbonfund.org may periodically audit the life cycle assessments of the participating companies to ensure that they are designed to the specifications referenced in this protocol.

12. Updating the protocol

Carbonfund.org has established a Technical Advisory Group of carbon experts and academics. This protocol was also open to the public to provide comments and recommendations. A 30-day public comment period will be initiated to revise periodically. After review by the TAG, comments will be incorporated into the document and posted to the website for common use.

13. Additional Information

Table 1. Recommended and default usage assumptions

Examples of product default "use" assumptions 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 * 240 days * 2 years (US) 8 hrs/day* 220 days * 2 years (other)
Washing machines	1 heavy duty cycle / day * 3 years
Driers	1 heavy duty load / day * 3 years
Refrigerators	Always on at 4°C * 5 years; 20°C ambient (F = (9/5)*C+32)
Brown goods (TVs, VCRs, Stereo)	Constant standby + 4hrs / day * 3 years
Small rechargeable electronic goods	Daily recharge * 2 years
Cars	100,000 miles
(will be added to over time)	

Suggested Links

Below are databases that may be useful in the creation of an LCA.

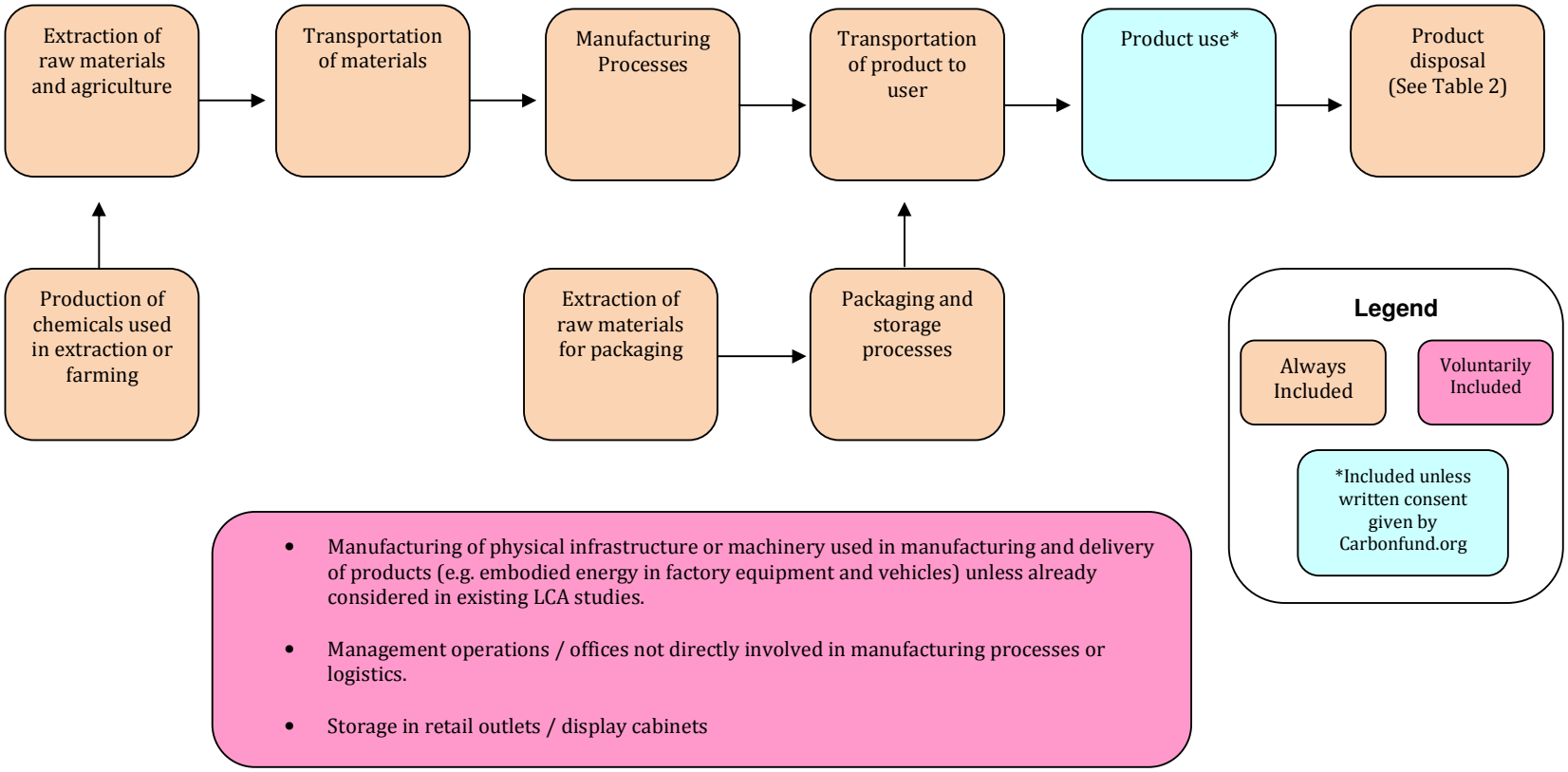
National Renewable Energy Laboratory's US Life Cycle Inventory Database (http://www.nrel.gov/lci/)

NREL and its partners created the U.S. Life Cycle Inventory (LCI) Database to help LCA experts answer their questions about environmental impact. This database provides a cradle-to-grave accounting of the energy and material flows into and out of the environment that are associated with producing a material, component, or assembly. It's an online storeroom of data collected on commonly used materials, products, and processes.

European LCA platform (http://lca.jrc.ec.europa.eu/lcainfohub/index.vm)

The European LCA platform was created to help LCA experts integrate life cycle thinking into product development and policy making by providing them with structured, cost free and independent information.

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



Please send comments and suggestions to:

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

Appendix

Short Summaries of Relevant Publications

WBCSD-WRI Greenhouse Gas Protocol for corporate GHG reporting
The World Business Council on Sustainable Development (WBCSD) – World Resources Institute (WRI) Greenhouse Gas Protocol for corporate greenhouse gas reporting is a document widely used to help organizations conduct a corporate greenhouse gas emissions assessment. It includes the best methods for tracking the 6 criteria greenhouse gases as defined by Kyoto and a calculator. It is one of the most recognized protocols available.

The Protocol is available for public download at:
http://www.ghgprotocol.org/standards/corporate-standard

PAS 2050:2008 (DEFRA, UK)
The Publically Available Specification (PAS) 2050:2008 provides a standard method for assessing product life cycle GHG emissions. PAS 2050 was created by the BSI British Standards and co-sponsored by the Carbon Trust and DEFRA, the UK Department of Environment, Food and Rural Affairs. The standard was created to allow businesses, from all sectors and of all sizes, to assess the life cycle carbon footprint of their goods and services and identify emission reduction opportunities.

The PAS 2050 standard is available for public download at:
http://www.bsigroup.com/en/Standards-and-Publications/Industry-Sectors/Energy/PAS-2050/

ISO Standard 14044 for life cycle assessment
The International Organization of Standardization (ISO) series 14000 discusses environmental management standards for conducting life cycle assessments. 14044 specifically address life cycle assessments – requirements and guidelines. This includes defining scope, boundaries, life cycle inventory, and others.

The ISO standard 14044 is not available for public download, but is available for a fee through: http://www.iso.org/iso/catalogue_detail?csnumber=38498

Le Bilan Carbone(R) par L'ADEME (France)
Le Bilan Carbone(R) is a carbon footprinting methodology created by the French government Agence de l'Environnement et de la Maitrise De l'Energie (ADEME). There are two versions, one of which is useful for quantifying carbon emissions and other greenhouse gases for corporate and the other for individual footprints. It primarily references the ISO standards and is meant mostly for francophone consumption.

For more information on the program:
http://www2.ademe.fr/servlet/KBaseShow?sort=-1&cid=96&m=3&catid=15730