



## CarbonFree® Product Certification

### Carbon Footprint Protocol



The original version of this document was created in 2007 by the Edinburgh Centre for Carbon Management, in conjunction with the Carbonfund.org Foundation.

Version: 3.0  
March 2010

## **CarbonFree<sup>®</sup> Product Certification – Carbon Footprint Protocol – Version 3.0**

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

### **Authors**

The first version of the CarbonFree<sup>®</sup> Product Certification Carbon Footprint Protocol was developed 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 CarbonFree<sup>®</sup> 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 (TAG). Comments were collected during a public comment period that took place from June 6, 2008- July 6, 2008.

The third version of the CarbonFree<sup>®</sup> 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 15, 2009 – December 15, 2009.

### **Acknowledgments**

We would like to extend our thanks to our Technical Advisory Group and the following businesses, universities and organizations whose staff contributed greatly to the creation and evolution of the protocol: Four Elements Consulting LLC, ECCM-Camco, Framework:CR, Franklin Associates, Sustainable Planning Partners, Michigan State University, Greenhouse Gas Experts Network Management Institute; Princeton University, Clemson University, Green Seal, University of Tennessee, Carnegie Mellon Green Design Institute, Environmental Resources Trust, World Resources Institute, and AgCert International. We would also like to thank the general public for the insightful comments received during the public comment periods.

**Table of Contents**

1. Background .....	4
2. Key objectives .....	4
3. Required Methodology.....	4
4. Glossary and acronyms.....	5
5. Emissions to be included .....	5
6. Product life cycle assessment emissions boundaries .....	6
7. Data sources and transparency of data quality .....	7
8. Linkage with corporate GHG reporting .....	7
9. Emission reduction plans.....	7
10. Transparency of data and disclosure requirements.....	8
11. Audits, auditors and Life Cycle Assessment consultants .....	8
12. Updating the protocol.....	8
13. Technical Advisory Group (TAG).....	8
14. Additional Information .....	9
15. Figure 1: Product life cycle assessment emissions boundaries .....	10
16. Contact Information .....	11
17. Appendix - Short Summaries of Relevant Publications .....	12

## **Purpose of this document**

**The purpose of this protocol is to provide guidelines and boundaries for determining the carbon footprint of CarbonFree<sup>®</sup> 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 nonprofit provider of climate solutions for individuals and businesses, has developed the CarbonFree<sup>®</sup> Product Certification as a carbon neutral product 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.

This document is meant to set the boundaries and provide a standard approach for CarbonFree<sup>®</sup> Certification program participants and affiliates to follow when conducting a Life-Cycle Assessment (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 methodologies**

To assure consistency in the carbon footprinting of CarbonFree<sup>®</sup> Products, this document shall be used in conjunction with one of the following standards:

- PAS 2050:2008
- ISO Standard 14044: 2006
- WBCSD-WRI Greenhouse Gas Protocol for corporate GHG reporting\*

*\* When finalized the WBCSD-WRI Product Life Cycle Accounting and Reporting Standard will replace the WBCSD-WRI Greenhouse Gas Protocol for corporate GHG reporting.*

Additionally, products that have received the Carbon Trust's Carbon Reduction label or meet the Carbon Pollution Reduction Scheme (formerly the Greenhouse Friendly<sup>™</sup> standard) developed by the Australian Government may automatically qualify for the CarbonFree<sup>®</sup> 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<sub>4</sub>*– Methane
- *CO<sub>2</sub>*– Carbon Dioxide
- *CO<sub>2</sub>e* – Carbon Dioxide Equivalent
- *GHG* – Greenhouse Gas
- *HFC* – Hydrofluorocarbon
- *LCA* – Life Cycle Assessment
- *N<sub>x</sub>O<sub>x</sub>* – Nitrous Oxides, Nitrogen Dioxide
- *PFC* – Perfluorocarbon
- *SF<sub>6</sub>* – Sulphur Hexafluoride
- *TAG* – Technical Advisory Group
- *CarbonFree<sup>®</sup> Products* – Products whose major life cycle GHG footprints have been certified and offset as part of the CarbonFree<sup>®</sup> 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<sub>2</sub> shall always be included in the LCA. The following greenhouse gases shall also be included, when applicable, in the assessment and converted to CO<sub>2</sub> equivalents (CO<sub>2</sub>e):

- CH<sub>4</sub>, N<sub>2</sub>O, SF<sub>6</sub>
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Biomass CO<sub>2</sub> 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<sub>2</sub> equivalent GHGs they may also be excluded from the assessment, with an explanation.

## **6. Product life cycle assessment 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/processing of materials used in product;
- 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.

*\* The product use phase must be included unless written consent is given by Carbonfund.org to exclude it from the assessment on a limited case-by-case basis. This requirement is new for Version 3.0 of the protocol.*

### **Disposal and Recycling**

- Disposal and recycling of product.

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 recently concluded 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 CarbonFree<sup>®</sup> 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 to the public, but are encouraged to do so. Carbonfund.org, likewise, does not disclose product footprints but 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 to the public 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**

The protocol will be reviewed and updated annually with guidance from the TAG and after a 30-day public comment period. After the public comment period and review by the TAG, recommendations will be incorporated into the document and posted to the website for common use.

### **13. Technical Advisory Group (TAG)**

The Carbonfund.org TAG:

1. Advises Carbonfund.org on technical questions regarding our CarbonFree<sup>®</sup> Product Certification Carbon Footprint Protocol.
2. Participates in discussions regarding Life-Cycle Assessment methodologies and pending regulation.
3. Provides additional technical expertise on an as-needed basis.

#### **TAG Members**

**Nana Wilberforce (TAG Chair)**- Energy Manager at PNC Financial Services Group

**Laura C. Draucker** - Associate, Climate and Energy Program at the World Resources Institute

**Michael Gillenwater** - Co-founder, Executive Director, and Dean of the Greenhouse Gas Management Institute

**Anne Landfield-Grieg** - Principal and owner of Four Elements Consulting, LLC

**Lise Laurin** – Founder of EarthShift

**Dr. Shelie Miller** - Assistant professor of Environmental Engineering and Earth Sciences at Clemson University

**Dr. Susan E. Selke** - Associate Director of the School of Packaging at Michigan State University



#### 14. Additional information

##### Usage assumptions

The use profile for the use phase of a product shall be based on the recommendations as outlined in the methodology used to perform the assessment.

##### 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 (NREL)** (<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.



**16. Contact information**

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](mailto:products@carbonfund.org)

## **17. Appendix - Short Summaries of Relevant Publications**

### **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](http://www.iso.org/iso/catalogue_detail?csnumber=38498)

### **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>