



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.

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The Carbonfree® Product Certification label is aimed at increasing awareness of the carbon dioxide emissions of products 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 product certification and labeling program was started by the Carbonfund.org Foundation in March 2007. This program protocol has been reviewed and updated in 2010, 2012 and 2015.

Authors

The first version of the Carbonfree® Product Certification Carbon Footprint Protocol was developed jointly by the staff at the Edinburgh Centre for Carbon Management and Carbonfund.org. It was first published in 2007. The Protocol has been updated several times since the original version by Carbonfund.org, with input from EarthShift, program participants and the public.

Acknowledgments

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Purpose of this document

The purpose of this protocol is to provide guidelines and boundaries for determining and neutralizing the carbon footprint of applicable products through the Carbonfree® Certified Products program.

1. Background

Driven by corporate responsibility, consumer demand, 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 labeling increasingly popular and a viable educational tool for the consumer.

Carbonfund.org Foundation, a leading nonprofit provider of climate solutions for individuals and businesses, has developed the Carbonfree® Product Certification as a globally-recognized 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 sets the boundaries and provides a standard approach for Carbonfree® Certification program participants and affiliates to follow when conducting an assessment of a product's carbon footprint in order to apply for Carbonfree® Product Certification program registration.

2. Key objectives

The main objective of this protocol is to provide a clear, transparent and practical method that can be consistently applied by qualified consulting firms and product manufacturers across a broad range of industries and products to determine the carbon footprint of products, discover and develop strategies to reduce product carbon footprints, and neutralize remaining product carbon footprint impact.

3. Required methodology

To assure consistency in evaluating the carbon footprint of Carbonfree® Products, the program protocol requires a "cradle-to-grave"* product carbon footprint assessment report that is compliant with one or more of the following standards:

- World Resources Institute/World Business Council for Sustainable Development Greenhouse Gas Protocol for Product Accounting & Reporting Standard (2013)
- PAS 2050:2011
- ISO 14067:2018
- ISO 14025:2006 Environmental Product Declaration following applicable Product Category Rule
- ISO 14040-14044:2006 Product Life Cycle Assessment (LCA) – full LCA or single attribute LCA for carbon footprint only

It is the responsibility of the preparer of the product's carbon footprint assessment to apply conservative standards in order to assure that the full carbon footprint of the product is captured, to assure that the resulting product carbon footprint report is in compliance with one or more of the protocol's required standards, and to identify the standard(s) to which the product carbon footprint assessment complies.

Any material deviations or exclusions from the standard(s) followed in the product's carbon footprint assessment must be explained, justified according to the methodologies as allowed in the standard(s), and approved by Carbonfund.org prior to the product's consideration for program registration.

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

**Any exception to product carbon footprint analysis that does not comply with "cradle-to-grave" requirement must be justified in accordance with one of the accepted standards and presented to Carbonfund.org for review and approval.*

4. Glossary and acronyms

Carbonfree® Products – Products whose "cradle-to-grave" life cycle carbon footprints have been certified and offset as part of the Carbonfree® Product Certification.

Product Carbon Footprint – an estimate of the main GHG emissions produced in the full "cradle-to-grave" life cycle of a product. Product Carbon Footprint and Product Greenhouse Gases (GHG) Footprint/assessment/inventory are considered interchangeable terms in this protocol.

LCA - Life Cycle Assessment is a technique for assessing the potential environmental aspects and potential aspects associated with a product (or service), by compiling an inventory of relevant inputs and outputs, evaluating the potential environmental impacts associated with those inputs and outputs, interpreting the results of the inventory and impact phases in relation to the objectives of the study.

IPCC - Intergovernmental Panel on Climate Change

GHGs – Greenhouse Gases, currently:

- *CH₄* - Methane
- *CO₂* – Carbon Dioxide
- *CO_{2e}* – Carbon Dioxide Equivalent
- *GHG* – Greenhouse Gases
- *GWP* – Global Warming Potential
- *HFC* – Hydrofluorocarbon
- *N_xO_x* – Nitrous Oxides, Nitrogen Dioxide
- *PFC* – Perfluorocarbon
- *SF₆* – Sulphur Hexafluoride

"cradle-to-grave" – assesses the product carbon footprint impacts to include the extraction of raw materials; the processing, manufacturing, and fabrication of the product; the transportation or distribution of the product to the consumer; the use of the product by the consumer; and the disposal or recovery of the product after its useful life.

EPD® - Environmental Product Declaration is an independently verified and registered document that communicates transparent and comparable information about the life-cycle environmental impact of products.

PCR - Product Category Rules; documents that define the rules and requirements for EPDs of a certain product category. They are vital for the concept of environmental declarations according to ISO 14025 as they enable transparency and comparability between different EPDs based on the same PCR.

5. Emissions to be included

The protocol is designed to guide businesses, manufacturers and qualified third-party consulting firms to calculate the GHG emissions over the full “cradle-to-grave” life cycle of a product and produce a product carbon footprint assessment report that will qualify the product for registration in the Carbonfree® Product Certification Program.

The product carbon footprint report shall include an assessment of all greenhouse gases required by the UNFCCC/Kyoto Protocol and the applicable standard(s) at the time the product inventory is being compiled and converted to CO₂ equivalents (CO₂e). These GHGs currently are:

- Carbon Dioxide (CO₂)
- Methane (CH₄)
- Nitrous Oxide (N₂O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulphur Hexafluoride (SF₆), and
- Nitrogen Trifluoride (NF₃)
- Biomass CO₂ emissions

The GHGs shall be assessed to the 100-year Global Warming Potential (GWP) values for these GHGs as defined in IPCC Assessment Reports, unless otherwise specified in the applicable Product Category Rule in compliance with ISO 14025.

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, Distribution 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 justification for use phase exclusion that is compliant with one or more of the standards is presented to Carbonfund.org and written consent is given by Carbonfund.org to exclude use phase from the assessment, on a limited case-by-case basis.*

Disposal and Recycling

- Disposal and recycling of product.

In addition, other 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);
- 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 primary and secondary data and data sources consistent with the requirements of the chosen standard and its required methodology (Sec. 3 above).

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

8. GHG emissions reduction plans

Product carbon footprint reports should be used to help identify and target GHG savings and GHG reduction opportunities in the product supply chain. Carbonfund.org requires business partners with registered Carbonfree® Products to annually provide a GHG emissions reduction plan for all registered Carbonfree® Products.

Elements of a product’s GHG emissions reduction plan should include targets for annual product GHG emission reductions and progress towards achieving these targets, and should include an assessment of changes to areas in the product’s life cycle that may have affected the product’s carbon footprint, including but not limited to:

- a) changes in processes, equipment, technology and/or transportation methods due to improvements or upgrades made by the reporting organization;
- b) selection and/or changes to suppliers in any stage of the product’s life cycle;
- c) deliberate and verifiable process improvements made by reporting organization and/or suppliers;
- d) improvements in the use stage and in the end-of-life stage achieved through improved product design or an improved end-of-life procedure.

9. Transparency of data and disclosure requirements

Companies participating in the Carbonfree® Product Certification Program are not required to disclose the carbon footprint of their product to the public, but are encouraged to do so. Carbonfund.org, likewise, does not disclose product carbon footprints but will retain access to a copy of the product carbon footprint inventory report and related data for its records.

When the carbon footprint of the product is disclosed to the public, the results shall be clearly shown in metric tonnes of carbon dioxide equivalent per unit of product, and in accordance with any requirements for carbon footprint reporting and/or communication as set forth in the applicable standards in Section 3.

10. Audits, auditors and Life Cycle Assessment consultants

Carbonfund.org may periodically audit the product GHG emissions reports of the participating companies to ensure that they are designed to the specifications referenced in this protocol.

11. Updating the protocol

The protocol will be reviewed and updated periodically. Carbonfund.org Foundation will lead the review and update process, and will include input from program participants, qualified third-party consulting firms and the public, as Carbonfund.org determines is necessary and beneficial to the program, its protocol and achieving the programs goals. If updates to the protocol are significant, Carbonfund.org will also seek input from the public via a 30-day public comment period. After the public comment period, recommendations will be incorporated into the document and posted to the website for common use.

12. Contact information

Please send comments and suggestions to:

Carbonfund.org Foundation
Carbonfree® Product Certification Program
Attn: Linda Kelly
853 Main Street
East Aurora, NY 14052

Or by e-mail to: products@carbonfund.org or lkelly@carbonfund.org

13. Additional information

Below are databases that may be useful in the creation of product carbon footprint assessment report.

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

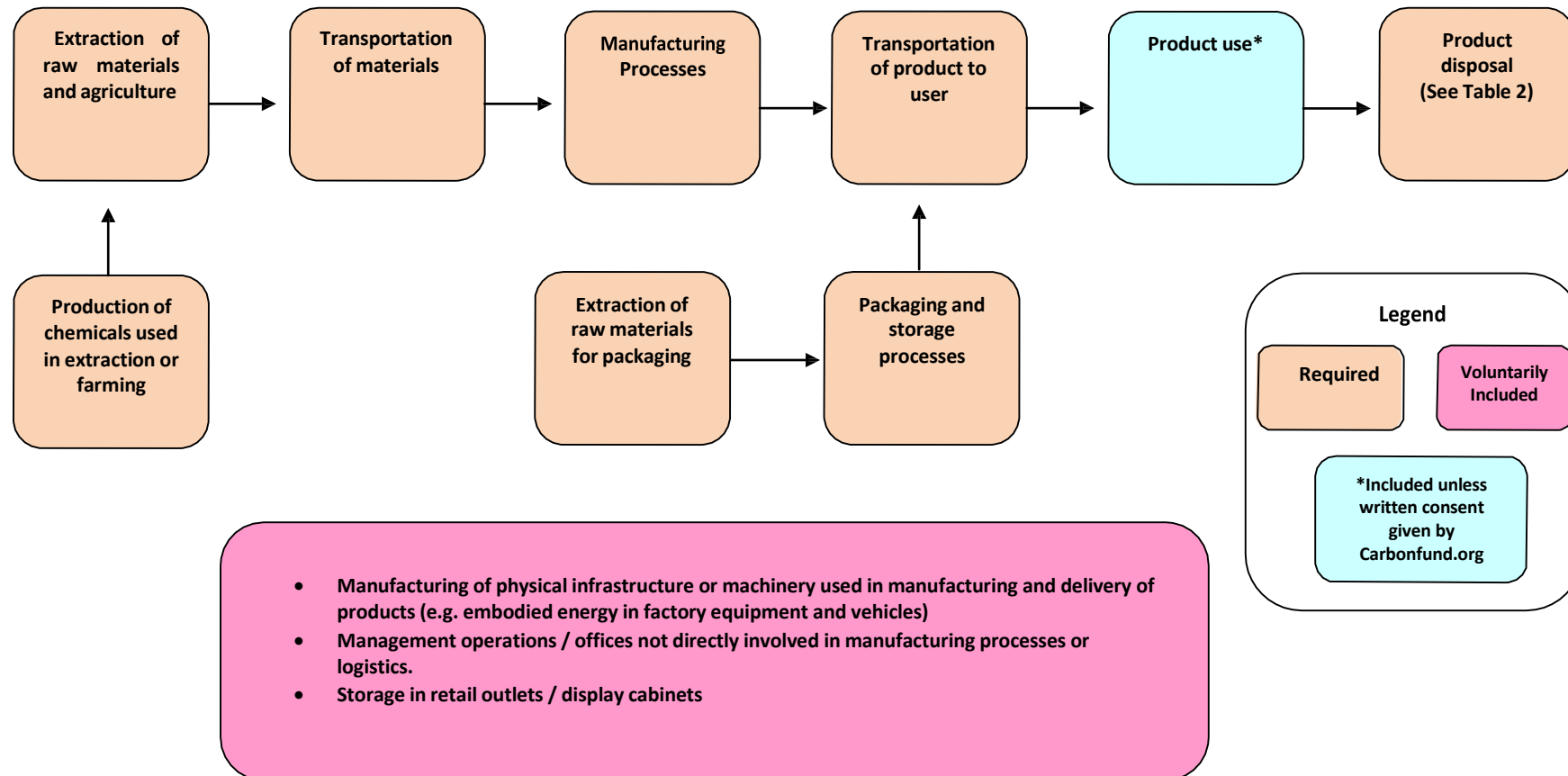
NREL and its partners created the U.S. Life Cycle Inventory (LCI) Database to help LCA experts answer their questions about environmental impact. This database provides a cradle-to-grave accounting of the energy and material flows into and out of the environment that are associated with producing a material,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

European LCA platform (<http://eplca.jrc.ec.europa.eu/>)

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.

14. Figure 1: Product cradle-to-grave life cycle assessment process to determine product carbon emissions and boundaries

Sources of GHG emissions to be considered in product carbon footprint estimation for Carbonfree® Products



Appendix

Short Summaries of Relevant Standards Publications

WRI/WBCSD Greenhouse Gas Protocol for Product Accounting & Reporting Standard:

The World Business Council on Sustainable Development (WBCSD) – World Resources Institute (WRI) GHG Protocol Product Life Cycle Accounting and Reporting Standard (referred to as the Product Standard) provides requirements and guidance for companies and other organizations to quantify and publicly report an inventory of GHG emissions and removals associated with a specific product.

The primary goal of this standard is to provide a general framework for companies to make informed choices to reduce greenhouse gas emissions from the products (goods or services) they design, manufacture, sell, purchase, or use. In the context of this standard, public reporting refers to product GHG-related information reported publicly in accordance with the requirements specified in the standard. It is widely expected to become one of the leading standards used for product LCAs, particularly in the United States.

The Standard is available for public download at:

http://www.ghgprotocol.org/files/ghgp/public/Product-Life-Cycle-Accounting-Reporting-Standard_041613.pdf

PAS 2060:2014 (DEFRA, UK)

The Publicly Available Specification (PAS) 2060 was developed in response to broad community and industry desire for a consistent method for assessing the life cycle GHG emissions of goods and services. Life cycle GHG emissions are the emissions that are released as part of the processes of creating, modifying, transporting, storing, using, providing, recycling or disposing of such goods and services.

PAS 2060 offers organizations a method to deliver improved understanding of the GHG emissions arising from their supply chains, but the primary objective of this PAS is to provide a common basis for GHG emission quantification that will inform and enable meaningful GHG emission reduction programs.

The PAS 2060 standard is not available for public download, but is available for a fee:

<http://shop.bsigroup.com/ProductDetail/?pid=000000000030286698>

ISO/TS 14067:2013 Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification and communication:

The International Organization of Standardization (ISO) series 14000 discusses environmental management standards for conducting life cycle assessments. ISO/TS 14067 provides details regarding principles, requirements and guidelines for the quantification and communication of the carbon footprint of products (CFPs), including both goods and services, based on GHG emissions and removals over the life cycle of a product. Requirements and guidelines for the quantification and communication of a partial carbon footprint of products (partial CFP) are also provided.

The communication of the CFP to the intended audience is based on a CFP study report that provides an accurate, relevant and fair representation of the CFP.

This Technical Specification (TS) is based on existing International Standards ISO 14020, ISO 14024, ISO 14025, ISO 14040 and ISO 14044 and aims to set specific requirements for the quantification and communication of a CFP, including additional requirements where the CFP information is intended to be publicly available.

ISO/TS 14067 is not available for public download, but is available for a fee:

http://www.iso.org/iso/catalogue_detail?csnumber=59521

ISO 14025:2006 Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures:

ISO 14025:2006 establishes the principles and specifies the procedures for developing Type III environmental declaration programs and Type III environmental declarations. It specifically establishes the use of the ISO 14040 series of standards in the development of Type III environmental declaration programs and Type III environmental declarations.

ISO 14025:2006 is not available for public download, but is available for a fee:

http://www.iso.org/iso/home/store/catalogue_tc/catalogue_detail.htm?csnumber=38131

ISO 14040:2006 Environmental management -- Life cycle assessment -- Principles and framework:

ISO 14040:2006 describes the principles and framework for life cycle assessment (LCA) including: definition of the goal and scope of the LCA, the life cycle inventory analysis (LCI) phase, the life cycle impact assessment (LCIA) phase, the life cycle interpretation phase, reporting and critical review of the LCA, limitations of the LCA, the relationship between the LCA phases, and conditions for use of value choices and optional elements. ISO 14040:2006 covers life cycle assessment (LCA) studies and life cycle inventory (LCI) studies. It does not describe the LCA technique in detail, nor does it specify methodologies for the individual phases of the LCA.

ISO 14040:2006 is not available for public download, but is available for a fee:

http://www.iso.org/iso/home/store/catalogue_tc/catalogue_detail.htm?csnumber=37456

ISO 14044:2006 Environmental management -- Life cycle assessment -- Requirements and guidelines:

ISO 14044:2006 specifies requirements and provides guidelines for life cycle assessment (LCA) including: definition of the goal and scope of the LCA, the life cycle inventory analysis (LCI) phase, the life cycle impact assessment (LCIA) phase, the life cycle interpretation phase, reporting and critical review of the LCA, limitations of the LCA, relationship between the LCA phases, and conditions for use of value choices and optional elements. ISO 14044:2006 covers life cycle assessment (LCA) studies and life cycle inventory (LCI) studies.

ISO 14044:2006 is not available for public download, but is available for a fee:

http://www.iso.org/iso/home/store/catalogue_tc/catalogue_detail.htm?csnumber=38498