



Product Optimization: LCA Impact Reduction Certification of Building Products

**Standard Audit Plan
April 2024**

1.0 Background

Product Optimization: Life Cycle Assessment (LCA) Impact Reduction Certification demonstrates an organization's commitment to continuous improvement within the overall life cycle impacts of their products. For building product manufacturers, there is an increased pressure to reduce the impacts of the built environment and movement from voluntary green building standards to mandatory requirements for green building codes and legislation. These standards and codes include mandates that use products which have documented embodied carbon values through LCA.

During the audit process, GreenCircle Certified, LLC (GreenCircle) will obtain a complete understanding of the product's life cycle, review and audit the initial and current LCAs and/or related Environmental Product Declaration's (EPD) that were completed and verify the modifications to the product and/or manufacturing process that were incorporated to reduce the environmental impacts of the product(s). GreenCircle will validate the overall life cycle impact reductions of the product based on these implemented changes. As a result, GreenCircle will verify and certify percentage reductions for various impact categories (i.e., Eutrophication, Global Warming Potential, etc.). GreenCircle will validate the reduction in environmental impacts of a product by comparing a baseline LCA or EPD to the LCA or EPD of the optimized product.

2.0 Goal

To validate the reduction of environmental impacts of a product based on changes to the product and/or manufacturing process after baseline and current LCAs were completed.

3.0 Company Qualifications

To qualify for Product Optimization: Life Cycle Assessment (LCA) Impact Reduction Certification a company must first complete a baseline LCA, have participated in an industry wide LCA, or have an industry wide LCA against which they would like to compare. The company must then complete an LCA in accordance with ISO 14040/ISO 14044 standards which includes the same system boundary of the baseline LCA (i.e., cradle to gate or cradle to grave). Lastly, the company is required to demonstrate the changes in life cycle impact are the result of implemented changes to the product formulation and/or manufacturing process.

During the proposal development process, GreenCircle will conduct initial interviews with the client to understand the products, operations and implemented optimization measures to verify if the proposed product(s) will likely qualify for an audit and possible

certification. It is not guaranteed that a product will be certified for Life Cycle Assessment Optimized certification until a thorough audit is completed by GreenCircle.

4.0 Documentation Requirements

To qualify for certification a company must be able to provide the following:

Option 1 – Multi-Attribute Optimization – Optimized EPD or LCA

- A copy of both the original published LCA and EPD for the product being analyzed and a second LCA and EPD after making improvements towards impact reductions
 - Both LCAs/EPDs must be critically reviewed to conform to ISO 14040/44 and have at least a cradle-to-gate scope.
 - LCAs must conform to the comparability guidelines of ISO 14025 and EN 15804 or ISO 21930 for construction products.
 - Impact reductions must be achieved for the specified functional unit
- SimaPro/GaBi files of previously completed LCAs for the product being analyzed.
 - Information on the validation period and type of assessment methodology for both LCAs and EPD's.
 - LCA software, practitioner, and program operator details involved in development of both LCAs.
- Detailed information on the product and/or manufacturing optimization measures implemented that are expected to reduce the life cycle environmental impacts of the product.
 - Documentation to prove that impact reduction/optimization measures have been implemented. If documentation is not provided, a site visit to visually inspect and verify these implemented optimization measures have occurred will be required.
 - If an optimization measure has been implemented within the product (i.e., recycled content was added in lieu of a virgin material), GreenCircle will need to collect the updated product recipe as well as purchasing documentation of recycled materials utilized for this product to verify the reduced impacts in association with this change.
 - If an optimization measure has been implemented within the operation (i.e., reduced the amount of water use or energy use within a piece of machinery), GreenCircle will need to collect updated utility data and documentation of the equipment changes or conservation measures implemented to verify the reduced impacts in association with this change.
- Building products with significant reductions may be evaluated through the LEED rating system. In LEED v4.1, there are thresholds to determine the value of a building product:

- The comparative analysis must show impact reduction in the global warming potential (GWP) impact category and must include a narrative describing how reductions in impacts were achieved. The published comparisons must be third-party verified (value at 100% by cost or 1 product).
- The comparative analysis must show impact reduction(s) of at least 10% in the global warming potential (GWP) impact category and must include a narrative describing how the impact reductions were achieved. The published comparisons must be third-party verified (value at 150% by cost or 1.5 products).
- The comparative analysis must show impact reduction(s) of at least 20% in the global warming potential (GWP) impact category and demonstrate at least 5% reduction in two additional impact categories. A narrative describing how the impact reductions were achieved is required. The published comparisons must be third-party verified (value at 200% by cost or 2 products).

Option 2 – Multi-Attribute Optimization – Action Plan

- LCA using ISO 14025 and EN 15804 or ISO 21930 for construction products
 - Publicly available action plan to mitigate or reduce life cycle impact
 - For building products, it must be product specific using the specified PCR functional unit, critically reviewed, and include the following:
 - Description of the LCA conducted including dataset, software, or platform used by company to complete analysis.
 - Identification of the largest life cycle impact areas identified in the analysis and a narrative description of the impact areas targeted for reduction in the action plan.
 - Description of specific steps anticipated in implementation of the action plan.
 - Proposed changes in formulation or manufacturing processes.
 - Specific dates and a full timeline for completion of all steps in the action plan.

5.0 Audit and Certification Process

5.1 Data Collection

Once the proposal and certification agreement are signed by the Client, GreenCircle will conduct an initial project meeting, via video or conference call, with contact(s) at each manufacturing facility to discuss the required data, GreenCircle’s audit plan, and project schedule. GreenCircle will gain an understanding of the previous LCA conducted and changes that were implemented to the product or manufacturing process to reduce the

environmental impact. GreenCircle will provide an initial data request to be completed by the facility contact(s). See the Documentation Requirements for information that will be requested in the data collection stage.

5.2 LCA Optimized Review and Calculations

GreenCircle will conduct a thorough review of both the initially completed and post-improvement LCAs and create a comparative analysis of the results between the two life cycle assessments per comparability of ISO 14025 and EN 15804 or ISO 21930 for building products. This comparative analysis is valid for three (3) years from the second-life cycle assessment. Following the comparative analysis, GreenCircle will verify the implemented optimization measures to the product and/or operation and associated narrative showing how the impact reductions were achieved. After completion of the GreenCircle Life Cycle Assessment Optimized Certification, GreenCircle will certify percent reductions per impact category.

For Multi-Attribute Optimization, showing impact reduction in GWP valued at 1 LEED product. Impact reductions in GWP of at least 10% valued at 1.5 LEED products. Comparative analysis showing GWP reduction of at least 20% and at least 5% reduction in two additional impact categories is valued at 2 LEED products.

5.3 Audit Deliverables

Upon verification of the Product Optimization: Life Cycle Assessment (LCA) Impact Reduction Certification claims, GreenCircle will issue GreenCircle Certified, LLC certificates and marks the product. The certificate will document that an independent evaluation of the LCA Optimized claim has been conducted on behalf of the company for the specified product(s). The certificate will include the percent reduction of environmental impacts by category. GreenCircle will prepare a written LCA Optimization audit report on the audit process and findings and provide this report to the Client.

If the product also has a GreenCircle Certified Environmental Facts (CEF) label, then embodied carbon reductions and manufacturing and operations improvements will be documented on the label. GreenCircle will list the final certificates on the GreenCircle Certified Product Database website and provide GreenCircle marks for use in marketing.

6.0 Annual Recertification Process

The comparative analysis is valid for a maximum of five (5) years from the second life-cycle assessment conducted for building products; corresponding to an EPD's period of validity.

All Product Optimization: Life Cycle Assessment (LCA) Impact Reduction Certifications will have annual reverifications by GreenCircle. It is important for GreenCircle to evaluate any changes within the product and operations or manufacturing processes to ensure continued compliance with the established criteria. After five (5) years or the expiration of the EPD/LCA, a full recertification analysis will be required to ensure continued transparency and further use of the GreenCircle mark.

7.0 Complaints, Appeals and Disputes

GreenCircle must be contacted immediately if there is a complaint, appeal, and or dispute brought against a certification that GreenCircle has verified. GreenCircle will follow the GreenCircle Appeals, Complaints and Disputes procedure to review and resolve the issue.

8.0 Guidelines for Private Label User

The Product Optimization: Life Cycle Assessment (LCA) Impact Reduction Certification is for the exclusive use of the Client. Companies that produce private label products will require any private label customers, or downstream re-sellers of the certified product(s) who desire to utilize the GreenCircle Product Optimization: Life Cycle Assessment (LCA) Impact Reduction Certification to enter into a separate Licensing Agreement with GreenCircle regarding the use of the GreenCircle Mark on private label product and promotional materials. Please contact GreenCircle directly for more information.

9.0 Labeling Requirements

The Client agrees to promptly cease display and use of the GreenCircle Certified, LLC mark: (1) Upon expiration of the certification period; (2) If Client is no longer in compliance with one or more of the terms and conditions of the GreenCircle Certification Agreement. Please reference the **GreenCircle Certified Mark Usage Guidelines** for further details and more information on using the mark. The Client shall take caution to ensure that the GreenCircle Certification mark is not associated with products and/or operations which do not comply with the GreenCircle Certification System (GCCS). The Client will be asked to remove the GreenCircle mark immediately if it is found that they have applied the mark on a non-conforming GCCS product and/or operation. If the Client fails to remove the misused mark, an investigation will be conducted pertaining to the misuse, in which the full cost of the investigation shall be borne by the Client. The Client shall not allow the GCCS Certification mark to remain on non-conforming products offered for sale. Such action could invite prosecution under U.S. Trademark statutes or attract other penalty provisions in other U.S. or State law.

10.0 Key Terminology

Component: A constituent part of something (such as a system or mixture).

Critical Review: Process intended to ensure consistency between a life cycle assessment, Environmental Product Declaration, and the principles and requirements.¹

Elementary Flow: material or energy entering the system being studied that has been drawn from the environment without previous human transformation, or material or energy leaving the system being studied that is released into the environment without subsequent human transformation.¹

Impact Category: class representing environmental issues of concern to which life cycle inventory analysis results may be assigned.¹

Impact categories:

| Impact Category | Unit | Definition |
|------------------------|---|---|
| GWP | kg CO ₂ e | global warming potential (greenhouse gases) |
| ODP | kg CFC-11e | depletion of the stratospheric ozone layer |
| AP | moles H ⁺ or kg SO ₂ e | acidification of land and water sources |
| EP | kg N or kg PO ₄ -eq | eutrophication |
| POCP | kg NO _x , kg O ₃ eq, or kg ethene | formation of tropospheric ozone |
| ADP – Fossil Fuels | MJ | depletion of nonrenewable energy resources |

Life Cycle Perspective: LCA considers the entire life cycle of a product, from raw material extraction and acquisition, through energy and material production and manufacturing, to use and end of life treatment and final disposal (for cradle to grave analysis). Through such a systematic overview and perspective, the shifting of a potential environmental burden between life cycle stages or individual processes can be identified and possibly avoided.¹

Life Cycle Assessment: Compilation and evaluation of the inputs, outputs and potential environmental impacts of a product system throughout its life cycle.¹

Material Inputs: All incoming materials including original products collected, materials or components reclaimed or recycled, virgin or purchased materials.

Material Outputs: All outgoing materials or products from a manufacturing or processing facility.

Product Category: Group of products that can fulfill equivalent functions.²

Product Category Rules: Set of specific rules, requirements, and guidelines for developing Type III product specific environmental declarations for one or more product categories.²

Raw Material: primary or secondary material that is used to produce a product.¹

Reference Flow: measure of the outputs from processes in a given product system required to fulfil the function expressed by the functional unit.¹

1. ISO 14040:2006 definition

2. ISO 14025:2006 definition

11.0 Reference Documents

GreenCircle Certification Scheme, GCC-OPS-03-1, Revision 6 – Outlines the certification process and GreenCircle’s Management System

The Greenhouse Gas Protocol - A Corporate Accounting and Reporting Standard - World Resource Institute

The Federal Trade Commission’s Green Guides:2012 – Guides for the Use of Environmental Marketing Claims

ASTM 1991-05: Standard Guide for Environmental Life Cycle Assessment of Building Materials/Products

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

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

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

EN 15804:2012: Sustainability of construction works, Environmental product declarations, Core rules for the product category of construction products

ISO 21930:2017: Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services

ISO 17065:2012: Conformity assessment – Requirements for bodies certifying products, processes and services

ISO 14071:2014: Environmental management – Life cycle assessment – Critical review processes and reviewer competencies

Amendment History

| Date | Issue | Summary of Amendments |
|-------------|--------------|---|
| 04/01/2011 | Rev. 0 | Official issue date of document. |
| 07/15/2013 | Rev.1 | Update language and definitions |
| 06/30/2015 | Rev. 2 | Additional update language and definitions |
| 05/22/2019 | Rev. 3 | Additional documentation requirements, definitions, and reference documents |
| 5/20/2022 | Rev. 4 | Editorial revisions |
| 12/22/2022 | Rev. 5 | Formatting revisions |
| 1/09/2023 | Rev. 6 | Split into building and non-building |

Certification Officer: Michelle Goreme