

**REVIEW DRAFT FOR STAKEHOLDER ADVISORY GROUP
SUMMARY OF KEY REQUIREMENTS - NOVEMBER 2009**



Product Life Cycle Accounting and Reporting Standard

SUMMARY OF KEY REQUIREMENTS

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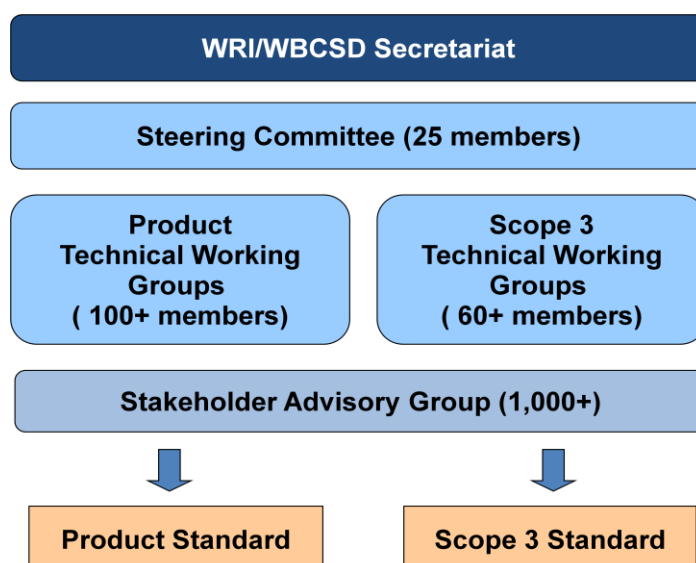
Introduction to Stakeholder Review Draft

Standard Development Process

The GHG Protocol Initiative follows a multi-stakeholder, consensus-based process to develop greenhouse gas accounting and reporting standards with participation from businesses, government agencies, nongovernmental organizations, and academic institutions from around the world.

This draft standard was developed between January and October 2009 by two technical working groups collectively comprised of over 70 members from a diversity of businesses, government agencies, NGOs, and academic institutions. The development was led and coordinated by WRI and WBCSD. A Steering Committee consisting of 25 organizations met three times between September 2008 and September 2009 to provide strategic and technical direction to the process.

Process Structure



Timeline

Date	Activity
November 2007	✓ Survey and consultations to assess need for new standards
September 2008	✓ Steering Committee Meeting #1 (Washington DC) ✓ Technical Working Group Meeting #1 (London)
January 2009	✓ Working groups begin drafting
March 2009	✓ Steering Committee Meeting #2 (Geneva)
June 2009	✓ Technical Working Group Meeting #2 (Washington DC)
August 2009	✓ Stakeholder webinar and comment period

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October 2009	✓ Steering Committee Meeting #3 (Washington DC)
November - December 2009	✓ First draft of standards released for stakeholder review ▪ Five stakeholder workshops (in Berlin, Germany; Guangzhou, China; Beijing, China; London, UK; Washington, DC, USA) ▪ Stakeholder comment period on first drafts
January - June 2010	▪ Pilot testing by several companies
Summer 2010	▪ Public comment period on second drafts
December 2010	▪ Publication of final standards

Process for Submitting Written Comments

- This draft is open for stakeholder comment from November 11, 2009 through December 21, 2009.
- To provide written comments, please use the comment template provided, instead of sending comments in a separate file or e-mail, in order to streamline the comment process.
- When using the comment template, please organize comments by chapter/section and reference page numbers and line numbers.
- If you have questions during the public comment process, please email Holly Lahd at hlahd@wri.org.
- Submit comments as an attached MS Word file by email to Holly Lahd at hlahd@wri.org no later than **Monday, December 21st, 2009**. We appreciate any effort to submit written comments before the deadline.

Process for Revising the Draft Standard

In 2010, WRI and WBCSD, in collaboration with the Steering Committee and Technical Working Groups, will:

- Revise the draft standard based on feedback received during five stakeholder workshops and the stakeholder comment period (November 11 – December 21, 2009)
- Road test the draft standard with 10-15 companies from a diversity of industry sectors and geographic locations during January to June 2010
- Revise the draft standard based on feedback received during road testing
- Circulate a second draft for public comment in mid-2010
- Revise the second draft based on feedback received
- Publish the final standard in December 2010

Terminology: Shall, should and may

The term “**shall**” is used in this standard to indicate what is required in order for a GHG inventory to be in conformance with the *GHG Protocol Product Standard*. The term “**should**” is used to indicate a recommendation, but not a requirement. The term “**may**” is used to indicate an option that is permissible or allowable.

1. Introduction to the GHG Protocol

The Greenhouse Gas Protocol Initiative (*GHG Protocol*) is a multi-stakeholder partnership of businesses, non-governmental organizations (NGOs), governments and others convened by the World Resources Institute (WRI), a US based environmental NGO, and the World Business Council for Sustainable Development (WBCSD), a Geneva-based coalition of approximately 200 international companies. Launched in 1998, the Initiative's mission is to develop internationally accepted greenhouse gas (GHG) emissions accounting and reporting standards and guidelines and to promote their use by businesses, governments, NGOs and other organizations.

The GHG Protocol Initiative has previously produced the following standards and guidelines:

- GHG Protocol *Corporate Accounting and Reporting Standard* (2004)
- GHG Protocol for Project Accounting (2005)
- GHG Protocol *Land Use, Land-Use Change and Forestry Guidance for GHG Project Accounting* (2006)
- GHG Protocol *Guidelines for Quantifying GHG Reductions from Grid-Connected Electricity Projects* (2007)



The GHG Protocol launched a new initiative in 2008 to develop two new standards for:

- Product Life Cycle Accounting and Reporting
- Corporate Scope 3 (value chain) Accounting and Reporting

2. Goal and Scope of the Product Standard

The goal of the GHG Protocol Product Standard is to support public reporting of product life cycle greenhouse gas (GHG) emissions to help companies and other organizations reduce these emissions by making informed choices about the products they design, manufacture, sell, purchase or use. This standard is sufficiently flexible to support GHG quantification and reporting for many different types of products.

This standard does not in itself directly enable product comparisons, comparative assertions, or product labeling. Valid comparison or labeling requires a greater degree of prescriptiveness than is provided in this standard, for example through sector-specific guidance. Further, this standard is not intended to support the accounting of GHG emission offsets or claims of carbon neutrality. This standard focuses on emissions generated during a product's life cycle and does not address avoided emissions or actions taken to compensate for released emissions.

3. Key Requirements

3.1. *Overview of the Product Life Cycle Methodology*

This standard is based on a process life cycle approach to product GHG accounting. Under the process life cycle accounting approach, companies shall quantify and aggregate the emissions from each specific process within the established boundary of the product system.

Companies shall report emissions of all Kyoto Protocol greenhouse gases from the product life cycle. These include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), hydrofluorocarbon compounds (HFCs), and perfluorocarbon compounds (PFCs). Companies may additionally report non-Kyoto gases as applicable.

This standard is based on an attributional approach to product GHG accounting. Companies shall use an attributional approach to assign life cycle GHG emissions to an individual product system for the purpose of public reporting, unless existing sector specific or program guidance stipulate the need to address indirect or consequential emissions sources. An attributional approach to GHG emissions accounting in products provides information about the GHG emitted directly by a product and its life cycle.

3.2. *Defining the Functional Unit*

Companies shall define the unit of analysis as the functional unit of the product. Companies shall consider the following elements when determining the functional unit:

- The function or performance characteristics provided by the product system
- Reference flow (i.e., amount of product necessary to fulfill the function and the quantity to which assessment results will be normalized)
- Relevance to the study goal (i.e., why a particular functional unit was chosen in the context of a particular goal)

Companies should consider the following elements if relevant:

- Product/system properties that differentiate the function being provided based on properties such as technical quality and aesthetics
- Market segment characteristics such as geographic location, customer preferences and temporal scales

3.3. *Setting the Boundary*

Processes that are attributable to the function of the product shall be included in the boundary of the product system. These processes are directly connected over the product's life cycle by material or energy flows, from extraction and pre-processing of product components through to the product's end-of-life. These processes are referred to as foreground processes throughout this standard.

Processes that are not directly attributable to the function of a product include facility operations, corporate activities, and capital goods. These are referred to as background processes throughout this standard.

- Capital goods shall be included in the product system if deemed significant for the studied product or product sector
- Facility operations and corporate activities should be included in the product system where relevant

Significance can be proven for capital goods using a qualitative or quantitative test. Qualitative significance is based on existing literature and/or sector specific data, while quantitative significance is based on the contribution of capital goods to the total system impacts. Companies shall perform the qualitative significance test first. If significance is not determined, a company should try to collect or estimate data before using the quantitative significance test. If neither test provides sufficient evidence of the insignificance of capital goods for the studied

product or product sector, capital goods must be considered significant and shall be included in the system boundary.

Companies shall conduct a cradle-to-grave assessment for all final products. Companies may conduct a cradle-to-gate assessment for intermediate products when the eventual fate of a product is unknown.

3.4. Allocation

Allocation problems exist when a process directly attributable to the studied (subject) product involves multiple inputs and/or multiple outputs. These processes are referred to as shared processes. When faced with an allocation problem, a company shall consider the following general principles:

- When addressing a shared process, a company shall first consider if allocation can be avoided.
- To perform allocation, a company shall adhere to the general accounting principles of completeness (account for all emissions), transparency (clearly document how emissions are calculated), accuracy (conduct a true accounting of the product's GHG inventory), and consistency (apply a process similarly to multiple outputs).
- The appropriate allocation methods shall be chosen with a preference for decisions based on natural science.
- To avoid allocation, a company may use one of the following methods:
 - Process subdivision: Avoid allocation by disaggregating shared processes.
 - Direct system expansion: Avoid allocation by expanding the functional unit to include outputs (co-products) from a shared process. To adhere to the methodological requirements of the standard, a company shall not use the avoided burden method to avoid allocation by system expansion.

If allocation is necessary, the company shall use one of the following methods to determine an allocation factor. The method must be selected in accordance with the general principles for solving allocation problems. In all cases, the method used to solve the allocation problem shall be justified and documented. The following methods can be used:

- Allocating based on the underlying (non-arbitrary) physical relationship: using the underlying relationship of the inputs and outputs of a shared process to determine an allocation factor.
- Allocating by substitution: using substitute data (i.e. average data for the co-product from a different production process) to determine an allocation factor. This approach is only applicable when the co-product does not share the same underlying physical relationship as the subject product (i.e., mass and energy outputs), and data is available that meets the data quality requirements.
- Allocating based on market value: using the market relationship between the subject product and co-product(s) to determine an allocation factor. This approach is only applicable if the market relationship between the subject product and the co-product(s) is fairly stable (i.e., stable price ratio regardless of price fluctuations).
- Allocation methods based on value choices or arbitrary assumptions: If the above methods are not applicable to the shared process, than an arbitrary assumption must be used to determine an allocation factor.

The general principles and allocation methods described above are also applicable to recycling. A company shall clearly report the assumptions made and justify the methodology used to allocate emissions as a result of recycling.

3.5. **Collecting Data**

Companies should establish a data management plan and complete an emission screening prior to collecting data. A data management plan is an organizational tool to ensure all data is collected and all relevant data information (source, type, quality) is recorded. The results from an emission screening help a company identify and prioritize the largest potential emission sources.

Primary data shall be collected for all processes under the financial control or operational control (as defined by the GHG Protocol *Corporate Standard*) of the company undertaking the product inventory. Primary data includes activity data, emissions factors, or direct emission measurements for a specific process related to a specific product manufactured by the reporting company or a company in its supply chain.

For all other processes, data of the highest practical quality shall be collected. Quality is based on how well the data represents the actual process, applying the following indicators: technological, temporal, and geographical representativeness, completeness, and precision. For processes where a company can engage suppliers to meet data collection needs, high quality primary data is preferred. For all other data needs, the best quality secondary data is preferred. Secondary process data relates to activity data, emissions factors or direct emissions measurements for processes related to a specific product that are not directly measured by the reporting company or a company in its supply chain. Secondary non-process data includes input-output data, which is derived from environmentally extended sector-based economic models. Any remaining data gaps shall be filled using proxy data (unmodified data based on a similar process) or extrapolated data (i.e., proxy data that has been customized).

3.6. **Data Quality and Uncertainty Assessment**

A data quality assessment shall be undertaken for all GHG emissions sources that cumulatively sum to 75% of total product emissions, beginning with the largest emissions source. Data quality shall be evaluated using either a descriptive or quantitative assessment based on the following metrics: technological, temporal and geographical representativeness, completeness, and precision. A statement regarding the overall methodology appropriateness and consistency of the inventory shall be made.

A company should assess the uncertainty of the inventory data and perform sensitivity on key emissions or data assumptions.

3.7. **Assurance**

Assurance (referred to as “verification” in the GHG Protocol *Corporate Standard*) is an objective assessment of the accuracy, completeness and presentation of a reported product GHG inventory and the conformity of the product GHG inventory to the standard. In order to state compliance with the standard, the product GHG inventory shall be assured. The following types of assurance are permissible:

- First Party (“Self” or “Internal”) assurance – Persons from within the organization but independent of the product GHG inventory determination process, conduct first party internal assurance;
- Third Party (“External”) assurance – Persons from a certification or assurance body independent of the product GHG inventory determination process, conduct independent third party external assurance.

Assurance providers, whether internal or external to the organization, shall be sufficiently independent of any involvement in the determination of the product GHG inventory or development of any declaration and have no conflicts of interests resulting from their position in the organization, such that they can exercise objective and impartial judgment. Although either of the above types of assurance is permitted, benefits of external assurance are outlined in the guidance section and disclosed in the GHG inventory report.

The assurance opinion shall be expressed in the form of either reasonable (high) or limited (moderate) assurance.

3.8. Reporting

A company shall publicly disclose a GHG inventory report. This report is divided into a summary and detailed report to address the needs of different audiences: the general audience (summary), and the audience familiar with GHG inventory accounting (detailed). The summary report shall include an introduction, the summary template (Table 1), the process map of the subject product, and a brief discussion on how the results will be used (i.e., to facilitate emission reductions).

Table 1: Summary Report Template

<i>Type of Inventory</i>		
Final Product - Complete GHG Inventory (Cradle to Grave), OR Intermediate Product - Partial GHG Inventory (Cradle to Gate)		
General Information		
<i>Parameter</i>	<i>Description [Template Notes]</i>	
Company Name and Contact Information		
Product Name	[Material Product or Service, Brand Name if applicable]	
Product Description	[Brief product description including whether it is a final or intermediate product]	
Functional Unit (study basis)	[For Cradle to Gate assessments, the boundary of the functional unit should be clearly stated]	
Country/Region of Product Consumption	[for Cradle to Grave assessments]	
Inventory Date and Version	[Year inventory was finalized] [1 if first inventory, 2,3 etc. for future versions]	
Study Results: Total Product GHG Inventory		
<i>Parameter</i>	<i>Value</i>	<i>Unit</i>
Total GHG Inventory	[Value]	[gram base unit ¹ CO ₂ e per Functional Unit]
Study Results: Percent of Life Cycle Stage		
<i>Stage Name</i>	<i>Value (Percent of Total CO₂e)</i>	<i>Comments</i>
Raw Material Acquisition & Preprocessing	[Value]	[Brief description of inclusions and end points for each stage]
Production & Service Delivery		
Distribution & Storage		
Use		
End-of-Life		
Quality Assessment Information		
Assurance Type	[External or Internal, Performed by Whom]	
Assurance Opinion	[Limited or Reasonable]	
Data Quality Assessment	[Statement on Overall Data Quality]	
¹ Gram shall be the base unit reported with a logical prefix (kg, mg, etc.), as applicable.		

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The company shall disclose whether internal assurance or external assurance was provided.

The detailed report shall include additional information on methodological assumptions, types of data used, and any justifications made during the inventory that a company is required to disclose. The full list of reporting requirements for the detailed report can be found in the full standard.

4. Glossary

Term	Definition
Accuracy (principle)	Ensure that reported GHG emissions are not consistently greater than or less than actual emissions and that uncertainties are reduced as far as practicable. Achieve sufficient accuracy to enable users to make decisions with reasonable assurance as to the reliability of the reported information. Clearly explain any estimates and avoid bias so that the report faithfully represents what it purports to represent.
Assurance	An objective assessment of the accuracy, completeness and presentation of a reported product GHG inventory and the conformity of the product GHG inventory to the Standard designed to enhance the degree of confidence of the intended users.
Attributional Approach to GHG Accounting	Provides information about the GHG emitted directly by a product and its life cycle. The system boundary includes processes that are directly linked to the product by material, energy flows or services following a supply-chain logic.
Background Processes	Processes that are not directly connected to the product or its components. Background processes include facility operations, corporate activities, and capital goods.
Comparative Assertion	<i>An environmental claim regarding the superiority or equivalence of one product versus a competing product that performs the same function. This standard does not directly enable comparative assertion. Source: ISO 14040</i>
Completeness (principle)	Ensure that the GHG report covers all product life cycle emissions within the specified boundaries (including temporal), state clearly any life cycle stages or significant non-GHG environmental impacts that have been excluded and justify these exclusions.
Consequential Approach to GHG Accounting	Provides information about the GHG emitted, directly or indirectly, as a consequence of changes in demand for the product. This approach typically describes changes in GHG emissions levels from affected processes, which are identified by linking causes with effects.
Consistency (principle)	Use methodologies to allow for meaningful comparisons of emissions over time. Transparently document any changes to the data, inventory boundary, methods, or other relevant factors in the time series.
Co-Products	Products produced in the product system under study but are used in other product systems.
Cradle-to-Grave Assessment	An assessment that includes all GHG emissions in the complete life cycle of a product from the beginning of the life cycle (e.g. raw material extraction) through final disposal or end use by the end consumer.
Data Quality	The characteristics of data for satisfying stated requirements. Generally data quality characteristics address how well the data corresponds to the time, geography and technology represented in the product inventory, the precision of any direct measurements, the completeness of processes represented in the inventory and the consistency of data across processes in the inventory.
Data Quality Indicator	Indicator used to describe individual process data in the system boundary.

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Global Warming Potentials	GWP is a metric used to describe the radiative characteristics of well mixed greenhouse gases which combine the effects of the differing times GHGs remain in the atmosphere and their relative effectiveness in absorbing outgoing infrared radiation (IPCC).
Emission Factors	These factors are calculated ratios relating GHG emissions to a proxy measure of activity at an emission source. (GHGP Corporate Standard)
Estimated Data	Where GHG emissions are available, but cover the whole production site and need to be disaggregated to a specific process/product.
Extrapolated Data	Emissions data from the same or similar products that have been customized to a new situation (e.g., region).
Final Product	Products that are ultimately consumed by the end user rather than used in the production of another product. Final goods enter the use phase in its current form without further transformation.
First Party ("Self" or "Internal") Assurance	Assurance provided by persons from within the organization but independent of the product GHG inventory determination process.
Foreground Processes	Processes that are directly connected over the product's life cycle by material or energy flows, from extraction and pre-processing of product components through to the product's end-of-life.
Functional Unit	The quantified performance of a product system for use as a reference unit (ISO 14044:2006)
Intermediate Products	Products that are used as inputs in the production of other products and therefore do not enter the use phase in their current form.
Input-Output Data	Data derived from environmentally extended input-output analysis (IOA), which is the method of allocating GHG emissions (or other environmental impacts) associated with upstream production processes to groups of finished products by means of inter-industry transactions. The main data sources for IOA are sectoral economic and environmental accounts. Economic accounts are compiled by a survey of facilities on economic inputs and outputs and tax data from individual establishments. Environmental accounts are derived from (surveyed) fossil fuel consumption by industry and other GHG sources compiled in national emission inventories.
Life Cycle	Consecutive and interlinked stages of a product system, from raw material acquisition or generation of natural resources to end of life. (ISO 14044:2006)
Life Cycle Stage	Defined to aid in boundary definition and emission reporting along the life cycle of a product. Stages are defined in this standard as raw material acquisition and preprocessing, production, product distribution and storage, use, and end-of-life.
Measured Data	Direct GHG emissions measurements for a process at the production site.
Multi-Input Process – remove allocation	Occurs when a number of different products (including the subject product) are treated in the same process.
Multi-Output Process	Occurs when the product system under study includes a common process with multiple outputs from which only the subject product output is included in the studied product system (and the other outputs belong to other product systems).
Primary Data	Relates to activity data, emissions factors, or direct emission measurements for a specific process related to a specific product manufactured by a company or another company in its supply chain.
Process Approach	A method of product life cycle accounting that involves quantifying and aggregating the emissions from each specific unit process within the established boundary of the product system.
Process Data	Physical flow data relating to the individual process within the defined system boundary, and may consist of site specific process data, generic/average process data, process data from literature studies and expert estimates, results from impact assessments, and proxy and extrapolated process data.

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Process Subdivision	Method of dividing the common process into sub-processes in order to eliminate the need for allocation.
Product	Any good or service
Product Differentiation	A broad term encompassing all the specific end uses of product level GHG inventory that can help a company distinguish their product in the market place.
Product level GHG inventory	Compilation and evaluation of the inputs, outputs and the potential GHG impacts of a product system throughout its life cycle.
Proxy Data	Unmodified emissions data from the same product but from a different locality or produced using different technology or GHG emissions of a similar product.
Raw Material	Primary or secondary material that is used to produce a product (note: secondary includes recycled material) (ISO 14044:2006)
Relevance (principle)	Ensure the product GHG report serves the decision-making needs of all users identified within the report. Present information in the report in a way that is readily understandable by the intended users with a reasonable knowledge of GHG accounting and who are willing to study the information.
Secondary Data	Relates to activity data, emissions factors or direct emissions measurements for processes related to a specific product that are not directly measured by the reporting company or a company in its supply chain.
Subject Products	Products used within the product system under study.
System Expansion	A method of expanding the functional unit of a study to avoid allocation.
Third Party ("External") Assurance	Assurance provided by persons from a certification or assurance body independent of the product GHG inventory determination process.
Transparency (principle)	Address and document all relevant issues in a factual and coherent manner, based on a clear audit trail. Disclose any relevant assumptions and make appropriate references to the methodologies and data sources used.
Uncertainty	Measure of the knowledge of the magnitude of a parameter. Uncertainty can be reduced by research, i.e., the parameter value can be refined. Uncertainty is quantified as a distribution.