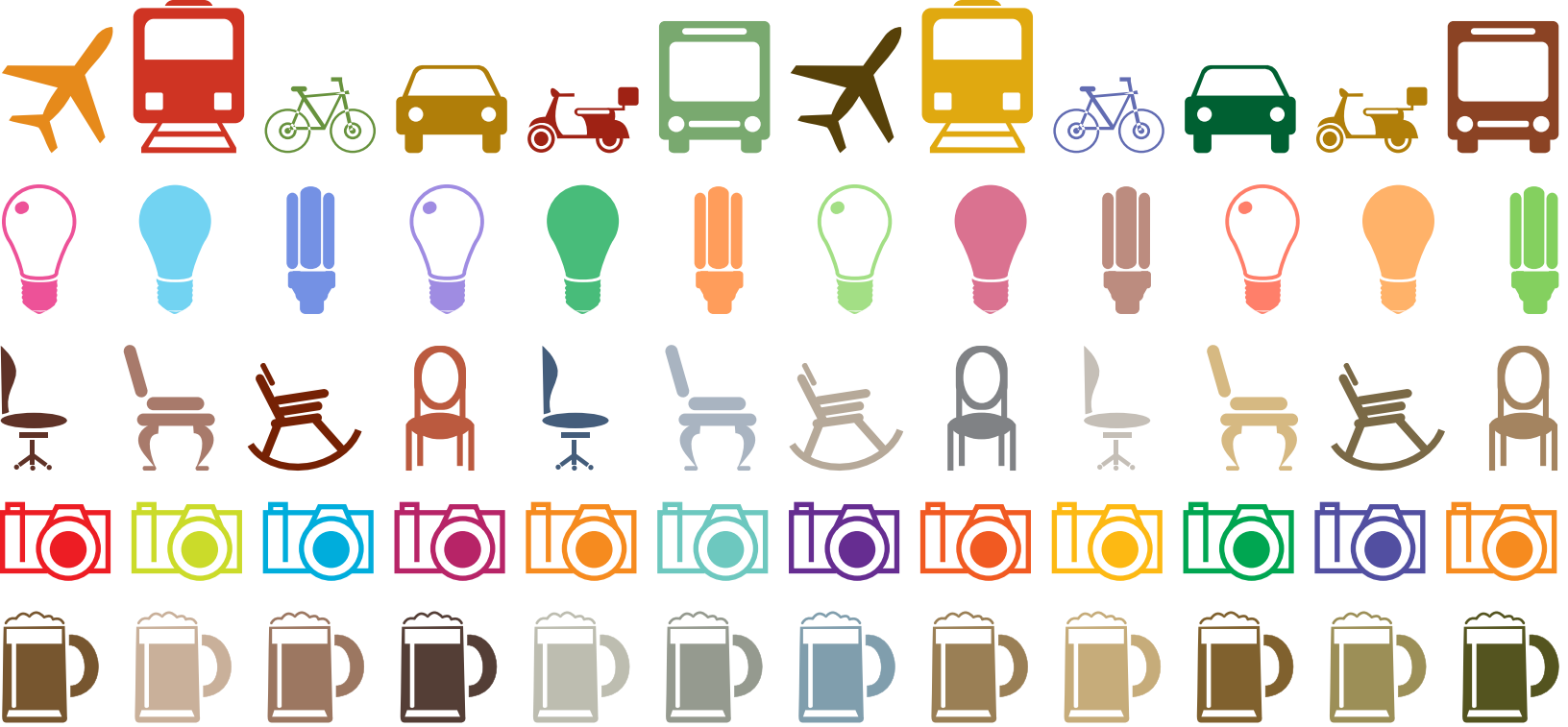

Guidance for Product Category Rule Development

Version 1.0
August 28, 2013

Product Category Rule
Guidance Development Initiative

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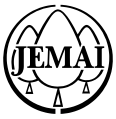
[i] See disclaimer on page 5

Contributing Organizations



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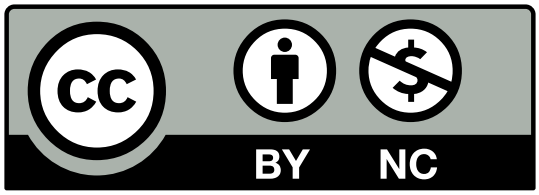

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Recommended Citation: Guidance for Product Category Rule Development. 2013. Ingwersen, W., Subramanian, V., editors. The Product Category Rule Guidance Development Initiative. Version 1.0. http://www.pcrguidance.org

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Acknowledgements: We would like to acknowledge the American Center for Life Cycle Assessment (ACLCA) for hosting two special conference sessions on PCR Alignment (LCA XI, 2011) and PCR Guidance (LCA XII, 2011) which were invaluable to this effort. We would like to acknowledge the ACLCA and PRé Sustainability for hosting virtual participant meetings and the Canadian Standards Association for hosting the public comment period.

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Photography: Thema 1 GmbH (Flickr)

Document History: This is the first public version of the document. The public draft (v0.9) was available for comment from January 15, 2013 to March 15, 2013. Comments received during this period and our responses are available on our website, http://www.pcrguidance.org.

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Acronyms

Acronym	Expansion
CPA	Classification of Products by Activity
CPC	Central Product Classification (United Nations)
EC	European Commission
EPD	Environmental Product Declaration
GHG	Greenhouse Gas
GPC	Global Product Classification
GPI	General Program Instructions
IERE	Institute for Environmental Research and Education
ILCD	International Reference Life Cycle Data System (EC)
ISO	International Organization of Standardization
LCA	Life Cycle Assessment
LCI	Life Cycle Inventory
LCIA	Life Cycle Impact Assessment
NASE	Nomenclature des Activités Économiques dans la Communauté Européenne
NGO	Non-Governmental Organization
PCF	Product Carbon Footprint
PCR	Product Category Rule
PEF	Product Environmental Footprint
TSC	The Sustainability Consortium
UNSPSC	United Nations Standard Products and Services Code

Terms and Definitions

Below, square brackets enclose the source of the term.

adapted PCR A PCR developed from an existing PCR (valid or expired). This is distinct from a new PCR.

consensus [U.S. Office of Management and Budget (OMB) Circular A-119] general agreement, but not necessarily unanimity, and includes a process for attempting to resolve objections by interested parties, as long as all comments have been fairly considered, each objector is advised of the disposition of his or her objection(s) and the reasons why, and the consensus body members are given an opportunity to change their votes after reviewing the comments.

NOTE Consensus is implemented by standards development organizations in many different ways. For example, some require 75 percent approval of an action while others might require 66 percent or 50 percent for the same action to be approved.

conservative assumption [var. of EPA Eco Risk Assessment Glossary: 2012] A conservative assumption estimates high-end impact rather than low-end impact. A conservative assumption should not underestimate impact.

cradle-to-gate [GHG Protocol Product Standard: 2011, UNEP Global Guidance Principles for LCA Databases: 2011, EC Product Environmental Footprint Guide: 2013] A part of the product's life cycle, from the natural resources that are extracted or harvested and processed through each subsequent stage of manufacturing and transportation through the production of the studied product and excluding the use or end-of-life stages.

cradle-to-grave [UNEP Global Guidance Principles for LCA Databases: 2011, EC Product Environmental Footprint Guide: 2013] All stages of a product's life cycle, from the natural resources that are extracted from the ground or harvested and processed through each subsequent stage of manufacturing, transportation, product use, recycling, and disposal.

gate-to-gate [var. of GHG Protocol Product Standard: 2011, EC Product Environmental Footprint Guide: 2013]. Only the processes under control of the reporting company.

information modules [var. of ISO 14025: 2006] Compilation of data to be used as a basis for a product claim, covering a unit process or a combination of unit processes that are part of the life cycle of a product. Herein information modules apply to any type of LCA-based product claim.

life cycle assessment [ISO 14044: 2006] Compilation and evaluation of the inputs, outputs and potential environmental impacts of a product system throughout its life cycle.

PCR alignment The process of making PCRs consistent within or across product categories. Alignment is only concluded when two or more PCRs have identical data requirements, LCA rules, and program-related procedures.

primary data [var. of BP X 30-323-0: 2011, EC Product Environmental Footprint Guide: 2013, ISO/TS: 2013] Quantified value of a unit process or an activity within the product system from a direct measurement or a calculation based on direct measurements at its original source. Also known as foreground data or specific data.

product carbon footprint (PCF) An LCA-based claim presenting information on global warming potential in carbon dioxide equivalents (carbon footprint) for a product.

NOTE Herein used to represent carbon footprint claims made in accordance with any LCA-based carbon footprint standard.

product category [ISO 14025: 2006] A group of products that can fulfill equivalent functions.

product category claim An environmental label or declaration (see product claims) that represents the full product category, instead of a single product. This may be an average, minimum bar, or other representation of performance of the product category.

product category rules (PCRs) [ISO 14025: 2006] Set of specific rules, requirements and guidelines for developing Type III environmental declarations for one or more product categories.

NOTE Related terms referred to herein as PCRs include product rules [GHG Protocol Product Standard: 2011], product environmental footprint category rules [EC Product Environmental Footprint Guide: 2012], and supplementary requirements [PAS 2050:2011].

product claims [ISO 14020: 2000]. An environmental label or declaration that may take the form of a statement, symbol, or graphic that indicates an environmental aspect of a product, a component, or packaging.

NOTE Herein product claims refer exclusively to standardized declarations and labels that are based on a life cycle assessment, or LCA-based claims, such as an ISO 14025 EPD, PCF or PEF. This does not include an LCA report, which contains all the relevant information about the assessment. Terms used interchangeably include environmental claims or claims.

program operator [ISO 14025: 2006] Body or bodies that conduct a Type III environmental declaration program. Here the term is used for the manager of PCRs for any product claims, and is used interchangeably with the term programs.

secondary data [BP X 30-323-0: 2011, EC Product Environmental Footprint Guide: 2013, ISO/TS: 2013] Quantified value of a unit process or an activity obtained from sources other than the direct measurement or calculation from direct measurements. Also known as background data or generic data.

Type III environmental declaration [ISO 14025: 2006]. Providing quantified environmental data using predetermined parameters and, where relevant, additional environmental information. Also known as environmental product declarations or EPDs.

underlying LCA An LCA study used as the basis for developing a PCR.

unified PCR A PCR created by more than one program operator that satisfies the demands of a PCR for that product category across all stated geographies and technologies.

Foreword

This guidance document is a response to an internationally recognized need for additional instruction on the development of rules specific to a category of products for making claims based on a life cycle assessment (LCA). The purpose is to supplement existing standards for LCA-based claims that require the development of product category rules (PCRs) or their equivalents. The aim is that PCRs can be developed in a consistent manner and used to support claims based on multiple standards. The scope of the Guidance is global. The Guidance embodies the efforts of individuals with expertise in LCA and LCA-based product claims from more over 40 organizations in 13 countries and regions under the name of The Product Category Rule Guidance Development Initiative. The Initiative received no financial support from any standard or other product claim program and this Guidance reflects no bias toward any particular standard or program. The Guidance does not in and of itself create any legal rights or obligations. The Guidance is intended to be a living document and we hope that it will continue to improve as the application of product claims based on LCA expands and diversifies.

Wesley Ingwersen & Vee Subramanian
Co-leaders

Product Category Rule
Guidance Development Initiative

Executive Summary

Product claims based on life cycle assessment (LCA) can provide quantitative, full life cycle information on products in a format that can permit comparisons and thereby inform purchasing decisions. In recent years, a number of standards and guides have emerged for making both multi-attribute and single-attribute product claims. The proliferation of these standards and guides has necessitated that additional rules be defined for the LCA and other types of sustainability information for each product category. These additional rules are referred to as Product Category Rules (PCRs).

The existence of a number of programs (in many countries) to develop PCRs that cover a wide array of product categories, in conjunction with the emergence of multiple LCA-based product claim standards, has resulted in a lack of cooperation on PCR development. Additionally, these standards and guides do not provide sufficient guidance for creating PCRs. These factors result in inefficiencies in the creation of PCRs, lead to incomparable environmental claims, create market confusion, increase the burden of preparing claims, and reduce the overall credibility of the LCA-based product claims for market applications in business-to-business and business-to-consumer communication.

Background

Formal discussions regarding the problems related to PCR inconsistency began at the PCR Roundtable, a side event of the Product Carbon Footprint World Forum in 2011. The PCR Roundtable chartered a taskforce that resolved that additional guidance on PCR development is necessary – a need which was reinforced at a special event on PCR Alignment at the LCA XI conference in Chicago. The American Center for LCA agreed to take the lead on creating a guidance document and appointed the managing editors to lead this effort.

In order to build on existing best practices in programs across the world and to develop an internationally relevant document, the informal Product Category Rule Guidance Development Initiative was founded and calls were issued to recruit volunteers. Over 60 participants representing 13 countries and regions eventually participated in the Initiative. A 12-member steering committee of international experts was appointed to advise and direct the leadership of the Initiative. In the initial stages an outline and operational procedures were approved. A self-appointed group of drafters began writing and a first draft was completed by October 2012. The draft went through internal review and revision in late 2012 and public review and revision in the first half of 2013.

Summary of Contents

The Guidance is intended to be a supplement to existing LCA-based product claim standards. The main document is structured to provide requirements and recommendations related to all stages of PCR development: planning, drafting, reviewing, publication and use.

In the planning stage, prior to PCR development, instructions are provided to determine when PCRs are required or recommended. When PCR development is pursued, instructions are provided on how to define and classify the product category, who to involve in the process, how to find and adapt existing PCRs if they are available, and what the requirements are for an underlying LCA study to inform the PCR.

The Guidance specifies what elements must comprise PCRs. PCRs should contain background information, review information, goal and scope, life cycle inventory instructions, life cycle impact assessment instructions, directions on presentation and interpretation of LCA results, instructions for providing additional information, and references and various annexes that provide additional documentation. Detailed specifications are provided for each element in a PCR, and a PCR template is included as a separate document that integrates each of these required elements into a common structure for PCRs.

The review process, review panel composition, public consultation, and PCR revision and publication process are all described in the Guidance. PCRs must be approved by a formal review committee and be open for public comments prior to publication. The review committee must address all comments received and the program oper-

ator must make their responses freely available to the public. The program operator is responsible for publishing PCRs and making them readily discoverable and easily accessible in one or more languages that are acceptable to the region of application. The program operator is also responsible for maintaining the PCR and collecting public comments while the PCR is still valid.

The use of PCRs was determined to primarily be beyond the scope of the Guidance, but guidance is provided on what elements in a PCR must be identical for creation of labels and declarations that are comparable.

The Guidance includes a number of best practice recommendations regarding the content of PCRs and the process of PCR development, and outlines additional efforts that will greatly enhance the development of PCRs. Recommendations are made on topics such as the extent of variation permitted in a product category, how to develop PCRs that are concise and prescriptive, and how to handle unresolved issues in LCA methodology within PCRs. In order to develop PCRs that are compliant with multiple standards and work in different regions, recommendations are made for the use of both fixed and flexible content in PCRs as well as to consider developing a unified PCR that applies to multiple standards and geographies. Additional needs to support PCR development and alignment are articulated, such as increased provision of public data, the creation of a global repository of PCRs, and central notification mechanisms to notify potentially interested parties of PCR-related activities. Furthermore, suggestions on systematic PCR development are provided to encourage more complete PCR coverage with increased consistency between and among product categories. The Guidance also highlights that PCRs need to be adaptable to potential future uses in more dynamic and digital forms.

Annexes in the Guidance include the PCR template, a comparison of LCA requirements in existing standards, a comparison of product classification systems, and additional criteria to inform selection of life cycle impact assessment methods.

Resumen Ejecutivo

Las declaraciones ambientales de productos basadas en análisis de ciclo de vida (ACV), entregan información cuantitativa del desempeño ambiental de productos, basada en su ciclo de vida, que permite realizar comparaciones y tomar decisiones de compras informadas. En los últimos años, ha surgido una variedad de guías y normas para la elaboración de declaraciones de productos, que informan un sólo atributo o múltiples atributos ambientales. La proliferación de estas normas dio como resultado la necesidad de desarrollar reglas que definan la información basada en ACV, y que definan otra información sobre la sustentabilidad de cada categoría de producto. Estas reglas adicionales se conocen como Reglas por Categoría de Producto (RCP).

La existencia de abundantes programas (en varios países) que desarrollan RCP para una vasta cantidad de categorías de producto, y la aparición de numerosas normas para declaraciones de productos basadas en ACV, derivaron en una falta de cooperación en el desarrollo de RCP. Además, las guías y normas existentes no proveen indicaciones suficientes para la elaboración de las RCP. Estos factores resultan en ineficiencias en la creación de las RCP, conducen a declaraciones ambientales incomparables, crean confusión en el mercado, aumentan las barreras para el desarrollo de declaraciones de producto, y reducen la credibilidad de los programas de declaraciones basados en ACV para la comunicación en el mercado empresa-a-empresa y empresa-a-consumidor.

Antecedentes

Las primeras discusiones formales acerca de los problemas ocasionados por las inconsistencias en las RCP, tuvieron lugar en la Mesa Redonda que se realizó en el Product Carbon Footprint World Forum del 2011. Como resultado, se identificó la necesidad de una guía adicional para la elaboración de las RCP. Más tarde ese año, en la LCA XI Conference de Chicago, se recalcó esta necesidad en una Sesión Especial sobre alineación de RCP. El American Center for LCA aceptó liderar la creación de la Guía y designó a los editores para coordinar el esfuerzo.

Con el objetivo de tomar como base las mejores prácticas existentes en los diferentes programas alrededor del mundo, y para desarrollar un documento que sea relevante a nivel internacional, se creó lo que informalmente se denominó la “Iniciativa para el Desarrollo de la Guía Global de Reglas por Categoría de Producto”, y se realizó una llamada para reclutar voluntarios. Alrededor de 60 representantes de 13 países y regiones diferentes, participaron de dicha Iniciativa. Se designó un Comité Directivo, compuesto por 12 expertos internacionales, para la asesoría y dirección de la Iniciativa. En las etapas iniciales, se aprobaron tanto el esquema del contenido de la Guía, así como los procedimientos operacionales para su elaboración. Un grupo de autores auto-designados comenzó la redacción del primer borrador, que se finalizó en Octubre de 2012. La Guía se sometió a revisión interna a fines del 2012, para luego ser revisada públicamente durante la primer mitad de 2013.

Resumen del Contenido

La Guía tiene por objetivo ser un suplemento de las normas que existen actualmente en materia de declaraciones ambientales de producto basadas en ACV. El documento principal está estructurado de manera tal de proveer los requerimientos y recomendaciones de cada etapa en el desarrollo de las RCP: planificación, elaboración del borrador, revisión, publicación, y uso.

Para la etapa de planificación, antes del desarrollo de las RCP, se indican las instrucciones para determinar cuándo es necesario o recomendado el uso de una RCP. Para la etapa de desarrollo, se proveen las instrucciones para determinar cómo se define y clasifica la categoría de producto, a quiénes se debe involucrar en el proceso, cómo buscar y adaptar RCP existentes si están disponibles, y qué requerimientos posee el estudio de ACV en el cuál se basa la RCP.

La Guía especifica qué elementos deben conformar una RCP. Las RCP deben contener antecedentes, información acerca de la revisión, definición del objetivo y alcance, instrucciones para el inventario de ciclo de vida,

instrucciones para el análisis de impacto de ciclo de vida, indicaciones sobre la presentación e interpretación de los resultados del ACV, instrucciones para la provisión de información adicional, y referencias y anexos que entreguen documentación complementaria. La Guía provee especificaciones detalladas sobre cada elemento que conforma las RCP, e incluye una plantilla de RCP que integra cada uno de estos elementos en una estructura común.

La Guía también describe el proceso de revisión externa, la composición del panel revisor, la etapa de consulta pública, y el proceso de publicación y actualización de las RCP. Éstas deben ser aprobadas por un comité revisor, y deben someterse a consulta pública antes de ser publicadas. El comité revisor debe responder a todos los comentarios que se reciban, y sus respuestas deben estar libremente disponibles al público a través del operador del programa. Dicho operador es el responsable de publicar las RCP y de que éstas sean fáciles de encontrar, y accesibles en uno o más idiomas admisibles para la región de aplicación. El operador de programa es también responsable de mantener las RCP, y recolectar comentarios públicos mientras las RCP son válidas.

En principio, se ha determinado que el uso de las RCP esté fuera del alcance de esta Guía. Sin embargo, se orienta al lector sobre qué elementos de las RCP deben ser idénticos para la creación de etiquetas y declaraciones comparables.

La Guía incluye una serie de recomendaciones de buenas prácticas sobre el contenido y el proceso de desarrollo de las RCP, y además determina los esfuerzos adicionales que podrían mejorar enormemente el desarrollo de las mismas. Se realizan recomendaciones tales como cuál es el grado de variación de producto permitido dentro de una misma categoría, cómo desarrollar RCP concisas y prescriptivas, y cómo manejar temas aún no resueltos de la metodología ACV en el contexto de RCP. Para lograr el desarrollo de RCP que sean conformes con las numerosas normas y trabajos en diferentes regiones, se realizan recomendaciones para el uso de elementos fijos y flexibles en una RCP, además de la consideración del desarrollo de RCP unificadas que se alinean a múltiples normas y alcances geográficos. Se determinan las necesidades adicionales para apoyar el desarrollo y alineación de las RCP, tales como un aumento en la provisión de datos públicos, la creación de una Base Global de RCP, y mecanismos de notificación centralizados que permitan notificar a las partes potencialmente interesadas en actividades relacionadas con las RCP. Además, se proveen sugerencias sobre el desarrollo sistemático de las RCP a fin de fomentar una cobertura más completa, con una mayor consistencia entre y al interior de las categorías de producto. La Guía también resalta que las RCP deben ser adaptables a usos potenciales futuros en formatos cada vez más digitalizados y dinámicos.

Los anexos de la Guía incluyen una plantilla modelo de RCP, una comparación de los requerimientos de ACV en las diferentes normas existentes, una comparación de los sistemas de clasificación de productos, y criterios adicionales para la selección de métodos de análisis de impacto de ciclo de vida.

摘要

产品声明能依据生命周期评价方法(即LCA)提供关于产品的量化的生命周期的信息，也能为消费者提供与其它产品相比较的依据，进而帮助消费者决定购买与否。近年来已经出现了许多针对产品的某一种或多种属性的声明标准和指导规范，因而有必要将这些标准和规范进一步衍生和细化，并以产品的类别为单位统一其与生命周期评价相关的规则，这些新的规则就被称为产品类别规则（Product Category Rule，即PCR）。

目前，许多国家针对产品类别规则制定了一系列方案，囊括了很多产品类别和不同的生命周期评价方法，但总体来说缺乏统一性和规范性。此外，这些标准和规范多数自成一体，并未为如何建立产品类别规则提供足够的指导依据。基于上述原因，产品类别规则的建立目前并不完善，不同环境声明之间缺乏可比性，造成市场困惑，增加声明准备过程中的负担，还会导致基于生命周期评价的产品声明在市场应用中的整体可信度的降低，不利于企业与企业之间或者企业与客户之间的交流。

背景

关于产品类别规则的不统一性的正式讨论始于2011年产品碳足迹世界论坛上的“产品类别规划圆桌会议”。这次会议上的特别工作小组决议认为，为产品类别规则的制定提供更多的指导规范是必要的，而这一必要性在随后在芝加哥举行的“生命周期评价第六次大会”（LCA XI Conference）上得到进一步肯定。同时，美国生命周期评价中心（ACLCA）决定带头编撰规范指导文本，并成立了编委委员会推动这一编撰工作。

为了能集合全世界的最佳实践案例，并使这份文本成为国际参照标准，产品类别规则编委委员会发起了一项关于“如何制定产品类别规则的指导规范”的倡议，成立了一个由12位国际专家组成的指导委员会，并公开征集志愿者。来自13个国家和地区的超过60名志愿者参与了这一编著工作。在指导委员会的推动下，先完成了提纲和操作过程的编制，然后开始起草文本。初稿于2012年10月完成，并于2012年底经过内部评审和修编，于2013年上半年完成公开评审和修编。

内容总介

本指导规范旨在作为现有的基于生命周期评价的产品声明标准的增补，其文本则为产品类别规则的建立提出了要求和建议，其中涵盖了规划、起草、评审、出版和使用等各个环节。

文本的内容包括：在最初的规划阶段如何决定何时应开始制定产品类别规则？决定使用产品类别规则后，应该如何定义该产品的类别？哪些人或机构应该参与到这一规则的制定过程？如果该产品类别的规则已经存在，应该如何找到这些规则并在其基础上做出适当调整？当有必要时，如何进行该产品的生命周期评价以便为该产品类别规则的制定提供依据？

本指导规范明确指出产品类别规则应由哪些要素组成，这其中包括背景资料、评审资料、目标和范围、生命周期清单说明、生命周期影响评价说明、生命周期评价的结果及阐释、相关额外信息的说明、参考资料及其它相关文献。针对上述每一个要素，本规范还提供了详细的解释，并将这些要素整合成一个关于产品类别规则的模板，编辑成一个独立文本作为附件。

本指导规范为评审过程、评审委员会的组成、公开咨询、修编和出版等提出了详细的指导意见。最终确立的产品类别规则必须经由一个正式的评审委员会的审核通过，并在正式出版前经过公开的公共咨询。评审委员会必须对在公共咨询中收到的评价做出回应和相应的调整，而这些回应和调整也必须完全公开。整个项目的执行委员会有责任发布该产品类别规则的结果，并确保其相应的用户能够快速检索并使用这些规则。因而该规则应该提供多语言版本，并符合不同地区的应用要求。此外，在该产品类别规则保持有效的期间，其执行委员会有责任持续接受公众的建议并对该规则进行更新维护。

当然，是否制定和采用的产品类别规则取决于很多外在因素。但是本指导规范明确了在制定产品类别规则时哪些要素应该是统一的，以及产品声明中哪些要素应该是具有可比性的。

本指导规范中所涵盖的世界最佳案例主要是关于产品类别规则的内容和制定流程，同时罗列出如何进一步改善产品类别规则的方法。具体的包括：某一产品类别应该怎样划定其范围；精确的规则和描述性的规则应分别如何制定；在产品类别规则中，如果其生命周期评价方法中有些部分尚未定论，应该如何处理等等。由于不同

地区的产品规范各不相同，为了能制定出可以适用于不同区域的产品类别规则，应如何对各项要求进行灵活处理的问题在本规范中也有相应阐述。同时，对最终出版的文本和数据等方面也做出了要求，比如基础数据的进一步公开化，建立全球产品类别规则数据库，以及相应的管理机制以便实时更新与产品类别规则相关的研究和应用进展情况。此外，还提出了系统化建议，鼓励制定的产品类别规则系统扩大其覆盖面，提高产品类别之间的一致性。未来的数字化应用趋势也是值得重视的一个发展方向。

本指导规范的附件包括：产品类别规则的模板、对产品生命周期评价要求的现有标准的对比分析、产品分类系统的对比以及如何选择不同生命周期评价方法的建议。

Sommaire exécutif

Basées sur l'analyse du cycle de vie (ACV), les déclarations environnementales de produits fournissent des renseignements quantifiés sur l'impact environnemental du cycle de vie d'un produit et ce, sous un format permettant comparaison et choix de consommation éclairés. Au cours des dernières années, plusieurs normes et guides méthodologiques se sont multipliés pour encadrer les déclarations environnementales de produits tant mono critère que multi critères.

Devant cette prolifération, des règles complémentaires sont devenues essentielles pour encadrer la réalisation d'ACVs et d'autres types de déclarations environnementales et ce d'une catégorie de produits à une autre. Ces règles complémentaires sont dénommées règles de catégories de produits (selon la terminologie anglophone « product category rules » ou PCR).

De nombreux programmes et initiatives ont vu le jour dans différents pays pour encadrer le développement de ces PCRs et ce, pour un large éventail de catégorie de produits. En parallèle, différents standards encadrant les déclarations environnementales de produits basées sur l'ACV ont également émergé, ne fournissant toutefois que peu de détails quant au processus de développement des PCRs. Ces différents éléments de contexte ont contribué à un manque de coopération dans les efforts de développement des PCRs. Cumulés, ils résultent en une inefficacité dans la création des PCRs, des déclarations environnementales non comparables, une confusion sur les marchés, un alourdissement du fardeau associé au développement des déclarations environnementales. Tout ceci contribue à porter préjudice à la crédibilité générale des déclarations environnementales basées sur l'ACV, tant dans une perspective de communication entre entreprises (« business-to-business », B2B) que de communication d'une entreprise vers les consommateurs. (« business-to-consumer », B2C).

Contexte

Les discussions formelles concernant la problématique de l'incohérence des PCRs ont débuté lors de la Table Ronde des PCRs (PCR Round Table), évènement tenu en marge du Product Carbon Footprint World Forum de 2011. Le groupe de travail issu de cette table ronde a conclu en la nécessité d'un meilleur encadrement du développement des PCRs, conclusion consolidée lors d'une session dédiée lors de la conférence LCA XI à Chicago. L'American Center for Life Cycle Assessment (ACLCA) a accepté de coordonner la création de lignes directrices visant un meilleur encadrement des PCRs et a désigné les rédacteurs en chef pour en diriger les efforts.

Dans la perspective de capitaliser sur les meilleures pratiques des différents programmes existants et de produire un document pertinent à l'échelle internationale, le groupe de travail collaboratif Product Category Rule Guidance Development Initiative a été mis sur pied. Un appel à volontaires a permis de rassembler plus de 60 personnes représentant 13 pays et régions pour participer au développement des Lignes Directrices. Cette équipe a été conseillée et dirigée par un comité directeur composé de 12 experts internationaux ayant par ailleurs approuvé le plan d'action et les procédures opérationnelles de l'initiative tôt dans son processus de mise en place. Un groupe s'est porté volontaire pour rédiger une version préliminaire des Lignes Directrices qui a été complétée au mois d'octobre 2012. Cette première version a été soumise à un processus de révision interne à la fin 2012, de même qu'à un processus de revue publique début 2013.

Contenu

Les Lignes Directrices se veulent un complément aux normes existantes encadrant les déclarations environnementales de produits basées sur des ACVs. Le document s'articule de manière à fournir des exigences et des recommandations pour chacune des étapes du développement d'un PCR : planification, ébauche, révision, publication et utilisation.

Au début du processus de développement du PCR, soit l'étape de planification, les Lignes Directrices permettent

en premier lieu de déterminer si un PCR est requis ou nécessaire. Si le développement d'un PCR est requis, plusieurs éléments sont détaillés tels que la manière de définir et de classifier la catégorie de produits, les parties prenantes à impliquer dans le processus de développement, la manière de trouver et d'adapter des PCRs éventuellement existants de même que les exigences relatives aux ACVs sous tendant le PCR à développer.

Les Lignes Directrices détaillent les éléments devant être inclus dans un PCR. Les PCRs devraient donc contenir des renseignements relatifs au contexte, au processus de révision de même qu'aux objectifs et au champ de l'étude en plus de fournir les instructions relatives à l'inventaire du cycle de vie et à l'évaluation des impacts du cycle de vie. Des spécifications quant à la présentation et l'interprétation des résultats d'ACV devraient également être fournies, de même que la manière de présenter les renseignements additionnels, les références et les différentes annexes contenant la documentation complémentaire. Des spécifications détaillées sont fournies pour chacun des éléments d'un PCR et un modèle de PCR intégrant chacun de ces éléments dans une structure commune de PCR est annexé aux Lignes Directrices.

Tous les éléments de la révision du PCR sont décrits dans les lignes directrices, tant le processus de révision, que la composition du comité de revue, la consultation publique et le processus de publication. Un PCR doit être approuvé par un comité officiel de revue et être soumis à une période de consultation publique avant sa publication. Le comité de revue doit répondre à chacun des commentaires des réviseurs et il est de la responsabilité de l'opérateur de programme de mettre ces réponses à disposition du public. L'opérateur de programme est responsable de publier le PCR et d'en faciliter la diffusion et l'accessibilité dans une ou plusieurs des langues d'usage dans les régions d'application. Finalement, l'opérateur de programme est également responsable de mettre à jour le PCR de même que de collecter les commentaires que le public pourrait avoir à son sujet pendant sa période de validité.

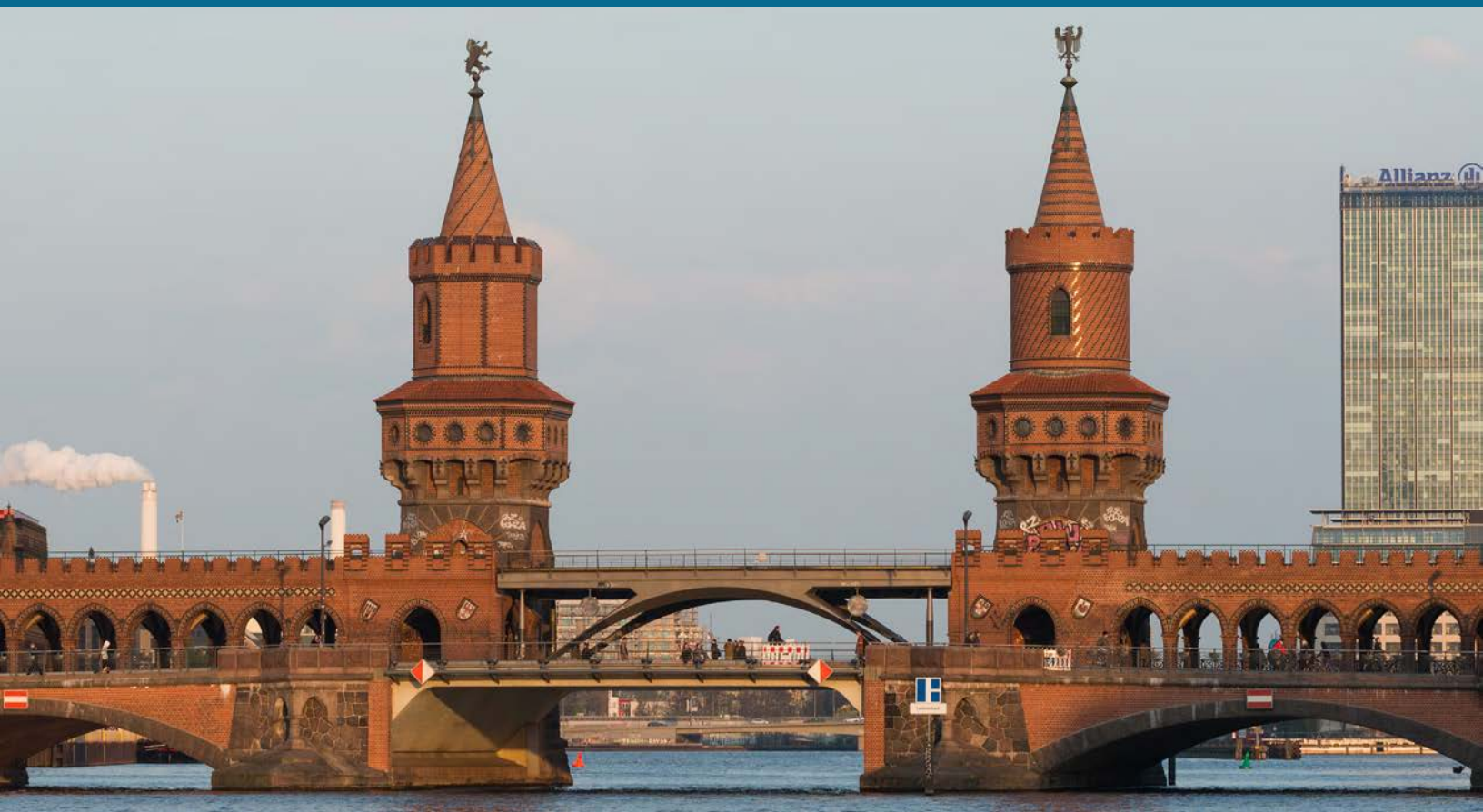
Les Lignes Directrices ne visent pas à encadrer l'utilisation des PCRs. Elles détaillent toutefois les éléments devant être identiques d'un PCR à l'autre pour favoriser la comparabilité des étiquettes et déclarations environnementales de produits.

Les Lignes Directrices émettent des recommandations quant aux bonnes pratiques à mettre en œuvre dans le développement de PCRs. Elles mettent également en lumière certains aspects devant encore être consolidés pour améliorer ce processus de développement. Les recommandations touchent divers aspects dont entre autres la marge de variabilité acceptable dans une catégorie de produits, la manière de développer des PCR concis et prescriptifs de même que de la manière dont les PCRs devraient traiter des enjeux méthodologiques sensibles de l'ACV. Dans la perspective de développer des PCRs conformes à plusieurs standards et applicables dans différents contextes, les recommandations sont articulées de manière à proposer des éléments de contenu tant fixes que flexibles, en plus d'ouvrir la voie au développement de PCRs unifiés qui soient applicables à divers standards et contextes géographiques.

Plusieurs enjeux devant être consolidés pour favoriser le développement et l'alignement des PCRs sont présentés dont entre autres une meilleure accessibilité à des données publiques, la création d'un répertoire international de PCRs, un mécanisme de notification centralisé pour signaliser aux parties prenantes des activités évènements sur le sujet des PCRs. Qui plus est, la systématisation du processus de développement des PCRs est proposée comme outil pou favoriser une couverture plus complète des différentes catégories de produits et une meilleur cohérence entre et au sein des différentes catégories de produits. Les Lignes Directrices mettent également en lumière le fait que les PCRs doivent être adaptables à de potentielles utilisations futures dans des formats plus dynamiques et digitaux.

Les annexes des lignes directrices proposent un modèle de PCR, une comparaison des exigences de différents standards existant relativement à l'ACV, une comparaison des système de classification des produits de même que des critères complémentaires visant à guider les choix éclairées de méthodes d'évaluation des impacts du cycle de vie.

Chapter 1
Context for the Guidance



1.1. Background and Context

1.1.1. Definition and purpose of PCRs

Product category rules (PCRs) provide product category specific rules, requirements, and guidelines for calculating and reporting environmental data across the full life cycle of a product. PCRs, as defined in the ISO 14025: 2006 standard, are a requirement for the creation of Type III environmental product declarations (EPDs)[i]. Rules analogous to PCRs exist for other types of LCA-based product claims, such as product carbon footprints (PCFs) or other forms of quantitative product environmental footprints. PCRs are capable of supporting both business-to-business (B2B) and business-to-consumer (B2C) communication. The life cycle-based standards and specifications themselves do not provide sufficient specificity to ensure that consistent assumptions and calculations are made to support comparable claims across all products in a given product category and to support consistency in claims across all products. This Guidance is intended to provide additional guidance for developing LCA-based claims specific to a product category. This Guidance can be used in conjunction with various LCA-based product claim standards (Section 1.5 I & III) that refer to product-specific requirements.

1.1.2. Context for the creation of the Guidance

EPDs, PCFs and other forms of product claims based on an ISO 14044 life cycle assessment (LCA) are increasingly being used as a basis for labels and reports that inform purchasers in the supply chain and final consumers. Programs to develop EPDs have been in place for more than a decade in Northern Europe, and demand for this type of product information is now growing in other parts of the world.[ii] Programs that permit manufacturers to develop EPDs are now present in Europe, Asia, and North America.[iii] These programs often develop different PCRs for the same product category due to the regional nature of the contained methodologies and involved organizations, and in lieu of strong international coordination among program operators. This, combined with insufficient specificity in the standard, results in the lack of strong consensus on how to develop sound and consistent PCRs. The existence of a growing number of programs and international standards for life cycle-based quantitative environmental claims has already resulted in duplicate and inconsistent PCRs within the same product category.[iv] It must be noted that aforementioned duplication may or may not be intended, and our focus is to ensure the latter does not happen. Increased public demand for product related environmental information and the emergence of new types of LCA-based product claims are likely to spur the creation of additional programs with additional PCRs. As a consequence, the existence of a large number of PCRs that produce incomparable claims threatens the legitimacy of environmental labels and product claim comparisons.

Through discussions over the past few years in multi-stakeholder organizations such as the PCF World Forum's PCR Roundtable and Taskforce, the American Center for LCA PCR Committee, and workshops such as the PCR Alignment Special Session in the LCA XI conference[v], it has become clear that more guidance on the development of PCRs could benefit all parties involved and help improve the legitimacy of the product declarations. In response to this need, in December 2011 the American Center for LCA PCR Committee created a subcommittee to initiate a collaborative effort to develop a PCR guidance document. The Product Category Rule Guidance Development Initiative was launched in early 2012 under the premise that the Guidance would be the shared product of all

[i] Type III environmental declarations differ from Type I (verified eco-labels) and Type II (self-declared claims).

[ii] Fava J, Baer S, Cooper J (2011) Green(er) Product Standard Trends in North America. Journal of Industrial Ecology 15 (1):9-12. doi:10.1111/j.1530-9290.2010.00317.x

[iii] Ingwersen WW, Stevenson MJ (2012) Can we compare the environmental performance of this product to that one? An update on the development of product category rules and future challenges toward alignment. Journal of Cleaner Production 24:102-108. doi:10.1016/j.jclepro.2011.10.040

[iv] Subramanian V, Ingwersen WW, Hensler C, Collie H (2012) Comparing Product Category Rules from Different Programs: Learned Outcomes Towards Global Alignment. International Journal of Life Cycle Assessment. doi:10.1007/s11367-012-0419-6

[v] Ingwersen WW, Subramanian V, Schenck R, Bushi L, Draucker L, East C, Hensler C, Lahd H, Ryding S-O (2012) Product Category Rules Alignment Workshop, October 4, 2011 in Chicago, IL, USA. International Journal of Life Cycle Assessment 17:258–263. doi:10.1007/s11367-011-0357-8

organizations wishing to take part in its development, and that it would be international and voluntary. This Guidance is the product of the aforementioned Initiative.

1.2. Purpose of the Guidance

The Guidance aims to provide additional instructions for developing PCRs for LCA-based product claim standards with the goal of making PCRs more consistent and robust and reducing the need to duplicate PCRs for compliance with multiple standards. By providing additional instructions, the Guidance

- Purports that a single PCR can be used by various ISO 14044-compliant standards for product claims
- Establishes a consistent document structure for PCRs that are required by various product claim standards
- Provides consistency in the content that is included in PCRs
- Fills gaps in guidance on PCRs by conforming with ISO 14040/44 and is based on other standards, peer-reviewed journal articles, guides, or program rules
- Provides clarity in the level of detail of the content included in PCRs
- Reduces cost and time required to develop a PCR, often by supporting the adaptation of an existing PCR
- Reduces confusion and frustration when creating PCRs that are based on standards and/or programs that are lacking in sufficient guidance
- Improves the chances of comparability of claims across programs using the same product claim standard
- Introduces visionary thinking by pushing the boundaries for improving PCR creation and use
- Suggests means of improving visibility of PCRs and program operators which will help reduce PCR duplication

In seeking to fulfill its purpose, the Guidance

- Uses ISO 14040 and ISO 14044 as the basis for alignment
- Treats all product claim standards equally, while adopting the terminology and principles of ISO 14025 – the first and most thorough product claim standard that defines PCRs
- Does not intend to supersede the instructions provided in any product claim standard or program instructions
- Is setting the stage for the use of LCA-based product claims in decision making
- Directly uses, paraphrases, or modifies some content from some standards for the sake of addressing insufficiency in other product claim standards

1.3. Limitations of the Guidance

The Guidance IS NOT INTENDED TO do the following:

- Pre-empt the development of ISO 14025 or other LCA-based product claim standards
- Act as a standard by itself
- Preclude application to any LCA-based standards and programs
- Promote or advantage any particular program or program operator

1.4. Principles of the Guidance

This Guidance is driven by two core principles, collaboration and alignment.

1.4.1. Fostering collaboration

Collaboration drove the process of developing common guidance. Collaboration works best though transparent procedures and processes and democratic participation. Inviting and engaging all interested parties, establishing operational procedures, providing full access to drafts and all related documents, clarifying roles and expectations, and establishing timelines were all aspects of the Guidance development effort that facilitated collaboration.

The scope of this Guidance is global. Therefore, international collaboration was essential to achieving global

relevance and ensuring the document is useful for making product claims throughout the world. The product claims supplemented by this Guidance are largely based on international standards (e.g., ISO 14025), and many claims are intended for an international audience.

The collaboration to develop this Guidance was altruistic; the Guidance is not designed to advantage or disadvantage any particular organization.

1.4.2. Promoting alignment of PCRs

Providing guidance on PCR development is intended to be a step towards improved alignment of PCRs. Alignment is a process of revising existing standards or guidelines or developing future guidelines with the aims of consistency and compatibility. Greater alignment of PCRs will reduce differences in the underlying rules for LCA-based claims and that reduction will improve their legitimacy and consistency.

1.5. Scope of the Guidance

This Guidance is intended to supplement and/or align with the following standards and guidance documents:

I. ISO 14025 and other Type III Standards, including:
- ISO 14025: 2006 – Environmental labels and declarations – Type III environmental declarations – Principles and procedures (ISO)
- BP X30-323-0: 2011 – Principes généraux pour l'affichage environnemental des produits de grande consummation (AFNOR, France)
- CEN 15804: 2008 – Sustainability of construction works – Environmental product declarations – Product category rules (CEN, Europe)
- ISO 21930 Sustainability in building construction – Environmental declaration of building products
- Product Environmental Footprint Guide (European Commission Joint Research Centre, 2013)

II. All Program Operator Rules based on ISO 14025

III. Product Carbon Footprint Standards and other Single-Criteria LCA-based standards
- Greenhouse Gas Product Accounting and Reporting Standard (GHG Protocol, 2011)
- PAS 2050 – Specification for the assessment of the life cycle greenhouse gas emissions of goods and services (BSI, 2011)
- TS Q 0010 – General Principles for the Assessment and Labeling of Carbon Footprint of Products (JEMAI, Japan, 2009)

IV. Other Standards or Guidance
- ISO 14020: 2000 Environmental labels and declarations – General principles
- ISO 14021: 1999 Environmental labels and declarations – Self-declared environmental claims (Type II environmental labeling)
- ISO 14040: 2006 Environmental management – Life cycle assessment – Principles and framework
- ISO 14044: 2006 Environmental management – Life cycle assessment – Requirements and guidelines
- ISO 14050: 2006 Environmental management – Vocabulary
- ISO 17024: 2003 Conformity assessment – General requirements for bodies operating certification of persons

It may be helpful to refer to these standards when reading this Guidance document.

1.6. Intended Audience and Use

The intended audience of this document includes all those wishing to develop, interpret, or understand the intent and/or content of PCRs and their relationship with product claims. This group includes EPD program operators,

standards bodies, other parties that might develop PCRs, and manufacturers that intend to engage in the PCR development process to make claims for their products.

Programs that published LCA-based claims (e.g., program operators) may look to this Guidance to improve or align their own program instructions and procedures regarding PCR development, review, and publication.

Standards bodies or other organizations that develop LCA-based product claims standards might refer to this Guidance when planning revisions to standards to improve alignment with other standards and programs.

Other PCR developers including coalitions of manufacturers, experts and stakeholders should find the Guidance useful for planning PCR development, creating PCRs, and having them reviewed and published.

Manufacturers and service providers that have interest in standardized product environmental performance measurement may find this Guidance useful to understanding the function of product category rules, whether or not they are necessary for their purposes, and to understanding what is involved in their creation.

Other parties engaged in some aspect of product supply chain management or sustainable production and consumption may find this Guidance provides useful insight into requirements for rules that allow quantitative product comparison within product categories.

1.7. Structure of the Guidance

The Guidance has been structured to reflect the chronology of PCR development (Figure 1.1). Chapter 2, 'Preparation for PCR Development,' covers important topics that all parties need to consider before engaging in development of a product category rule. Chapter 3, 'Required Elements of a PCR,' covers all the elements that must be considered and incorporated into a PCR document to be deemed consistent with this Guidance. Chapter 4, 'PCR Review,' and Chapter 5, 'Publishing a PCR,' provide recommendations on handling the PCR following development, including the review stage and final publishing of the PCR. Chapter 6, 'PCR Use,' provides limited recommendations on the use of PCRs. All steps in the process should be informed by Chapter 7, 'Best Practices for PCR Development and Management.' Annex I: Product Category Rule Template provides a link to a template that is required for use with PCR development and may also be used for PCR review. Annex II: Comparison of LCA Methodologies in Existing Standards provides a comparison of methodologies in selected LCA-based claim standards, both of which should be used and referenced during PCR development and review. Annex III: Comparison of Systems of Product Classification compares three international systems of product classification that may be useful for understanding how such a system can be used to classify the product category. Annex IV: Additional Criteria for Selection of LCIA Methods provides additional criteria for use in the selection of LCIA methods during PCR development.

1.8. Use of Should, Shall, May or Can

This Guidance uses precise terminology to indicate the requirements, the recommendations and options regarding the development of PCRs. The term "shall" is used to indicate what is required in order for a PCR to be in conformance with the Guidance. The term "should" is used to indicate a recommendation, not a requirement. The terms "may" or "can" are used to indicate an option that is permissible or allowable.

1.9. Future of the Guidance

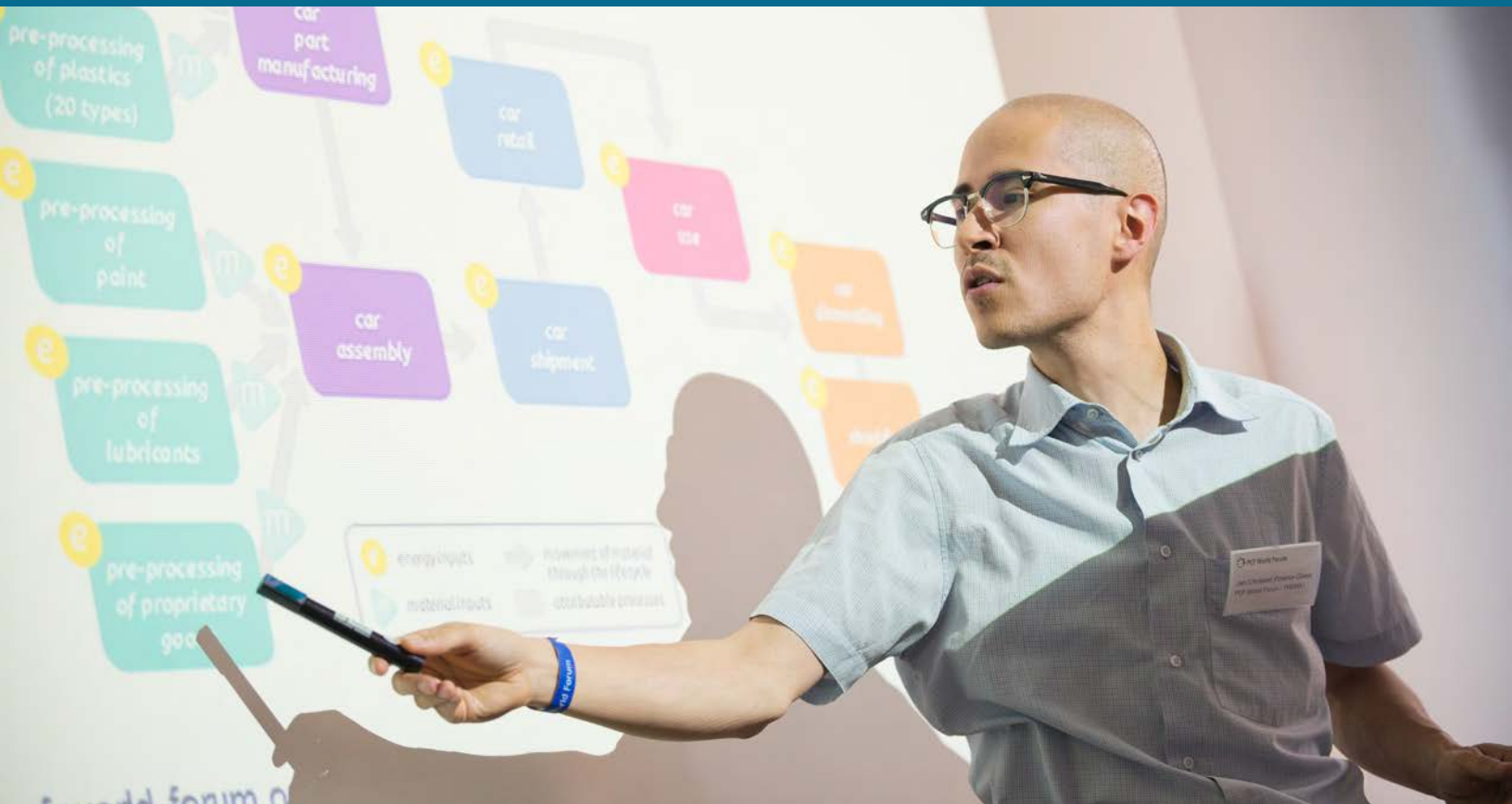
This is intended to be a 'living' document that is subject to revision as environmental claims and life cycle assessment continue to advance. The timing of revisions will be based on the audience need and the consent and capacity of the authoring organizations to revise this document, not to exceed 5 years following publication. The Product Category Rule Guidance Development Initiative will continue to accept comments and feedback regarding the Guidance and its applications through the Initiative website at http://www.pcrguidance.org.

Figure 1.1. Steps in PCR development as described in the Guidance. It is recomended the Guidance be used in conjunction with one or more product claim standards and the general program instructions provided by a program operator.

STEPS	ACTIVITIES	ACTORS	SECTIONS	ADDITIONAL RESOURCES
(1) PCR Initiation	Determine the need for PCRs	(1) Organization(s) proposing PCR development	2.1	
	Identify a program operator	(1) Organization(s) proposing PCR development	2.2	(1) PCR Guidance website
	Determine the product category	(1) Organization(s) proposing PCR development (2) Program operator	2.4, Annex III	(1) Technical standards (2) Product classification system
	Perform PCR search	(1) Organization(s) proposing PCR development (2) Program operator	2.2	(1) PCR repository (2) Program operator websites (3) Internet search
	Announce intention to develop PCRs	(1) Program operator	2.3	
	Involve appropriate stakeholders	(1) Program operator	2.3	
	Create PCR committee	(1) Program operator	2.3	
	Determine the need for (1) revised PCR, (2) new PCR, (3) adapted PCR, or (4) unified PCR	(1) Program operator (2) PCR committee	2.5	
	Identify underlying LCA and ensure characteristics and requirements are applicable	(1) PCR committee	2.6	

STEPS	ACTIVITIES	ACTORS	SECTIONS	ADDITIONAL RESOURCES
(2) PCR Development	Create PCR	(1) PCR committee	3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, Annex I, Annex II, Annex IV	(1) Underlying LCA (2) PCR repository
(3) PCR Review	Create PCR review panel	(1) Program operator	4.1, 4.2	
	Perform PCR review	(1) PCR review panel	4.3, 4.4	
	Public consultation	(1) Program operator	4.5	
	Addressing reviewer comments	(1) PCR committee	4.6	
(4) PCR Publication & Maintenance	PCR publication & maintenance	(1) Program operator	5.1, 5.2, 5.3, 5.4, 5.5	
(5) PCR Use	PCR use	(1) Program operator	6.1, 6.2	

Chapter 2
Preparation for PCR Development



This chapter provides information to guide the preparation and initial stages of PCR development.

2.1. Scenarios That Do and Do Not Necessitate the Use of PCRs

Given the definition and purpose of PCRs in Section 1.1.1, situations may exist when PCRs are inapplicable or unnecessary. This section delves into scenarios when PCRs are necessary, unnecessary, or inapplicable in the contexts of internal use, business-to-business (B2B) transactions, or business-to-consumer (B2C) transactions[i].

Scenario 1: Product improvement

This scenario occurs when a single product is compared to only its variations and to no other products. It is also referred to as performance tracking of a single product over time. PCRs and product claim standards can provide consistency in the assessments of the product, which is valuable in ensuring that decisions made from the results are robust. In this scenario, PCRs are optional, but can be used to preserve consistency in performance tracking.

Scenario 2: Non-standardized forms of public communication

An organization may wish to convey the environmental performance of a product without any underlying intention for comparison or decision-making for purchasing/procurement. This may be a self-declaration or LCA report. In this scenario, PCRs are optional, but are not required.

Scenario 3: Product category benchmarking and category claims

An industry or a group of companies that produces products from the same product category may come together to improve the environmental performance of the products they produce. This can be achieved by creating a benchmark for the product category, which could be a minimum bar or an average product profile. In such a case, a product category claim may be made[ii]. In this scenario, PCRs are recommended for benchmarking because they engage industry members in collectively defining a transparent set of rules for product assessment. PCRs are required if a product category claim is to be made public.

Scenario 4: Standardized product labels and declarations

Manufacturers or retailers may wish to make public LCA-based product claims in the form of labels or declarations. The goals of LCA-based claims include enabling comparison with claims of other products from the same category to make informed purchasing decisions. In this scenario, PCRs are required for all LCA-based claims to be disclosed to the public to provide a transparent basis for the claims and to enable product comparison within product categories.

2.2. Steps to Carry Out before the Creation of a PCR

The following steps should be followed sequentially to assure consistency in PCR development.

1. Identify a program operator

ISO 14025 requires that PCRs are developed under a Type III environmental declaration program. Program operators are responsible for the development of a PCR, thus any organization that wishes to create a PCR needs to identify a program operator first. Standards like the GHG Protocol, PAS 2050 and the EC Product Environmental Footprint may not explicitly state requirements for a program operator, but PCR development should still proceed under the guidance provided in this chapter.

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[i] Inspired by: The Greenhouse Gas Protocol Initiative (2011) Product Life Cycle Accounting and Reporting Standard. World Resources Institute. World Business Council for Sustainable Development. Pg 118 – 119.

[ii] Also referred to as a sector EPD, but we prefer the term 'product category' which is more clearly defined. Strazza C., Borghi, A.D., Blengini, G.A., Gallo, M. (2010) Definition of the methodology for a Sector EPD: Case Study of the Average Italian Cement, Int. J. LCA, 15 (6): 540-548.

There are multiple program operators throughout the world. A list can be found at www.pcrguidance.org/programoperators. Entities interested in creating PCRs should perform a search for existing program operators and determine which operator to use for PCR creation. The selection of program operators should be based on (a) the requirements of the overarching product claim standard, (b) the experience of the program operator in developing PCRs in the related industry, (c) maturity of the PCR program, (d) expertise of the program operator in the industry, and (e) the program operator's reputation and credibility in relevant markets.

Alternatively, a new program operator can be created. See ISO 14025 for program operator conformance.

2. Determine the product category to which the PCR will be applicable.

See Section 2.4.

3. Perform a thorough search for PCRs that belong to the same category.

PCRs from different program operators may not be readily available or accessible. While this may be the case, three distinct methods can be utilized to ensure that a thorough search for PCRs from the same product category has been performed.

- Use PCR databases. See Box 2.1 and Section 7.8.
- Search for PCRs on program operator websites. Program operators may or may not host PCRs on their websites, but they can be contacted to inquire about PCRs.
- Perform an Internet search using strings that include but are not limited to "product category rules + <product category name>".

Databases may not provide information on PCRs that are under development. It is important to either contact program operators or make certain through information provided on their websites the operator is not already developing PCRs for a certain product category.

4. Involve appropriate parties and begin PCR development or adaptation.

If no PCR for the product of interest is found, the program operator may move forward to involve the appropriate parties (Section 2.3) and develop a PCR. However, when the program operator finds that a PCR exists for the same or overlapping product category in one or more other program(s), PCR development should follow the suggested steps towards alignment described in Section 2.5.

Box 2.1. PCR Library

The PCR Library (http://pcr-library.edf.org.tw) is one of the only registries of PCRs from different programs. The Japanese Environmental Association originally set up this site for Industry (JEMAI), with the support of the Ministry of Economy, Trade and Industry of the Government of Japan. Since August 2011, the Environment and Development Foundation (EDF) of Taiwan took over the maintenance of this website. EDF and JEMAI are both members of the Global Type III Environmental Product Declarations Network (GEDnet), which is an international non-profit organization of Type III environmental declaration organizations and practitioners established in 1999.

2.3. Stakeholders Involved in PCR Development

The process of developing a PCR shall be managed by a program operator and include relevant stakeholders[iii]. The driver behind PCR development may be any stakeholder, but the process must be managed by a program operator.

The process of developing PCRs shall be open and transparent and shall include public notices and a public consultation process with relevant stakeholders that begins prior to PCR development and continues in stages as long as the PCR remains active. Reasonable efforts should be made to achieve a consensus throughout the process.[iv] The inclusion of a public consultation process aids in ensuring the opportunity exists for any and all stakeholders to become part of the PCR development process or to provide comments regarding the PCR being developed, resulting in a transparent and credible process. In this section, public consultation before and during the development of the PCR will be addressed. Section 4.6 addresses public consultation in the revision stage and after the publication of the PCR.

2.3.1. Program operator

A program operator is a body that conducts an LCA-based product claims program through the creation, verification, and maintenance of PCRs and/or product claims. A program operator shall be the secretariat of the PCR and manage the procedures for PCR development. In order for the program operator to remain impartial in the PCR development process, the program operator should not have a vested financial interest in the product categories to which the PCRs apply.

The program operator shall either develop and publish program instructions or refer to an existing standard or guidance document that describes a process of PCR development that is suitable for their program.

2.3.2. Announcing the intention to develop a PCR

The program operator shall publish the intention to develop a PCR on their website, in relevant industry and trade publications or news services, and through centralized notification mechanisms (see Section 7.8). The announcements shall include contact information that allows interested parties to request more information about participation in the PCR development or review process.

2.3.3. Identifying the stakeholders

Every project has multiple stakeholders that may have conflicting interests. It is pertinent that the appropriate stakeholders be identified and invited to the PCR Committee (Section 2.3.4) or to the public consultation (Section 2.3.5) so the PCR will reflect the input of a balanced and representative stakeholder group. When a program operator engages the public in the PCR development process, the Stakeholder Identification Worksheet in Table 2.1 can be used to ensure that all affected parties and individuals are considered as potential stakeholders.[v]

Stakeholders that need to be considered are those that:[vi]

- Manufacture products in the product category
- Use products in the product category
- Are experts in the product category
- Represent manufacturers or users of products in the product category
- Have financial interests in the product category

[iii] ISO 14025

[iv] ISO 14020

[v] Reference example modified from the Office of Collaborative Action and Dispute Resolution, U.S. Department of the Interior – Collaborative Action Toolkit [online] available at http://mits.doi.gov/cadr/toolkit/stakeholder_index.cfm

[vi] Inspired by Egeland, Brad. (2011) Defining the Stakeholder – Part 1, [online] available at http://pmtips.net/defining-stakeholder-part-1/

- Are in the chain of accountability
- Have authority or decision-making power over some aspect of products in the product category
- Are program operators
- Are PCR developers
- Are experts in the field of product sustainability
- Are non-governmental organizations (NGOs) or other organizations interested in societal wellbeing or environment protection

Table 2.1. Example of a stakeholder identification worksheet

Stakeholder name	Stakeholder type	Interests at stake	Participation Type
X	Government	Want consistency in rules; promote public interest	PCR Committee
Y	Manufacturer	Financial gain through competition in the product category; interest in unbiased modeling rules	PCR Committee
Z	Consumer	Interest in reliability of claims	Public Consultation

2.3.4. PCR committee

The PCR should be drafted by a committee. The program operator shall see that the PCR committee is composed of enough independent members to assure the interests of one party do not dominate the PCR development process. The PCR committee should include:[vii]

- At least two industry representatives from independent organizations
- At least one LCA expert (who may be an employee of the program operator)
- At least one interested party, such as a member of a non-governmental or governmental organization

Committee members should meet the minimum requirements stated below:

a) Academic qualifications

- For LCA experts: Individuals who have completed a degree in a relevant discipline and have experience in LCA
- For industry representatives: Individuals who possess extensive industry experience or one who has a degree in the relevant discipline

OR

b) Other competencies

For LCA experts:

- Preferably individuals who have received accreditation or certifications from a recognized institution, or who have a record of publications, presentations, participation in peer-reviews, etc. in the LCA field.
- For industry representatives:
- Individuals who are familiar with LCA and product-related environmental aspects
- Individuals who have knowledge of the regulatory framework within the scope of the PCR and LCA-based claims

Program operators may consider using a scoring system for rating committee member qualification such as the system suggested in the EC PEF Guide: 2013.

No single organization or value chain shall dominate the PCR committee by holding more than 50% of the membership of a PCR committee. The PCR committee should include members representing the geographical scope of the PCR.

[vii] Adapted from ACLCA. 2010. Standard practice for program operators. American Center for Life Cycle Assessment.

To assure that conflicts of interest are disclosed, program operators shall provide forms for each PCR committee member to list any conflicts of interest. Each PCR committee member shall complete the form, which will then be attached to the appendix of the PCR. The conflict of interest form shall include:

- The name of the PCR and program operator
- The name of the committee member
- The committee member's employer
- Anticipated or known customer/vendor/partner relationships with other PCR committee members
- Substantial financial interest of a committee member or a member's immediate family in the subject of a PCR being developed
- The signature of the committee member
- The date of the signature

When the form is published, measures may be taken by the program operator to protect individual committee member privacy.

2.3.5. Public consultation

The program operator shall actively reach out to relevant stakeholders, including parties outside of the program operator's country or region. The program operator should create and maintain a log of those stakeholders that have been communicated with and responded to. A public consultation procedure should be prepared in such a manner as to support the usage of an open Internet-based participatory process. Public consultations can also, supplementary to this procedure, have the form of a public meeting.[viii] An open Internet-based consultation helps to broaden the participation of stakeholders from different parts of the world. The use of the Internet has the advantage that it facilitates participation from interested parties having difficulties attending in-person meetings.

2.4. Definition and Classification of the Product Category

2.4.1. Definition of the product category

It is important to clearly define the scope of the PCR so that users can appropriately apply specific rules to guide the life cycle assessment. ISO 14025 states that a PCR includes a product category definition and description. This includes a product description, functions, and the use of the products in the category (see Section 3.3). This description should also state which products are not covered by the PCR if there is potential ambiguity in the product category.

It is important to be as specific as possible when defining the product category to ensure comparability of the results of the LCA and to support resulting claims.

ISO 14025 states that a product category is a group of products that perform the same function. Product categories shall be primarily defined by product functionality. The PCR shall clearly define the product category for which the rules apply both by using descriptive language and by using the relevant code in any of the existing systems of product classification (2.4.2. Classification systems for product categories). Products that ARE NOT covered by the PCR shall be clearly listed (as a clarification when products are similar). Accessories (e.g., batteries) typically sold with a product in the category that are not covered by the PCR should be listed as not covered by the PCR.

The following should be considered when choosing and defining the product category in the PCR:

Defining product categories for multifunctional products

A product maybe designed to perform one or more primary functions. All the primary functions should be defined.

[viii] THE INTERNATIONAL EPD SYSTEM General information for Product Category Rules – Consultation Phase.

Complex products may be designed to perform a multitude of functions. In such a case, it is preferred to define the scope of the PCR in such a way that it does not limit the PCR to only a subset of those functions. For example, a smart phone functions as a mobile phone, a music player, an Internet device, a gaming device, an e-reader, etc. A PCR for smart phones should encompass all of these functions.

Group components of a product into one product category

A group of components can be grouped into a single product category rule if they are used together to provide a particular function. The components can be separated in the PCR into separate modules to define the rules for each component to allow the LCA analyst to determine the LCA impacts from each component in the system. The system would then have the impact of the sum of its parts.

Group products which serve the same function although the processes of production differ

If different types of products all serve the same or similar function, they may be grouped into one product category so the results of the LCAs may be compared if it is appropriate. For example, flooring, wood, laminate, tile, and carpet products can be grouped into a single product category with different modules to define the specific differences in the life cycle of each product type.

Use international standards to define the product function

International standards contain information relevant to the definition of product functions. For example, "cleaning" with respect to laundering is defined by the ISO 862 standard. Table 2.2 provides a limited list of standardization bodies.

Table 2.2. Example of international standards offering definitions of product fucntions

Standardization body	**Acronym of standards**	**Link**
International Organization for Standardization	ISO	http://www.iso.org/
American Society for Testing and Materials	ASTM	http://www.astm.org/
British Standards Institution	BS	http://www.bsigroup.com/
German Institute for Standardization	DIN	http://www.beuth.de/en/
European Committee for Standardization	EN	Purchase through national members (e.g., BSI Group and DIN)
Japanese Industrial Standards Committee	JIS	http://www.jsa.or.jp/

2.4.2. Classification systems for product categories

Products can be classified using existing classification systems, which provide a hierarchical structure using classification codes. These product classification systems assign a product to a product group based on its attributes and application areas.[ix] Product classification systems shall not be the single determinant for defining the product category. Annex III: Comparison of Systems of Product Classification presents three widely used product classification systems employed by program operators throughout the world: United Nations Standard Products and Services Code (UNSPSC)[x], the Central Product Classification (CPC)[xi], and Global Product Classification (GPC)[xii]. Other classification systems are in use and proposed for PCRs: The Product Environmental Footprint Guide[xiii] uses NASE/CPA codes to define the product category, and the Swiss government has proposed using

[ix] Leukel, J., Schmitz, V., Dorloff, F.-D. (2002) A modeling approach for product classification systems. Proceedings of DEXA '02 Proceedings of the 13th International Workshop on Database and Expert Systems Applications, IEEE Computer Society Washington, DC, USA, Pages 868-874.

[x] http://www.unspsc.org

[xi] http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=16

[xii] http://www.gs1.org/gdsn/gpc

[xiii] European Commission (2013) Product Environmental Footprint Guide.

the Classification of Individual Consumption According to Purpose (COICOP)[xiv]. It is recommended to identify the product category according to one classification system and use that to identify matches in other classification systems. Efforts are underway[xv] to map UNSPSC and UNCPC, as well as to map other classification systems such as ISIC, NAPCS, CPA, and HS[xvi]. Product classification systems that require an access fee might not be a feasible option for some program operators.

Determining the product classification codes using a comprehensive classification system will not only help improve the search for existing PCRs, but also the effectiveness of the search using double checks.

Product classification enables:

- Easy discovery of PCRs
- Assessment of the distribution of PCR availability across a broad range of product categories
- Determination of product categories where effort is necessary to support additional PCR creation
- Identification where PCRs or claims are available that can serve as modules (Section 3.4.2) for downstream PCR creation
- Identification of product sectors where claims are in use

2.5. Taking Steps Toward Alignment of PCRs

As discussed in Chapter 1, an explicit objective of this Guidance is to promote the alignment of product category rules. This section introduces the concept of alignment, elements of PCRs critical for alignment to be successful, and suggested steps toward alignment.

2.5.1. Alignment and its factors

Alignment refers to the process of making PCRs consistent and may happen within or across product categories. Alignment is a process that is only concluded when complete alignment across data, LCA rules, and procedures has been achieved. Claims that are made with strict adherence to completely aligned PCRs are comparable, provided they follow the same overarching standard. This section primarily applies to alignment within categories, which refers to alignment of two or more PCRs that cover the same or an overlapping category of products.[xvii] Applying the guidance in this document to all PCRs will generally improve alignment across product categories, which is recommended when, for example, LCA-based product claims are used as information modules (see Section 3.4.3).

Alignment needs to occur across three principle factors for complete alignment to be realized: data; rules for LCA and additional information; and PCR-related procedures.

Data alignment. For data alignment to occur, data needs to be of comparable scope and quality. When primary data are required, identical requirements for data collection shall be in place. For secondary data, scope and quality shall be clearly specified. Recommendations for use of specific datasets or databases may facilitate this process. However, if databases are required, alternatives or modifications shall be proposed for geographic areas or technologies beyond the scope of these datasets.

Rule alignment. All rules for the life cycle assessment, including specification of the functional unit, scope of the study, inventory collection, any allocation rules, impact assessment, and rules for additional information, shall be identical.

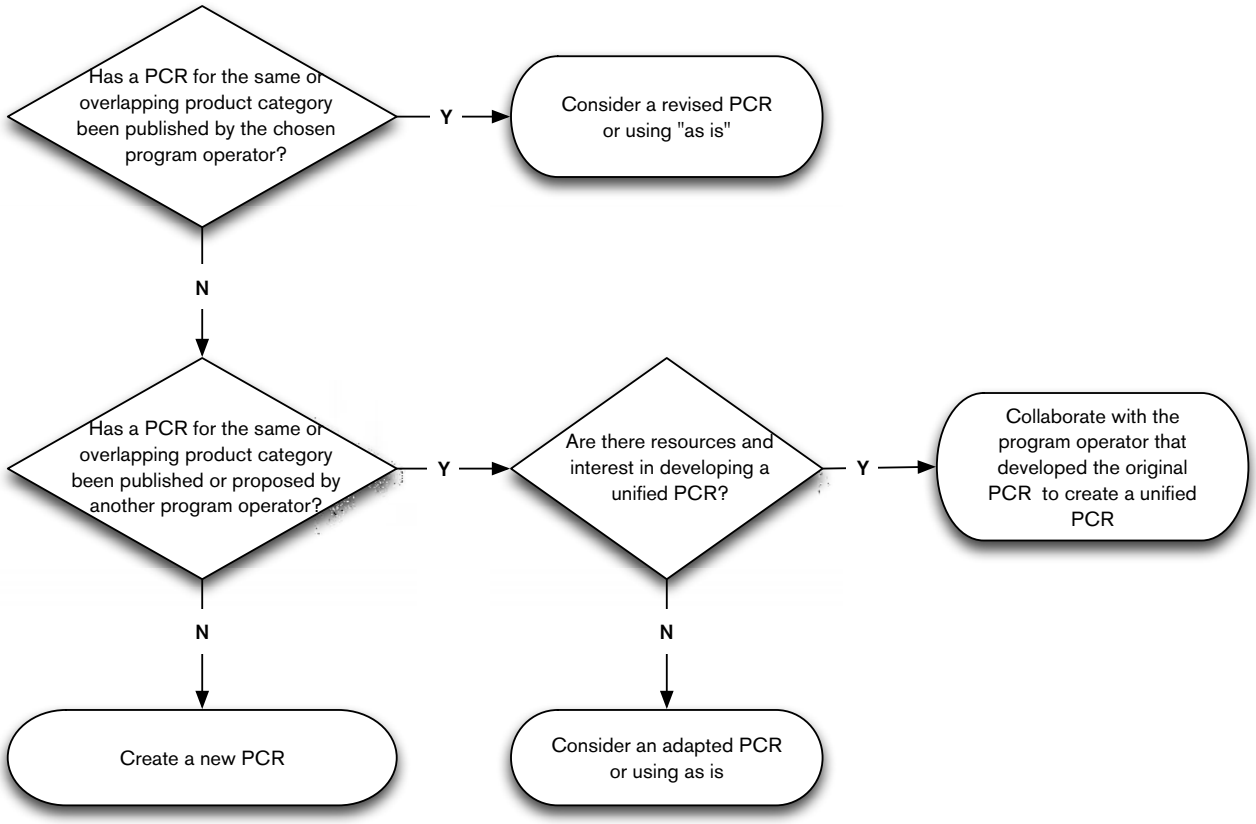
[xiv] http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=5

[xv] Institute for Environmental Research and Education. http://www.iere.org/

[xvi] ISIC = International Standard Industrial Classification (International), NAPCS = North American Product Classification System, CPA = Classification of Products By Activity (Europe), HS = Harmonized System (UN)

[xvii] 'Fruit juice from concentrate' and 'orange juice from concentrate' are overlapping product categories, with the latter being a subset of the former.

Figure 2.1. Pathways toward PCR alignment



Procedural alignment. Requirements for PCR creation and review shall be equivalent, if not identical, for PCR alignment. For example, rules for membership on PCR committees, and the number and types of reviewers shall be equivalent across programs.

Other elements of PCRs, including the PCR format, language, and requirements for format of the claim, do not necessarily need to be the same to achieve complete alignment of PCRs, but may facilitate alignment due to easier interpretation.

2.5.2. Methods for achieving alignment

Some potential paths toward alignment of PCRs are described in this section and illustrated in Figure 2.1.

2.5.2.1. Unified PCR

When a PCR committee finds that a PCR exists for a product category in one or more other programs, they may approach the other program operators to suggest the development of a unified PCR. More about unified PCRs can be found in Section 7.9.

2.5.2.2. Adaptation of existing PCR

When a PCR committee is unable to develop a unified PCR with another program operator, they should attempt to adapt the PCR from that program. Adaptation of the PCR involves modification of the PCR for different regional circumstances, technologies, overarching standards, or program operator rules. Attempts should be made to make the minimal amount of modifications to the rules to promote alignment. A claim based on an adapted PCR is not strictly comparable with a claim based on the original PCR, and this shall be indicated in the adapted PCR. The

program operator and the PCR committee should consult with the original PCR developers to ensure copyright laws are respected when adapting a PCR. Some contents of the PCR should remain fixed while other can be flexible (Section 7.3).

The PCR comparison template[xviii] can be used to perform the adaptation, which entails recording and comparing assumptions, modeling rules, data rules, etc. In the adaptation of a PCR, the efforts undertaken to unify the existing PCR or the reasons for adapting a PCR shall be thoroughly documented and published in the adapted PCR. Reference shall be made to the original PCR.

2.5.3. Revision or update of a PCR for the purpose of alignment

PCRs can be updated or revised (see Section 5.3 and Section 5.4) for the purpose of alignment. A program operator may update a PCR to promote alignment by incorporating elements of this Guidance into its program instructions. A PCR Committee formed to revise a PCR may incorporate elements of this Guidance to advance alignment.

2.5.4. Reasons to adapt a PCR

There may be reasons for an existing PCR to be adapted to be used in another context. Those reasons include the following:

- If more impact categories are deemed necessary to report or the original PCR's impact categories are deemed irrelevant (Section 3.4.5)
- If more additional information requirements are deemed necessary to report or the original PCR's additional information requirements are deemed irrelevant (Section 3.5)
- If the scope of the PCR excludes unit operations which previous studies (including non-LCA studies) identify as potentially major contributors to final indicator results
- If the stakeholder group solicited for the original development of the PCR does not meet the requirements of Section 2.3 of this Guidance
- If the PCR committee and review panel does not meet the requirements of Section 2.3 and Section 4.1 of this Guidance
- If the PCR has expired, no interested parties wish to revise the current PCR, and there are no revisions pending by the responsible PCR program operator
- If the PCR is based on information from another region or country that is not applicable to the local situation

2.6. The Underlying LCA Used in PCR Development

It is a requirement of ISO 14025 the PCR be based on one or more life cycle assessments conducted in accordance with ISO 14044. The LCA upon which the PCR is based is the underlying LCA[xix]. This section provides guidance for two aspects of the underlying LCA used in the development of a PCR: minimum requirements and recommended characteristics. The guidance in this section refers to all of the LCA studies the PCR is based on. The underlying LCA study may be carried out in parallel to the PCR development.

2.6.1. Minimum requirements for the underlying LCA

The functional unit used in the underlying LCA shall be directly applicable to the PCR.

The underlying LCA shall meet all requirements of ISO 14044, and other pertinent standards. If the LCA has not been critically reviewed by a third-party[xx], the underlying LCA shall undergo an internal verification by the PCR developer according to these standards.

[xviii] Subramanian, V., Ingwersen, W., Hensler, C. (2011). PCR Comparison Template. http://www.lcacenter.org/product-category-rule.aspx

[xix] The underlying LCA is distinct from LCAs that are developed as a part of product claims.

[xx] ISO 14044

2.6.2. Recommended characteristics for the underlying LCA

The underlying LCA should represent the current product design, market conditions, and material sourcing, all based on the product's lifetime in the market. A newly developed product should have a new underlying LCA. In the development of a PCR, the market conditions and product design of the underlying LCA should be carefully analyzed to understand if a new underlying LCA should be conducted to support PCR development efforts.

The underlying LCA should include inventory and LCIA results for all impact categories relevant to the product category as determined by the PCR committee (see Section 3.4.5).

The underlying LCA should be equivalent in scope to the PCR in the following regards:

- Includes all life cycle stages which are relevant to all indicator results or other environmental information;
- The geographical scope of the proposed PCR should correspond to the system boundary;
- The product system assessed should be representative of the state of technology and geographic distribution of production in the scope of the PCR. For example, for a product sold or used in North America, but produced in Asia, the underlying LCA should characterize production in Asia. If data is inadequate to accurately characterize impacts occurring overseas, this should be documented as additional environmental information.

2.6.3. Documentation and referencing

Reference information for the underlying LCA and for any critical review performed should be documented clearly within the PCR. Reference information should include the following: date of publication, author names and their contact information, and contact information of the institution that commissioned the LCA.

Chapter 3
Elements of a PCR

3.1. Structure of PCR Document

The PCR template (see Annex I: Product Category Rule Template) provides a uniform structure for a PCR that contains all of the required elements described in the Guidance. The template shall be used to develop PCRs. Using the PCR template makes PCRs consistent and enables direct comparison among PCRs from different programs. Furthermore, the PCR template is a useful tool when adapting new PCRs from existing PCRs (Section 2.5). The PCR shall be compliant with the standards and any relevant program instructions under which the PCR is being developed.

3.2. General and Background Information

The PCR shall report on the following general items:

- Name and registration number of the PCR
- General information about the program: name of the program, contact information, logo and website if applicable
- General information about the PCR committee
- Publication date
- Expiration date and renewal schedule
- Types of product claims covered by the PCR, with references to standards
- Product category (see Section 3.3)
- Geographical representativeness of the PCR
- Original language and translations (if existing)
- How to make comments to the PCR

The PCR shall report the following information about the review process and background of the PCR:

- Review panel information
- Public consultation period and participants[i]
- Other existing PCRs for the product category and reasons for developing a new one (see Section 2.5)
- Reference to underlying LCAs
- Whether the PCR has been reviewed according to this Guidance

3.3. Product Category Description, Scope and Classification

The PCR shall provide sufficient information to clearly describe the scope of products and services for which the rules apply (Section 2.4). This shall include requirements for:

- Description of function(s) of products in the category
- Description of intended use of products in the category
- Product classification

This may also include:

- National or international technical standards which apply to products in the category
- Other common names for products in the category

3.4. Specification for Life Cycle Assessment

This section applies to the LCA that must be performed in accordance with the PCR to make an LCA-based claim. The PCR shall establish LCA requirements that are consistent with ISO 14044, with a few specific exceptions[ii].

[i] In which public consultation participants approve the publication of their names

[ii] LCA-based claims do not require an iterative approach to the LCA because all of the rules applying to each phase of the LCA are pre-established in the PCR. The goal and scope are established in the PCR. The interpretation phase of a PCR is simplified since LCA-based claims are not required to state conclusions and recommendations.

3.4.1. Goal and scope

The PCR shall identify and document the goal and scope of the LCA-based information for the product category[iii].

The goal of a PCR should include the intention to support LCA-based claims for all products in the product category. Accordingly, the scope should be sufficiently well defined to ensure the breadth, depth and detail of the study are compatible and sufficient to address the stated goal.

PCRs may be developed to enable both business-to-business (b2b) communication and business-to-consumer (b2c) communication.

The following sub-section provides additional guidance on what needs to be addressed when developing the goal and scope section.

Functional or declared unit

The PCR shall clearly specify the functions that describe the performance characteristics of the product under consideration[iv]. In cases where there are more functions of the product than the one included in the PCR, why these functions are excluded should be explained and documented. A clearly defined and measurable functional or declared unit shall be defined in the PCR. The functional unit is defined by ISO 14044 as the "quantified performance of a product system for use as a reference unit." The ILCD General Guide for Life Cycle Assessment[v] recommends that four aspects of functionality be considered, including "what," "how much," "how well," and "how long." A declared unit, for example, mass (kilogram) or volume (cubic meter), can be applied for situations in which a functional unit cannot be assigned due to the fact the whole life cycle of the product is either not accounted for or cannot be stated (i.e., cradle-to-gate or gate-to-gate).

When difficulty in defining functional units arises, particularly in achieving comparability, alternative definitions should be discussed[vi]. State-of-the-art knowledge and information regarding the functions is helpful in defining a working functional unit. The way the functional unit is defined within the PCR determines the number of product types that can be covered by the PCR and the range of comparable claims associated with it. Relevant standards on technical performance and other types of qualities of the product should be used in specifying the function and defining the functional units. This avoids ambiguity in the scoping of the functions to be included and of which products to cover under the same PCR.

Comparability between claims is not possible unless the functional unit is the same. However, functional units, if appropriately defined, can be applied very broadly. For example, a PCR that is based on a functional unit for an internal, load-bearing wall system can be applied to a multitude of material types. Using a functional unit that is too specific will result in a PCR that cannot be used in most situations.

System boundary

The system boundary section of the PCR shall identify the unit processes to be included within the LCA in a way that is consistent with the study goal of using well identified and explained criteria[vii]. While cradle-to-grave, cradle-to-gate, gate-to-gate, and others are common terms to label different system boundaries in LCA, they are not sufficiently descriptive. To avoid any confusion, a system diagram should be included to help visualize the system boundary as well as included and excluded processes. A table clearly stating what is and is not considered in the

[iii] ISO 14025 clause 6.7

[iv] ISO 14044 clause 4.2.3.2

[v] European Commission - Joint Research Centre - Institute for Environment and Sustainability: International Reference Life Cycle Data System (ILCD) Handbook - General Guide for Life Cycle Assessment - Detailed guidance. First edition March 2010.

[vi] See for instance the alternative definitions of food product functional units in Schau and Fet (2007) LCA Studies of Food Products as Background for Environmental Product Declarations. International Journal of Life Cycle Assessment, 13(3): 255-264.

[vii] ISO 14044 clause 4.2.3.3.1

systems boundary may be provided. The minimum system boundary for consideration in PCRs is "cradle-to-gate"[viii] for a virgin product, where the "gate" represents the finished product at the manufacturing facility or "end-of-life -gate" for a recycled or waste by-product[ix]. Any deviation from the default approach shall be explicitly specified and justified.

Capital goods and infrastructure

ISO 14044 does not explicitly define requirements on inclusion of capital goods and infrastructure. However, as long as the inputs and outputs associated with such infrastructure are relevant for the goal and scope of the PCR, they should be included to the extent they significantly affect the conclusions of the LCA or the additional information (based on the underlying LCA or other studies). The PCR shall list the capital goods and infrastructure to be included by unit process. If capital goods and infrastructure are included, lifetimes shall be given or a standardized method of computing lifetimes referenced. The PCR shall specify the depreciation method to be utilized to allocate the burden of capital goods over their lifetime. Any deviation from the default approach shall be explicitly specified and justified.

The PCR should state whether the system boundary includes overhead at the production facility or other facilities and whether the boundary includes activities supporting the product production that may be offsite.

3.4.2. Data requirements

The PCR shall identify the data that is to be collected. The PCR shall state which types of flows are to be accounted for based on the results to be reported in claims, including inventory information, selected LCIA indicators (see Section 3.4.5) or additional information requirements. The flows included in the inventory should correspond to flows available in the selected methods for reporting the results. When flows are in an aggregated form, the PCR should provide methods to disaggregate the flows, as needed, to characterize them using the selected LCIA methods. For example, the PCR should define methods to disaggregate volatile organic compounds (VOCs) if the selected impact assessment methods provide characterization factors for individual VOCs (e.g., acrolein).

PCRs shall state which processes are to be based on primary data and which ones on secondary data. PCRs or general program instructions (GPI) shall specify secondary data sources (e.g., LCI databases) to ensure that differences between claim results are rooted in actual technical differences rather than being artifacts of different background data. Justification should be included for the choices of secondary data sources in terms of representativeness, consistency, and completeness. As an alternative to specified external sources of secondary data, the PCR or GPI shall provide default datasets that can be used. If a secondary data source is not part of the data sources specified by the PCR, it shall be verified by the program operators to be a consistent and comprehensive replacement to the specified data sets. The use of freely available secondary data would increase accessibility.

The PCR shall state that primary data[x],[xi],[xii] be collected for every process in the product system under the control of the organization making the product claim. Primary data are derived directly from the process under consideration. The PCR shall specify the means by which primary data are to be collected and may provide templates to facilitate harmonized data collection[xiii]. The means of primary data collection are not intended to create an advantage of one organization over another, so flexibility should be afforded to account for a situation where the specified data collection method is impossible or impractical. Options for specification of primary data collection include direct

[viii] If logistics and storage or installation impacts are deemed significant, the point of sale or installation can be included in the cradle-to-gate system boundary.

[ix] Using a polluter-pays allocation principle, products from recycled, reclaimed, and waste by-products are not allocated the full burden of the virgin materials product system, and therefore have a truncated scope. See International EPD System. 2008. Supporting Annexes.

[x] GHG Protocol (2011) Product Life Cycle Accounting and Reporting Standard. World Resources Institute, World Business Council for Sustainable Development, Washington and Geneva

[xi] AFNOR/ADEME (2011) BP X30-323: General principles for communication of environmental information on mass market products.

[xii] BSI (2011) PAS 2050: 2011 Specification for the assessment of the life cycle greenhouse gas emissions of goods and services. British Standards Institute.

[xiii] Earthsure. 2012. Beer Product Category Rule. 20 December 2012.

measurement, primary activity data with emissions factors, interviews, questionnaires or surveys, bookkeeping or enterprise resource planning (ERP) systems, etc. Note that primary data may originate from more than one source[xiv].

Secondary data[xv],[xvi],[xvii] can be used for ancillary materials and processes outside the control of the reporting organization. Secondary data are typically taken from public or private aggregated databases, government and/or industry association reports, peer-reviewed literature, or other sources external to the reporter. Secondary data should conform to the data quality requirements set out in the PCR (see Section 3.4.3). When selecting and using life cycle databases, it is important to consider their geographic focus, methodology, uncertainties, cost, update frequency, and review processes. PCR developers may refer to baseline LCA studies for the product category, established PCRs, or other LCA sources to determine which secondary sources are most appropriate. When use and end-of-life stages are included, the PCR shall specify all parameters of the assumed scenario to ensure comparability and consistency of results.

Avoidance of cut-off criteria

The PCR should be as prescriptive as possible when defining the data requirements, thereby avoiding the need for defining and using arbitrary cut-off criteria. Where data are unavailable, the PCR shall provide default values, which are based on a conservative assumption for the specified processes. Based on the underlying LCA and/or additional studies informing the PCR, the PCR shall specify all the data that are to be collected, rather than specify cut-off criteria for inventory. Any flows or groups or flows that are not included should be listed and justified in the PCR. PCRs should state that all hazardous and toxic materials used in the product system that are under the control of the organization making the product claim be included in the inventory, regardless of contribution to final impacts.

Information modules

Modularity is a key principle underlying LCA based-claims. It allows the assembly of LCA inventory or results from products that serve as inputs to another product system or from components of the final product to complete the inventory or impact assessment of the final product.

Quantified environmental information in an LCA-based claim shall be based on the results from an LCIA, LCI, additional information (Section 3.5), or information modules. Information modules are LCA-based information for materials, parts, components, and other inputs that are used in the manufacture or assembly of products[xviii]. Information modules may be, but do not have to be, LCA-based claims. Information modules have a cradle-to-gate or gate-to-gate scope and are essentially an LCA dataset that was developed with the intention of being useable in a product claim.

Information modules can be combined to produce an LCA-based claim, as long as they are adjusted in accordance with the relevant PCR. Figure 4.1 shows a diagram that represents the development of a claim for a product using information modules. PCRs should give provisions on how to combine information modules in the following order[xix]:

- Use existing claims for inputs, parts and components of the product system of interest, making the relevant adjustments
- If information modules are not available, search for and reference existing PCRs for inputs, parts and components to create information modules
- If no PCR is available for parts and components, use the information module as a compilation of LCA-based data.

[xiv] See Chapter 2.2 of the 'Global Guidance Principles' (UNEP-SETAC 2011) and Chapter 8 of the 'Product Standard' (GHG Protocol 2011).

[xv] GHG Protocol (2011) Product Life Cycle Accounting and Reporting Standard. World Resources Institute, World Business Council for Sustainable Development, Washington and Geneva

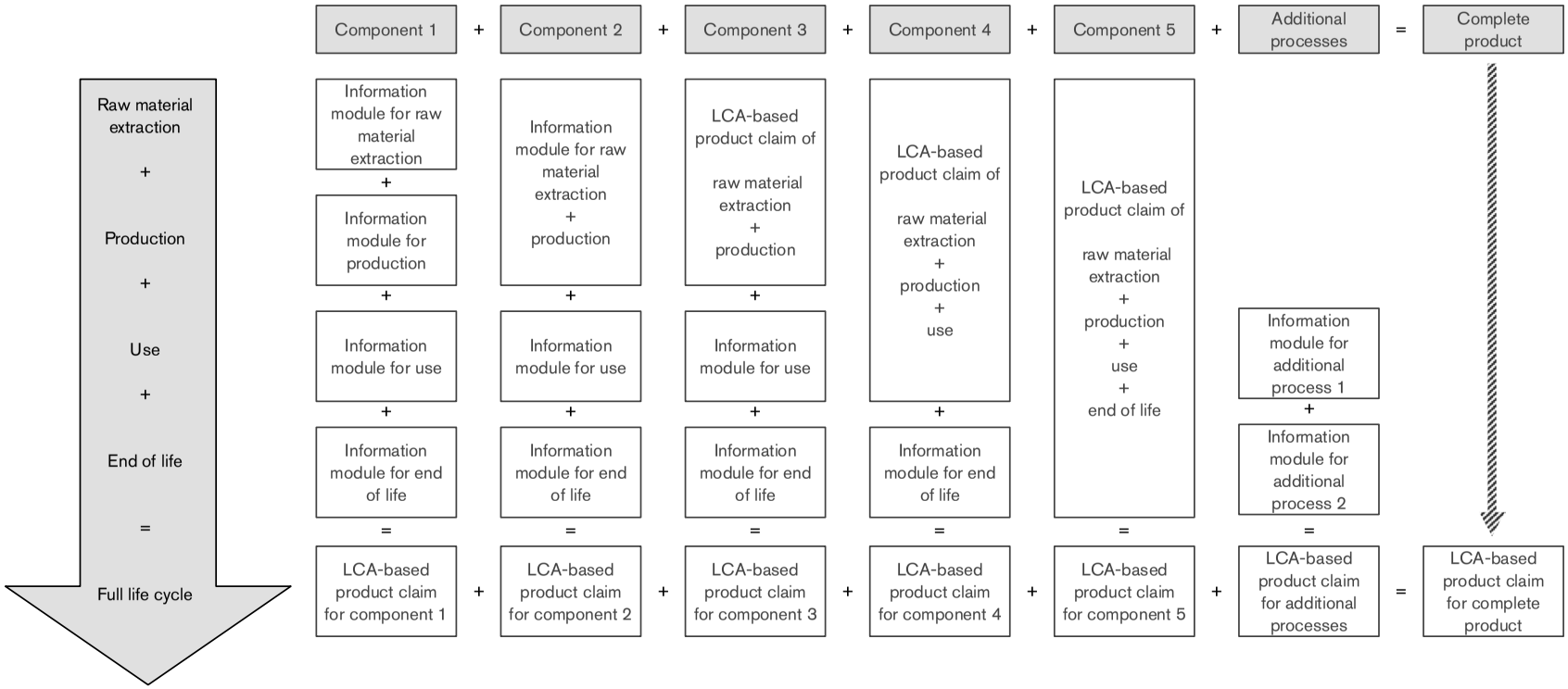
[xvi] AFNOR/ADEME (2011) BP X30-323: General principles for communication of environmental information on mass market products.

[xvii] BSI (2011) PAS 2050: 2011 Specification for the assessment of the life cycle greenhouse gas emissions of goods and services. British Standards Institute.

[xviii] ISO 14025

[xix] ACLCA (2010) Draft standard practice for product category rule program operators. American Center for Life Cycle Assessment.

Figure 3.1. The development of an LCA-based product claim for a product using information modules



Information modules can only be used when claims contain at minimum the data necessary to calculate the inventory and impact category results for the final product. When information modules are used, they should be scaled to the reference flow of the final product. Information modules used shall conform to the data quality requirements (Section 3.4.3).

3.4.3. Data quality requirements

Data quality in LCA refers to representativeness (temporal, geographical and technological), completeness, precision, consistency, and reproducibility. The PCR shall state data quality requirements for all data applicable for use in claims[xx].

The PCR shall specify that a data quality assessment be performed for the primary data collected. A specific data quality assessment methodology (e.g., pedigree matrix) should be indicated or described in the PCR. The PCR shall specify that wherever primary data are gathered, the data are verified to be compliant with the data quality requirements. When secondary data sources are specified by the PCR, the PCR committee shall verify that:

- Temporal, geographical and technological coverage of the secondary data is compatible with the scope of the PCR
- System boundaries are equivalent and reference flows are adaptable to the product system specified in the PCR
- Sources of secondary data are cited
- Allocation procedures used for secondary data are appropriate for the system under study

The PCR may suggest the use of a data quality management plan. A data quality management plan can help keep data organized and consistently documented, and can include the source, quality, and any assumptions made [xxi].

3.4.4. Allocation, recycling and waste handling rules

Allocation

The need for allocation arises with multiproduct processes and multifunctional products. Multiproduct processes refer to processes that produce more than one product (i.e., a main product and co- or by-products that are functionally different). Products that perform more than one function (i.e., a main function and co-functions) are called multifunctional products (e.g., a combined unit designed to perform functions of a printer, copier, scanner and fax machine). The purpose of allocation is to ensure that only the appropriate inputs and outputs of the process are counted for the analyzed function (i.e., the inventory of the specified function is isolated). The PCR committee should identify all the multiproduct and multifunctional unit processes within the defined system boundaries. If allocation can be avoided by the subdivision of processes, the PCR shall specify which processes are to be subdivided and how the subdivision is to be performed.

Where allocation by physical relationship is applied, the PCR shall specify the relevant underlying physical relationships to be considered, and establish or refer to the relevant allocation rules. Where allocation by some other relationship is applied, the PCR shall specify the relationship and establish or refer to the relevant allocation rules. For example, in the case of economic allocation, the PCR shall specify the rules for determining the economic values of co-products. In all cases, the sum of the allocated amounts of inventory flows should be equal to the un-allocated inventory of the process.

[xx] See chapter 4.2 of the UNEP/SETAC Life Cycle Initiative (2011) Global Guidance Principles for Life Cycle Assessment Databases (Shonan Guidance Principles).

[xxi] An example of a data management plan is provided in Appendix C of GHG Protocol (2011) Product Life Cycle Accounting and Reporting Standard. World Resources Institute, World Business Council for Sustainable Development, Washington, and Geneva.

Reuse, recycling and waste handling rules

The PCR shall define or refer to the accounting rules for reuse, recycling, and waste handling in the cases in which those rules are not defined by the LCA-based claim standards. PCRs should be flexible to regional differences in definitions of co-products and wastes[xxii]. PCRs should be clear on defining rules for allocation and recycling for each region. A PCR should specify how the LCA rules for one region can be altered to fit those of another region.

3.4.5. Impact categories and impact assessment methodology

To ensure full comparability of LCA-based claims, the PCR needs to define the impact categories to be assessed by the LCA when they are not clearly defined by the overarching LCA-based standard, specification, guidelines, or general program instructions. The PCR shall specify at least one LCIA method that includes characterization factors for calculating category indicator results for each impact category and each geographical region covered by the PCR. The PCR should contain justification for its selection of LCIA methods.

The selection of impact categories should include a review of literature (both LCA and non-LCA) surrounding a product category, including review of concerns by civil society organizations and consumers, or it should be based on an original analysis. Program operators may provide a default list of impact categories, but ultimately the choice of impact categories is at the discretion of the PCR committee. Impact categories may include categories in the LCIA framework or inventory categories. The potential impacts may not always be quantifiable within the LCA framework. If known impacts are not quantified in the LCA, they should be included as "additional information" (See Section 3.5).

The selection of the best available methods is a crucial part of the PCR to ensure the accuracy, environmental relevance, and comparability of results. ISO 14044 recommends that impact assessment methodologies be both scientifically and technically valid and be environmentally relevant[xxiii].

The PCR should provide a reference to a description of the environmental mechanisms for all selected impact categories. Many impact assessment methodologies lack specific methods for calculation of category indicators for certain impact categories[xxiv]; in these cases, it can be appropriate to source from multiple impact assessment frameworks to ensure that methods have been assigned for all relevant impact categories. Annex IV provides guidance on selecting impact assessment methods based on the requirements in ISO 14044 and those suggested in the ILCD Handbook[xxv].

3.4.6. Interpretation

The interpretation phase in an LCA brings together the goal and scope and the findings from the inventory analysis and the impact assessment, and communicates them in an appropriate context.

The PCR shall provide instructions on the following aspects of reporting and interpretation of LCA results:

- How and which results are to be reported in the claim
- The methods that are to be used to identify and to report the main contributing unit processes, groups of processes, and elementary flows to the results
- The completeness checks of the inventory data, process coverage and impact calculations that are to be performed
- The consistency checks of assumptions, methods and data quality considerations that are to be performed
- The quantitative approaches to interpretation to be used[xxvi]

[xxii] See for example the way differences in definitions of waste in the US and the EU are handled in the following PCR: Carbon Leadership Forum (2012). Concrete PCR. North American Product Category Rules (PCR) For ISO 14025 TYPE III Environmental Product Declarations (EPDs) and/or GHG Protocol Conformant Product 'Carbon Footprint' of Concrete.

[xxiii] ISO 14044 clause 4.4.5.

[xxiv] The term "methodologies" refers to collections of different impact assessment methods that have been published under a common name by the same authors / institutions. Therefore, while CML2001 is an impact assessment framework, the IPCC characterization model for infrared radiative forcing is the underlying methodology for the impact category Global Warming Potential.

[xxv] EC JRC (2010) Analysis of existing Environmental Impact Assessment Methodologies for use in Life Cycle Assessment.

[xxvi] These may include contribution or dominance analysis, perturbation analysis, uncertainty analysis, comparative analysis and discernibility analysis (See Section 4.5 and Annex B of ISO 14044 and Heijungs and Kleijn (2000) Numerical approaches towards life cycle interpretation: five examples. CML-SSP Working Paper 2000.001. Centrum voor Milieukunde, Leiden University, The Netherlands.)

- The limitations to be stated

3.5. Additional Information

A claim may contain information beyond the scope of the LCA that supplements the information from the LCA. To ensure that claims are truly comprehensive, PCRs should include requirements for quantification and/or description of environmental or social attributes associated with the product that cannot be quantified in an LCA. Environmental, social, and economic aspects in all countries producing products within the product category should be considered. There is a growing demand in the marketplace for the reporting of social indicators, which are critical when comparing products from developing and developed countries[xxvii].

Thus PCRs, where relevant, can include information that is not strictly specified in ISO 14025 or 14040/44, either quantitative or qualitative, but is referred to as other relevant environmental information. This open-ended category of information is an opportunity for alignment between LCA-driven indicators and other indicators that have been insufficiently treated by LCA methods in the past, including water use and scarcity, biodiversity and habitat, land use, persistence in the environment, individual toxicity, etc. Additional information may capture conformance with other performance standards. Additional information may provide an opportunity to capture socially relevant aspects of product systems.

Many of these non-LCA indicators are of critical importance to healthy human populations and ecosystems. Often, their strong spatial and temporal dependence makes them difficult to model in LCA. Exclusion of these indicators could result in the redistribution of environmental problems elsewhere in the biosphere or could risk focusing on indirect threats rather than direct threats to high conservation value areas or to the toxicity susceptibility of vulnerable populations.

This additional category of information provides an opportunity for conversation and possible alignment on indicators that LCA cannot quantify sufficiently, but which are critical to capture true life cycle thinking and to promote the design of healthy, sustainable systems. Other methodologies that can be used in the development of PCRs and to complement LCA results with a robust set of indicators include, but are not limited to, Social LCA, Externality Costing, Ecosystem Services Assessment, Human Health Risk Assessment, Environmental Risk Assessment, and Water Footprinting. These tools are not discussed further here[xxviii],[xxix]. However, it is expected these tools, like LCA, will continue to evolve to provide a more accurate understanding of the interface of human industrial activity and its impacts on the environment and society.

3.6. Assumptions and Limitations

Assumptions are an integral part of any LCA study and are likely necessary for indicators used in the additional information section. Assumptions are necessary to reduce the inherent complexity to a manageable degree. Assumptions lead to limitations regarding the possible conclusions that can be drawn from the results. The PCR shall state all known assumptions and limitations that are used when creating claims. Additional assumptions specific to the claim, along with the assumptions in the PCR, shall be made available with the claim, as part either of the claim or separately. Conservative assumptions should be used[xxx]. Assumptions shall be consistently applied across the LCA and across methods used for providing additional information[xxxi].

[xxvii] UNEP (2011) Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication. http://www.unep.org/greeneconomy/

[xxviii] See WWF (2012) Comparing Assessment Methods by Audience, Boundary & Indicators. Providing during the public comment period as a supplement to this document. http://www.pcrguidance.org/wp-content/uploads/2013/04/WWF-2013-Comparing-Assessment-Methods.pdf

[xxix] See Section 4.5 of the EC PEF Guide: 2013.

[xxx] See Terms and Definitions.

[xxxi] UNEP/SETAC Life Cycle Initiative (2011) Global Guidance Principles for Life Cycle Assessment Databases (Shonan Guidance Principles), available at: http://lcinitiative.unep.fr/includes/file.asp?site=lcinit&file=E8C5CAD7-D1AC-49BE-BBFF-7AA6D25F1DA4.

3.7. Uncertainty

Various types of uncertainty exist within LCA results, including data, model, and scenario uncertainty[xxxii]. Reporting of uncertainty enhances the accuracy of results and the comparability between claims. Although numerous methods exist to address uncertainty, there is no consensus on the method for classification or estimation of uncertainty. The PCR should specify methods for handling and reporting uncertainty in the LCA results as well as with the additional information. Uncertainty assessment may be quantitative or qualitative. The PCR should provide any quantitative or qualitative data that are available for uncertainty estimation in the datasets, parameters, or LCIA factors. These data may be confidence intervals or other measures of variance[xxxiii]. The PCR should specify how these data are to be used along with a method for propagation of uncertainty.

[xxxii] Llyod S, Ries R (2007) Characterizing, propagating, and analyzing uncertainty in life cycle assessment. Journal of Industrial Ecology 11: 161-179.

[xxxiii] For example, the Intergovernmental Panel on Climate Change (IPCC) has estimated the uncertainty associated with Global Warming Potentials is ±35% for the 90% confidence bounds. See IPCC Fourth Assessment Report (2007) Working Group I: Section 2.10.2. http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html

Chapter 4
PCR Review

The review process of the PCR shall include a panel review and a review through public consultation (see Section 2.3).

4.1. Review Panel Composition

The program operator shall set up an independent third-party panel composed of a minimum of three members (a chair and two members) for PCR review. The panel should be comprised of at least one LCA expert (preferably with a background in the product category under consideration and in product-related environmental aspects) and one expert for the specific product category reflected in the PCR. The expert in the product category may be a representative of a manufacturing company, trade association, technical association, or council in that specific product category. The panel members shall disclose any conflicts of interest using the conflict of interest form described in Section 2.3.4.

4.2. Review Panelist Qualifications

Selection of panelists should follow the same guidance as described for PCR committee members in Section 2.3.4.

4.3. Procedure for Review

With the assistance of the program operator, the PCR review panel shall meet[i] to discuss the PCR and perform their review. The program operator should provide a standardized review template to collect comments in a consistent and comprehensive manner. Comments may be general, editorial, or substantive. The general comments apply to overarching issues affecting the entire PCR whereas editorial and substantive comments may apply to specific sections within the PCR.

Within a period agreed upon by the PCR review panel and the program operator, not to exceed 90 days, the PCR panel shall generate and compile their comments in a review report. The review report shall be sent to the PCR committee for their consideration (see Section 4.7).

4.4. Panel Review Criteria

The reviewers shall investigate whether the PCR has been developed in accordance with relevant LCA-based claim standards, general program instructions, specifications and guidelines, and ensure that it supports the creation of credible and consistent claims. The review panel shall ensure the PCR is compliant with this Guidance.

4.5. Public Consultation during Review

Public consultation shall be utilized during the PCR review process (Section 2.3.5). The public consultation of the completed draft PCR shall include at a minimum a 30-calendar-day period for comments to be submitted. The comments from the public consultation and the PCR Committee's responses to those comments should be published and made freely available by the program operator. This process will ensure that transparency in the PCR development is maintained and will allow other non-key stakeholders to put forward comments in a timely manner.

4.6. Addressing Reviewer Comments

The PCR committee shall review the comments from the PCR review panel and the public consultation and develop a response for each. Using the PCR review report, the PCR committee's responses may include:

- Acceptance of the proposal, as is; change draft PCR to reflect proposal
- Acceptance of the proposal, with changes; change draft PCR with modification to original proposal
- Acknowledged but not changed; include supporting commentary on why the committee did not agree with the proposal
- Request more information on the comment.

The PCR review panel should review the responses to the comments provided by the PCR committee and the

[i] An in-person meeting is not required.

revised version of the PCR. If any responses to the comments are not accepted by the panel, the comments are noted as “unaddressed” or “unresolved” issues. These issues should be reported in the PCR review report. Objections provided by producers in the product category should be seriously considered by the PCR committee to attempt to create a PCR that is acceptable to all parties. If the objecting producers believe their comments are not fairly handled, they have the right to file an appeal under the appeals mechanism (Section 4.7).

4.7. Appeals Mechanism

Program operators shall publish and implement procedures for an appeals mechanism to ensure prompt and impartial handling of procedural complaints regarding any action or inaction of the PCR committee, PCR review panel, or program operator[ii].

[ii] ANSI Essential Requirements:2013; ISO/IEC Guide 59:1994.

Chapter 5
Publishing and Maintaining a PCR

The program operator shall be responsible for publishing the PCR and its supporting documentation.

5.1. Accessibility

The published PCR and its supporting documentation shall be publicly available, readily discoverable, and easily accessible. Program operators should provide them free of charge. The ease of finding and accessing PCRs may help avoid duplication of effort and enable greater harmonization across PCR development. Ideally, PCRs should be discoverable and accessible via a central repository (Section 7.8).

5.2. Language

A program operator should translate and publish the PCR in languages that are acceptable for the regions where the PCR is intended to be used. The language in which a PCR is published may affect its accessibility to multiple readers. As English is the language used by most international standard-setting organizations and the international scientific community, every effort should be made to translate and publish the PCR in English. A program operator shall not act as a barrier to translating the PCR.

5.3. Updating PCRs

Program operators should regularly update PCRs to reflect the best available practices, data, and methods. A PCR Committee is not required to update a PCR; the program operator may act alone in making changes for the following reasons:

- Changes to program operator rules and supplementary materials referenced by the PCR
- Changes to overarching standards
- Changes to secondary data sources or parameters that apply to the program as a whole
- Updates to existing LCIA methods used by the PCR
- Updates to methods for additional information that apply to the program as a whole

PCRs should be updated when resolving previously unresolved issues that have been highlighted in the PCR or when errors are discovered in the PCR. Before the PCR is updated, the program operator shall notify the public of the updates that will be made and allow comments to be submitted in response to those updates. The program operator shall diligently consider the comments before making updates to the PCR. Whenever a PCR is updated, the program operator shall publicize the updated PCR, preferably through a centralized notification mechanism (Section 7.8).

5.4. Revising a PCR

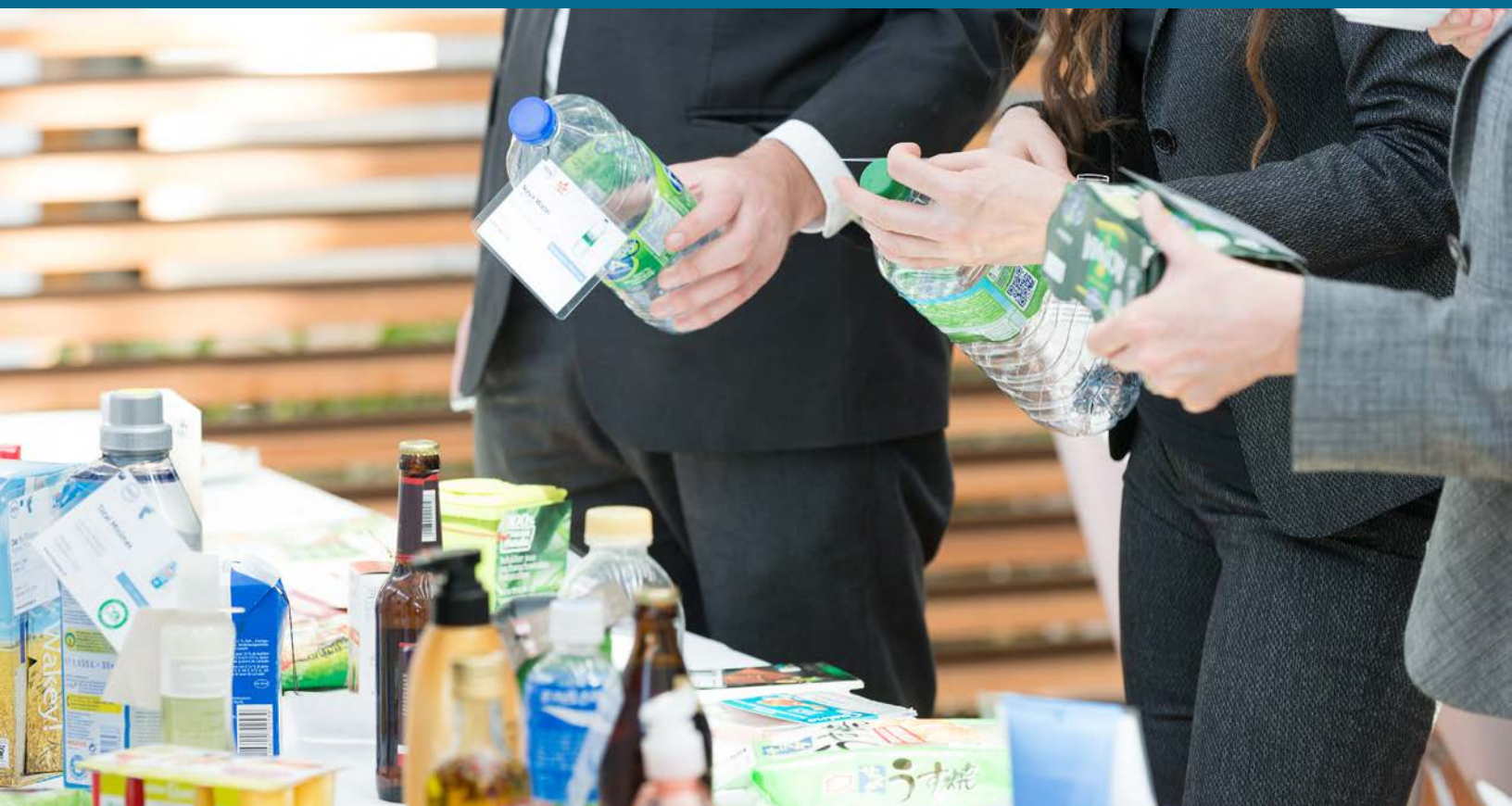
A revised PCR is a change to a PCR by the original PCR developer/program operator under the direction of a PCR committee. Some reasons for revising a PCR include:

- Expiration of the original PCR
- Technology and material changes to products in the category
- Technical and quality standards for products in the category
- Availability of new LCA-based information generated in the industry sector

5.5. PCR Expiration

PCRs shall have an expiration date of no more than five years from the date of publication. PCRs shall be considered invalid beyond their expiration.

CHAPTER 6
PCR Use



Application of PCRs is largely beyond the scope of this Guidance. However, we provide a limited number of requirements and recommendations related to the content and comparability of claims.

6.1. Content of the Claim

The content of the claim shall conform to the requirements of the PCR. The format of the claim should be based on the guidelines of applicable standards and program rules of the program operator.

6.2. Comparability of Claims

As one of the principle applications of LCA-based claims is to allow comparability of the environmental performance of products within the same category on a life cycle basis, specific requirements should be followed for comparability.

The following should be IDENTICAL:

- Product category definition and description
- Functional unit
- System boundary
- Criteria for inclusion or exclusion of flows
- Data quality
- Calculation procedures (transformation of data collected into flows)
- Allocation rules
- Impact categories and LCIA methodologies
- Predetermined parameters for inventory indicators and LCIA characterization factors

The following should be EQUIVALENT[i]:

- Methods of data collection
- Data sources
- Units
- Additional information requirements
- Declaration of materials and substances that affect human health and the environment

[i] Comparable but not identical

Chapter 7
Best Practices for PCR Development and Management

The following represent best practices for the development and management of PCRs. Program operators should strive to implement the practices.

7.1. Clarity in Content

To ensure that this document effectively serves its purpose of enabling the development of consistent and robust PCRs, the content should convey the same information to all readers in a consistent manner. In other words, clarity in content helps prevent misinterpretation. Clarity in content can be achieved by three means:

- Through the use of appropriate examples to describe processes and scenarios
- Through the use of prescriptive text to describe instructions and processes
- Through peer-review and/or public consultation to ensure consistent interpretation

7.2. Level of Detail and Prescriptiveness of Content in a PCR

PCR developers should be highly detailed in their description of the different components of a PCR to ensure the PCR is interpreted consistently. A PCR that is consistently interpreted will ensure that claims produced from the PCR by different entities are comparable.

7.3. Fixed and Flexible Content in PCRs

In Chapter 3 Elements of a PCR, a fixed structure is recommended for PCRs to promote comparison. To accommodate variability in geographies and technologies within a product category, some elements of the PCR should have flexible content, while other elements should have a fixed content. ISO 14025 states that PCRs can provide flexibility and practicality provided they maintain their technical credibility. Flexible content refers to specifications that differ based on differences in geographies, technologies, overarching standards, and regulations. Elements may contain one or more options to treat these differences, or PCRs may be adapted to include one or more of these options.

Table 7.1. Fixed and flexible elements of a PCR

Element	Content	Notes
General information	Fixed	
Functional unit	Fixed	
System boundaries	Fixed	
Data requirements	Flexible	Differ based on regional availability and technology differences
Multiproduct/multifunctional allocation	Fixed	
Waste handling rules	Flexible	Due to regional differences in waste definitions
Data quality	Fixed	
Impact categories	Fixed	Accommodates requirements from all standards that PCR subscribes to
Characterization factors	Flexible	Permits regional differences
Additional information	Flexible	Permits regional differences
Quantitative approaches to interpretation	Fixed	
Assumptions and limitations	Flexible	Permits regional differences and differences in data requirements
Uncertainty characterization	Fixed	

7.4. Specifying the Extent of Product Variation a Single PCR Can Represent

The diversity of products is increasing as new products are frequently introduced into the market. The variation between individual products can be functional or non-functional. The variation can be complex because it may encompass a number of physical, chemical, and biological parameters that differentiate products. The product category should be defined broadly in such a way that it accommodates non-functional variation and some of the functional variation.

Industry seeks to provide a diverse offering of products with a high degree of functional and non-functional variation to serve consumer needs, but new PCRs should not be created every time a product variation is introduced. Sometimes these products are based on radical innovations while other times they are improvements of existing products. Even the radical innovations can be captured within the same product category. For example, television technology has evolved from CRT to plasma to LCD to LED, while still fitting within the same category of televisions. Right now, there are televisions that can respond to voice input, but they still fall under the category of televisions. For all the above products, the quality aspect of the function has changed, but the functional unit can be designed to accommodate these changes. A robust but somewhat broad definition of product categories in relation to functionality will expand the scope of PCRs, reduce the total number of PCRs which must be developed, and improve the comparability of claims.

7.5. Supporting the Development of Data to Enable LCA-Based Claims

The accuracy and quality of LCA studies are often constrained by lack of appropriate data. Even in the case when primary data of high quality are provided by a manufacturer, these data must be combined with data describing the origins of all inputs from the "cradle" and destinations of all wastes to the "grave." In general, public (e.g., European Reference Life Cycle Database) and proprietary LCI databases (e.g., Ecoinvent and GaBi) are used to provide secondary data because they provide a complete or near-complete set of processes to enable full cradle-to-grave assessment. However, large gaps persist in regions such as North America[i],[ii], and in many sectors such as consumer products and retailing. Environmental extended input-output (EEIO) models have been used to fill data gaps in background processes where process life cycle inventory data is missing in a practice commonly known as hybrid analysis. EEIO datasets may be considered for use in secondary data sources[iii]. However, EEIO datasets are not available in all regions and may not meet data quality standards desired for use in product claims.

LCA-based claims are highly dependent on good quality secondary data both for accuracy and to enable product comparison. Poor availability of data is a significant impediment to their growth[iv]. When data are available, lack of consistency in inventory methodology, documentation, format, and transparency of data hamper the use of data in claims because non-equivalent secondary data cannot support comparability. The Global Guidance for LCA Databases[v] supports movement in the direction of data harmonization; LCI data built on PCRs themselves can support this movement.

We strongly recommend that all stakeholders in product sustainability participate and support efforts to increase LCI data availability and consistency since consistency is essential to the broader use and accuracy of LCA-based claims.

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[i] National Round Table on the Environment and the Economy (2012) Canada's Opportunity: Adopting Life Cycle Approaches for Sustainable Development, Ottawa, Ontario.

[ii] Fava, J., Baer, S., Cooper, J., (2009) Increasing Demands for Life Cycle Assessments in North America. Journal of Industrial Ecology.13, 491-494. http://dx.doi.org/10.1111/j.1530-9290.2009.00150.x.

[iii] de Haes, H.A.U., Heijungs, R., Suh, S., Huppes, G., 2004. Three Strategies to Overcome the Limitations of Life-Cycle Assessment. Journal of Industrial Ecology.8, 19-32. http://dx.doi.org/10.1162/1088198042442351

[iv] Ingwersen, W.W., Stevenson, M.J., 2012. Can we compare the environmental performance of this product to that one? An update on the development of product category rules and future challenges toward alignment. Journal of Cleaner Production.24, 102-108. http://dx.doi.org/10.1016/j.jclepro.2011.10.040

[v] UNEP/SETAC Life Cycle Initiative, 2011. Global Guidance Principles for Life Cycle Assessment Databases (Shonan Guidance Principles), available at: http://lcinitiative.unep.fr/includes/file.asp?site=lcinit&file=E8C5CAD7-D1AC-49BE-BBFF-7AA6D25F1DA4.

7.6. Handling Methodological Issues of LCA within PCRs

Various product claim standards and program operators address methodological issues (e.g., allocation, functional unit definition, waste handling rules, normalization and weighting) differently. Some standards or programs offer more complete instructions for handling issues while others may fail to address or insufficiently address issues. While some issues are addressed in consistent ways that increase alignment, others are addressed in contradictory ways. Annex II: Comparison of LCA Methodologies in Existing Standards provides a comprehensive comparison of how different methodological issues are addressed by different programs and standards. The intent is to highlight points that need to be considered if a program intends to design a PCR that is applicable to more than one standard or program.

Handling Unresolved Issues

Many unresolved issues exist within LCA. It is more than likely that compromises will be made when attempting to address these issues. These issues should be highlighted in the PCR by a footnote wherein the unresolved nature of the issue can be explained in a concise manner.

Handling Unaddressed Issues in PCRs

Situations often arise when a PCR is finalized before consensus or majority agreement on one or more issue can be reached. Such situations occur due to reasons related to time or to technical issues. To ensure these issues are addressed in the next iteration of the PCR, the PCR should highlight these issues as a footnote in the PCR and should indicate, "This issue deserves further study."

7.7. Making PCRs and Claims Dynamic and Digital

PCRs and claims based upon them have largely been created in the form of static documents to date. Current practice should not be considered a constraint on the forms and uses of PCRs and claims in the future. As production and consumption in large entities (e.g., corporations and governments) is largely managed by enterprise data and software systems, and increasingly decisions are aided by the use of software tools, PCRs may be better integrated into such systems in a more automated way. Some programs in Asia already provide tools for PCR use that automate and greatly facilitate the creation and use of claims[vi]. These approaches will facilitate automated and dynamic use of claims for integration into design tools and databases, and allow more flexible and modular use of the data and information provided by both PCRs and claims.

Such future approaches should still be consistent with this Guidance.

7.8. Establishing a Centralized Global PCR Repository and Notification Mechanisms

The creation of a global repository is recommended for the publication of PCRs in a single location. The manager of the repository should ensure that potentially interested parties from all regions not be precluded from accessing the repository. The repository should be centralized such that all PCRs are made available at a single location, although the PCRs and related materials may still reside on the program operator's website. The global repository should organize PCR using one or more product classification systems. The benefits of using classification systems to identify PCRs are described in Section 2.4.

Centralized notification of PCRs available for public review and publication

We recommend the use of a common means of publicizing PCRs available for public review by all programs, such as a website and/or email listserv. This will enable all interested parties to be made aware of PCRs that are available for public review. We recommend notification of the publication of PCRs via these mechanisms.

[vi] See for example: Wang H, 2009, Establishment of Type III Environmental Declaration Program in China. Presentation at the 8th International Conference on EcoBalance, Tokyo.

7.9. Developing a Unified PCR

A unified PCR is a single PCR that is developed from previously disparate PCRs that serves as the basis for claims in more than one program or standard (See Section 2.5). The development of a unified PCR should involve more than one program operator, and ideally all program operators who have published or proposed PCRs for the same or overlapping product categories.

A unified PCR will typically be based on two or more published or proposed PCRs for the same category, and will supersede those PCRs. The process should begin with a statement of intent sent by the initiating organization to one or more organizations that have published or proposed PCRs in the product category of interest. Notification of this intention should be made via a centralized notification mechanism. The statement of intent should express the intention to harmonize the PCR, and should invite the participation of relevant stakeholders. For the PCR to be considered 'unified,' the organizations that possess published PCRs for the same category should consent to the unified PCR and express willingness to use it in the future.

A unified PCR may contain flexible content (Section 7.3) that allows for differences in overarching standards, program instructions, and other technological or regional differences.

7.10. Systematic PCR Development

While this Guidance describes a process of individual PCR development, and a PCR Committee is only charged with producing a single PCR, there are strong benefits to alignment if PCR development is done systematically. Extending on the concept of information modules (Section 3.4.2), PCRs are essentially building blocks with each new PCR expanding the coverage of rules for LCA-based product claims to another category of products. The ultimate endpoint is a system of PCRs that covers the entire market. PCRs may be similar in several respects, including: (1) common unit processes (for common elements in supply chains) or (2) inherited elements, which means that a PCR for a specific category inherits characteristics from a broader category.

The more aligned the PCRs from different program operators are, the more usage of common elements and inheritance will be possible. This will create efficiencies in PCR development and ensure that PCRs are more cohesive and internally consistent as a system. Examples that support the systematic consideration of PCRs include the development of sector-specific PCR standards and guidance, and the use of basic modules for a broader category of products that can be adapted for more specific product categories[vii]. Such efforts make PCR development more consistent and efficient, and can avoid duplication and inconsistencies. Existing means of systemization are largely applicable within existing programs or restricted to sectors, but, ideally, in the future, the means of PCR systemization need to be applicable on a global level with the collective participation of all program operators and other stakeholders. We recommend collective action towards global systemization of PCRs by undertaking collaborative efforts such as PCR evaluation and planning as well as tool development.

7.11. Participation of Small and Medium Size Enterprises (SMEs)

PCR development requires investment of time and resources by businesses to participate in the process to develop a robust PCR. SMEs should not be precluded from the process of PCR development due to cost or lack of LCA expertise.

[vii] For example, the 'basic modules' of the International EPD system serve this function.

Annexes

Annex I.
Product Category Rule Template

A PCR template is available which incorporates the requirements and recommendations of the Guidance into elements organized into sections on general information, PCR review and background information, goal and scope, life cycle inventory, life cycle impact assessment, and additional information along with a glossary and reference section, and appendices. We recommend PCRs be developed using this structure and containing these elements to support conformity to this Guidance and to promote alignment of PCRs.

The PCR template is available at: http://www.pcrguidance.org/pcrtemplate.docx

Annex II.
Comparison of LCA Methodologies in Existing Standards

The tables in this annex outline how methodological issues within LCA are handled in different standards and programs[i].

[i] Other comparisons between subsets of these product claim standards that have informed this study include European Commission Joint Research Center (2011) Analysis of Existing Environmental Footprint Methodologies for Products and Organizations: Recommendations, Rationale, and Alignment (http://ec.europa.eu/environment/eussd/pdf/Deliverable.pdf) and GHG Protocol (2011) Quantifying the Greenhouse Gas Emissions of Products: PAS 2050 and the GHG Protocol Product Standard. http://www.ghgprotocol.org/files/ghgp/public/GHG%20Protocol%20PAS%202050%20Factsheet.pdf

Table A.1. System boundary inclusions

ISO 14025:2006	Consistent with ISO 14040.
ISO/TS 14067:2013	▪ Shall be consistent with the goal of the study. ▪ For B2C, all stages of the life cycle shall be included. ▪ For B2B, cradle-to-gate shall be included. Partial gate-to-gate PCF shall be justified. ▪ For internal applications, a restricted number of life cycle stages within the life cycle may be considered. ▪ For decision-making, the whole life cycle should be considered, in addition to other impacts.
PAS 2050:2011	▪ Emissions and removals of biogenic carbon used in the production of food and feed. ▪ Non-CO2 emissions that arise from degradation of waste food and feed and enteric fermentation. ▪ Any biogenic component in material that is part of the final product but is not intended to be ingested. ▪ Emissions and removals from, but not limited to: Energy use, combustion processes, chemical reaction, loss to atmosphere of refrigerants and other fugitive GHG's, process operations, service provision and delivery, land use and land use change, livestock production and other agricultural processes, waste management. ▪ For cradle-to-gate assessments, the transfer of products to another party, that is not a consumer, is included. ▪ Production materials (development of material sources, mining, consumables, waste generated at each stage of extraction and pre-processing of production materials, fertilizers, direct land use change energy intensive atmospheric growing conditions, emissions from crop production and livestock). ▪ Energy (associated with the provision and use of energy in the life cycle of the product). ▪ All sources of emissions and processes for removal that are anticipated to make material contribution to the life cycle GHG emissions of the functional unit. ▪ Storage of inputs, environmental controls associated with storage, storage of products in use-phase, and storage prior to reuse, recycling or disposal activities. ▪ Use-phase and final disposal phase shall be included based on the scope of the assessment.

GHG Protocol: 2011	▪ Attributable processes along the life cycle that are directly connected to the studied product and its ability to perform its function.
	▪ Cradle-to-grave of the final product.
	▪ Non-attributable processes shall be reported if they are included; Examples of these processes are:
	  ▪ Capital goods
	  ▪ Overhead operations
	  ▪ Corporate activities and services
	  ▪ Transport of the product user to the retail location
	  ▪ Transport of employees to and from works

EN 15804:2012	The following stages are required to be part of the declaration: ▪ Raw material extraction and processing, processing of secondary material input ▪ Transport to manufacturer ▪ Manufacturing ▪ Other stages are optional
ISO 21930:2007	▪ Consistent with ISO 14044:2006. ▪ Cradle-to-grave of the final product. ▪ Product stage, design and construction stage, use/operation stage and end-of-life stage.
PEF Guide	▪ All life cycle stages, as appropriate to the intended application of the study. ▪ All processes linked to the product supply chain relative to the unit of analysis.
BPX 30-323	All gases driving greenhouse gas emissions shall be included in the inventories produced. The inventory of these gases throughout the product life cycle is compiled based on accounting rules provided in the standard.

Table A.2. System boundary allowable exclusions

ISO 14025:2006	Consistent with ISO 14044.
ISO/TS 14067:2013	Consistent with ISO 14044.
PAS 2050:2011	▪ Exclude emissions and removals from human food and animal feed products ▪ Emissions and removals from the production of capital goods shall be excluded, unless provided for in supplementary requirements. ▪ Exclude emissions associated with human energy inputs to processes and/or pre-processing. ▪ Exclude emissions associated with transport of consumers to and from the point of retail purchase. ▪ Exclude emissions associated with transport of employees to and from their normal place of work. ▪ Exclude emissions associated with animals providing transport services.
GHG Protocol: 2011	Attributable processes may be excluded if ▪ A data gap exists because primary and secondary data cannot be collected ▪ Extrapolated and proxy data cannot be determined to fill the data gap ▪ An estimation determines the data are insignificant
EN 15804:2012	▪ The following life cycle stages may be excluded ▪ Construction process stage ▪ Use stage, related to building fabric ▪ Use stage, related to the operation of the building ▪ End-of-life stage ▪ Processes of waste processing shall be assigned to the product system that generates the waste until the end-of-waste state is reached.
ISO 21930:2007	Consistent with ISO 14044:2006.
PEF Guide	Not Specified.
BPX 30-323	▪ Flows tied to R&D are not accounted for due to the difficulties involved in pinpointing the R&D share assignable to the product or system under study. ▪ Flows tied to employee transport from home to work and back are not covered in the environmental impact assessment. This is also the case for out-of-office missions. ▪ Flows tied to services allied to a product or system, such as advertising, canvassing and marketing, are considered as falling outside the system boundaries. ▪ Information related to the impacts of customer transportation to a product sale outlet is made available to the consumer, but this information is not integrated into the product's environmental communication indicators.

Table A.3. Cut-off criteria

ISO 14025:2006	Not Specified.
ISO/TS 14067:2013	Consistent with ISO 14044.
PAS 2050:2011	Include at least 95% of the anticipated life cycle GHG emissions and removals associated with the functional unit.
GHG Protocol: 2011	Attributable processes may be excluded if estimation determines the data are insignificant.
EN 15804:2012	In case of insufficient input data or data gaps for a unit process, then the following rules apply: ▪ 1% of renewable and non-renewable primary energy usage ▪ 1% of the total mass input of that unit process ▪ The total neglected input flow per module shall be a maximum of 5% of energy usage and mass
ISO 21930:2007	Consistent with ISO 14044 ▪ For material flows, 5% by mass, energy or environmental relevancy shall be a maximum starting point.
PEF Guide	Not Allowed.
BPX 30-323	For all three criteria (mass, energy and environmental impact radius), total cumulated flows of less than 5% of the benchmark flow can be excluded.

Table A.4. Assessment period/Time boundary

ISO 14025:2006	Not Specified.
ISO/TS 14067:2013	▪ Covers the entire life cycle of the product. ▪ For all life cycle stages, except the use and end-of-life, emissions and removals shall appear to occur at the beginning of the assessment period. ▪ When emissions and removals in the use stage and end of life stage occur within 10 years after the product has been brought to use, then they will appear to have been released and removed at the beginning of the assessment period. ▪ When emissions and removals in the use stage and the end-of-life stage occur over a period of more than 10 years, the effect of timing will be considered.
PAS 2050:2011	Emissions and removals arising during the use phase and disposal phase of the product during the 100-year assessment period shall be included.
GHG Protocol: 2011	▪ For non-durable goods, the typical time period that a product takes to complete a life cycle is one year or less. ▪ For durable goods, the typical time period that a product takes to complete a life cycle is three years or more. ▪ For products for which scientific evidence, sector guidance, or product rules don't exist, a minimum time period of 100 years should be assumed.
EN 15804:2012	Inputs to and outputs from the product system will be accounted for 100 years from the year for which the data is deemed representative. A longer time period shall be used if relevant.
ISO 21930:2007	Not specified.
PEF Guide	Temporal specifications should be assigned to each life cycle stage and the processes assigned to those stages.
BPX 30-323	▪ The 100-year-horizon GWP is utilized to calculate the contribution of each GHG to the overall increase in GHGs. ▪ Formulae have been provided to account for GHG effect over the time interval spanning product production and the next 100 years and to integrate the effect of a time lag in GHG emissions due to the product life span.

Table A.5. Allocation rules

ISO 14025:2006	Consistent with ISO 14044.
ISO/TS 14067:2013	Consistent with ISO 14044.
PAS 2050:2011	▪ Emissions associated with the process used for prototyping are allocated to the resulting product(s) and co-product(s). Preferred approach to allocation of emissions and removals to co-products shall be, in the following order of preference: ▪ Dividing unit processes into sub-processes ▪ Expanding product system to include additional functions in proportion to their economic value
GHG Protocol: 2011	A co-product without economic value is considered waste and hence, no emissions or removals are allocated. Allocation shall be avoided whenever possible by using process subdivision, redefining the functional unit, or using system expansion. If allocation cannot be avoided then, allocation shall be based on the underlying physical relationship between the studied product and co-product(s). When physical relationship alone cannot be used as the basis for allocation, either economic allocation or another allocation method that reflects the physical relationship of the product and the co-product(s) shall be selected. The same allocation methods shall be applied to similar inputs and outputs within the product's life cycle.
EN 15804:2012	▪ Allocation should be avoided as much as possible. If a process can be sub-divided, then it shall be sub-divided between its different products or functions in such a way that it reflects the underlying physical relationship. Basic procedures and assumptions provided on allocation in ISO 14044:2006 have been refined in this standard. ▪ For joint co-product allocation: ▪ Based on physical properties when difference in revenue from the co-products is low. In other cases, allocation based on economic values ▪ Material flows carrying specific inherent properties shall be allocated reflecting physical flows, irrespective of the allocation chosen for the process. ▪ Processes generating a very low contribution (<1%) to the overall revenue may be neglected.
ISO 21930:2007	Consistent with ISO 14044:2006.
PEF Guide	A decision tree for handing multifunctional processes is provided. First, attempt to use subdivision or system expansion. Then, attempt to use allocation based on relevant underlying physical relationship (Direct substitution). Then, use allocation based on some other relationship (Indirect substitution).
BPX 30-323	Allocation shall be performed according to one of six stated procedures, listed in order of priority.

Table A.6. Recycling/Reuse

ISO 14025:2006	Not Specified.
ISO/TS 14067:2013	Consistent with ISO 14040 and ISO 14044.
PAS 2050:2011	When recycled content is used as input in a product, the emissions and removals associated with the conversion process are included.
GHG Protocol: 2011	Provides two methods: (1) closed loop approximation method, and (2) recycled content method. For allocation due to recycling, any one of the provided methods shall be used. Allows other methods to be used if they are documented and justified.
EN 15804:2012	▪ Reuse, recovery, and/or recycling potentials are optional to the EPD. ▪ Includes reuse of products or materials from a previous product system for module A1-A3. ▪ Waste processing of the material flows (recovery or recycling) during any module of the product system is included within the system boundary of the respective module. ▪ The “design for reuse, recycling, and recovery” are recognized by indicating the potential benefits of avoided future use of primary materials and fuels while taking into account the loads associated with the recycling and recovery process beyond the system boundary. ▪ Declares potential loads and benefits of secondary material, secondary fuel or recovered energy leaving the product system. ▪ The calculation of potential benefits or avoided loads that result from recycling or recovery should be based on current average technology or practice. ▪ Three methods to calculate net impacts are provided.
ISO 21930:2007	Consistent with ISO 14044.
PEF Guide	Provides formulae, which are applicable for both open-loop and closed-loop recycling. If relevant/applicable, it can accommodate re-use of the product being assessed. This is modelled in the same manner as recycling. If relevant/applicable, it can accommodate downcycling (i.e.. any differences in quality between the secondary material (i.e., recycled or reused material) and the primary material (i.e., virgin material)). If relevant/applicable, it can accommodate energy recovery.
BPX 30-323	Environmental impacts tied to recycling, energy recovery and land filling are accounted for in the calculation of the environmental impacts of products on a pro rata basis indexed to national practices. Modelling rules for closed-loop system recycling with or without energy recovery and open-loop system recycling with or without energy recovery are provided.

Table A.7. Economic input-output vs. process data

ISO 14025:2006	Not Specified.
ISO/TS 14067:2013	Primary data signifies process data Secondary data include literature data, calculated data, estimates or other representative data.
PAS 2050:2011	EEIO is a type of secondary data and may be used whenever secondary data is needed. EEIO is recommended for screening to help companies identify which products to study.
GHG Protocol: 2011	Environmentally Extended Input-Output (EEIO) may be used for screening purposes to identify products that are GHG intensive; these products will be studied using the standard.
EN 15804:2012	Not Specified.
ISO 21930:2007	Not Specified.
PEF Guide	Not Specified.
BPX 30-323	Not Specified.

Table A.8. Fossil and biogenic carbon

ISO 14025:2006	Not Specified.
ISO/TS 14067:2013	▪ All sources and sinks will be included in the study, including biomass cultivation and production. ▪ The amount of CO2 uptake of biomass and amount of CO2 emissions from biomass is equivalent, making the net emissions equal to zero at the point of complete oxidation when biomass carbon is not converted to methane, NMVOC, or to other precursor gases that are not converted to CO2.

PAS 2050:2011	▪ May exclude biogenic emissions and removals from food and feed that become part of the product. This exclusion does not apply to:
	  ▪ Emissions and removals of biogenic carbon used in the production of food and feed where that biogenic carbon does not become part of the product
	  ▪ Non-CO2 emissions arising from degradation of waste food and feed and enteric fermentation.
	  ▪ Any biogenic component in material that is part of the final product but is not intended to be ingested.
	▪ Where emissions and removals from biogenic sources have been excluded, the GWP factor of non-CO2 emissions originating from biogenic sources shall be corrected to take into account the removal of CO2 that gave rise to the biogenic carbon source.

GHG Protocol: 2011	Shall report emissions and removals from biogenic sources within the system boundary (as part of the inventory results) and separately in the inventory report for transparency.
EN 15804:2012	Shall be allocated reflecting the physical flows.
ISO 21930:2007	Not Specified.
PEF Guide	Removals and emissions of biogenic carbon shall be reported.
BPX 30-323	▪ Carbon emissions (fossil and biogenic) captured are accounted for, as mentioned in system boundary inclusions, but without factoring in time scale or time lag. ▪ The modelling process can be improved by integrating the time lag in compliance with the method provided in the standard.

Table A.9. Treatment of energy/electricity

ISO 14025:2006	Quantified; No Further Specification
ISO/TS 14067:2013	Include GHG emissions from the life cycle of the energy supply system, including but not restricted to: ▪ Emissions from the generation of electricity ▪ Transmission and distribution losses in the grid ▪ Upstream GHG emissions ▪ Downstream GHG emissions ▪ GHG emissions from the construction and deconstruction of the electricity supply system
PAS 2050:2011	Include GHG emissions and removals associated with the provision and use of energy in the life cycle of the product. This includes ▪ Emissions at the point of consumption ▪ Emissions from the provision of energy ▪ Generation of electricity and heat ▪ Transmission losses ▪ Transport fuels ▪ Upstream emissions ▪ Downstream emissions ▪ Growing and processing of biomass for use as fuel
GHG Protocol: 2011	Electricity emission factors should be geographically specific.
EN 15804:2012	▪ The generation of electricity, heat, steam from primary energy sources, and their extraction, refining, and processing are included. ▪ The assumptions associated with the generation of electricity and other relevant background data are to be part of the system boundary.
ISO 21930:2007	Not Specified.
PEF Guide	▪ Shall be modelled as precisely as possible giving preference to supplier-specific data. ▪ If supplier-specific data is not available, country-specific consumption-mix data shall be used of the country in which the life cycle stages occur. For electricity consumed during the use stage of products, the energy mix shall reflect ratios of sales between countries or regions. Where such data are not available, the average EU consumption mix, or otherwise most representative mix, shall be used. ▪ It shall be guaranteed the renewable electricity (and associated impacts) from the grid consumed upstream or within the defined PEF boundary is not double counted. ▪ If the electricity generated is consumed within a closed loop unconnected to the main network, any model that incorporates electricity production from renewable energy sources may replace the energy analysis model.
BPX 30-323	If the products are generated by electricity-intensive industries, specific rules may be devised to account for energy management efforts designed to incorporate electricity into baseline phases rather than advanced phases.

Table A.10. Direct land use change (dLUC)

ISO 14025:2006	Not Specified.
ISO/TS 14067:2013	In accordance with IPCC Guidelines.
PAS 2050:2011	▪ Emissions and removals arising from dLUC shall be addressed for any input to the life cycle of a product originating from that land. ▪ For countries and land use changes not included in the standard, the emissions from the product will be assessed using the emissions and removals from dLUC in accordance with the relevant sections of 2006 IPCC Guidelines for National Greenhouse Gas Inventories. ▪ The assessment of the impact of land use change shall include all direct land use change occurring not more than 20 years, or a single harvest period, prior to undertaking the assessment (whichever is the longer). The total GHG emissions and removals arising from direct land use change over that period shall be included in the quantification of GHG emissions of products arising from this land on the basis of equal allocation to each year of the period.
GHG Protocol: 2011	▪ Does not include changes in crop cover or crop rotation that occur in the cropland category. ▪ Does not include forest harvesting and regeneration into the same general forest type, for which the regenerated forest has comparable carbon stock to the harvested forest. ▪ Includes forestland, cropland, grassland, wetlands, settlements, and other lands such as bare soil, rock, ice, etc.
EN 15804:2012	Not Specified.
ISO 21930:2007	Not Specified.
PEF Guide	Greenhouse gas emissions that occur as a result of direct land use change shall be allocated to goods/services for 20 years after the land use change occurs using the IPCC default values table.
BPX 30-323	Where significant, dLUC impacts shall be accounted for.

Table A.11. Indirect land use change (iLUC)

ISO 14025:2006	Not Specified.
ISO/TS 14067:2013	Include only when an internationally agreed upon procedure exists. Shall be documented if calculated.
PAS 2050:2011	While GHG emissions arise from indirect land use change, the methods and data requirements for calculating these emissions are not fully developed. Therefore, the assessment of emissions arising from indirect land use change is not included in this PAS. The inclusion of indirect land use change will be considered in future revisions of this PAS.
GHG Protocol: 2011	Inclusion is not a requirement. If impacts are calculated and determined to be significant, then the results should be reported.
EN 15804:2012	Not Specified.
ISO 21930:2007	Not Specified.
PEF Guide	Greenhouse gas emissions that occur as a result of indirect land use change shall be included.
BPX 30-323	Indirect land use changes shall be taken into consideration once an internationally-recognized method becomes available.

Table A.12. Soil carbon change

ISO 14025:2006	Not Specified.
ISO/TS 14067:2013	Shall be documented if calculated and in accordance with internationally recognized methods such as IPCC guidelines for National Greenhouse Gas Inventories.
PAS 2050:2011	▪ When not caused by land use change, the emissions and removals of carbon content from soils shall be excluded, unless specified in supplementary requirements. ▪ If supplementary requirements for soil carbon change have been developed for the product being assessed, then they should be used.
GHG Protocol: 2011	Soil carbon change as a result of land use changes may be included if a reasonable estimation of emissions and removals is possible.
EN 15804:2012	Not Specified.
ISO 21930:2007	Not Specified.
PEF Guide	Shall be excluded, unless calculated as part of LUC or unless provided for in a supplementary requirement of PAS 2050:2011.
BPX 30-323	Not Specified.

Table A.13. Product carbon storage/sequestration

ISO 14025:2006	Not Specified.
ISO/TS 14067:2013	▪ The calculation used to estimate carbon storage shall be documented. ▪ The effect of carbon storage arising from the use stage and/or end of life stage of products shall be documented if calculated.
PAS 2050:2011	▪ Included in assessment. ▪ Forest management activities that result in additional carbon storage through the retention of forest biomass, is not included. ▪ While the use of weighting factor to assess delayed emissions is no longer required by this standard, provisions are provided. ▪ The data source, from which the quantity of carbon storage was calculated, together with the carbon storage profile of the product over the 100-year assessment period, shall be recorded and retained.
GHG Protocol: 2011	The amount of removal calculated for materials of biogenic origin should only reflect the amount of carbon contained, or embedded, in that material.
EN 15804:2012	Not Specified.
ISO 21930:2007	Not Specified.
PEF Guide	Credits associated with temporary (carbon) storage or delayed emissions shall not be considered in the calculation of the PEF for the default impact categories, unless otherwise specified in a supporting PEFCR.
BPX 30-323	Shall be updated according to relevant best practices, in particular those released in the final draft of the "ILCD Handbook: General guide for Life Cycle Assessment — Detailed guidance" by the EC Joint Research Centre.

Table A.14. Non-CO2 emissons and removals

ISO 14025:2006	Not Provided.
ISO/TS 14067:2013	The non-CO2 emissions and removals (e.g., N2O and CH4) arising from livestock, manure or soils shall be included in the PCF and shall be assessed in accordance with internationally recognized methods such as the IPCC Guidelines for National Greenhouse Gas Inventories.
PAS 2050:2011	▪ Non-CO2 emissions arising from food and feed shall be included in the calculation of GHG emissions from the life cycle of products. ▪ Where emissions and removals from biogenic sources have been excluded, the GWP factor for non-CO2 emissions originating from biogenic carbon sources (e.g., CO2 removed from the atmosphere and subsequently emitted as CH4) shall be corrected to take into account the removal of the CO2 that gave rise to the biogenic carbon source.
GHG Protocol: 2011	Not Provided.
EN 15804:2012	Not Provided.
ISO 21930:2007	Not Provided.
PEF Guide	Not Provided.
BPX 30-323	Not Provided.

ANNEX III.

COMPARISON OF SYSTEMS OF PRODUCT CLASSIFICATION

Table A.15. Comparison of systems of product classification: UNSPSC, GPC, and UNCPC

	CPC	UNSPSC	GPC
Name	Central Product Classification	United Nations Standard Products and Services Code	Global Product Classification
Latest version	Version 2 – 2008	Version 14.0801 – 2012	2006
Overarching organization	Developed and maintained by United Nations Statistics Division	-Developed by United Nations Development Program	Developed and maintained by GS1 (global office in Brussels)
-		Maintained under contract by GS1 US[i]	
Used by (examples)	The international EPD® System (IES)	Earth Sure (IERE)	Sustainability measurement and reporting system (TSC, proposed)
Objectives	▪ Assign a product to a product group based on its attributes and application areas ▪ Provide economic statistics	Provide a global, multi-sector classification system to primarily support spend analysis, procurement and catalogues	▪ Support selling and buying programs and provide global categorization reference[ii] ▪ Provide a mandatory classification methodology across 36 categories
Format	5-digit code XXXXX	8-digit code XXXXXXXX	8-digit code XXXXXXXX

[i] Global Synchronization Network (2012) GPC-UNSPSC Alignment update or the User Community. Online: http://www.gs1.org/docs/gpc/gpc_unspcs_integration_update.pdf

	CPC	UNSPSC	GPC
Structure	Classification: Section: XXXXX ▪ 0: Agriculture, forestry and fishery products ▪ 1: Ores and minerals; and electricity, gas and water ▪ 2: Food products, beverages and tobacco; and textiles, apparel and leather products ▪ 3: Other transportable goods (except metal products, machinery and equipment) ▪ 4: Metal products, machinery and equipment ▪ 5: Construction and construction services ▪ 6: Distributive trade services; accommodation, food and beverage serving services; transport services; and electricity, gas and water distribution services ▪ 7: Financial and related services; real estate services; and rental and leasing services ▪ 8: Business and production services ▪ 9: Community, social and personal services Divisions: XXXXX Group: XXXXX Class: XXXXX Subclass: XXXXX	Classification: Segment: XXXXXXXX ▪ Raw materials: 10 to 15 ▪ Industrial equipment: 20 to 27 ▪ Component and supplies: 30 to 41 ▪ End use products: 42 to 60 ▪ Services: 70 to 94 ▪ Family: XXXXXXXX ▪ Codes are arbitrary and reflect no specific sequence ▪ Class: XXXXXXXX ▪ Codes are arbitrary and reflect no specific sequence ▪ Commodity: XXXXXXXX ▪ Codes are arbitrary and reflect no specific sequence ▪ Not defined as bulk materials, but in the broader sense as any article of commerce including capital equipment, high value products, and professional services	Classification: Segment: an industry segmentation or vertical Family: a broad division of a segment Class: a group of categories Brick: categories of like products Brick attributes: attribute values 1, 2, etc. Example: Segment: cleaning/hygiene products Family: cleaning product Class: laundry Brick: laundry detergents Brick attributes: if hand machine wash, if with concentrate claim

	CPC	UNSPSC	GPC
Advantages	▪ The numbering of each level and sub-level is clear ▪ As far as possible an attempt is made to make a one-to-one correspondence with International Standard Industrial Classification (ISIC Rev.4) of all economic activities and Harmonized Commodity Description and Coding System (HS 2007)[iii] ▪ Compatible with Classification of Product (CPA) at European level[iv], as well as North American Product Classification System (NAPCS)[v] and Harmonized Tariff System (HTC)[vi] at North American Level ▪ Compatible with Ecoinvent 3	▪ Life cycle perspective in the classification of segments ▪ Clear subdivision of segment numbering ▪ Open standard, not proprietary, and neutral ▪ Category titles are unambiguous and mutually exclusive ▪ Products grouped according to dominant usage in world market ▪ Has broad industry sector participation in 55 segments, including products and services[vii]	▪ Gives buyers and sellers a common language to group products the same way globally to ensure effective data synchronization in the Global Data Synchronization Network (GDSN)
Disadvantages	▪ Less detailed than UNSPSC and GPC	▪ Numbering for families, classes and commodities is arbitrary and reflects no specific sequence	▪ GPC access requires a fee

[iii] http://unstats.un.org/unsd/tradekb/Knowledgebase/Harmonized-Commodity-Description-and-Coding-Systems-HS
[iv] http://unstats.un.org/unsd/cr/ctryreg/ctrydetail.asp?id=1108
[v] http://unstats.un.org/unsd/cr/ctryreg/ctrydetail.asp?id=264
[vi] http://unstats.un.org/unsd/cr/ctryreg/ctrydetail.asp?id=262
[vii] ibid

Annex IV. Additional Criteria for Selection of LCIA Methods

This Annex supplements Section 3.4.5 in providing additional guidance on selection of LCIA methods for a PCR.

Methods should be scientifically and technically valid

Only LCIA indicators that are scientifically and technically valid should be included in the PCR, with a clear reference to the scientific publication describing the impact assessment method[i]. According to ISO 14044[ii], category indicators are scientifically and technically valid if they use "a distinct identifiable environmental mechanism and/or reproducible empirical observation."

Methods should be environmentally relevant

According to ISO 14044, the environmental relevance of a category indicator is determined by the degree of linkage to its respective endpoint, characterized for a particular indicator as high, moderate, or low linkage.

According to ISO 14044[iii], the category indicator can be chosen anywhere along the environmental mechanism between the LCI results and the category endpoint. The closer the selected indicator is linked to the endpoint, the higher the environmental relevance, and the better the result will represent impacts that would occur. The environmental relevance should be weighed against the uncertainty in the inventory and in the LCIA methods to determine the appropriate impact categories for the PCR.

Methods should be complete

The method should be comprehensive in classification and characterization of elementary flows.

Methods should be transparent and well-documented

- The model documentation is published and accessible (includes a description of the mechanism, the model, temporal and spatial scale, etc.)
- The characterization factors and underlying models are published and accessible
- Third parties are able to freely generate additional, consistent factors and to further develop models. For example, it is possible to incorporate further geographical/emission situation, temporal and speciation differentiation
- Value choices are explicitly stated

Methods should be commonly accepted

- There is an authoritative body behind the general model principles like the IPCC model
- The principles of the model are easily understood by non-LCIA experts and preferably by the general public
- The covered elementary flows and impact models do not inappropriately favor or disfavor specific industries, processes, or products

[i] There is one environmental mechanism for each impact category.

[ii] ISO 14044 clause 4.4.5.

[iii] ISO 14044 clause 4.4.2.2.2.

Methods should be convenient to use

- The indicator is easily understood and interpretable
- The impact characterization factors are available in major software programs
- The data is available to appropriately use the impact model

Methods should be independent from economic interests

Methods should account for variability in the receiving environment

As a result of variations in geography, topography, population density, and other factors, resource use and emissions in different regions would lead to different effects. Additionally, factors such as the timing and duration of an emission can substantially change the effect of an emission.

There are two types of variability in an environmental mechanism that may occur and should be accounted for in the method selected for use in the PCR:

- Spatial. The method should account for regional variability in the effects of an emission or consumed resource. It must account for the geographic areas affected by the identified environmental mechanism.
- Temporal. The impact assessment method must account for temporal characteristics such as duration, residence time, persistence, timing, etc.

Depending on the environmental mechanism, spatial and temporal differentiation of the characterization model relating the LCI results to the category indicator should be considered. Due to the current limitations in the ability of LCIA methods to account for regional differences, more than one method for impact calculation for a category (e.g., eutrophication) may be recommended for that impact category.

Use of Additional Guidance Documents

If other, more sector-, region-, or otherwise specific guidance documents on the selection of impact category indicators exist, the PCR developer should take these into account to the extent they comply with the goal and scope of the PCR to be developed.

Product Category Rule
Guidance Development Initiative

www.pcrguidance.org

ISBN: 978-0-9897737-0-6