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0 Introduction	0 介绍
0.1 General information Climate change continues to be one of the greatest challenges facing nations, governments, business and citizens and will influence the way we live and work in future decades (IPCC 2007 [1]). Past and current actions, including the release of carbon dioxide (CO_2) and other greenhouse gases through human activities such as the burning of fossil fuels, emissions from chemical processes and other sources of anthropogenic greenhouse gases, will have an effect on future global climate.	**0.1 一般信息** 气候变化仍然是国家、政府、企业和公民面临的最大挑战之一，并将影响我们未来几十年的生活和工作方式（IPCC 2007 [1]）。 过去和现在的行动，包括通过人类活动（例如燃烧化石燃料、化学过程的排放和其他人为温室气体来源）释放二氧化碳（CO_2）和其他温室气体，将对未来的全球气候产生影响。
While greenhouse gas (GHG) emissions are often viewed at global, national, corporate or organizational levels, emissions within these groupings can arise from supply chains within business, between businesses and between nations. The GHG emissions associated with goods and services reflect the impact of processes, materials and decisions occurring throughout the life cycle of those goods and services.	虽然温室气体（GHG）排放量通常在全球、国家、公司或组织层面上被看待，但这些集团内的排放可能来自企业内部、企业之间和国家之间的供应链。 与商品和服务相关的温室气体排放反映了在这些商品和服务的整个生命周期中发生的过程、材料和决策的影响。
PAS 2050 was developed in response to broad community and industry desire for a consistent method for assessing the life cycle GHG emissions of goods and services. Life cycle GHG emissions are the emissions that are released as part of the processes of creating, modifying, transporting, storing, using, providing, recycling or disposing of such goods and services. PAS 2050 offers organizations a method to deliver improved understanding of the GHG emissions arising from their supply chains, but the primary objective of this PAS is to provide a common basis for GHG emission quantification that will inform and enable meaningful GHG emission reduction programmes.	PAS 2050 的制定是为了响应广泛的社区和行业对评估商品和服务生命周期温室气体排放量的一致方法的渴望。 生命周期温室气体排放是作为此类商品和服务的创建、修改、运输、储存、使用、提供、回收或处置过程的一部分而释放的排放。 PAS 2050 为组织提供了一种方法来更好地了解其供应链产生的温室气体排放，但该 PAS 的主要目标是为温室气体排放量化提供一个共同基础，从而为有意义的温室气体减排计划提供信息和支持。
During the first two years of its use, this PAS has been shown to be generically applicable to a wide range of goods and services and therefore does not itself make provision for the special treatment of particular product sectors. However, it is recognized that the availability of supplementary requirements could aid consistent application of the PAS to products within specific product sectors by providing: a) a sector or product group focus for aspects of the PAS 2050 assessment where options are permitted; b) rules or calculation requirements that are directly relevant to the main sources of emissions for a specific sector or product group; c) clarity on how to apply specific elements of the PAS 2050 assessment within a specific sector or product group. To facilitate this, this new edition of PAS 2050 includes a set of principles (see **4.3**) governing the development of supplementary requirements for the application of PAS 2050 to particular product types. These principles are intended to ensure that such supplementary requirements are not in conflict with the requirements of this PAS. Although there is no requirement for, or standardization of, communication techniques in this specification, this PAS supports the assessment of life cycle GHG emissions of goods and services in a manner that can be later disclosed. For this reason, great emphasis is given to proper recording of processes and outcomes. Where an organization implementing this PAS chooses to disclose all or part of the results of an assessment of GHG emissions, all relevant supporting information should also be made available.	在其使用的头两年中，该 PAS 已被证明普遍适用于广泛的商品和服务，因此本身并未对特定产品部门的特殊待遇做出规定。然而，人们认识到补充要求的可用性可以通过提供以下内容来帮助 PAS 对特定产品部门内的产品的一致应用： a) 允许选项的 PAS 2050 评估方面的部门或产品组重点； b) 与特定部门或产品组的主要排放源直接相关的规则或计算要求； c) 明确如何在特定部门或产品组中应用 PAS 2050 评估的特定要素。 为促进这一点，新版 PAS 2050 包括一套原则（见 4.3），用于管理将 PAS 2050 应用于特定产品类型的补充要求的制定。这些原则旨在确保此类补充要求不与本 PAS 的要求相冲突。 虽然本规范中没有对通信技术的要求或标准化，但本 PAS 支持以稍后公开的方式评估商品和服务的生命周期 GHG 排放。因此，非常重视正确记录过程和结果。如果实施本 PAS 的组织选择披露全部或部分温室气体排放评估结果，则还应提供所有相关支持信息。

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Where communication is directed to the consumer, the user should refer to additional specifications or further guidance on environmental claims (e.g. ISO 14021 1 or UK Department of Environment Food and Rural Affairs Green Claims Guidance [7] 2). Using PAS 2050 to quantify the life cycle GHG emissions from goods and services aids informed decision-making when considering reducing emissions for products and services. This PAS is focused on a single environmental issue (i.e. GHG emissions and their contribution to climate change), but this is only one of a range of possible environmental impacts from specific goods or services. The relative importance of those impacts can vary significantly from product to product, and it is important to be aware that decisions taken on the basis of a “single issue” assessment could be detrimental to other environmental impacts potentially arising from the provision and use of the same product.	在针对消费者的情况下，用户应参考有关环境声明的附加规范或进一步指南（例如 ISO 14021 1 或英国环境部食品和农村事务部绿色声明指南 [7] 2）。 在考虑减少产品和服务的排放时，使用 PAS 2050 量化商品和服务的生命周期温室气体排放量有助于做出明智的决策。 本 PAS 专注于单一环境问题（即温室气体排放及其对气候变化的贡献），但这只是特定商品或服务可能对环境造成的一系列影响之一。这些影响的相对重要性可能因产品而异，重要的是要意识到基于“单一问题”评估做出的决定可能对提供和使用这些产品可能产生的其他环境影响有害。相同的产品。
0.2 Background, benefits and context of PAS 2050 PAS 2050 builds on existing life cycle assessment methods established through BS EN ISO 14040 and BS EN ISO 14044 by giving requirements specifically for the assessment of GHG emissions within the life cycle of goods and services. These requirements further clarify the implementation of these standards in relation to the assessment of GHG emissions of goods and services, and establish particular principles and techniques, including: a) cradle-to-gate and cradle-to-grave GHG emissions assessment data as part of the life cycle GHG emissions assessment of goods and services; b) scope of greenhouse gases to be included (see **5.1**); c) criteria for global warming potential (GWP) data (see **5.3**); d) treatment of emissions and removals from land use change and biogenic and fossil carbon sources; e) treatment of the impact of carbon storage in products and offsetting; f) requirements for the treatment of GHG emissions arising from specific processes; g) data requirements and accounting for emissions from renewable energy generation.	**0.2 PAS 2050 的背景、好处和内容** PAS 2050 建立在通过 BS EN ISO 14040 和 BS EN ISO 14044 建立的现有生命周期评估方法的基础上，提出了专门用于评估商品和服务生命周期内的温室气体排放的要求。这些要求进一步阐明了这些标准在商品和服务温室气体排放评估方面的实施，并建立了特定的原则和技术，包括： a) 作为商品和服务生命周期温室气体排放评估一部分的从摇篮到大门和从摇篮到坟墓的温室气体排放评估数据； b) 要包括的温室气体范围（见 5.1）； c) 全球变暖潜能值（GWP）数据的标准（见 5.3）； d) 处理土地利用变化以及生物和化石碳源的排放和清除； e) 产品碳储存和抵消影响的处理； f) 处理特定过程产生的温室气体排放的要求； g) 可再生能源发电的数据要求和排放核算。
This PAS benefits organizations, businesses and other stakeholders by providing a clear and consistent method for the assessment of the life cycle GHG emissions associated with goods and services. Specifically, this PAS provides the following benefits: a) for organizations that supply goods and services, this PAS: • allows internal assessment of the existing life cycle GHG emissions of goods and services; • facilitates the evaluation of alternative product configurations, sourcing and manufacturing methods, raw material choices and supplier selection on the basis of the life cycle GHG emissions associated with goods and is to be used as a basis for comparison of services; • provides a benchmark for programmes aimed at reducing GHG emissions; • allows for the quantification, management and potential comparison of GHG emissions from goods or services using a common, recognized and standardized approach to life cycle GHG emissions assessment; and • supports reporting (e.g. on corporate responsibility). b) for consumers of goods and services, this PAS provides a common basis for understanding the assessment of life cycle GHG emissions when making purchasing decisions and using goods and services.	本 PAS 为评估与商品和服务相关的生命周期 GHG 排放提供了一种清晰且一致的方法，从而使组织、企业和其他利益相关者受益。具体而言，该 PAS 提供以下好处： a) 对于提供商品和服务的组织，本 PAS： • 允许对商品和服务的现有生命周期温室气体排放进行内部评估； • 根据与商品相关的生命周期温室气体排放，促进对替代产品配置、采购和制造方法、原材料选择和供应商选择的评估，并用作比较服务的基础； • 为旨在减少温室气体排放的计划提供基准； • 允许使用通用、公认和标准化的生命周期温室气体排放评估方法对商品或服务的温室气体排放进行量化、管理和潜在比较；和 • 支持报告（例如关于企业责任）。 b) 对于商品和服务的消费者，本 PAS 提供了在做出购买决策和使用商品和服务时理解生命周期 GHG 排放评估的共同基础。

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1 Scope	1 范围
This Publicly Available Specification (PAS) specifies requirements for the assessment of the life cycle GHG emissions of goods and services (collectively referred to as “products”) based on key life cycle assessment techniques and principles. This PAS is applicable to organizations assessing the GHG emissions of products across their life cycle, and to organizations assessing the cradle-to-gate GHG emissions of products.	本公开可用规范 (PAS) 规定了基于关键生命周期评估技术和原则对商品和服务(统称为“产品”)的生命周期 GHG 排放进行评估的要求。本规范适用于评估产品全生命周期温室气体排放的组织 ,以及评估产品从摇篮到门的温室气体排放的组织。
Requirements are specified for identifying the system boundary, the sources of GHG emissions associated with products that fall inside the system boundary, the data requirements for carrying out the analysis, and the calculation of the results.	规定了识别系统边界、与系统边界内产品相关的温室气体排放源、执行分析的数据要求以及结果计算的要求。
This PAS addresses the single impact category of global warming. It does not assess other potential social, economic and environmental impacts or issues arising from the provision of products or issues associated with the life cycle of products, such as non-GHG emissions, acidification, eutrophication, toxicity, biodiversity or labour standards. The life cycle GHG emissions of products, as calculated using this PAS, do not provide an indicator of the overall environmental impact of these products, such as may result from other types of life cycle assessment.	本 PAS 涉及全球变暖的单一影响类别。 它不评估其他潜在的社会、经济和环境影响或因提供产品或与产品生命周期相关的问题而产生的问题，例如非温室气体排放、酸化、富营养化、毒性、生物多样性或劳工标准。 使用本 PAS 计算的产品生命周期 GHG 排放不提供这些产品的整体环境影响的指标，例如可能来自其他类型的生命周期评估。
PAS 2050 is generically applicable to a wide range of goods and services. However, this revision includes principles for the preparation and use of supplementary requirements to provide a focused approach for specific industry sectors or product categories in a manner that will facilitate consistent application of PAS 2050 within the particular sector or product category.	PAS 2050 一般适用于范围广泛的商品和服务。 但是，此修订版包括补充要求的准备和使用原则，以便为特定行业部门或产品类别提供重点方法，以促进 PAS 2050 在特定部门或产品类别中的一致应用。
This PAS does not specify requirements for the disclosure or communication of the results of a quantification of the life cycle GHG emissions of goods and services.	本规范未规定对商品和服务生命周期温室气体排放量化结果的披露或交流要求。
2 Normative references	2 规范性引用
The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.	下列参考文件对于本文件的应用是必不可少的。 对于注明日期的参考文献，仅适用所引用的版本。 对于未注明日期的参考文献，适用参考文件的最新版本（包括任何修订）。
BS EN ISO 14021, *Environmental labels and declarations – Self-declared environmental claims (Type II environmental labelling)*	BS EN ISO 14021，环境标签和声明 - 自我声明的环境声明（II 类环境标签）
BS EN ISO 14044:2006, *Environmental management – Life cycle assessment – Requirements and guidelines*	BS EN ISO 14044:2006，环境管理 – 生命周期评估 – 要求和指南
IPCC 2006, *Guidelines for National Greenhouse Gas Inventories*. National Greenhouse Gas Inventories Programme, Intergovernmental Panel on Climate Change ***Note*** *Subsequent amendments to IPCC 2006 also apply.*	IPCC 2006，国家温室气体清单指南。 国家温室气体清单计划，政府间气候变化专门委员会 **注** IPCC 2006 的后续修订也适用。
IPCC 2007, *Climate Change 2007: The Physical Science Basis.* Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon S, Qin D, Manning M, Chen Z, Marquis M, Avery KB, Tignor M, Miller HL (editors)]. Cambridge, UK: Cambridge	IPCC 2007，气候变化 2007：物理科学基础。 第一工作组对政府间气候变化专门委员会第四次评估报告的贡献 [Solomon S、Qin D、Manning M、Chen Z、Marquis M、Avery KB、Tignor M、Miller HL（编辑）]。 英国剑桥：剑桥大学出版社，996 页。

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University Press, 996 pp. ***Note*** *Subsequent amendments to IPCC 2007 also apply.*	**注** 对 IPCC 2007 的后续修订也适用。
3 Terms and Definition	3 条目及定义
3.1 allocation partitioning the inputs to or emissions from a shared process or a product system between the product system under study and one or more other product systems	**3.1 分配** 在所研究的产品系统和一个或多个其他产品系统之间划分共享过程或产品系统的输入或排放
3.2 anticipated life cycle greenhouse gas emissions initial estimate of greenhouse gas (**3.19**) emissions for a product (**3.35**) that is calculated using secondary data (**3.41**) or a combination of primary activitity data (**3.34**) and secondary data, for all processes used in the life cycle of the product	**3.2 预期生命周期温室气体排放** 使用二级数据 (3.41) 或初级活动数据 (3.34) 和二级数据的组合计算产品 (3.35) 的温室气体 (3.19) 排放量的初始估计，用于产品生命周期中使用的所有过程
3.3 biogenic derived from biomass, but not from fossilized or fossil sources	**3.3 生物** 来自生物质，但不是来自化石或化石来源
3.5 biomass material of biological origin, excluding material embedded in geological formations or transformed to fossil [Adapted from CEN/TR 14980:2004, 4.3]	**3.5 生物质** 生物来源的材料，不包括嵌入地质构造或转化为化石的材料 [改编自 CEN/TR 14980:2004, 4.3]
3.4 biogenic carbon carbon that is contained in biomass ***Note*** *For the purpose of calculations in accordance with this PAS, CO2 from air converted to non-biomass carbonates is calculated as biogenic carbon.*	**3.4 生物碳** 生物质中所含的碳 **注** 为了根据本 PAS 进行计算，转化为非生物质碳酸盐的空气中的 CO2 被计算为生物碳。
3.6 capital goods goods, such as machinery, equipment and buildings, used in the life cycle of products	**3.6 资本货物** 在产品的生命周期中使用的商品，例如机械、设备和建筑物
3.7 carbon dioxide equivalent (CO2e) unit for comparing the radiative forcing of a greenhouse gas to carbon dioxide [BS ISO 14064-1:2006, 2.19] ***Note 1*** *The term carbon dioxide (CO2) used throughout this PAS should not be confused with carbon dioxide equivalent (CO2e).* ***Note 2*** *The CO2e is calculated by multiplying the mass of a given GHG by its global warming potential (see **3.23** for a definition of global warming potential).* ***Note 3*** *Greenhouse gases, other than CO2, are converted to their CO2e on the basis of their per unit radiative forcing using 100-year global warming potentials defined by the Intergovernmental Panel on Climate Change (IPCC).*	**3.7 二氧化碳当量（CO2e）** 用于比较温室气体与二氧化碳的辐射强迫的单位 [BS ISO 14064-1:2006, 2.19] **注 1** 本 PAS 中使用的术语二氧化碳 (CO2) 不应与二氧化碳当量 (CO2e) 混淆。 **注 2** CO2e 的计算方法是给定 GHG 的质量乘以其全球变暖潜能值（全球变暖潜能值的定义见 3.23）。 **注 3** 除 CO2 外，温室气体根据其每单位辐射强迫使用政府间气候变化专门委员会 (IPCC) 定义的 100 年全球变暖潜能值转换为其 CO2e。
3.8 carbon storage retention of carbon from biogenic or fossil sources or of atmospheric origin in a form other than as an atmospheric gas	**3.8 碳储存** 以非大气气体的形式保留来自生物或化石来源或大气来源的碳
3.9 combined heat and power (CHP)	**3.9 热电联产（CHP）**

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simultaneous generation in one process of usable thermal, electrical and/or mechanical energy	在一个过程中同时产生可用的热能、电能和/或机械能
3.10 consumable ancillary input that is necessary for a process to occur but that does not form a tangible part of the product or co-products arising from the process ***Note 1*** *Consumables differ from capital goods in that they have an expected life of one year or less, or a need to replenish on a one year or less basis (e.g. lubricating oil, tools and other rapidly wearing inputs to a process).* ***Note 2*** *Fuel and energy inputs to the life cycle of a product are not considered to be consumables.*	**3.10 消耗品** 过程发生所必需的辅助投入，但不构成过程产生的产品或联产品的有形部分 **注 1** 消耗品与资本货物的不同之处在于它们的预期寿命为一年或更短，或者需要在一年或更短的时间内进行补充（例如润滑油、工具和其他快速磨损的过程输入）。 **注 2** 产品生命周期中的燃料和能源输入不被视为消耗品。
3.11 consumer user of goods or services	**3.11 消费者** 商品或服务的使用者
3.12 co-product any of two or more products from the same unit process or product system [BS EN ISO 14044:2006, 3.10] ***Note*** *Where two or more products can be produced from a unit process, they are considered co-products only where one cannot be produced without the other being produced.*	**3.12 联产品** 来自同一单元过程或产品系统的两种或多种产品中的任何一种 [BS EN ISO 14044:2006, 3.10] **注** 如果两个或多个产品可以从一个单元过程中生产出来，那么只有当一个产品不能在另一个产品被生产的情况下才能生产时，它们才被视为联产品。
3.13 cradle-to-gate life cycle stages from the extraction or acquisition of raw materials to the point at which the product leaves the organization undertaking the assessment	**3.13 从摇篮到门** 从原材料的提取或获取到产品离开进行评估的组织的生命周期阶段
3.14 cradle-to-grave life cycle stages from the extraction or acquisition of raw materials to recycling and disposal of waste	**3.14 从摇篮到坟墓** 从原材料的提取或获取到废物的回收和处置的生命周期阶段
3.15 data quality characteristics of data that relate to their ability to satisfy stated requirements [BS EN ISO14044:2006, 3.19]	**3.15 数据质量** 与满足规定要求的能力相关的数据特征 [BS EN ISO14044:2006, 3.19]
3.16 downstream emissions GHG emissions associated with processes that occur in the life cycle of a product subsequent to the processes owned or operated by the organization implementing this PAS	**3.16 下游排放** 与实施本 PAS 的组织拥有或运营的过程之后的产品生命周期中发生的过程相关的温室气体排放
3.17 economic value market value of a product, co-product or waste (see **3.49** for a definition of waste) at the point of production	**3.17 经济价值** 产品、副产品或废物（废物的定义见 3.49）在生产点的市场价值
3.18 emission factor amount of greenhouse gases emitted, expressed as CO2e (**3.7**) and relative to a unit of activity ***Note*** *For example, kgCO2e per unit input. Emission factor data would be obtained from secondary data sources.*	**3.18 排放因子** 排放的温室气体量，以 CO2e (3.7) 和相对于一个活动单位表示 **注** 例如，每单位输入的 kgCO2e。 排放因子数据将从二级数据来源获得。
3.19 (GHG) emissions release to air and discharges to water and land that result in GHGs entering the atmosphere	**3.19 (GHG) 排放** 释放到空气中并排放到水和土地中，导致温室气体进入大气

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3.20 food and feed substances in solid or liquid form intended to be consumed by humans or animals	**3.20 食品和饲料** 供人类或动物食用的固体或液体形式的物质
3.21 fossil carbon carbon that is contained in fossilized material ***Note*** *Examples of fossilized material are coal, oil and natural gas. For the purposes of this PAS, peat is also to be treated as fossilized material with regard to its combustion.*	**3.21 化石碳** 包含在化石材料中的碳 **注** 化石材料的例子是煤、石油和天然气。 就本 PAS 而言，泥炭在其燃烧方面也被视为化石材料。
3.22 functional unit quantified performance of a product system for use as a reference unit [BS EN ISO 14044:2006, 3.20] ***Note*** *For the purposes of GHG emissions assessment, the functional unit can be a single item of product or a generally accepted sales quantity (e.g. 1 rose or 1 dozen roses).*	**3.22 功能单元** 用作参考单元的产品系统的量化性能 [BS EN ISO 14044:2006, 3.20] **注** 出于温室气体排放评估的目的，功能单位可以是单个产品项目或普遍接受的销售数量（例如 1 朵玫瑰或 1 打玫瑰）。
3.23 global warming potential (GWP) factor describing the radiative forcing impact of one mass-based unit of a given greenhouse gas relative to an equivalent unit of CO2 over a given period of time [BS ISO 14064-1:2006, 2.18] ***Note*** *CO2 is assigned a GWP of 1, while the GWP of other gases is expressed relative to the GWP of CO2. Annex A contains global warming potentials for a 100-year time period produced by the Intergovernmental Panel on Climate Change (IPCC).*	**3.23 全球变暖潜势（GWP）** 描述给定温室气体的一个质量单位相对于等量单位 CO2 在给定时间内的辐射强迫影响的因子 [BS ISO 14064-1:2006, 2.18] **注** CO2 的 GWP 为 1，而其他气体的 GWP 表示相对于 CO2 的 GWP。 附件 A 包含政府间气候变化专门委员会 (IPCC) 制定的 100 年全球变暖潜能值。
3.24 greenhouse gases (GHGs) gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere and clouds ***Note*** *The GHGs included in this PAS are specified in Annex A.*	**3.24 温室气体 (GHG)** 大气中自然和人为的气态成分，它们吸收和发射地球表面、大气和云发射的红外辐射光谱内特定波长的辐射 **注** 本 PAS 中包含的温室气体在附录 A 中进行了规定。
3.25 input product, material or energy flow that enters a unit process [BS EN ISO 14040:2006, 3.21]	**3.25 输入** 进入单元过程的产品、材料或能量流 [BS EN ISO 14040:2006, 3.21]
3.26 intermediate product output from a unit process that is an input to other unit processes involving further transformation within the system	**3.26 中间产品** 一个单元过程的输出是其他单元过程的输入，涉及系统内的进一步转换
3.27 land use change change in the purpose for which land is used by humans (e.g. between crop land, grass land, forest land, wetland, industrial land) ***Note 1*** *Change in the use of land at the location of production of the product being assessed is referred to as direct land use change.* ***Note 2*** *Change in the use of land elsewhere is referred to as indirect land use change.*	**3.27 土地利用变化** 人类使用土地用途的变化（例如耕地、草地、林地、湿地、工业用地之间） **注 1** 被评估产品生产地点的土地利用变化称为直接土地利用变化。 **注 2** 其他地方土地利用的变化称为间接土地利用变化。
3.28 life cycle consecutive and interlinked stages of a product system, from raw material acquisition or generation of natural resources to end of life, inclusive of any recycling or recovery activity [Adapted from BS EN ISO 14040:2006, 3.1]	**3.28 生命周期** 产品系统的连续和相互关联的阶段，从原材料获取或自然资源的产生到寿命结束，包括任何回收或回收活动 [改编自 BS EN ISO 14040:2006, 3.1]

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3.29 life cycle assessment (LCA) compilation and evaluation of inputs, outputs and potential environmental impacts of a product system throughout its life cycle [BS EN ISO 14040:2006, 3.2]	**3.29 生命周期评估（LCA）** 对产品系统整个生命周期的输入、输出和潜在环境影响的汇编和评估 [BS EN ISO 14040:2006, 3.2]
3.30 life cycle GHG emissions sum of greenhouse gas emissions resulting from all stages of the life cycle of a product and within the specified system boundaries of the product ***Note*** *This includes all emissions and removals associated with the processes within the boundary of the life cycle of the product, including obtaining, creating, modifying, transporting, storing, operating, using and end-of-life disposal of the product. To avoid undue repetition, reference to removals is not always included in the text, but it is intended that assessment should include removals wherever they occur.*	**3.30 生命周期温室气体排放** 产品生命周期所有阶段和产品指定系统边界内产生的温室气体排放总和 **注** 这包括与产品生命周期边界内过程相关的所有排放和清除，包括产品的获取、创建、修改、运输、储存、操作、使用和报废处置。 为避免不必要的重复，正文中并不总是提及移除，但评估应包括发生在任何地方的移除。
3.33 output product, production material or energy that leaves a unit process [Adapted from BS EN ISO 14044:2006, 3.25] ***Note*** *Production materials may include raw materials, intermediate products, co-products, products and emissions.*	**3.33 输出** 离开单元过程的产品、生产材料或能源 [改编自 BS EN ISO 14044:2006, 3.25] **注** 生产材料可能包括原材料、中间产品、联产品、产品和排放物。
3.34 primary activity data quantitative measurement of activity from a product's life cycle that, when multiplied by the appropriate emission factor, determines the GHG emissions arising from a process ***Note 1*** *Examples of primary activity data include the amount of energy used, material produced, service provided or area of land affected.* ***Note 2*** *Primary activity data sources are typically preferable to secondary data sources as the data will reflect the specific nature/efficiency of the process and the GHG emissions associated with the process.* ***Note 3*** *Primary activity data do not include emission factors.*	**3.34 主要活动数据** 对产品生命周期活动的定量测量，当乘以适当的排放因子时，确定过程产生的温室气体排放 **注 1** 主要活动数据的示例包括使用的能源量、生产的材料、提供的服务或受影响的土地面积。 **注 2** 主要活动数据源通常优于次要数据源，因为数据将反映过程的特定性质/效率以及与过程相关的温室气体排放。 **注 3** 主要活动数据不包括排放因子。
3.35 product good or service ***Note*** *Services have tangible and intangible elements. The provision of a service can involve, for example, the following:* *a) an activity performed on a consumer-supplied tangible product (e.g. automobile to be repaired);* *b) an activity performed on a consumer-supplied intangible product (e.g. the income statement needed to prepare a tax return);* *c) the delivery of an intangible product (e.g. the delivery of information in the context of knowledge transmission);* *d) the creation of ambience for the consumer (e.g. in hotels and restaurants);* *e) software, which consists of information and is generally intangible and can be in the form of approaches, transactions or procedures.* [Adapted from BS ISO 14040:2006, 3.9]	**3.35 产品** 好或服务 **注** 服务有有形和无形的元素。 例如，提供服务可能涉及以下内容： a) 对消费者提供的有形产品（例如要修理的汽车）进行的活动； b) 对消费者提供的无形产品进行的活动（例如准备纳税申报表所需的损益表）； c) 无形产品的交付（例如在知识传播背景下的信息交付）； d) 为消费者营造氛围（例如在酒店和餐厅）； e) 软件，由信息组成，通常是无形的，可以是方法、交易或程序的形式。 [改编自 BS ISO 14040:2006, 3.9]
3.36 product category group of products that can fulfil equivalent functions [BS ISO 14025:2006, 3.12]	**3.36 产品类别** 可以实现等效功能的一组产品 [BS ISO 14025:2006, 3.12]

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3.37 product system collection of unit processes with elementary and product flows, performing one or more defined functions, that models the life cycle of a product [BS EN ISO 14040:2006, 3.28]	**3.37 产品体系** 具有基本和产品流的单元过程的集合，执行一个或多个定义的功能，对产品的生命周期进行建模 [BS EN ISO 14040:2006, 3.28]
3.38 production material primary or secondary material that is used to produce a product ***Note*** *Secondary material includes recycled material.* [BS EN ISO 14040:2006, 3.15]	**3.38 生产材料** 用于生产产品的主要或次要材料 **注** 次要材料包括回收材料。 [BS EN ISO 14040:2006, 3.15]
3.39 (GHG) removals absorption and isolation of greenhouse gases from the atmosphere ***Note*** *Removals typically occur when CO2 is absorbed by biogenic materials during photosynthesis. Removals may also occur when a product absorbs CO2 during use*	**3.39 (GHG) 清除** 从大气中吸收和隔离温室气体 **注** 当 CO2 在光合作用过程中被生物材料吸收时 ,通常会发生去除。当产品在使用过程中吸收 CO2 时，也可能发生去除
3.40 renewable energy energy from non-fossil energy sources: wind, solar, geothermal, wave, tidal, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases [Adapted from Directive 2001/77/EC, Article 2 [4]]	**3.40 可再生能源** 来自非化石能源的能源：风能、太阳能、地热能、波浪能、潮汐能、水能、生物质能、垃圾填埋气、污水处理厂气体和沼气 [改编自指令 2001/77/EC，第 2 [4] 条]
3.41 secondary data data obtained from sources other than direct measurement of the emissions from processes included in the life cycle of the product ***Note*** *Secondary data are used when primary activity data are not available or it is impractical to obtain primary activity data.*	**3.41 二手资料** 从其他来源获得的数据，而不是直接测量产品生命周期中包含的过程的排放量 **注** 当主要活动数据不可用或获取主要活动数据不切实际时，将使用次要数据。
3.42 supplementary requirement life cycle greenhouse gas emissions quantification requirements applicable to a particular product type or product sector, to enhance the application of PAS 2050	**3.42 补充要求** 适用于特定产品类型或产品部门的生命周期温室气体排放量化要求，以加强 PAS 2050 的应用
3.43 system boundary set of criteria specifying which unit processes are part of a product system [BS EN ISO 14040:2006, 3.32]	**3.43 系统边界** 一组标准，指定哪些单元过程是产品系统的一部分 [BS EN ISO 14040:2006, 3.32]
3.44 unit process smallest portion of a life cycle for which data are analysed when performing a life cycle assessment	**3.44 单元过程** 在执行生命周期评估时分析数据的生命周期的最小部分
3.45 upstream emissions GHG emissions associated with processes that occur in the life cycle of a product prior to the processes owned, operated or controlled by the organization implementing this PAS	**3.45 上游排放** 在实施本 PAS 的组织拥有、运营或控制的过程之前，与产品生命周期中发生的过程相关的温室气体排放
3.46 use phase that part of the life cycle of a product that occurs between the transfer of the product to the consumer and the point of transfer to recycling and waste disposal ***Note*** *For services, the use phase includes the provision of the service.*	**3.46 使用阶段** 产品生命周期的一部分，发生在产品转移给消费者和转移到回收和废物处理之间 **注** 对于服务，使用阶段包括提供服务。

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3.47 use profile criteria against which the GHG emissions arising from the use phase are determined	**3.47 使用配置文件** 确定使用阶段产生的温室气体排放的标准
3.48 useful energy energy that meets a demand by displacing another source of energy ***Note*** *For example, where heat production from a CHP unit is utilized to meet a demand for heat that was previously met by another form of energy, or meets a new demand for heat that would have required additional energy input, then the heat from the CHP is providing useful energy. Had the heat from the CHP not met a demand, but instead been dissipated (e.g. vented to the atmosphere), the heat would not be considered useful energy (in which case no emissions from the CHP would be assigned to the heat production).*	**3.48 有用能量** 通过替代另一种能源来满足需求的能源 **注** 例如，如果热电联产装置产生的热量用于满足之前由另一种形式的能源满足的热量需求，或者满足需要额外能量输入的新热量需求，则来自 CHP 的热量 正在提供有用的能量。 如果来自 CHP 的热量没有满足需求，而是被消散（例如排放到大气中），则热量不会被视为有用能源（在这种情况下，CHP 的排放不会分配给热量生产 ）。
3.49 waste materials, co-products, products or emissions that the holder discards or intends, or is required to, discard	**3.49 浪费** 持有人丢弃或打算或被要求丢弃的材料、副产品、产品或排放物
4 Principles and implementation	4 原理与实现
4.1 General requirements Assessment of the GHG emissions of products shall be carried out using LCA techniques (see Note). Unless otherwise indicated, the assessment of the life cycle GHG emissions of products shall be made using the attributional approach, i.e. by describing the inputs and their associated emissions attributed to the delivery of a specified amount of the product functional unit. ***Note*** *LCA techniques are specified in BS EN ISO 14040 and BS EN ISO 14044. Where the approach described in these standards is incompatible with the requirements of this PAS, the requirements of this PAS take precedence.*	**4.1 一般要求** 产品的温室气体排放评估应使用 LCA 技术（见注 ）。 除非另有说明，产品生命周期 GHG 排放的评估应使用归因方法进行，即通过描述归因于交付特定数量的产品功能单元的输入及其相关排放。 **注** LCA 技术在 BS EN ISO 14040 和 BS EN ISO 14044 中指定。如果这些标准中描述的方法与本 PAS 的要求不兼容，则本 PAS 的要求优先。
4.2 Principles Organizations claiming that an assessment conforms to this PAS shall ensure that the assessment of the life cycle GHG emissions of a product is complete and applies only to the product for which the assessment is conducted. They shall be able to demonstrate that the following principles have been adhered to when carrying out the assessment: a) **Relevance:** GHG emissions and removals data and methods appropriate to the assessment of the GHG emissions arising from specific products have been selected. b) **Completeness**: all product life cycle GHG emissions and removals arising within the system and temporal boundaries for a specified product which provide a material contribution to the assessment of GHG emissions arising from that product have been included. c) **Consistency**: assumptions, methods and data have been applied in the same way throughout the quantification and support reproducible, comparable outcomes. d) **Accuracy**: bias and uncertainty have been reduced as far as practical. e) **Transparency**: where the results of life cycle GHG emissions assessment carried out in accordance with this PAS are to be disclosed to a third party, GHG emissions-related information is made available that is sufficient to support disclosure and allow such a third party to make associated decisions with confidence. ***Note*** *The above principles are adapted from BS ISO 14064-1:2006, Clause 3.*	**4.2 原则** 声称评估符合本 PAS 的组织应确保对产品生命周期 GHG 排放的评估是完整的，并且仅适用于进行评估的产品。他们应能够证明在进行评估时遵守了以下原则： a) 相关性：选择了适合评估特定产品产生的温室气体排放的温室气体排放和清除数据和方法。 b) 完整性：所有产品生命周期温室气体排放和清除在特定产品的系统和时间边界内产生，这些产品对评估该产品产生的温室气体排放有重大贡献。 c) 一致性：假设、方法和数据在整个量化过程中以相同的方式应用，并支持可重复的、可比较的结果。 d) 准确性：已尽可能减少偏差和不确定性。 e) 透明度：如果根据本 PAS 进行的生命周期温室气体排放评估结果要向第三方披露，则提供足以支持披露的温室气体排放相关信息，并允许第三方自信地做出相关决策。 **注** 上述原则改编自 BS ISO 14064-1:2006 第 3 条。
4.3 Supplementary requirements	**4.3 补充要求**

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Provision for the development and use of supplementary requirements has been included in this revision of PAS 2050 because it is recognized that their use could enhance the application of PAS 2050 for some product sectors or categories. Where supplementary requirements are available and are in accordance with the principles a) through i) of this clause, those requirements should be used to support the application of PAS 2050 to the product sectors or categories for which they were developed. Supplementary requirements used in support of PAS 2050 should be: a) **supplementary:** requirements and related guidance for which specific provision is made in this PAS and that are supplementary to and not in conflict with it; b) **broadly recognized:** internationally, nationally, industry or sector wide; c) **inclusive and consensus-based:** developed through a transparent process that is open to stakeholders; d) **scoped appropriately:** having scope and requirements that are directly applicable to the specific stakeholder base; e) **harmonized:** developed after having regard to relevant existing product sector or category rules, guidance or requirements by adopting, referencing or building on these. Where there is a valid reason for them not being adopted, the reason shall be clearly justified and referenced within the supplementary requirements. f) **comprehensive:** address all stages of the relevant product life cycle either by the inclusion of specific requirements where permitted by PAS 2050 or by deference to it; g) **justified:** by the inclusion of rationales identifying and explaining the supplements to the assessment method provided in PAS 2050 and confirming how the principles set out in a) through h) of this clause have been met; h) **publicly available:** free from use restrictions and in the public domain; i) **maintained:** ensuring validity over time. ***Note 1*** *It is expected that in developing supplementary requirements for a given product or product sector a wide cross-section of stakeholders will have been given the opportunity to contribute to their development.* ***Note 2*** *Development of supplementary requirements should not be undertaken without consideration having fi rst been given to adopting or modifying existing rules (such as PCRs under ISO 14025). There may be a valid reason for not adopting existing rules in their entirety (e.g. where rules are in conflict with the PAS 2050). Such reasons should be clearly justified and documented within the rationales supporting the supplementary requirements.* ***Note 3*** *Supplementary requirements could include product category rules (PCRs) (see ISO 14025), product rules, product footprint rules or sector-specific standards where these can be demonstrated to meet the above principle.* ***Note 4*** *It is envisaged that, in line with PAS 2050, supplementary requirements would be made available free of charge.* ***Note 5*** *Independent verification that supplementary requirements have been developed in accordance with the principles established in a) through i) of this clause is recommended and will increase their credibility significantly. The creation of a common registration facility for verified supplementary requirements would greatly facilitate their use. The BSI PAS 2050 web-pages3 will provide information in this area (verification and registration) as it becomes available.*	本次 PAS 2050 修订版中包含了制定和使用补充要求的规定，因为人们认识到，补充要求的使用可以增强 PAS 2050 对某些产品部门或类别的应用。如果补充要求可用且符合本条款 a) 至 i) 的原则，则应使用这些要求来支持 PAS 2050 应用于制定这些要求的产品部门或类别。用于支持 PAS 2050 的补充要求应该是： a) 补充性：本规范中有具体规定的要求和相关指南，是对本规范的补充而不是与之冲突； b) 广泛认可：国际、国家、行业或部门范围内； c) 包容性和基于共识：通过对利益相关者开放的透明流程制定； d) 范围适当：具有直接适用于特定利益相关者群体的范围和要求； e) 协调的：在考虑相关的现有产品部门或类别规则、指南或要求后，通过采用、参考或建立在这些规则、指南或要求的基础上而制定的。有正当理由不予采纳的，应当说明理由，并在补充要求中予以引用。 f) 综合性：通过在 PAS 2050 允许的情况下或通过遵守 PAS 2050 的特定要求，解决相关产品生命周期的所有阶段； g) 证明：通过包含识别和解释 PAS 2050 中提供的评估方法的补充的基本原理，并确认如何满足本条款 a) 至 h) 中规定的原则； h) 公开可用：不受使用限制且在公共领域； i) 保持：确保长期有效。 **注 1** :预计在为特定产品或产品部门制定补充要求时，广泛的利益相关者将有机会为他们的发展做出贡献。 **注 2** 如果没有首先考虑采用或修改现有规则（例如 ISO 14025 下的 PCRs），则不应制定补充要求。不完全采用现有规则可能有正当理由（例如，当规则与 PAS 2050 冲突时）。此类原因应在支持补充要求的理由中明确说明并记录在案。 **注 3** 补充要求可包括产品类别规则 (PCR)（参见 ISO 14025）、产品规则、产品足迹规则或特定行业标准，只要这些可以证明满足上述原则。 **注 4** 根据 PAS 2050，预计将免费提供补充要求。 **注 5** 建议根据本条款 a) 至 i) 中确立的原则制定补充要求的独立验证，这将显着提高其可信度。为经核实的补充要求创建一个共同的注册设施将极大地促进它们的使用。 BSI PAS 2050 网页 3 将在可用时提供该领域（验证和注册）的信息。
4.4 Record-keeping Data supporting an assessment undertaken using this PAS, including but not limited to those identified in Annex B and other data required in this PAS, shall be documented and maintained in a format suitable	**4.4 记录保存** 支持使用本 PAS 进行的评估的数据，包括但不限于附件 B 中确定的数据和本 PAS 中要求的其他数据，应以适合分析和验证的格式记录和维护。 记录应至少保存三年。

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for analysis and verification. Records shall be kept for a minimum of three years.	
4.5 Implementation The quantification of life cycle GHG emissions and removals for products shall be identified as either: a) a cradle-to-grave quantification, which includes the emissions and removals arising from the full life cycle of the product; or b) cradle-to-gate quantification, which includes the GHG emissions and removals arising up to the point at which the product leaves the organization undertaking the assessment for transfer to another party.	**4.5 实施** 产品生命周期温室气体排放和清除的量化应确定为： a) 从摇篮到坟墓的量化，包括产品整个生命周期产生的排放和清除； 要么 b) 从摇篮到大门的量化，包括在产品离开组织进行评估以转移给另一方之前所产生的温室气体排放和清除。
5 Emissions and removals	5 排放和清除
5.1 Scope of GHG emissions and removals **5.1.1 GHG emissions and removals to be included** Both emissions to the atmosphere and removals from the atmosphere shall be accounted for in the assessment of the overall GHG emissions of the product being assessed. This assessment shall include the gases listed in Annex A arising from both fossil and biogenic sources for all products, with the exception of human food and animal feed products. For food and feed, emissions and removals arising from biogenic sources that become part of the product may be excluded. This exclusion shall not apply to: a) emissions and removals of biogenic carbon used in the production of food and feed (e.g. in burning biomass for fuel) where that biogenic carbon does not become part of the product; b) non-CO2 emissions arising from degradation of waste food and feed and enteric fermentation (**5.1.1.1**); c) any biogenic component in material that is part of the final product but is not intended to be ingested (e.g. packaging). ***Note 1*** *This permitted exception avoids the need to calculate the CO2 emissions and removals caused by the consumption and digestion of food and feed and from human and animal waste.* ***Note 2*** *It is unlikely that food and feed will persist for more than the 100 years assessment period; however, where it does, the carbon storage implications need to be addressed (**5.2** and **5.5**).* ***Note 3*** *Where food and feed is excluded the assessment of products that could have both food and nonfood use (e.g. vegetable oil) are likely to give rise to different outcomes. The GHG emissions for a given product can therefore differ according to the intended or actual use of the product.* ***Note 4*** *Carbon incorporated in plants or trees with a life of 20 years or more (e.g. fruit trees) that are not products themselves but are part of a product system should be treated in the same way as soil carbon (**5.7**), unless the plants and trees are resulting from a direct land use change occurring within the previous 20 years (**5.6**).*	**5.1 温室气体排放和清除范围** **5.1.1 要包括的温室气体排放量和清除量** 在评估被评估产品的总体温室气体排放时，应考虑向大气排放和从大气中清除。该评估应包括附录 A 中列出的所有产品的化石和生物来源产生的气体，但人类食品和动物饲料产品除外。 对于食品和饲料，可排除成为产品一部分的生物源产生的排放和清除。本除外条款不适用于： a) 用于食品和饲料生产（例如燃烧生物质作为燃料）的生物碳的排放和清除，其中生物碳不成为产品的一部分； b) 废弃食品和饲料降解以及肠道发酵引起的非二氧化碳排放（5.1.1.1）； c) 作为最终产品一部分但不打算被摄入的材料中的任何生物成分（例如包装）。 **注 1** 这一允许的例外避免了计算由食物和饲料的消耗和消化以及人类和动物废物引起的 CO2 排放和清除的需要。 **注 2** 食品和饲料不太可能持续超过 100 年的评估期；然而，在这种情况下，需要解决碳储存的影响（5.2 和 5.5）。 **注 3** 在排除食品和饲料的情况下，对可能同时用于食品和非食品用途的产品（例如植物油）的评估可能会产生不同的结果。因此，特定产品的温室气体排放量可能因产品的预期或实际用途而异。 **注 4** 寿命为 20 年或以上的植物或树木（例如果树）中的碳，这些植物或树木本身不是产品而是产品系统的一部分，应以与土壤碳相同的方式处理（5.7），除非植物树木是由过去 20 年内发生的直接土地利用变化产生的 (5.6)。
5.1.1.1 Inclusion of non-CO2 emissions arising from food and feed 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	**5.1.1.1 包括食品和饲料产生的非 CO2 排放** 食品和饲料产生的非二氧化碳排放量应包括在产品生命周期温室气体排放量的计算中。 如果排除了来自生物源的排放和清除，则来自生物碳源的非 CO2 排放的 GWP 因子（例如从大气中清除并随后作为 CH4 排放的 CO2）应进行修正，以考虑到 产生了生物碳源。

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the removal of the CO2 that gave rise to the biogenic carbon source.	
5.1.1.2 Inclusion of CH4 emissions used for energy Where CH4 emissions are captured and used to produce energy with emission of CO2, the treatment of such emissions shall be in accordance with **8.2.2**.	**5.1.1.2 包括用于能源的 CH4 排放** 当 CH4 排放被捕获并用于生产排放 CO2 的能源时，此类排放的处理应按照 8.2.2 进行。
5.1.2 Product life cycle processes to be included The assessment of GHG emissions and removals during the life cycle of products shall include emissions and removals as identified in **5.1.1** from processes including but not limited to: a) energy use (including energy sources, such as electricity, that were themselves created using processes that have GHG emissions associated with them); b) combustion processes; c) chemical reactions; d) loss to atmosphere of refrigerants and other fugitive GHGs; e) process operations; f) service provision and delivery; g) land use and land use change; h) livestock production and other agricultural processes; i) waste management. ***Note*** *See **6.2** for the assessment of the emissions arising from part of the life cycle of the product for cradle-to-gate assessment purposes, and Clause **7** for data sources.*	**5.1.2 要包括的产品生命周期过程** 对产品生命周期中 GHG 排放和清除的评估应包括 5.1.1 中确定的过程中的排放和清除，包括但不限于： a) 能源使用（包括能源，例如电力，它们本身是使用与温室气体排放相关的过程产生的）； b) 燃烧过程； c) 化学反应； d) 制冷剂和其他逸散性温室气体排放到大气中； e) 过程操作； f) 服务提供和交付； g) 土地利用和土地利用变化； h) 畜牧生产和其他农业过程； i) 废物管理。 **注** 见 6.2 对产品生命周期的一部分产生的排放进行评估，用于从摇篮到门的评估，数据来源见第 7 条。
5.2 Time period for inclusion of GHG emissions and removals The assessment of the GHG emissions and removals arising from the life cycle of products shall include the GHG emissions and removals identified in **5.1** occurring during the 100-year period following the formation of the product (i.e. the 100-year assessment period). Where supplementary requirements relating to the assessment period have been developed for the product being assessed in accordance with the principles set out in **4.3**, they should be used. ***Note*** *Where significant emissions are expected to occur beyond 100 years for specific product groups or sectors, supplementary requirements should provide for the inclusion of these emissions.*	**5.2 包含温室气体排放和清除的时间段** 产品生命周期产生的温室气体排放和清除量的评估应包括产品形成后 100 年（即 100 年评估期）发生的 5.1 中确定的温室气体排放和清除量。 如果根据 4.3 中规定的原则为被评估产品制定了与评估期相关的补充要求，则应使用它们。 **注**：如果特定产品组或部门预计在 100 年之后会发生大量排放，则补充要求应规定将这些排放包括在内。
5.3 Global warming potential (GWP) GHG emissions and removals shall be measured by mass and shall be converted into CO2e using the latest IPCC 100-year global warming potential (GWP) coefficients (**Annex A**), except where otherwise specified. ***Note*** *For example, methane has a GWP coefficient of 25, and 1 kg of methane is equivalent to 25 kg CO2e in terms of its GWP.*	**5.3 全球变暖潜势（GWP）** GHG 排放量和清除量应按质量测量，并应使用最新的 IPCC 100 年全球变暖潜能值 (GWP) 系数（附件 A）转换为 CO2e，除非另有规定。 **注** 例如，甲烷的 GWP 系数为 25，就其 GWP 而言，1 千克甲烷相当于 25 千克 CO2e。
5.4 Aircraft emissions and removals No multiplier or other correction shall be applied to the GWP of emissions and removals arising from aircraft transport. ***Note*** *The application of a multiplier for aircraft emissions was further considered in the revision of this*	**5.4 航空器排放和清除** 不得对航空器运输产生的排放和清除的 GWP 应用乘数或其他修正。 **注**：在本 PAS 的修订中进一步考虑了航空器排放乘数的应用，但由于缺乏专家对所采用方法的一致意见，

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PAS, but given the lack of expert agreement regarding the approach to be taken the position taken in the 2008 version of PAS 2050 has been retained. Entities wishing to account for radiative forcing should do this separately from their PAS 2050 conformity assessment. Information on an appropriate multiplier is provided in 2010 Guidelines to Defra/DECC's GHG Conversion Factors for Company Reporting: Methodology Paper for Emission Factors*. If radiative forcing is accounted for in a parallel assessment, then the outcome including radiative forcing should be recorded separately and clearly differentiated.*	因此保留了 2008 版 PAS 2050 中采取的立场。 希望考虑辐射强迫的实体应与其 PAS 2050 符合性评估分开进行。 有关适当乘数的信息在 2010 年 Defra/DECC 的公司报告温室气体转换因子指南 :排放因子的方法论文件中提供。 如果在平行评估中考虑了辐射强迫，那么包括辐射强迫在内的结果应单独记录并明确区分。
5.5 Carbon storage in products **5.5.1 Treatment of stored carbon** Where some or all removed carbon will not be emitted to the atmosphere within the 100-year assessment period, the portion of carbon not emitted to the atmosphere during that period shall be treated as stored carbon. ***Note 1*** *Carbon storage might arise where biogenic carbon forms part or all of a product (e.g. wood fibre in a table), or where atmospheric carbon is taken up by a product over its life cycle (e.g. cement).* ***Note 2*** *Storage of biogenic carbon in products varies depending on the type of product, the mean life span of the product, its rate of recycling and its disposal route (e.g. landfill, incineration).* ***Note 3*** *Non-CO2 emissions, such as CH4 , can arise through the decomposition of the product in any form or location, such as in landfill.* ***Note 4*** *While forest management activities might result in additional carbon storage in managed forests through the retention of forest biomass, this potential source of storage is not included in the scope of this PAS.* ***Note 5*** *The use of a weighting factor to assess delayed emissions is no longer a requirement of this PAS. However, for entities wishing to undertake such assessment, provision is made in* ***6.4.9.3.2*** *and* ***Annex E****.*	**5.5 产品中的碳储存** **5.5.1 储存碳的处理** 在 100 年评估期内部分或全部去除的碳不会排放到大气中的，该期间未排放到大气中的碳部分应作为储存碳处理。 **注 1** 当生物碳构成产品的一部分或全部（例如桌子中的木纤维），或产品在其生命周期内（例如水泥）吸收大气碳时，可能会出现碳储存。 **注 2** 产品中生物碳的储存量因产品类型、产品的平均寿命、回收率和处置途径（例如垃圾填埋、焚烧）而异。 **注 3** 非 CO2 排放，例如 CH4，可以通过产品在任何形式或位置（例如垃圾填埋场）的分解而产生。 **注 4** 虽然森林经营活动可能会通过保留森林生物量而导致管理森林中额外的碳储存，但这种潜在的储存来源不包括在本 PAS 的范围内。 **注 5** 使用加权因子来评估延迟排放不再是本 PAS 的要求。但是，对于希望进行此类评估的实体，在 6.4.9.3.2 和附件 E 中有规定。
5.5.2 Recording the basis of carbon storage assessment Where the assessment of the life cycle GHG emissions of a product includes some carbon storage, the data sources from which the quantity of stored carbon was calculated, together with the carbon storage profile of the product over the 100-year assessment period, shall be recorded and retained (**4.4**).	**5.5.2 记录碳储量评估的依据** 产品全生命周期温室气体排放评估包含部分碳储量的，应当记录计算储碳量的数据来源，以及产品在 100 年评估期内的碳储量曲线 并保留（4.4）。
5.6 Inclusion and treatment of land use change **5.6.1 General** The GHG emissions and removals arising from direct land use change shall be assessed for any input to the life cycle of a product originating from that land and shall be included in the assessment of GHG emissions of the product. Where supplementary requirements relating to land use change have been developed for the product being assessed in accordance with the principles set out in **4.3**, they should be used. Where such supplementary requirements are not used, the emissions arising from the product shall be assessed on the basis of the default land use change values provided in **Annex C**. For countries and land use changes not included in **Annex C**, the emissions arising from the product shall be assessed using the included GHG emissions and removals occurring as a result of direct land use	**5.6 土地利用变化的纳入与处理** **5.6.1 总则** 直接土地利用变化产生的温室气体排放和清除应针对源自该土地的产品生命周期的任何输入进行评估，并应包括在产品的温室气体排放评估中。 如果根据 4.3 中规定的原则为被评估的产品制定了与土地利用变化有关的补充要求，则应使用它们。 如果不使用此类补充要求，则产品产生的排放量应根据附件 C 中提供的默认土地利用变化值进行评估。 对于附件 C 中未包含的国家和土地利用变化，应根据 2006 年 IPCC 国家指南的相关章节，使用包含的因土地利用直接变化而产生的温室气体排放和清除来评估产品产生的排放。温室气体清单。

change in accordance with the relevant sections of the *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.	土地利用变化影响的评估应包括在进行评估之前（以较长者为准）发生的不超过 20 年或单个收获期的所有直接土地利用变化。该期间直接土地利用变化产生的温室气体排放和清除总量，应在该期间每年平均分配的基础上纳入该土地产生的产品温室气体排放的量化。
Note 1 *Where it can be demonstrated that the land use change occurred more than 20 years prior to the assessment being carried out in accordance with this PAS, no emissions from land use change should be included in the assessment as all emissions resulting from the land use change would be assumed to have occurred prior to the application of the PAS.*	**注 1** 如果可以证明土地利用变化发生在根据本 PAS 进行评估之前 20 年以上，则土地利用变化引起的排放不应包括在评估中，因为土地利用产生的所有排放将假定更改已在应用 PAS 之前发生。
Note 2 *Large emissions of GHGs can result as a consequence of land use change. Removals as a direct result of land use change (and not as a result of long term management practices) do not usually occur, although it is recognized that this could happen in specific circumstances. Examples of direct land use change are the conversion of land used for growing crops to industrial use or conversion from forest land to crop land. All forms of land use change that result in emissions or removals are to be included. Indirect land use change refers to such conversions of land use as a consequence of changes in land use elsewhere.*	**注 2** 土地利用变化可能导致温室气体的大量排放。由于土地利用变化的直接结果（而不是长期管理实践的结果）而导致的搬迁通常不会发生，尽管人们认识到这可能在特定情况下发生。直接土地利用变化的例子是用于种植作物的土地转变为工业用途或从林地转变为农田。导致排放或清除的所有形式的土地利用变化都应包括在内。间接土地利用变化是指由于其他地方土地利用变化而导致的土地利用转变。
Note 3 *While GHG emissions also 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.*	**注 3** 虽然温室气体排放也来自间接土地利用变化，但计算这些排放的方法和数据要求尚未完全制定。因此，间接土地利用变化产生的排放评估不包括在本标准分析中。在本 PAS 的未来修订中将考虑包括间接土地利用变化。
5.6.2 Limited traceability of products The following hierarchy shall apply when determining the GHG emissions and removals arising from land use change occurring not more than 20 years or a single harvest period, prior to making the assessment (whichever is the longer):	**5.6.2 产品可追溯性有限** 在进行评估（以较长者为准）之前，在确定不超过 20 年或单个收获期的土地利用变化引起的温室气体排放和清除时，应适用以下层次结构：
a) where the country of production is known and the previous land use is known, the GHG emissions and removals arising from land use change shall be those resulting from the change in land use from the previous land use to the current land use in that country;	a) 在生产国已知且先前土地用途已知的情况下，土地利用变化产生的温室气体排放和清除应为该国土地利用从先前土地利用转变为当前土地利用所产生的温室气体排放和清除量;
b) where the country of production is known, but the former land use is not known, the GHG emissions arising from land use change shall be the estimate of average emissions from the land use change for that crop in that country;	b) 如果生产国已知，但以前的土地用途未知，则土地利用变化产生的温室气体排放量应为该国该作物土地利用变化产生的平均排放量的估计值；
c) where neither the country of production nor the former land use is known, the GHG emissions arising from land use change shall be the weighted average of the average land use change emissions of that commodity in the countries in which it is grown.	c) 如果生产国和以前的土地用途都不知道，土地利用变化产生的温室气体排放量应是该商品在其种植国的平均土地利用变化排放量的加权平均值。
Note *Countries in which a crop is grown can be determined from import statistics, and a cut-off threshold of not less than 90% of the weight of imports may be applied.*	**注** 可根据进口统计数据确定种植作物的国家/地区，并且可以应用不少于进口重量 90% 的临界值。

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5.6.3 Limited knowledge of the timing of land use change Where the timing of land use change cannot be demonstrated to be more than 20 years, or a single harvest period, prior to making the assessment (whichever is the longer), it shall be assumed that the land use change occurred on 1 January of either: a) the earliest year in which it can be demonstrated that the land use change had occurred; or b) On 1 January of the year in which the assessment of GHG emissions and removals is being carried out.	**5.6.3 对土地利用变化时间的了解有限** 如果不能证明土地利用变化的时间在评估前超过 20 年或一个收获期（以较长者为准），则应假定土地利用变化发生在任一年份的 1 月 1 日 a) 可以证明土地利用变化发生的最早年份； 要么 b) 进行温室气体排放和清除评估的当年的 1 月 1 日。
5.6.4 Recording the type and timing of land use change Data sources, location and timing of land use change associated with inputs to products shall be recorded and retained (**4.4**) by the organization. ***Note*** *Knowledge of the prior land use can be demonstrated using a number of sources of information, such as satellite imagery and land survey data. Where records are not available, local knowledge of prior land use can be used.*	**5.6.4 记录土地利用变化的类型和时间** 与产品投入相关的土地利用变化的数据来源、位置和时间应由组织记录和保留 (4.4)。 **注** 可以使用多种信息来源（例如卫星图像和土地调查数据）证明对先前土地利用的了解。 在没有记录的情况下，可以使用先前土地使用的当地知识。
5.7 Treatment of soil carbon change in existing systems Where not arising from land use change (**5.5**), changes in the carbon content of soils including both emissions and removals shall be excluded from the assessment of GHG emissions under this PAS unless provided for in supplementary requirements in accordance with the principles set out in **4.3**. Where supplementary requirements relating to soil carbon change have been developed for the product being assessed in accordance with the principles set out in **4.3**, they should be used. ***Note 1*** *This exclusion refers to changes such as tilling techniques, crop types and other management actions taken in relation to agricultural land. It does not refer to the impact of land use change on carbon emissions, which is included in **5.6**.* ***Note 2*** *Soils are important in the carbon cycle, both as a source and a sink for carbon, and it is acknowledged that scientific understanding is improving regarding the impact of different techniques in agricultural systems. For this reason, provision is made for future supplementary requirement or revision to the PAS 2050 requirements that could facilitate the inclusion of emissions and removals arising from changes in soil carbon.*	**5.7 现有系统土壤碳变化的处理** 如果不是由土地利用变化（5.5）引起的，土壤碳含量的变化（包括排放和清除）应排除在本 PAS 下的温室气体排放评估之外，除非根据 4.3 中规定的原则在补充要求中作出规定. 如果根据 4.3 中规定的原则为被评估的产品制定了与土壤碳变化有关的补充要求，则应使用它们。 **注 1** 此排除项指的是耕作技术、作物类型和其他与农业用地相关的管理措施的变化。不是指土地利用变化对碳排放的影响，包含在 5.6 中。 **注 2** 土壤在碳循环中很重要，既是碳的来源，也是碳汇，人们承认，关于不同技术对农业系统的影响的科学认识正在提高。出于这个原因，为未来对 PAS 2050 要求的补充要求或修订做出了规定，以促进将土壤碳变化引起的排放和清除纳入其中。
5.8 Offsetting GHG emissions offset mechanisms, including but not limited to, voluntary offset schemes or nationally or internationally recognized offset mechanisms, shall not be used at any point in the assessment of the GHG emissions of the product. ***Note*** *It is the intention that this PAS reflects the GHG intensity of the production process prior to the implementation of external measures to offset GHG emissions. The use of an energy source that results in lower GHG emissions to the atmosphere and therefore achieves a lower emission factor, such as renewable electricity (see **7.9.4**) or conventional thermal generation with carbon capture and storage, is not a form of offsetting.*	**5.8 偏移** 温室气体排放抵消机制，包括但不限于自愿抵消计划或国家或国际认可的抵消机制，不得在产品温室气体排放评估的任何时候使用。 **注** 本 PAS 旨在反映在实施外部措施以抵消 GHG 排放之前生产过程的 GHG 强度。 使用可减少向大气排放温室气体并因此实现较低排放因子的能源，例如可再生电力（见 7.9.4）或具有碳捕获和储存功能的传统热发电，不是一种抵消形式。
5.9 Unit of analysis	**5.9 分析单位**

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Assessment of the GHG emissions arising from the life cycle of products shall be carried out in a manner that allows the mass of CO2e to be determined per functional unit for the product. The functional unit shall be recorded to two significant figures. Where a product is commonly available on a variable unit size basis, the calculation of GHG emissions shall be proportional to the unit size (e.g. per kilogram or per litre of goods sold, or per month or year of a service provided). Where supplementary requirements establishing a preferred unit of analysis have been developed for the product being assessed in accordance with the principles set out in **4.3**, they should be used. ***Note 1*** *For services, the appropriate reporting unit may be established either on the basis of time (e.g. annual emissions associated with an internet service) or event (e.g. per night emissions associated with a hotel stay).* ***Note 2*** *The functional unit may differ according to the purpose of the assessment activity. For example, the functional unit for internal organizational reporting may differ from the functional unit communicated to consumers.*	对产品生命周期产生的温室气体排放的评估应以允许确定产品每个功能单元的 CO2e 质量的方式进行。功能单元应记录为两位有效数字。 如果产品通常以可变单位尺寸为基础提供，则温室气体排放的计算应与单位尺寸成比例（例如，每公斤或每升售出的商品，或提供服务的每月或每年）。 如果根据 4.3 中规定的原则为被评估的产品制定了建立首选分析单位的补充要求，则应使用它们。 **注 1** 对于服务，可以根据时间（例如与互联网服务相关的年度排放量）或事件（例如与酒店住宿相关的每晚排放量）建立适当的报告单位。 **注 2** 根据评估活动的目的，功能单元可能有所不同。例如，内部组织报告的功能单元可能不同于传达给消费者的功能单元。
6 System boundary	6 系统边界
6.1 Establishing the system boundary The system boundary shall be clearly defined for each product under assessment and shall include all of its material life cycle processes (**6.3**) in accordance with **6.4** and subject to the exclusions in **6.5**. Where supplementary requirements specifying a system boundary have been developed for the product being assessed in accordance with the principles set out in **4.3**, they should be used. ***Note 1*** *It is important that in setting the system boundary the points during the product life cycle where removals are likely to occur are clearly identified so as to enable the relevant removal data to be collected in the inventory process. The amount of removal calculated for a material of biogenic origin should reflect only the amount of carbon embedded in that material, consistent with **5.1**.* ***Note 2*** *Consideration should be given to the material contribution that different processes within the system boundary will make to the total GHG emissions of a product (see **6.3**).*	**6.1 建立系统边界** 系统边界应为被评估的每个产品明确定义，并应包括其所有材料生命周期过程 (6.3)，根据 6.4 和 6.5 中的排除。 如果根据 4.3 中规定的原则为被评估的产品制定了指定系统边界的补充要求，则应使用它们。 **注 1**：重要的是，在设置系统边界时，产品生命周期中可能发生清除的点必须明确标识，以便能够在清单过程中收集相关清除数据。为生物源材料计算的去除量应仅反映嵌入该材料中的碳量，与 5.1 一致。 **注 2** 应考虑系统边界内不同过程对产品温室气体排放总量的贡献（见 6.3）。
6.2 Cradle-to-gate GHG emission and removals assessment **6.2.1 Cradle-to-gate system boundary** The system boundary for an assessment identified as cradle-to-gate shall include the emissions and removals identified in **5.1** that have occurred up to and including the point where the product leaves the organization undertaking the assessment for transfer to another party that is not the consumer. For products that use recycled content as an input, the emissions and removals associated with the processing of that material shall be included as defined by **Annex D**. **6.2.2 Cradle-to-gate GHG emissions assessment recording** Cradle-to-gate GHG emissions assessment information shall be clearly identified as such so as not to be mistaken for a full assessment of the life cycle GHG emissions of a product.	**6.2 从摇篮到大门的温室气体排放和清除评估** **6.2.1 从摇篮到门的系统边界** 确定为从摇篮到门的评估的系统边界应包括在 5.1 中确定的排放和清除，这些排放和清除已经发生到并包括产品离开进行评估的组织转移到非消费者的另一方的时间点.对于使用回收成分作为输入的产品，与该材料加工相关的排放和清除应包括在附件 D 中。 **6.2.2 从摇篮到大门的温室气体排放评估记录** 从摇篮到大门的温室气体排放评估信息应明确标识，以免被误认为是对产品生命周期温室气体排放的全面评估。

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Note 1 *Records for all stages of the assessment should be maintained and all relevant information, including separate reference to any end-of-life emissions, is provided where cradle-to-gate assessments are made available to support downstream assessments (**4.4** and **Annex B**).* ***Note 2*** *Cradle-to-gate GHG emission and removals assessment can facilitate the provision of consistent GHG emission information within the supply chain for products and services. This cradle-to-gate perspective of the supply chain enables incremental addition of GHG assessments at different stages of the supply until the product or service is made available to the consumer (where the assessment will include the emissions and removals arising from the entire life cycle).* ***Note 3*** *Examples of system boundaries for services are further described in the* Guide to PAS 2050*.* ***Note 4*** *W here cradle-to-gate emissions assessment information is disclosed to another business, it should be clearly identified as not representing a full assessment of the lifecycle GHG emissions of the product and therefore as not being appropriate for issue to consumers.*	注 1 应保留评估所有阶段的记录，并提供所有相关信息，包括对任何报废排放的单独参考，以支持下游评估（4.4 和附件 B）。 注 2 从摇篮到门的温室气体排放和清除评估可以促进在产品和服务的供应链内提供一致的温室气体排放信息。供应链的这种从摇篮到门的视角能够在供应的不同阶段逐步增加温室气体评估，直到向消费者提供产品或服务（其中评估将包括整个生命周期中产生的排放和清除）。 注 3 PAS 2050 指南中进一步描述了服务的系统边界示例。 注释 4 如果此处从摇篮到门的排放评估信息披露给另一家企业，则应明确指出该信息不代表对产品生命周期温室气体排放的全面评估，因此不适合向消费者发布。
6.3 Material contribution and threshold Calculations carried out in accordance with this PAS shall include all emissions and removals within the system boundary that have the potential to make a material contribution to the assessment of GHG emissions of the product (see **3.31**). For GHG emissions and removals arising from the life cycle of a product, the assessment shall include: a) all sources of emissions and processes for removal anticipated to make a material contribution to the life cycle GHG emissions of the functional unit; and b) at least 95% of the anticipated life cycle GHG emissions and removals associated with the functional unit. Where a preliminary assessment is carried out to assist in the determination of system boundary for the product under assessment, the selection of any secondary data used shall be undertaken in accordance with **7.2**. ***Note*** *A preliminary assessment of the sources of GHG emissions in the life cycle of a product may be undertaken using secondary data or through an Environmentally Extended Input–Output (EEIO) approach. This preliminary assessment could provide an overview of the key sources of GHG emissions within the life cycle of the product and identify major contributors to the GHG emissions assessment.*	**6.3 材料贡献和门槛** 根据本 PAS 进行的计算应包括系统边界内有可能对产品的 GHG 排放评估做出重大贡献的所有排放和清除（见 3.31）。 对于产品生命周期产生的温室气体排放和清除，评估应包括： a) 预计会对功能单元的生命周期温室气体排放产生实质性贡献的所有排放源和清除过程；和 b) 至少 95% 的与功能单元相关的预期生命周期 GHG 排放和清除。如果进行初步评估以帮助确定被评估产品的系统边界，则应根据 7.2 选择使用的任何辅助数据。 **注** 对产品生命周期中 GHG 排放源的初步评估可以使用二手数据或通过环境扩展投入产出 (EEIO) 方法进行。该初步评估可以概述产品生命周期内温室气体排放的主要来源，并确定温室气体排放评估的主要贡献者。
6.4 产品体系的要素 **6.4.1 General** The life cycle elements covered in **6.4.2** to **6.4.10** shall be included in the system boundary for the assessment of the life cycle GHG emissions and removals associated with the products under assessment. ***Note 1*** *While the system boundary is defined by the requirements in **6.4.2** to **6.4.10**, not all products will have processes or emissions arising from each of the categories.* ***Note 2*** *Product systems are typically described as a series of interconnected life cycle stages: raw materials; manufacture; distribution/retail; use; and final disposal/recycling, with processes or emissions assigned at each stage. Describing the life cycle of services can be more difficult as not all stages may be relevant. For example, the raw materials, production and use stages may be combined into the service delivery stage. Definition of life cycle stages can also be influenced by the perspective of the organization implementing this PAS, and its position in the supply chain. Transparency is therefore important when defining boundaries and assigning the processes and emissions that are included at each stage.*	**6.4 产品体系的要素** **6.4.1 总则** 6.4.2 至 6.4.10 中涵盖的生命周期要素应包含在系统边界中，以评估与被评估产品相关的生命周期 GHG 排放和清除。 **注 1**：虽然系统边界由 6.4.2 至 6.4.10 中的要求定义，但并非所有产品都会有来自每个类别的过程或排放。 **注 2** 产品系统通常被描述为一系列相互关联的生命周期阶段：原材料；生产;分销/零售；采用;和最终处置/回收，在每个阶段分配过程或排放。描述服务的生命周期可能会更加困难，因为并非所有阶段都相关。例如，可以将原材料、生产和使用阶段合并为服务交付阶段。生命周期阶段的定义也会受到实施该 PAS 的组织的观点及其在供应链中的位置的影响。因此，在定义边界和分配每个阶段包含的过程和排放时，透明度很重要。 PAS 2050 指南中进一步描述了系统边界的示例。

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Examples of system boundaries are further described in the Guide to PAS 2050*.*	
6.4.2 Production materials The GHG emissions and removals arising from all processes used in the formation, extraction or transformation of materials used in production (including farming, horticulture, fishing and forestry) shall be included in the assessment, including all sources of energy consumption or direct GHG emissions associated with that formation, extraction or transformation. The GHG emissions and removals arising from materials used in production shall include, for example, those from: • development of material sources (e.g. surveying, prospecting); • mining or extracting raw materials (solids, liquids and gases, such as iron, oil and natural gas), including emissions from any machinery used; • consumables used in sourcing production materials; • waste generated at each stage of the extraction and pre-processing of production materials; • fertilizers (e.g. N2O emissions arising from the application of nitrogen fertilizer and emissions arising from the production of the fertilizer); • direct land use change (e.g. draining of peatland or removal of a forest); • energy-intensive atmospheric growing conditions (e.g. heated greenhouse); • emissions from crop production (e.g. methane from rice cultivation) and livestock (e.g. methane from cattle).	**6.4.2 生产材料** 评估中应包括在生产中使用的材料（包括农业、园艺、渔业和林业）的形成、提取或转化过程中使用的所有过程产生的 GHG 排放和清除，包括所有能源消耗来源或相关的直接 GHG 排放伴随着那个形成、提取或转化。 生产中使用的材料产生的温室气体排放和清除应包括，例如，来自以下方面的排放和清除： • 材料来源的开发（例如勘测、勘探）； • 开采或提取原材料（固体、液体和气体，例如铁、石油和天然气），包括所用机器的排放； • 用于采购生产材料的消耗品； • 在生产材料的提取和预处理的每个阶段产生的废物； • 肥料（例如氮肥施用产生的 N2O 排放和肥料生产产生的排放）； • 直接的土地利用变化（例如泥炭地排水或森林砍伐）； • 能源密集型大气生长条件（例如加热温室）； • 作物生产（例如水稻种植产生的甲烷）和牲畜（例如牛产生的甲烷）的排放。
6.4.3 Energy The GHG emissions and removals associated with the provision and use of energy in the life cycle of the product shall be included in the emissions arising from the energy supply system. ***Note*** *Emissions from energy include the emissions arising from the life cycle of the energy. This includes emissions at the point of consumption of the energy (e.g. emissions from the burning of coal and gas) and emissions arising from the provision of the energy, including the generation of electricity and heat, and emissions from transmission losses, transport fuels; upstream emissions (e.g. the mining and transport of fuel to the electricity generator or other combustion plant); downstream emissions (e.g. the treatment of waste arising from the operation of nuclear electricity generators); and the growing and processing of biomass for use as a fuel.*	**6.4.3 能源** 与产品生命周期中能源的提供和使用相关的温室气体排放和清除应包括在能源供应系统产生的排放中。 **注** 能源排放包括能源生命周期产生的排放。 这包括能源消耗点的排放（例如煤和天然气燃烧的排放）和能源供应（包括发电和供热）产生的排放，以及传输损失、运输燃料的排放； 上游排放（例如开采和运输燃料到发电机或其他燃烧设备）； 下游排放（例如处理核发电机运行产生的废物）； 以及用作燃料的生物质的种植和加工。
6.4.4 Capital goods The GHG emissions and removals arising from the production of capital goods used in the life cycle of the product shall be excluded from the assessment unless provided for in supplementary requirements in accordance with the principles set out in **4.3**. Where such supplementary requirements relating to the treatment of capital goods have been developed for the product being assessed, they should be used. ***Note*** *An assessment of the materiality of capital goods in relation to a particular product or product sector (including reference to existing studies) can be conducted as part of the supplementary requirement development process. Where capital goods are found to make a significant contribution to the level of GHG emissions from those products, requirements and guidance on how to include capital goods in the assessment should be included as part of the supplementary requirements*	**6.4.4 资本货物** 产品生命周期中使用的资本货物的生产所产生的温室气体排放和清除应排除在评估之外，除非根据 4.3 中规定的原则在补充要求中作出规定。 如果已经为被评估的产品制定了与资本货物处理相关的补充要求，则应使用它们。 **注** 与特定产品或产品部门相关的资本货物重要性评估（包括参考现有研究）可以作为补充要求开发过程的一部分进行。 如果发现资本货物对这些产品的温室气体排放水平有重大贡献，则应将有关如何将资本货物纳入评估的要求和指南作为补充要求的一部分

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6.4.5 Manufacturing and service provision The GHG emissions and removals arising from manufacturing and service provision that occur as part of the life cycle of the product, including emissions associated with the use of consumables, shall be included in the assessment of the GHG emissions of the life cycle of the product. Where a process is used for prototyping a new product, the emissions associated with the prototyping activities shall be allocated to the resulting product(s) and coproduct(s) of the process.	**6.4.5 制造和服务提供** 作为产品生命周期一部分的制造和服务提供产生的温室气体排放和清除，包括与消耗品使用相关的排放，应包括在产品生命周期的温室气体排放评估中。 如果过程用于新产品的原型制作，与原型制作活动相关的排放应分配给该过程的最终产品和联产品。
6.4.6 Operation of premises The GHG emissions and removals arising from the operation of premises, including those from factories, warehouses, central supply centres, offices, retail outlets, etc., shall be included in the assessment of the GHG emissions of the life cycle of the product. ***Note*** *Operation includes the lighting, heating, cooling, ventilation, humidity control and other environmental controls over the premises. An appropriate approach for the division of emissions arising from the operation of, for example, warehouses would be to use the residence time and volume of space occupied by the product as a basis for the division.*	**6.4.6 经营场所** 包括工厂、仓库、中央供应中心、办公室、零售店等场所经营产生的温室气体排放和清除，应纳入产品生命周期温室气体排放评估。 **注** 操作包括对场所的照明、加热、冷却、通风、湿度控制和其他环境控制。 对因仓库运营而产生的排放进行划分的一种适当方法是使用产品占用的停留时间和空间体积作为划分的基础。
6.4.7 Transport The GHG emissions and removals arising from road, air, water, rail or other transport methods that form part of the life cycle of the product shall be included in the assessment of the GHG emissions of the life cycle of the product taking account of the requirements in **8.6.** Where supplementary requirements relating to transport have been developed for the product being assessed in accordance with the principles set out in **4.3**, they should be used. ***Note 1*** *Emissions associated with environmental control requirements throughout the life cycle are included in **6.4.8**. Care is necessary to avoid double counting (e.g. for refrigerated transport).* ***Note 2*** *GHG emissions from transport include the emissions associated with transporting fuels (e.g. emissions arising from the operation of pipelines, transmission networks and other fuel transport activities).* ***Note 3*** *GHG emissions from transport include the emissions arising from transport associated with individual processes, such as the movement of inputs, products and co-products within a factory (e.g. by conveyor belt or other localized transport methods).* ***Note 4*** *Where products are distributed to different points of sale (i.e. different locations within a country), emissions associated with transport will vary from location to location due to different transport requirements. Where this occurs, organizations should calculate the average release of GHGs associated with transporting the product based on the average distribution of the product within each country, unless more specific data are available. Where the same product is sold in identical form in multiple countries, country-specific data could be used, or the average could be weighted by the amount of product sold in each country.*	**6.4.7 运输** 构成产品生命周期一部分的公路、航空、水路、铁路或其他运输方式产生的温室气体排放和清除，应纳入产品生命周期温室气体排放的评估，并考虑要求在 8.6。如果根据 4.3 中规定的原则为被评估的产品制定了与运输相关的补充要求，则应使用这些补充要求。 **注 1** 与整个生命周期的环境控制要求相关的排放包含在 6.4.8 中。必须小心避免重复计算（例如冷藏运输）。 **注 2** 运输产生的温室气体排放包括与运输燃料相关的排放（例如管道、传输网络和其他燃料运输活动产生的排放）。 **注 3** 运输产生的温室气体排放包括与单个过程相关的运输产生的排放，例如工厂内投入物、产品和联产品的移动（例如通过传送带或其他本地化运输方法）。 **注 4** 如果产品被分配到不同的销售点（即一个国家内的不同地点），由于运输要求不同，与运输相关的排放量会因地点而异。如果发生这种情况，除非有更具体的数据，否则组织应根据产品在每个国家/地区的平均分布来计算与产品运输相关的 GHG 平均释放量。如果同一产品在多个国家以相同的形式销售，则可以使用特定国家的数据，或者可以通过每个国家销售的产品数量加权平均值。
6.4.8 Storage of products The GHG emissions and removals arising from storage shall be included in the assessment of the life cycle GHG emissions of the product, including: a) storage of inputs, including raw materials, at any point in the product life cycle; b) environmental controls (e.g. cooling, heating, humidity control and other controls) related to a product	**6.4.8 产品储存** 储存产生的温室气体排放量和清除量应纳入产品生命周期温室气体排放量的评估，包括： a) 在产品生命周期的任何时间点储存投入品，包括原材料； b) 在产品生命周期 (6.4.6) 的任何时间点与产品相关的环境控制（例如冷却、加热、湿度控制和其他控

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at any point in the product life cycle (**6.4.6)** for the operation, including environmental control, of factories in which products may be stored; c) storage of products in the use phase ; d) storage prior to reuse, recycling or disposal activities. ***Note*** *GHG emissions identified under* ***6.4.8*** *relate to storage activities not already covered by* ***6.4.6****.* Where supplementary requirements relating to the storage of products have been developed for the product being assessed in accordance with the principles set out in **4.3**, they should be used.	制)，以用于可能存储产品的工厂的运营，包括环境控制； c) 产品在使用阶段的储存； d) 再利用、回收或处置活动之前的储存。 **注** 6.4.8 中确定的 GHG 排放与 6.4.6 未涵盖的储存活动有关。 如果根据 4.3 中规定的原则为被评估的产品制定了与产品储存相关的补充要求，则应使用它们。
6.4.9 Use phase **6.4.9.1 General principle** The GHG emissions and removals arising from the use of products shall be included in the assessment of the life cycle GHG emissions of products, subject to the provisions of **6.2** for cradle-to-gate assessments. The emission factor associated with energy used in the use phase of products shall be determined in accordance with **6.4.3**. ***Note*** *The calculation of GHG emissions from energy use is based on country-specific annual average emission factors for energy, unless it can be demonstrated that a different emission factor is more representative of the energy use characteristics of the product. For example, where the use phase includes the consumption of electricity by the consumer in relation to the product being assessed, the country-specific annual average emission factor of the electricity would be used; where an identical product is supplied to multiple international markets, the emission factor for the energy used by the product in the use phase would be the average emission factor of the countries where the product is supplied, weighted by the proportion of the product supplied in the different countries.*	**6.4.9 使用阶段** **6.4.9.1 一般原则** 产品使用过程中产生的温室气体排放量和清除量，应纳入产品生命周期温室气体排放量的评估，但应符合 6.2“从摇篮到门”评估的规定。与产品使用阶段使用的能源相关的排放因子应根据 6.4.3 确定。 **注** 能源使用产生的温室气体排放量的计算基于特定国家能源的年平均排放因子，除非可以证明不同的排放因子更能代表产品的能源使用特征。例如，如果使用阶段包括消费者与被评估产品相关的电力消耗，则将使用特定国家电力的年平均排放因子；向多个国际市场供应相同产品的，产品在使用阶段所用能源的排放因子为产品供应国的平均排放因子，按该产品供应国的比例加权不同的国家。
6.4.9.2 Basis of the use profile Determination of the use profile for the use phase of products shall be based on a hierarchy of boundary definitions in the following order of preference: 1) supplementary requirements in accordance with the principles set out in **4.3**, which include a use phase for the product being assessed; 2) published international standards that specify a use phase for the product being assessed; 3) published national guidelines that specify a use phase for the product being assessed; 4) published industry guidelines that specify a use phase for the product being assessed. Where no method for determining the use phase of products has been established in accordance with points 1–4 of this clause, the approach taken in determining the use phase of products shall be established by the organization carrying out the assessment of GHG emissions for the product and recorded. Where emissions arise from energy use in the use phase, the use profile shall record the emission factor of each energy type used by the product and the source of the emission factor. Where the emission factor is not an annual average emission factor for a single country, the determination of the emission factor shall be included in the recording of the use phase profile and retained (**4.4**). ***Note*** *The manufacturer's recommended method for achieving the functional unit (e.g. cooking by oven at a specified temperature for a specified time) may provide a basis for determining the use phase of a*	**6.4.9.2 使用概况的基础** 产品使用阶段的使用概况的确定应基于以下优先顺序的边界定义层次结构： 1) 根据 4.3 规定的原则的补充要求，包括被评估产品的使用阶段； 2) 已公布的国际标准，规定了被评估产品的使用阶段； 3) 已公布的国家指南，规定了被评估产品的使用阶段； 4) 已发布的行业指南，规定了被评估产品的使用阶段。 如果根据本条第 1-4 点未建立确定产品使用阶段的方法，则确定产品使用阶段所采用的方法应由进行产品温室气体排放评估的组织确定并记录下来。 如果排放来自使用阶段的能源使用，使用概况应记录产品使用的每种能源类型的排放因子和排放因子的来源。如果排放因子不是单个国家的年平均排放因子，则排放因子的确定应包括在使用阶段概况的记录中并保留（4.4）。 **注**：制造商推荐的实现功能单元的方法（例如，在指定温度下用烤箱烹饪指定时间）可以为确定产品的使用阶段提供依据。但是，实际使用模式可能与推荐的不同，使用配置文件应寻求代表实际使用模式。

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product. However, actual usage patterns may differ from those recommended, and the use profile should seek to represent the actual usage pattern.	
6.4.9.3 Time period for use-phase GHG assessment **6.4.9.3.1** The emissions and removals specified in **5.1** arising during the use phase of the product during the 100-year assessment period shall be included. Where the use phase of a product results in the release of GHG emissions over time, the total emissions projected to occur over the 100-year assessment period shall be included in the assessment of GHG emissions of that product as if occurring at the start of the 100-year assessment period. **6.4.9.3.2** Organizations wishing to identify the effect of emissions released over time during the use phase shall do this separately from the single-release assessment specified in **6.4.9.3.1** provided that both outcomes are recorded together in parallel. The method used for calculating the weighted average impact of delayed emissions arising from the use phase of the product over a period of more than one year shall be that provided in **Annex E.**	**6.4.9.3 使用阶段温室气体评估的时间段** **6.4.9.3.1** 100 年评估期内产品使用阶段产生的 5.1 规定的排放量和清除量。 如果产品的使用阶段导致随着时间的推移释放 GHG 排放 ,则预计在 100 年评估期内发生的总排放量应包括在该产品的 GHG 排放评估中，就像发生在评估开始时一样。 100 年评估期。 **6.4.9.3.2** 希望确定在使用阶段随时间释放的排放影响的组织应与 6.4.9.3.1 中规定的单次释放评估分开进行，前提是两个结果同时记录在一起。 用于计算产品使用阶段超过一年的延迟排放的加权平均影响的方法应在附件 E 中提供。
6.4.9.4 Recording the basis of use-phase calculations for products Where use-phase emissions and removals form part of an assessment carried out under this PAS, the detail of the basis on which the use phase for the product is assessed shall be recorded and retained (**4.4** and **Annex B**).	**6.4.9.4** 记录产品使用阶段计算的基础 如果使用阶段的排放和清除构成根据本 PAS 进行的评估的一部分 ,则应记录并保留产品使用阶段评估依据的详细信息（4.4 和附录 B）。
6.4.9.5 Impact of the product on the use phase of other products Where the operation or application of a product causes a change (either increase or decrease) in the GHG emissions arising from the use phase of another product, this change shall be excluded from the assessment of the life cycle GHG emissions of the product being assessed.	**6.4.9.5** 产品对其他产品使用阶段的影响 如果产品的运行或应用导致另一产品使用阶段产生的温室气体排放量发生变化（增加或减少），则该变化应排除在被评估产品的生命周期温室气体排放量评估之外。
6.4.10 GHG emissions from final disposal The GHG emissions arising from final disposal (e.g. waste disposed of through landfill, incineration, burial and wastewater) shall be included in the assessment of the life cycle GHG emissions of the product, subject to the provisions of **6.2** for cradle-to-gate assessments and **8.2** emissions from waste. Determination of the waste disposal profile shall follow the data quality rules (**7.2**) and be based on a hierarchy of boundary definitions in the following order of preference: 1) supplementary requirements in accordance with the principles set out in **4.3**, which include a waste disposal profile for the product being assessed; 2) published international standards that specify a waste disposal profile for the product being assessed; 3) published national guidelines that specify a waste disposal profile for the product being assessed; 4) published industry guidelines that specify a waste disposal profile for the product being assessed. Where no method for determining the waste disposal profile of the product has been established in accordance with points 1–4 of this clause, the approach taken in determining the waste disposal profile shall be established by the organization carrying out the assessment of GHG emissions for the product. Where emissions arise from energy use in waste disposal, the profile shall record the emission factor of each energy type used during disposal of the product and the source of the emission factor. Where the emission factor is not an annual average emission factor for a single country, the	**6.4.10 最终处置的温室气体排放** 最终处置（如通过填埋、焚烧、掩埋和废水处置的废物）产生的温室气体排放应纳入产品生命周期温室气体排放的评估，但须符合 6.2 对摇篮到门评估的规定 8.2 废物排放。 废物处置概况的确定应遵循数据质量规则 (7.2) 并基于以下优先顺序的边界定义层次结构： 1) 根据 4.3 中规定的原则的补充要求，包括被评估产品的废物处置概况； 2) 已公布的国际标准，规定了被评估产品的废物处置概况； 3) 已公布的国家指南，规定了被评估产品的废物处置概况； 4) 已发布的行业指南，规定了被评估产品的废物处置概况。如果未根据本条第 1-4 点确定确定产品废物处置概况的方法，则确定废物处置概况所采用的方法应由进行温室气体排放评估的组织确定。产品。 如果排放来自废物处置中的能源使用 ,则配置文件应记录产品处置过程中使用的每种能源类型的排放因子以及排放因子的来源。 如果排放因子不是单个国家的年平均排放因子，排放因子的确定应包括在废物处置概况的记录中并保留

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determination of the emission factor shall be included in the recording of the waste disposal profile and retained (**4.4**). ***Note*** *Where waste arises from recyclable material, the emissions associated with that waste are included in the assessment of emissions from recycled material (see Annex D).*	（4.4）。 **注** 如果废物来自可回收材料，则与该废物相关的排放包括在回收材料的排放评估中（见附件 D）。
6.4.10.1 Time period for GHG emissions from final disposal The GHG emissions specified in **5.1** arising from final disposal during the 100-year assessment period shall be included. Where the fi nal disposal of materials or products results in the release of GHG emissions over time (e.g. decomposition of food waste sent to landfill), the total emissions projected to occur over the 100-year assessment period shall be included in the assessment of GHG emissions of the product giving rise to the disposal, as if occurring at the start of the 100-year assessment period.	**6.4.10.1 最终处置温室气体排放的时间段** 5.1 中规定的 100 年评估期内最终处置产生的 GHG 排放应包括在内。如果材料或产品的最终处置导致随着时间的推移释放 GHG 排放（例如送入垃圾填埋场的食物垃圾分解），则预计在 100 年评估期内发生的排放总量应包括在 GHG 评估中导致处置的产品排放，就好像发生在 100 年评估期开始时一样。
6.4.10.2 Effect of emissions released over time during final disposal Entities wishing to identify the effect of emissions released over time during the disposal phase may do this separately from the single-release assessment specified in **6.4.10.1** provided that both outcomes are recorded together in parallel. The method used for calculating the weighted average impact of delayed emissions arising from the use phase of the product over a period of more than one year shall be that provided in **Annex E.**	**6.4.10.2 最终处置期间随时间释放的排放的影响** 希望确定在处置阶段随时间释放的排放影响的实体可以与 6.4.10.1 中规定的单次释放评估分开进行，前提是两个结果同时记录在一起。用于计算产品使用阶段超过一年的延迟排放的加权平均影响的方法应在附件 E 中提供。
6.4.10.3 Activities following final disposal Where the emissions from fi nal disposal are diverted to another system (e.g. combustion of methane arising from landfill, combustion of waste timber fi bre), the assessment of GHG emissions from the products giving rise to the emissions shall reflect the emissions arising from this diversion, as described in **8.2**.	**6.4.10.3 最终处置后的活动** 如果最终处置产生的排放物被转移到另一个系统（例如垃圾填埋场产生的甲烷燃烧、废弃木材纤维的燃烧），产生排放的产品的温室气体排放评估应反映这种转移产生的排放量 ，如 8.2 所述。
6.5 System boundary exclusions The system boundary of the product life cycle shall exclude the GHG emissions associated with: a) human energy inputs to processes and/or preprocessing (e.g. if fruit is picked by hand rather than by machinery); b) transport of consumers to and from the point of retail purchase; c) transport of employees to and from their normal place of work; d) animals providing transport services.	**6.5 系统边界排除** 产品生命周期的系统边界应排除与以下相关的温室气体排放： a) 过程和/或预处理过程中的人力投入（例如，如果水果是手工采摘而不是机器采摘）； b) 消费者往返零售购买点的运输； c) 员工往返正常工作地点的交通； d) 提供运输服务的动物。
7 Data	**7 数据**
7.1 General The data recorded in relation to a product shall include all GHG emissions and removals occurring within the system boundary of that product.	**7.1 总则** 记录的与产品相关的数据应包括在该产品的系统边界内发生的所有温室气体排放和清除。
7.2 Data quality rules When identifying primary activity data and secondary data for use in GHG emissions and removals assessment, the following preferences shall be applied. a) For time-related coverage (e.g. age of data and the minimum length of time over which the data are collected); data that are time-specific to the product being assessed shall be preferred. b) For geographical specificity (e.g. geographical area from which data are collected such as district, country, region); data that are geographically specific to the product being assessed shall be preferred.	**7.2 数据质量规则** 在确定用于温室气体排放和清除评估的主要活动数据和次要数据时，应采用以下优先选择。 a) 与时间相关的覆盖范围（例如数据的年龄和收集数据的最短时间长度）；对被评估产品具有特定时间的数据应优先考虑。 b) 地理特征（例如收集数据的地理区域，如地区、国家、地区）；应优先考虑被评估产品的地理特定数据。

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c) For technology coverage (e.g. whether the data relate to a specific technology or a mix of technologies); data that are technology-specific to the product being assessed shall be preferred. d) For accuracy of the information (e.g. data, models and assumptions); data that are most accurate shall be preferred; e) For precision: measure of the variability of the data values for each data expressed (e.g. variance); data that are more precise (i.e. have the lowest statistical variance) shall be preferred. In addition, the following shall be documented: 1) Completeness: (the percentage of data that are measured, and the degree to which the data represents the population of interest; is the sample size large enough, is the periodicity of measurement sufficient, etc.). 2) Consistency: (qualitative assessment of whether the selection of data is carried out uniformly in the various components of the analysis). 3) Reproducibility: (qualitative assessment of the extent to which information about the method and data values would allow an independent practitioner to reproduce the results reported in the study). 4) Data sources: (with reference to the primary or secondary nature of the data). ***Note 1*** *Adapted from BS EN ISO 14044:2006, 4.2.3.4.3.* ***Note 2*** *Assessment of GHG emissions should use data that will reduce bias and uncertainty as far as practicable by using the best quality data achievable. Determination of the best quality data could be supported by a data-scoring framework that allows the different attributes of data quality to be combined.*	c) 技术覆盖范围（例如数据是否与特定技术或技术组合相关）；被评估产品的技术特定数据应优先考虑。 d) 信息的准确性（例如数据、模型和假设）；最准确的数据应优先考虑； e) 对于精度：测量每个表达数据的数据值的可变性（例如方差）；更精确（即具有最低统计方差）的数据应优先考虑。 此外，还应记录以下内容： 1) 完整性：（测量数据的百分比，以及数据代表感兴趣总体的程度；样本量是否足够大，测量的周期性是否足够等）。 2）一致性：（对数据的选择在分析的各个组成部分是否统一进行的定性评估）。 3) 再现性：（关于方法和数据值的信息允许独立从业者再现研究中报告的结果的程度的定性评估）。 4) 数据来源：（参考数据的主要或次要性质）。 **注 1** 改编自 BS EN ISO 14044:2006, 4.2.3.4.3。 **注 2** 温室气体排放的评估应使用可通过使用可获得的最佳质量数据来尽可能减少偏差和不确定性的数据。数据评分框架可以支持对最佳质量数据的确定，该框架允许组合数据质量的不同属性。
7.3 Primary activity data Primary activity data shall be collected from those processes owned, operated or controlled by the organization implementing this PAS. The primary activity data requirement shall not apply to downstream emission sources. Where the organization implementing this PAS does not contribute 10% or more to the upstream GHG emissions of the product or input prior to its provision to another organization or to the end user, the collection of primary activity data shall apply to the emissions arising from those processes owned, operated or controlled by the organization and any upstream supplier(s) that cumulatively contribute 10% or more to the upstream GHG emissions of the product or input. The 10% contribution figure shall be based on the net emissions excluding any stored carbon that may be released over the 100-year assessment period. Primary activity data shall be collected for individual processes or for premises where processes are occurring and shall be representative of the process for which it is collected. Allocation between co-products, where required, shall be carried out in accordance with **8.1.1**. The requirement to obtain primary activity data shall not apply where implementing the requirement would necessitate the physical measurement of the GHG emissions (e.g. measuring CH4 emissions from livestock or N2O emissions from fertilizer application). ***Note 1*** *Obtaining primary data for operations that are not under the control of the organization implementing the PAS (i.e. upstream emissions) enhances the ability of the organization to differentiate the GHG assessment of its products from other products.*	**7.3 主要活动数据** 主要活动数据应从实施本 PAS 的组织拥有、运营或控制的过程中收集。主要活动数据要求不适用于下游排放源。 如果实施本 PAS 的组织在将产品或输入提供给另一个组织或最终用户之前对上游 GHG 排放的贡献不超过 10%，则主要活动数据的收集应适用于由这些产品或输入产生的排放。由组织和任何上游供应商拥有、运营或控制的过程，这些过程对产品或输入的上游 GHG 排放累积贡献 10% 或更多。 10% 的贡献数字应基于净排放量，不包括在 100 年评估期内可能释放的任何储存碳。 主要活动数据应针对单个过程或发生过程的场所收集，并应代表收集数据的过程。如果需要，联产品之间的分配应按照 8.1.1 进行。 获取主要活动数据的要求不适用于实施要求需要对温室气体排放进行物理测量的情况（例如，测量来自牲畜的 CH4 排放或来自施肥的 N2O 排放）。 **注 1** 获取不受实施 PAS 组织控制的操作的原始数据（即上游排放）可增强组织将其产品的 GHG 评估与其他产品区分开来的能力。

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Note 2 *Where an organization imposes conditions on the supply of products to it, such as a retailer specifying the quality of the product supplied to it or the manner of its packaging, this is evidence of control over the processes upstream of the organization implementing the PAS. In this situation, the requirement for primary activity data applies to the processes upstream of the organization implementing this PAS.*	**注 2**：如果组织对其产品供应施加条件，例如零售商指定提供给它的产品质量或包装方式，则这是对实施 PAS 的组织上游过程进行控制的证据.在这种情况下，对主要活动数据的要求适用于实施该 PAS 的组织的上游流程。
Note 3 *Examples of primary activity data would be the measurement of energy use or material use in a process, or fuel use in transport.*	**注 3** 主要活动数据的示例是对过程中能源使用或材料使用或运输中的燃料使用的测量。
Note 4 *To be representative, primary activity data should reflect the conditions normally encountered in the process that are specific to the product being assessed. For example, if refrigerated storage of a product is required, the primary activity data associated with this refrigeration (e.g. quantity of energy used and quantity of refrigerant escaped) should reflect the long-term operation of the refrigeration and not those associated with a period of typically higher (e.g. August) or lower (e.g. January) energy consumption or refrigerant escape.*	**注 4**：为了具有代表性，主要活动数据应反映在过程中通常遇到的特定于被评估产品的条件。例如，如果需要冷藏储存产品，则与该制冷相关的主要活动数据（例如使用的能量数量和逸出的制冷剂数量）应反映制冷的长期运行，而不是与一段时间相关的数据。通常较高（例如 8 月）或较低（例如 1 月）的能源消耗或制冷剂逸出。
Note 5 *Emissions from livestock, their manure and soils are treated as secondary data (see **7.4**).*	**注 5** 来自牲畜、它们的粪便和土壤的排放被视为次要数据（见 7.4）。
Note 6 *Material input volumes are treated as primary data, provided these inputs undergo a transformation process (i.e. volume of goods handled through retail, wholesale, import/export or repackaging does not qualify as primary activity data for the purposes of the requirement in this clause).*	**注 6** 材料输入量被视为主要数据，前提是这些输入经过转换过程（即通过零售、批发、进出口或重新包装处理的货物量不符合本条款要求的主要活动数据）)。
Note 7 *Where cradle-to-gate emissions assessment information is used for a specific input material and has been included in certification to PAS 2050, It may be assumed that this contains a minimum of 10% primary data for the purpose of this clause. Where the exact proportion of primary data has been communicated, that figure may be used in the assessment.*	**注 7**：如果从摇篮到大门排放评估信息用于特定输入材料并已包含在 PAS 2050 认证中，则出于本条款的目的，可以假定该信息包含至少 10% 的原始数据。如果已经传达了原始数据的确切比例，则可以在评估中使用该数字。
7.4 Secondary data **7.4.1 General** Secondary data shall be used for inputs where primary activity data have not been obtained.	**7.4 辅助数据** **7.4.1 总则** 二级数据应用于尚未获得初级活动数据的输入。
7.4.2 Use of PAS 2050 GHG assessment information as secondary data Where data conforming to the requirements of this PAS (e.g. cradle-to-gate information from a supplier) is available for inputs to the life cycle of the product being assessed, preference shall be given to the use of this data over other secondary data.	**7.4.2 使用 PAS 2050 GHG 评估信息作为辅助数据** 如果符合本 PAS 要求的数据（例如来自供应商的从摇篮到大门的信息）可用于被评估产品的生命周期的输入，则应优先使用该数据而不是其他辅助数据。
7.4.3 Other secondary data Where secondary data in accordance with **7.4.1** is not available, the data quality rules (**7.2**) shall be used to select the most relevant source of secondary data. Determination of the source of the secondary data (see **7.2i)** shall recognize that secondary data arising from competent sources (e.g. national government, official United Nations publications and publications by United Nations-supported organizations, and peer review publications) are preferred over secondary data from other sources. ***Note*** *Reference to the International Reference Life Cycle Data System (ILCD)[2] as a source of secondary data remains under consideration for inclusion in a future revision of this PAS.*	**7.4.3 其他二手资料** 如果 7.4.1 中的辅助数据不可用，则应使用数据质量规则 (7.2) 来选择最相关的辅助数据来源。 二级数据来源的确定（见 7.2i）应承认来自主管来源（例如国家政府、联合国官方出版物和联合国支持组织的出版物以及同行评审出版物）的二级数据优于二级数据 来自其他来源。 **注** 参考国际参考生命周期数据系统 (ILCD)[2] 作为辅助数据的来源仍在考虑中，以包含在本 PAS 的未来修订版中。
7.5 Changes in the life cycle of a product	**7.5 产品生命周期的变化**

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7.5.1 Temporary unplanned change Where an unplanned change to the life cycle of a product results in an increase in the assessment of GHG emissions of more than 10% and is experienced for more than three months, a reassessment of the life cycle GHG emissions associated with the product shall be carried out.	**7.5.1 临时计划外变更** 如果产品生命周期的计划外变更导致温室气体排放评估增加 10% 以上且持续时间超过三个月，则应重新评估与产品相关的生命周期温室气体排放 出去。
7.5.2 Planned change Where a planned change to the life cycle GHG emissions or removals of a product leads to an increase in the assessment result of 5% or greater for a period exceeding three months, a reassessment of the life cycle GHG emissions and removals associated with the product shall be carried out.	**7.5.2 计划变更** 如果产品生命周期 GHG 排放或清除的计划变化导致评估结果在超过三个月的时间内增加 5% 或更多，则应重新评估与产品相关的生命周期 GHG 排放和清除 进行。
7.6 Variability in emissions and removals associated with the product life cycle Where the GHG emissions or removals associated with the life cycle of a product vary over time, data shall be collected over a period of time sufficient to establish the average GHG emissions and removals associated with the life cycle of the product. Where a product is made available on a continuing basis, the assessment of GHG emissions and removals shall be carried out over a period that is characteristic of the long-term production of that product (typically 1 year). Where a product is new (i.e. has been in production for less than 1 year) or where a product is differentiated by time (e.g. seasonal products), the assessment of GHG emissions and removals shall cover the particular period associated with the production of the product under assessment (see **7.2** and **7.5**). ***Note 1*** *The average result should be informed by historic data, where available.* ***Note 2*** *The life cycle GHG emissions of sources of energy, particularly electricity, can vary over time. Where this occurs, data representing the most recent estimate of GHG emissions associated with the energy source should be used.*	**7.6 与产品生命周期相关的排放和清除的可变性** 如果与产品生命周期相关的 GHG 排放或清除随时间变化，则应在一段足以确定与产品生命周期相关的平均 GHG 排放和清除的时间段内收集数据。 如果产品持续可用，则温室气体排放和清除的评估应在该产品长期生产特征的一段时间内（通常为 1 年）进行。如果产品是新产品（即生产时间少于 1 年）或产品按时间区分（例如季节性产品），温室气体排放和清除的评估应涵盖与产品生产相关的特定时期评估中（见 7.2 和 7.5）。 **注 1** 平均结果应根据历史数据（如果有）提供。 **注 2** 能源（尤其是电力）的生命周期温室气体排放可能会随时间变化。如果发生这种情况，应使用代表与能源相关的温室气体排放的最新估算数据。
7.7 Data sampling Where an input to a process arises from multiple sources and emissions and removals data are collected from a representative sample of the sources used in the assessment of GHG emissions and removals for a product, the use of sampling shall conform to the requirements for data quality under **7.2**. ***Note*** *Examples of where data sampling might be appropriate include:* *a) a bank may include data from a representative sample of its branches, rather than from all branches;* *b) a flour mill may include data from a representative sample of grain sources, rather than from all farms that provide it with grain;* *c) where a factory has a number of production lines that produce the same product, it may include data from a representative sample of the production lines.*	**7.7 数据采样** 如果过程的输入来自多个来源，并且排放和清除数据是从用于评估产品的温室气体排放和清除的来源的代表性样本中收集的，则抽样的使用应符合以下数据质量要求 7.2. **注** 可能适合进行数据采样的示例包括： a) 银行可能包括来自其分行的代表性样本的数据，而不是来自所有分行的数据； b) 面粉厂可能包含来自谷物来源的代表性样本的数据，而不是来自为其提供谷物的所有农场的数据； c) 如果工厂有多条生产相同产品的生产线，则可以包括来自生产线代表性样本的数据。
7.8 Non-CO2 emissions data for livestock and soils The estimation of the non-CO2 GHG emissions arising from livestock, their manure or soils shall use whichever of the two approaches yields the highest assessment with reference to the data quality rules specified in **7.2**: a) the highest tier approach set out in the *IPCC Guidelines for National Greenhouse Gas Inventories*, Clause 2; or b) the highest tier approach employed by the country in which the emissions were produced. Where the anticipated emissions from such an input does not make a material difference then a tier 1 approach, or	**7.8 牲畜和土壤的非二氧化碳排放数据** 来自牲畜、牲畜粪便或土壤的非 CO2 温室气体排放量的估算应使用两种方法中的任何一种，参考 7.2 中规定的数据质量规则，得出最高评估： a) IPCC 国家温室气体清单指南第 2 条中规定的最高层方法；要么 b) 排放产生国采用的最高层方法。如果来自此类输入的预期排放不会产生实质性差异，则应使用第 1 层方法或源自排放产生国的国家清单的结果。

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results derived from national inventories of the country in which the emissions were produced, shall be used. ***Note*** *Where organizations implementing this PAS rely on secondary data sources when assessing the GHG emissions arising from livestock, their manure or soils, they should confirm whether the secondary data source includes emissions arising from direct land use change or whether this needs to be calculated separately.*	**注** 如果实施本 PAS 的组织在评估牲畜、粪便或土壤产生的温室气体排放时依赖二级数据源，则应确认二级数据源是否包括直接土地利用变化产生的排放，或者是否需要单独计算。
7.9 Emissions data for fuel, electricity and heat **7.9.1 General** Fuel and energy data shall include: a) the amount of energy used; and b) the average emission factor of the energy input (e.g. kgCO2e/kg fuel, kgCO2e/MJ electricity or heat) based on the source of energy used. The emissions associated with fuel and energy used in the life cycle of a product shall be determined using an emission factor calculated by a method consistent with this PAS and including emissions from fuel inputs and other upstream emissions.	**7.9 燃料、电力和热能的排放数据** **7.9.1 总则** 燃料和能源数据应包括： a) 使用的能源量； 和 b) 基于所用能源的能源输入的平均排放因子（例如 kgCO2e/kg 燃料、kgCO2e/MJ 电或热）。 与产品生命周期中使用的燃料和能源相关的排放应使用通过与本 PAS 一致的方法计算的排放因子确定，包括来自燃料输入的排放和其他上游排放。
7.9.2 Onsite generation of electricity and heat Where electricity and/or heat are generated and used onsite, the emission factor for the electricity and/or heat shall be calculated using the method described in this PAS, including emissions from fuel input and upstream emissions.	**7.9.2 就地发电和供热** 在现场产生和使用电力和/或热力的情况下，电力和/或热力的排放因子应使用本 PAS 中描述的方法计算，包括燃料输入和上游排放的排放。
7.9.3 Offsite generation of electricity and heat Where electricity and/or heat are generated offsite, the emission factor used shall be either: a) for electricity and heat delivered by a stand-alone source (i.e. not part of a larger energy transmission system), the emission factor relevant to that source (e.g. for purchases of heat from third-party CHP), the emission factor calculated in accordance with **8.1** and **8.5**); or b) for electricity and heat delivered via a larger energy transmission system, secondary data that is as specific to the product system as possible (e.g. average electricity supply emission factor for the country in which the electricity is used).	**7.9.3 异地发电和供热** 如果电力和/或热量在场外产生，则使用的排放因子应为： a) 对于由独立来源（即不属于较大能源传输系统的一部分）提供的电力和热量，与该来源相关的排放因子（例如从第三方 CHP 购买热量），在 符合 8.1 和 8.5）； 要么 b) 对于通过更大的能源传输系统传输的电力和热量，尽可能针对产品系统的次要数据（例如，电力使用国的平均电力供应排放因子）。
7.9.4 GHG emissions associated with renewable electricity generation **7.9.4.1 Eligibility of renewable energy-specific emission factors** A renewable energy-specific emission factor shall be applied to a process using renewable energy only where both of the following can be demonstrated. a) The process used the energy (i.e. use of renewable energy generated onsite) or used an equivalent amount of energy of the same type to that generated (i.e. use of renewable energy delivered via an energy transmission network that combines different types of energy generation), and another process did not use the energy generated whilst claiming it as renewable. b) The generation of this renewable energy does not influence the emission factor of any other process or organization using the same type of energy (e.g. renewable electricity) and is excluded from the national average emission factor. Where conditions a) or b) are not met, national average energy emission factors shall be used.	**7.9.4 与可再生能源发电相关的温室气体排放** **7.9.4.1 可再生能源特定排放因子的适用性** 可再生能源特定排放因子应仅适用于使用可再生能源的过程，前提是可以证明以下两项。 a) 该过程使用能源（即使用现场产生的可再生能源）或使用与所产生能源相同类型的等量能源（即使用通过结合不同类型能源的能源传输网络输送的可再生能源） ，另一个过程没有使用产生的能量，同时声称它是可再生的。 b) 这种可再生能源的产生不影响使用相同类型能源（例如可再生电力）的任何其他过程或组织的排放因子，并且被排除在国家平均排放因子之外。 如果不满足条件 a) 或 b)，则应使用国家平均能源排放因子。

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Note 1 *Demonstration that the energy is from a renewable source should be carried out independent of other verifi cation or trading schemes.* ***Note 2*** *In many situations, the emission factor for renewable energy generation is automatically incorporated into the national average energy emission factor. For example, renewable electricity is typically assumed to be a source of zero-emissions electricity in national reporting of electricity emission factors; were a company to claim a low emission factor for the purchase of renewable electricity (e.g. through the purchase of a "green tariff") that was also included in national reporting, double-counting of the low emissions benefit of the electricity would occur. In many countries, methods for reporting the impact of renewable electricity generation on the national emissions factor for electricity are not sufficiently developed to separately account for grid-average and tariff-specific electricity supplies.* ***Note 3*** *In countries where the flow of renewable electricity is accurately accounted for, the requirement allows companies using renewable electricity, or purchasing renewable electricity through a dedicated tariff, to use the GHG emission of the renewable electricity (rather than grid-average carbon intensity) when calculating the emissions arising from their processes.*	**注 1** 能源来自可再生能源的证明应独立于其他验证或交易计划进行。 **注 2** 在许多情况下，可再生能源发电排放因子自动纳入全国平均能源排放因子。例如，在国家电力排放因子报告中，可再生电力通常被假定为零排放电力的来源；如果一家公司为购买可再生电力（例如通过购买"绿色电价"）而申报低排放因子，该因子也包含在国家报告中，则电力的低排放效益将发生重复计算。在许多国家，报告可再生能源发电对国家电力排放因子影响的方法还不够完善，无法单独考虑电网平均和特定关税的电力供应。 **注 3** 在准确核算可再生电力流量的国家/地区，该要求允许使用可再生电力或通过专用关税购买可再生电力的公司使用可再生电力的温室气体排放（而不是电网平均碳强度）在计算其过程产生的排放量时。
7.9.4.2 Emissions from renewable electricity The assessment of emissions and removals from renewable electricity generation shall include those emissions and removals arising within the system boundary specified in **6.4.3** (e.g. where renewable electricity is generated from biomass, the emissions associated with the electricity generation shall include emissions and removals associated with the direct land use change, growing, harvesting, processing, transporting, etc., of the biomass as applicable).	**7.9.4.2 可再生电力的排放** 可再生能源发电的排放量和清除量评估应包括在 6.4.3 规定的系统边界内产生的排放量和清除量（例如，当可再生电力由生物质产生时，与发电相关的排放量应包括与 生物质的直接土地利用变化、生长、收获、加工、运输等（如适用）。
7.9.5 Emissions from biomass and biofuels Emissions and removals arising from the use of biomass (e.g. co-firing of biomass, biodiesel, and bioethanol) shall include the GHG emissions and removals arising from both the production of the fuel and the combustion of the fuel *(***8.2.1).** ***Note 1*** *Where biofuel is produced from waste (e.g. cooking oil after it has been used in a cooking process), the GHG* emissions and removals *arising from the production of the fuel are those arising from the conversion of the waste to fuel.* ***Note 2*** *Where the biofuel is not produced from waste (e.g. biodiesel produced from oilseed rape or palm oil, ethanol produced from wheat, sugar beet, sugarcane or corn), the GHG* emissions and removals *associated with the use of the biofuel include all upstream emissions (see **6.4.3**), including where appropriate direct land use change emissions (see **5.6**) and other emissions and removals.*	**7.9.5 生物质和生物燃料的排放** 使用生物质（例如生物质、生物柴油和生物乙醇的混烧）产生的排放和清除应包括燃料生产和燃料燃烧产生的温室气体排放和清除（8.2.1）。 **注 1** 如果生物燃料是由废物（例如在烹饪过程中使用后的食用油）生产的，则燃料生产产生的温室气体排放和清除是将废物转化为燃料产生的温室气体排放和清除。 **注 2** 如果生物燃料不是由废物生产的（例如油菜籽或棕榈油生产的生物柴油，小麦、甜菜、甘蔗或玉米生产的乙醇），与生物燃料使用相关的温室气体排放和清除包括所有上游排放 （见 6.4.3），包括适当的直接土地利用变化排放（见 5.6）和其他排放和清除。
7.10 Validity of analysis Results obtained from the implementation of this PAS shall be valid for a maximum period of two years, unless there is a change in the life cycle of the product whose GHG emissions are being assessed (see **7.5**), in which situation the validity ceases. ***Note*** *Within the permitted two-year period, the length of time that an analysis is valid varies depending on the characteristics of the life cycle of the product.*	**7.10 分析的有效性** 从实施本 PAS 中获得的结果的有效期最长为两年，除非正在评估其 GHG 排放的产品的生命周期发生变化（见 7.5），在这种情况下，有效性将终止。 **注** 在允许的两年期限内，分析有效的时间长度因产品生命周期的特征而异。
8 Allocation of emissions	8 排放量分配
8.1 General requirements	**8.1 一般要求**

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8.1.1 Allocation to co-products The preferred approach to allocation of emissions and removals to co-products shall be, in order of preference: a) dividing the unit processes to be allocated into two or more sub-processes and collecting the input and output data related to these sub-processes; or b) expanding the product system to include additional functions related to the co-products where: 1) a product that is displaced by one or more of the co-products of the process being considered can be identified; and 2) the avoided GHG emissions associated with the displaced product represent the average emissions arising from the provision of the avoided product. ***Note 1*** *As an example of 2), where a process results in the co-production of electricity that is exported to a larger electricity transmission system, the avoided emissions resulting from this co-production of electricity would be based on the average GHG emissions intensity of grid electricity.* ***Note 2*** *See BS EN ISO 14044:2006, 4.3.4.2(a).* Where neither of these approaches is practicable and where supplementary requirements in accordance with the principles set out in **4.3** have been developed to deal with allocation (e.g. on the basis of physical allocation or mass) in connection with the product being assessed, they should be used. When used, the method should be uniformly applied. Where the approaches in a) and b) are not practicable and applicable supplementary requirements are not available, the GHG emissions and removals arising from the process shall be allocated between the co-products in proportion to their economic value. **8.1.2 Recording allocation assumptions** The applied approach to the allocation of emissions to co-product shall be recorded by the organization implementing this PAS. Where the allocation to co-products is carried out by expanding the product system (**8.1.1b)**), the organization implementing this PAS shall record the assumptions made regarding the scope and emissions of the expanded product system.	**8.1.1 分配给联产品** 将排放量和清除量分配给副产品的首选方法应按优先顺序为： a) 将待分配的单元过程划分为两个或多个子过程，并收集与这些子过程相关的输入和输出数据；要么 b) 扩展产品系统以包括与联产品相关的附加功能，其中： 1) 可以识别被所考虑过程的一种或多种副产品取代的产品；和 2) 与替代产品相关的避免的温室气体排放量代表因提供可避免的产品而产生的平均排放量。 **注 1** 作为 2) 的示例，如果一个过程导致联合生产电力并输出到更大的输电系统，则该联合生产电力产生的避免排放将基于平均温室气体排放强度电网电力。 **注 2** 见 BS EN ISO 14044:2006, 4.3.4.2(a)。 如果这些方法都不可行，并且根据 4.3 中规定的原则制定了补充要求来处理与被评估产品有关的分配(例如，基于物理分配或质量)，则应使用它们.使用时，应统一采用该方法。 如果 a) 和 b) 中的方法不可行且适用的补充要求不可用，则过程产生的 GHG 排放和清除应按其经济价值的比例在联产品之间分配。 **8.1.2 记录分配假设** 实施本 PAS 的组织应记录用于分配副产品排放的应用方法。如果通过扩展产品系统(8.1.1b))进行联产品分配，则实施本 PAS 的组织应记录对扩展产品系统的范围和排放所做的假设。
8.2 Emissions from waste **8.2.1 General allocation principle** Where waste results in GHG emissions (e.g. organic matter disposed of in a landfill), those emissions (CO2 and non-CO2) shall be allocated to the product system that gave rise to the waste. This allocation also applies to methane combusted without the generation of useful energy (i.e. flaring). **8.2.2 Waste combustion with energy recovery** Where waste or fuel derived from waste is combusted to generate useful electricity and/or heat, GHG emissions shall be allocated to the generation of the energy. GHG removals shall also be allocated to the energy generation system.	**8.2 废弃物排放** **8.2.1 一般分配原则** 如果废物导致温室气体排放（例如在垃圾填埋场处置的有机物），则这些排放（CO2 和非 CO2）应分配给产生废物的产品系统。 这种分配也适用于没有产生有用能量（即燃烧）的甲烷燃烧。 **8.2.2 废物燃烧与能量回收** 如果废物或源自废物的燃料燃烧以产生有用的电力和/或热量，则温室气体排放应分配给能源的产生。 温室气体清除量也应分配给能源生产系统。
8.3 Use of recycled material and recycling The method for assessing emissions arising from recycled or recyclable material shall be as specified in **Annex D**.	**8.3 回收材料的使用和回收** 评估回收或可回收材料产生的排放的方法应符合附录 D 的规定。

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8.4 Treatment of emissions associated with reuse Where a product is reused, the GHG emissions per instance of use or reuse shall be assessed on the basis of: $$\text{GHG emissions} = \frac{a+f}{b} + c + d + e$$ where: *a* is the total life cycle GHG emissions of the product, excluding use-phase emissions; *b* is the anticipated number of reuse instances for a given product; *c* is emissions arising from an instance of refurbishment of the product to make it suitable for reuse (e.g. recovering and sterilising a glass bottle); *d* is emissions arising from the use phase; *e* is emissions arising from transport returning the product for reuse; *f* is emissions arising from disposal. ***Note*** *This is a simplified treatment of reuse assuming a steady state and more sophisticated modelling should be used where data is available to take account of changing demand patterns and losses in the system.*	**8.4 与再利用相关的排放处理** 如果产品被重复使用，每次使用或重复使用的温室气体排放量应根据以下因素进行评估： 温室气体排放量= (a+f)/b+c+d+e 其中： a 是产品的全生命周期温室气体排放量，不包括使用阶段的排放量； b 是给定产品的预期重用实例数； c 是对产品进行翻新以使其适合再利用而产生的排放 （例如回收和消毒玻璃瓶）； d 是使用阶段产生的排放量； e 是运输返回产品以供再利用所产生的排放； f 是处置产生的排放量。 **注** 这是一种简化的重用处理，假设处于稳定状态，并且在数据可用的情况下应使用更复杂的建模，以考虑不断变化的需求模式和系统中的损失。
8.5 Emissions from energy production using CHP Where energy production from CHP is exported to a larger system (e.g. export of electricity to a national electricity network), the avoided GHG emissions arising from the exported energy shall be allocated in accordance with **8.1.1** (i.e. the avoided emissions resulting from the co-production of electricity would be based on the average GHG emissions intensity of grid electricity). Where some or all of the heat and electricity production from CHP is used by more than one process, the emissions arising from CHP, less any avoided burden calculated in **8.1.1**, shall be allocated between the heat and electricity used. The allocation shall be carried out in proportion to the amount of useful energy delivered in each form, multiplied by the intensity of GHG emissions associated with each unit of useful energy delivered as heat and electricity. The intensity of GHG emissions shall be: a) for boiler-based CHP systems (e.g. coal, wood, solid fuel) – emissions per MJ electricity: emissions per MJ heat in the ratio of 2.5:1; b) for turbine-based CHP systems (e.g. natural gas, landfill gas) – emissions per MJ electricity: emissions per MJ heat in the ratio of 2.0:1. Where other forms of CHP are used, the organization implementing this PAS shall identify the emissions ratios for the various types of energy from the particular system under assessment. ***Note*** *The allocation of emissions to heat and electricity arising from CHP relies on the process-specific ratio of heat to electricity arising from each CHP system. For example, where a boiler-based CHP system delivers useful energy in the electricity: heat ratio of 1:6, 2.5 units of emissions would be allocated to each unit of electricity, and 1 unit of emission would be allocated to each unit of heat delivered by the CHP system. In this example, while the CHP system had a useful electricity: heat ratio of 1:6, the corresponding GHG emissions ratio was 2.5:6. These results will change with different electricity: heat characteristics of the CHP system.*	**8.5 使用 CHP 能源生产的排放** 如果 CHP 生产的能源输出到更大的系统（例如向国家电网输出电力），则输出能源产生的避免的 GHG 排放应按照 8.1.1 进行分配（即，co 产生的避免的排放）。 -电力生产将基于电网电力的平均温室气体排放强度）。 如果热电联产的部分或全部热电生产用于多个过程，则热电联产产生的排放量减去 8.1.1 中计算的任何避免的负担，应在所使用的热电之间分配。分配应按每种形式提供的有用能源的数量乘以与每单位以热能和电力形式提供的有用能源相关的温室气体排放强度成比例进行。温室气体排放强度应为： a) 对于基于锅炉的 CHP 系统（例如煤、木材、固体燃料）——每 MJ 电力的排放量：每 MJ 排放量热量比例为 2.5:1； b) 对于基于涡轮的 CHP 系统（例如天然气、垃圾填埋气）——每 MJ 电力的排放量：每 MJ 热量的排放量，比例为 2.0:1。 当使用其他形式的 CHP 时，实施本 PAS 的组织应确定来自被评估的特定系统的各种类型能源的排放比率。 **注** CHP 产生的热量和电力的排放分配取决于每个 CHP 系统产生的特定过程的热量与电力的比率。例如，如果基于锅炉的 CHP 系统在电热比为 1:6 的情况下提供有用的能量，则每单位电力将分配 2.5 单位排放，每单位热量将分配 1 单位排放由 CHP 系统提供。在这个例子中，虽然 CHP 系统的有用电热比为 1:6，但相应的温室气体排放比为 2.5:6。这些结果会随着不同的电：热电联产系统的热特性而变化。
8.6 Emissions from transport	**8.6 交通排放**

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Where more than one product is being transported by a transport system (e.g. truck, ship, aircraft, train), the emissions arising from the transport system shall be divided amongst the products on the basis of: a) where mass is the limiting factor for the transport system, the relative mass of the different products being transported; or b) where volume is the limiting factor for the transport system, the relative volume of the different products being transported. Transport emissions shall include the emissions associated with the entire delivery journey from source to delivery point and back, including those arising from any portion of the journey that products were not being transported (e.g. as in a delivery by road in which the delivery vehicle makes the return trip empty). Where return journeys are used to transport other products, the emissions from those journeys shall be allocated to the products transported on the return journey.	如果一个运输系统（例如卡车、轮船、飞机、火车）运输不止一种产品，则运输系统产生的排放应根据以下各项在产品中分配： a) 当质量是运输系统的限制因素时，运输的不同产品的相对质量； 要么 b) 当体积是运输系统的限制因素时，被运输的不同产品的相对体积。 运输排放应包括与从源头到交货点再返回的整个运输过程相关的排放，包括产品未运输的任何旅程部分产生的排放（例如，在公路运输中，运输车辆在 回程空）。 回程用于运输其他产品的，这些旅程的排放应分配给回程运输的产品。
9 Calculation of the GHG emissions of products	9 产品温室气体排放量计算
This PAS requires that both emissions to the atmosphere and removals from the atmosphere be taken into account in calculating the total GHG emissions of a product over its lifecycle. The following method shall be used to calculate the GHG emissions per functional unit of the product under assessment. 1) Determine the emissions and removals for each activity within the system boundary as primary activity data or secondary data, with emissions included as positive values and removals included as negative values. 2) Convert the primary activity data and secondary data to GHG emissions and removals per functional unit of the product under assessment by multiplying the data by the emission factor for each activity. 3) Convert the GHG emissions and removals data into units of CO2e by multiplying the individual GHG emissions or removals figures by the relevant GWP. 4) Calculate the overall impact of carbon storage associated with the product in accordance with **5.5.1** expressed as CO2e (**5.3**) and recorded in accordance with **5.5.2**. 5) Sum the CO2e emissions and removals occurring in the life cycle of the product under assessment (taking account of the impact of carbon storage), to determine the net CO2e emissions (negative or positive) per functional unit. The result shall be unambiguously expressed as cradle-to-gate or cradle-to-grave.	本 PAS 要求在计算产品在其生命周期内的温室气体排放总量时，同时考虑向大气中的排放量和从大气中的清除量。以下方法用于计算被评估产品的每个功能单元的温室气体排放量。 1) 确定系统边界内每项活动的排放量和清除量作为主要活动数据或次要数据，排放量包括为正值，清除量包括为负值。 2) 通过将数据乘以每个活动的排放因子，将初级活动数据和次级数据转换为被评估产品的每个功能单位的温室气体排放量和清除量。 3) 通过将单个 GHG 排放或清除数据乘以相关 GWP，将 GHG 排放和清除数据转换为 CO2e 单位。 4) 根据 5.5.1 计算与产品相关的碳储存的总体影响，表示为 CO2e (5.3) 并根据 5.5.2 记录。 5) 将评估产品生命周期中发生的 CO2e 排放量和清除量相加（考虑碳储存的影响），以确定每个功能单元的净 CO2e 排放量（负或正）。结果应明确表示为从摇篮到大门或从摇篮到坟墓。
10 Claims of conformity	10 符合性声明
10.1 General While this PAS does not require external disclosure or public communication of the assessment, where claims of conformity to PAS 2050 are made the provisions in **10.2** and **10.3** shall apply. These provisions include identification of the type of certification/verification undertaken (**10.2**) and requirements for how the claim shall be expressed (**10.3**). ***Note*** *Organizations seeking to make a claim should ensure the overall representation of the claim is accurate, clear and not misleading, to comply with international and national regulations on consumer protection. Further international guidance, standards and regulations on communication of environmental claims are available to assist organizations in this area and include:* *• The international standard on self-declared environmental claims, BS EN ISO/IEC 14021;* • The European Commission Guidance for Making and Assessing Environmental Claims*; and*	**10.1 总则** 虽然本 PAS 不要求评估的外部披露或公开交流，但在声明符合 PAS 2050 的情况下，10.2 和 10.3 中的规定应适用。这些规定包括确定所进行的认证/验证类型 (10.2) 以及如何表达声明的要求 (10.3)。 **注** 寻求提出声明的组织应确保声明的整体表述准确、清晰且没有误导性，以符合国际和国家消费者保护法规。有关环境声明交流的进一步国际指南、标准和法规可用于协助该领域的组织，包括： • 自我声明环境声明的国际标准，BS EN ISO/IEC 14021； • 欧盟委员会提出和评估环境声明的指南；和

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• Guidelines on the EU Unfair Commercial Practices Directive. *National government guidelines are also available in some countries e.g.:* • UK Department of Environment Food and Rural Affairs Green Claims Guidance (http://www.defra.gov.uk/environment/economy/products-consumers/greenclaims-labels); • The UK Code of Non-Broadcast Advertising, Sales Promotion and Direct Marketing (CAP code) and Code of Broadcast Advertising (BCAP); • US Federal Trade Commission Green Guides (http://www.ftc.gov/opa/reporter/greengds.shtm • Canadian Competition Bureau: Environmental Claims– a guide for industry and advertisers (http://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/02701.html) • Green Marketing and Australian Consumer Law (http://www.accc.gov.au/content/index.phtml/itemId/815763) • NZ Commerce Commission guidelines on green marketing and carbon claims: (http://www.comcom.govt.nz/green-marketing-and-carbon-claims /)	• 关于欧盟不公平商业行为指令的指南。某些国家/地区也提供国家政府指南，例如： • 英国环境部食品和农村事务部绿色声明指南（http://www.defra.gov.uk/environment/economy/products-consumers/greenclaims-labels）； • 英国非广播广告、促销和直销守则（CAP 守则）和广播广告守则（BCAP）； • 美国联邦贸易委员会绿色指南（http://www.ftc.gov/opa/reporter/greengds.shtm • 加拿大竞争局：环境声明——行业和广告商指南（http://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/02701.html） • 绿色营销和澳大利亚消费者法（http://www.accc.gov.au/content/index.phtml/itemId/815763） • 新西兰商务委员会关于绿色营销和碳声明的指南：(http://www.comcom.govt.nz/green-marketing-and-carbon-claims /)
10.2 Basis of claim **10.2.1 General** The claim shall identify the type of conformity assessment undertaken as one of the following: a) independent third-party certification in accordance with **10.2.2**; b) other-party verification in accordance with **10.2.3**; or c) self-verification in accordance with **10.2.4**. **10.2.2 Independent third-party certification** Organizations seeking to demonstrate that their calculations of GHG emissions have been independently verified as being in accordance with this PAS shall undergo assessment by an independent third-party certification body accredited to provide assessment and certification to this PAS. **10.2.3 Other-party verification** Organizations using an alternative method of verification involving parties other than those qualifying as accredited independent third-parties shall satisfy themselves that any such party is able to demonstrate compliance with recognized standards setting out requirements for certification bodies. ***Note 1*** *Other-party assessment bodies are those undertaking assessment services without having achieved accreditation from the authorized accreditation service (e.g. UKAS in the UK). Such bodies could include those which, although independent of the organization undertaking the assessment of GHG emissions and removals, cannot demonstrate complete independence, e.g. a trade body providing assessment services for its members or a consultant employed for such a purpose).* ***Note 2*** *Examples of such recognized standards include BS EN ISO/IEC 17021 and BS EN 45011.* **10.2.4 Self-verification** Organizations shall be able to demonstrate that the calculations have been made in accordance with this PAS, and make supporting documentation available on request. The appropriate method for self-verification and for presentation of the results shall be through the application of BS EN ISO 14021. ***Note*** *Organizations for whom neither independent third-party certification nor other-party verification is a realistic option, may rely on self-verification. In so doing, organizations should be aware that independent verification could be required in the event of challenge and that consumers could have less confidence*	**10.2 索赔依据** **10.2.1 总则** 索赔应确定符合性评估的类型为以下之一： a) 符合 10.2.2 的独立第三方认证； b) 按照 10.2.3 的其他方验证；要么 c) 按照 10.2.4 进行自我验证。 **10.2.2 独立第三方认证** 寻求证明其温室气体排放计算已根据本 PAS 进行独立验证的组织应接受独立的第三方认证机构的评估，该机构获得认可为本 PAS 提供评估和认证。 **10.2.3 其他方验证** 使用替代验证方法的组织应使自己确信，任何此类方都能够证明符合规定认证机构要求的公认标准。 **注 1** 其他方评估机构是指在未获得授权认可服务机构（例如英国的 UKAS）认可的情况下开展评估服务的机构。这些机构可以包括那些虽然独立于进行温室气体排放和清除评估的组织，但不能证明完全独立的机构，例如：为其成员提供评估服务的贸易机构或为此目的雇用的顾问）。 **注 2** 此类公认标准的示例包括 BS EN ISO/IEC 17021 和 BS EN 45011。 **10.2.4 自我验证** 组织应能够证明计算是根据本 PAS 进行的，并应要求提供支持文件。自我验证和结果呈现的适当方法应通过应用 BS EN ISO 14021。 **注** 对于独立第三方认证和其他方验证都不是一个现实选择的组织，可以依赖自我验证。这样做时，组织应该意识到在遇到挑战时可能需要独立验证，并且消费者可能对这个选项缺乏信心。

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in this option.	
10.3 Permitted forms of disclosure Claims of conformity shall use the appropriate form of disclosure, as follows: a) For claims of conformity based on independent third-party certification in accordance with **10.2.2**: “Greenhouse gas emission calculated by ***[insert unambiguous identification of the claimant]*** in accordance with PAS 2050**, *[insert unambiguous identification of the certifying body]*** certified.” b) For claims of conformity based on other-party assessment in accordance with **10.2.3**: “Greenhouse gas emission calculated by ***[insert unambiguous identification of the claimant]*** in accordance with PAS 2050, ***[insert unambiguous identification of the validating body]*** declared.” c) For claims of conformity based on self-verification in accordance with **10.2.4**: “Greenhouse gas emission calculated by ***[insert unambiguous identification of the claimant]*** in accordance with PAS 2050, self-declared.”	**10.3 允许的披露形式** 符合性声明应使用适当的披露形式，如下所示： a) 对于根据 10.2.2 的基于独立第三方认证的符合性声明： “根据 PAS 2050 由**[插入索赔人的明确标识]**计算的温室气体排放，**[插入认证机构的明确标识]**认证。” b) 对于根据 10.2.3 的基于其他方评估的符合性声明： “根据 PAS 2050 计算的温室气体排放量**[插入索赔人的明确标识]**，声明**[插入验证机构的明确标识]**。” c) 对于基于 10.2.4 自我验证的符合性声明： “根据 PAS 2050，由**[插入明确的索赔人身份]**计算的温室气体排放量，自我声明。”