

## Glossary of Terms - Product Related Terms

August 11, 2013

**The terms in this glossary have been categorized based on their relevance to products or whole building. In ‘Product Related Terms’, terms that relate to the creation, performance, and composition of a product may be found. This section includes terms that are often used to describe and measure environmental impacts throughout the entire lifetime (origins, manufacturing, use, and end-of-life) of a product. As well, this category includes a list of chemical compounds with demonstrated adverse affects to human and ecological health.**

Terms from:

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## Product Related Terms

**Acidification:** An acid is a chemical that can produce hydrogen ions (H<sup>+</sup>, also called a 'proton') when it meets water. Hydrogen ions are highly reactive and can cause other substances to change their composition and their physical properties. When acidic gases react with rain ('acid rain') or water in the soil, the process is known as acid deposition.

**Biodegradable:** Substances capable of being decomposed by natural biological processes; the ability of a substance to be broken down physically and/or chemically by microorganisms to elements found in nature. For example, many chemicals, food scraps, cotton, wool, and paper are biodegradable; plastics and polyester generally are not.

**By-Product:** Materials, other than the intended product, generated as a result of an industrial process.

**Carbon Dioxide (CO<sub>2</sub>):** The greenhouse gas whose concentration is being most affected directly by human activities. CO<sub>2</sub> also serves as a reference to compare all other greenhouse gases. The major source of CO<sub>2</sub> emissions is fossil fuel combustion. Atmospheric concentrations of CO<sub>2</sub> have been increasing at a rate of about 0.5% per year and are now about 30% above preindustrial levels.

**Carbon Sequestration:** The removal and long-term storage of carbon dioxide from the atmosphere through the use of natural carbon sinks. One example of carbon sequestration can be seen in forests where atmospheric carbon is sequestered into increasing plant biomass.

**Carbon Sinks:** Carbon reservoirs and conditions that take in and store more carbon (carbon sequestration) than they release. Carbon sinks can serve to partially offset greenhouse gas emissions. Forests and oceans are the best known carbon sinks on the earth.

**Chain-of-Custody (COC):** A document that tracks the movement of a wood product from the forest to a vendor and is used to verify compliance with Forest Stewardship Council guidelines. A "vendor" is defined as the company that supplies wood products to project contractors or subcontractors for on-site installation.

**Characterised profile:** the amount of impact in each of the environmental impact categories. Many different emissions can contribute to each impact category. The different emissions in each category are converted into the amount of reference substance needed to give the same effect. Each category has its own reference substance, e.g. CO<sub>2</sub> is the reference substance for Climate Change, and the amounts of any Green House gases in the Inventory Table are converted to the amount of CO<sub>2</sub> needed to cause the same effect. The impact categories are in different units and the values cannot be compared.

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**Chlorofluorocarbons (CFCs):** CFCs are chemicals manufactured from hydrocarbons, such as methane, chlorine, fluorine, or bromine. Hydrocarbons used as refrigerants that deplete the stratospheric ozone layer.

**Closed-Loop Recycling:** Reclaiming or reusing wastewater for non-potable purposes in an enclosed process. OR Recycling in which products at the end of useful life are used as a resource to remanufacture the same product.

**Composite Wood:** A product consisting of wood or plant particles or fibers bonded together by a synthetic resin or binder (that is, plywood, particle-board, oriented strand board (OSB), medium density fiberboard (MDF), composite door cores.)

**Compostable:** Material that breaks down completely to humus, which is a nutrient packed soil substance important to overall soil health. The main difference between biodegradable and compostable is the quality of the resulting humus. Compostable materials usually are required to degrade to useable and uncontaminated humus that requires no additional treatment.

**Dose:** Refers to the amount of a chemical absorbed into the body from an exposure to that chemical.

**Ecotoxicity (to freshwater and land):** The impact on aquatic and terrestrial ecosystems from water-borne toxic substances. Toxicity can be either acute or chronic. Ecotoxicity potentials typically are calculated with a toxicity model, USES-LCA, which is based on EUSES, the European Union's toxicity model. This provides a method for describing fate, exposure and the effects of toxic substances on the environment.

**Embodied Energy:** Energy used during the entire life cycle of the product for extraction, manufacturing, transporting, and, sometimes, disposing of the product, as well as the inherent energy captured within the product itself.

**Emission:** The release or discharge of a substance into the environment. Generally refers to the release of gases or particulates into the air.

**Emissivity:** The ratio of the radiation emitted by a surface to the radiation emitted by a blackbody at the same temperature.

**Endocrine Disruptor:** Compounds that mimic, block, or interfere with hormone production, and/or metabolism and/or excretion causing malfunction of the endocrine system and creates potential malfunction/s of the reproductive and/or nervous, and/or immune systems.

**Environmental impact category:** environmental issue being examined, e.g. Climate Change, Acid Deposition and Human Toxicity to Air. Usually used for LCA.

**Environmental Label, Environmental Declaration:** Claim which indicates the environmental aspects of a product or service. An environmental label or declaration may take the form of a

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statement, symbol or graphic on a product or package label, in product literature, in technical bulletins, in advertising or in publicity, amongst other things.

**Functional unit:** the materials needed to achieve the desired purpose (function). For LCA.

**Environmentally Preferable Purchasing (EPP):** A United States federal-wide program (Executive Order 13101) that encourages and assists executive agencies in the purchasing of Environmentally Preferable Products and Services.

**Eutrophication:** Plants need nitrates and phosphates to grow. However the success and balance of ecosystems are very sensitive to the amount of these nutrients (many plants need a low-nutrient environment). If the amount of nutrients becomes too high, eutrophication (over 'nutrification') occurs, and the ecosystem collapses.

**Extended Producer Responsibility (EPR):** Extended Producer Responsibility (EPR) is a mandatory type of product stewardship that includes, at a minimum, the requirement that the producer's responsibility for their product extends to post-consumer management of that product and its packaging. There are two related features of EPR policy: (1) shifting financial and management responsibility, with government oversight, upstream to the producer and away from the public sector; and (2) providing incentives to producers to incorporate environmental considerations into the design of their products and packaging.

**Fly ash:** The fine ash waste collected from the flue gases of coal combustion, smelting, or waste incineration.

**Forest Stewardship Council (FSC):** An internationally recognized non-profit organization supporting sustainable, economically viable and socially beneficial management of forestry. Certification by FSC means the timber has Chain of Custody - verification the extraction source of the timber was an FSC certified forest that meets the Principles and Criteria of Forest Stewardship.

**Fossil Fuel Depletion:** A life cycle analysis indicator category related to the use of fossil fuels. Fossil fuels provide a valuable source of energy and feedstock for materials such as plastics. Although there are alternatives, these are only able to replace a small proportion of our current use. Fossil fuels are a finite resource and their continued consumption will make them unavailable for use by future generations.

**Greenhouse Gas (GHG):** Gases such as carbon dioxide, methane, and chlorofluorocarbons (CFCs) that are relatively transparent to the higher-energy sunlight, but trap lower-energy infrared radiation.

**Greenwash:** Disinformation disseminated by an organization so as to present an environmentally responsible public image.

**Halon:** Bromine-containing compounds with long atmospheric lifetimes whose breakdown in the stratosphere causes depletion of ozone.

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**Heavy Metals:** Arsenic, barium, cadmium, chromium, cobalt, lead, manganese, mercury, selenium, zinc. Pigments in paints, inclusions in many, many products. Toxic to highly-toxic.

**Human Toxicity (through air, soil, water):** The impact on human health from toxic substances. Toxicity can be either acute or chronic. Characterization factors, expressed as Human Toxicity Potentials (HTP), are typically calculated using USES-LCA, as with Ecotoxicity, which describes fate, exposure and effects of toxic substances for an infinite time horizon.

**Hydrochlorofluorocarbons (HCFCs, hydrogenated chlorofluorocarbons):** Chemical compounds less destructive to ozone, they are a substitute for CFCs, although less efficient as refrigerants and sometimes quite toxic.

**Industrial Waste:** Unwanted materials produced in or eliminated from an industrial operation and categorized under a variety of headings, such as liquid wastes, sludge, solid wastes, and hazardous wastes.

**Infrared or Thermal Emittance:** A parameter between 0 and 1 (or 0% and 100%) that indicates the ability of a material to shed infrared radiation (heat). The wavelength range for this radiant energy is roughly 3 to 40 micrometers. Most building materials (including glass) are opaque in this part of the spectrum, and have an emittance of roughly 0.9.

**Information Module:** compilation of data to be used as a basis for a Type III environmental declaration, covering a unit process or a combination of unit processes that are part of the life cycle of a product.

**Input:** material or energy that enters a unit process (can include raw materials and intermediate products).

**Intermediate products:** material that has already been processed before being used to produce the final product.

**LC/LD Toxicity:** LC50 (lethal concentration) is the concentration of a material in the atmosphere that will kill 50% of an animal population in a specific time period. LD50 (lethal dose) is the single dose of a toxic substance taken in by any route other than inhalation that will cause the death of 50% of an animal population.

**Life cycle:** consecutive and interlinked stages of a product system from raw material acquisition or generation of natural resources to the final disposal.

**Life cycle assessment (LCA):** compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle.

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**Life Cycle Cost (LCC) Method:** A technique of economic evaluation that sums over a given study period the costs of initial investment (less resale value), replacements, operations (including energy use), and maintenance and repair of an investment decision (expressed in present or annual value terms).

**Material Safety Data Sheet (MSDS):** Printed material concerning a hazardous chemical, or extremely hazardous substance, including its physical properties; hazards to personnel; fire and explosion potential; safe handling recommendations; health effects; fire fighting techniques; reactivity, and proper disposal.

**Mineral Resource Extraction:** The extraction of virgin abiotic material; e.g. extraction of aggregates, metal ores, minerals, earth. In life cycle analysis, the mineral resource extraction indicator is based on the Total Material Requirement (TMR) indicators developed by the Wuppertal Institute, based on earlier work from the World Resources Institute.

**Minimized or Minimization:** Measures or techniques that reduce the amount of wastes generated during industrial production processes; this term also is applied to recycling and other efforts to reduce the volume of waste going into landfills. This term is interchangeable with waste reduction and waste minimization.

**Non-renewable resource:** Resource that exists in a fixed amount that cannot be replenished on a human time scale.

**Off-gassing:** The emission of volatile organic compounds (VOCs) from synthetic and natural products. See volatile organic compounds (VOCs) for more information.

**Output:** material or energy that leaves a unit process (may include raw materials, intermediate products, products, emissions and waste).

**Phthalates:** Plasticizers in a range of plastics, up to 50% content, pseudo-estrogens, endocrine disruption, moderately persistent environmental poisons. Higher risk to children. Have been shown to have pseudo-estrogenic effects in humans and other mammals. They are volatile compounds emitted by common materials sources such as vinyl fabric, floors, toys, etc. as they evaporate slowly at room temperatures.

**Photochemical Ozone Depletion:** When ozone is created in the Earth's lower atmosphere (troposphere), smog can be created. The creation of ozone happens when volatile organic compounds (VOCs) react to sunlight, a process known as photo-oxidation. The speed of low-level ozone creation is affected by the presence of nitrogen oxides (NOx).

**Photovoltaic (PV):** Composite materials that convert sunlight directly into electrical power.

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**Post-Consumer Material:** Waste material generated by households or by commercial, industrial, and institutional facilities in their role as end-users of the product, that can no longer be used for its intended purpose. This includes return of materials from the distribution chain.

**Post-Consumer Recycled Content:** Percentage of post-consumer material, by weight, incorporated into the product.

**Pre-Consumer Material (previously referred to as Post-Industrial):** Material diverted from the waste stream during the manufacturing process. Excluded is reutilization of materials such as rework, re-grind or scrap generated in a process and capable of being reclaimed within the same process that generated it.

**Pre-Consumer Recycled Content:** Percentage of pre-consumer material, by weight, incorporated into the product.

**Primary energy:** gross energy in the primary fuels extracted from resource stocks. “Stock within the earth” needs definition and is sometimes used to mean materials used for fuel that cannot be renewed, i.e. ‘fossil fuels’.

**Product category:** Group of construction products that fall into a specific group or category based on their functions.

**Product category rules (PCR):** Set of specific rules, requirements and guidelines for developing Type III environmental declarations for one or more product categories.

**Product Stewardship:** Product Stewardship is the act of minimizing health, safety, environmental and social impacts, and maximizing economic benefits of a product and its packaging throughout all lifecycle stages. The producer of the product has the greatest ability to minimize adverse impacts, but other stakeholders, such as suppliers, retailers, and consumers, also play a role.

**Polyvinyl chloride (PVC):** In its plasticized form PVC contains a range of softeners including a range of chemicals known as phthalates. There are upstream environmental issues and downstream disposal issues as very few recycling opportunities exist. Issues mostly surround problematic and persistent chlorinated organic compounds.

**Rapidly Renewable Materials:** Material considered to be an agricultural product, both fiber and animal, that takes ten years or less to grow or raise, and to harvest in an ongoing and sustainable fashion. Rapidly renewable materials include products made from bamboo, cotton, flax, jute, straw, sunflower seed hulls, vegetable oils, wheat, or wool.

**Raw materials:** unprocessed material that is used to produce a product.

**Reduce:** A strategy to lessen or minimize material use or to use materials more efficiently.

**Reference substance:** substance that is used to calculate how much of this substance would be needed to give the same environmental impact as each of the many substance contributing

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to an environmental impact category. For example, carbon dioxide (CO<sub>2</sub>) is the reference substance for Climate Change (CC100), so all the other gases contributing to Climate Change are converted into the amount of CO<sub>2</sub> that would be needed to give the amount of Climate Change that each different gas would cause, e.g. 1 kg of methane causes 23 times as much Climate Change as CO<sub>2</sub> (for the 100-year timeframe), so 1 kg methane is equivalent to 23 kg of CO<sub>2</sub>.

**Renewable resource:** Resource that is grown, naturally replenished or cleansed on a human time scale. For example, trees in forests, grasses in grasslands and fertile soil. A renewable resource is capable of being exhausted, but may last indefinitely with proper stewardship.

**Regionally Manufactured Materials:** A product that is manufactured within a defined distance (usually defined by a green standard) to the construction site.

**Regionally Extracted, Harvested, or Recovered Materials:** A product that from cradle to gate is from a set distance (based on a varying standards) of the project site.

**Reuse:** A strategy to return materials to active use in the same or a related capacity.

**R-value:** A unit of thermal resistance used for comparing insulating values of different materials; the higher the R-value, the greater its insulating properties.

**Salvaged Materials:** Construction materials recovered from existing buildings or construction sites and reused in other buildings. Common salvaged materials include structural beams and posts, flooring, doors, cabinetry, brick, and decorative items.

**Sealant:** Any material with adhesive properties that is formulated primarily to fill, seal, or waterproof gaps or joints between two surfaces. Sealants include sealant primers and caulks.

**Solar Reflectance (Albedo):** The ratio of the reflected solar energy to the incoming solar energy over wavelengths of approximately 0.3 to 2.5 micrometers. A reflectance of 100% means that all of the energy striking a reflecting surface is reflected back into the atmosphere and none of the energy is absorbed by the surface.

**Solar Reflectance Index (SRI):** A measure of a material's ability to reject solar heat, as shown by a small temperature rise. It is defined so that a standard black (reflectance 0.05, emittance 0.90) is 0 and a standard white (reflectance 0.80, emittance 0.90) is 100.

**Stratospheric Ozone Depletion:** The ozone layer is part of Earth's upper atmosphere (stratosphere). Loss of ozone in this layer creates the 'ozone hole' and increases the intensity of ultra violet (UV) energy in sunlight that is able to penetrate the atmosphere.

**Suspended Solids (SS):** The concentration of suspended solids represents the amount of insoluble organic and inorganic particles in the wastewater, which increase water turbidity and demand for oxygen through the slow hydrolysis rate of the organic fraction of the material.

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**Sustainable Forestry:** The practice of managing forest resources to meet the long-term forest product needs of humans while maintaining the biodiversity of forested landscapes. The primary goal is to restore, enhance, and sustain a full range of forest values, economic, social, and ecological.

**Third Party:** person or body that is recognized as being independent of the parties involved, as concerns the issues in question. "Parties involved" are usually supplier ("first party") and purchaser ("second party") interests.

**Toxicity:** The ability of a chemical to produce adverse effects in living organisms, i.e. damage an organ system, to disrupt a biochemical process, or to disturb an enzyme system.

**Toxic Substance:** A chemical or mixture that can cause illness, death, disease, or birth defects. The quantities and exposures necessary to cause these effects can vary widely. Many toxic substances are pollutants and contaminants in the environment.

### **Type III environmental declaration / environmental product declaration (EPD) /**

**Environmental Profiles:** Environmental declaration providing quantified environmental data using predetermined parameters and, where relevant, additional environmental information. The predetermined parameters are based on the ISO 14040 series of standards, which is made up of ISO 14040:2006 and ISO 14044:2006.

**Type III Environmental Declaration Program:** voluntary program for the development and use of Type III environmental declarations, based on a set of operating rules.

**Urea Formaldehyde:** A combination of urea and formaldehyde that is used in some glues and may emit formaldehyde at room temperature.

**U-value:** U-value represents the rate of air-to-air heat transfer, in watts, through a 1m<sup>2</sup> area of the building element, when there is a temperature difference of 1 degrees Celsius between the air on either side of the particular building element.

**Visible Light Transmittance (Tvis):** The ratio of total transmitted light to total incident light. In other words, it is the amount of visible spectrum (380 - 780 nanometers) light passing through a glazing surface divided by the amount of light striking the glazing surface. A higher Tvis value indicates that a greater amount of visible spectrum incident light is passing through the glazing.

**Volatile Organic Compounds (VOCs):** Organic compounds with a boiling point between 50°C and 260°C or a vapour pressure more than 0.1mm Hg 25 C. Examples of VOCs include benzene, toluene, chlorofluorocarbons (CFCs), halons, formaldehyde, carbon tetrachloride and some pesticides.

**Water Extraction:** The abstraction of water from sources such as rivers, reservoirs and aquifers. Water extraction can cause depletion, disruption, and/or pollution of water sources.

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