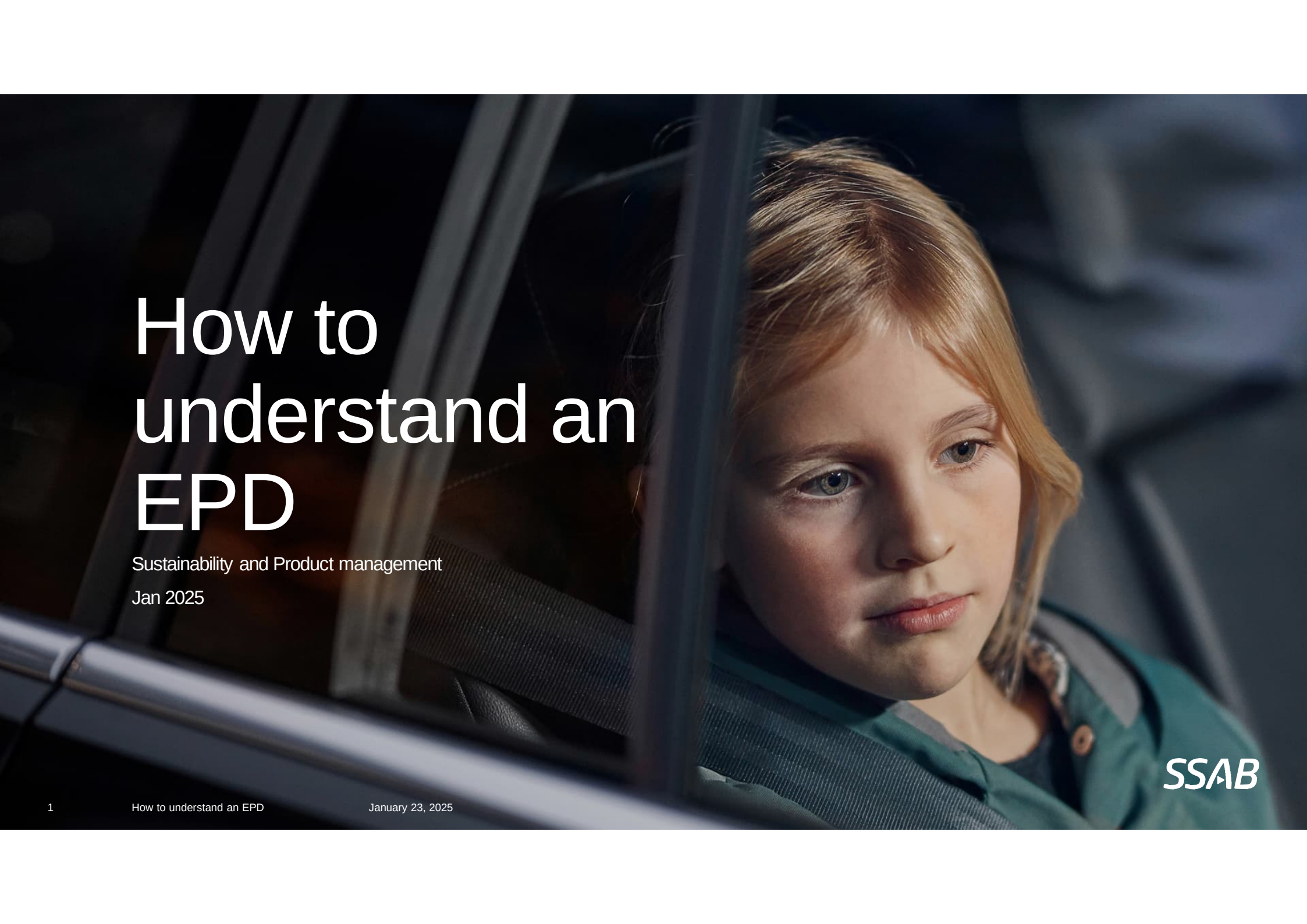




How to understand an EPD

Sustainability and Product management

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Summary

- The environmental impact from LCA modules A1-A3 (cradle to gate) represents the values that customers can use as input for their own EPDs.
- When comparing steel products, **GWP-total** is a useful reference.
 - Comparison between products should be made for LCA modules **A1-A3** (see picture).
- **GWP-total** is the sum of GWP-fossil + GWP-biogenic + GWP-luluc.
 - For steel products GWP-fossil and GWP-total is roughly the same.
- When comparing EPDs created according to EN 15804:2012+A2:2019 with those based on the old standard (EN 15804:2012+A1:2013), **GWP-fossil** should be used as a reference for GWP.
- The indicator SM (secondary material) measures the amount of previously used material or waste from outside the product system (excluding internal scrap) that replaces primary materials. The indicator does not measure the recycled content of the product itself, as it excludes internal scrap; instead, it quantifies pre- and post-consumer scrap from external sources outside of the product system.
- Results for end-of-life stage (modules C1-C4) and benefits and loads beyond the system boundary (module D) are often based on industry averages.

Parameter	Acronyms	Unit	Total A1-A3	C3	C4	D
Climate Change - total	GWP-total	kg CO ₂ eq	2.22E+03	2.62E+00	8.04E-01	-1.55E-03
Climate Change - fossil	GWP-fossil	kg CO ₂ eq	2.22E+03	2.58E+00	7.99E-01	-1.55E-03
Climate Change - biogenic	GWP-biogenic	kg CO ₂ eq	1.47E-01	4.72E-03	1.21E-03	4.11E-01
Climate Change - land use and land use change	GWP-luluc	kg CO ₂ eq	5.14E-01	3.25E-02	3.87E-03	-2.67E-02
Ozone depletion	ODP	kg CFC-11 eq	5.73E-11	6.17E-15	3.28E-15	9.39E-06
Acidification	AP	mole H ⁺ eq	4.86E+00	2.54E-02	5.55E-03	-3.51E+00
Eutrophication aquatic freshwater	EP-freshwater	kg P eq	1.49E-03	1.12E-05	1.81E-06	-8.61E-04
Eutrophication aquatic marine	EP-marine	kg N eq	1.20E+00	1.22E-02	1.42E-03	-6.89E-01
Eutrophication terrestrial	EP-terrestrial	mole N eq	1.30E+01	1.34E-01	1.56E-02	-6.97E+00
Photochemical ozone formation	POCP	kg MPVOC eq	3.70E+00	3.56E-02	4.31E-03	-2.72E+00
Depletion of abiotic resources - minerals and metals	ADP-minerals & metals ⁽¹⁾	kg Sb eq	1.27E-03	2.80E-06	7.32E-08	-4.55E-03
Depletion of abiotic resources - fossil fuels	ADP-fossil	MJ	2.41E+04	5.01E+01	1.08E+01	-1.39E+04
Water use	WDP	m ³	4.30E+02	5.13E-01	8.37E-02	6.24E+01

LCA vocabulary

Term	Definition	Term	Definition
EPD	<i>Environmental Product Declaration (EPD) is a standardized document that provides transparent and comparable information about the environmental impact of a product</i>	Impact category	<i>An impact category is a specific environmental aspect or effect assessed in a life cycle assessment, such as global warming potential or resource depletion, used to evaluate and quantify the overall impact of a product or process.</i>
LCA	<i>Life Cycle Assessment (LCA) is a systematic process for evaluating the environmental impacts of a product or service throughout its entire life cycle (or parts of), from raw material extraction to disposal or recycling.</i>	Allocation	<i>Distribution of environmental impact among different products or production processes.</i>
LCA module	<i>LCA modules describes specific parts of a product's life cycle, such as raw material extraction (A1), manufacturing (A3), use (B1-B7), and end-of-life (C1-C4).</i>	Functional unit	<i>Functional unit is a measure of the quantified performance of a product system used as a reference point to ensure comparability of results.</i>
		Declared unit	<i>Declared unit is quantity of a construction product for use as a reference unit in an EPD e.g., mass (kg), volume (m³) etc..</i>
Cradle to gate	<i>An analysis of a product's environmental impact from raw material extraction (cradle) until it leaves the factory as a finished product (gate). Cradle to gate covers LCA modules A1-A3.</i> <i>According to EN 15804:2012+A2:2019 an EPD for construction products shall as minimum include modules A1-A3, C1-C4 and D (cradle to gate with modules C1–C4 and module D).</i>	GHG	<i>Greenhouse gases (GHGs) are gases in the atmosphere, such as carbon dioxide (CO₂) and methane (CH₄), that contribute to the heating of the Earth and the so-called greenhouse effect. This process is essential for life on Earth, but excessive emissions of GHGs due to human activities are rapidly changing the Earth's climate.</i>
Cradle to grave	<i>A life cycle assessment that covers all phases, from raw material extraction (cradle) to use and final waste management or recycling (grave). Cradle to grave covers LCA modules A1-C4.</i>	CO₂e	<i>Not only carbon dioxide contributes to global warming; emissions of gases such as methane and nitrogen oxides have a higher contribution to global warming per unit. Carbon dioxide equivalents (CO₂e) measure greenhouse gas emissions in terms of their equivalent impact compared to carbon dioxide.</i>
Upstream	<i>Processes that occur prior to the production of the product within the scope of the LCA, such as raw material extraction, energy production, and material transportation.</i>	Conversion factor	<i>According to EN 15804:2012+A2:2019 a conversion factor to mass per declared or functional unit shall be provided.</i>
Downstream	<i>Processes that occur after the product within the scope of the LCA has been produced, including distribution, use, and waste management.</i>	GPI	<i>GPI (General Programme Instructions) for EPDs is a set of overarching guidelines and requirements that govern how environmental declarations should be designed, reported, and verified to ensure consistency and transparency.</i>
		PCR	<i>Product Category Rules (PCR) are specific guidelines that define the requirements and methodologies for creating EPDs for products within a particular category, ensuring consistency and comparability across similar products. PCRs can also include Sub-PCRs (or c-PCRs), which provide more detailed requirements for specific product groups.</i>

LCA Modules



LCA Modules

Life Cycle Stages	LCA modules*	Explanation	Scopes GHG-protocol**	SSAB EPDs		
				SSAB Zero™ steels	Blast Furnace steels	SSAB in the US
Product stage: grade-to-gate	A1-A3	A1 = Raw material extraction and processing, processing of secondary material input (e.g. for iron ore, alloys, scrap metal etc.) A2 = Transport to the manufacturer (from supplier to SSAB manufacturing site) A3 = Manufacturing (e.g. combustion of fuels at SSAB manufacturing site)	Scope 3 (upstream) Scope 1 + 2	X	X	X
Construction process stage	A4	Transport to the customer (from SSAB to customer)	Scope 3 (downstream)			
	A5	Installation (e.g. energy and materials needed and waste generated from installation/construction process)	Scope 3 (downstream)			
Use stage	B1-B7	B1 = Use of the installed product; B2 = Maintenance; B3 = Repairs; B4 = replacement; B5 = Refurbishment; B6 = Operational energy use; B7 = Operational water use.	Scope 3 (downstream)			
End-of-life stage	C1-C4	C1 = De-construction, demolition (e.g. energy needed to separate steel from other materials), C2 = Transport to waste processing (e.g. from building site to recycling facility) C3 = Waste processing for reuse, recovery and/or recycling (e.g. sorting and cutting the steel for recycling) C4 = Disposal (e.g. landfilling of steel product).	Scope 3 (downstream)	X	(Partly)	
Beyond system boundary	D	Reuse, recovery and/or recycling potentials, expressed as net impacts and benefits (recycled steel removes the need for virgin raw materials when producing new steel, and is reported as a negative value, indicating a reduction in environmental impact)	-	X	X	

* LCA modules A1, A2 and A3 are aggregated (A1-A3) in an EPD.

** Scopes used in the GHG Protocol and LCA modules in an EPD are not entirely comparable. This is a simplified categorization.

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Environmental performance indicators

Impact category	Explanation
GWP-fossil	Global warming potential (GWP –fossil) refers to the climate impact of greenhouse gas emissions from fossil fuels, such as oil and coal, which contribute to global warming.
GWP-biogenic	Global warming potential (GWP-biogenic) refers to the climate impact of greenhouse gases from biological sources, such as wood or organic waste, which contribute to the global warming.
GWP-luluc	Global warming potential (GWP-LULUC) refers to the climate impact of greenhouse gases from land use and land-use changes, such as deforestation or afforestation, which affect carbon storage and uptake.
GWP-total	Global warming potential (GWP-total) is the sum of GWP-fossil + GWP-biogenic + GWP-luluc.
ODP	Ozone Depletion Potential (ODP) refers to the potential impact of substances that harm the ozone layer, which protects the Earth from harmful ultraviolet radiation.
AP	Acidification Potential (AP) refers to the potential impact of substances that cause acidification of the environment, which can lead to damage to ecosystems, soil, and water bodies.
EP-freshwater	Eutrophication Potential (EP-freshwater) refers the potential impact of substances that can contribute to the excessive enrichment of nutrients in aquatic environments, such as rivers and streams.
EP-marine	Eutrophication Potential (EP-marine) refers the potential impact of substances that can contribute to the excessive enrichment of nutrients in aquatic environments, such as oceans and seas.
EP-terrestrial	Eutrophication Potential (EP-terrestrial) refers the potential impact of substances that can contribute to the excessive enrichment of nutrients in terrestrial environments, such as soils.
POCP	Photochemical Ozone Creation Potential (POCP) refers to the potential impact of substances that can contribute to the formation of ground-level ozone.
ADP-minerals&metals	Abiotic Depletion Potential (ADP) for non-fossil resources refers to the impact of extracting and using non-renewable mineral resources, such as metals and their long-term availability due to depletion from the Earth's crust.
ADP-fossil	Abiotic Depletion Potential (ADP) for fossil resources refers to the impact of extracting and using non-renewable fossil fuels, such as oil, coal or natural gas and their long-term availability due to depletion from the Earth's reserves.
WDP	Water Depletion Potential (WDP) refers the impact of using freshwater resources and their long-term availability, considering the rate of consumption in relation to natural replenishment.
GWP-GHG	Global Warming potential-Greenhouse gas (GWP-GHG) is a supplementary indicator required according to the Product category rules (PCR 2019:14) for construction products. The GWP-GHG indicator is identical to GWP-total except that the characterization factor (CF) for biogenic CO ₂ is set to zero.

Resource indicators

Indicator	Explanation
PERE	Primary energy renewable – Used as energy carrier (PERE) refers to the use of renewable primary energy excluding renewable resources inherent in raw material. PERE refers the amount of renewable energy directly used for energy services.
PERM	Primary energy renewable – Used as raw material (PERM) refers to renewable resources that are utilized as inputs in manufacturing or industrial processes rather than being used directly for energy. One example is the energy contained in wood when manufacturing a wooden table.
PERT	Primary energy renewable – Total (PERT) is the sum of PERE + PERM.
PENRE	Primary energy non-renewable – Used as energy carrier (PENRE) refers to the use of non-renewable primary energy excluding non-renewable resources inherent in raw material. PENRE refers the amount of non-renewable energy directly used for energy services.
PENRM	Primary energy non-renewable – Used as raw material (PENRM) refers to non-renewable resources that are utilized as inputs in manufacturing or industrial processes rather than being used directly for energy. One example is the energy contained in plastic when manufacturing a plastic pipe.
PENRT	Primary energy non-renewable – Total (PENRT) is the sum of PENRE + PENRM.
SM	Use of secondary material (SM) refers to material recovered from previous use or from waste which substitutes primary materials.
RSF	Use of renewable secondary fuels (RSF) refers to the use of renewable materials, such as biomass or waste-derived fuels, that are repurposed for energy generation instead of being discarded.
NRSF	Use of non-renewable secondary fuels (NRSF) refers to the use of non-renewable materials, such as fossil fuel by-products or waste materials, that are repurposed for energy generation instead of being discarded.
FW	Use of net fresh water (FW) refers to total amount of fresh water used in the production process, minus any water that is returned to the environment.

Waste indicators

Indicator	Explanation
Hazardous waste disposed	Net flows of hazardous waste crossing the system boundaries after waste treatment.
Non-hazardous waste disposed	Net flows of non-hazardous waste crossing the system boundaries after waste treatment.
Radioactive waste disposed	Net flows of radioactive waste crossing the system boundaries after waste treatment.

Output flow indicators

Indicator	Explanation
Components for re-use	Gross amounts of components that could be re-used leaving the system boundary.
Material for recycling	Gross amounts of materials for recycling leaving the system boundary.
Materials for energy recovery	Gross amounts of materials for energy recovery leaving the system boundary.
Exported energy, electricity	Gross amounts of exported energy as electricity leaving the system boundary.
Exported energy, thermal	Gross amounts of exported energy as thermal heat leaving the system boundary.

Comparisons between EPD according to EN 15804:2012+A1:2013

Impact category EN 15804:2012+A2:2019	Impact category EN 15804:2012+A1:2013	Notes
GWP-fossil (Global warming potential fossil)	GWP (Global warming potential)	The impact category for Global Warming Potential (GWP) has been divided into four different impact categories. When comparing EPDs according to the old standard (EN 15804:2012+A1:2013) with the new standard (EN 15804:2012+A2:2019), the comparison should be made between GWP and GWP-fossil.
GWP-biogenic (Global warming potential biogenic)		
GWP-luluc (Global warming potential land use/change)		
GWP-total (Global warming potential total)		
ODP (Ozone depletion potential)	ODP	
AP (Acidification potential)	AP	Change in unit for specifying impact category, from kg SO ₂ equivalents (EN 15804+A1) to mol H ⁺ equivalents (EN15804+A2).
EP-freshwater	EP (Eutrophication potential)	EP in old standard (EN 15804+A1) is comparable to EP-freshwater in new standard (EN 15804+A2). Note that the new standard has changed the unit from kg PO ₄ -3 equivalents to kg P equivalents.
EP-marine		
EP-terrestrial		
POCP	POCP (Formation potential of tropospheric ozone)	Change in unit for specifying impact category, from kg Ethene equivalents (EN 15804+A1) to kg NMVOC equivalents (EN15804+A2).
ADP-minerals&metals	APD elements (Depletion of abiotic resources-elements)	
ADP-fossil	APD fossil (Depletion of abiotic resources-fossil fuels)	
WDP	WDP	
GWP-GHG	-	New impact category for Construction products.

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