ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	Grundfos Holding A/S
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-GRU-20250667-CBA2-EN
Issue date	18/12/2025
Valid to	12/05/2031

SCALA2 3-45 115V 60HZ NEMA 5-15 plug (US version)

Grundfos Holding A/S

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD VERIFIED

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General Information

Grundfos Holding A/S

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number

EPD-GRU-20250667-CBA2-EN

This declaration is based on the product category rules:

Pumps for liquids and liquids with solids, 01/08/2021
(PCR checked and approved by the SVR)

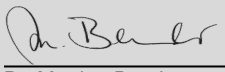
Issue date

18/12/2025

Valid to

12/05/2031

Dipl.-Ing. Hans Peters
(Chairman of Institut Bauen und Umwelt e.V.)



Dr. Martina Bender
(Managing Director Institut Bauen und Umwelt e.V.)

SCALA2 3-45 115V 60HZ NEMA 5-15 plug (US version)

Owner of the declaration

Grundfos Holding A/S
Poul Due Jensens Vej 7
8850 Bjerringbro
Denmark

Declared product / declared unit

One piece of SCALA2 3-45 115V 60HZ NEMA 5-15 plug (US version).

Scope:

This declaration applies to 1 piece of SCALA2 3-45 115V 60HZ NEMA 5-15 plug (US version).

The declaration covers the following variant:
SCALA2 3-45 115V 60HZ NEMA 5-15 plug for the US market PN number: 93013251
The product is assembled in Serbia.
The life cycle assessment is based on data collected from the ERP system of the manufacturer, including data from the manufacturing plant.
EPD of construction products may not be comparable if they do not comply with EN 15804+A2 standard.

The applicable standards are EN 15804+A2 and ISO 21930:2017 (referred to as ISO 21930)
The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard EN 15804 serves as the core PCR			
Independent verification of the declaration and data according to ISO 14025:2011			
☐	internally	☒	externally

Mrs Kim Allbury,
(Independent verifier)

Product

Product description/Product definition

Grundfos SCALA2 pumps are all-in-one integrated pressure boosters designed for domestic use and ensure a constant supply of clean water to households, gardens and light commercial applications. Grundfos SCALA2 is a fully integrated, high-efficiency, self-priming pressure booster.

SCALA2 incorporates integrated speed control, enabling constant water pressure at the taps. The electronically controlled inverter limits the starting and operating currents, providing soft starts and high energy savings. The water-cooled motor and pump design offer a very low noise level down to 44 dB(A) in typical usage. SCALA2 is equipped with an integrated sensor that measures the pressure discharged from the pump. The sensor sends a signal to the pump control and compares the measured pressure level with the desired pressure level, which is the pressure set according to the homeowner's needs.

SCALA2 pumps are recommended for the following applications:
• pressure boosting of city mains water
• pressure boosting of water from roof tank
• pressure boosting of water from break tank
• pressure boosting of water from ground tank
• water supply from shallow wells [8 m (26.2 ft)]
• garden irrigation
• water transfer.

These pumps are designed to provide reliable, efficient, and sustainable solutions for various heating and cooling applications, ensuring optimal performance and reduced energy consumption through its permanent magnet motor and variable speed drive (VSD).

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Application

Grundfos SCALA2 pumps are all-in-one integrated pressure boosters designed for domestic use and ensure a constant supply of clean water to households, gardens and light commercial applications.

Technical Data

The declared unit is represented by the pump variant whose technical data is provided in the Pump technical data table.

Pump technical data for SCALA2 3-45 115V 60HZ NEMA 5-15 plug

Name	Value	Unit
Frequency	60	Hz
Voltage	1 x 115	V
Pumped liquid (e.g. water)	Clean water	-
Head max.	45	m
Flow range (max)	4.6	m^3/h
Max input power	0.550	kW
Power input average from load profile	0.232	kW
Nominal capacity	0.450	kW
Energy Efficiency Index (EEI)	≤ 0.23	-

Performance data of the product according to the harmonised standards, based on provisions for harmonization.

Base materials/Ancillary materials

Main constituents of the representative product (% mass)

Name	Value	Unit
Aluminium	24.26	%
Aluminium oxide	0.04	%
Brass	0.01	%
Carbon steel	13.75	%
Cardboard	14.00	%
Copper	3.72	%
Rubber	0.38	%
Polymers and composites	21.05	%
Electronics	1.94	%
Paper	1.27	%
Stainless steel	13.34	%
Wood	4.04	%
Grease, lubricant	0.21	%
Ferrite powder	1.99	%

REACH

At least one partial article (component) of the declared product contains substances listed in the candidate list (date: 25-Jun-2025) exceeding 0.1 percentage by mass: Yes.
A list of respective SVHC and their CAS-number is provided in below table. Information on the concentration in the partial article(s) is available by searching for articles notified under the listed 'SCIP Number' in *ECHA's* SCIP-database: https://echa.europa.eu/scip-database

Substance Name	CAS Number	Properties of concern	SCIP number
lead monoxide	1317-36-8	Toxic to Reproduction	a1aaa997-1dbb-432a-bafa-e394fe14ec2f
1-Butanesulfonic acid, 1,1,2,2,3,3,4,4,4-nonafluoro-, potassium salt	29420-49-3	Under assessment as Persistent, Bioaccumulative and Toxic	
Lead	7439-92-1	Toxic to Reproduction, some data submitters indicate this substance as Carcinogenic	

CMR

This product contains other carcinogenic, mutagenic, reprotoxic (CMR) substances in categories 1A or 1B which are not on the candidate list exceeding 0.1 percentage by mass: No

Biocide

Biocide products were added to this product: No

Manufacturing process:

Every Scala2 pump is assembled in Serbia at a Grundfos Inđija production plant (GMS1). Some plastic components of Scala2 product are injection molded also in Inđija plant, other components are produced at or sourced from Hungary, Italy and Denmark. The steps of the final assembly process are partly manual and comprise 1) Shaft and motor stool assembly on motor; 2) Mounting of the shaft seal and insertion of impeller; 3) Mounting of sensor; 4) Joining the motor and impeller assembly with the pump housing, using the clamp ring [=complete pump]; 5) Semi-automated functional tests and software test & upload; and finally 6) Manual packing of Scala2 on wooden pallet, adding manuals and topping with cardboard box.

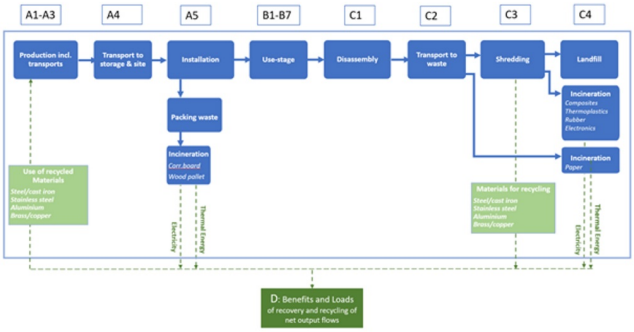
Reference service life

In agreement with the Europump (2024) guideline, a reference service life of 10 years was assumed for the purpose of this study, for estimating the energy consumption during the use stage of the pump.

LCA: Calculation rules

Declared Unit

The declared unit is one piece (pce.) of a SCALA2 3-45 115V 60HZ NEMA 5-15 plug pump variant (for US market) whose mass including packaging is provided in the table below.



Declared unit

Name	Value	Unit
Declared unit	1	pce.
Mass reference	12.29	kg/pce
Conversion factor [Mass/Declared Unit]	12.29	-

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System boundary

This EPD is classified as a Cradle-to-Grave and module D. All major steps from the extraction of natural resources to the final disposal of the product are included in the scope of the study, following the modular approach of *EN 15804*.
Modules A1-A3 refer to the product stage and include raw materials extraction and processing, transportation, and the manufacturing process as well as the processing of waste arising from those processes. The assembly of the product, as well as the packaging, are included in A3. Wastes and losses are included in the modules where they occur according to the polluter pays principle and the modular approach of *EN 15804*.
Module A4 regards the transportation from the production site to the regional distribution center, and finally to the construction and product application site.
Module A5 refers to the installation process of the pump site and the waste treatment of packaging. The use of energy during installation is negligible for the selected functional unit.
Modules B1-B7 refer to the use stage. All use stage modules are assessed in the study, though B1 and B7 are assessed to be zero. The modules B3, B4 and B5 are declared as "MNR" (module not relevant) according to decision no. 20170712-n of the SVR. Module B6 regards energy use during the operation of the pump and includes the electricity consumption of the product. The total electricity consumption over the reference service lifetime is assessed by calculating the average power input using a specified load profile and multiplying it with the number of running hours per year and the number of years of the RSL.
Modules C1-C4 refer to the End-of-life stage. A product reaches the end-of-life of its service life when it no longer provides any functionality. This life cycle stage includes all activities from the end-of-life of the pump until all materials and components are processed, reused, recycled, or disposed of.
C1 regards the dismantling of the pump, and this module is a manual activity. C2 regards the transport to waste processing, C3 refers to the processing (shredding) of waste for recycling, and C4 refers to waste disposal: landfilling and incineration. The End-of-Life assumption is that 95 % is collected as electronic waste, while 5 % goes to landfill.
Module D refers to the burdens and benefits beyond the system boundaries. According to *EN 15804*, module D includes the reuse, recovery and/or recycling potentials, expressed in net impacts and benefits. Contributions to module D come from waste incineration processes in A5 and C4 as well as material (metal) recycling in C3. The specific fractions and net flows are shown in the scenarios section of this declaration.

Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product´s lifespan: United States

Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account.
The primary database used for background data is *Sphera*, while *Ecoinvent* served as a secondary database.

LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

In the declared net product, there is no biogenic carbon exceeding the minimal reporting requirement of 5% of the mass of the net product. Biogenic carbon in the packaging (corrugated board and wood) is reported below.

Information on biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in accompanying packaging	0.956	kg C

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO_2.

In the following, technical scenario information is provided for modules A4, A5, B6, C1-C4, and D.

Transport from the gate to the site (A4)

Name	Value	Unit
Transport distance	13297.9	km
Liters of fuel	1.7	l/100tkm

Installation in building (A5)

Name	Value	Unit
Packaging waste for incineration	2.223	kg

Reference service life

Name	Value	Unit
Life Span according to the manufacturer	10	a

For pump products like the declared unit, an RSL of 10 years can be assumed according to the guideline by Europump (2024). Therefore, to facilitate building reference calculations, an RSL of 10 years is declared.
The pump can be installed indoors or outdoors, but it must not be exposed to frost. The manufacturer recommends installing the pump near a drain or in a drip tray connected to a drain to ensure proper removal of possible condensation from cold surfaces. The product must be installed in a well-ventilated room to prevent condensation. The installation location must be protected from rain, humidity, condensation, direct sunlight, and dust. The relative air humidity must not exceed 95%.If installed outdoors in areas where frost may occur, the product must be protected from freezing.

Operational energy use (B6) and Operational water use (B7)

For the calculation of Use stage Operational energy use, a European Consumption (Technology) grid mix was applied.

The pump running conditions during the service life are partially specified in the PCR-B: The number of running hours per year is assumed to be 3625 h according to the guideline Europump (2024). The pump load profile for calculating the average power input during operation is specified in the PCR-B according to the first two columns of the following table, while the third column results when scaling with the annual running hours:

Q in % of $Q_{100\%}$	H in % of $H_{100\%}$	Time in % of annual operating hours	Time (h) per year
100	100	6	217
75	87,5	15	544
50	75	35	1269
25	62,5	44	1595
		Total:	3625

It should also be noted that this EPD follows additional requirements for construction products considered as Electronic or Electric Equipment, using energy in module B6 of the use stage (ECO Platform (2024), section 2.10).

Name	Value	Unit
Water consumption	-	m^3
Usage conditions: Operating hours per year	3625	h
Electricity consumption per year	839.7	kWh/y

End of life (C1-C4)

Name	Value	Unit
Collected as mixed construction waste	10.067	kg
Transportation distance (C2)	322	km
Aluminium for recycling	2.83	kg
Steel for recycling	0.97	kg
Electronics for incineration w/energy	0.0228	kg
Copper for recycling (incl. brass)	0.34	kg
Stainless steel for recycling	1.21	kg
Plastics for incineration w/energy	2.57	kg
Landfilling	3.4334	kg

Reuse, recovery and/or recycling potentials (D), relevant scenario information

The net output flow of metals for recycling was calculated as the surplus from C3 Recycling after subtracting Secondary materials applied as input for A1-A3.

Name	Value	Unit
A5, Packaging incineration w/ energy recovery (Electricity)	4.85	MJ
A5, Packaging incineration w/energy recovery (Thermal energy)	8.79	MJ
C3, Aluminium for recycling (net output flow)	2.83	kg
C3, Steel for recycling (net output flow)	0.97	kg
C3, Stainless Steel for recycling (net output flow)	1.21	kg
C3, Copper for recycling (net output flow)	0.34	kg
C4, Waste incineration w/energy recovery (Electricity)	0.1	MJ
C4, Waste incineration w/energy recovery (Thermal energy)	0	MJ

LCA: Results

Characterization model: *EN 15804*, based on EF 3.1.
The indicator results for module B2 and B6 have been calculated for the entire RSL of 10 years and declared for one piece of SCALA2 3-45 115V 60HZ NEMA 5-15 plug pump. Annual results can be obtained by dividing the indicator results for module B6 by a factor 10.

Specific GWP index of electricity mix within A1-A3: 0,418 $kgCO_2$ eq/kWh.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
X	X	X	X	X	X	X	MNR	MNR	MNR	X	X	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 PCE. SCALA2 3-45 115V 60HZ NEMA 5-15 plug

Parameter	Unit	A1-A3	A4	A5	B1	B2	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	5.93E+01	4.18E+00	3.28E+00	0	1.34E+02	4.1E+04	0	0	1.67E-01	1.68E-01	5.82E-01	-9.01E+00
GWP-fossil	kg CO_2 eq	6.29E+01	4.2E+00	1.09E-01	0	1.33E+02	4.09E+04	0	0	1.66E-01	1.68E-01	1.29E-01	-9.02E+00
GWP-biogenic	kg CO_2 eq	-3.68E+00	-4.34E-02	3.17E+00	0	6.67E-02	4.33E+01	0	0	8.67E-04	1.78E-04	4.53E-01	3.1E-02
GWP-luluc	kg CO_2 eq	1.2E-01	2.25E-02	1.02E-04	0	6.29E-01	7.49E+01	0	0	8.76E-05	3.08E-04	3.05E-04	-2.29E-02
ODP	kg CFC11 eq	1.38E-08	7.9E-13	4.36E-13	0	2.14E-03	3.03E-07	0	0	3.91E-14	1.24E-12	3.65E-13	-1.33E-10
AP	mol H^+ eq	7.67E-01	4.21E-02	9.04E-04	0	3.71E-01	5.69E+01	0	0	8.37E-04	2.34E-04	6.85E-04	-6.05E-02
EP-freshwater	kg P eq	5.65E-04	7.36E-06	8.34E-08	0	5.83E-04	1.35E-02	0	0	3E-07	5.56E-08	4.61E-05	-1.05E-05
EP-marine	kg N eq	5.78E-02	1.91E-02	3.32E-04	0	1.59E-01	1.23E+01	0	0	4.18E-04	5.05E-05	1.87E-04	-7.28E-03
EP-terrestrial	mol N eq	6.26E-01	2.09E-01	4.15E-03	0	1.79E+00	1.35E+02	0	0	4.59E-03	5.54E-04	1.78E-03	-7.89E-02
POCP	kg NMVOC eq	1.98E-01	4.57E-02	8.66E-04	0	3.36E-01	3.54E+01	0	0	9.19E-04	1.46E-04	6.76E-04	-2.31E-02
ADPE	kg Sb eq	3.3E-03	4.44E-07	7.88E-09	0	3.83E-05	4.79E-03	0	0	2.55E-08	1.97E-08	7.39E-09	-1.09E-03
ADPF	MJ	8.93E+02	5.25E+01	1.21E+00	0	1.72E+03	6.72E+05	0	0	2.13E+00	2.76E+00	1.87E+00	-1.04E+02
WDP	m^3 world eq deprived	1.64E+01	2.53E-02	3.93E-01	0	5.25E+00	8.42E+03	0	0	2.34E-03	3.46E-02	1.29E-02	-3.1E+00

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential)

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 PCE. SCALA2 3-45 115V 60HZ NEMA 5-15 plug

Parameter	Unit	A1-A3	A4	A5	B1	B2	B6	B7	C1	C2	C3	C4	D
PERE	MJ	2.24E+02	2.62E+00	2.47E+00	0	1.54E+02	1.95E+05	0	0	8.87E-02	8E-01	2.63E+00	-1.82E+01
PERM	MJ	4.55E+00	0	-2.22E+00	0	0	0	0	0	0	0	-2.34E+00	0
PERT	MJ	2.28E+02	2.62E+00	2.53E-01	0	1.54E+02	1.95E+05	0	0	8.87E-02	8E-01	2.97E-01	-1.82E+01
PENRE	MJ	8.33E+02	5.25E+01	1.45E+00	0	1.72E+03	6.72E+05	0	0	2.13E+00	2.76E+00	5.84E+01	-1.04E+02
PENRM	MJ	5.98E+01	0	-2.42E-01	0	0	0	0	0	0	0	-5.65E+01	0
PENRT	MJ	8.93E+02	5.25E+01	1.21E+00	0	1.72E+03	6.72E+05	0	0	2.13E+00	2.76E+00	1.87E+00	-1.04E+02
SM	kg	6.41E+00	0	0	0	8.91E-01	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0
FW	m^3	5.39E-01	1.97E-01	2.57E+02	0	3.81E-04	9.25E-03	0	3.81E-04	-1.13E-01	0	0	-1.13E-01

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 PCE. SCALA2 3-45 115V 60HZ NEMA 5-15 plug

Parameter	Unit	A1-A3	A4	A5	B1	B2	B6	B7	C1	C2	C3	C4	D
HWD	kg	3.75E-01	5.32E-09	5.38E-10	0	1.74E-02	3.99E-04	0	0	3.53E-10	1.64E-09	3.98E-10	-6.49E-04
NHWD	kg	3.47E+00	5.84E-03	9.25E-02	0	5.49E-01	2.31E+02	0	0	2.18E-04	9.49E-04	3.81E+00	6.4E-01
RWD	kg	2.08E-02	1.35E-04	5.01E-05	0	5.13E-03	6.59E+01	0	0	7.32E-06	2.71E-04	2.59E-05	-4.4E-04
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	1.46E-01	0	0	0	0	5.29E+00	0	0
MER	kg	0	0	0	0	0	0	0	0	0	0	0	0
EEE	MJ	0	0	4.85E+00	0	1.57E+00	0	0	0	0	0	1E-01	0
EET	MJ	5.04E-01	0	8.79E+00	0	7.17E+00	0	0	0	0	0	0	0

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:
1 PCE. SCALA2 3-45 115V 60HZ NEMA 5-15 plug

Parameter	Unit	A1-A3	A4	A5	B1	B2	B6	B7	C1	C2	C3	C4	D
PM	Disease incidence	7.64E-06	7.47E-07	5.15E-09	0	2.24E-06	5.25E-04	0	0	4.69E-09	2.16E-09	7.19E-09	-9.99E-07
IR	kBq U235 eq	2.64E+00	1.44E-02	7.82E-03	0	6.04E-01	5.45E+03	0	0	6.13E-04	2.24E-02	3.5E-03	-4.72E-02
ETP-fw	CTUe	4.2E+02	5.17E+01	5.37E-01	0	1.59E+03	1.22E+05	0	0	1.54E+00	5.83E-01	3.35E+00	-5.06E+01
HTP-c	CTUh	9.48E-07	7.39E-10	2.92E-11	0	1.32E-07	5.39E-06	0	0	2.43E-11	7.73E-11	5.04E-11	-8.97E-08
HTP-nc	CTUh	7.07E-07	3.26E-08	7.55E-10	0	9.26E-07	7.87E-05	0	0	7.73E-10	5.55E-09	1.54E-09	-5.02E-08
SQP	SQP	4.15E+02	1.35E+01	2.82E-01	0	4.72E+02	6.31E+04	0	0	3.16E-01	2.59E-01	2.81E-01	-2.26E+01

PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “potential soil quality index”. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.

References

STANDARDS

EN 15804
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