SNX201, SNX203 MINIATURE CIRCUIT BREAKER

PEP ecopassport®

Product Environmental Profile

Registration number:	**ABBG-00212-V01.03-EN**	Drafting rules:	**PCR-ed4-EN-2021 09 06**
Contact information:	**EPD_ELSB@abb.com**	Supplemented by:	**PSR-0005-ed2-EN-2016 03 29**
Verifier accreditation number:	**VH42**	Information and reference documents:	**www.pep-ecopassport.org**
Date of issue:	**Aug 23**	Validity period:	**5 years**

Independent verification of the declaration and data in compliance with ISO 14025: 2006

Internal: ☐ **External:** ☒

The PCR review was conducted by a panel of experts chaired by Julie Orgelet (Ddemain)

PEPs are compliant with XP C08-100-1:2016 and EN 50693:2019 or NF E38-500 :2022
The components of the present PEP may not be compared with components from any other program.

Document complies with ISO 14025:2006 "Environmental labels and declarations. Type III environmental declarations"

ABB Purpose & Embedding Sustainability

ABB is committed to continually promoting and embedding sustainability across its operations and value chain, aspiring to become a role model for others to follow.
With its ABB Purpose, ABB is focusing on reducing harmful emissions, preserving natural resources and championing ethical and humane behavior.
The contect of this PEP cannot be compared with the content based on another program/database.
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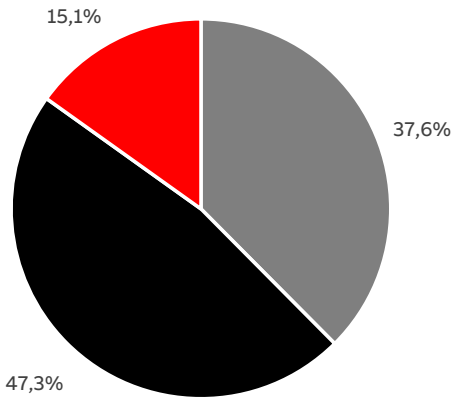
General information

Reference product	SNX201 B16 6kA 1P+N - 2CSS255301R0165
Description of the product	The compact SNX200 range of FlexLine® Miniature Circuit Breakers (MCBs) is designed to protect any type of building from overloads and short circuits, ensuring reliability and safety under all operating conditions. All MCBs in the product range SNX201 comply with IEC/EN 60898-1 allowing their use in residential applications.
Functional unit	The functional unit is designed to protect for 20 years the installation against overloads and short-circuits with assigned voltage 230 V, and rated current 16 A. This protection is ensured in accordance with the following parameters: - Number of poles 1P+N - Rated breaking capacity 6kA - Tripping curve B
Other products covered	SNX200 homogeneous family: Beaking capacity up to 6kA 230V rated voltage B & C char from 6 up to 32 A 1+N or 3+N Poles
Manufacturing address	ABB S.p.A. – ELSB Viale dell'Industria, 18 20009 Vittuone (MI) - Italy www.new.abb.com

Constituent Materials



Total weight of reference product and packaging	**125,5**	**g**

Plastics as % of weight		**Metals as % of weight**		**Others as % of weight**	
Name and CAS number	Weight%	Name and CAS number	Weight%	Name and CAS number	Weight%
PA	25,3	**Steel**	34,1	**Cardboard**	7,8
Glass fiber	8,8	**Copper**	10,5	**Wood**	6,1
PC	2,4	**Brass**	1,5	**Paper**	1,2
PPS	0,8	**Manganese**	0,7	**Other**	0,0
PE	0,2	**Other metals**	0,4		

Total weight of the reference product is 106,3 and its packaging is 19,2g

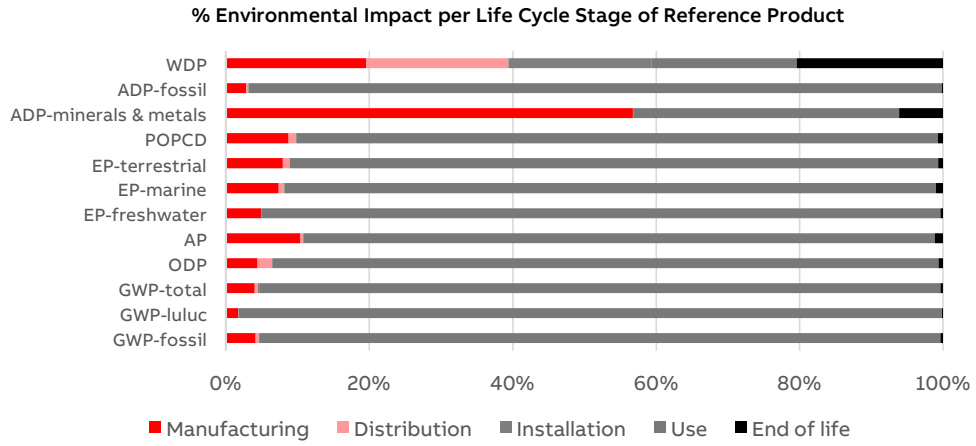
Additional Information

Manufacturing	Includes the environmental impacts associated with extraction and processing of the raw materials used to produce and assembly the product and its pacakging, distribution to the manufacturer’s last logistic platform.
Distribution	Includes the transportation in its pacakging from the manufacturer's last logistic platform to the distributor.
Installation	Installation stage includes the installation of the products made manually and waste treatment of discarded materials.
Use	Energy consumption is calculated by following the PSR. The energy models used in this phase are the specific energy mixes based on ABB distribution. No maintenance is necessary.
End of life	Includes its removal, dismantling and transportationof the dismantled product to the treatment site and the treatment process. A value of 1000 km transport by lorry is used for the transportation.
Benefits and loads beyond the system boundaries	N/A

Environmental Impacts

Reference lifetime	20 years
Product category	Circuit Breaker
Installation elements	Installation carried out manually. End of life of packaging.
Use scenario	Load time: 50% of rated current in continuous operation (In). Use time rate: 30% of reference lifetime (RLT).
Geographical representativeness	Europe
Technological representativeness	Materials and processes data are specific for the production of SNX201 B16 6kA 1P+N - 2CSS255301R0165 and its family
Software and database used	Simapro 9.4.0.2 and Ecoinvent v3.8
Energy model used	
Manufacturing	Electricity, medium voltage {IT}| market for | Cut-off, System_GO energy mix_ei 3.8 System
Installation	Manually done. Europe
Use	Electricity, low voltage {RER}| market group for | Cut-off, S
End of life	The energy-related processes used for the inputs of the end-of-life stage are those included in the ecoinvent datasets

Common base of mandatory indicators



Environmental impact indicators

Indicator		Unit	Total	Manufacturing	Distribution	Installation	Use	End of life	Benefits
GWP	Total	kg CO2 eq.	2,13E+01	8,54E-01	9,06E-02	4,53E-02	2,02E+01	7,50E-02	NA
	Fossil	kg CO2 eq.	2,05E+01	8,52E-01	9,05E-02	5,26E-03	1,95E+01	7,20E-02	NA
	Biogenic	kg CO2 eq.	6,73E-01	1,48E-03	8,43E-05	4,00E-02	6,28E-01	2,94E-03	NA
	Luluc	kg CO2 eq.	4,69E-02	7,99E-04	3,52E-05	1,77E-06	4,60E-02	7,06E-05	NA
ODP		kg CFC-11 eq.	1,06E-06	4,66E-08	2,12E-08	8,44E-10	9,82E-07	6,73E-09	NA
AP		H+ eq.	1,26E-01	1,31E-02	4,59E-04	2,22E-05	1,11E-01	1,43E-03	NA
EP	Freshwater	kg P eq.	2,07E-02	1,02E-03	5,84E-06	3,93E-07	1,96E-02	7,62E-05	NA
	Marine	kg N eq.	2,04E-02	1,50E-03	1,58E-04	1,05E-05	1,85E-02	2,00E-04	NA
	Terrestrial	mol N eq.	1,80E-01	1,43E-02	1,73E-03	8,36E-05	1,63E-01	1,27E-03	NA
POPCD		kg NMVOC eq.	5,01E-02	4,39E-03	4,97E-04	2,48E-05	4,48E-02	3,76E-04	NA
ADP	Minerals & metals	kg SB eq.	4,94E-04	2,80E-04	2,96E-07	1,63E-08	1,83E-04	3,02E-05	NA
	Fossil	MJ	4,29E+02	1,21E+01	1,39E+00	5,93E-02	4,15E+02	8,84E-01	NA
WDP		m^3 eq. depr.	4,95E+02	9,70E+01	9,80E+01	9,90E+01	1,00E+02	1,01E+02	NA

Resource use indicators

Indicator	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life	Benefits
PERE	MJ	8,88E+01	3,19E+00	1,92E-02	1,04E-03	8,55E+01	1,14E-01	NA
PERM	MJ	4,27E-01	4,27E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	NA
PERT	MJ	8,92E+01	3,61E+00	1,92E-02	1,04E-03	8,55E+01	1,14E-01	NA
PENRE	MJ	4,28E+02	1,04E+01	1,39E+00	5,93E-02	4,15E+02	8,84E-01	NA
PENRM	MJ	1,72E+00	1,72E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	NA
PENRT	MJ	4,29E+02	1,21E+01	1,39E+00	5,93E-02	4,15E+02	8,84E-01	NA

Common base of mandatory indicators

Use of secondary materials, water, and energy resources

Indicator	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life	Benefits
SM	kg	2,86E-06	2,86E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	NA
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	NA
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	NA
FW	m^3	5,74E+00	9,40E-01	4,31E-03	2,67E-04	4,76E+00	3,22E-02	NA

Waste category indicators

Indicator	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life	Benefits
HWD	kg	4,82E-04	1,60E-04	3,57E-06	1,54E-07	3,16E-04	2,18E-06	NA
N-HWD	kg	1,82E+00	1,97E-01	8,34E-02	6,77E-03	1,45E+00	8,73E-02	NA
RWD	kg	3,09E-03	2,68E-05	9,39E-06	3,82E-07	3,05E-03	5,16E-06	NA

Output flow indicators

Indicator	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life	Benefits
CfRu	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	NA
MfR	kg	1,22E-01	5,54E-02	0,00E+00	1,15E-02	0,00E+00	5,46E-02	NA
MfER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	NA
EE	MJ	1,01E-01	4,97E-02	0,00E+00	2,36E-02	0,00E+00	2,72E-02	NA

Other indicators

Indicator		Unit	Total
Biogenic Carbon	Product	kg of C	0,00E+00
	Packaging	kg of C	6,65E-03
Environmental Cost		€	0,00E+00

Optional indicators

Indicator	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life	Benefits
Tot PE	MJ	5,18E+02	1,57E+01	1,41E+00	6,03E-02	5,00E+02	9,98E-01	NA
Efp	Dise inc	4,30E-07	6,09E-08	8,63E-09	3,78E-10	3,54E-07	6,45E-09	NA
IrHH	kBq U-235 eq	1,15E+01	7,00E-02	7,11E-03	3,02E-04	1,14E+01	1,19E-02	NA
ETX FW	CTUe	3,70E+02	9,82E+01	1,08E+00	6,23E-02	2,63E+02	7,54E+00	NA
HTX CE	CTUh	1,35E-08	3,91E-09	3,40E-11	3,24E-12	8,08E-09	1,43E-09	NA
HTX N-CE	CTUh	4,24E-07	1,41E-07	1,15E-09	5,94E-11	2,58E-07	2,38E-08	NA
IrLS	Pt	8,53E+01	8,41E+00	1,08E+00	4,00E-02	7,50E+01	7,92E-01	NA

Extrapolation Factors

For other products than the Reference product covered by this PEP, the environmental impacts for each phase of the lifecycle are obtained by a linear correlation with respect to weight for the production, distribution, and end-of-life phase and with respect to average power loss for the use phase. Each environmental indicator value shall be calculated using the following formulas.

For the **manufacturing stage, distribution stage and end-of-life stage:**

$$y = a_n x_1 + b_n$$

where **y** is the considered impact at a specific stage and **x1** is the **weight of the product.**
For the **use stage:**

$$y = a_n x_2 + b_n$$

Where **y** is the considered impact at a specific stage and **x2** is the average **power loss** of the product.

The next tables report the linear coefficients an & bn for each life cycle stage.
Note: The calculation of the coefficient a3 & b3 for the Installation Stage was not performed because the selected parameters do not affect the values for this stage.

IMPACT CATEGORY	MANUF.		DISTRIB.		INSTALL.		USE		END OF LIFE	
	a_1	b_1	a_2	b_2	a_3	b_3	a_4	b_4	a_5	b_5
Climate change	7.17E-03	1.05E-01	7.34E-04	1.39E-02	1.0E+00	0.0E+00	2.13E+01	-9.69E-02	7.17E-04	1.47E-05
Climate change - Fossil	7.09E-03	1.11E-01	7.33E-04	1.39E-02	1.0E+00	0.0E+00	2.06E+01	-9.36E-02	6.88E-04	1.36E-05
Climate change - Biogenic	7.47E-05	-6.33E-03	6.84E-07	1.27E-05	1.0E+00	0.0E+00	6.63E-01	-3.02E-03	2.81E-05	7.29E-07
Climate change - Land use and LU change	6.19E-06	1.52E-04	2.85E-07	5.42E-06	1.0E+00	0.0E+00	4.86E-02	-2.21E-04	6.74E-07	7.79E-08
Ozone depletion	3.37E-10	1.14E-08	1.72E-10	3.22E-09	1.0E+00	0.0E+00	1.04E-06	-8.80E-09	6.44E-11	-6.11E-12
Acidification	1.22E-04	3.77E-04	3.72E-06	7.01E-05	1.0E+00	0.0E+00	1.17E-01	-5.33E-04	1.37E-05	1.47E-07
Eutrophication, freshwater	9.52E-06	2.25E-05	4.72E-08	9.03E-07	1.0E+00	0.0E+00	2.07E-02	-9.41E-05	7.27E-07	1.42E-07
Eutrophication, marine	1.26E-05	1.78E-04	1.28E-06	2.42E-05	1.0E+00	0.0E+00	1.95E-02	-8.85E-05	1.92E-06	1.81E-07
Eutrophication, terrestrial	1.25E-04	1.21E-03	1.40E-05	2.65E-04	1.0E+00	0.0E+00	1.72E-01	-7.83E-04	1.21E-05	3.27E-07
Photochemical ozone formation	3.73E-05	4.90E-04	4.02E-06	7.65E-05	1.0E+00	0.0E+00	4.73E-02	-2.15E-04	3.60E-06	-1.85E-07
Resource use, minerals and metals	2.67E-06	1.26E-06	2.40E-09	4.52E-08	1.0E+00	0.0E+00	1.93E-04	-8.60E-07	2.89E-07	-2.43E-08
Resource use, fossils	9.78E-02	1.86E+00	1.12E-02	2.13E-01	1.0E+00	0.0E+00	4.38E+02	-1.99E+00	8.45E-03	1.69E-04
Water use (AWARE)	5.43E-03	3.73E-01	3.49E-05	6.60E-04	1.0E+00	0.0E+00	5.03E+00	-2.29E-02	3.08E-04	6.35E-06
Total use of primary energy during the life cycle	1.08E-01	4.46E+00	1.14E-02	2.16E-01	1.0E+00	0.0E+00	5.28E+02	-2.40E+00	9.54E-03	1.91E-04
Use of renewable primary energy, excluding renewable primary energy resources used as raw materials	9.68E-03	2.17E+00	1.55E-04	2.94E-03	1.0E+00	0.0E+00	9.02E+01	-4.11E-01	1.09E-03	2.21E-05
Use of renewable primary energy resources used as raw materials	0.00E+00	4.27E-01	0.00E+00	0.00E+00	1.0E+00	0.0E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use renew. primary energy res.	9.68E-03	2.60E+00	1.55E-04	2.94E-03	1.0E+00	0.0E+00	9.02E+01	-4.11E-01	1.09E-03	2.21E-05
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials	8.06E-02	2.00E+00	1.12E-02	2.13E-01	1.0E+00	0.0E+00	4.38E+02	-1.99E+00	8.45E-03	1.69E-04
Use of non-renewable primary energy resources used as raw materials	1.73E-02	-1.42E-01	0.00E+00	0.00E+00	1.0E+00	0.0E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use non-renew. primary energy res.	9.78E-02	1.86E+00	1.12E-02	2.13E-01	1.0E+00	0.0E+00	4.38E+02	-1.99E+00	8.45E-03	1.69E-04
Use of secondary material	2.73E-08	2.74E-09	0.00E+00	0.00E+00	1.0E+00	0.0E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.0E+00	0.0E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.0E+00	0.0E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	1.40E-04	8.82E-03	1.27E-06	2.44E-05	1.0E+00	0.0E+00	3.81E-01	-1.73E-03	9.61E-06	2.69E-07

Extrapolation Factors

IMPACT CATEGORY	MANUF.		DISTRIB.		INSTALL.		USE		END OF LIFE	
	a_1	b_1	a_2	b_2	a_3	b_3	a_4	b_4	a_5	b_5
Hazardous waste disposed	1.49E-06	4.31E-06	2.89E-08	5.50E-07	1.0E+00	0.0E+00	3.33E-04	-1.70E-06	2.09E-08	2.46E-09
Non-hazardous waste disposed	1.60E-03	3.06E-02	6.75E-04	1.28E-02	1.0E+00	0.0E+00	1.53E+00	-6.97E-03	8.35E-04	1.66E-05
Radioactive waste disposed	2.24E-07	3.40E-06	7.58E-08	1.46E-06	1.0E+00	0.0E+00	3.22E-03	-1.47E-05	4.92E-08	1.75E-08
Particulate matter	5.31E-10	5.44E-09	7.00E-11	1.31E-09	1.0E+00	0.0E+00	3.71E-07	7.81E-10	6.16E-11	1.70E-11
Ionising radiation	6.06E-04	6.66E-03	5.76E-05	1.09E-03	1.0E+00	0.0E+00	1.20E+01	-5.46E-02	1.14E-04	2.05E-06
Ecotoxicity, freshwater	9.27E-01	1.32E+00	8.77E-03	1.66E-01	1.0E+00	0.0E+00	2.77E+02	-1.26E+00	7.21E-02	1.45E-03
Human toxicity, cancer	3.66E-11	7.52E-11	2.75E-13	5.23E-12	1.0E+00	0.0E+00	8.56E-09	-6.77E-11	1.36E-11	2.22E-13
Human toxicity, non-cancer	1.33E-09	1.36E-09	9.26E-12	1.78E-10	1.0E+00	0.0E+00	2.72E-07	-1.33E-09	2.27E-10	-1.37E-11
Land use	4.89E-02	3.30E+00	8.78E-03	1.66E-01	1.0E+00	0.0E+00	7.92E+01	-3.60E-01	7.58E-03	1.51E-04
Component for reuse	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.0E+00	0.0E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	1.15E-04	4.34E-02	1.15E-04	4.34E-02	1.0E+00	0.0E+00	0.00E+00	0.00E+00	5.22E-04	1.06E-05
Materials for energy recovery	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.0E+00	0.0E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	-4.54E-10	4.97E-02	-4.54E-10	4.97E-02	1.0E+00	0.0E+00	0.00E+00	0.00E+00	2.60E-04	5.70E-06

For the weight and average power loss data of the variants, please refer to table below.

ABB Code of the specific product	Name	Weight of the product [g]	Average power loss (Wloss) [W] @50% In
2CSS255301R0064	SNX201-C6	106.58	0.56
2CSS255301R0065	SNX201-B6	106.58	0.56
2CSS255301R0104	SNX201-C10	105.96	0.57
2CSS255301R0105	SNX201-B10	105.96	0.57
2CSS255301R0134	SNX201-C13	105.96	0.57
2CSS255301R0135	SNX201-B13	105.96	0.57
2CSS255301R0164	SNX201-C16	104.57	0.95
2CSS255301R0165	SNX201-B16	104.57	0.95
2CSS255301R0204	SNX201-C20	105.77	1.02
2CSS255301R0205	SNX201-B20	105.77	1.02
2CSS255301R0254	SNX201-C25	110.30	0.97
2CSS255301R0255	SNX201-B25	110.30	0.97
2CSS255301R0324	SNX201-C32	111.42	1.12
2CSS255301R0325	SNX201-B32	111.42	1.12
2CSS255301U0134	SNX201-C13	105.96	0.57
2CSS255301U0164	SNX201-C16	104.57	0.95
2CSS255301U0165	SNX201-B16	104.57	0.95
2CSS256301R0064	SNX203-C6	287.01	1.65
2CSS256301R0065	SNX203-B6	287.01	1.65
2CSS256301R0104	SNX203-C10	285.95	1.31
2CSS256301R0105	SNX203-B10	285.95	1.31
2CSS256301R0134	SNX203-C13	285.95	1.31
2CSS256301R0135	SNX203-B13	285.95	1.31
2CSS256301R0164	SNX203-C16	280.38	2.30
2CSS256301R0165	SNX203-B16	280.38	2.30
2CSS256301R0204	SNX203-C20	284.20	2.02
2CSS256301R0205	SNX203-B20	284.20	2.02
2CSS256301R0254	SNX203-C25	294.74	2.49
2CSS256301R0255	SNX203-B25	294.74	2.49
2CSS256301R0324	SNX203-C32	298.35	2.80
2CSS256301R0325	SNX203-B32	298.35	2.80

Glossary

Environmental impact Indicators	
GWP-total	Global Warming Potential total (Climate hange)
GWP-fossil	Global Warming Potential fossil
GWP-biogenic	Global Warming Potential biogenic
GWP-luluc	Global Warming Potential land use and land use change
ODP	Depletion potential of the stratospheric ozone layer
AP	Acidification potential
EP-freshwater	Eutrophication potential - freshwater compartment
EP-marine	Eutrophication potential - fraction of nutrients reachin marine end compartment
EP-terrestrial	Eutrophication potential - Accumulated Exceedance
POCP	Formation potential of tropospheric ozone
ADP-m&m	Abiotic Depletion for non-fossil resources potential
ADP-fossil	Abiotic Depletion for fossil resources potential, WDP
WDP	Water deprivation potential

Resource indicators	
PENRE	Use of non-renewable primary energy excluding renewable primary energy resources used as raw material
PENRM	Use of non-renewable primary energy resources used as raw material
PENRT	Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials
PERE	Use of renewable primary energy excluding non-renewable primary energy resources used as raw material.
PERM	Use of renewable primary energy resources used as raw material
PERT	Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)

Secondary materials, water and energy resources	
SM	Use of secundary materials
RSF	Use of renewable secondary fuels
NRSF	Use of non-renewable secondary fuels
FW	Net use of fresh water

Waste category indicators	
HWD	Hazardous waste disposed
N-HWD	Non-hazardous waste disposed
RWD	Radioactive waste disposed

Output flow indicators	
CfRu	Components for re-use
MfR	Materials for recycling
MfER	Materials for energy recovery
EE	Exported Energy

Optional indicators	
Tot PE	Total use of primary energy during the life cycle
Efp	Emissions of Fine particles
IrHH	Ionizing radiation, human health
ETX FW	Ecotoxicity, freshwater
HTX CE	Human toxicity, carcinogenic effects
HTX N-CE	Human toxicity, non-carcinogenic effects
IrLS	Impact related to Land use / soil quality

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