epddanmark

ECO PLATFORM EPD VERIFIED

Owner: Actulux
No.: MD-24143-EN
Issued: 18-12-2024
Valid to: 18-12-2029

3rd PARTY **VERIFIED**

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | **ISO 14025 & EN 15804**

Owner of declaration

Actulux A/S
Porsborgparken 35, 9530
Stoevring, Denmark
www.actulux.dk
VAT no. 28892195

Programme
EPD Danmark
www.epddanmark.dk

☐ Industry EPD

☒ Product EPD

Declared product(s)

Opening System SA Power Mini (3 variations)
221721/221100/221555

Opening System SA Power Single (5 variations)
120054/120817/128722/128660/128416

Opening System SA Power Double (2 variations)
130805/130812

Opening System SA Power Large (2 variations)
130805/110910

Number of **declared datasets**/product variations: 4

Production site
Porsborgparken 35, 9530 Stoevring, Denmark

Use of Guarantees of Origin

☒ No certificates used

☐ Electricity covered by GoO

☐ Biogas covered by GoO

Declared/ functional unit
1 kg

Year of production site data (A3)
2023

EPD version
Version nr. 1

Issued: 18-12-2024

Valid to: 18-12-2029

Basis of calculation
This EPD is developed and verified in accordance with the European standard EN 15804+A2.

Comparability
EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database.

Validity
This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

Use
The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

EPD type
☐Cradle-to-gate with modules C1-C4 and D
☒Cradle-to-gate with options, modules C1-C4 and D
☐Cradle-to-grave and module D
☐Cradle-to-gate
☐Cradle-to-gate with options

CEN standard EN 15804 serves as the core PCR

Independent verification of the declaration and data, according to EN ISO 14025

☐ internal ☒ external

Third party verifier:

[Mirko Miseljic]

Martha Katrine Sørensen
EPD Danmark

Life cycle stages and modules (MND = module not declared)															
Product			Construction process		Use							End of life				Beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport	Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Re-use, recovery and recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	X	X	X	X	X	X	X	X	X	X	X	X

Table 1:Life cycles and modules

Modules B1, B2, B3, B4, B5, and B7 have been deemed to have a very low impact or no impact at all for the declared products, so they will be subject to cut off. The products do not consume water and have no direct environmental emissions during the use phase. Furthermore, there is no identified need for repair, replacement, or renovation during the product's lifetime, provided that installation and maintenance are carried out in accordance with Actulux's installation guidelines.

Product information

Product description

The ranges of the main material groups weight in % are shown in the table below for a traverse-mounted systems for skylights - SA POWER. Some of the components are found only in some variations of the specific models, therefore there is 0 amount % for that material (fx. Paper)

Materials for SA Power	Weight of SA Power Mini	Weight of SA Power Single	Weight of SA Power Double	Weight of SA Power Large
Paper and cardboard	0 - 1.77	0	0	0
Plastic and silicon	3.18 - 4.91	1.93 - 67.31	2.23 - 2.81	2.25 - 3.87
Motor and PCB	3.41 - 5.18	0.03 - 4.60	3.37 - 4.09	2.70 - 5.31
Steel products	88.14 - 93.35	32.64 - 95.43	93.07 - 94.29	90.78 - 94.96

Table 2: SA Power material composition

Product packaging:

The composition of the sales- and transport packaging of the product is shown in the table below. The study includes both the packaging used for the raw materials and the packaging for product delivery. The amounts presented in the table below will be the worst case scenario of packaging for each data set declared.

Input to [1kg] from raw materials in A1 - packaging								
	SA Power Mini		SA Power Single		SA Power Double		SA Power Large	
Material/component	Weight (kg)	Weight (%)	Weight (kg)	Weight (%)	Weight (kg)	Weight (%)	Weight (kg)	Weight (%)
Pallet and frames (wood)	0.01166	40.74	0.00172	97.72	0.00407	23.65	0.00331	16.85
Cardboard boxes	0.01688	58.98	0	0	0.01314	76.35	0.01634	83.15
Plastic wrap and strips	0.00008	0.28	0.00004	2.27	0	0	0	0
Total	**0,0286**	**100**	**0.0018**	**100**	**0.0172**	**100**	**0.0197**	**100**

Table 3: Packaging composition for each model

Representativity

This declaration represents the production of 4 SA Power opening systems, displayed as a reference worst-case product, at Actulux A/S production site in Stoevring, Denmark. Product specific data are based on average values collected within the entire 2023 year. Background data are based on the Ecoinvent 3.10 database and are less than 10 years old. End of life scenarios are based on international documents and reports referred to in this study.

Hazardous substances

The weight % of the declared product concerning substances of very high concern is calculated to represent 0.00097% of the total product. (http://echa.europa.eu/candidate-list-table)

Substance for SA Power	CAS no.	Weight % of declared product
Lead	7439-92-1	0.00097%
trans-cyclohexane-1,2-dicarboxylic anhydride	14166-21-3	
Lead monoxide (lead oxide)	1317-36-8	
2,2',6,6'-tetrabromo-4,4'-isopropylidenediphenol	79-94-7	

Table 4: Dangerous substances

Product(s) use

The opening system is especially designed for small, medium and large skylights, domes and smoke hatches in buildings, staircases etc.

The SA Power opening systems can be used for both fire and comfort ventilation. The opening system has an elegant design and takes up no space in the room under the skylight or smoke hatch.

Essential characteristics

Information on essential properties and technical specifications can be obtained by request from Actulux A/S or on Actulux's homepage.

Reference Service Life (RSL)

The reference service life following DS/EN 17212:2020 is set to 30 years. For more information about the RSL, it is advised to visit the manufacturer webpage: www.actulux.dk

Picture of product(s)

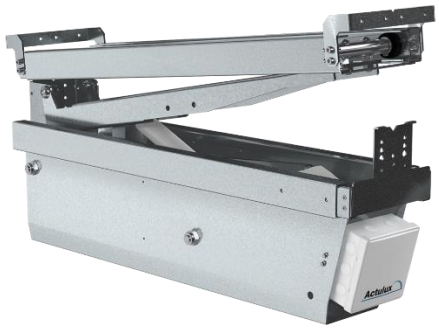

Figure 1: SA Power Mini

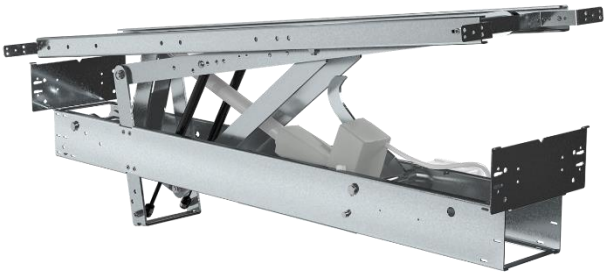

Figure 2: SA Power Single

Figure 3: SA Power Large

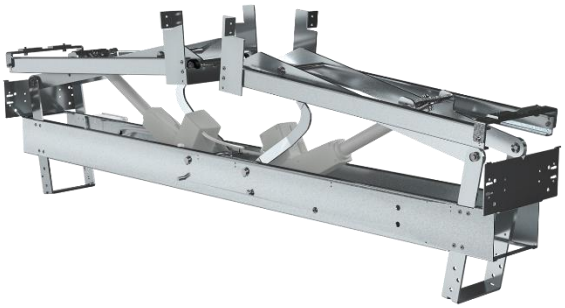

Figure 4: SA Power Double

LCA background

Declared unit

The LCI and LCIA results in this EPD relates to 1 kg of SA Power opening system (SA Power Mini/Single/Double/Large) from Actulux.

Name	Value	Unit
Declared unit	1	kg
Density	1	kg/kg
Conversion factor to 1 kg.	1	-

Table 5: Declared unit

Functional unit

Not defined.

PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804:2012+A2.

The method for choosing between different variations of the same model follows EPD Denmark's worst case grouping rules. The description can be found in EPD Denmark's consultant kit – document "Grouping rules".

This EPD is an EPD of grouped products, where a reference worst-case product is identified for each product group. A worst-case product is a product for which all environmental impact results are worst, within a group of products.

Energy modelling principles

Foreground system:

The product is produced using both grid mix energy as well as solar power produced on site and modelled according to the requirement of residual mix for the grid electricity. Following EPD Denmark's rules about modelling of energy consumption, the residual electricity mix production in Denmark from Ecoinvent 3.10 is used. This dataset describes the residual mix on the medium voltage level in Denmark.

Background system:

Upstream and downstream processes in the background system are modelled using average grid mix electricity, where electricity is used in the aggregated secondary datasets.

System boundary

This EPD is based on a cradle-to-gate with module B1-B7, C1-C4 and D, in which 100 weight-% of the product has been accounted for.

The general rules for the exclusion of inputs and outputs (cut-off) follows the requirements in EN 15804, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and 1 % of energy usage and mass for unit processes.

This LCA contains all available information from the manufacturer and 100% of the product have been declared. Product specific data are based on data values collected in the period of 2023 (whole year & representative data). The activities in B2 and B4 are not included in the LCIA calculation, due to the cut-off rule, and that these exclusions were of negligeable importance to the final results.

Economic allocation is applied in this project for the energy use calculation in A3 module.

No other allocation is performed in this project.

This EPD is of grouped products with declaring the reference worst case product as the result.

Flow diagram

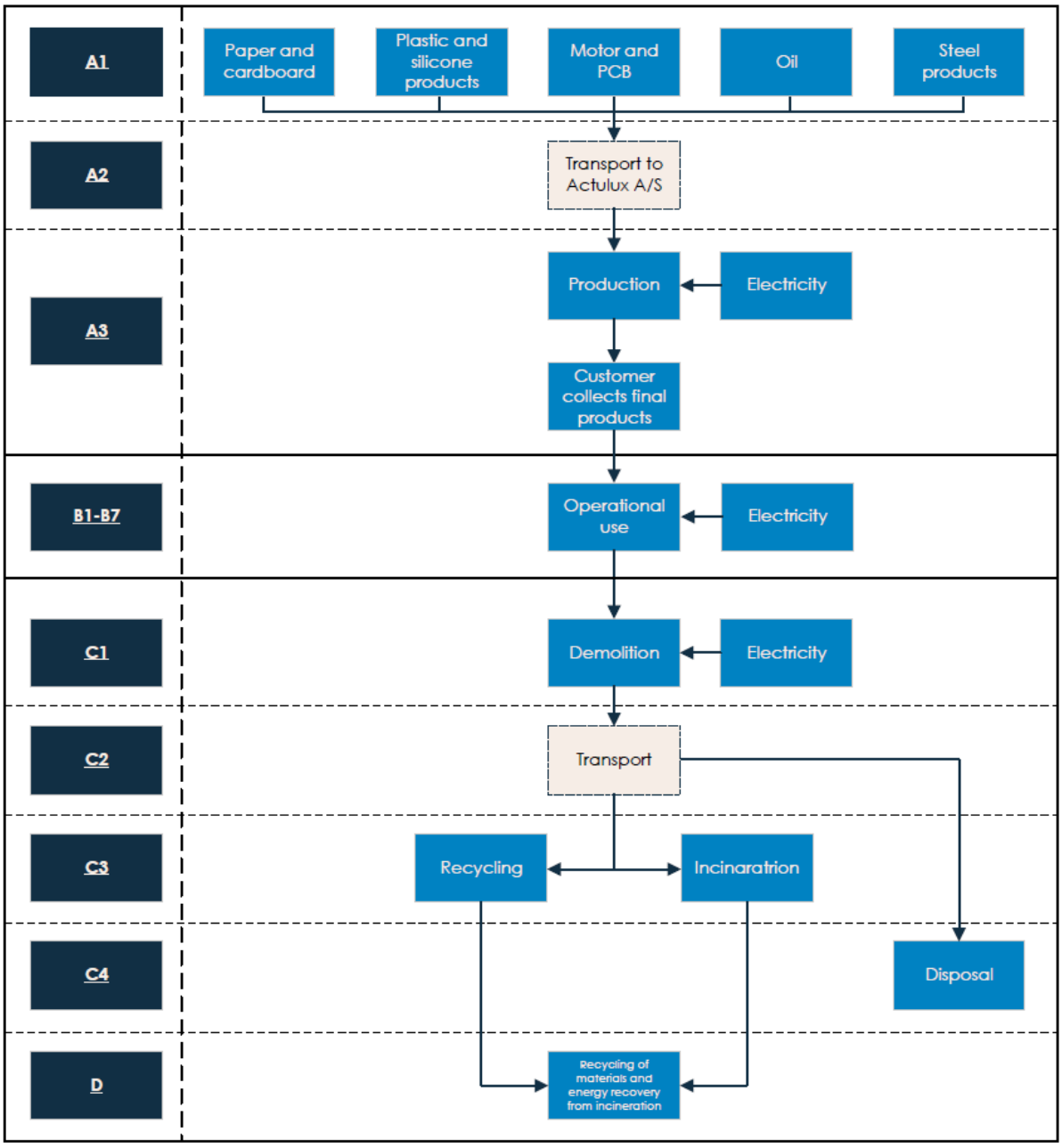

Figure 5: Flow diagram

Product stage (A1-A3) includes:

A1 – Extraction and processing of raw materials

A2 – Transport to the production site

A3 – Manufacturing processes

The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, packaging and waste processing up to the "end-of-waste" state or final disposal. The LCA results are declared in aggregated form for the product stage, which means, that the sub-modules A1, A2 and A3 are declared as one module A1-A3.

The raw materials: Materials used for the assembly of the SA Power opening system are bought from Vietnam, Germany and Denmark and afterwards transported and assembled in the factory at Actulux. The packaging from the raw materials is disposed of in A3.

Transportation: Due to the lack of information about the specific transport type used for delivering raw materials/component to the production site, all transportation was assumed to be done with one vehicle type. The distance was calculated on land and on water specifically from the supplier to the storing facility in Denmark at Actulux.

Manufacturing: The assembly of the final product is done at the production facility where Actulux resides. The production facility and the storage facility are under the same roof. The materials are sorted when arriving at the warehouse. When an order is placed, due to the high organisational methods, each component is found based on their number and collected in a pallet box to limit the time used by the workers for searching of each individual component. Different assembly stations move the pallet box from the first to the last person that is responsible for assembling specific components. The products are then assembled on different tables depending on the part of the product. Different professionals are responsible for different parts of the assembly process.

When the product is finalised, it is then sent to the delivery area where it is organised either on a wooden pallet with plastic strips or in cardboard boxes, and afterwards delivered to the customer. The product packaging is then disposed of in A5.

Construction process stage (A4-A5) includes:

A4-A5 phase are not included in this project. The biogenic carbon that should have been declared in A5 is declared in the background report.

Use stage (B1-B7) includes:

B1: No activity occurs in module B1.

B2: In accordance with applicable law, the SA Power opening system must be inspected by a certified service technician once a year. This only includes technician transport to site.

B3: No activity occurs in module B3. If components are worn out, they are replaced and allocated in B4.

B4: After 10 years of operation one gas spring must be replaced to ensure safe operation of the opening system.

B5: No activity occurs in module B5.

B6: Electricity (EU market average) is included for the operation of the opening system SA Power. The electricity consumption is calculated based on the number of times the system will open, the opening time, voltage consumption and current consumption and number of actuators in an opening system. The total energy use is listed in the table below.

Name	Value	Unit
SA Power Mini	13.2	kWh
SA Power Single	17.6	kWh
SA Power Large	35.2	kWh
SA Power Double	35.2	kWh

Table 6: Energy use per RSL

B6 is modelled for a year of product use.

Name	Value	Unit
SA Power Mini	0.44	kWh
SA Power Single	0.59	kWh
SA Power Large	1.17	kWh
SA Power Double	1.17	kWh

Table 7: Energy use per year

B7: No activity occurs in module B7.

End of Life (C1-C4) includes:

It is considered that the products are dismantled by using electrical drills and then transported to the waste processing facilities, where the parts are disposed, recycled, or incinerated depending on the type of material, as well as handled as hazardous waste.

The End-of-Life scenario includes electrical equipment and cables, plastics, and metals being recycled, incinerated, or landfilled.

Re-use, recovery and recycling potential (D) includes:

Module D includes reuse, recovery and/or recycling potential, expressed as net impact and benefits, due to reuse, recycling and incineration of materials with energy recovery in module C3. The energy recovery is credited in module D and the energy recovered is based on the calorific values of materials from the incineration of plastic.

OneClickLCA EPD tool

This EPD is generated with a pre-verified EPD tool from OneClickLCA. The EN & ISO-compliant EPD generation tool streamlines LCA analysis and sustainability reporting. The modelling process was done using Ecoinvent 3.10 data and the results of the EPD are checked for plausibility.

Identification name and version number of the EPD-generator: EPD Generator - Ecoinvent 3.10 (IES PreVerified).

Estimates and assumptions

All transport in A2 and C2 is with EURO 5 trucks due to the lack of specific data.
In the C module the end-of-life scenario considered is that the opening system is demounted during the deconstruction process and a small amount of energy for power tools is required for this process. The used system is transported to a municipal waste collection and sorting station, the average transport distance from the demolition place to the station is set to 50km for all waste facilities.
The scenarios attributed to the modules where data was unavailable are considered representative to the generic European data and are also descriptive to the geography of the project.

LCA results – SA POWER Mini:

ENVIRONMENTAL IMPACTS PER [kg]									
Parameter	**Unit**	**A1-A3**	**B1-B5, B7**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	5.69E+00	0.00E+00	8.42E-03	7.25E-04	1.18E-02	1.74E-01	3.99E-02	-9.23E-01
GWP-fossil	[kg CO_2 eq.]	5.74E+00	0.00E+00	8.39E-03	7.24E-04	1.18E-02	1.74E-01	3.99E-02	-9.23E-01
GWP-biogenic	[kg CO_2 eq.]	-5.57E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.10E-04
GWP-luluc	[kg CO_2 eq.]	6.46E-03	0.00E+00	2.60E-05	9.71E-07	3.72E-06	2.26E-05	4.45E-07	-1.52E-04
ODP	[kg CFC 11 eq.]	1.65E-07	0.00E+00	1.45E-10	4.56E-12	2.36E-10	2.14E-10	2.42E-11	-3.58E-08
AP	[mol H^+ eq.]	4.79E-02	0.00E+00	4.28E-05	3.52E-06	3.53E-05	1.58E-04	5.55E-05	-3.78E-03
EP-freshwater	[kg P eq.]	6.15E-04	0.00E+00	8.00E-07	3.48E-08	8.88E-08	1.10E-06	8.55E-09	-3.80E-05
EP-marine	[kg N eq.]	6.65E-03	0.00E+00	5.68E-06	6.38E-07	1.17E-05	5.68E-05	2.43E-05	-7.73E-04
EP-terrestrial	[mol N eq.]	1.35E-01	0.00E+00	6.45E-05	7.09E-06	1.29E-04	5.22E-04	2.66E-04	-9.01E-03
POCP	[kg NMVOC eq.]	2.14E-02	0.00E+00	2.14E-05	2.10E-06	5.57E-05	1.62E-04	2.36E-04	-4.59E-03
ADPm[1]	[kg Sb eq.]	9.27E-04	0.00E+00	1.87E-08	6.70E-10	3.86E-08	3.09E-07	1.40E-09	-1.75E-05
ADPf[1]	[MJ]	7.25E+01	0.00E+00	1.98E-01	9.33E-03	1.65E-01	2.35E-01	2.06E-02	-8.17E+00
WDP[1]	[m^3 world eq. deprived]	2.03E+00	0.00E+00	5.14E-03	1.54E-04	7.90E-04	1.17E-02	4.80E-04	-1.69E-01
Caption	GWP-total = Globale Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidifcation; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water depletion potential								
	The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: $1.95*10^2$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0.0000000000112.								
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.								

Additional environmental impacts, as declared in the project report of this EPD, may be declared in this EPD (if not please state "ND" (Not Declared) as result):

ADDITIONAL ENVIRONMENTAL IMPACTS PER [kg]									
Parameter	**Unit**	**A1-A3**	**B1-B5, B7**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	5.15E-07	0.00E+00	1.26E-10	3.10E-11	7.94E-10	5.02E-09	6.94E-07	-6.11E-08
IRP[2]	[kBq U235 eq.]	1.92E-01	0.00E+00	1.76E-03	3.75E-05	8.74E-05	4.04E-04	5.37E-06	3.14E-02
ETP-fw[1]	[CTUe]	1.17E+02	0.00E+00	2.55E-02	1.83E-03	4.31E-02	1.69E+00	3.72E-01	-3.28E+01
HTP-c[1]	[CTUh]	9.12E-08	0.00E+00	1.71E-11	7.85E-13	7.06E-11	3.01E-10	1.17E-08	7.76E-09
HTP-nc[1]	[CTUh]	1.51E-07	0.00E+00	7.56E-11	4.32E-12	9.89E-11	3.26E-09	1.13E-09	-2.20E-08
SQP[1]	-	3.18E+01	0.00E+00	3.37E-02	1.39E-03	8.47E-02	6.52E-01	4.12E-02	-2.89E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)								
	The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: $1.95*10^2$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0.0000000000112.								
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.								
	[2] 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 nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.								

RESOURCE USE PER [kg]									
Parameter	**Unit**	**A1-A3**	**B1-B5, B7**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	8.04E+00	0.00E+00	4.64E-02	1.13E-03	3.17E-03	2.23E-02	2.02E-04	-6.81E-01
PERM	[MJ]	4.61E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	8.50E+00	0.00E+00	4.64E-02	1.13E-03	3.17E-03	2.23E-02	2.02E-04	-6.81E-01
PENRE	[MJ]	7.07E+01	0.00E+00	1.98E-01	9.33E-03	1.65E-01	-5.16E-01	-7.44E-01	-8.07E+00
PENRM	[MJ]	8.88E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-6.26E-01	-2.26E-01	1.11E-01
PENRT	[MJ]	7.16E+01	0.00E+00	1.98E-01	9.33E-03	1.65E-01	-1.14E+00	-9.70E-01	-7.96E+00
SM	[kg]	9.90E-01	0.00E+00	2.13E-05	9.51E-07	7.21E-05	2.81E-04	5.39E-06	5.31E-01
RSF	[MJ]	1.16E-02	0.00E+00	8.76E-08	4.55E-09	7.32E-07	2.02E-05	1.10E-07	-8.45E-05
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m^3]	4.89E-02	0.00E+00	1.65E-04	4.42E-06	2.23E-05	2.50E-04	-1.07E-05	-2.03E-03
Caption	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 = Net use of fresh water The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: $1.95*10^{2}$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0.0000000000112.								

WASTE CATEGORIES AND OUTPUT FLOWS PER [kg]									
Parameter	**Unit**	**A1-A3**	**B1-B5, B7**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	1.17E+00	0.00E+00	4.52E-04	6.26E-05	2.15E-04	1.34E-02	2.42E-05	-3.06E-01
NHWD	[kg]	1.82E+01	0.00E+00	3.68E-02	1.52E-03	5.05E-03	1.12E-01	4.07E-02	-1.51E+00
RWD	[kg]	1.28E-04	0.00E+00	1.42E-06	2.41E-08	6.30E-08	2.52E-07	3.38E-09	2.15E-06
RU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	1.02E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.96E-01	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	[MJ]	1.85E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.55E-01	0.00E+00	0.00E+00
EET	[MJ]	2.48E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.90E-01	0.00E+00	0.00E+00
Caption	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 The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: $1.95*10^{2}$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0.0000000000112.								

BIOGENIC CARBON CONTENT PER [kg]		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packaging	[kg C]	1.66E-04 kg C
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

LCA results – SA POWER Single:

ENVIRONMENTAL IMPACTS PER [kg]									
Parameter	**Unit**	**A1-A3**	**B1-B5, B7**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	7.41E+00	0.00E+00	6.46E-03	4.81E-01	1.19E-02	1.33E-01	3.61E-02	-9.52E-01
GWP-fossil	[kg CO_2 eq.]	7.41E+00	0.00E+00	6.44E-03	4.81E-01	1.19E-02	1.33E-01	3.61E-02	-9.51E-01
GWP-biogenic	[kg CO_2 eq.]	-3.04E-04	0.00E+00	-1.69E-21	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.59E-04
GWP-luluc	[kg CO_2 eq.]	6.15E-03	0.00E+00	1.99E-05	6.45E-04	3.75E-06	2.19E-05	4.32E-07	-1.53E-04
ODP	[kg CFC 11 eq.]	1.73E-07	0.00E+00	1.12E-10	3.02E-09	2.38E-10	2.02E-10	2.39E-11	-3.70E-08
AP	[mol H^+ eq.]	4.35E-02	0.00E+00	3.28E-05	2.33E-03	3.56E-05	1.52E-04	5.13E-05	-3.90E-03
EP-freshwater	[kg P eq.]	6.87E-04	0.00E+00	6.14E-07	2.31E-05	8.96E-08	1.10E-06	8.21E-09	-3.92E-05
EP-marine	[kg N eq.]	7.99E-03	0.00E+00	4.36E-06	4.24E-04	1.18E-05	5.42E-05	2.24E-05	-7.98E-04
EP-terrestrial	[mol N eq.]	1.10E-01	0.00E+00	4.95E-05	4.71E-03	1.30E-04	4.92E-04	2.46E-04	-9.30E-03
POCP	[kg NMVOC eq.]	2.85E-02	0.00E+00	1.64E-05	1.40E-03	5.62E-05	1.55E-04	2.17E-04	-4.75E-03
ADPm[1]	[kg Sb eq.]	9.47E-04	0.00E+00	1.44E-08	4.45E-07	3.89E-08	3.16E-07	1.33E-09	-1.81E-05
ADPf[1]	[MJ]	9.12E+01	0.00E+00	1.52E-01	6.20E+00	1.66E-01	2.26E-01	2.02E-02	-8.30E+00
WDP[1]	[m^3 world eq. deprived]	2.15E+00	0.00E+00	3.94E-03	1.02E-01	7.97E-04	1.04E-02	4.42E-04	-1.73E-01
Caption	GWP-total = Globale Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidifcation; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water depletion potential The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: $1.95*10^2$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0.0000000000112.								
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.								

Additional environmental impacts, as declared in the project report of this EPD, may be declared in this EPD (if not please state "ND" (Not Declared) as result):

ADDITIONAL ENVIRONMENTAL IMPACTS PER [kg]									
Parameter	**Unit**	**A1-A3**	**B1-B5, B7**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	5.83E-07	0.00E+00	9.68E-11	2.06E-08	8.02E-10	5.11E-09	6.37E-07	-6.31E-08
IRP[2]	[kBq U235 eq.]	1.82E-01	0.00E+00	1.35E-03	2.49E-02	8.82E-05	4.00E-04	5.09E-06	3.38E-02
ETP-fw[1]	[CTUe]	1.50E+02	0.00E+00	1.96E-02	1.21E+00	4.35E-02	1.60E+00	3.40E-01	-3.40E+01
HTP-c[1]	[CTUh]	2.08E-07	0.00E+00	1.31E-11	5.22E-10	7.13E-11	2.90E-10	1.07E-08	8.07E-09
HTP-nc[1]	[CTUh]	1.71E-07	0.00E+00	5.80E-11	2.87E-09	9.98E-11	3.04E-09	1.03E-09	-2.28E-08
SQP[1]	-	4.38E+01	0.00E+00	2.59E-02	9.20E-01	8.55E-02	6.72E-01	4.01E-02	-2.98E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless) The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: $1.95*10^2$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0.0000000000112.								
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.								
	[2] 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 nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.								

RESOURCE USE PER [kg]									
Parameter	**Unit**	**A1-A3**	**B1-B5, B7**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	7.90E+00	0.00E+00	3.56E-02	7.47E-01	3.20E-03	2.22E-02	1.91E-04	-6.97E-01
PERM	[MJ]	2.68E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.42E-07
PERT	[MJ]	7.90E+00	0.00E+00	3.56E-02	7.47E-01	3.20E-03	2.22E-02	1.91E-04	-6.97E-01
PENRE	[MJ]	9.05E+01	0.00E+00	1.52E-01	6.20E+00	1.66E-01	-3.79E-03	-4.88E-01	-8.28E+00
PENRM	[MJ]	7.40E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-5.23E-01	-1.88E-01	3.00E-02
PENRT	[MJ]	9.12E+01	0.00E+00	1.52E-01	6.20E+00	1.66E-01	-5.26E-01	-6.76E-01	-8.25E+00
SM	[kg]	6.62E-01	0.00E+00	1.64E-05	6.31E-04	7.27E-05	2.66E-04	5.15E-06	5.50E-01
RSF	[MJ]	2.12E-03	0.00E+00	6.72E-08	3.02E-06	7.38E-07	2.06E-05	1.06E-07	-8.77E-05
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m^3]	4.52E-02	0.00E+00	1.27E-04	2.94E-03	2.25E-05	2.31E-04	1.12E-05	-2.02E-03
Caption	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 = Net use of fresh water The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: $1.95*10^{2}$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0.0000000000112.								

WASTE CATEGORIES AND OUTPUT FLOWS PER [kg]									
Parameter	**Unit**	**A1-A3**	**B1-B5, B7**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	1.42E+00	0.00E+00	3.47E-04	4.16E-02	2.17E-04	1.21E-02	2.29E-05	-3.17E-01
NHWD	[kg]	2.28E+01	0.00E+00	2.82E-02	1.01E+00	5.10E-03	9.85E-02	1.28E-02	-1.56E+00
RWD	[kg]	1.18E-04	0.00E+00	1.09E-06	1.60E-05	6.36E-08	2.49E-07	3.20E-09	2.60E-06
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	2.75E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.17E-01	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	[MJ]	6.10E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.09E-01	0.00E+00	0.00E+00
EET	[MJ]	8.40E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.49E-01	0.00E+00	0.00E+00
Caption	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 The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: $1.95*10^{2}$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0.0000000000112.								

BIOGENIC CARBON CONTENT PER [kg]		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packaging	[kg C]	2.42E-04 kg C
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

LCA results – SA POWER Double:

ENVIRONMENTAL IMPACTS PER [kg]									
Parameter	**Unit**	**A1-A3**	**B1-B5, B7**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	6.79E+00	0.00E+00	7.74E-03	7.25E-04	1.20E-02	1.73E-01	4.86E-02	-9.36E-01
GWP-fossil	[kg CO_2 eq.]	6.78E+00	0.00E+00	7.70E-03	7.24E-04	1.20E-02	1.73E-01	4.86E-02	-9.36E-01
GWP-biogenic	[kg CO_2 eq.]	-1.61E-04	0.00E+00	1.73E-05	0.00E+00	-1.65E-24	0.00E+00	0.00E+00	-1.51E-04
GWP-luluc	[kg CO_2 eq.]	5.50E-03	0.00E+00	2.38E-05	9.71E-07	3.79E-06	2.44E-05	4.17E-07	-1.51E-04
ODP	[kg CFC 11 eq.]	1.27E-07	0.00E+00	1.34E-10	4.56E-12	2.40E-10	2.38E-10	2.30E-11	-3.64E-08
AP	[mol H^+ eq.]	4.54E-02	0.00E+00	3.93E-05	3.52E-06	3.59E-05	1.67E-04	6.73E-05	-3.83E-03
EP-freshwater	[kg P eq.]	5.09E-04	0.00E+00	7.34E-07	3.48E-08	9.04E-08	1.11E-06	7.93E-09	-3.86E-05
EP-marine	[kg N eq.]	7.17E-03	0.00E+00	5.22E-06	6.38E-07	1.19E-05	5.97E-05	2.96E-05	-7.85E-04
EP-terrestrial	[mol N eq.]	1.24E-01	0.00E+00	5.92E-05	7.09E-06	1.31E-04	5.53E-04	3.23E-04	-9.15E-03
POCP	[kg NMVOC eq.]	2.51E-02	0.00E+00	1.96E-05	2.10E-06	5.67E-05	1.72E-04	2.91E-04	-4.67E-03
ADPm[1]	[kg Sb eq.]	5.78E-04	0.00E+00	1.72E-08	6.70E-10	3.93E-08	3.14E-07	1.29E-09	-1.78E-05
ADPf[1]	[MJ]	8.14E+01	0.00E+00	1.82E-01	9.33E-03	1.68E-01	2.55E-01	1.95E-02	-8.19E+00
WDP[1]	[m^3 world eq. deprived]	2.18E+00	0.00E+00	4.72E-03	1.54E-04	8.04E-04	1.30E-02	5.78E-04	-1.70E-01
Caption	GWP-total = Globale Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidifcation; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water depletion potential The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: $1.95*10^2$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0.0000000000112.								
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.								

Additional environmental impacts, as declared in the project report of this EPD, may be declared in this EPD (if not please state "ND" (Not Declared) as result):

ADDITIONAL ENVIRONMENTAL IMPACTS PER [kg]									
Parameter	**Unit**	**A1-A3**	**B1-B5, B7**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	6.02E-07	0.00E+00	1.16E-10	3.10E-11	8.09E-10	5.05E-09	8.64E-07	-6.21E-08
IRP[2]	[kBq U235 eq.]	1.44E-01	0.00E+00	1.61E-03	3.75E-05	8.90E-05	4.34E-04	4.93E-06	3.31E-02
ETP-fw[1]	[CTUe]	1.42E+02	0.00E+00	2.35E-02	1.83E-03	4.39E-02	1.96E+00	4.60E-01	-3.34E+01
HTP-c[1]	[CTUh]	2.53E-07	0.00E+00	1.57E-11	7.85E-13	7.19E-11	3.04E-10	1.46E-08	7.93E-09
HTP-nc[1]	[CTUh]	1.57E-07	0.00E+00	6.94E-11	4.32E-12	1.01E-10	3.80E-09	1.40E-09	-2.24E-08
SQP[1]	-	3.80E+01	0.00E+00	3.10E-02	1.39E-03	8.63E-02	6.60E-01	3.86E-02	-2.93E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless) The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: $1.95*10^2$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0.0000000000112.								
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.								
	[2] 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 nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.								

RESOURCE USE PER [kg]									
Parameter	**Unit**	**A1-A3**	**B1-B5, B7**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	7.45E+00	0.00E+00	4.26E-02	1.13E-03	3.23E-03	2.35E-02	1.85E-04	-6.87E-01
PERM	[MJ]	1.42E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	7.45E+00	0.00E+00	4.26E-02	1.13E-03	3.23E-03	2.35E-02	1.85E-04	-6.87E-01

PENRE	[MJ]	8.01E+01	0.00E+00	1.82E-01	9.33E-03	1.68E-01	-3.93E-02	-6.63E-01	-8.15E+00
PENRM	[MJ]	1.27E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-9.15E-01	-3.30E-01	4.40E-02
PENRT	[MJ]	8.14E+01	0.00E+00	1.82E-01	9.33E-03	1.68E-01	-9.54E-01	-9.92E-01	-8.11E+00
SM	[kg]	4.62E-01	0.00E+00	1.96E-05	9.51E-07	7.34E-05	2.70E-04	4.99E-06	5.41E-01
RSF	[MJ]	7.88E-03	0.00E+00	8.04E-08	4.55E-09	7.45E-07	2.09E-05	1.03E-07	-8.62E-05
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m^3]	4.33E-02	0.00E+00	1.51E-04	4.42E-06	2.27E-05	2.88E-04	7.64E-06	-2.00E-03
Caption	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 = Net use of fresh water The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: $1.95*10^{2}$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0.0000000000112.								

WASTE CATEGORIES AND OUTPUT FLOWS PER [kg]									
Parameter	**Unit**	**A1-A3**	**B1-B5, B7**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	1.55E+00	0.00E+00	4.15E-04	6.26E-05	2.19E-04	1.59E-02	2.22E-05	-3.12E-01
NHWD	[kg]	2.21E+01	0.00E+00	3.38E-02	1.52E-03	5.15E-03	1.13E-01	1.63E-02	-1.53E+00
RWD	[kg]	9.25E-05	0.00E+00	1.31E-06	2.41E-08	6.42E-08	2.71E-07	3.10E-09	2.51E-06
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	1.83E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.16E-01	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	[MJ]	7.30E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.39E-01	0.00E+00	0.00E+00
EET	[MJ]	1.01E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.92E-01	0.00E+00	0.00E+00
Caption	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 The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: $1.95*10^{2}$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0.0000000000112.								

BIOGENIC CARBON CONTENT PER [kg]		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packaging	[kg C]	1.25E-05 kg C
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

LCA results – SA POWER Large:

ENVIRONMENTAL IMPACTS PER [kg]									
Parameter	**Unit**	**A1-A3**	**B1-B5, B7**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	7.48E+00	0.00E+00	9.36E-03	7.25E-04	1.20E-02	1.57E-01	4.50E-02	-9.48E-01
GWP-fossil	[kg CO_2 eq.]	7.48E+00	0.00E+00	9.33E-03	7.24E-04	1.20E-02	1.57E-01	4.50E-02	-9.48E-01
GWP-biogenic	[kg CO_2 eq.]	-9.05E-05	0.00E+00	0.00E+00	0.00E+00	-8.27E-25	0.00E+00	-2.65E-23	-1.62E-04
GWP-luluc	[kg CO_2 eq.]	5.17E-03	0.00E+00	2.89E-05	9.71E-07	3.78E-06	2.37E-05	4.16E-07	-1.52E-04
ODP	[kg CFC 11 eq.]	1.18E-07	0.00E+00	1.62E-10	4.56E-12	2.40E-10	2.28E-10	2.30E-11	-3.68E-08
AP	[mol H^+ eq.]	3.51E-02	0.00E+00	4.76E-05	3.52E-06	3.59E-05	1.63E-04	6.28E-05	-3.88E-03
EP-freshwater	[kg P eq.]	4.53E-04	0.00E+00	8.90E-07	3.48E-08	9.03E-08	1.11E-06	7.90E-09	-3.90E-05
EP-marine	[kg N eq.]	7.52E-03	0.00E+00	6.32E-06	6.38E-07	1.19E-05	5.80E-05	2.75E-05	-7.95E-04
EP-terrestrial	[mol N eq.]	8.35E-02	0.00E+00	7.17E-05	7.09E-06	1.31E-04	5.33E-04	3.01E-04	-9.27E-03
POCP	[kg NMVOC eq.]	2.88E-02	0.00E+00	2.38E-05	2.10E-06	5.67E-05	1.66E-04	2.70E-04	-4.73E-03
ADPm[1]	[kg Sb eq.]	4.31E-04	0.00E+00	2.08E-08	6.70E-10	3.92E-08	3.16E-07	1.28E-09	-1.81E-05
ADPf[1]	[MJ]	9.16E+01	0.00E+00	2.21E-01	9.33E-03	1.67E-01	2.47E-01	1.95E-02	-8.27E+00
WDP[1]	[m^3 world eq. deprived]	1.95E+00	0.00E+00	5.71E-03	1.54E-04	8.03E-04	1.21E-02	5.39E-04	-1.72E-01
Caption	GWP-total = Globale Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidifcation; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water depletion potential The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: $1.95*10^2$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0.0000000000112.								
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.								

Additional environmental impacts, as declared in the project report of this EPD, may be declared in this EPD (if not please state "ND" (Not Declared) as result):

ADDITIONAL ENVIRONMENTAL IMPACTS PER [kg]									
Parameter	**Unit**	**A1-A3**	**B1-B5, B7**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	5.90E-07	0.00E+00	1.40E-10	3.10E-11	8.08E-10	5.08E-09	8.00E-07	-6.29E-08
IRP[2]	[kBq U235 eq.]	1.28E-01	0.00E+00	1.95E-03	3.75E-05	8.89E-05	4.25E-04	4.90E-06	3.38E-02
ETP-fw[1]	[CTUe]	1.27E+02	0.00E+00	2.84E-02	1.83E-03	4.38E-02	1.86E+00	4.27E-01	-3.39E+01
HTP-c[1]	[CTUh]	2.61E-07	0.00E+00	1.90E-11	7.85E-13	7.18E-11	2.99E-10	1.35E-08	8.04E-09
HTP-nc[1]	[CTUh]	1.45E-07	0.00E+00	8.41E-11	4.32E-12	1.01E-10	3.58E-09	1.29E-09	-2.27E-08
SQP[1]	-	5.24E+01	0.00E+00	3.75E-02	1.39E-03	8.62E-02	6.67E-01	3.86E-02	-2.97E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless) The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: $1.95*10^2$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0.0000000000112.								
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.								
	[2] 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 nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.								

RESOURCE USE PER [kg]									
Parameter	**Unit**	**A1-A3**	**B1-B5, B7**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	6.93E+00	0.00E+00	5.16E-02	1.13E-03	3.23E-03	2.32E-02	1.84E-04	-6.94E-01
PERM	[MJ]	7.92E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	6.93E+00	0.00E+00	5.16E-02	1.13E-03	3.23E-03	2.32E-02	1.84E-04	-6.94E-01
PENRE	[MJ]	9.07E+01	0.00E+00	2.21E-01	9.33E-03	1.67E-01	5.82E-02	-5.77E-01	-8.24E+00
PENRM	[MJ]	9.22E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-6.66E-01	-2.40E-01	3.00E-02
PENRT	[MJ]	9.16E+01	0.00E+00	2.21E-01	9.33E-03	1.67E-01	-6.08E-01	-8.17E-01	-8.21E+00
SM	[kg]	4.69E-01	0.00E+00	2.37E-05	9.51E-07	7.33E-05	2.67E-04	4.96E-06	5.48E-01
RSF	[MJ]	6.38E-03	0.00E+00	9.74E-08	4.55E-09	7.44E-07	2.09E-05	1.02E-07	-8.74E-05
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m^3]	3.74E-02	0.00E+00	1.83E-04	4.42E-06	2.27E-05	2.72E-04	1.22E-05	-2.01E-03
Caption	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 = Net use of fresh water The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: $1.95*10^{2}$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0.0000000000112.								

WASTE CATEGORIES AND OUTPUT FLOWS PER [kg]									
Parameter	**Unit**	**A1-A3**	**B1-B5, B7**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	1.55E+00	0.00E+00	5.03E-04	6.26E-05	2.18E-04	1.48E-02	2.20E-05	-3.16E-01
NHWD	[kg]	2.16E+01	0.00E+00	4.09E-02	1.52E-03	5.14E-03	1.07E-01	1.06E-02	-1.55E+00
RWD	[kg]	8.19E-05	0.00E+00	1.58E-06	2.41E-08	6.41E-08	2.66E-07	3.08E-09	2.61E-06
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	1.40E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.20E-01	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	[MJ]	5.60E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.93E-02	0.00E+00	0.00E+00
EET	[MJ]	7.70E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.23E-01	0.00E+00	0.00E+00
Caption	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 The numbers are declared in scientific notation, fx 1.95E+02. This number can also be written as: $1.95*10^{2}$ or 195, while 1.12E-11 is the same as $1.12*10^{-11}$ or 0.0000000000112.								

BIOGENIC CARBON CONTENT PER [kg]		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packaging	[kg C]	2.72E-05 kg C
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Additional information

LCA interpretation

1. SA Power Mini

In the case of SA Power Mini, this version is the one with the weight in between the smallest and the largest model. This result is due to the top frame unit of the product being made of more components than for both smallest and biggest model. From the data, the A1 (raw material extraction) phase is the main contributor to most environmental impacts, especially for GWP, ODP, AP, EP, and ADP. This suggests that improving material sourcing, increasing efficiency in raw material extraction, or using alternative materials could significantly reduce overall environmental impacts. Given that A1 is a hotspot, exploring the use of lower-impact or recycled materials could reduce the burden.

2. SA Power Single

In the case of SA Power Single, this version contains an electronic component extra that influenced the environmental footprint to this being the version with the highest emissions. The A1 phase (raw material extraction) consistently emerges as the dominant contributor across all impact categories. This suggests that focusing on reducing the environmental impacts in this phase could yield the greatest overall improvements. Focusing on more sustainable material sourcing, improving the circular economy, and optimizing deconstruction and waste processing practices can reduce the overall environmental impact of the product.

3. SA Power Large

In the case of SA Power Large, the smallest model showed the bigger environmental impact. The results show that the A1 phase (raw material extraction) is consistently the largest contributor to all impact categories, including GWP, ODP, AP, EP, POCP, ADP, and WDP. This suggests that raw material sourcing is the most environmentally intensive phase in the life cycle of the product. Since the A1 phase (raw material extraction) contributes the most to environmental impacts, switching to less resource-intensive or recycled materials could significantly reduce the environmental footprint. Increasing the energy efficiency of the manufacturing processes (A3) could help mitigate the impacts in this stage.

4. SA Power Double

For this model of SA Power Double, the smallest variant has the bigger environmental impact in this group. The highest GWP comes from raw material extraction (A1), but recovery processes (D) provide significant carbon savings, reducing the overall GWP substantially. The results reveal that the A1 phase (raw material extraction) is the dominant contributor to almost all environmental impact categories, including GWP, ODP, AP, EP, POCP, ADP, and WDP. This indicates that sourcing raw materials is the most environmentally impactful stage of the product's life cycle. Given that the A1 phase (raw material extraction) contributes the most to environmental impacts, switching to more sustainable or recycled materials can significantly reduce the overall environmental footprint. Improving energy efficiency during the A3 phase (manufacturing) can reduce fossil fuel depletion (ADPf1) and GWP impacts.

Indoor air

The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.1.

Soil and water

The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.2.

References

Publisher	www.epddanmark.dk Template version 2023.2
Programme operator	Danish Technological Institute Gregersensvej 1 DK-2630 Taastrup www.teknologisk.dk
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General programme instructions
General Programme Instructions, version 2.0, spring 2020
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