



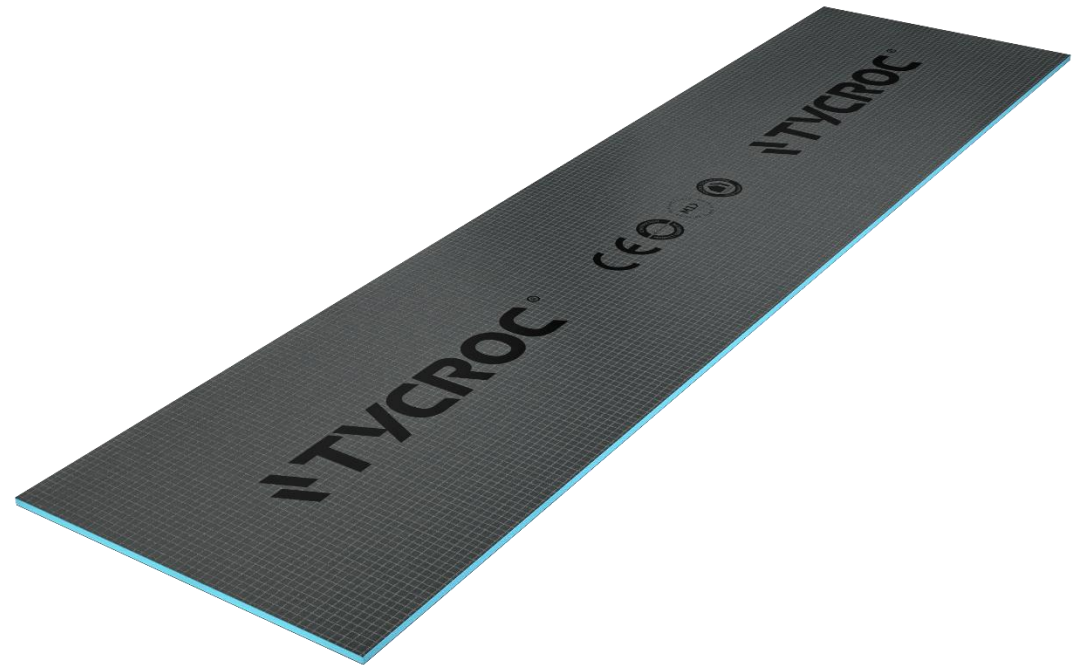
# TYCROC®

## ENVIRONMENTAL PRODUCT DECLARATION

MULTIPLE PRODUCT EPD WITH MULTIPLE DECLARED RESULTS  
IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

**Waterproof building boards**  
**Bendable and flexible boards**  
**Bathboards and shower bases**

**Tycroc OÜ**



Programme operator: Rakennustieto Oy

Malminkatu 16 A, 00100 Helsinki

<https://ymparisto.rakennustieto.fi/>

EPD registration number: RTS\_478\_26

Publication date: 16.04.2026

Valid until: 16.04.2031

*An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication.*

Jukka Seppänen  
RTS EPD Committee Secretary

Laura Apilo  
Managing Director



## GENERAL INFORMATION

### MANUFACTURER

EPD owner	Tycroc OÜ
Address	Pirni 7/1, 10617, Tallinn
Contact details	info@tycroc.com
Website	www.tycroc.com

### PRODUCT IDENTIFICATION

Product name	Waterproof building boards, Bendable and flexible boards, Bathboards and shower bases
Product reference	Waterproof building boards (TWP06, TWP12/XL, TWP20/XL, TWP30, TWP40, TWP50, TWP80) Bendable and flexible boards (FXL20/FXW20, FXL30/FXW30)
Place of production	Xuancheng industrial zone, Anhui province, China
Period for data	01.01.2024-31.12.2024

### EPD INFORMATION

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

EPD program operator	Rakennustieto Oy
EPD standards	This EPD is in accordance with EN 15804+A2:2019 and ISO 14025
Product category rules	The CEN standard EN 15804 serves as the core PCR. In addition, the RTS EPD PCR 2024 (12.11.2024) is used.
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Andra Ainsaar, Sustinere OÜ
Category of EPD	Third party verified EPD
EPD verification	Independent verification of this EPD and data, according to ISO 14025: <input type="checkbox"/> Internal verification <input checked="" type="checkbox"/> External verification
EPD verifier	Anni Oviir, LCA Support (Rangi Maja OÜ)
EPD number	RTS_478_26
Verification date	15.04.2026
Publishing date	16.04.2026
EPD valid until	16.04.2031



## PRODUCT INFORMATION

### PRODUCT DESCRIPTION

Tycroc's building boards deliver reliable, lightweight, and versatile solutions designed for modern construction and renovation in both wet and dry environments. Their extruded polystyrene foam (XPS) core, combined with polymer cement mortar layers reinforced by fiberglass mesh, ensures durable, rigid, and fully waterproof surfaces that prevent moisture penetration and capillary condensation.

The product range includes versatile boards for flat and curved applications, such as partition walls, shower cabins, sauna benches, and shelves, along with bathboards that simplify the finishing of bath sides and shower bases to offer leak-proof, thermally insulated, and ready-to-install solutions that significantly reduce installation time and eliminate the need for traditional floor slopes. Installation involves fasteners and/or adhesives depending on the substrate and installation method.

By combining easy installation, excellent waterproofing, thermal insulation, and design adaptability, Tycroc's building boards and accessory systems provide efficient and long-lasting building envelope protection, making them ideal for bathrooms, spas, saunas, and seasonal properties. Their hydrophobic, tile-ready surfaces ensure safe, durable, and attractive final finishes, meeting the demands of both professionals and DIY enthusiasts.

Further information can be found at [www.tycroc.com](http://www.tycroc.com)

### TECHNICAL PROPERTIES

PARAMETER	VALUE	STANDARD
Waterproofing capability	Passed	EN 14891 (150 kPa / 7 days) and water column 100 mm / 14 days
Long-term water absorption by total immersion	< 1.2 vol. %	EN 12078:2013
Watertightness at penetrations	Passed	ETAG 022 Annex A and F
Joint-bridging ability	Passed	ETAG 022 Annex A and F
Water vapour diffusion resistance factor ( $\mu$ )	100	EN 12086
Density	36.9 kg/m <sup>3</sup>	EN 13164
Compressive stress at 10% deformation	$\geq 300$ kPa; CS(10)300	EN 826:2013
Tensile strength	400 kPa	EN 1607:2013
Thermal conductivity ( $\lambda$ D)	0.036 W/(m·K)	EN 13164:2012+A1:2015
Capillarity	0	
Sound reduction index (Rw)	21 dB	ISO 717
Temperature limits	-50 °C / +75 °C	
Reaction to fire	Class E	EN 13501-1:2018-12
Tolerances: length, width, thickness, squareness, flatness	L(2), W(2), T(3), S(1), P(3)	EN 822:2013, EN 823:2013, EN 824:2013, EN 825:2013

\*The technical properties presented in this table apply to all Tycroc building boards covered by this EPD.

### SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

## BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	
Bathboards	0.075
Shower bases	0.368
FXL20/FXW20	0.082
FXL30/FXW30	0.088
TWP06	0.022
TWP12/XL	0.063
TWP20/XL	0.082
TWP30	0.087
TWP40	0.087
TWP50	0.093
TWP80	0.123



## PRODUCT RAW MATERIAL COMPOSITION

All product raw materials are on average 75% mineral and 25% fossil materials.

Material	Amount, mass %	Usability			Origin
		Renewable	Non-renewable	Recycled	
<b>Waterproof building boards (TWP06, TWP12/XL, TWP20/XL, TWP30, TWP40, TWP50, TWP80)</b>					
Polystyrene	24%		x		CN
Polymer cement mortar	69%		x		CN
Fiberglass mesh	7%		x		CN
<i>Packaging raw material composition</i>					
Cardboard boxes	100%	x			CN
<b>Bendable and flexible boards (FXL20/FXW20, FXL30/FXW30)</b>					
Polystyrene	18%		x		CN
Polymer cement mortar	76%		x		CN
Fiberglass mesh	7%		x		CN
<i>Packaging raw material composition</i>					
Cardboard boxes	100%	x			CN
<b>Bathboards and shower bases</b>					
Polystyrene	18%		x		CN
Polymer cement mortar	75%		x		CN
Fiberglass mesh	7%		x		CN
<i>Packaging raw material composition</i>					
Cardboard boxes	100%	x			CN

Weight of packaging per DU	
Waterproof building boards	0.19 kg
Bendable and flexible boards	0.20 kg
Bathboards and shower bases	0.54 kg

## PRODUCT LIFE-CYCLE

### MANUFACTURING AND PACKAGING (A1-A3)

The production of Tycroc waterproof panels starts with the selection of materials like polystyrene, polymer cement mortar and fiberglass mesh (A1). These materials are transported (A2) to the factory in Xuancheng, China, where the panels are produced. The production process (A3) begins with polystyrene extrusion followed by cutting the panels and covering with cement mortar and fiberglass mesh for better durability and water resistance. Before delivery to Rapla warehouse in Estonia, the product is inspected for quality and compliance with requirements. The panels are packed in cardboard boxes to protect them during transportation and storage.

### TRANSPORT AND INSTALLATION (A4-A5)

Module A4 includes the transportation from the factory in China to the central warehouse in Rapla, Estonia, and then further to the main customers in Estonia, Finland and Latvia. Environmental impacts from installation (A5) into the building include 0.01% product installation loss and waste packaging. Installation materials, including energy, have not been assessed.

### PRODUCT END OF LIFE (C1-C4, D)

Since the panels are installed in a building, the energy required to demolish the building (C1) at the end of life is taken into account. It is assumed that 100% of the waste is collected and transported (C2) to the waste treatment center. Based on Estonian construction and demolition waste study (Keskkonnaagentuur, 2024), 100% of insulation material and other construction waste goes to landfill (C4). The benefits beyond the system boundaries (D) include cardboard recycling from A5.

## MANUFACTURING PROCESS (A3)



## LIFE-CYCLE ASSESSMENT

### DATA PERIOD

The period for data represents 01.01.2024-31.12.2024.

### DECLARED UNIT

Declared unit	1 m <sup>2</sup> of waterproof board	
	Mass per declared unit, kg	Thickness, mm
Bathboards	4.46	30
Shower bases	7.96	20
FXL20/FXW20	4.4	20
FXL30/FXW30	4.53	30
TWP06	3.2	6
TWP12/XL	3.66	12
TWP20/XL	4	20
TWP30	4.66	30
TWP40	5	40
TWP50	5.33	50
TWP80	6	80



### SYSTEM BOUNDARY

The scope of the EPD is cradle to gate with options, A4-A5, and modules C1-C4, D.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
x	x	x	x	x	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	x		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/ demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

not declared = ND

### CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded. Installation materials (e.g. screws and adhesives) are excluded from the assessment, as their type and quantity depend on the installation surface and method and are therefore not representative of the declared product; these materials have not been evaluated.

### ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR.

In this study, as per EN 15804, allocation is conducted in the following order;

1. Allocation should be avoided.
2. Allocation should be based on physical properties (e.g. mass, volume) when the difference in revenue is small.
3. Allocation should be based on economic values.

Most of the data is product specific. Energy consumed during the manufacturing stage have been allocated to the analysed product based on the amount of kg that is produced.

### DATA QUALITY

Data collection for production, transport, and packaging was collected from the manufacturer via a questionnaire for reference year 2024. Upstream process calculations rely on generic data from the One Click LCA databases and Ecoinvent. The inventory and environmental data is assessed as good or very good quality.

### LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.10.1/3.11 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1/3.11 environmental data sources follow the methodology 'allocation, Cut-off, EN 15804+A2'.

3rd CEER Report on Power Losses 2025, Council of European Energy Regulators. Accessed on: <https://www.ceer.eu/publication/3rd-ceer-report-on-power-losses/>

Bozdag, Ö. & Secer, M. 2007. Accessed on: [www.irbnet.de/daten/iconda/CIB\\_DC24603.pdf](http://www.irbnet.de/daten/iconda/CIB_DC24603.pdf)

Ecoinvent 3.10.1/3.11 database

Ehitus- ja lammutusjäätmete teke ja käitlemine 2024, Keskkonnaagentuur. Accessed on: <https://keskkonnaportaali.ee/et/ehitus-ja-lammutusjaatmete-teke-ja-kaitlemine>

## ENVIRONMENTAL IMPACT DATA (TWP06)

### CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total <sup>1)</sup>	kg CO <sub>2</sub> e	2,34E+00	2,46E-02	1,43E-01	2,51E+00	6,18E-01	1,15E-01	ND	ND	ND	ND	ND	ND	ND	1,16E-02	1,72E-02	0,00E+00	2,95E-01	-3,50E-02
GWP – fossil	kg CO <sub>2</sub> e	2,44E+00	2,46E-02	1,75E-01	2,64E+00	6,18E-01	3,26E-04	ND	ND	ND	ND	ND	ND	ND	1,16E-02	1,72E-02	0,00E+00	2,95E-01	-4,77E-02
GWP – biogenic	kg CO <sub>2</sub> e	-1,03E-01	5,54E-06	-3,39E-02	-1,37E-01	1,45E-04	1,14E-01	ND	ND	ND	ND	ND	ND	ND	2,21E-06	3,90E-06	0,00E+00	1,44E-04	1,50E-02
GWP – LULUC	kg CO <sub>2</sub> e	1,03E-02	1,10E-05	1,73E-03	1,20E-02	3,67E-04	1,24E-06	ND	ND	ND	ND	ND	ND	ND	1,19E-06	7,71E-06	0,00E+00	2,15E-05	-2,22E-03
Ozone depletion pot.	kg CFC-11e	2,33E-07	3,64E-10	1,95E-09	2,35E-07	8,68E-09	2,44E-11	ND	ND	ND	ND	ND	ND	ND	1,72E-10	2,54E-10	0,00E+00	8,83E-10	-1,43E-09
Acidification potential	mol H <sup>+</sup> e	8,93E-03	8,40E-05	1,05E-03	1,01E-02	1,45E-02	2,44E-06	ND	ND	ND	ND	ND	ND	ND	1,04E-04	5,87E-05	0,00E+00	2,54E-04	-2,30E-04
EP-freshwater <sup>2)</sup>	kg Pe	2,01E-04	1,92E-06	5,77E-05	2,60E-04	3,52E-05	2,91E-08	ND	ND	ND	ND	ND	ND	ND	3,73E-07	1,34E-06	0,00E+00	3,70E-06	-2,90E-05
EP-marine	kg Ne	2,07E-03	2,76E-05	2,27E-04	2,33E-03	3,74E-03	6,69E-07	ND	ND	ND	ND	ND	ND	ND	4,82E-05	1,93E-05	0,00E+00	6,57E-03	-1,24E-04
EP-terrestrial	mol Ne	2,03E-02	3,00E-04	1,76E-03	2,23E-02	4,14E-02	6,37E-06	ND	ND	ND	ND	ND	ND	ND	5,28E-04	2,10E-04	0,00E+00	1,03E-03	-8,01E-04
POCP (“smog”) <sup>3)</sup>	kg NMVOCe	6,83E-03	1,24E-04	5,15E-04	7,47E-03	1,14E-02	1,89E-06	ND	ND	ND	ND	ND	ND	ND	1,58E-04	8,66E-05	0,00E+00	4,26E-04	-1,95E-04
ADP-minerals & metals <sup>4)</sup>	kg Sbe	3,88E-05	6,87E-08	2,16E-07	3,91E-05	8,70E-07	4,00E-09	ND	ND	ND	ND	ND	ND	ND	4,17E-09	4,80E-08	0,00E+00	6,67E-08	-2,08E-07
ADP-fossil resources	MJ	5,28E+01	3,57E-01	2,08E+00	5,52E+01	7,76E+00	6,28E-03	ND	ND	ND	ND	ND	ND	ND	1,51E-01	2,50E-01	0,00E+00	7,81E-01	-7,13E-01
Water use <sup>5)</sup>	m <sup>3</sup> e depr.	6,40E+00	1,77E-03	1,09E+00	7,49E+00	3,27E-02	8,53E-04	ND	ND	ND	ND	ND	ND	ND	3,89E-04	1,23E-03	0,00E+00	3,42E-02	-3,05E-02

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

**ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	1,98E-08	2,47E-09	6,88E-09	2,92E-08	3,23E-08	6,22E-12	ND	ND	ND	ND	ND	ND	ND	2,96E-09	1,72E-09	0,00E+00	5,67E-09	-2,10E-09
Ionizing radiation <sup>6)</sup>	kBq 11235e	5,82E-05	3,11E-04	5,12E-03	5,49E-03	6,69E-03	1,23E-06	ND	ND	ND	ND	ND	ND	ND	6,42E-05	2,18E-04	0,00E+00	6,60E-04	-5,53E-03
Ecotoxicity (freshwater)	CTUe	2,75E+00	5,06E-02	6,36E+00	9,16E+00	7,92E-01	1,12E-03	ND	ND	ND	ND	ND	ND	ND	8,62E-02	3,54E-02	0,00E+00	1,26E+01	-1,85E+01
Human toxicity, cancer	CTUh	3,83E-11	4,07E-12	4,53E-11	8,76E-11	1,30E-10	2,20E-14	ND	ND	ND	ND	ND	ND	ND	1,18E-12	2,84E-12	0,00E+00	1,97E-11	-1,49E-11
Human tox. non-cancer	CTUh	4,89E-10	2,31E-10	1,60E-09	2,32E-09	2,61E-09	5,27E-13	ND	ND	ND	ND	ND	ND	ND	1,86E-11	1,62E-10	0,00E+00	3,43E-09	-3,41E-10
SQP <sup>7)</sup>	-	1,07E-02	3,60E-01	3,92E+00	4,29E+00	2,19E+00	6,69E-04	ND	ND	ND	ND	ND	ND	ND	9,98E-03	2,52E-01	0,00E+00	1,84E+00	-2,08E+00

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

**USE OF NATURAL RESOURCES**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy <sup>8)</sup>	MJ	4,46E+00	4,90E-03	5,12E-02	4,51E+00	1,11E-01	4,62E-04	ND	ND	ND	ND	ND	ND	ND	9,47E-04	3,43E-03	0,00E+00	1,08E-02	2,78E-01
Renew. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	4,46E+00	4,90E-03	5,12E-02	4,51E+00	1,11E-01	4,62E-04	ND	ND	ND	ND	ND	ND	ND	9,47E-04	3,43E-03	0,00E+00	1,08E-02	2,78E-01
Non-re. PER as energy	MJ	4,93E+01	3,57E-01	2,11E+00	5,18E+01	7,76E+00	4,83E-03	ND	ND	ND	ND	ND	ND	ND	1,51E-01	2,50E-01	0,00E+00	-1,16E+02	-7,26E-01
Non-re. PER as material	MJ	9,46E+00	0,00E+00	5,52E-03	9,47E+00	0,00E+00	-5,52E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	-9,46E+00	-2,23E-03
Total use of non-re. PER	MJ	5,88E+01	3,57E-01	2,11E+00	6,12E+01	7,76E+00	-6,96E-04	ND	ND	ND	ND	ND	ND	ND	1,51E-01	2,50E-01	0,00E+00	-1,25E+02	-7,29E-01
Secondary materials	kg	6,59E-02	1,52E-04	4,02E-02	1,06E-01	4,61E-03	1,11E-05	ND	ND	ND	ND	ND	ND	ND	6,25E-05	1,06E-04	0,00E+00	0,00E+00	0,00E+00
Renew. secondary fuels	MJ	1,82E-02	1,93E-06	5,85E-03	2,40E-02	1,70E-05	2,40E-06	ND	ND	ND	ND	ND	ND	ND	1,64E-07	1,35E-06	0,00E+00	5,38E-06	-4,95E-03
Non-ren. secondary fuels	MJ	1,94E-01	0,00E+00	0,00E+00	1,94E-01	0,00E+00	1,94E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m <sup>3</sup>	1,04E-01	5,28E-05	2,34E-03	1,07E-01	8,29E-04	1,06E-05	ND	ND	ND	ND	ND	ND	ND	9,67E-06	3,69E-05	0,00E+00	-1,18E-02	-6,83E-04

8) PER = Primary energy resources.

**END OF LIFE – WASTE**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	5,20E-02	6,06E-04	3,94E-03	5,65E-02	1,44E-02	7,10E-06	ND	ND	ND	ND	ND	ND	ND	1,69E-04	4,23E-04	0,00E+00	1,30E-03	-2,87E-03
Non-hazardous waste	kg	8,44E-01	1,12E-02	8,12E-01	1,67E+00	2,21E-01	2,72E-04	ND	ND	ND	ND	ND	ND	ND	2,47E-03	7,84E-03	0,00E+00	8,46E+00	-7,81E-02
Radioactive waste	kg	6,66E-02	7,62E-08	1,93E-06	6,66E-02	1,63E-06	6,66E-06	ND	ND	ND	ND	ND	ND	ND	1,58E-08	5,33E-08	0,00E+00	1,61E-07	-1,41E-06

**END OF LIFE – OUTPUT FLOWS**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	1,49E-02	0,00E+00	0,00E+00	1,49E-02	0,00E+00	1,49E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

## ENVIRONMENTAL IMPACT DATA (TWP12/XL)

### CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total <sup>1)</sup>	kg CO <sub>2</sub> e	3,39E+00	3,17E-02	4,17E-01	3,84E+00	6,18E-01	3,32E-01	ND	ND	ND	ND	ND	ND	ND	1,33E-02	1,97E-02	0,00E+00	3,38E-01	-1,01E-01
GWP – fossil	kg CO <sub>2</sub> e	3,48E+00	3,16E-02	5,11E-01	4,03E+00	6,18E-01	4,67E-04	ND	ND	ND	ND	ND	ND	ND	1,33E-02	1,97E-02	0,00E+00	3,37E-01	-1,38E-01
GWP – biogenic	kg CO <sub>2</sub> e	-1,02E-01	7,06E-06	-9,88E-02	-2,01E-01	1,45E-04	3,31E-01	ND	ND	ND	ND	ND	ND	ND	2,52E-06	4,46E-06	0,00E+00	1,65E-04	4,35E-02
GWP – LULUC	kg CO <sub>2</sub> e	1,10E-02	1,42E-05	5,01E-03	1,60E-02	3,67E-04	1,64E-06	ND	ND	ND	ND	ND	ND	ND	1,36E-06	8,81E-06	0,00E+00	2,46E-05	-6,44E-03
Ozone depletion pot.	kg CFC-11e	2,59E-07	4,67E-10	5,68E-09	2,65E-07	8,68E-09	2,74E-11	ND	ND	ND	ND	ND	ND	ND	1,97E-10	2,91E-10	0,00E+00	1,01E-09	-4,14E-09
Acidification potential	mol H <sup>+</sup> e	1,28E-02	1,08E-04	3,07E-03	1,59E-02	1,45E-02	3,05E-06	ND	ND	ND	ND	ND	ND	ND	1,19E-04	6,72E-05	0,00E+00	2,90E-04	-6,68E-04
EP-freshwater <sup>2)</sup>	kg Pe	2,40E-04	2,46E-06	1,66E-04	4,08E-04	3,52E-05	4,43E-08	ND	ND	ND	ND	ND	ND	ND	4,26E-07	1,53E-06	0,00E+00	4,23E-06	-8,41E-05
EP-marine	kg Ne	2,70E-03	3,55E-05	6,35E-04	3,37E-03	3,74E-03	7,67E-07	ND	ND	ND	ND	ND	ND	ND	5,52E-05	2,21E-05	0,00E+00	7,51E-03	-3,59E-04
EP-terrestrial	mol Ne	2,69E-02	3,86E-04	5,11E-03	3,24E-02	4,14E-02	7,39E-06	ND	ND	ND	ND	ND	ND	ND	6,04E-04	2,40E-04	0,00E+00	1,18E-03	-2,32E-03
POCP (“smog”) <sup>3)</sup>	kg NMVOCe	1,01E-02	1,59E-04	1,50E-03	1,18E-02	1,14E-02	2,32E-06	ND	ND	ND	ND	ND	ND	ND	1,81E-04	9,90E-05	0,00E+00	4,87E-04	-5,66E-04
ADP-minerals & metals <sup>4)</sup>	kg Sbe	4,06E-05	8,83E-08	6,22E-07	4,13E-05	8,70E-07	4,22E-09	ND	ND	ND	ND	ND	ND	ND	4,77E-09	5,49E-08	0,00E+00	7,62E-08	-6,03E-07
ADP-fossil resources	MJ	7,70E+01	4,59E-01	6,06E+00	8,36E+01	7,76E+00	9,14E-03	ND	ND	ND	ND	ND	ND	ND	1,73E-01	2,86E-01	0,00E+00	8,93E-01	-2,07E+00
Water use <sup>5)</sup>	m <sup>3</sup> e depr.	7,54E+00	2,27E-03	3,20E+00	1,07E+01	3,27E-02	1,08E-03	ND	ND	ND	ND	ND	ND	ND	4,45E-04	1,41E-03	0,00E+00	3,92E-02	-8,85E-02

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

**ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	5,80E-08	3,17E-09	1,99E-08	8,11E-08	3,23E-08	1,14E-11	ND	ND	ND	ND	ND	ND	ND	3,38E-09	1,97E-09	0,00E+00	6,48E-09	-6,08E-09
Ionizing radiation <sup>6)</sup>	kBq 11235e	1,70E-04	4,00E-04	1,48E-02	1,54E-02	6,69E-03	2,21E-06	ND	ND	ND	ND	ND	ND	ND	7,35E-05	2,49E-04	0,00E+00	7,55E-04	-1,60E-02
Ecotoxicity (freshwater)	CTUe	8,05E+00	6,50E-02	1,84E+01	2,65E+01	7,92E-01	2,83E-03	ND	ND	ND	ND	ND	ND	ND	9,86E-02	4,04E-02	0,00E+00	1,44E+01	-5,37E+01
Human toxicity, cancer	CTUh	1,12E-10	5,22E-12	1,31E-10	2,48E-10	1,30E-10	3,80E-14	ND	ND	ND	ND	ND	ND	ND	1,35E-12	3,25E-12	0,00E+00	2,26E-11	-4,33E-11
Human tox. non-cancer	CTUh	1,43E-09	2,97E-10	4,56E-09	6,29E-09	2,61E-09	9,20E-13	ND	ND	ND	ND	ND	ND	ND	2,12E-11	1,85E-10	0,00E+00	3,92E-09	-9,88E-10
SQP <sup>7)</sup>	-	3,12E-02	4,63E-01	1,14E+01	1,19E+01	2,19E+00	1,42E-03	ND	ND	ND	ND	ND	ND	ND	1,14E-02	2,88E-01	0,00E+00	2,11E+00	-6,04E+00

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

**USE OF NATURAL RESOURCES**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy <sup>8)</sup>	MJ	4,84E+00	6,29E-03	1,48E-01	4,99E+00	1,11E-01	5,11E-04	ND	ND	ND	ND	ND	ND	ND	1,08E-03	3,92E-03	0,00E+00	1,23E-02	8,05E-01
Renew. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	4,84E+00	6,29E-03	1,48E-01	4,99E+00	1,11E-01	5,11E-04	ND	ND	ND	ND	ND	ND	ND	1,08E-03	3,92E-03	0,00E+00	1,23E-02	8,05E-01
Non-re. PER as energy	MJ	6,36E+01	4,59E-01	6,14E+00	7,02E+01	7,76E+00	6,81E-03	ND	ND	ND	ND	ND	ND	ND	1,73E-01	2,86E-01	0,00E+00	-1,32E+02	-2,11E+00
Non-re. PER as material	MJ	1,98E+01	0,00E+00	1,60E-02	1,98E+01	0,00E+00	-1,60E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	-1,98E+01	-6,48E-03
Total use of non-re. PER	MJ	8,34E+01	4,59E-01	6,15E+00	9,00E+01	7,76E+00	-9,19E-03	ND	ND	ND	ND	ND	ND	ND	1,73E-01	2,86E-01	0,00E+00	-1,52E+02	-2,11E+00
Secondary materials	kg	7,05E-02	1,96E-04	1,17E-01	1,87E-01	4,61E-03	1,92E-05	ND	ND	ND	ND	ND	ND	ND	7,14E-05	1,22E-04	0,00E+00	0,00E+00	0,00E+00
Renew. secondary fuels	MJ	1,94E-02	2,48E-06	1,70E-02	3,64E-02	1,70E-05	3,64E-06	ND	ND	ND	ND	ND	ND	ND	1,87E-07	1,55E-06	0,00E+00	6,15E-06	-1,44E-02
Non-ren. secondary fuels	MJ	2,08E-01	0,00E+00	0,00E+00	2,08E-01	0,00E+00	2,08E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m <sup>3</sup>	1,27E-01	6,79E-05	6,83E-03	1,34E-01	8,29E-04	1,34E-05	ND	ND	ND	ND	ND	ND	ND	1,11E-05	4,23E-05	0,00E+00	-1,36E-02	-1,98E-03

8) PER = Primary energy resources

**END OF LIFE – WASTE**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	6,50E-02	7,78E-04	1,13E-02	7,70E-02	1,44E-02	9,16E-06	ND	ND	ND	ND	ND	ND	ND	1,94E-04	4,84E-04	0,00E+00	1,49E-03	-8,31E-03
Non-hazardous waste	kg	9,07E-01	1,44E-02	1,06E+00	1,99E+00	2,21E-01	2,93E-04	ND	ND	ND	ND	ND	ND	ND	2,82E-03	8,96E-03	0,00E+00	9,68E+00	-2,26E-01
Radioactive waste	kg	7,12E-02	9,79E-08	3,04E-06	7,12E-02	1,63E-06	7,12E-06	ND	ND	ND	ND	ND	ND	ND	1,80E-08	6,09E-08	0,00E+00	1,85E-07	-4,10E-06

**END OF LIFE – OUTPUT FLOWS**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	1,59E-02	0,00E+00	0,00E+00	1,59E-02	0,00E+00	1,59E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

## ENVIRONMENTAL IMPACT DATA (TWP20/XL)

### CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total <sup>1)</sup>	kg CO <sub>2</sub> e	4,55E+00	3,87E-02	7,20E-01	5,31E+00	6,18E-01	4,29E-01	ND	ND	ND	ND	ND	ND	ND	1,45E-02	2,15E-02	0,00E+00	3,69E-01	-1,31E-01
GWP – fossil	kg CO <sub>2</sub> e	4,63E+00	3,87E-02	8,41E-01	5,51E+00	6,18E-01	6,02E-04	ND	ND	ND	ND	ND	ND	ND	1,45E-02	2,15E-02	0,00E+00	3,69E-01	-1,79E-01
GWP – biogenic	kg CO <sub>2</sub> e	-9,19E-02	8,63E-06	-1,28E-01	-2,20E-01	1,45E-04	4,28E-01	ND	ND	ND	ND	ND	ND	ND	2,76E-06	4,88E-06	0,00E+00	1,80E-04	5,62E-02
GWP – LULUC	kg CO <sub>2</sub> e	1,11E-02	1,73E-05	6,49E-03	1,76E-02	3,67E-04	1,81E-06	ND	ND	ND	ND	ND	ND	ND	1,48E-06	9,63E-06	0,00E+00	2,69E-05	-8,33E-03
Ozone depletion pot.	kg CFC-11e	2,73E-07	5,72E-10	8,32E-09	2,82E-07	8,68E-09	2,91E-11	ND	ND	ND	ND	ND	ND	ND	2,15E-10	3,18E-10	0,00E+00	1,10E-09	-5,35E-09
Acidification potential	mol H <sup>+</sup> e	1,70E-02	1,32E-04	5,11E-03	2,22E-02	1,45E-02	3,58E-06	ND	ND	ND	ND	ND	ND	ND	1,30E-04	7,34E-05	0,00E+00	3,17E-04	-8,63E-04
EP-freshwater <sup>2)</sup>	kg Pe	2,73E-04	3,01E-06	2,51E-04	5,27E-04	3,52E-05	5,34E-08	ND	ND	ND	ND	ND	ND	ND	4,66E-07	1,68E-06	0,00E+00	4,63E-06	-1,09E-04
EP-marine	kg Ne	3,35E-03	4,34E-05	9,50E-04	4,34E-03	3,74E-03	8,49E-07	ND	ND	ND	ND	ND	ND	ND	6,03E-05	2,41E-05	0,00E+00	8,21E-03	-4,65E-04
EP-terrestrial	mol Ne	3,38E-02	4,72E-04	7,94E-03	4,22E-02	4,14E-02	8,27E-06	ND	ND	ND	ND	ND	ND	ND	6,60E-04	2,62E-04	0,00E+00	1,29E-03	-3,01E-03
POCP (“smog”) <sup>3)</sup>	kg NMVOCe	1,38E-02	1,95E-04	2,31E-03	1,63E-02	1,14E-02	2,74E-06	ND	ND	ND	ND	ND	ND	ND	1,98E-04	1,08E-04	0,00E+00	5,33E-04	-7,32E-04
ADP-minerals & metals <sup>4)</sup>	kg Sbe	4,08E-05	1,08E-07	8,08E-07	4,17E-05	8,70E-07	4,27E-09	ND	ND	ND	ND	ND	ND	ND	5,21E-09	6,01E-08	0,00E+00	8,33E-08	-7,80E-07
ADP-fossil resources	MJ	1,05E+02	5,62E-01	9,85E+00	1,15E+02	7,76E+00	1,21E-02	ND	ND	ND	ND	ND	ND	ND	1,89E-01	3,12E-01	0,00E+00	9,76E-01	-2,67E+00
Water use <sup>5)</sup>	m <sup>3</sup> e depr.	8,49E+00	2,78E-03	5,78E+00	1,43E+01	3,27E-02	1,97E-03	ND	ND	ND	ND	ND	ND	ND	4,86E-04	1,54E-03	0,00E+00	4,28E-02	-1,15E-01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

**ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	1,06E-07	3,88E-09	2,69E-08	1,36E-07	3,23E-08	1,69E-11	ND	ND	ND	ND	ND	ND	ND	3,70E-09	2,16E-09	0,00E+00	7,08E-09	-7,87E-09
Ionizing radiation <sup>6)</sup>	kBq 11235e	3,10E-04	4,89E-04	2,17E-02	2,25E-02	6,69E-03	2,92E-06	ND	ND	ND	ND	ND	ND	ND	8,03E-05	2,72E-04	0,00E+00	8,25E-04	-2,07E-02
Ecotoxicity (freshwater)	CTUe	1,46E+01	7,95E-02	2,41E+01	3,89E+01	7,92E-01	4,06E-03	ND	ND	ND	ND	ND	ND	ND	1,08E-01	4,42E-02	0,00E+00	1,57E+01	-6,95E+01
Human toxicity, cancer	CTUh	2,04E-10	6,39E-12	1,79E-10	3,89E-10	1,30E-10	5,21E-14	ND	ND	ND	ND	ND	ND	ND	1,48E-12	3,55E-12	0,00E+00	2,47E-11	-5,60E-11
Human tox. non-cancer	CTUh	2,61E-09	3,64E-10	6,85E-09	9,82E-09	2,61E-09	1,27E-12	ND	ND	ND	ND	ND	ND	ND	2,32E-11	2,02E-10	0,00E+00	4,29E-09	-1,28E-09
SQP <sup>7)</sup>	-	5,68E-02	5,66E-01	1,48E+01	1,54E+01	2,19E+00	1,77E-03	ND	ND	ND	ND	ND	ND	ND	1,25E-02	3,15E-01	0,00E+00	2,30E+00	-7,82E+00

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

**USE OF NATURAL RESOURCES**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy <sup>8)</sup>	MJ	5,00E+00	7,70E-03	2,10E-01	5,22E+00	1,11E-01	5,33E-04	ND	ND	ND	ND	ND	ND	ND	1,18E-03	4,28E-03	0,00E+00	1,35E-02	1,04E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	5,00E+00	7,70E-03	2,10E-01	5,22E+00	1,11E-01	5,33E-04	ND	ND	ND	ND	ND	ND	ND	1,18E-03	4,28E-03	0,00E+00	1,35E-02	1,04E+00
Non-re. PER as energy	MJ	7,86E+01	5,62E-01	9,97E+00	8,92E+01	7,76E+00	8,79E-03	ND	ND	ND	ND	ND	ND	ND	1,89E-01	3,12E-01	0,00E+00	-1,44E+02	-2,72E+00
Non-re. PER as material	MJ	3,23E+01	0,00E+00	2,07E-02	3,23E+01	0,00E+00	-2,07E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	-3,23E+01	-8,38E-03
Total use of non-re. PER	MJ	1,11E+02	5,62E-01	9,99E+00	1,21E+02	7,76E+00	-1,19E-02	ND	ND	ND	ND	ND	ND	ND	1,89E-01	3,12E-01	0,00E+00	-1,77E+02	-2,73E+00
Secondary materials	kg	7,09E-02	2,39E-04	1,51E-01	2,22E-01	4,61E-03	2,27E-05	ND	ND	ND	ND	ND	ND	ND	7,81E-05	1,33E-04	0,00E+00	0,00E+00	0,00E+00
Renew. secondary fuels	MJ	1,96E-02	3,04E-06	2,19E-02	4,15E-02	1,70E-05	4,15E-06	ND	ND	ND	ND	ND	ND	ND	2,05E-07	1,69E-06	0,00E+00	6,72E-06	-1,86E-02
Non-ren. secondary fuels	MJ	2,09E-01	0,00E+00	0,00E+00	2,09E-01	0,00E+00	2,09E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m <sup>3</sup>	1,49E-01	8,31E-05	1,17E-02	1,61E-01	8,29E-04	1,61E-05	ND	ND	ND	ND	ND	ND	ND	1,21E-05	4,62E-05	0,00E+00	-1,48E-02	-2,56E-03

8) PER = Primary energy resources.

**END OF LIFE – WASTE**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	7,87E-02	9,52E-04	1,46E-02	9,42E-02	1,44E-02	1,09E-05	ND	ND	ND	ND	ND	ND	ND	2,12E-04	5,29E-04	0,00E+00	1,63E-03	-1,07E-02
Non-hazardous waste	kg	9,39E-01	1,76E-02	1,17E+00	2,13E+00	2,21E-01	3,01E-04	ND	ND	ND	ND	ND	ND	ND	3,08E-03	9,79E-03	0,00E+00	1,06E+01	-2,93E-01
Radioactive waste	kg	7,17E-02	1,20E-07	4,29E-06	7,17E-02	1,63E-06	7,17E-06	ND	ND	ND	ND	ND	ND	ND	1,97E-08	6,66E-08	0,00E+00	2,02E-07	-5,31E-06

**END OF LIFE – OUTPUT FLOWS**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	1,60E-02	0,00E+00	0,00E+00	1,60E-02	0,00E+00	1,60E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

## ENVIRONMENTAL IMPACT DATA (TWP30)

### CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total <sup>1)</sup>	kg CO <sub>2</sub> e	6,19E+00	4,85E-02	1,09E+00	7,33E+00	6,18E-01	4,57E-01	ND	ND	ND	ND	ND	ND	ND	1,69E-02	2,51E-02	0,00E+00	4,30E-01	-1,40E-01
GWP – fossil	kg CO <sub>2</sub> e	6,27E+00	4,84E-02	1,22E+00	7,53E+00	6,18E-01	8,17E-04	ND	ND	ND	ND	ND	ND	ND	1,69E-02	2,51E-02	0,00E+00	4,30E-01	-1,91E-01
GWP – biogenic	kg CO <sub>2</sub> e	-8,85E-02	1,08E-05	-1,36E-01	-2,25E-01	1,45E-04	4,56E-01	ND	ND	ND	ND	ND	ND	ND	3,21E-06	5,68E-06	0,00E+00	2,10E-04	5,99E-02
GWP – LULUC	kg CO <sub>2</sub> e	1,20E-02	2,17E-05	6,91E-03	1,90E-02	3,67E-04	1,93E-06	ND	ND	ND	ND	ND	ND	ND	1,73E-06	1,12E-05	0,00E+00	3,13E-05	-8,87E-03
Ozone depletion pot.	kg CFC-11e	3,10E-07	7,15E-10	1,06E-08	3,22E-07	8,68E-09	3,30E-11	ND	ND	ND	ND	ND	ND	ND	2,51E-10	3,70E-10	0,00E+00	1,29E-09	-5,70E-09
Acidification potential	mol H <sup>+</sup> e	2,29E-02	1,65E-04	7,45E-03	3,05E-02	1,45E-02	4,51E-06	ND	ND	ND	ND	ND	ND	ND	1,51E-04	8,55E-05	0,00E+00	3,70E-04	-9,20E-04
EP-freshwater <sup>2)</sup>	kg Pe	3,32E-04	3,77E-06	3,33E-04	6,69E-04	3,52E-05	7,04E-08	ND	ND	ND	ND	ND	ND	ND	5,43E-07	1,95E-06	0,00E+00	5,39E-06	-1,16E-04
EP-marine	kg Ne	4,33E-03	5,43E-05	1,25E-03	5,63E-03	3,74E-03	9,81E-07	ND	ND	ND	ND	ND	ND	ND	7,02E-05	2,81E-05	0,00E+00	9,56E-03	-4,95E-04
EP-terrestrial	mol Ne	4,40E-02	5,91E-04	1,08E-02	5,54E-02	4,14E-02	9,69E-06	ND	ND	ND	ND	ND	ND	ND	7,69E-04	3,06E-04	0,00E+00	1,51E-03	-3,20E-03
POCP (“smog”) <sup>3)</sup>	kg NMVOCe	1,89E-02	2,43E-04	3,13E-03	2,23E-02	1,14E-02	3,37E-06	ND	ND	ND	ND	ND	ND	ND	2,30E-04	1,26E-04	0,00E+00	6,20E-04	-7,80E-04
ADP-minerals & metals <sup>4)</sup>	kg Sbe	4,07E-05	1,35E-07	8,67E-07	4,17E-05	8,70E-07	4,26E-09	ND	ND	ND	ND	ND	ND	ND	6,07E-09	7,00E-08	0,00E+00	9,71E-08	-8,31E-07
ADP-fossil resources	MJ	1,41E+02	7,03E-01	1,40E+01	1,56E+02	7,76E+00	1,64E-02	ND	ND	ND	ND	ND	ND	ND	2,20E-01	3,64E-01	0,00E+00	1,14E+00	-2,85E+00
Water use <sup>5)</sup>	m <sup>3</sup> e depr.	1,02E+01	3,47E-03	9,06E+00	1,93E+01	3,27E-02	1,93E-03	ND	ND	ND	ND	ND	ND	ND	5,66E-04	1,80E-03	0,00E+00	4,99E-02	-1,22E-01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

**ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	1,66E-07	4,85E-09	3,08E-08	2,02E-07	3,23E-08	2,35E-11	ND	ND	ND	ND	ND	ND	ND	4,31E-09	2,51E-09	0,00E+00	8,25E-09	-8,38E-09
Ionizing radiation <sup>6)</sup>	kBq 11235e	4,88E-04	6,12E-04	2,76E-02	2,87E-02	6,69E-03	3,54E-06	ND	ND	ND	ND	ND	ND	ND	9,35E-05	3,17E-04	0,00E+00	9,61E-04	-2,21E-02
Ecotoxicity (freshwater)	CTUe	2,31E+01	9,95E-02	2,64E+01	4,96E+01	7,92E-01	5,12E-03	ND	ND	ND	ND	ND	ND	ND	1,26E-01	5,15E-02	0,00E+00	1,83E+01	-7,40E+01
Human toxicity, cancer	CTUh	3,21E-10	8,00E-12	2,07E-10	5,37E-10	1,30E-10	6,68E-14	ND	ND	ND	ND	ND	ND	ND	1,72E-12	4,14E-12	0,00E+00	2,87E-11	-5,96E-11
Human tox. non-cancer	CTUh	4,11E-09	4,55E-10	8,99E-09	1,36E-08	2,61E-09	1,64E-12	ND	ND	ND	ND	ND	ND	ND	2,70E-11	2,36E-10	0,00E+00	5,00E-09	-1,36E-09
SQP <sup>7)</sup>	-	8,94E-02	7,08E-01	1,58E+01	1,66E+01	2,19E+00	1,89E-03	ND	ND	ND	ND	ND	ND	ND	1,45E-02	3,67E-01	0,00E+00	2,68E+00	-8,33E+00

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

**USE OF NATURAL RESOURCES**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy <sup>8)</sup>	MJ	5,48E+00	9,64E-03	2,57E-01	5,74E+00	1,11E-01	5,85E-04	ND	ND	ND	ND	ND	ND	ND	1,38E-03	4,99E-03	0,00E+00	1,57E-02	1,11E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	5,48E+00	9,64E-03	2,57E-01	5,74E+00	1,11E-01	5,85E-04	ND	ND	ND	ND	ND	ND	ND	1,38E-03	4,99E-03	0,00E+00	1,57E-02	1,11E+00
Non-re. PER as energy	MJ	9,94E+01	7,03E-01	1,42E+01	1,14E+02	7,76E+00	1,14E-02	ND	ND	ND	ND	ND	ND	ND	2,20E-01	3,64E-01	0,00E+00	-1,68E+02	-2,90E+00
Non-re. PER as material	MJ	4,86E+01	0,00E+00	2,21E-02	4,87E+01	0,00E+00	-2,21E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	-4,86E+01	-8,93E-03
Total use of non-re. PER	MJ	1,48E+02	7,03E-01	1,42E+01	1,63E+02	7,76E+00	-1,06E-02	ND	ND	ND	ND	ND	ND	ND	2,20E-01	3,64E-01	0,00E+00	-2,17E+02	-2,91E+00
Secondary materials	kg	7,72E-02	2,99E-04	1,61E-01	2,38E-01	4,61E-03	2,43E-05	ND	ND	ND	ND	ND	ND	ND	9,10E-05	1,55E-04	0,00E+00	0,00E+00	0,00E+00
Renew. secondary fuels	MJ	2,13E-02	3,80E-06	2,34E-02	4,47E-02	1,70E-05	4,47E-06	ND	ND	ND	ND	ND	ND	ND	2,38E-07	1,97E-06	0,00E+00	7,83E-06	-1,98E-02
Non-ren. secondary fuels	MJ	2,27E-01	0,00E+00	0,00E+00	2,27E-01	0,00E+00	2,27E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m <sup>3</sup>	1,84E-01	1,04E-04	1,75E-02	2,01E-01	8,29E-04	2,01E-05	ND	ND	ND	ND	ND	ND	ND	1,41E-05	5,38E-05	0,00E+00	-1,73E-02	-2,73E-03

8) PER = Primary energy resources.

**END OF LIFE – WASTE**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	9,61E-02	1,19E-03	1,56E-02	1,13E-01	1,44E-02	1,27E-05	ND	ND	ND	ND	ND	ND	ND	2,47E-04	6,17E-04	0,00E+00	1,90E-03	-1,14E-02
Non-hazardous waste	kg	9,85E-01	2,20E-02	1,28E+00	2,29E+00	2,21E-01	3,08E-04	ND	ND	ND	ND	ND	ND	ND	3,59E-03	1,14E-02	0,00E+00	1,23E+01	-3,12E-01
Radioactive waste	kg	7,80E-02	1,50E-07	5,20E-06	7,80E-02	1,63E-06	7,80E-06	ND	ND	ND	ND	ND	ND	ND	2,30E-08	7,76E-08	0,00E+00	2,35E-07	-5,65E-06

**END OF LIFE – OUTPUT FLOWS**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	1,74E-02	0,00E+00	0,00E+00	1,74E-02	0,00E+00	1,74E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

## ENVIRONMENTAL IMPACT DATA (TWP40)

### CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total <sup>1)</sup>	kg CO <sub>2</sub> e	7,52E+00	5,69E-02	1,42E+00	9,00E+00	6,18E-01	4,58E-01	ND	ND	ND	ND	ND	ND	ND	1,81E-02	2,69E-02	0,00E+00	4,61E-01	-1,40E-01
GWP – fossil	kg CO <sub>2</sub> e	7,58E+00	5,69E-02	1,55E+00	9,19E+00	6,18E-01	9,82E-04	ND	ND	ND	ND	ND	ND	ND	1,81E-02	2,69E-02	0,00E+00	4,61E-01	-1,91E-01
GWP – biogenic	kg CO <sub>2</sub> e	-7,35E-02	1,27E-05	-1,36E-01	-2,10E-01	1,45E-04	4,57E-01	ND	ND	ND	ND	ND	ND	ND	3,45E-06	6,10E-06	0,00E+00	2,25E-04	6,00E-02
GWP – LULUC	kg CO <sub>2</sub> e	1,18E-02	2,54E-05	6,93E-03	1,88E-02	3,67E-04	1,91E-06	ND	ND	ND	ND	ND	ND	ND	1,85E-06	1,20E-05	0,00E+00	3,36E-05	-8,88E-03
Ozone depletion pot.	kg CFC-11e	3,20E-07	8,39E-10	1,24E-08	3,33E-07	8,68E-09	3,42E-11	ND	ND	ND	ND	ND	ND	ND	2,69E-10	3,97E-10	0,00E+00	1,38E-09	-5,71E-09
Acidification potential	mol H <sup>+</sup> e	2,77E-02	1,94E-04	9,56E-03	3,75E-02	1,45E-02	5,20E-06	ND	ND	ND	ND	ND	ND	ND	1,62E-04	9,18E-05	0,00E+00	3,97E-04	-9,21E-04
EP-freshwater <sup>2)</sup>	kg Pe	3,66E-04	4,43E-06	4,02E-04	7,73E-04	3,52E-05	8,08E-08	ND	ND	ND	ND	ND	ND	ND	5,83E-07	2,09E-06	0,00E+00	5,78E-06	-1,16E-04
EP-marine	kg Ne	5,04E-03	6,37E-05	1,49E-03	6,60E-03	3,74E-03	1,07E-06	ND	ND	ND	ND	ND	ND	ND	7,54E-05	3,01E-05	0,00E+00	1,03E-02	-4,96E-04
EP-terrestrial	mol Ne	5,17E-02	6,93E-04	1,33E-02	6,56E-02	4,14E-02	1,07E-05	ND	ND	ND	ND	ND	ND	ND	8,25E-04	3,28E-04	0,00E+00	1,62E-03	-3,21E-03
POCP (“smog”) <sup>3)</sup>	kg NMVOCe	2,31E-02	2,86E-04	3,84E-03	2,72E-02	1,14E-02	3,87E-06	ND	ND	ND	ND	ND	ND	ND	2,47E-04	1,35E-04	0,00E+00	6,66E-04	-7,81E-04
ADP-minerals & metals <sup>4)</sup>	kg Sbe	4,29E-05	1,59E-07	8,75E-07	4,40E-05	8,70E-07	4,48E-09	ND	ND	ND	ND	ND	ND	ND	6,51E-09	7,51E-08	0,00E+00	1,04E-07	-8,32E-07
ADP-fossil resources	MJ	1,74E+02	8,25E-01	1,77E+01	1,93E+02	7,76E+00	2,01E-02	ND	ND	ND	ND	ND	ND	ND	2,36E-01	3,90E-01	0,00E+00	1,22E+00	-2,85E+00
Water use <sup>5)</sup>	m <sup>3</sup> e depr.	1,12E+01	4,08E-03	1,21E+01	2,33E+01	3,27E-02	2,33E-03	ND	ND	ND	ND	ND	ND	ND	6,07E-04	1,93E-03	0,00E+00	5,35E-02	-1,22E-01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

**ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	2,23E-07	5,69E-09	3,30E-08	2,62E-07	3,23E-08	2,95E-11	ND	ND	ND	ND	ND	ND	ND	4,62E-09	2,69E-09	0,00E+00	8,85E-09	-8,39E-09
Ionizing radiation <sup>6)</sup>	kBq 11235e	6,55E-04	7,19E-04	3,23E-02	3,37E-02	6,69E-03	4,04E-06	ND	ND	ND	ND	ND	ND	ND	1,00E-04	3,40E-04	0,00E+00	1,03E-03	-2,21E-02
Ecotoxicity (freshwater)	CTUe	3,09E+01	1,17E-01	2,72E+01	5,82E+01	7,92E-01	5,98E-03	ND	ND	ND	ND	ND	ND	ND	1,35E-01	5,52E-02	0,00E+00	1,96E+01	-7,41E+01
Human toxicity, cancer	CTUh	4,31E-10	9,39E-12	2,25E-10	6,66E-10	1,30E-10	7,97E-14	ND	ND	ND	ND	ND	ND	ND	1,85E-12	4,44E-12	0,00E+00	3,08E-11	-5,97E-11
Human tox. non-cancer	CTUh	5,51E-09	5,34E-10	1,08E-08	1,68E-08	2,61E-09	1,96E-12	ND	ND	ND	ND	ND	ND	ND	2,90E-11	2,53E-10	0,00E+00	5,36E-09	-1,36E-09
SQP <sup>7)</sup>	-	1,20E-01	8,31E-01	1,59E+01	1,69E+01	2,19E+00	1,92E-03	ND	ND	ND	ND	ND	ND	ND	1,56E-02	3,93E-01	0,00E+00	2,88E+00	-8,34E+00

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

**USE OF NATURAL RESOURCES**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy <sup>8)</sup>	MJ	5,63E+00	1,13E-02	2,92E-01	5,93E+00	1,11E-01	6,04E-04	ND	ND	ND	ND	ND	ND	ND	1,48E-03	5,35E-03	0,00E+00	1,68E-02	1,11E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	5,63E+00	1,13E-02	2,92E-01	5,93E+00	1,11E-01	6,04E-04	ND	ND	ND	ND	ND	ND	ND	1,48E-03	5,35E-03	0,00E+00	1,68E-02	1,11E+00
Non-re. PER as energy	MJ	1,18E+02	8,25E-01	1,80E+01	1,36E+02	7,76E+00	1,37E-02	ND	ND	ND	ND	ND	ND	ND	2,36E-01	3,91E-01	0,00E+00	-1,81E+02	-2,91E+00
Non-re. PER as material	MJ	6,35E+01	0,00E+00	2,21E-02	6,35E+01	0,00E+00	-2,21E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	-6,35E+01	-8,94E-03
Total use of non-re. PER	MJ	1,81E+02	8,25E-01	1,80E+01	2,00E+02	7,76E+00	-8,39E-03	ND	ND	ND	ND	ND	ND	ND	2,36E-01	3,91E-01	0,00E+00	-2,44E+02	-2,91E+00
Secondary materials	kg	7,57E-02	3,51E-04	1,61E-01	2,37E-01	4,61E-03	2,41E-05	ND	ND	ND	ND	ND	ND	ND	9,76E-05	1,66E-04	0,00E+00	0,00E+00	0,00E+00
Renew. secondary fuels	MJ	2,09E-02	4,46E-06	2,34E-02	4,43E-02	1,70E-05	4,43E-06	ND	ND	ND	ND	ND	ND	ND	2,56E-07	2,11E-06	0,00E+00	8,40E-06	-1,98E-02
Non-ren. secondary fuels	MJ	2,23E-01	0,00E+00	0,00E+00	2,23E-01	0,00E+00	2,23E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m <sup>3</sup>	2,07E-01	1,22E-04	2,27E-02	2,30E-01	8,29E-04	2,30E-05	ND	ND	ND	ND	ND	ND	ND	1,51E-05	5,77E-05	0,00E+00	-1,85E-02	-2,73E-03

8) PER = Primary energy resources.

**END OF LIFE – WASTE**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	1,14E-01	1,40E-03	1,56E-02	1,31E-01	1,44E-02	1,46E-05	ND	ND	ND	ND	ND	ND	ND	2,65E-04	6,62E-04	0,00E+00	2,03E-03	-1,15E-02
Non-hazardous waste	kg	1,05E+00	2,59E-02	1,28E+00	2,36E+00	2,21E-01	3,11E-04	ND	ND	ND	ND	ND	ND	ND	3,85E-03	1,22E-02	0,00E+00	1,32E+01	-3,12E-01
Radioactive waste	kg	7,65E-02	1,76E-07	5,88E-06	7,65E-02	1,63E-06	7,65E-06	ND	ND	ND	ND	ND	ND	ND	2,47E-08	8,33E-08	0,00E+00	2,52E-07	-5,66E-06

**END OF LIFE – OUTPUT FLOWS**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	1,71E-02	0,00E+00	0,00E+00	1,71E-02	0,00E+00	1,71E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

## ENVIRONMENTAL IMPACT DATA (TWP50)

### CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total <sup>1)</sup>	kg CO <sub>2</sub> e	8,71E+00	6,40E-02	1,72E+00	1,05E+01	6,18E-01	4,86E-01	ND	ND	ND	ND	ND	ND	ND	1,93E-02	2,87E-02	0,00E+00	4,92E-01	-1,49E-01
GWP – fossil	kg CO <sub>2</sub> e	8,76E+00	6,40E-02	1,86E+00	1,07E+01	6,18E-01	1,13E-03	ND	ND	ND	ND	ND	ND	ND	1,93E-02	2,87E-02	0,00E+00	4,91E-01	-2,03E-01
GWP – biogenic	kg CO <sub>2</sub> e	-6,24E-02	1,43E-05	-1,45E-01	-2,07E-01	1,45E-04	4,85E-01	ND	ND	ND	ND	ND	ND	ND	3,68E-06	6,50E-06	0,00E+00	2,40E-04	6,37E-02
GWP – LULUC	kg CO <sub>2</sub> e	1,18E-02	2,86E-05	7,36E-03	1,92E-02	3,67E-04	1,96E-06	ND	ND	ND	ND	ND	ND	ND	1,98E-06	1,28E-05	0,00E+00	3,58E-05	-9,43E-03
Ozone depletion pot.	kg CFC-11e	3,33E-07	9,44E-10	1,43E-08	3,48E-07	8,68E-09	3,57E-11	ND	ND	ND	ND	ND	ND	ND	2,87E-10	4,23E-10	0,00E+00	1,47E-09	-6,06E-09
Acidification potential	mol H <sup>+</sup> e	3,20E-02	2,18E-04	1,15E-02	4,37E-02	1,45E-02	5,82E-06	ND	ND	ND	ND	ND	ND	ND	1,73E-04	9,78E-05	0,00E+00	4,23E-04	-9,78E-04
EP-freshwater <sup>2)</sup>	kg Pe	3,99E-04	4,98E-06	4,71E-04	8,75E-04	3,52E-05	9,11E-08	ND	ND	ND	ND	ND	ND	ND	6,21E-07	2,23E-06	0,00E+00	6,17E-06	-1,23E-04
EP-marine	kg Ne	5,70E-03	7,17E-05	1,74E-03	7,51E-03	3,74E-03	1,16E-06	ND	ND	ND	ND	ND	ND	ND	8,03E-05	3,21E-05	0,00E+00	1,09E-02	-5,26E-04
EP-terrestrial	mol Ne	5,87E-02	7,80E-04	1,57E-02	7,51E-02	4,14E-02	1,17E-05	ND	ND	ND	ND	ND	ND	ND	8,80E-04	3,50E-04	0,00E+00	1,72E-03	-3,40E-03
POCP (“smog”) <sup>3)</sup>	kg NMVOCe	2,69E-02	3,21E-04	4,52E-03	3,17E-02	1,14E-02	4,31E-06	ND	ND	ND	ND	ND	ND	ND	2,63E-04	1,44E-04	0,00E+00	7,10E-04	-8,29E-04
ADP-minerals & metals <sup>4)</sup>	kg Sbe	4,31E-05	1,78E-07	9,33E-07	4,42E-05	8,70E-07	4,51E-09	ND	ND	ND	ND	ND	ND	ND	6,94E-09	8,00E-08	0,00E+00	1,11E-07	-8,84E-07
ADP-fossil resources	MJ	2,03E+02	9,28E-01	2,12E+01	2,25E+02	7,76E+00	2,33E-02	ND	ND	ND	ND	ND	ND	ND	2,51E-01	4,16E-01	0,00E+00	1,30E+00	-3,03E+00
Water use <sup>5)</sup>	m <sup>3</sup> e depr.	1,21E+01	4,59E-03	1,48E+01	2,69E+01	3,27E-02	2,69E-03	ND	ND	ND	ND	ND	ND	ND	6,48E-04	2,06E-03	0,00E+00	5,70E-02	-1,30E-01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

**ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	2,72E-07	6,40E-09	3,65E-08	3,15E-07	3,23E-08	3,48E-11	ND	ND	ND	ND	ND	ND	ND	4,93E-09	2,87E-09	0,00E+00	9,44E-09	-8,91E-09
Ionizing radiation <sup>6)</sup>	kBq 11235e	8,00E-04	8,08E-04	3,73E-02	3,89E-02	6,69E-03	4,56E-06	ND	ND	ND	ND	ND	ND	ND	1,07E-04	3,63E-04	0,00E+00	1,10E-03	-2,35E-02
Ecotoxicity (freshwater)	CTUe	3,78E+01	1,31E-01	2,93E+01	6,72E+01	7,92E-01	6,88E-03	ND	ND	ND	ND	ND	ND	ND	1,44E-01	5,89E-02	0,00E+00	2,09E+01	-7,87E+01
Human toxicity, cancer	CTUh	5,26E-10	1,06E-11	2,51E-10	7,87E-10	1,30E-10	9,19E-14	ND	ND	ND	ND	ND	ND	ND	1,97E-12	4,73E-12	0,00E+00	3,29E-11	-6,34E-11
Human tox. non-cancer	CTUh	6,73E-09	6,01E-10	1,26E-08	1,99E-08	2,61E-09	2,27E-12	ND	ND	ND	ND	ND	ND	ND	3,09E-11	2,70E-10	0,00E+00	5,72E-09	-1,45E-09
SQP <sup>7)</sup>	-	1,47E-01	9,35E-01	1,70E+01	1,81E+01	2,19E+00	2,04E-03	ND	ND	ND	ND	ND	ND	ND	1,66E-02	4,19E-01	0,00E+00	3,07E+00	-8,86E+00

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

**USE OF NATURAL RESOURCES**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy <sup>8)</sup>	MJ	5,77E+00	1,27E-02	3,32E-01	6,12E+00	1,11E-01	6,23E-04	ND	ND	ND	ND	ND	ND	ND	1,58E-03	5,70E-03	0,00E+00	1,79E-02	1,18E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	5,77E+00	1,27E-02	3,32E-01	6,12E+00	1,11E-01	6,23E-04	ND	ND	ND	ND	ND	ND	ND	1,58E-03	5,70E-03	0,00E+00	1,79E-02	1,18E+00
Non-re. PER as energy	MJ	1,33E+02	9,28E-01	2,15E+01	1,55E+02	7,76E+00	1,56E-02	ND	ND	ND	ND	ND	ND	ND	2,51E-01	4,16E-01	0,00E+00	-1,92E+02	-3,09E+00
Non-re. PER as material	MJ	7,64E+01	0,00E+00	2,35E-02	7,65E+01	0,00E+00	-2,35E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	-7,64E+01	-9,49E-03
Total use of non-re. PER	MJ	2,09E+02	9,28E-01	2,15E+01	2,32E+02	7,76E+00	-7,82E-03	ND	ND	ND	ND	ND	ND	ND	2,51E-01	4,16E-01	0,00E+00	-2,69E+02	-3,09E+00
Secondary materials	kg	7,57E-02	3,95E-04	1,71E-01	2,47E-01	4,61E-03	2,51E-05	ND	ND	ND	ND	ND	ND	ND	1,04E-04	1,77E-04	0,00E+00	0,00E+00	0,00E+00
Renew. secondary fuels	MJ	2,09E-02	5,02E-06	2,48E-02	4,57E-02	1,70E-05	4,57E-06	ND	ND	ND	ND	ND	ND	ND	2,73E-07	2,25E-06	0,00E+00	8,96E-06	-2,10E-02
Non-ren. secondary fuels	MJ	2,23E-01	0,00E+00	0,00E+00	2,23E-01	0,00E+00	2,23E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m <sup>3</sup>	2,29E-01	1,37E-04	2,75E-02	2,57E-01	8,29E-04	2,57E-05	ND	ND	ND	ND	ND	ND	ND	1,61E-05	6,15E-05	0,00E+00	-1,97E-02	-2,90E-03

8) PER = Primary energy resources.

**END OF LIFE – WASTE**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	1,28E-01	1,57E-03	1,65E-02	1,46E-01	1,44E-02	1,61E-05	ND	ND	ND	ND	ND	ND	ND	2,82E-04	7,05E-04	0,00E+00	2,17E-03	-1,22E-02
Non-hazardous waste	kg	1,08E+00	2,91E-02	1,34E+00	2,45E+00	2,21E-01	3,17E-04	ND	ND	ND	ND	ND	ND	ND	4,11E-03	1,31E-02	0,00E+00	1,41E+01	-3,32E-01
Radioactive waste	kg	7,64E-02	1,98E-07	6,67E-06	7,65E-02	1,63E-06	7,65E-06	ND	ND	ND	ND	ND	ND	ND	2,63E-08	8,87E-08	0,00E+00	2,69E-07	-6,01E-06

**END OF LIFE – OUTPUT FLOWS**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	1,70E-02	0,00E+00	0,00E+00	1,70E-02	0,00E+00	1,70E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

## ENVIRONMENTAL IMPACT DATA (TWP80)

### CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total <sup>1)</sup>	kg CO <sub>2</sub> e	1,23E+01	8,50E-02	2,70E+00	1,50E+01	6,18E-01	6,44E-01	ND	ND	ND	ND	ND	ND	ND	2,17E-02	3,23E-02	0,00E+00	5,53E-01	-1,97E-01
GWP – fossil	kg CO <sub>2</sub> e	1,23E+01	8,50E-02	2,88E+00	1,52E+01	6,18E-01	1,59E-03	ND	ND	ND	ND	ND	ND	ND	2,17E-02	3,23E-02	0,00E+00	5,53E-01	-2,69E-01
GWP – biogenic	kg CO <sub>2</sub> e	-1,17E-02	1,90E-05	-1,92E-01	-2,03E-01	1,45E-04	6,42E-01	ND	ND	ND	ND	ND	ND	ND	4,14E-06	7,31E-06	0,00E+00	2,70E-04	8,43E-02
GWP – LULUC	kg CO <sub>2</sub> e	1,04E-02	3,80E-05	9,75E-03	2,01E-02	3,67E-04	2,05E-06	ND	ND	ND	ND	ND	ND	ND	2,23E-06	1,44E-05	0,00E+00	4,03E-05	-1,25E-02
Ozone depletion pot.	kg CFC-11e	3,42E-07	1,25E-09	2,12E-08	3,65E-07	8,68E-09	3,73E-11	ND	ND	ND	ND	ND	ND	ND	3,23E-10	4,77E-10	0,00E+00	1,65E-09	-8,02E-09
Acidification potential	mol H <sup>+</sup> e	4,48E-02	2,90E-04	1,78E-02	6,29E-02	1,45E-02	7,75E-06	ND	ND	ND	ND	ND	ND	ND	1,94E-04	1,10E-04	0,00E+00	4,76E-04	-1,30E-03
EP-freshwater <sup>2)</sup>	kg Pe	4,80E-04	6,61E-06	7,09E-04	1,20E-03	3,52E-05	1,23E-07	ND	ND	ND	ND	ND	ND	ND	6,99E-07	2,51E-06	0,00E+00	6,94E-06	-1,63E-04
EP-marine	kg Ne	7,55E-03	9,52E-05	2,60E-03	1,02E-02	3,74E-03	1,43E-06	ND	ND	ND	ND	ND	ND	ND	9,04E-05	3,62E-05	0,00E+00	1,23E-02	-6,97E-04
EP-terrestrial	mol Ne	7,87E-02	1,04E-03	2,38E-02	1,04E-01	4,14E-02	1,45E-05	ND	ND	ND	ND	ND	ND	ND	9,90E-04	3,94E-04	0,00E+00	1,94E-03	-4,51E-03
POCP (“smog”) <sup>3)</sup>	kg NMVOCe	3,82E-02	4,27E-04	6,86E-03	4,55E-02	1,14E-02	5,69E-06	ND	ND	ND	ND	ND	ND	ND	2,96E-04	1,62E-04	0,00E+00	7,99E-04	-1,10E-03
ADP-minerals & metals <sup>4)</sup>	kg Sbe	4,22E-05	2,37E-07	1,24E-06	4,37E-05	8,70E-07	4,45E-09	ND	ND	ND	ND	ND	ND	ND	7,82E-09	9,01E-08	0,00E+00	1,25E-07	-1,17E-06
ADP-fossil resources	MJ	2,90E+02	1,23E+00	3,27E+01	3,24E+02	7,76E+00	3,32E-02	ND	ND	ND	ND	ND	ND	ND	2,83E-01	4,69E-01	0,00E+00	1,46E+00	-4,01E+00
Water use <sup>5)</sup>	m <sup>3</sup> e depr.	1,43E+01	6,09E-03	2,34E+01	3,77E+01	3,27E-02	3,77E-03	ND	ND	ND	ND	ND	ND	ND	7,29E-04	2,31E-03	0,00E+00	6,42E-02	-1,72E-01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

**ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	4,31E-07	8,51E-09	5,10E-08	4,91E-07	3,23E-08	5,23E-11	ND	ND	ND	ND	ND	ND	ND	5,55E-09	3,23E-09	0,00E+00	1,06E-08	-1,18E-08
Ionizing radiation <sup>6)</sup>	kBq 11235e	1,27E-03	1,07E-03	5,52E-02	5,75E-02	6,69E-03	6,43E-06	ND	ND	ND	ND	ND	ND	ND	1,20E-04	4,08E-04	0,00E+00	1,24E-03	-3,11E-02
Ecotoxicity (freshwater)	CTUe	5,98E+01	1,74E-01	3,97E+01	9,97E+01	7,92E-01	1,01E-02	ND	ND	ND	ND	ND	ND	ND	1,62E-01	6,63E-02	0,00E+00	2,36E+01	-1,04E+02
Human toxicity, cancer	CTUh	8,33E-10	1,40E-11	3,54E-10	1,20E-09	1,30E-10	1,33E-13	ND	ND	ND	ND	ND	ND	ND	2,22E-12	5,33E-12	0,00E+00	3,70E-11	-8,40E-11
Human tox. non-cancer	CTUh	1,06E-08	7,98E-10	1,88E-08	3,03E-08	2,61E-09	3,31E-12	ND	ND	ND	ND	ND	ND	ND	3,48E-11	3,03E-10	0,00E+00	6,43E-09	-1,92E-09
SQP <sup>7)</sup>	-	2,32E-01	1,24E+00	2,26E+01	2,41E+01	2,19E+00	2,64E-03	ND	ND	ND	ND	ND	ND	ND	1,87E-02	4,72E-01	0,00E+00	3,46E+00	-1,17E+01

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

**USE OF NATURAL RESOURCES**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy <sup>8)</sup>	MJ	5,73E+00	1,69E-02	4,83E-01	6,23E+00	1,11E-01	6,34E-04	ND	ND	ND	ND	ND	ND	ND	1,78E-03	6,42E-03	0,00E+00	2,02E-02	1,56E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	5,73E+00	1,69E-02	4,83E-01	6,23E+00	1,11E-01	6,34E-04	ND	ND	ND	ND	ND	ND	ND	1,78E-03	6,42E-03	0,00E+00	2,02E-02	1,56E+00
Non-re. PER as energy	MJ	1,78E+02	1,23E+00	3,31E+01	2,13E+02	7,76E+00	2,15E-02	ND	ND	ND	ND	ND	ND	ND	2,83E-01	4,69E-01	0,00E+00	-2,17E+02	-4,09E+00
Non-re. PER as material	MJ	1,18E+02	0,00E+00	3,11E-02	1,18E+02	0,00E+00	-3,11E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	-1,18E+02	-1,26E-02
Total use of non-re. PER	MJ	2,96E+02	1,23E+00	3,32E+01	3,30E+02	7,76E+00	-9,61E-03	ND	ND	ND	ND	ND	ND	ND	2,83E-01	4,69E-01	0,00E+00	-3,34E+02	-4,10E+00
Secondary materials	kg	6,63E-02	5,25E-04	2,26E-01	2,93E-01	4,61E-03	2,98E-05	ND	ND	ND	ND	ND	ND	ND	1,17E-04	1,99E-04	0,00E+00	0,00E+00	0,00E+00
Renew. secondary fuels	MJ	1,83E-02	6,67E-06	3,29E-02	5,12E-02	1,70E-05	5,12E-06	ND	ND	ND	ND	ND	ND	ND	3,07E-07	2,53E-06	0,00E+00	1,01E-05	-2,79E-02
Non-ren. secondary fuels	MJ	1,95E-01	0,00E+00	0,00E+00	1,95E-01	0,00E+00	1,95E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m <sup>3</sup>	2,86E-01	1,82E-04	4,30E-02	3,29E-01	8,29E-04	3,29E-05	ND	ND	ND	ND	ND	ND	ND	1,81E-05	6,93E-05	0,00E+00	-2,22E-02	-3,84E-03

8) PER = Primary energy resources.

**END OF LIFE – WASTE**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	1,71E-01	2,09E-03	2,19E-02	1,95E-01	1,44E-02	2,10E-05	ND	ND	ND	ND	ND	ND	ND	3,17E-04	7,94E-04	0,00E+00	2,44E-03	-1,61E-02
Non-hazardous waste	kg	1,13E+00	3,87E-02	1,42E+00	2,59E+00	2,21E-01	3,26E-04	ND	ND	ND	ND	ND	ND	ND	4,62E-03	1,47E-02	0,00E+00	1,59E+01	-4,39E-01
Radioactive waste	kg	6,69E-02	2,63E-07	9,66E-06	6,69E-02	1,63E-06	6,69E-06	ND	ND	ND	ND	ND	ND	ND	2,96E-08	9,99E-08	0,00E+00	3,03E-07	-7,96E-06

**END OF LIFE – OUTPUT FLOWS**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	1,49E-02	0,00E+00	0,00E+00	1,49E-02	0,00E+00	1,49E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

## ENVIRONMENTAL IMPACT DATA (FXL20/FXW20)

### CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total <sup>1)</sup>	kg CO <sub>2</sub> e	4,78E+00	4,08E-02	6,94E-01	5,52E+00	7,33E-01	4,51E-01	ND	ND	ND	ND	ND	ND	ND	1,59E-02	2,37E-02	0,00E+00	4,06E-01	-1,31E-01
GWP – fossil	kg CO <sub>2</sub> e	4,88E+00	4,08E-02	8,15E-01	5,74E+00	7,32E-01	6,49E-04	ND	ND	ND	ND	ND	ND	ND	1,59E-02	2,37E-02	0,00E+00	4,06E-01	-1,79E-01
GWP – biogenic	kg CO <sub>2</sub> e	-1,09E-01	9,10E-06	-1,28E-01	-2,36E-01	1,72E-04	4,50E-01	ND	ND	ND	ND	ND	ND	ND	3,04E-06	5,36E-06	0,00E+00	1,98E-04	5,62E-02
GWP – LULUC	kg CO <sub>2</sub> e	1,26E-02	1,82E-05	6,49E-03	1,91E-02	4,35E-04	1,95E-06	ND	ND	ND	ND	ND	ND	ND	1,63E-06	1,06E-05	0,00E+00	2,96E-05	-8,33E-03
Ozone depletion pot.	kg CFC-11e	3,07E-07	6,02E-10	8,17E-09	3,15E-07	1,03E-08	3,26E-11	ND	ND	ND	ND	ND	ND	ND	2,37E-10	3,50E-10	0,00E+00	1,21E-09	-5,35E-09
Acidification potential	mol H <sup>+</sup> e	1,79E-02	1,39E-04	4,95E-03	2,29E-02	1,71E-02	4,01E-06	ND	ND	ND	ND	ND	ND	ND	1,42E-04	8,07E-05	0,00E+00	3,49E-04	-8,63E-04
EP-freshwater <sup>2)</sup>	kg Pe	3,00E-04	3,18E-06	2,46E-04	5,49E-04	4,18E-05	5,91E-08	ND	ND	ND	ND	ND	ND	ND	5,13E-07	1,84E-06	0,00E+00	5,09E-06	-1,09E-04
EP-marine	kg Ne	3,59E-03	4,57E-05	9,33E-04	4,57E-03	4,41E-03	9,45E-07	ND	ND	ND	ND	ND	ND	ND	6,63E-05	2,65E-05	0,00E+00	9,03E-03	-4,65E-04
EP-terrestrial	mol Ne	3,61E-02	4,97E-04	7,75E-03	4,43E-02	4,89E-02	9,33E-06	ND	ND	ND	ND	ND	ND	ND	7,26E-04	2,89E-04	0,00E+00	1,42E-03	-3,01E-03
POCP (“smog”) <sup>3)</sup>	kg NMVOCe	1,44E-02	2,05E-04	2,26E-03	1,69E-02	1,35E-02	3,04E-06	ND	ND	ND	ND	ND	ND	ND	2,17E-04	1,19E-04	0,00E+00	5,86E-04	-7,32E-04
ADP-minerals & metals <sup>4)</sup>	kg Sbe	4,33E-05	1,14E-07	8,08E-07	4,43E-05	1,04E-06	4,53E-09	ND	ND	ND	ND	ND	ND	ND	5,73E-09	6,61E-08	0,00E+00	9,17E-08	-7,80E-07
ADP-fossil resources	MJ	1,08E+02	5,92E-01	9,56E+00	1,18E+02	9,21E+00	1,27E-02	ND	ND	ND	ND	ND	ND	ND	2,08E-01	3,44E-01	0,00E+00	1,07E+00	-2,67E+00
Water use <sup>5)</sup>	m <sup>3</sup> e depr.	9,36E+00	2,92E-03	5,54E+00	1,49E+01	3,88E-02	1,49E-03	ND	ND	ND	ND	ND	ND	ND	5,35E-04	1,70E-03	0,00E+00	4,71E-02	-1,15E-01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

**ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	1,04E-07	4,08E-09	2,68E-08	1,34E-07	3,84E-08	1,73E-11	ND	ND	ND	ND	ND	ND	ND	4,07E-09	2,37E-09	0,00E+00	7,79E-09	-7,87E-09
Ionizing radiation <sup>6)</sup>	kBq 11235e	3,04E-04	5,15E-04	2,13E-02	2,21E-02	7,94E-03	3,01E-06	ND	ND	ND	ND	ND	ND	ND	8,83E-05	2,99E-04	0,00E+00	9,07E-04	-2,07E-02
Ecotoxicity (freshwater)	CTUe	1,44E+01	8,37E-02	2,41E+01	3,85E+01	9,42E-01	4,04E-03	ND	ND	ND	ND	ND	ND	ND	1,19E-01	4,86E-02	0,00E+00	1,73E+01	-6,95E+01
Human toxicity, cancer	CTUh	2,00E-10	6,73E-12	1,77E-10	3,84E-10	1,54E-10	5,40E-14	ND	ND	ND	ND	ND	ND	ND	1,62E-12	3,91E-12	0,00E+00	2,71E-11	-5,60E-11
Human tox. non-cancer	CTUh	2,55E-09	3,83E-10	6,71E-09	9,65E-09	3,11E-09	1,30E-12	ND	ND	ND	ND	ND	ND	ND	2,55E-11	2,22E-10	0,00E+00	4,72E-09	-1,28E-09
SQP <sup>7)</sup>	-	5,57E-02	5,96E-01	1,47E+01	1,54E+01	2,64E+00	1,82E-03	ND	ND	ND	ND	ND	ND	ND	1,37E-02	3,46E-01	0,00E+00	2,53E+00	-7,82E+00

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

**USE OF NATURAL RESOURCES**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy <sup>8)</sup>	MJ	5,56E+00	8,11E-03	2,07E-01	5,77E+00	1,31E-01	5,90E-04	ND	ND	ND	ND	ND	ND	ND	1,30E-03	4,71E-03	0,00E+00	1,48E-02	1,04E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	5,56E+00	8,11E-03	2,07E-01	5,77E+00	1,31E-01	5,90E-04	ND	ND	ND	ND	ND	ND	ND	1,30E-03	4,71E-03	0,00E+00	1,48E-02	1,04E+00
Non-re. PER as energy	MJ	8,26E+01	5,92E-01	9,68E+00	9,29E+01	9,21E+00	9,39E-03	ND	ND	ND	ND	ND	ND	ND	2,08E-01	3,44E-01	0,00E+00	-1,59E+02	-2,72E+00
Non-re. PER as material	MJ	3,24E+01	0,00E+00	2,07E-02	3,24E+01	0,00E+00	-2,07E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	-3,24E+01	-8,38E-03
Total use of non-re. PER	MJ	1,15E+02	5,92E-01	9,70E+00	1,25E+02	9,21E+00	-1,13E-02	ND	ND	ND	ND	ND	ND	ND	2,08E-01	3,44E-01	0,00E+00	-1,91E+02	-2,73E+00
Secondary materials	kg	8,08E-02	2,52E-04	1,51E-01	2,32E-01	5,46E-03	2,37E-05	ND	ND	ND	ND	ND	ND	ND	8,59E-05	1,46E-04	0,00E+00	0,00E+00	0,00E+00
Renew. secondary fuels	MJ	2,23E-02	3,20E-06	2,19E-02	4,42E-02	2,03E-05	4,43E-06	ND	ND	ND	ND	ND	ND	ND	2,25E-07	1,86E-06	0,00E+00	7,39E-06	-1,86E-02
Non-ren. secondary fuels	MJ	2,38E-01	0,00E+00	0,00E+00	2,38E-01	0,00E+00	2,38E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m <sup>3</sup>	1,62E-01	8,75E-05	1,13E-02	1,73E-01	9,86E-04	1,73E-05	ND	ND	ND	ND	ND	ND	ND	1,33E-05	5,08E-05	0,00E+00	-1,63E-02	-2,56E-03

8) PER = Primary energy resources.

**END OF LIFE – WASTE**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	8,15E-02	1,00E-03	1,46E-02	9,71E-02	1,70E-02	1,14E-05	ND	ND	ND	ND	ND	ND	ND	2,33E-04	5,82E-04	0,00E+00	1,79E-03	-1,07E-02
Non-hazardous waste	kg	1,00E+00	1,86E-02	1,27E+00	2,30E+00	2,63E-01	3,16E-04	ND	ND	ND	ND	ND	ND	ND	3,39E-03	1,08E-02	0,00E+00	1,16E+01	-2,93E-01
Radioactive waste	kg	8,17E-02	1,26E-07	4,23E-06	8,17E-02	1,94E-06	8,17E-06	ND	ND	ND	ND	ND	ND	ND	2,17E-08	7,33E-08	0,00E+00	2,22E-07	-5,31E-06

**END OF LIFE – OUTPUT FLOWS**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	1,82E-02	0,00E+00	0,00E+00	1,82E-02	0,00E+00	1,82E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

## ENVIRONMENTAL IMPACT DATA (FXL30/FXW30)

### CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total <sup>1)</sup>	kg CO <sub>2</sub> e	5,49E+00	4,50E-02	8,82E-01	6,42E+00	7,33E-01	4,60E-01	ND	ND	ND	ND	ND	ND	ND	1,64E-02	2,44E-02	0,00E+00	4,18E-01	-1,41E-01
GWP – fossil	kg CO <sub>2</sub> e	5,58E+00	4,49E-02	1,01E+00	6,63E+00	7,32E-01	7,39E-04	ND	ND	ND	ND	ND	ND	ND	1,64E-02	2,44E-02	0,00E+00	4,18E-01	-1,92E-01
GWP – biogenic	kg CO <sub>2</sub> e	-9,86E-02	1,00E-05	-1,37E-01	-2,36E-01	1,72E-04	4,60E-01	ND	ND	ND	ND	ND	ND	ND	3,12E-06	5,52E-06	0,00E+00	2,04E-04	6,03E-02
GWP – LULUC	kg CO <sub>2</sub> e	1,23E-02	2,01E-05	6,97E-03	1,93E-02	4,35E-04	1,97E-06	ND	ND	ND	ND	ND	ND	ND	1,68E-06	1,09E-05	0,00E+00	3,04E-05	-8,94E-03
Ozone depletion pot.	kg CFC-11e	3,09E-07	6,63E-10	9,51E-09	3,19E-07	1,03E-08	3,29E-11	ND	ND	ND	ND	ND	ND	ND	2,44E-10	3,60E-10	0,00E+00	1,25E-09	-5,74E-09
Acidification potential	mol H <sup>+</sup> e	2,04E-02	1,53E-04	6,17E-03	2,67E-02	1,71E-02	4,38E-06	ND	ND	ND	ND	ND	ND	ND	1,47E-04	8,31E-05	0,00E+00	3,59E-04	-9,27E-04
EP-freshwater <sup>2)</sup>	kg Pe	3,16E-04	3,50E-06	2,92E-04	6,12E-04	4,18E-05	6,54E-08	ND	ND	ND	ND	ND	ND	ND	5,28E-07	1,90E-06	0,00E+00	5,24E-06	-1,17E-04
EP-marine	kg Ne	3,96E-03	5,03E-05	1,10E-03	5,11E-03	4,41E-03	9,98E-07	ND	ND	ND	ND	ND	ND	ND	6,83E-05	2,73E-05	0,00E+00	9,30E-03	-4,99E-04
EP-terrestrial	mol Ne	4,01E-02	5,48E-04	9,33E-03	4,99E-02	4,89E-02	9,89E-06	ND	ND	ND	ND	ND	ND	ND	7,48E-04	2,97E-04	0,00E+00	1,46E-03	-3,23E-03
POCP (“smog”) <sup>3)</sup>	kg NMVOCe	1,67E-02	2,26E-04	2,71E-03	1,96E-02	1,35E-02	3,31E-06	ND	ND	ND	ND	ND	ND	ND	2,24E-04	1,23E-04	0,00E+00	6,03E-04	-7,86E-04
ADP-minerals & metals <sup>4)</sup>	kg Sbe	4,31E-05	1,25E-07	8,70E-07	4,41E-05	1,04E-06	4,52E-09	ND	ND	ND	ND	ND	ND	ND	5,90E-09	6,80E-08	0,00E+00	9,44E-08	-8,38E-07
ADP-fossil resources	MJ	1,25E+02	6,52E-01	1,18E+01	1,38E+02	9,21E+00	1,47E-02	ND	ND	ND	ND	ND	ND	ND	2,14E-01	3,54E-01	0,00E+00	1,11E+00	-2,87E+00
Water use <sup>5)</sup>	m <sup>3</sup> e depr.	9,79E+00	3,22E-03	7,20E+00	1,70E+01	3,88E-02	1,70E-03	ND	ND	ND	ND	ND	ND	ND	5,50E-04	1,75E-03	0,00E+00	4,85E-02	-1,23E-01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

**ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	1,35E-07	4,50E-09	2,96E-08	1,69E-07	3,84E-08	2,08E-11	ND	ND	ND	ND	ND	ND	ND	4,19E-09	2,44E-09	0,00E+00	8,02E-09	-8,44E-09
Ionizing radiation <sup>6)</sup>	kBq 11235e	3,96E-04	5,68E-04	2,48E-02	2,58E-02	7,94E-03	3,38E-06	ND	ND	ND	ND	ND	ND	ND	9,09E-05	3,08E-04	0,00E+00	9,34E-04	-2,23E-02
Ecotoxicity (freshwater)	CTUe	1,87E+01	9,23E-02	2,61E+01	4,49E+01	9,42E-01	4,68E-03	ND	ND	ND	ND	ND	ND	ND	1,22E-01	5,00E-02	0,00E+00	1,78E+01	-7,46E+01
Human toxicity, cancer	CTUh	2,61E-10	7,42E-12	1,98E-10	4,66E-10	1,54E-10	6,22E-14	ND	ND	ND	ND	ND	ND	ND	1,67E-12	4,02E-12	0,00E+00	2,79E-11	-6,01E-11
Human tox. non-cancer	CTUh	3,33E-09	4,22E-10	7,93E-09	1,17E-08	3,11E-09	1,50E-12	ND	ND	ND	ND	ND	ND	ND	2,63E-11	2,29E-10	0,00E+00	4,86E-09	-1,37E-09
SQP <sup>7)</sup>	-	7,25E-02	6,57E-01	1,59E+01	1,66E+01	2,64E+00	1,94E-03	ND	ND	ND	ND	ND	ND	ND	1,41E-02	3,56E-01	0,00E+00	2,61E+00	-8,39E+00

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

**USE OF NATURAL RESOURCES**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy <sup>8)</sup>	MJ	5,55E+00	8,94E-03	2,36E-01	5,80E+00	1,31E-01	5,93E-04	ND	ND	ND	ND	ND	ND	ND	1,34E-03	4,85E-03	0,00E+00	1,52E-02	1,12E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	5,55E+00	8,94E-03	2,36E-01	5,80E+00	1,31E-01	5,93E-04	ND	ND	ND	ND	ND	ND	ND	1,34E-03	4,85E-03	0,00E+00	1,52E-02	1,12E+00
Non-re. PER as energy	MJ	9,16E+01	6,52E-01	1,19E+01	1,04E+02	9,21E+00	1,05E-02	ND	ND	ND	ND	ND	ND	ND	2,14E-01	3,54E-01	0,00E+00	-1,64E+02	-2,92E+00
Non-re. PER as material	MJ	4,05E+01	0,00E+00	2,22E-02	4,05E+01	0,00E+00	-2,22E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	-4,05E+01	-8,99E-03
Total use of non-re. PER	MJ	1,32E+02	6,52E-01	1,20E+01	1,45E+02	9,21E+00	-1,17E-02	ND	ND	ND	ND	ND	ND	ND	2,14E-01	3,54E-01	0,00E+00	-2,04E+02	-2,93E+00
Secondary materials	kg	7,90E-02	2,78E-04	1,62E-01	2,41E-01	5,46E-03	2,47E-05	ND	ND	ND	ND	ND	ND	ND	8,84E-05	1,51E-04	0,00E+00	0,00E+00	0,00E+00
Renew. secondary fuels	MJ	2,18E-02	3,53E-06	2,35E-02	4,53E-02	2,03E-05	4,54E-06	ND	ND	ND	ND	ND	ND	ND	2,32E-07	1,91E-06	0,00E+00	7,61E-06	-1,99E-02
Non-ren. secondary fuels	MJ	2,33E-01	0,00E+00	0,00E+00	2,33E-01	0,00E+00	2,33E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m <sup>3</sup>	1,73E-01	9,64E-05	1,43E-02	1,87E-01	9,86E-04	1,88E-05	ND	ND	ND	ND	ND	ND	ND	1,37E-05	5,23E-05	0,00E+00	-1,68E-02	-2,75E-03

8) PER = Primary energy resources.

**END OF LIFE – WASTE**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	9,00E-02	1,10E-03	1,57E-02	1,07E-01	1,70E-02	1,24E-05	ND	ND	ND	ND	ND	ND	ND	2,40E-04	5,99E-04	0,00E+00	1,84E-03	-1,15E-02
Non-hazardous waste	kg	1,01E+00	2,04E-02	1,29E+00	2,33E+00	2,63E-01	3,18E-04	ND	ND	ND	ND	ND	ND	ND	3,49E-03	1,11E-02	0,00E+00	1,20E+01	-3,14E-01
Radioactive waste	kg	7,99E-02	1,39E-07	4,82E-06	7,99E-02	1,94E-06	7,99E-06	ND	ND	ND	ND	ND	ND	ND	2,23E-08	7,54E-08	0,00E+00	2,29E-07	-5,69E-06

**END OF LIFE – OUTPUT FLOWS**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	1,78E-02	0,00E+00	0,00E+00	1,78E-02	0,00E+00	1,78E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

## ENVIRONMENTAL IMPACT DATA (BATHBOARDS)

### CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total <sup>1)</sup>	kg CO <sub>2</sub> e	5,55E+00	4,50E-02	9,00E-01	6,49E+00	1,05E+00	3,93E-01	ND	ND	ND	ND	ND	ND	ND	1,62E-02	2,40E-02	0,00E+00	4,11E-01	-1,20E-01
GWP – fossil	kg CO <sub>2</sub> e	5,63E+00	4,50E-02	1,01E+00	6,68E+00	1,05E+00	7,75E-04	ND	ND	ND	ND	ND	ND	ND	1,62E-02	2,40E-02	0,00E+00	4,11E-01	-1,64E-01
GWP – biogenic	kg CO <sub>2</sub> e	-9,35E-02	1,01E-05	-1,17E-01	-2,11E-01	2,46E-04	3,92E-01	ND	ND	ND	ND	ND	ND	ND	3,08E-06	5,44E-06	0,00E+00	2,01E-04	5,15E-02
GWP – LULUC	kg CO <sub>2</sub> e	1,20E-02	2,01E-05	5,95E-03	1,79E-02	6,22E-04	1,85E-06	ND	ND	ND	ND	ND	ND	ND	1,65E-06	1,07E-05	0,00E+00	3,00E-05	-7,63E-03
Ozone depletion pot.	kg CFC-11e	3,02E-07	6,64E-10	8,91E-09	3,11E-07	1,47E-08	3,26E-11	ND	ND	ND	ND	ND	ND	ND	2,40E-10	3,54E-10	0,00E+00	1,23E-09	-4,90E-09
Acidification potential	mol H <sup>+</sup> e	2,06E-02	1,53E-04	6,19E-03	2,69E-02	2,45E-02	5,15E-06	ND	ND	ND	ND	ND	ND	ND	1,44E-04	8,18E-05	0,00E+00	3,54E-04	-7,91E-04
EP-freshwater <sup>2)</sup>	kg Pe	3,13E-04	3,50E-06	2,80E-04	5,96E-04	5,96E-05	6,56E-08	ND	ND	ND	ND	ND	ND	ND	5,20E-07	1,87E-06	0,00E+00	5,16E-06	-9,96E-05
EP-marine	kg Ne	3,96E-03	5,04E-05	1,05E-03	5,06E-03	6,33E-03	1,19E-06	ND	ND	ND	ND	ND	ND	ND	6,72E-05	2,69E-05	0,00E+00	9,15E-03	-4,26E-04
EP-terrestrial	mol Ne	4,02E-02	5,48E-04	9,04E-03	4,97E-02	7,01E-02	1,20E-05	ND	ND	ND	ND	ND	ND	ND	7,36E-04	2,93E-04	0,00E+00	1,44E-03	-2,75E-03
POCP (“smog”) <sup>3)</sup>	kg NMVOCe	1,69E-02	2,26E-04	2,62E-03	1,97E-02	1,93E-02	3,91E-06	ND	ND	ND	ND	ND	ND	ND	2,20E-04	1,21E-04	0,00E+00	5,94E-04	-6,71E-04
ADP-minerals & metals <sup>4)</sup>	kg Sbe	4,24E-05	1,25E-07	7,46E-07	4,33E-05	1,48E-06	4,48E-09	ND	ND	ND	ND	ND	ND	ND	5,81E-09	6,70E-08	0,00E+00	9,29E-08	-7,15E-07
ADP-fossil resources	MJ	1,27E+02	6,53E-01	1,17E+01	1,39E+02	1,32E+01	1,53E-02	ND	ND	ND	ND	ND	ND	ND	2,10E-01	3,48E-01	0,00E+00	1,09E+00	-2,45E+00
Water use <sup>5)</sup>	m <sup>3</sup> e depr.	9,67E+00	3,22E-03	7,48E+00	1,72E+01	5,54E-02	1,72E-03	ND	ND	ND	ND	ND	ND	ND	5,42E-04	1,72E-03	0,00E+00	4,77E-02	-1,05E-01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

**ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	1,40E-07	4,50E-09	2,63E-08	1,71E-07	5,47E-08	2,26E-11	ND	ND	ND	ND	ND	ND	ND	4,12E-09	2,40E-09	0,00E+00	7,90E-09	-7,21E-09
Ionizing radiation <sup>6)</sup>	kBq 11235e	4,11E-04	5,69E-04	2,32E-02	2,42E-02	1,13E-02	3,56E-06	ND	ND	ND	ND	ND	ND	ND	8,95E-05	3,03E-04	0,00E+00	9,20E-04	-1,90E-02
Ecotoxicity (freshwater)	CTUe	1,94E+01	9,24E-02	2,26E+01	4,22E+01	1,34E+00	4,44E-03	ND	ND	ND	ND	ND	ND	ND	1,20E-01	4,93E-02	0,00E+00	1,75E+01	-6,37E+01
Human toxicity, cancer	CTUh	2,71E-10	7,43E-12	1,77E-10	4,55E-10	2,21E-10	6,77E-14	ND	ND	ND	ND	ND	ND	ND	1,65E-12	3,96E-12	0,00E+00	2,75E-11	-5,13E-11
Human tox. non-cancer	CTUh	3,46E-09	4,23E-10	7,56E-09	1,14E-08	4,42E-09	1,61E-12	ND	ND	ND	ND	ND	ND	ND	2,59E-11	2,26E-10	0,00E+00	4,78E-09	-1,17E-09
SQP <sup>7)</sup>	-	7,53E-02	6,57E-01	1,36E+01	1,43E+01	3,73E+00	1,82E-03	ND	ND	ND	ND	ND	ND	ND	1,39E-02	3,51E-01	0,00E+00	2,57E+00	-7,17E+00

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

**USE OF NATURAL RESOURCES**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy <sup>8)</sup>	MJ	5,43E+00	8,95E-03	2,17E-01	5,66E+00	1,88E-01	5,84E-04	ND	ND	ND	ND	ND	ND	ND	1,32E-03	4,77E-03	0,00E+00	1,50E-02	9,55E-01
Renew. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	5,43E+00	8,95E-03	2,17E-01	5,66E+00	1,88E-01	5,84E-04	ND	ND	ND	ND	ND	ND	ND	1,32E-03	4,77E-03	0,00E+00	1,50E-02	9,55E-01
Non-re. PER as energy	MJ	9,21E+01	6,53E-01	1,18E+01	1,05E+02	1,32E+01	1,10E-02	ND	ND	ND	ND	ND	ND	ND	2,10E-01	3,48E-01	0,00E+00	-1,61E+02	-2,50E+00
Non-re. PER as material	MJ	4,17E+01	0,00E+00	1,90E-02	4,18E+01	0,00E+00	-1,90E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	-4,17E+01	-7,68E-03
Total use of non-re. PER	MJ	1,34E+02	6,53E-01	1,19E+01	1,46E+02	1,32E+01	-8,01E-03	ND	ND	ND	ND	ND	ND	ND	2,10E-01	3,48E-01	0,00E+00	-2,03E+02	-2,50E+00
Secondary materials	kg	7,67E-02	2,78E-04	1,38E-01	2,15E-01	7,80E-03	2,23E-05	ND	ND	ND	ND	ND	ND	ND	8,71E-05	1,48E-04	0,00E+00	0,00E+00	0,00E+00
Renew. secondary fuels	MJ	2,11E-02	3,53E-06	2,01E-02	4,12E-02	2,89E-05	4,13E-06	ND	ND	ND	ND	ND	ND	ND	2,28E-07	1,88E-06	0,00E+00	7,49E-06	-1,70E-02
Non-ren. secondary fuels	MJ	2,26E-01	0,00E+00	0,00E+00	2,26E-01	0,00E+00	2,26E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m <sup>3</sup>	1,72E-01	9,65E-05	1,45E-02	1,87E-01	1,41E-03	1,87E-05	ND	ND	ND	ND	ND	ND	ND	1,35E-05	5,15E-05	0,00E+00	-1,65E-02	-2,35E-03

8) PER = Primary energy resources.

**END OF LIFE – WASTE**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	9,05E-02	1,11E-03	1,34E-02	1,05E-01	2,43E-02	1,29E-05	ND	ND	ND	ND	ND	ND	ND	2,36E-04	5,90E-04	0,00E+00	1,81E-03	-9,85E-03
Non-hazardous waste	kg	1,00E+00	2,05E-02	1,20E+00	2,22E+00	3,75E-01	3,18E-04	ND	ND	ND	ND	ND	ND	ND	3,44E-03	1,09E-02	0,00E+00	1,18E+01	-2,68E-01
Radioactive waste	kg	7,75E-02	1,39E-07	4,41E-06	7,75E-02	2,76E-06	7,75E-06	ND	ND	ND	ND	ND	ND	ND	2,20E-08	7,43E-08	0,00E+00	2,25E-07	-4,86E-06

**END OF LIFE – OUTPUT FLOWS**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	1,73E-02	0,00E+00	0,00E+00	1,73E-02	0,00E+00	1,73E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

## ENVIRONMENTAL IMPACT DATA (SHOWER BASES)

### CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total <sup>1)</sup>	kg CO <sub>2</sub> e	8,70E+00	7,60E-02	1,52E+00	1,03E+01	1,05E+00	1,93E+00	ND	ND	ND	ND	ND	ND	ND	2,88E-02	4,29E-02	0,00E+00	7,34E-01	-5,89E-01
GWP – fossil	kg CO <sub>2</sub> e	8,88E+00	7,60E-02	2,07E+00	1,10E+01	1,05E+00	1,21E-03	ND	ND	ND	ND	ND	ND	ND	2,88E-02	4,28E-02	0,00E+00	7,34E-01	-8,04E-01
GWP – biogenic	kg CO <sub>2</sub> e	-1,95E-01	1,66E-05	-5,75E-01	-7,70E-01	2,46E-04	1,92E+00	ND	ND	ND	ND	ND	ND	ND	5,49E-06	9,70E-06	0,00E+00	3,59E-04	2,53E-01
GWP – LULUC	kg CO <sub>2</sub> e	2,27E-02	3,40E-05	2,91E-02	5,19E-02	6,22E-04	5,25E-06	ND	ND	ND	ND	ND	ND	ND	2,95E-06	1,92E-05	0,00E+00	5,35E-05	-3,74E-02
Ozone depletion pot.	kg CFC-11e	5,53E-07	1,12E-09	2,82E-08	5,82E-07	1,47E-08	5,97E-11	ND	ND	ND	ND	ND	ND	ND	4,28E-10	6,32E-10	0,00E+00	2,20E-09	-2,40E-08
Acidification potential	mol H <sup>+</sup> e	3,25E-02	2,59E-04	1,22E-02	4,49E-02	2,45E-02	6,95E-06	ND	ND	ND	ND	ND	ND	ND	2,58E-04	1,46E-04	0,00E+00	6,32E-04	-3,88E-03
EP-freshwater <sup>2)</sup>	kg Pe	5,42E-04	5,92E-06	7,72E-04	1,32E-03	5,96E-05	1,38E-07	ND	ND	ND	ND	ND	ND	ND	9,27E-07	3,34E-06	0,00E+00	9,21E-06	-4,89E-04
EP-marine	kg Ne	6,52E-03	8,51E-05	2,98E-03	9,58E-03	6,33E-03	1,62E-06	ND	ND	ND	ND	ND	ND	ND	1,20E-04	4,80E-05	0,00E+00	1,63E-02	-2,09E-03
EP-terrestrial	mol Ne	6,55E-02	9,26E-04	2,30E-02	8,95E-02	7,01E-02	1,60E-05	ND	ND	ND	ND	ND	ND	ND	1,31E-03	5,22E-04	0,00E+00	2,57E-03	-1,35E-02
POCP (“smog”) <sup>3)</sup>	kg NMVOCe	2,62E-02	3,82E-04	6,81E-03	3,34E-02	1,93E-02	5,28E-06	ND	ND	ND	ND	ND	ND	ND	3,93E-04	2,15E-04	0,00E+00	1,06E-03	-3,29E-03
ADP-minerals & metals <sup>4)</sup>	kg Sbe	7,93E-05	2,12E-07	3,59E-06	8,31E-05	1,48E-06	8,45E-09	ND	ND	ND	ND	ND	ND	ND	1,04E-08	1,20E-07	0,00E+00	1,66E-07	-3,51E-06
ADP-fossil resources	MJ	1,97E+02	1,10E+00	2,53E+01	2,23E+02	1,32E+01	2,37E-02	ND	ND	ND	ND	ND	ND	ND	3,76E-01	6,22E-01	0,00E+00	1,94E+00	-1,20E+01
Water use <sup>5)</sup>	m <sup>3</sup> e depr.	1,69E+01	5,45E-03	1,04E+01	2,73E+01	5,54E-02	2,74E-03	ND	ND	ND	ND	ND	ND	ND	9,67E-04	3,07E-03	0,00E+00	8,52E-02	-5,15E-01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

**ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, EF 3.1**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	1,90E-07	7,61E-09	1,10E-07	3,07E-07	5,47E-08	3,62E-11	ND	ND	ND	ND	ND	ND	ND	7,36E-09	4,29E-09	0,00E+00	1,41E-08	-3,53E-08
Ionizing radiation <sup>6)</sup>	kBq 11235e	5,58E-04	9,60E-04	7,33E-02	7,48E-02	1,13E-02	8,62E-06	ND	ND	ND	ND	ND	ND	ND	1,60E-04	5,41E-04	0,00E+00	1,64E-03	-9,32E-02
Ecotoxicity (freshwater)	CTUe	2,64E+01	1,56E-01	1,05E+02	1,31E+02	1,34E+00	1,33E-02	ND	ND	ND	ND	ND	ND	ND	2,14E-01	8,79E-02	0,00E+00	3,13E+01	-3,12E+02
Human toxicity, cancer	CTUh	3,67E-10	1,25E-11	7,11E-10	1,09E-09	2,21E-10	1,31E-13	ND	ND	ND	ND	ND	ND	ND	2,94E-12	7,07E-12	0,00E+00	4,91E-11	-2,52E-10
Human tox. non-cancer	CTUh	4,69E-09	7,14E-10	2,15E-08	2,69E-08	4,42E-09	3,15E-12	ND	ND	ND	ND	ND	ND	ND	4,62E-11	4,03E-10	0,00E+00	8,54E-09	-5,75E-09
SQP <sup>7)</sup>	-	1,02E-01	1,11E+00	6,57E+01	6,70E+01	3,73E+00	7,08E-03	ND	ND	ND	ND	ND	ND	ND	2,48E-02	6,26E-01	0,00E+00	4,58E+00	-3,51E+01

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

**USE OF NATURAL RESOURCES**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy <sup>8)</sup>	MJ	1,01E+01	1,51E-02	7,61E-01	1,08E+01	1,88E-01	1,10E-03	ND	ND	ND	ND	ND	ND	ND	2,36E-03	8,52E-03	0,00E+00	2,68E-02	4,68E+00
Renew. PER as material	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	1,01E+01	1,51E-02	7,61E-01	1,08E+01	1,88E-01	1,10E-03	ND	ND	ND	ND	ND	ND	ND	2,36E-03	8,52E-03	0,00E+00	2,68E-02	4,68E+00
Non-re. PER as energy	MJ	1,51E+02	1,10E+00	2,56E+01	1,77E+02	1,32E+01	1,86E-02	ND	ND	ND	ND	ND	ND	ND	3,76E-01	6,22E-01	0,00E+00	-2,87E+02	-1,22E+01
Non-re. PER as material	MJ	5,93E+01	0,00E+00	9,30E-02	5,94E+01	0,00E+00	-9,30E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	-5,93E+01	-3,77E-02
Total use of non-re. PER	MJ	2,10E+02	1,10E+00	2,57E+01	2,37E+02	1,32E+01	-7,45E-02	ND	ND	ND	ND	ND	ND	ND	3,76E-01	6,22E-01	0,00E+00	-3,47E+02	-1,23E+01
Secondary materials	kg	1,46E-01	4,69E-04	6,77E-01	8,23E-01	7,80E-03	8,31E-05	ND	ND	ND	ND	ND	ND	ND	1,55E-04	2,65E-04	0,00E+00	0,00E+00	0,00E+00
Renew. secondary fuels	MJ	4,01E-02	5,96E-06	9,86E-02	1,39E-01	2,89E-05	1,39E-05	ND	ND	ND	ND	ND	ND	ND	4,07E-07	3,36E-06	0,00E+00	1,34E-05	-8,35E-02
Non-ren. secondary fuels	MJ	4,29E-01	0,00E+00	0,00E+00	4,29E-01	0,00E+00	4,29E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m <sup>3</sup>	2,93E-01	1,63E-04	2,56E-02	3,19E-01	1,41E-03	3,20E-05	ND	ND	ND	ND	ND	ND	ND	2,40E-05	9,19E-05	0,00E+00	-2,95E-02	-1,15E-02

8) PER = Primary energy resources.

**END OF LIFE – WASTE**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	1,49E-01	1,87E-03	6,55E-02	2,16E-01	2,43E-02	2,41E-05	ND	ND	ND	ND	ND	ND	ND	4,21E-04	1,05E-03	0,00E+00	3,24E-03	-4,83E-02
Non-hazardous waste	kg	1,83E+00	3,46E-02	3,28E+00	5,15E+00	3,75E-01	5,85E-04	ND	ND	ND	ND	ND	ND	ND	6,13E-03	1,95E-02	0,00E+00	2,10E+01	-1,32E+00
Radioactive waste	kg	1,47E-01	2,35E-07	1,58E-05	1,47E-01	2,76E-06	1,47E-05	ND	ND	ND	ND	ND	ND	ND	3,92E-08	1,33E-07	0,00E+00	4,02E-07	-2,38E-05

**END OF LIFE – OUTPUT FLOWS**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	3,28E-02	0,00E+00	0,00E+00	3,28E-02	0,00E+00	3,28E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

## SCENARIO DOCUMENTATION

### Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Electricity, consumption mix w/o renewables, China, 2023 (One Click LCA)
Electricity CO <sub>2</sub> e/kWh	1.15

### Transport scenario documentation A4

Scenario parameter	Value
Specific transport CO <sub>2</sub> e emissions, kg CO <sub>2</sub> e/tkm	0.0527 (train), 0.0102 (container ship), 0.11 (lorry), 0.12 (ferry) 0.12
Average transport distance, km	2905
Capacity utilization (including empty)	100%
Bulk density of transported products	-
Volume capacity utilization factor	1

### Installation scenario documentation A5

Scenario information	Value
Waste materials on the building site before waste processing, generated by the product's installation (specified by type), kg	Installation loss 2.242E-05 kg (Bathboards) 1.256E-05 kg (Shower bases) 2.273E-05 kg (FXL20/FXW20) 2.208E-05 kg (FXL30/FXW30) 3.13E-05 kg (TWP06) 2.73E-05 kg (TWP12/XL) 2.50E-05 kg (TWP20/XL) 2.15E-05 kg (TWP30) 2.00E-05 kg (TWP40) 1.88E-05 kg (TWP50) 1.67E-05 kg (TWP80)
Output materials as result of waste processing at the building site e.g. collection for recycling, for energy recovery, disposal, kg	-
Direct emissions to ambient air, soil and water, kg	0.27493 kg (Bathboards) 1.34806 kg (Shower bases) 0.3 kg (FXL20/FXW20)

	0.32199 kg (FXL30/FXW30) 0.08 kg (TWP06) 0.23193 kg (TWP12/XL) 0.3 kg (TWP20/XL) 0.31954 kg (TWP30) 0.32 kg (TWP40) 0.33979 kg (TWP50) 0.45 kg (TWP80)
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### End of life scenario documentation

Scenario information	Value
Collection process specified by type, kg	4.460E+00 kg (Bathboards) 7.960E+00 kg (Shower bases) 4.400E+00 kg (FXL20/FXW20) 4.530E+00 kg (FXL30/FXW30) 3.20E+00 kg (TWP06) 3.66E+00 kg (TWP12/XL) 4.00E+00 kg (TWP20/XL) 4.66E+00 kg (TWP30) 5.00E+00 kg (TWP40) 5.33E+00 kg (TWP50) 6.00E+00 kg (TWP80)
Recovery process – kg for recycling	-
Recovery process – kg for energy recovery	-
Disposal specified by type, kg	4.460E+00 kg (Bathboards) 7.960E+00 kg (Shower bases) 4.400E+00 kg (FXL20/FXW20) 4.530E+00 kg (FXL30/FXW30) 3.20E+00 kg (TWP06) 3.66E+00 kg (TWP12/XL) 4.00E+00 kg (TWP20/XL) 4.66E+00 kg (TWP30) 5.00E+00 kg (TWP40) 5.33E+00 kg (TWP50) 6.00E+00 kg (TWP80)
Scenario assumptions e.g. transportation	50 km