

## Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for multiple products:

### Acoustic pods GEN4 family

SPOT, FOCUS, CHAT<sup>2</sup>, CHAT<sup>4</sup>, SUMMIT<sup>4</sup>, SUMMIT<sup>6</sup>, SUMMIT<sup>8</sup>

Programme:	Czech Environmental Information Agency (CENIA) <a href="http://www.cenia.cz">www.cenia.cz</a> , "National programme of environmental labeling" - CZ
Programme operator:	CENIA, Czech Environmental Information Agency, Executive Body of NPEZ Agency
EPD owner:	SilentLab s.r.o. <a href="http://www.silent-lab.com">www.silent-lab.com</a>
Author:	Envitrail s.r.o.
Publication date:	20.02.2025
Valid until:	19.02.2030



## General information

### Programme information

<b>Accountabilities for PCR, LCA and independent, third-party verification</b>
<b>Product Category Rules (PCR)</b>
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): <i>EN 15804:2012+A2:2019 + NPCR 026 - Furniture Part B</i>
<b>Life Cycle Assessment (LCA)</b>
LCA accountability: <i>Ing. Eva-Žofie Bergmannová, Envitrail s.r.o., <a href="mailto:bergmannova@envitrail.com">bergmannova@envitrail.com</a>, Ing. Miroslava Česká <a href="https://envitrail.com/">https://envitrail.com/</a></i>
<b>Third-party verification</b>
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:  <input checked="" type="checkbox"/> EPD verification by individual verifier  Third-party verifier: <i>Doc. Ing. Jan Weinzettel, Ph.D.</i>
Procedure for follow-up of data during EPD validity involves third party verifier:  <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

## Company information

Owner of the EPD:

SilentLab s.r.o., Za Zastávkou 373, 111 01 Praha 10 - Dolní Měcholupy, IČO: 04545486

Contact Ing. František Sehnal, email: [frantisek.sehnal@silent-lab.com](mailto:frantisek.sehnal@silent-lab.com), +420 731 343 838

Description of the organisation: The Czech company SilentLab is a leader in acoustic solutions, transforming the way workspaces are experienced. With a focus on innovation and maximum functionality, they create products that bring peace and focus to even the most challenging environments. Their comprehensive acoustic services cover everything from design and manufacturing to the implementation of custom solutions, always prioritizing user comfort and design. SilentLab is shaping the future of office acoustics and work environments globally.

Product-related or management system-related certifications: ISO 23351:2020: Acoustics — Measurement of speech level reduction of furniture ensembles and enclosures; CE (LVD & EMC); UL 962: Household and Commercial Furnishings

Name and location of production site: SilentLab - Production site, Řípská 1181/18a, 627 00 Brno - Slatina

## Product information

Product name: GEN4 family – SPOT, FOCUS, CHAT<sup>2</sup>, CHAT<sup>4</sup>, SUMMIT<sup>4</sup>, SUMMIT<sup>6</sup>, SUMMIT<sup>8</sup>

Product identification: GEN4 acoustic pods offer advanced sound insulation and customizable, modular design. Ideal for modern offices, they enhance productivity and wellbeing with no effort.

Product description: The new generation seamlessly fits any setting, elevating the space to its peak and creating a perfect environment for both work and rest. With precise craftsmanship and a timeless design, our solution features advanced acoustics, superior ventilation, and pro-cognitive lighting, reducing fatigue and keeping you feeling refreshed. Our cutting-edge ventilation system ensures efficient air circulation and silent operation, with adjustable intensity for comfortable long-term work in our acoustic pods. Our pro-cognitive lighting, with a CRI of 98%, mimics natural daylight, enhancing focus and visual comfort in any workspace. It allows easy adjustment of light intensity, so you can customize the atmosphere to suit your needs. With our user interface you control lighting, ventilation and background sound. As a benefit you can recall a mood to adjust light intensity, set the right tone for either productivity, relaxation or more, in one single touch.

UN CPC code: 3812

Geographical scope: Global

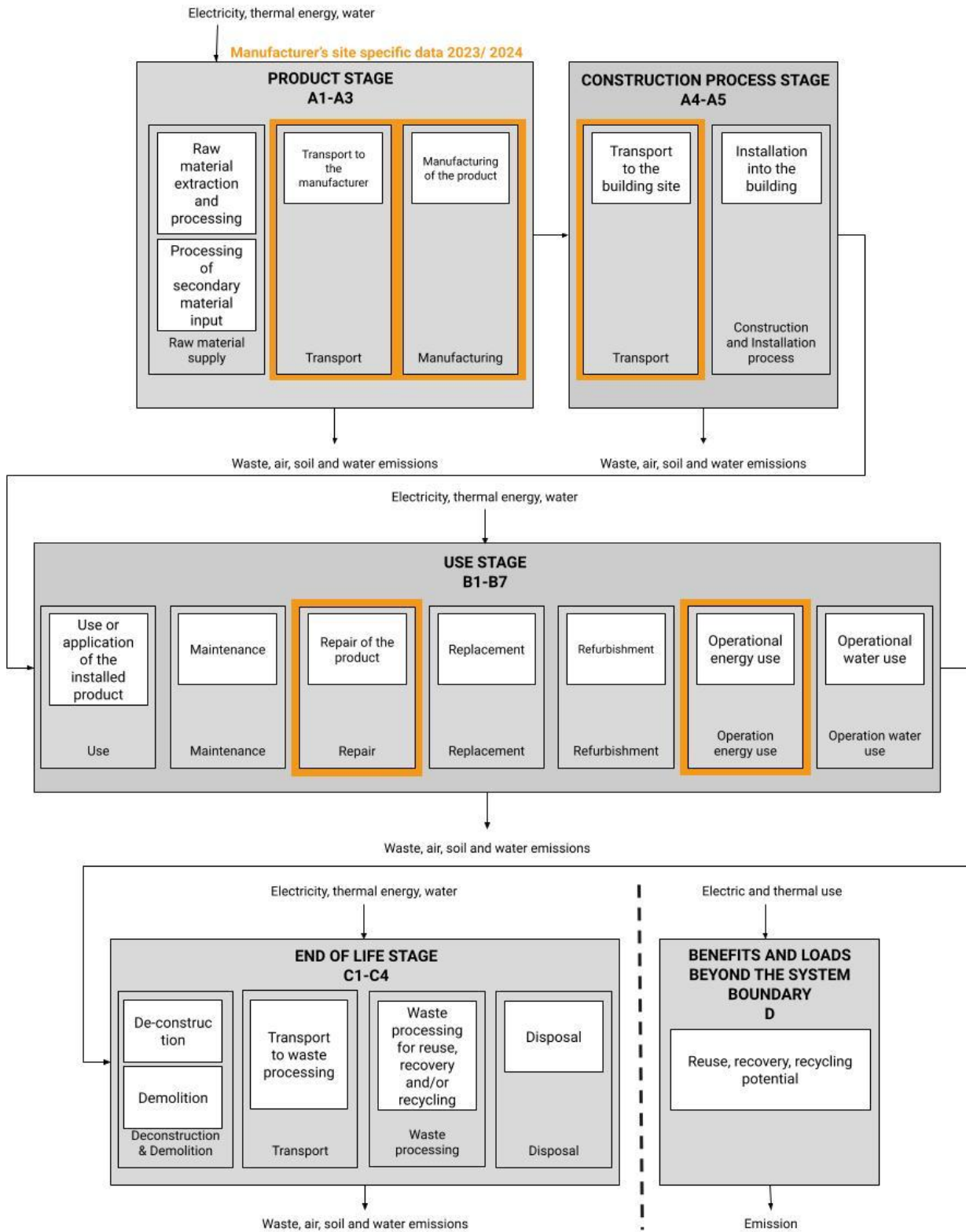
Table 1: Technical information of products – SPOT, FOCUS, CHAT<sup>2</sup>, CHAT<sup>4</sup>, SUMMIT<sup>4</sup>, SUMMIT<sup>6</sup>, SUMMIT<sup>8</sup>

Parameter	SPOT	FOCUS	CHAT <sup>2</sup>	CHAT <sup>4</sup>	SUMMIT <sup>4</sup>	SUMMIT <sup>6</sup>	SUMMIT <sup>8</sup>
External dimension [mm]	1170 x 2270 x 1030	1910 x 2270 x 1490	2295 x 2270 x 1030	2295 x 2270 x 1490	2675 x 2270 x 2060	2675 x 2270 x 3090	2675 x 2270 x 4120
Internal dimension [mm]	945 x 2068 x 945	1685 x 2068 x 1405	2075x 2068 x 945	2075x 2068 x 1405	2455x 2068 x 1975	2455x 2068 x 3090	2455x 2068 x 4035
Weight	360 kg	615 kg	645 kg	850 kg	900 kg	1100 kg	1200 kg
Door dimension	1007 x 2145 mm	898 x 2135 mm	898 x 2135 mm	898 x 2135 mm	898 x 2135 mm	898 x 2135 mm	898 x 2135 mm
Natural light	procognitive full-spectrum LED lighting with a color temperature of 4800K, <95 CRI	procognitive full-spectrum LED lighting with a color temperature of 4800K, <95 CRI	procognitive full-spectrum LED lighting with a color temperature of 4800K, <95 CRI	procognitive full-spectrum LED lighting with a color temperature of 4800K, <95 CRI	procognitive full-spectrum LED lighting with a color temperature of 4800K, <95 CRI	procognitive full-spectrum LED lighting with a color temperature of 4800K, <95 CRI	procognitive full-spectrum LED lighting with a color temperature of 4800K, <95 CRI
Ambient light	LED lighting with adjustable color temperature (3000K - 6000K, > 90 CRI) and light intensity	LED lighting with adjustable color temperature (3000K - 6000K, > 90 CRI) and light intensity	LED lighting with adjustable color temperature (3000K - 6000K, > 90 CRI) and light intensity	LED lighting with adjustable color temperature (3000K - 6000K, > 90 CRI) and light intensity	LED lighting with adjustable color temperature (3000K - 6000K, > 90 CRI) and light intensity	LED lighting with adjustable color temperature (3000K - 6000K, > 90 CRI) and light intensity	LED lighting with adjustable color temperature (3000K - 6000K, > 90 CRI) and light intensity
Ventilation	Standard air flow: 114 m <sup>3</sup> /h Maximum air flow: 179 m <sup>3</sup> /h	Standard air flow: 228 m <sup>3</sup> /h Maximum air flow: 358 m <sup>3</sup> /h	Standard air flow: 228 m <sup>3</sup> /h Maximum air flow: 358 m <sup>3</sup> /h	Standard air flow: 456 m <sup>3</sup> /h Maximum air flow: 716 m <sup>3</sup> /h	Standard air flow: 592 m <sup>3</sup> /h Maximum air flow: 912 m <sup>3</sup> /h	Standard air flow: 888 m <sup>3</sup> /h Maximum air flow: 1368 m <sup>3</sup> /h	Standard air flow: 1184 m <sup>3</sup> /h Maximum air flow: 1824 m <sup>3</sup> /h
Power supply	220-240 V, 50/60 Hz, 10 A	220-240 V, 50/60 Hz, 10 A	220-240 V, 50/60 Hz, 10 A	220-240 V, 50/60 Hz, 10 A	220-240 V, 50/60 Hz, 10 A	220-240 V, 50/60 Hz, 10 A	220-240 V, 50/60 Hz, 10 A
Electricity consumption	Operation mode: 53 W Standby mode: 12,5 W	Operation mode: 57 W Standby mode: 15 W	Operation mode: 57 W Standby mode: 15 W	Operation mode: 61,2 W Standby mode: 17,5 W	Operation mode: 101 W Standby mode: 20 W	Operation mode: 145 W Standby mode: 25 W	Operation mode: 189 W Standby mode: 30 W
Equipment	Electrical socket (1x), motion sensor, procognitive and full-spectrum LED lighting, ventilation, 7" LCD control panel	Electrical socket (2x), motion sensor, procognitive and full-spectrum LED lighting, ventilation, 7" LCD control panel	Electrical socket (2x), motion sensor, procognitive and full-spectrum LED lighting, ventilation, 7" LCD control panel	Electrical socket (4x), motion sensor, procognitive and full-spectrum LED lighting, ventilation, 7" LCD control panel	Electrical socket (3x), motion sensor, procognitive and full-spectrum LED lighting, ventilation, 7" LCD control panel	Electrical socket (3x), motion sensor, procognitive and full-spectrum LED lighting, ventilation, 7" LCD control panel	Electrical socket (3x), motion sensor, procognitive and full-spectrum LED lighting, ventilation, 7" LCD control panel

## LCA information

<p><b>Declared unit</b></p>	<p>One piece of SPOT acoustic pod ensuring one place with maximum attenuation of ambient sounds for its lifetime (10 years).</p> <p>One piece of FOCUS acoustic pod ensuring 2 places with maximum attenuation of ambient sounds for its lifetime (10 years).</p> <p>One piece of CHAT<sup>2</sup> acoustic pod ensuring 2 places with maximum attenuation of ambient sounds for its lifetime (10 years).</p> <p>One piece of CHAT<sup>4</sup> acoustic pod ensuring 4 places with maximum attenuation of ambient sounds for its lifetime (10 years).</p> <p>One piece of SUMMIT<sup>4</sup> acoustic pod ensuring 4 places with maximum attenuation of ambient sounds for its lifetime (10 years).</p> <p>One piece of SUMMIT<sup>6</sup> acoustic pod ensuring 6 places with maximum attenuation of ambient sounds for its lifetime (10 years).</p> <p>One piece of SUMMIT<sup>8</sup> acoustic pod ensuring 8 places with maximum attenuation of ambient sounds for its lifetime (10 years).</p>
<p><b>Reference flow</b></p>	<p>1 piece of acoustic pod GEN4 family</p>
<p><b>Reference service life</b></p>	<p>10 years</p>
<p><b>Time representativeness</b></p>	<p>Data collection period: 04/2023-03/2024  <i>The data set will be considered valid until there are significant changes to data in the production, technology, supply chain or operational and end of life scenarios.</i></p>
<p><b>Database(s) and LCA software used</b></p>	<p>OpenLCA ver. 2.1.1., ecoinvent 3.10, cut-off, LCIA methodology EF v. 3.1</p>
<p><b>Description of system boundaries</b></p>	<p>Cradle-to-grave and module D  <i>Modules B1, B4, B5, B7 are considered as zero.</i></p>
<p><b>Cut-off rules</b></p>	<p>Ecoinvent cut-off system model is based on the recycled content or cut-off approach. In this system model, wastes are the producer's responsibility (Polluters Pays Principle), and recyclable products are available burden-free (cut-off). Processes and flows with a predicted resulting impact of less than 1% have been excluded from the system.</p>
<p><b>Allocations</b></p>	<p>Waste allocation uses the selected Polluter Pays Principle (PPP). The allocation of input materials, consumption of energy and output flows was done through a mass allocation based on a reference flow of declared unit. The mass allocation of the material distribution from the SPOT pod measured values has been used to evaluate the other types of GEN4 pods.</p>
<p><b>Disclaimer</b></p>	<p>The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks. It is not recommended to use the results of modules A1-A3 (A1-A5 for services) without considering the results of module C.</p>

System diagram:



## Modules declared

CONSTRUCTION WORKS ASSESSMENT INFORMATION																
CONSTRUCTION WORKS LIFE CYCLE INFORMATION																SUPPLEMENTARY INFORMATION BEYOND CONSTRUCTION WORKS LIFE CYCLE
A1-A3			A4-A5		B1-B7							C1-C4				D
PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Raw material supply	Transport	Manufacturing	Transport	Construction and Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operation energy use	Operation water use	Deconstruction & Demolition	Transport	Waste processing	Disposal	Reuse, recovery, recycling potential
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

The product stage includes the following modules:

- A1 (Raw material supply)** – The product is assembled from components that are manufactured by various suppliers. Primary data was collected for acoustic pod SPOT by SilentLab s.r.o. This module does not include packaging materials production (packaging material is calculated in module A3). Material distribution for the products FOCUS, CHAT<sup>2</sup>, CHAT<sup>4</sup>, SUMMIT<sup>4</sup>, SUMMIT<sup>6</sup>, SUMMIT<sup>8</sup> was calculated based on SPOT mass allocation.
- A2 (Transport)** – Module A2 covers the transportation of the raw materials to the manufacturing site. The materials are transported by a lorry 16-32 t, lorry 3,5-7,5 t, freight ship and aircraft. Transportation of the input materials for the products FOCUS, CHAT<sup>2</sup>, CHAT<sup>4</sup>, SUMMIT<sup>4</sup>, SUMMIT<sup>6</sup>, SUMMIT<sup>8</sup> was calculated based on primary data of SPOT and mass allocation and SPOT transportation input data.
- A3 (Manufacturing)** – This module includes the manufacture of products and packaging. The processing of any waste arising from this stage is also included.

The manufacturing process is conducted in Brno, Czech Republic, and includes the formatting materials (such as plywood and fibreboards). These are cut and shaped according to the required specifications of each product type. Then, by using the CNC (Computer Numerical Control), further modifications such as machining, drilling, and creating grooves or other openings are carried out.

In the next step, electrical components are installed, followed by the addition of mechanical components (e.g. screws and nuts). Afterward, internal soundproof panels reinforced with acoustic foam (hardboard) and covered with decorative fabric are installed. This step also includes upholstering the outer panels. The final step involves the dispatch process.



It is assumed that due to the identical production process of the SPARK product line, the annual electricity consumption, waste and emissions production from the time period of 04/2023 – 03/2024 is going to be identical. The annual values of production parameters were converted to GEN4 products by mass allocation.

The specific electricity mix for the medium voltage on the production site of SilentLab s.r.o. was used (based on the supplier's invoice and ERÚ background data) [9]. The electric mix comprises 53,60 % fossil (43 % lignite, 5,5 % natural gas, 3,1 % hard coal), 40,95 % nuclear, and 5,46 % renewable electricity sources (0,672 kg CO<sub>2</sub>-Eq/kWh).

The waste generated during the production includes waste wood, wastepaper and cardboard, mixed construction and demolition waste, waste plastic and mixed municipal waste. Environmental impacts related to the infrastructure and capital goods are not considered except for processes included in selected datasets.

**The construction process phase includes modules:**

- **A4 (Transport)** – Module A4 includes transport of the product to the customer, based on the average delivery distance from the production site (Brno) to customers within the Czech Republic, derived from sales records of all SilentLab's acoustic pods from the time period of 04/2023 – 03/2024. Products are transported by the lorry 3,5-7,5 t. Another scenario of the customer transport has been evaluated within the climate change impact category (page 41, Additional environmental information).
- **A5 (Construction and Installation process)** – This module includes the installation of a product. The product installation at the customer's site is done manually without any electricity consumption. It is assumed that the production of packaging waste of SPOT is identical with product SPARK. Material distribution of the packaging waste for the products FOCUS, CHAT<sup>2</sup>, CHAT<sup>4</sup>, SUMMIT<sup>4</sup>, SUMMIT<sup>6</sup>, SUMMIT<sup>8</sup> was allocated according to mass from SPOT data. Packaging materials (MDF, PDP, cartons, and palettes) are assumed to be reused 5 times before entering the waste state.

**Use stage includes modules:**

- **B1 (Use)** – Use emissions were considered as zero.
- **B2 (Maintenance)** – Maintenance of the product: The five minutes of vacuum cleaning occurring every two weeks during the 10 years RSL was assumed for acoustic pod SPOT. For other products of GEN4 was used the allocation of vacuuming time, based on the internal area of the floor.



**B3 (Repair)** – Data for this module was exported from an internal database record. The most common repair activity occurring in the time period of 04/2023 – 03/2024 is a door adjustment (manual labour, once per lifetime). The average distance customer-factory was used in the calculation.

- **B4 (Replacement)** – Replacement-related activities were assumed to be zero as there are no regular replacements taking place.
- **B5 (Refurbishment)** – Refurbishment-related activities were assumed to be zero as no regular refurbishments are occurring.
- **B6 (Operational energy use)** – Includes electricity consumption of the lighting and ventilation. Primary data of electricity consumption was collected (measured) for each product of GEN4. As an assumption, there are 4 active hours per 1 working day (252 working days in a year) taken into account. The electricity consumption per lifetime is calculated using the following formula:

$$Electricity\ consumption_{lifetime} = [consumption_{active} * active\ hour(1008h) + consumption_{standby} * standby\ hour(7752\ h)] * lifetime(10\ years)$$

Another scenario of the country of operation (electricity production mix) has been evaluated within the climate change impact category (page 41, Additional environmental information).

- **B7 (Operation water use)** – No operational water use occurs during the life cycle of the product.

The end-of-life stage includes modules:

- **C1 (Deconstruction & demolition)** – The acoustic pod's deconstruction is carried out by manual labour, so it is considered to have zero environmental impacts.
- **C2 (Transport)** – This module describes the transportation of waste materials to the waste treatment site. The average transportation distance for the Czech Republic is 50,8 km [6].
- **C3 (Waste processing)** – Waste processing was modelled based on data from MilieuDatabase [5]. This database covers the percentage of MRF –material recovery flow as follows: metals (99 % steel) 95 %, electronics 79 %, plastic (PE, PP, rubber) 85 %, glass 70 % and mineral wool 100 % and ERF (energy recovery flow) – wood 95 %. Materials for energy recovery are identified based on the efficiency of energy recovery with a rate higher than 60 % [4].
- **C4 (Disposal)** – The amount of waste disposed was evaluated based on the waste treatment data from MilieuDatabase [5]. C4 details are presented in Table 1.

Table 1: Waste disposal: major flows, disposal methods and amounts treated [5]

Waste flow	Percentage of incineration [%]	Percentage of landfill [%]
Metals (99 % steel)	-	5
Melamine foam	100	-
Wood	-	5
Electronic	19	2
Plastics (PE, PP, rubber)	5	10
Chemical	-	100
Glass	-	30
Textile	100	-

### The benefits and costs beyond the product system in Module D:

Potential benefits and costs from waste utilisation are assessed in module D. Recyclable wastes from module A3, A5, C3 are used for the calculation of benefits from avoided primary materials production. Waste wood from module C4 is used for the calculation of energy benefits.

Sub-module D1 calculates the benefits of using the waste as a secondary material instead of primary raw material. This module was calculated for waste such as metal (steel), plastic, glass, cardboard and electronics. During the incineration of waste with energy recovery (D3), heat and electricity are produced, which can potentially substitute the electricity production mix of the Czech Republic, and the exported thermal energy generated from coal gas (defaultecoinvent process).

In the module D4, the trace amount of thermal energy generated by burning of landfill gas (based on the literature) has not been considered.

### Content information

Table 2: Material content in GEN4 family.

	SPOT	FOCUS	CHAT <sup>2</sup>	CHAT <sup>4</sup>	SUMMIT <sup>4</sup>	SUMMIT <sup>6</sup>	SUMMIT <sup>8</sup>
Material distribution	Amount [kg]	Amount [kg]	Amount [kg]	Amount [kg]	Amount [kg]	Amount [kg]	Amount [kg]
Metal	37,44	63,97	67,09	88,41	93,61	114,41	124,81
Wood	200,29	342,16	358,85	472,91	500,72	612,00	667,63
Plastic	11,11	18,97	19,90	26,22	27,76	33,93	37,02
Melamine foam	0,271	0,46	0,49	0,64	0,68	0,83	0,90
Chemical	0,03	0,05	0,05	0,07	0,08	0,09	0,10
Glass	105,68	180,54	189,35	249,53	264,21	322,92	352,28
Electronic	2,88	4,92	5,16	6,80	7,20	8,80	9,60
Textile	2,69	4,60	4,82	6,36	6,73	8,23	8,98
Total	360,40	615,7	645,7	850,9	901,0	1101,2	1201,3

Table 3: Material content in packaging materials for GEN4 family.

Category info	SPOT	FOCUS	CHAT <sup>2</sup>	CHAT <sup>4</sup>	SUMMIT <sup>4</sup>	SUMMIT <sup>6</sup>	SUMMIT <sup>8</sup>	Packaging weight (versus the product)
	Amount [kg]	Amount [kg]	Amount [kg]	Amount [kg]	Amount [kg]	Amount [kg]	Amount [kg]	%
MDFS	5,07	8,66	9,09	11,97	12,68	15,50	16,91	1,4%
PDP	7,88	13,45	14,11	18,59	19,69	24,06	26,25	2,2%
Cardboard	13,48	23,03	24,15	31,82	33,70	41,18	44,93	3,7%
Pallet	25	25	25	25	25	25	25	6,9%
Total	51,42	70,14	72,34	87,39	91,06	105,74	113,08	14,3%

There are either no SVHC substances present in the product, or they are below EU regulation limits.

### Biogenic carbon

The calculation of the biogenic carbon content was carried out according to the rules of EN 16449 [2] and based on the inventory results per declared unit of the final product – 1 piece of acoustic pod. The resulting biogenic carbon content for the GEN4 family is shown in Table 4.

Table 4: Biogenic carbon content

Biogenic carbon content	kg C/SPOT	kg C/FOCUS	kg C/CHAT <sup>2</sup>	kg C/CHAT <sup>4</sup>	kg C/SUMMIT <sup>4</sup>	kg C/SUMMIT <sup>6</sup>	kg C/SUMMIT <sup>8</sup>
Biogenic carbon content in product	60,53	103,41	108,46	142,93	151,34	172,47	188,15
Biogenic carbon content in accompanying packaging	11,20	19,13	20,06	26,44	28,00	34,22	37,33

NOTE: 1 kg biogenic carbon is equivalent to 44/12 kg of CO<sub>2</sub>

# SPOT



## Results of the environmental performance indicators – SPOT

Table 5: Mandatory impact category indicators according to EN 15804 (EF 3.1) – SPOT

Impact category	Reference unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	Module D
AP	mol H <sup>+</sup> -Eq	5,32E+00	1,18E-01	1,23E-03	0	9,05E-02	4,75E-01	0	0	2,99E+00	0	0	1,26E-02	3,96E-02	1,21E-02	-1,55E+00
GWP_total	kg CO <sub>2</sub> -Eq	5,84E+02	4,04E+01	1,12E+01	0	1,97E+01	1,40E+02	0	0	6,84E+02	0	0	2,80E+00	2,84E+02	9,51E+00	-3,29E+02
GWP - biogenic	kg CO <sub>2</sub> -Eq	-2,12E+02	2,58E-02	1,11E+01	0	3,35E-01	-9,54E-02	0	0	7,86E+00	0	0	1,65E-03	2,78E+02	3,16E+00	2,94E+00
GWP - fossil	kg CO <sub>2</sub> -Eq	7,96E+02	4,04E+01	1,18E-01	0	1,94E+01	1,40E+02	0	0	6,75E+02	0	0	2,80E+00	5,14E+00	6,35E+00	-3,32E+02
GWP - luluc	kg CO <sub>2</sub> -Eq	8,49E-01	1,55E-02	2,88E-05	0	3,07E-02	5,47E-02	0	0	1,10E+00	0	0	9,50E-04	2,81E-03	3,64E-04	-3,11E-01
ADP - fossil*	MJ	1,17E+04	5,61E+02	1,05E+00	0	5,61E+02	1,05E+00	0	0	1,17E+04	0	0	4,01E+01	6,13E+01	1,62E+01	-4,56E+03
EP - fw	kg P-Eq	5,28E-01	3,22E-03	5,11E-05	0	3,22E-03	5,11E-05	0	0	1,02E+00	0	0	1,92E-04	1,60E-03	1,95E-04	-4,07E-01
EP-marine	kg N-Eq	1,19E+00	3,73E-02	6,50E-04	0	3,73E-02	6,50E-04	0	0	6,49E-01	0	0	4,94E-03	1,91E-02	1,39E-02	-3,53E-01
EP - terrestrial	mol N-Eq	1,14E+01	4,06E-01	6,24E-03	0	4,06E-01	6,24E-03	0	0	4,83E+00	0	0	5,39E-02	1,86E-01	5,78E-02	-3,45E+00
ADP-elements*	kg Sb-Eq	1,41E-02	8,66E-05	1,29E-07	0	6,99E-05	5,09E-04	0	0	1,70E-03	0	0	7,48E-06	8,64E-07	-6,48E-03	1,65E-02
ODP	kg CFC-11-Eq	1,73E-04	7,96E-07	1,32E-09	0	1,58E-07	2,61E-06	0	0	4,87E-06	0	0	7,03E-08	2,19E-08	-7,29E-05	1,82E-04
POCP	kg NMVOC-Eq	3,75E+00	1,80E-01	1,57E-03	0	4,34E-02	5,75E-01	0	0	1,42E+00	0	0	1,93E-02	5,10E-02	1,58E-02	-9,72E-01
WDP*	m <sup>3</sup>	3,58E+02	3,18E+00	2,47E-01	0	6,37E+00	1,43E+01	0	0	2,23E+02	0	0	2,00E-01	6,66E+00	4,74E-01	-7,04E+01
<b>Acronyms</b>	<p><i>GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-elements = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption</i></p>															

**\*Disclaimer:** The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

**General disclaimer:** The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

## Additional mandatory and voluntary impact category indicators

Table 6: Additional mandatory and voluntary impact category indicators – SPOT

SPOT																
Indicators	Reference unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	Module D
Global warming potential (GWP-GHG)	kg CO2-Eq	8,01E+02	4,04E+01	1,18E-01	0	1,96E+01	1,40E+02	0	0	6,77E+02	0	0	2,80E+00	2,80E+00	6,91E+00	-3,31E+02
<b>Acronym</b>	GWP-total = Global Warming Potential total															

This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO2 is set to zero.

## Resource use indicators

Table 7: Resource use indicators for SPOT

SPOT																
Indicators	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	4,40E+01	1,35E+01	2,60E-02	0	2,37E+01	4,84E+01	0	0	9,01E+02	0	0	6,92E-01	6,53E-01	1,02E-01	-9,55E+01
PERM	MJ	3,77E+03	0,00E+00	0,00E+00	0	2,20E+00	0,00E+00	0	0	0,00E+00	0	0	0,00E+00	1,28E+00	1,54E-01	-7,87E+01
PERT	MJ	3,81E+03	1,35E+01	2,60E-02	0	2,59E+01	4,84E+01	0	0	9,01E+02	0	0	6,92E-01	1,93E+00	2,56E-01	-1,74E+02
PENRE	MJ	2,19E+03	5,61E+02	1,05E+00	0	3,09E+02	1,82E+03	0	0	1,17E+04	0	0	4,01E+01	2,62E+01	5,32E+00	-1,24E+03
PENRM	MJ	9,55E+03	3,08E-05	-3,12E-07	0	2,47E+01	-7,60E-05	0	0	4,98E-03	0	0	3,53E-06	3,51E+01	1,09E+01	#REF!
PENRT	MJ	1,17E+04	5,61E+02	1,05E+00	0	3,33E+02	1,82E+03	0	0	1,17E+04	0	0	4,01E+01	6,14E+01	1,62E+01	-4,56E+03
SM	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m3	9,12E+00	8,81E-02	1,52E-03	0	2,09E-01	3,67E-01	0	0	7,45E+00	0	0	5,62E-03	4,98E-02	-1,51E-01	-2,51E+00
<b>Acronyms</b>	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water															

### Waste indicators

Table 8: Waste indicators for SPOT

SPOT																
Waste category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	kg	6,22E+01	5,87E-01	4,21E-02	0	3,57E-01	5,13E+00	0	0	9,50E+00	0	0	3,91E-02	1,16E+00	1,66E-01	-3,73E+00
Non-hazardous waste disposed (NHWD)	kg	1,15E+03	7,99E+00	7,72E+00	0	6,11E+00	3,65E+01	0	0	1,44E+02	0	0	4,26E-01	1,97E+02	2,17E+02	-5,67E+01
High-level radioactive waste disposed (RWD)	kg	1,74E-02	1,38E-04	1,52E-07	0	1,04E-03	3,77E-04	0	0	3,90E-02	0	0	6,85E-06	1,29E-05	1,97E-06	-9,66E-03

### Output flow indicators

Table 9: Output flow indicators for SPOT

SPOT																
Indicators	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use (CRU)	kg	0	0	4,87E+01	0	0	0	0	0	0	0	0	0	0	0	0
Materials for recycling (MFR)	kg	3,77E+00	0	2,70E+00	0	0	0	0	0	0	0	0	0	1,14E+02	0	0
Materials for energy recovery (MER)	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported electrical energy (EEE)	MJ	2,36E+02	0	2,12E+01	0	0	0	0	0	0	0	0	0	5,31E+02	1,40E+01	0
Exported thermal energy (EET)	MJ	7,09E+02	0	6,35E+01	0	0	0	0	0	0	0	0	0	1,59E+03	2,53E+01	0



# FOCUS



## Results of the environmental performance indicators – FOCUS

Table 8: Mandatory impact category indicators according to EN 15804 (EF 3.1) – FOCUS

Impact category	Reference unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	Module D
AP	mol H+Eq	9,09E+00	2,02E-01	2,09E-03	0	2,40E-01	4,75E-01	0	0	3,36E+00	0	0	2,15E-02	6,77E-02	2,07E-02	-2,61E+00
GWP_total	kg CO2-Eq	9,98E+02	6,90E+01	1,92E+01	0	5,23E+01	1,40E+02	0	0	7,68E+02	0	0	4,79E+00	4,84E+02	1,63E+01	-5,55E+02
GWP - biogenic	kg CO2-Eq	-3,62E+02	4,40E-02	1,90E+01	0	8,89E-01	-9,54E-02	0	0	8,83E+00	0	0	2,82E-03	4,76E+02	5,40E+00	4,98E+00
GWP - fossil	kg CO2-Eq	1,36E+03	6,90E+01	2,02E-01	0	5,14E+01	1,40E+02	0	0	7,58E+02	0	0	4,78E+00	8,78E+00	1,08E+01	-5,59E+02
GWP - luluc	kg CO2-Eq	1,45E+00	2,64E-02	4,93E-05	0	8,12E-02	5,47E-02	0	0	1,23E+00	0	0	1,62E-03	4,79E-03	6,23E-04	-5,16E-01
ADP - fossil*	MJ	2,01E+04	9,59E+02	1,79E+00	0	8,83E+02	1,82E+03	0	0	1,32E+04	0	0	6,83E+01	1,05E+02	2,77E+01	-7,65E+03
EP - fw	kg P-Eq	9,03E-01	5,50E-03	8,74E-05	0	7,37E-02	1,85E-02	0	0	1,15E+00	0	0	3,28E-04	2,74E-03	3,34E-04	-6,77E-01
EP-marine	kg N-Eq	2,04E+00	6,37E-02	1,11E-03	0	4,98E-02	1,18E-01	0	0	7,29E-01	0	0	8,44E-03	3,27E-02	2,37E-02	-5,93E-01
EP - terrestrial	mol N-Eq	1,94E+01	6,93E-01	1,07E-02	0	3,82E-01	1,28E+00	0	0	5,43E+00	0	0	9,20E-02	3,19E-01	9,87E-02	-5,80E+00
ADP- elements*	kg Sb-Eq	2,41E-02	1,48E-04	2,21E-07	0	1,85E-04	5,09E-04	0	0	1,91E-03	0	0	6,56E-06	1,28E-05	1,48E-06	-1,08E-02
ODP	kg CFC-11-Eq	2,96E-04	1,36E-06	2,26E-09	0	4,18E-07	2,61E-06	0	0	5,47E-06	0	0	9,60E-08	1,20E-07	3,75E-08	-1,24E-04
POCP	kg NMVOC-Eq	6,72E+00	3,07E-01	2,68E-03	0	1,15E-01	5,75E-01	0	0	1,59E+00	0	0	3,30E-02	8,71E-02	2,70E-02	-1,64E+00
WDP*	m3	6,17E+02	5,43E+00	4,22E-01	0	1,69E+01	1,43E+01	0	0	2,50E+02	0	0	3,40E-01	1,14E+01	8,09E-01	-1,17E+02
<b>Acronyms</b>	<p>GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-elements = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption</p>															

**\*Disclaimer:** The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

**General disclaimer:** The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

### Additional mandatory and voluntary impact category indicators

Table 9: Additional mandatory and voluntary impact indicators – FOCUS

FOCUS																
Indicators	Reference unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	Module D
Global warming potential (GWP-GHG)	kg CO2-Eq	8,01E+02	4,04E+01	1,18E-01	0	1,96E+01	1,40E+02	0	0	6,77E+02	0	0	2,80E+00	2,80E+00	6,91E+00	-3,31E+02
<b>Acronym</b>	GWP-total = Global Warming Potential total															

This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO2 is set to zero.

### Resource use indicators

Table 10: Resource use indicators for FOCUS

FOCUS																
Indicator	Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	Module D
PERE	MJ	7,51E+01	2,30E+01	4,45E-02	0	6,28E+01	4,84E+01	0	0	1,01E+03	0	0	1,18E+00	1,12E+00	1,75E-01	-1,58E+02
PERM	MJ	6,44E+03	-4,82E-06	-1,46E-07	0	5,84E+00	-3,82E-06	0	0	3,86E-04	0	0	-2,43E-07	2,19E+00	2,62E-01	-1,31E+02
PERT	MJ	6,51E+03	2,30E+01	4,45E-02	0	6,86E+01	4,84E+01	0	0	1,01E+03	0	0	1,18E+00	3,30E+00	4,37E-01	-2,89E+02
PENRE	MJ	3,73E+03	9,59E+02	1,79E+00	0	8,18E+02	1,82E+03	0	0	1,32E+04	0	0	6,83E+01	4,48E+01	9,09E+00	-5,31E+03
PENRM	MJ	1,63E+04	1,85E-05	0,00E+00	0	6,54E+01	-7,60E-05	0	0	-2,33E-03	0	0	-6,10E-07	6,00E+01	1,86E+01	-2,34E+03
PENRT	MJ	2,01E+04	9,59E+02	1,79E+00	0	8,83E+02	1,82E+03	0	0	1,32E+04	0	0	6,83E+01	1,05E+02	2,77E+01	-7,65E+03
SM	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m3	1,56E+01	1,50E-01	2,60E-03	0	5,54E-01	3,67E-01	0	0	8,37E+00	0	0	9,60E-03	8,50E-02	-2,58E-01	-4,18E+00
<b>Acronyms</b>	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water															

### Waste indicators

Table 11: Waste indicators for FOCUS

FOCUS																
Waste category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	kg	1,06E+02	1,00E+00	7,20E-02	0	9,46E-01	5,13E+00	0	0	1,07E+01	0	0	6,68E-02	1,98E+00	2,84E-01	-6,28E+00
Non-hazardous waste disposed (NHWD)	kg	1,97E+03	1,37E+01	1,32E+01	0	1,62E+01	3,65E+01	0	0	1,62E+02	0	0	7,27E-01	3,36E+02	3,71E+02	-9,49E+01
High-level radioactive waste disposed (RWD)	kg	2,98E-02	2,37E-04	2,60E-07	0	2,75E-03	3,77E-04	0	0	4,38E-02	0	0	1,17E-05	2,20E-05	3,35E-06	-1,59E-02

### Output flow indicators

Table 12: Output flow indicators for FOCUS

FOCUS																
Indicator	Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0	0	6,55E+01	0	0	0	0	0	0	0	0	0	0	0	0
Material for recycling	kg	6,43E+00	0	4,61E+00	0	0	0	0	0	0	0	0	0	1,91E+02	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	4,04E+02	0	3,62E+01	0	0	0	0	0	0	0	0	0	9,07E+02	1,07E+01	0
Exported energy, thermal	MJ	1,21E+03	0	1,09E+02	0	0	0	0	0	0	0	0	0	2,72E+03	4,33E+01	0

# CHAT<sup>2</sup>



## Results of the environmental performance indicators – CHAT<sup>2</sup>

Table 13: Mandatory impact category indicators according to EN 15804 (EF 3.1) – CHAT<sup>2</sup>

Impact category	Reference unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	Module D
AP	mol H <sup>+</sup> -Eq	9,54E+00	2,12E-01	2,19E-03	0	1,99E-01	4,75E-01	0	0	3,36E+00	0	0	2,25E-02	7,10E-02	2,17E-02	-2,75E+00
GWP_total	kg CO <sub>2</sub> -Eq	1,05E+03	7,24E+01	2,01E+01	0	4,34E+01	1,40E+02	0	0	7,68E+02	0	0	5,02E+00	5,08E+02	1,70E+01	-5,84E+02
GWP - biogenic	kg CO <sub>2</sub> -Eq	-3,80E+02	4,62E-02	1,99E+01	0	7,36E-01	-9,54E-02	0	0	8,83E+00	0	0	2,95E-03	4,99E+02	5,67E+00	5,22E+00
GWP - fossil	kg CO <sub>2</sub> -Eq	1,43E+03	7,23E+01	2,12E-01	0	4,26E+01	1,40E+02	0	0	7,58E+02	0	0	5,01E+00	9,20E+00	1,14E+01	-5,88E+02
GWP - luluc	kg CO <sub>2</sub> -Eq	1,52E+00	2,77E-02	5,17E-05	0	6,73E-02	5,47E-02	0	0	1,23E+00	0	0	1,70E-03	5,03E-03	6,53E-04	-5,43E-01
ADP - fossil*	MJ	2,10E+04	1,01E+03	1,87E+00	0	7,32E+02	1,82E+03	0	0	1,32E+04	0	0	7,17E+01	1,10E+02	2,90E+01	-8,04E+03
EP - fw	kg P-Eq	9,47E-01	5,77E-03	9,16E-05	0	6,11E-02	1,85E-02	0	0	1,15E+00	0	0	3,44E-04	2,87E-03	3,50E-04	-7,15E-01
EP-marine	kg N-Eq	2,14E+00	6,68E-02	1,16E-03	0	4,13E-02	1,18E-01	0	0	7,29E-01	0	0	8,85E-03	3,43E-02	2,49E-02	-6,26E-01
EP - terrestrial	mol N-Eq	2,04E+01	7,27E-01	1,12E-02	0	3,17E-01	1,28E+00	0	0	5,43E+00	0	0	9,65E-02	3,34E-01	1,03E-01	-6,13E+00
ADP- elements*	kg Sb-Eq	2,52E-02	1,55E-04	2,31E-07	0	1,54E-04	5,09E-04	0	0	1,91E-03	0	0	6,88E-06	1,34E-05	1,55E-06	-1,15E-02
ODP	kg CFC-11-Eq	3,10E-04	1,43E-06	2,37E-09	0	3,47E-07	2,61E-06	0	0	5,47E-06	0	0	1,01E-07	1,26E-07	3,93E-08	-1,30E-04
POCP	kg NMVOC-Eq	7,05E+00	3,22E-01	2,81E-03	0	9,53E-02	5,75E-01	0	0	1,59E+00	0	0	3,46E-02	9,13E-02	2,83E-02	-1,73E+00
WDP*	m <sup>3</sup>	6,47E+02	5,69E+00	4,43E-01	0	1,40E+01	1,43E+01	0	0	2,50E+02	0	0	3,57E-01	1,19E+01	8,49E-01	-1,23E+02
<b>Acronyms</b>	<p>GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-elements = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption</p>															

**\*Disclaimer:** The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

**General disclaimer:** The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

## Additional mandatory and voluntary impact category indicators

Table 14: Additional mandatory and voluntary impact indicators – CHAT<sup>2</sup>

CHAT <sup>2</sup>																
Additional environmental impact indicators	Reference unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	Module D
Global warming potential (GWP-GHG)	kg CO <sub>2</sub> -Eq	1,44E+03	7,24E+01	2,12E-01	0	4,29E+01	1,40E+02	0	0	7,60E+02	0	0	5,02E+00	9,22E+00	1,24E+01	-5,87E+02
<b>Acronym</b>	GWP-total = Global Warming Potential total															
<p><i>This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO<sub>2</sub> is set to zero.</i></p>																

## Resource use indicators

Table 15: Resource use indicators for CHAT<sup>2</sup>

CHAT <sup>2</sup>																
Indicator	Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	Module D
PERE	MJ	7,88E+01	2,41E+01	4,67E-02	0	5,21E+01	4,84E+01	0	0	1,01E+03	0	0	1,24E+00	1,17E+00	1,84E-01	-1,65E+02
PERM	MJ	6,75E+03	3,29E-06	-2,51E-07	0	4,83E+00	-3,82E-06	0	0	3,86E-04	0	0	4,53E-07	2,29E+00	2,75E-01	-1,40E+02
PERT	MJ	6,83E+03	2,41E+01	4,67E-02	0	5,69E+01	4,84E+01	0	0	1,01E+03	0	0	1,24E+00	3,46E+00	4,59E-01	-3,05E+02
PENRE	MJ	3,91E+03	1,01E+03	1,87E+00	0	6,78E+02	1,82E+03	0	0	1,32E+04	0	0	7,17E+01	4,70E+01	9,53E+00	-5,75E+03
PENRM	MJ	1,71E+04	1,96E-04	1,49E-07	0	5,42E+01	-7,60E-05	0	0	0,00E+00	0	0	8,30E-07	6,29E+01	1,95E+01	-2,29E+03
PENRT	MJ	2,10E+04	1,01E+03	1,87E+00	0	7,32E+02	1,82E+03	0	0	1,32E+04	0	0	7,17E+01	1,10E+02	2,90E+01	-8,04E+03
SM	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m <sup>3</sup>	1,63E+01	1,58E-01	2,72E-03	0	4,59E-01	3,67E-01	0	0	8,37E+00	0	0	1,01E-02	8,92E-02	-2,71E-01	-4,40E+00
<b>Acronyms</b>	<p><i>PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water</i></p>															



## Waste indicators

Table 16: Waste indicators for CHAT<sup>2</sup>

CHAT <sup>2</sup>																
Waste category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	kg	1,11E+02	1,05E+00	7,55E-02	0	7,84E-01	5,13E+00	0	0	1,07E+01	0	0	7,00E-02	2,07E+00	2,98E-01	-6,61E+00
Non-hazardous waste disposed (NHWD)	kg	2,06E+03	1,43E+01	1,38E+01	0	1,34E+01	3,65E+01	0	0	1,62E+02	0	0	7,63E-01	3,53E+02	3,90E+02	-9,97E+01
High-level radioactive waste disposed (RWD)	kg	3,12E-02	2,48E-04	2,73E-07	0	2,28E-03	3,77E-04	0	0	4,38E-02	0	0	1,22E-05	2,30E-05	3,52E-06	-1,67E-02

## Output flow indicators

Table 17: Output flow indicators for CHAT<sup>2</sup>

CHAT <sup>2</sup>																
Indicator	Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0	0	6,75E+01	0	0	0	0	0	0	0	0	0	0	0	0
Material for recycling	kg	6,75E+00	0	4,83E+00	0	0	0	0	0	0	0	0	0	2,01E+02	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	4,24E+02	0	3,79E+01	0	0	0	0	0	0	0	0	0	9,51E+02	2,52E+01	0
Exported energy, thermal	MJ	1,27E+03	0	1,14E+02	0	0	0	0	0	0	0	0	0	2,85E+03	4,54E+01	0

# CHAT<sup>4</sup>



## Results of the environmental performance indicators – CHAT<sup>4</sup>

Table 18: Mandatory impact category indicators according to EN 15804 (EF 3.1) – CHAT<sup>4</sup>

Impact category	Reference unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	Module D
AP	mol H <sup>+</sup> -Eq	1,26E+01	2,80E-01	2,89E-03	0	2,95E-01	4,75E-01	0	0	3,47E+00	0	0	2,97E-02	9,35E-02	2,86E-02	-3,63E+00
GWP_total	kg CO <sub>2</sub> -Eq	1,38E+03	9,54E+01	2,65E+01	0	6,44E+01	1,40E+02	0	0	7,95E+02	0	0	6,61E+00	6,69E+02	2,25E+01	-7,71E+02
GWP - biogenic	kg CO <sub>2</sub> -Eq	-5,01E+02	6,08E-02	2,62E+01	0	1,09E+00	-9,54E-02	0	0	9,14E+00	0	0	3,89E-03	6,57E+02	7,47E+00	6,91E+00
GWP - fossil	kg CO <sub>2</sub> -Eq	1,88E+03	9,53E+01	2,79E-01	0	6,33E+01	1,40E+02	0	0	7,85E+02	0	0	6,61E+00	1,21E+01	1,50E+01	-7,78E+02
GWP - luluc	kg CO <sub>2</sub> -Eq	2,01E+00	3,65E-02	6,81E-05	0	1,00E-01	5,47E-02	0	0	1,28E+00	0	0	2,24E-03	6,62E-03	8,60E-04	-7,15E-01
ADP - fossil*	MJ	2,77E+04	1,33E+03	2,47E+00	0	1,09E+03	1,82E+03	0	0	1,36E+04	0	0	9,44E+01	1,45E+02	3,83E+01	-1,06E+04
EP - fw	kg P-Eq	1,25E+00	7,61E-03	1,21E-04	0	9,08E-02	1,85E-02	0	0	1,19E+00	0	0	4,54E-04	3,78E-03	4,62E-04	-9,42E-01
EP-marine	kg N-Eq	2,82E+00	8,81E-02	1,54E-03	0	6,13E-02	1,18E-01	0	0	7,55E-01	0	0	1,17E-02	4,51E-02	3,28E-02	-8,26E-01
EP - terrestrial	mol N-Eq	2,68E+01	9,58E-01	1,47E-02	0	4,71E-01	1,28E+00	0	0	5,62E+00	0	0	1,27E-01	4,40E-01	1,36E-01	-8,09E+00
ADP-elements*	kg Sb-Eq	3,33E-02	2,04E-04	3,05E-07	0	2,28E-04	5,09E-04	0	0	1,97E-03	0	0	9,07E-06	1,77E-05	2,04E-06	-1,51E-02
ODP	kg CFC-11-Eq	4,09E-04	1,88E-06	3,12E-09	0	5,15E-07	2,61E-06	0	0	5,66E-06	0	0	1,33E-07	1,66E-07	5,18E-08	-1,72E-04
POCP	kg NMVOC-Eq	9,29E+00	4,25E-01	3,71E-03	0	1,42E-01	5,75E-01	0	0	1,65E+00	0	0	4,56E-02	1,20E-01	3,73E-02	-2,29E+00
WDP*	m <sup>3</sup>	8,53E+02	7,50E+00	5,84E-01	0	2,08E+01	1,43E+01	0	0	2,59E+02	0	0	4,70E-01	1,57E+01	1,12E+00	-1,62E+02

**Acronyms**  
 GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-elements = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

**\*Disclaimer:** The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

**General disclaimer:** The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

### Additional mandatory and voluntary impact category indicators

Table 19: Additional mandatory and voluntary impact indicators – CHAT<sup>4</sup>

CHAT <sup>4</sup>																
Additional environmental impact indicators	Reference unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	Module D
Global warming potential (GWP-GHG)	kg CO2-Eq	1,37E+03	6,90E+01	2,02E-01	0	5,18E+01	1,40E+02	0	0	7,60E+02	0	0	4,78E+00	8,80E+00	1,18E+01	-5,58E+02
<b>Acronym</b>	GWP-total = Global Warming Potential total															

This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO2 is set to zero.

### Resource use indicators

Table 20: Resource use indicators for CHAT<sup>4</sup>

CHAT <sup>4</sup>																
Indicator	Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	Module D
PERE	MJ	1,04E+02	3,18E+01	6,15E-02	0	7,74E+01	4,84E+01	0	0	1,05E+03	0	0	1,63E+00	1,54E+00	2,42E-01	-2,18E+02
PERM	MJ	8,89E+03	-4,98E-06	-3,00E-07	0	7,18E+00	-3,82E-06	0	0	2,93E-04	0	0	-2,95E-07	3,02E+00	3,63E-01	-1,84E+02
PERT	MJ	9,00E+03	3,18E+01	6,15E-02	0	8,46E+01	4,84E+01	0	0	1,05E+03	0	0	1,63E+00	4,57E+00	6,05E-01	-4,02E+02
PENRE	MJ	5,16E+03	1,33E+03	2,47E+00	0	1,01E+03	1,82E+03	0	0	1,36E+04	0	0	9,45E+01	6,19E+01	1,26E+01	-7,58E+03
PENRM	MJ	2,26E+04	2,36E-04	2,35E-07	0	8,05E+01	-7,60E-05	0	0	-2,01E-03	0	0	6,20E-07	8,29E+01	2,57E+01	-3,04E+03
PENRT	MJ	2,77E+04	1,33E+03	2,47E+00	0	1,09E+03	1,82E+03	0	0	1,36E+04	0	0	9,45E+01	1,45E+02	3,83E+01	-1,06E+04
SM	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m3	2,15E+01	2,08E-01	3,59E-03	0	6,83E-01	3,67E-01	0	0	8,66E+00	0	0	1,33E-02	1,18E-01	-3,57E-01	-5,79E+00
<b>Acronyms</b>	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water															

### Waste indicators

Table 21: Waste indicators for CHAT<sup>4</sup>

CHAT <sup>4</sup>																
Waste category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	kg	1,47E+02	1,39E+00	9,95E-02	0	1,16E+00	5,13E+00	0	0	1,10E+01	0	0	9,23E-02	2,73E+00	3,93E-01	-8,72E+00
Non-hazardous waste disposed (NHWD)	kg	2,72E+03	1,89E+01	1,82E+01	0	1,99E+01	3,65E+01	0	0	1,67E+02	0	0	1,01E+00	4,65E+02	5,13E+02	-1,31E+02
High-level radioactive waste disposed (RWD)	kg	4,11E-02	3,27E-04	3,59E-07	0	3,39E-03	3,77E-04	0	0	4,53E-02	0	0	1,62E-05	3,04E-05	4,63E-06	-2,20E-02

### Output flow indicators

Table 22: Output flow indicators for CHAT<sup>4</sup>

FOCUS																
Indicator	Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0	0	8,10E+01	0	0	0	0	0	0	0	0	0	0	0	0
Material for recycling	kg	8,89E+00	0	6,37E+00	0	0	0	0	0	0	0	0	0	2,67E+02	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	5,58E+02	0	5,00E+01	0	0	0	0	0	0	0	0	0	1,23E+03	3,32E+01	0
Exported energy, thermal	MJ	1,67E+03	0	1,50E+02	0	0	0	0	0	0	0	0	0	3,69E+03	5,98E+01	0

# SUMMIT<sup>4</sup>



## Results of the environmental performance indicators – SUMMIT<sup>4</sup>

Table 23: Mandatory impact category indicators according to EN 15804 (EF 3.1) – SUMMIT<sup>4</sup>

Impact category	Reference unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	Module D
AP	mol H+Eq	1,33E+01	2,96E-01	3,06E-03	0	4,91E-01	4,75E-01	0	0	4,60E+00	0	0	3,14E-02	9,90E-02	3,02E-02	-3,83E+00
GWP_total	kg CO2Eq	1,46E+03	1,01E+02	2,81E+01	0	1,07E+02	1,40E+02	0	0	1,05E+03	0	0	7,00E+00	7,09E+02	2,38E+01	-8,16E+02
GWP - biogenic	kg CO2Eq	-5,30E+02	6,44E-02	2,78E+01	0	1,82E+00	-9,54E-02	0	0	1,21E+01	0	0	4,12E-03	6,96E+02	7,91E+00	7,31E+00
GWP - fossil	kg CO2Eq	1,99E+03	1,01E+02	2,95E-01	0	1,05E+02	1,40E+02	0	0	1,04E+03	0	0	7,00E+00	1,28E+01	1,59E+01	-8,23E+02
GWP - luluc	kg CO2Eq	2,12E+00	3,87E-02	7,21E-05	0	1,66E-01	5,47E-02	0	0	1,69E+00	0	0	2,37E-03	7,01E-03	9,11E-04	-7,55E-01
ADP - fossil*	MJ	2,93E+04	1,40E+03	2,62E+00	0	1,81E+03	1,82E+03	0	0	1,81E+04	0	0	1,00E+02	1,53E+02	4,05E+01	-1,12E+04
EP - fw	kg P-Eq	1,32E+00	8,05E-03	1,28E-04	0	1,51E-01	1,85E-02	0	0	1,58E+00	0	0	4,80E-04	4,01E-03	4,89E-04	-9,93E-01
EP-marine	kg N-Eq	2,99E+00	9,32E-02	1,63E-03	0	1,02E-01	1,18E-01	0	0	1,00E+00	0	0	1,23E-02	4,78E-02	3,47E-02	-8,72E-01
EP - terrestrial	mol NEq	2,84E+01	1,01E+00	1,56E-02	0	7,83E-01	1,28E+00	0	0	7,44E+00	0	0	1,35E-01	4,66E-01	1,44E-01	-8,53E+00
ADP- elements*	kg Sb-Eq	3,52E-02	2,16E-04	3,23E-07	0	3,80E-04	5,09E-04	0	0	2,61E-03	0	0	9,60E-06	1,87E-05	2,16E-06	-1,58E-02
ODP	kg CFC-11Eq	4,33E-04	1,99E-06	3,30E-09	0	8,57E-07	2,61E-06	0	0	7,49E-06	0	0	1,40E-07	1,76E-07	5,49E-08	-1,82E-04
POCP	kg NMVOC-Eq	9,84E+00	4,50E-01	3,93E-03	0	2,35E-01	5,75E-01	0	0	2,18E+00	0	0	4,83E-02	1,27E-01	3,95E-02	-2,41E+00
WDP*	m3	9,03E+02	7,95E+00	6,18E-01	0	3,46E+01	1,43E+01	0	0	3,43E+02	0	0	4,98E-01	1,67E+01	1,18E+00	-1,71E+02

### Acronyms

GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-elements = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

**\*Disclaimer:** The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

**General disclaimer:** The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.



### Additional mandatory and voluntary impact category indicators

Table 24: Additional mandatory and voluntary impact indicators – SUMMIT<sup>4</sup>

SUMMIT <sup>4</sup>																
Additional environmental impact indicators	Reference unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	Module D
Global warming potential (GWP-GHG)	kg CO2-Eq	2,00E+03	1,01E+02	2,96E-01	0	1,06E+02	1,40E+02	0	0	1,04E+03	0	0	7,00E+00	1,29E+01	1,73E+01	-8,21E+02
<b>Acronym</b>	GWP-total = Global Warming Potential total															
<p><i>This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO2 is set to zero.</i></p>																

### Resource use indicators

Table 25: Resource use indicators for SUMMIT<sup>4</sup>

SUMMIT <sup>4</sup>																
Indicator	Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	Module D
PERE	MJ	1,10E+02	3,37E+01	6,51E-02	0	1,29E+02	4,84E+01	0	0	1,39E+03	0	0	1,73E+00	1,63E+00	2,56E-01	-2,31E+02
PERM	MJ	9,42E+03	4,89E-06	-1,41E-07	0	1,20E+01	-3,82E-06	0	0	3,52E-04	0	0	-1,36E-07	3,20E+00	3,84E-01	-1,93E+02
PERT	MJ	9,53E+03	3,37E+01	6,51E-02	0	1,41E+02	4,84E+01	0	0	1,39E+03	0	0	1,73E+00	4,83E+00	6,40E-01	-4,24E+02
PENRE	MJ	5,46E+03	1,40E+03	2,62E+00	0	1,68E+03	1,82E+03	0	0	1,81E+04	0	0	1,00E+02	6,56E+01	1,33E+01	-8,03E+03
PENRM	MJ	2,39E+04	2,13E-04	-2,81E-07	0	1,34E+02	-7,60E-05	0	0	2,79E-03	0	0	4,30E-05	8,78E+01	2,72E+01	-3,21E+03
PENRT	MJ	2,93E+04	1,40E+03	2,62E+00	0	1,81E+03	1,82E+03	0	0	1,81E+04	0	0	1,00E+02	1,53E+02	4,05E+01	-1,12E+04
SM	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m3	2,28E+01	2,20E-01	3,80E-03	0	1,14E+00	3,67E-01	0	0	1,15E+01	0	0	1,40E-02	1,24E-01	-3,78E-01	-6,13E+00
<b>Acronyms</b>	<p>PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water</p>															

### Waste indicators

Table 26: Waste indicators for SUMMIT<sup>4</sup>

SUMMIT <sup>4</sup>																
Waste category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	kg	1,56E+02	1,47E+00	1,05E-01	0	1,94E+00	5,13E+00	0	0	1,46E+01	0	0	9,77E-02	2,89E+00	4,16E-01	-9,21E+00
Non-hazardous waste disposed (NHWD)	kg	2,88E+03	2,00E+01	1,93E+01	0	3,31E+01	3,65E+01	0	0	2,22E+02	0	0	1,06E+00	4,92E+02	5,44E+02	-1,39E+02
High-level radioactive waste disposed (RWD)	kg	4,36E-02	3,46E-04	3,81E-07	0	5,64E-03	3,77E-04	0	0	6,00E-02	0	0	1,71E-05	3,21E-05	4,91E-06	-2,33E-02

### Output flow indicators

Table 27: Output flow indicators for SUMMIT<sup>4</sup>

SUMMIT <sup>4</sup>																
Indicator	Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0	0	8,43E+01	0	0	0	0	0	0	0	0	0	0	0	0
Material for recycling	kg	9,41E+00	0	6,74E+00	0	0	0	0	0	0	0	0	0	2,84E+02	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	-5,91E+02	0	-5,29E+01	0	0	0	0	0	0	0	0	0	1,33E+03	3,51E+01	0
Exported energy, thermal	MJ	-1,77E+03	0	-1,59E+02	0	0	0	0	0	0	0	0	0	3,98E+03	6,33E+01	0

silentlab

EnviTrail

SUMMIT<sup>6</sup>



## Results of the environmental performance indicators – SUMMIT<sup>6</sup>

Table 28: Mandatory impact category indicators according to EN 15804 (EF 3.1) – SUMMIT<sup>6</sup>

Impact category	Reference unit	A1- A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	Module D
AP	mol H <sup>+</sup> -Eq	1,63E+01	3,62E-01	3,74E-03	0	7,69E-01	4,75E-01	0	0	5,85E+00	0	0	3,84E-02	1,21E-01	3,70E-02	-4,70E+00
GWP_total	kg CO <sub>2</sub> -Eq	1,79E+03	1,23E+02	3,43E+01	0	1,68E+02	1,40E+02	0	0	1,34E+03	0	0	8,56E+00	8,66E+02	2,91E+01	-1,00E+03
GWP - biogenic	kg CO <sub>2</sub> -Eq	-6,48E+02	7,87E-02	3,39E+01	0	2,85E+00	-9,54E-02	0	0	1,54E+01	0	0	5,04E-03	8,51E+02	9,67E+00	8,94E+00
GWP - fossil	kg CO <sub>2</sub> -Eq	2,43E+03	1,23E+02	3,61E-01	0	1,65E+02	1,40E+02	0	0	1,32E+03	0	0	8,55E+00	1,57E+01	1,94E+01	-1,01E+03
GWP - luluc	kg CO <sub>2</sub> -Eq	2,60E+00	4,73E-02	8,81E-05	0	2,60E-01	5,47E-02	0	0	2,15E+00	0	0	2,90E-03	8,57E-03	1,11E-03	-9,25E-01
ADP - fossil*	MJ	3,59E+04	1,72E+03	3,20E+00	0	2,83E+03	1,82E+03	0	0	2,29E+04	0	0	1,22E+02	1,87E+02	4,95E+01	-1,38E+04
EP - fw	kg P-Eq	1,61E+00	9,84E-03	1,56E-04	0	2,36E-01	1,85E-02	0	0	2,00E+00	0	0	5,87E-04	4,90E-03	5,97E-04	-1,22E+00
EP-marine	kg N-Eq	3,65E+00	1,14E-01	1,99E-03	0	1,60E-01	1,18E-01	0	0	1,27E+00	0	0	1,51E-02	5,84E-02	4,24E-02	-1,07E+00
EP - terrestrial	mol N-Eq	3,47E+01	1,24E+00	1,91E-02	0	1,23E+00	1,28E+00	0	0	9,46E+00	0	0	1,65E-01	5,70E-01	1,76E-01	-1,05E+01
ADP- elements*	kg Sb-Eq	4,30E-02	2,65E-04	3,94E-07	0	5,94E-04	5,09E-04	0	0	3,32E-03	0	0	1,17E-05	2,28E-05	2,64E-06	-1,94E-02
ODP	kg CFC-11-Eq	5,30E-04	2,43E-06	4,04E-09	0	1,34E-06	2,61E-06	0	0	9,53E-06	0	0	1,72E-07	2,15E-07	6,71E-08	-2,22E-04
POCP	kg NMVOC-Eq	1,20E+01	5,50E-01	4,80E-03	0	3,68E-01	5,75E-01	0	0	2,77E+00	0	0	5,90E-02	1,56E-01	4,83E-02	-2,96E+00
WDP*	m <sup>3</sup>	1,10E+03	9,71E+00	7,56E-01	0	5,41E+01	1,43E+01	0	0	4,36E+02	0	0	6,09E-01	2,04E+01	1,45E+00	-2,10E+02

**Acronyms**

GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-elements = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

**\*Disclaimer:** The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

**General disclaimer:** The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

### Additional mandatory and voluntary impact category indicators

Table 29: Additional mandatory and voluntary impact indicators – SUMMIT<sup>6</sup>

SUMMIT <sup>6</sup>																
Additional environmental impact indicators	Reference unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	Module D
Global warming potential (GWP-GHG)	kg CO2-Eq	2,45E+03	1,23E+02	3,61E-01	0	1,66E+02	1,40E+02	0	0	1,32E+03	0	0	8,56E+00	1,57E+01	2,11E+01	-1,01E+03

**Acronym** GWP-total = Global Warming Potential total

This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO2 is set to zero.

### Resource use indicators

Table 30: Resources use indicators for SUMMIT<sup>6</sup>

SUMMIT <sup>6</sup>																
Indicator	Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	Module D
PERE	MJ	1,34E+02	4,12E+01	7,96E-02	0	2,01E+02	4,84E+01	0	0	1,76E+03	0	0	2,11E+00	1,99E+00	3,13E-01	-2,82E+02
PERM	MJ	1,15E+04	3,44E-06	4,95E-07	0	1,87E+01	-3,82E-06	0	0	-2,08E-04	0	0	-4,99E-07	3,91E+00	4,69E-01	-2,37E+02
PERT	MJ	1,16E+04	4,12E+01	7,96E-02	0	2,20E+02	4,84E+01	0	0	1,76E+03	0	0	2,11E+00	5,91E+00	7,82E-01	-5,19E+02
PENRE	MJ	6,68E+03	1,72E+03	3,20E+00	0	2,62E+03	1,82E+03	0	0	2,29E+04	0	0	1,22E+02	8,02E+01	1,63E+01	-9,81E+03
PENRM	MJ	2,92E+04	-3,37E-04	-3,43E-07	0	2,09E+02	-7,60E-05	0	0	-3,74E-03	0	0	-4,74E-05	1,07E+02	3,33E+01	-3,96E+03
PENRT	MJ	3,59E+04	1,72E+03	3,20E+00	0	2,83E+03	1,82E+03	0	0	2,29E+04	0	0	1,22E+02	1,87E+02	4,95E+01	-1,38E+04
SM	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m3	2,79E+01	2,69E-01	4,65E-03	0	1,78E+00	3,67E-01	0	0	1,46E+01	0	0	1,72E-02	1,52E-01	-4,62E-01	-7,50E+00

**Acronyms**

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

### Waste indicators

Table 31: Waste indicators for SUMMIT<sup>6</sup>

SUMMIT <sup>6</sup>																
Waste category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	kg	1,90E+02	1,80E+00	1,29E-01	0	3,03E+00	5,13E+00	0	0	1,86E+01	0	0	1,19E-01	3,53E+00	5,09E-01	-1,13E+01
Non-hazardous waste disposed (NHWD)	kg	3,52E+03	2,44E+01	2,36E+01	0	5,19E+01	3,65E+01	0	0	2,82E+02	0	0	1,30E+00	6,02E+02	6,64E+02	-1,71E+02
High-level radioactive waste disposed (RWD)	kg	5,32E-02	4,24E-04	4,65E-07	0	8,83E-03	3,77E-04	0	0	7,63E-02	0	0	2,09E-05	3,92E-05	6,00E-06	-2,85E-02

### Output flow indicators

Table 32: Output flow indicators for SUMMIT<sup>6</sup>

SUMMIT <sup>6</sup>																
Indicator	Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0	0	9,75E+01	0	0	0	0	0	0	0	0	0	0	0	0
Material for recycling	kg	1,15E+01	0	8,24E+00	0	0	0	0	0	0	0	0	0	3,48E+02	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	7,22E+02	0	6,47E+01	0	0	0	0	0	0	0	0	0	1,62E+03	4,29E+01	0
Exported energy, thermal	MJ	2,17E+03	0	1,94E+02	0	0	0	0	0	0	0	0	0	4,87E+03	7,74E+01	0

# SUMMIT<sup>8</sup>





## Results of the environmental performance indicators – SUMMIT<sup>8</sup>

Table 28: Mandatory impact category indicators according to EN 15804 (EF 3.1) – SUMMIT<sup>8</sup>

Impact category	Reference unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	Module D
AP	mol H+Eq	1,77E+01	3,95E-01	4,08E-03	0	1,00E+00	4,75E-01	0	0	7,09E+00	0	0	4,19E-02	1,32E-01	4,03E-02	-5,10E+00
GWP_total	kg CO2-Eq	1,95E+03	1,35E+02	3,74E+01	0	2,19E+02	1,40E+02	0	0	1,62E+03	0	0	9,34E+00	9,45E+02	3,17E+01	-1,09E+03
GWP - biogenic	kg CO2-Eq	-7,07E+02	8,59E-02	3,70E+01	0	3,72E+00	-9,54E-02	0	0	1,87E+01	0	0	5,50E-03	9,28E+02	1,05E+01	9,75E+00
GWP - fossil	kg CO2-Eq	2,65E+03	1,35E+02	3,94E-01	0	2,15E+02	1,40E+02	0	0	1,60E+03	0	0	9,33E+00	1,71E+01	2,12E+01	-1,10E+03
GWP - luluc	kg CO2-Eq	2,83E+00	5,15E-02	9,61E-05	0	3,40E-01	5,47E-02	0	0	2,61E+00	0	0	3,16E-03	9,35E-03	1,22E-03	-1,01E+00
ADP - fossil*	MJ	3,91E+04	1,87E+03	3,49E+00	0	3,70E+03	1,82E+03	0	0	2,78E+04	0	0	1,33E+02	2,04E+02	5,40E+01	-1,50E+04
EP - fw	kg P-Eq	1,76E+00	1,07E-02	1,70E-04	0	3,08E-01	1,85E-02	0	0	2,43E+00	0	0	6,41E-04	5,34E-03	6,52E-04	-1,32E+00
EP-marine	kg N-Eq	3,98E+00	1,24E-01	2,17E-03	0	2,08E-01	1,18E-01	0	0	1,54E+00	0	0	1,65E-02	6,37E-02	4,63E-02	-1,16E+00
EP - terrestrial	mol N-Eq	3,79E+01	1,35E+00	2,08E-02	0	1,60E+00	1,28E+00	0	0	1,15E+01	0	0	1,79E-01	6,22E-01	1,93E-01	-1,14E+01
ADP-elements*	kg Sb-Eq	4,69E-02	2,89E-04	4,30E-07	0	7,76E-04	5,09E-04	0	0	4,03E-03	0	0	1,28E-05	2,49E-05	2,88E-06	-2,09E-02
ODP	kg CFC-11-Eq	5,78E-04	2,65E-06	4,40E-09	0	1,75E-06	2,61E-06	0	0	1,16E-05	0	0	1,87E-07	2,34E-07	7,32E-08	-2,42E-04
POCP	kg NMVOC-Eq	1,31E+01	6,00E-01	5,23E-03	0	4,81E-01	5,75E-01	0	0	3,36E+00	0	0	6,44E-02	1,70E-01	5,26E-02	-3,22E+00
WDP*	m3	1,20E+03	1,06E+01	8,24E-01	0	7,07E+01	1,43E+01	0	0	5,29E+02	0	0	6,64E-01	2,22E+01	1,58E+00	-2,28E+02

**Acronyms** GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-elements = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

**\*Disclaimer:** The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

**General disclaimer:** The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

### Additional mandatory and voluntary impact category indicators

Table 29: Additional mandatory and voluntary impact indicators - SUMMIT<sup>®</sup>

SUMMIT <sup>®</sup>																
Additional environmental impact indicators	Reference unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	Module D
Global warming potential (GWP-GHG)	kg CO <sub>2</sub> -Eq	2,67E+03	1,35E+02	3,94E-01	0	2,17E+02	1,40E+02	0	0	1,61E+03	0	0	9,33E+00	1,71E+01	2,30E+01	-1,10E+03
<b>Acronym</b>	GWP-total = Global Warming Potential total															
<p><i>This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO<sub>2</sub> is set to zero.</i></p>																

### Resource use indicators

Table 30: Resource use indicators for SUMMIT<sup>®</sup>

SUMMIT <sup>®</sup>																
Indicator	Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	Module D
PERE	MJ	1,47E+02	4,49E+01	8,68E-02	0	2,63E+02	4,84E+01	0	0	2,14E+03	0	0	2,30E+00	2,18E+00	3,41E-01	-3,08E+02
PERM	MJ	1,26E+04	3,19E-06	-1,88E-07	0	2,44E+01	-3,82E-06	0	0	-2,42E-04	0	0	-1,81E-07	4,27E+00	5,12E-01	-2,56E+02
PERT	MJ	1,27E+04	4,49E+01	8,68E-02	0	2,87E+02	4,84E+01	0	0	2,14E+03	0	0	2,30E+00	6,45E+00	8,54E-01	-5,64E+02
PENRE	MJ	7,28E+03	1,87E+03	3,49E+00	0	3,42E+03	1,82E+03	0	0	2,78E+04	0	0	1,33E+02	8,75E+01	1,77E+01	-1,07E+04
PENRM	MJ	3,18E+04	-3,83E-04	-3,75E-07	0	2,74E+02	-7,60E-05	0	0	1,38E-03	0	0	-4,26E-05	1,17E+02	3,63E+01	-4,29E+03
PENRT	MJ	3,91E+04	1,87E+03	3,49E+00	0	3,70E+03	1,82E+03	0	0	2,78E+04	0	0	1,33E+02	2,05E+02	5,40E+01	-1,50E+04
SM	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m <sup>3</sup>	3,04E+01	2,94E-01	5,07E-03	0	2,32E+00	3,67E-01	0	0	1,77E+01	0	0	1,87E-02	1,66E-01	-5,03E-01	-8,16E+00
<b>Acronyms</b>	<p><i>PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water</i></p>															

### Waste indicators

Table 31: Waste indicators for SUMMIT<sup>3</sup>

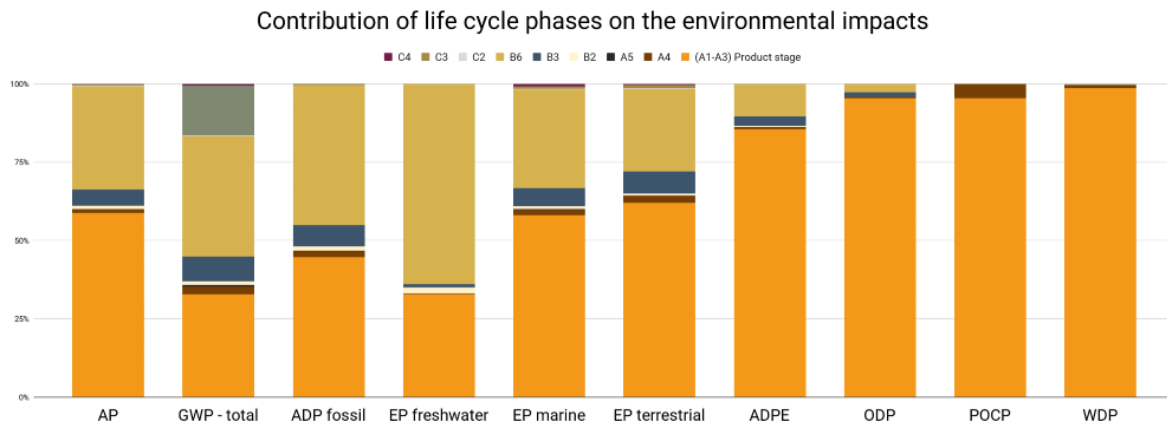
SUMMIT <sup>3</sup>																
Waste category	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	kg	2,07E+02	1,96E+00	1,40E-01	0	3,96E+00	5,13E+00	0	0	2,25E+01	0	0	1,30E-01	3,85E+00	5,55E-01	-1,23E+01
Non-hazardous waste disposed (NHWD)	kg	3,84E+03	2,66E+01	2,57E+01	0	6,77E+01	3,65E+01	0	0	3,42E+02	0	0	1,42E+00	6,56E+02	7,25E+02	-1,86E+02
High-level radioactive waste disposed (RWD)	kg	5,81E-02	4,62E-04	5,08E-07	0	1,15E-02	3,77E-04	0	0	9,25E-02	0	0	2,28E-05	4,29E-05	6,55E-06	-3,11E-02

### Output flow indicators

Table 32: Output flow indicators for SUMMIT<sup>3</sup>

SUMMIT <sup>3</sup>																
Indicator	Unit	A1 - A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for reuse	kg	0	0	1,04E+02	0	0	0	0	0	0	0	0	0	0	0	0
Material for recycling	kg	1,26E+01	0	8,90E+00	0	0	0	0	0	0	0	0	0	3,81E+02	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	-7,88E+02	0	-7,06E+01	0	0	0	0	0	0	0	0	0	1,77E+03	4,68E+01	0
Exported energy, thermal	MJ	-2,36E+03	0	-2,12E+02	0	0	0	0	0	0	0	0	0	5,31E+03	8,44E+01	0

## LCA interpretation



Graph 1: Contribution of life cycle phases on the environmental impacts – acoustic pod SPOT

Based on the normalised and weighted results according to the EF ver. 3.1 factors, the two most relevant impact categories (hotspots) are climate change and resource depletion – fossil fuels.

The production phase (modules A1-A3) and the operation energy use (B6) have the highest environmental impacts in all impact categories through the life cycle of the GEN4 family. The third most important phase of the life cycle is module C3 – waste wood processing.

## Environmental performance indicators

<p style="text-align: center;"><b>Acidification (AP)</b></p> <p>Acidification is the process of increasing the acidity of soils, air, or water caused by an elevated concentration of hydrogen ions. An indicator of the impact category of acidification is accumulated exceedance (AE). The result is expressed in mol H+ eq.</p>	<p style="text-align: center;"><b>Climate change (GWP)</b></p> <p>Climate change is divided into three parts: biogenic, fossil, land use and land use transformation. An indicator called global warming potential (GWP100) is used to measure the amount of greenhouse gases contributing to global warming. The results are quantified in kilograms of CO2 eq.</p>
<p style="text-align: center;"><b>Ozone depletion (ODP)</b></p> <p>Ozone layer depletion is the result of emissions of ozone-depleting substances, such as long-lived chlorine and bromine-containing gases (e.g., CFCs, HCFCs, Halons). It is quantified in kg CFC-11 eq., with the ozone depletion potential as its indicator.</p>	<p style="text-align: center;"><b>Water use (WDP)</b></p> <p>Water deprivation potential quantifies the potential of water deprivation to humans or ecosystems. It is quantified in m3 world eq. and helps evaluate the risks associated with water scarcity.</p>
<p style="text-align: center;"><b>Photochemical oxidant formation (POCP)</b></p> <p>The impact category photochemical oxidation formation aggregates substances that contribute to the formation of tropospheric ozone. Category indicator is tropospheric ozone concentration increase expressed in kg NMVOC eq.</p>	<p style="text-align: center;"><b>Resource use, minerals and metals (ADP)</b></p> <p>Resource scarcity and limitations for current and future generations includes depletion of abiotic resources - elements (ADPe), quantified in kg Sb eq. and depletion of abiotic resources - fossil fuels (ADPf), quantified in MJ.</p>
<p style="text-align: center;"><b>Eutrophication (EP)</b></p> <p>Eutrophication enriches the environment with nutrients, impacting land, water, and seas leading to excess plankton and algae growth, harming the water quality. It is categorised into terrestrial (accumulated exceedance expressed in mol N eq.), freshwater (nutrient fraction reaching freshwater end expressed in kg P eq.), and marine impacts (nutrient fraction reaching marine end expressed in kg N eq.).</p>	

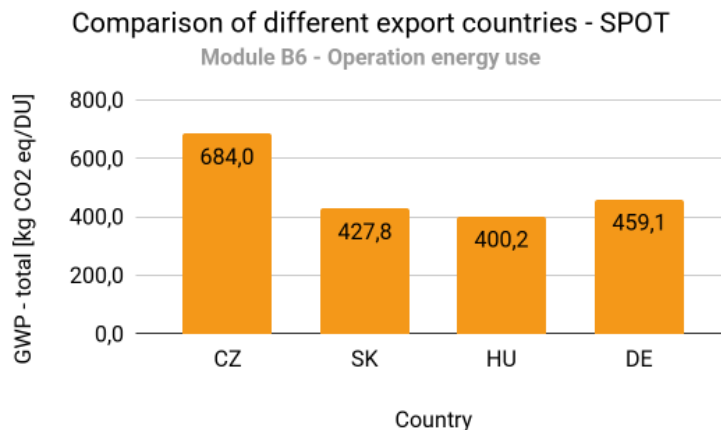
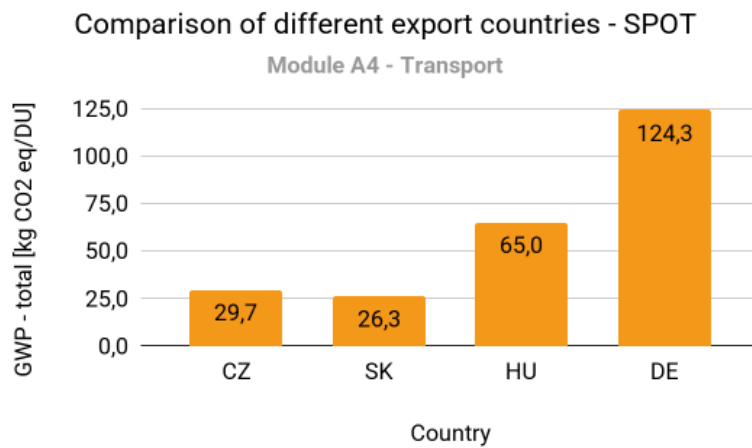
**Statement on the requirements for comparability of EPDs, adapted from ISO 14025:**

*EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.*

**Additional environmental information**

For a better overview of the use phase scenario, three additional countries of export were evaluated for the climate change impact category of the product SPOT. In case of module A4 (transport to a customer), an increase in emissions depending on the transport distance is demonstrated. In module B6, CO<sub>2</sub>-Eq. emissions change accordingly to the emission factor of the electricity production mix.

**Export countries comparison**



## References

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