Environmental Product Declaration (EPD)
According to ISO 14025 and EN 15804+A2

FBS II R

Registration number:	EPD-Kiwa-EE-000493-EN
Issue date:	17.06.2026
Valid until:	17.06.2031
Declaration owner:	fischerwerke GmbH & Co. KG
Publisher:	Kiwa-Ecobility Experts
Program operator:	Kiwa-Ecobility Experts
Status:	verified

1 General information

1.1 PRODUCT

FBS II R

1.2 REGISTRATION NUMBER

EPD-Kiwa-EE-000493-EN

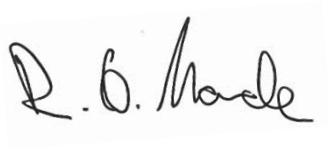
1.3 VALIDITY

Issue date: 17.06.2026

Valid until: 17.06.2031

1.4 PROGRAM OPERATOR

Kiwa-Ecobility Experts
Wattstraße 11-13
13355 Berlin
Germany



Raoul Mancke

(Head of program operations, Kiwa-Ecobility Experts)

Onur Üzüm

(Verification body, Kiwa-Ecobility Experts)

1.5 OWNER OF THE DECLARATION

Declaration owner: fischerwerke GmbH & Co. KG

Address: Klaus-Fischer-Straße 1, 72178 Waldachtal, Germany

E-mail: info@fischer.de

Website: www.fischer-international.com

Production location: fischerwerke GmbH & Co. KG in Germany; fischer Vyskov spol s.r.o. in the Czech Republic

Address production location: Klaus-Fischer-Straße 1, 72178 Waldachtal, Germany; Osvoboditelů 816/59, 68323, Ivanovice na Hané, the Czech Republic

1.6 VERIFICATION OF THE DECLARATION

The independent verification is in accordance with ISO 14025:2011. The LCA is in compliance with ISO 14040:2006 and ISO 14044:2006. The EN 15804:2012+A2:2019 serves as the core PCR.

☐ Internal ☒ External

Anastasiia Huk

(Third party verifier)

1.7 STATEMENTS

The owner of this EPD shall be liable for the underlying information and evidence. The program operator Kiwa-Ecobility Experts shall not be liable with respect to manufacturer data, life cycle assessment data and evidence.

1.8 PRODUCT CATEGORY RULES

General Product Category Rules: Product Category Rules for Building-Related Products and Services, from the Environmental Product Declaration of the Institute Construction and Environment e. V. (IBU), Part A: Calculation Rules for the Life Cycle Assessment and Requirements for the Project Report according to EN 15804+A2:2019

Specific Product Category Rules: PCR Guidance-Texts for Building-Related Products and Services, From the range of Environmental Product Declarations of Institute Construction and Environment e.V. (IBU), Part B: Requirements on the EPD for screws, Institut Bauen und Umwelt e.V., 01.08.2024 v11

1.9 COMPARABILITY

In principle, a comparison or assessment of the environmental impacts of different products is only possible if they have been prepared in accordance with EN 15804. For the evaluation of the comparability, the following aspects have to be considered in particular: PCR used, functional or declared unit, geographical reference, the definition of the system boundary, declared modules, data selection (primary or secondary data, background database, data quality), scenarios used for use and disposal phases, and the life cycle inventory (data collection, calculation methods, allocations, validity period). PCRs and general program instructions of different EPDs programs may differ. Comparability needs to be evaluated. For further guidance, see EN 15804+A2 (5.3 Comparability of EPD for construction products) and ISO 14025 (6.7.2 Requirements for comparability).

1.10 CALCULATION BASIS

LCA method: EN15804+A2

LCA software: LCA software Umberto 11.16.1

Characterization method: EN 15804 +A2 Method v1.0

LCA database profiles: ecoinvent EN15804 3.11

Version database: 3.11

1.11 PROJECT REPORT

This EPD is generated on the basis of the following report: 2026-03-23-LCA-Report-FBS-II-R-R01

2 Product

2.1 PRODUCT DESCRIPTION

The FBS II 8x80 30/15 US R concrete screw was chosen as the representative product of the FBS II R product group.

The fischer concrete screw ULTRACUT FBS II R is an anchor of sizes 6, 8, 10 and 12 mm made of stainless steel with a hardened tip. The anchor is screwed into a predrilled cylindrical drill hole. The special thread of the anchor cuts an internal thread into the member while setting. The anchorage is characterised by mechanical interlock in the special thread.

All represented products consist of the same materials and components.

The FBS II R consists of the concrete screw, cardboard packaging and installation manual.

Product specification

The composition of the product is described in the following table:

Material category	Material type	Weight [m-%]
Raw material	Stainless steel	95.62%
	Colour	0.97%
Packaging	Cardboard	2.51%
	Label	0.22%
	Installation manual	0.67%

2.2 APPLICATION (INTENDED USE OF THE PRODUCT)

The fischer concrete screw FBS II R can be used for anchoring metal profiles, steel constructions and consoles.

The base materials include cracked and non-cracked concrete C20/25 to C50/60 according to EN 206:2013+A2:2021, clay bricks according to EN 771-1, solid or perforated sand-lime bricks according to EN 771-2.

2.3 REFERENCE SERVICE LIFE (RSL)

No modules from the use phase have been declared. No reference service life is stated for this reason.

The verification and assessment methods on which the European Technical Assessment of the concrete screw is based lead to the assumption of a working life of the anchor of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer but are to be regarded only as a means for choosing the appropriate product in relation to the expected, economically reasonable working life of the works.

Since the use stage is not considered in this LCA, the reference service life (RSL) of the product is not taken into account.

USED RSL (YR) IN THIS CALCULATION

The use phase was not considered, which is why no information on the RSL is required.

2.4 TECHNICAL DATA

Description	Value	Unit
Bolt diameter	6 - 12	mm
Bolt length	50 - 280	mm
Material	stainless steel	-

Applicable Technical standards and approvals:

European Technical Assessment ETA-20/0134. This ETA is issued on the basis of the European Assessment Document EAD 330460-00-0604, Edition 04/2022

European Technical Assessment ETA-17/0740. This ETA is issued on the basis of the European Assessment Document EAD 330232-01-0601

European Technical Assessment ETA-24/0973. This ETA is issued on the basis of the European Assessment Document EAD 330747-00-0601

2.5 SUBSTANCES OF VERY HIGH CONCERN

The product contains no substances on the Candidate List of substances of very high concern for authorization (Substances of Very High Concern – SVHC) at a concentration

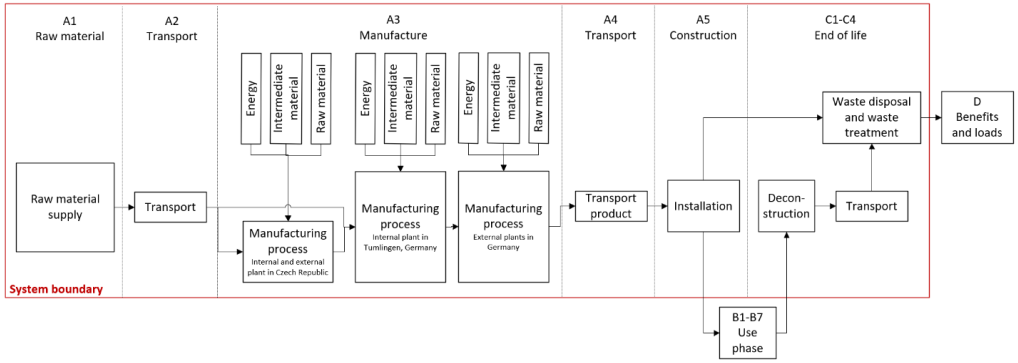
of above 0.1 % mass.

2.6 DESCRIPTION OF THE PRODUCTION PROCESS

The FBS II in the Version R is produced at the internal plants in Tumlingen, Germany and Ivanovice na Hané, Czech Republic. Finishing and processing take place externally in Germany and the Czech Republic.

Product flow diagram

The LCA considers the product stage (A1-A3), the construction stage (A4-A5), the disposal stage (C1-C4) and benefits and loads outside the system boundary (Module D). Modules A1 (provision of raw materials), A2 (transportation) and A3 (production) are aggregated in the assessment as modules A1-A3.



Modules A1 - A3 comprise the following activities:

- Provision of energy
- Provision of raw, operating and auxiliary materials and packaging
- Transportation to the plant
- Production of concrete screw including finishing steps
- Treatment of production waste

Module A4 includes:
- Transportation to the construction site

Module A5 includes:
- Disposal of product packaging
- Waste treatment of packaging

Module C1 includes:
- Dismantling

Module C2 includes:
- Transportation to the waste disposal site

Module C3 – C4 includes:
- End-of-life scenarios

Module D includes:
- Benefits and loads outside the system boundary

2.7 CONSTRUCTION DESCRIPTION

The installation of the concrete screw must be carried out in accordance with ETA-17/0740 of 2025/01/08, Annex B.

3 Calculation rules

3.1 DECLARED UNIT

The declared unit is 1 kg of concrete screw FBS II R based on the representative product.

- Reference unit: kilogram (kg)
- Bulk density: 1258.08 kilogram per cubic meter (kg/m³)

3.2 CONVERSION FACTORS

Description	Value	Unit
Reference unit	1	kg
Weight per reference unit	1	kg
Conversion factor to 1 kg	1,0000	kg

3.3 SCOPE OF DECLARATION AND SYSTEM BOUNDARIES

The system boundary was chosen “from cradle to gate with options”. Accordingly, the consideration includes the production stage (A1-A3), transportation to the place of use (A4), installation (A5) and the end-of-life stages (C1-C4) as well as benefits and loads outside the system boundary (D). The life cycle is modular in accordance with EN 15804.

The life cycle stages included are as shown below:

(X = module declared, ND = module not declared)

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

The modules of the EN15804+A2 contain the following:

Module A1 = Raw material supply

Module A2 = Transport

Module A3 = Manufacturing

Module A4 = Transport

Module A5 = Construction - waste treatment of packaging

Module B1 = Use

Module B2 = Maintenance

Module B3 = Repair

Module B4 = Replacement

Module B5 = Refurbishment

Module B6 = Operational energy use

Module B7 = Operational water use

Module C1 = Deconstruction / Demolition

Module C2 = Transport

Module C3 = Waste Processing

Module C4 = Disposal

Module D = Benefits and loads beyond the product system boundaries

3.4 REPRESENTATIVENESS

This EPD is representative of the FBS II R concrete screw produced by fischerwerke GmbH & Co. KG.

Information on modules A1-A3 comes directly from the manufacturer. European or more specific datasets were used for modules A1-A3. The geographical representativeness of modules A1-A3 can be classified as very good.

The manufacturer distributes its products worldwide. GLO datasets, RoW datasets and RER datasets were used for modules A4-A5 and EoL modules C1-C4 and D. The geographical representativeness of these modules can be classified as good.

3.5 CUT-OFF CRITERIA

All relevant inputs and outputs that contribute significantly to the environmental impacts have been included in the model.

Auxiliary Materials: The workplace-specific quantities were available for auxiliary material for selected workplaces.

Transport: For the transport processes the dataset “market group for transport, freight, lorry, diesel, unspecified” from the ecoinvent database was used. This dataset represents a conservative assumption. The use of this generic dataset ensures that environmental impacts are not underestimated.

Based on the detailed data collection of the manufacturer's data, it can be assumed that no significant mass or energy flows have been neglected. The total cut-off percentage is < 1.0% of the mass fraction in relation to the declared unit.

The following processes were excluded from the system boundaries:

Capital goods (machinery, production equipment): Excluded according to EN 15804+A2, as their contribution is considered negligible over the product lifecycle.

Infrastructure (buildings, facilities): Excluded.

3.6 ALLOCATION

Allocation has been avoided in the LCA of this EPD.

3.7 DATA COLLECTION & REFERENCE TIME PERIOD

Primary data including all raw materials, packaging materials, energy consumption and ancillary materials were comprehensively collected for the reference year from 2024-01-01 to 2024-12-31. The yearly averages were used for the calculation.

3.8 ESTIMATES AND ASSUMPTIONS

Transport to construction site (A4)

No manufacturer-specific data is available for transportation to the construction site (Module A4). Transportation to construction sites takes place over a distance of 500 km.

Construction – waste treatment of packaging (A5)

Waste treatment of packaging waste is also taken into account in this phase. The benefits resulting from the incineration of packaging waste were considered in Module D. Packaging waste treatment is modelled according to a conservative scenario in Phase A5: 60% of paper/cardboard packaging is landfilled and 40% is sent to incineration for energy recovery. The thermal and electrical energy generated and exported are declared

outside the system boundary in Module D as a benefit of subsequent use.

Deconstruction, demolition (C1)

The removal of the concrete screw from the building is calculated in Module C1. The demolition is carried out using an electric screwdriver. The electrical energy consumption for the tool is assumed to be 0.0014 kWh for the declared unit. The electricity consumption is calculated using a German electricity mix (electricity production, natural gas, conventional power plant - Germany - electricity, high voltage | ecoQuery).

Transport End-Of-Life (C2)

The removed products are transported to waste processing, recycling and landfilling facilities. The transport distance to the recycling center was assumed to be 200 km.

3.9 DATA QUALITY

Background data was taken exclusively from the ecoinvent EN15804 database Version 3.11.

Quality requirement	Specific requirement	Data quality level	Notes
Time-related coverage	Foreground data	Very good	Primary data from the year 2024 are collected for all activities taking place at fischer production sites.
	Background data	Good	All datasets are taken from the most recent ecoinvent 3.11 version. Here, all datasets are considered to be representative for current production technologies. However, even with the most up-to-date databases, it is possible that a few data records refer to data that is more than two years old.
Geographical coverage	Foreground data	Very good	The data was taken from the internal production. It reflects the actual locations of production plants in Tumlingen (Germany) and Ivanovice (CZ). The data of the finishing was taken from external plant in Germany. The data of the cleaning was taken from external plant in Czech Republic.
	Background data	very good (for A1-A3) good (for EoL)	Data sets with the geography GLO, RER and RoW describe module A1. Region-specific datasets for European and German production processes (e.g. pickling) were applied. Global datasets (GLO, RoW) were used for end-of-life scenarios and long-distance transport.
Technical representativeness	Foreground data	Very good	Data from the machines and processes was taken.
	Background data	Good	The data sets from ecoinvent 3.11 describe the process/technology of operations in the external factories.

3.10 POWER MIX

Energy inputs allocated to the product were determined based on process-specific measurement data from production facilities in Tumlingen and Czechia. Both output quantity and rated power per production equipment were taken into account in accordance with ISO 14044.

The market-based approach was used to account for electricity consumption at the different production sites.

For the internal production site in Tumlingen (Germany), 100% hydropower is used (4.37E-03 CO_2-Eq /kWh). These energy sources are covered by official Guarantees of Origin.

For the external production sites in Germany the data set “DE, electricity, medium voltage, residual mix” (8.20E-01 CO_2-Eq /kWh) is used.

For the external production sites in Germany where the production process is mapped with an ecoinvent dataset, the electricity mix included in this dataset is "RER, market group for electricity, low voltage" (3.40E-01 kg CO_2-Eq/kWh).

For the internal production site in Ivanovice na Hané, 100% nuclear power from CZ is used (7.02E-03 CO_2-Eq /kWh). These energy sources are covered by official Guarantees of Origin.

For the external production site in Czech Republic the data set “CZ, electricity, medium voltage, residual mix” (7.33E-01 CO_2-Eq /kWh) is used.

4 Scenarios and additional technical information

4.1 RAW MATERIAL SUPPLY (A1)

This module covers the extraction and processing of all raw materials required for the production, including steel components for the screw as well as packaging materials.

4.2 TRANSPORT TO MANUFACTURER (A2)

Module A2 accounts for the transportation of all raw materials and packaging components to the manufacturing facilities. Transport distances and modes are based on supplier information and average industry data.

4.3 MANUFACTURING (A3)

The manufacturing phase includes all production steps, including the massive forming of the steel coil into a screw, welding, hardening, colour marking and all transports between the production sites. Energy consumption and processing of waste materials during production are accounted for within this module.

4.4 TRANSPORT TO CONSTRUCTION SITE (A4)

The transport of the FBS II from the production site to the construction site is modelled with a standard transport distance of 500 km by truck. The transport dataset "market for transport, freight, lorry, unspecified" from the ecoinvent 3.11 database is used. The transport includes the delivery of the finished product to the place of installation.

4.5 INSTALLATION ON SITE (A5)

During installation, the FBS II is unpacked, and the packaging materials are disposed of. All packaging waste generated during installation is collected and assigned to the appropriate waste treatment processes. The environmental impacts of these waste flows are included in the assessment.

4.6 DECONSTRUCTION DEMOLITION (C1)

Module C1 covers the deconstruction and removal of the fastening system at the end of life of the building or structure.

4.7 TRANSPORT TO WASTE PROCESSING (C2)

This module accounts for the transport of demolished product components from the demolition site to waste treatment facilities. A standard transport distance is assumed.

4.8 END OF LIFE (C3, C4)

In Phase C3 and C4 95 % of the concrete screws are recycled and 5 % of the concrete screws are landfilled. This end-of-life scenario reflects current practice and represents the most likely scenario for steel fasteners from building demolition. The packaging materials are treated according to a very conservative worst-case scenario: 60 % is landfilled and 40 % is sent to incineration.

4.9 BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY (D)

In Module D, a recycling rate of 95% is assumed for the concrete screw with avoided burdens from avoided primary steel production credited in Module D. From incinerated packaging material, heat and electricity recovery generates environmental credits for avoided grid electricity and avoided natural gas heat production.

5 Results

For the impact assessment, the characterization factors of the LCIA method EN 15804 +A2 Method v1.0 are used. Long-term emissions (>100 years) are not considered in the impact assessment. The results of the impact assessment are only relative statements that do not make any statements about endpoints of the impact categories, exceedance of threshold values, safety margins or risks. The following tables show the results of the indicators of the impact assessment, of the use of resources as well as of waste and other output flows.

5.1 ENVIRONMENTAL IMPACT INDICATORS PER KILOGRAM

CORE ENVIRONMENTAL IMPACT INDICATORS EN15804+A2 per 1 kg FBS II R

Abbreviation	Unit	A1 - A3	A4	A5	C1	C2	C3	C4	D
AP	mol H^+ eqv.	1,84E+00	3,69E-04	2,26E-06	2,38E-05	2,85E-04	5,58E-04	1,02E-05	-3,40E-03
GWP-total	kg CO_2 eqv.	3,63E+00	8,06E-02	1,31E-03	2,21E-02	6,23E-02	6,35E-02	5,67E-02	-5,71E-01
GWP-b	kg CO_2 eqv.	-2,71E-02	2,76E-05	6,25E-04	6,27E-06	2,13E-05	2,58E-05	5,57E-02	-6,85E-03
GWP-f	kg CO_2 eqv.	3,64E+00	8,05E-02	6,80E-04	2,21E-02	6,22E-02	6,34E-02	1,08E-03	-5,63E-01
GWP-luluc	kg CO_2 eqv.	1,75E-02	3,73E-05	4,28E-07	1,06E-06	2,88E-05	1,15E-05	6,05E-07	-5,31E-04
EP-m	kg N eqv.	9,64E-01	1,36E-04	8,60E-07	1,01E-05	1,05E-04	2,56E-04	1,66E-05	-5,95E-04
EP-fw	kg P eqv.	2,64E-03	8,92E-06	1,94E-07	3,14E-07	6,89E-06	3,22E-06	1,36E-07	-6,51E-04
EP-T	mol N eqv.	1,06E+01	1,48E-03	5,50E-06	1,07E-04	1,14E-03	2,80E-03	3,49E-05	-6,23E-03
ODP	kg CFC 11 eqv.	3,91E-08	1,07E-09	3,44E-12	1,04E-09	8,25E-10	9,22E-10	2,09E-11	-3,94E-09
POCP	kg NMVOC eqv	2,48E+00	5,11E-04	1,62E-06	3,81E-05	3,95E-04	8,38E-04	2,02E-05	-1,95E-03
ADP-f	MJ	5,38E+01	1,13E+00	4,54E-03	3,43E-01	8,75E-01	8,27E-01	1,67E-02	-6,40E+00
ADP-mm	kg Sb-eqv.	5,41E-05	2,65E-07	6,52E-09	8,51E-09	2,04E-07	3,76E-08	2,22E-09	-1,90E-05
WDP	m^3 world eqv.	3,24E+00	6,34E-03	1,55E-04	1,47E-03	4,90E-03	2,71E-03	1,59E-03	-2,06E-01

AP=Acidification (AP) | **GWP-total**=Global warming potential (GWP-total) | **GWP-b**=Global warming potential - Biogenic (GWP-b) | **GWP-f**=Global warming potential - Fossil (GWP-f) | **GWP-luluc**=Global warming potential - Land use and land use change (GWP-luluc) | **EP-m**=Eutrophication marine (EP-m) | **EP-fw**=Eutrophication, freshwater (EP-fw) | **EP-T**=Eutrophication, terrestrial (EP-T) | **ODP**=Ozone depletion (ODP) | **POCP**=Photochemical ozone formation - human health (POCP) | **ADP-f**=Resource use, fossils (ADP-f) | **ADP-mm**=Resource use, minerals and metals (ADP-mm) | **WDP**=Water use (WDP)

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS EN15804+A2 per 1 kg FBS II R

Abbreviation	Unit	A1 - A3	A4	A5	C1	C2	C3	C4	D
ETP-fw	CTUe	3,01E+01	2,06E-01	5,38E-03	6,84E-03	1,59E-01	4,97E-02	8,76E-01	-8,93E+00
PM	Disease incidence	4,20E-06	7,55E-09	2,51E-11	6,17E-11	5,83E-09	1,57E-08	1,25E-10	-5,40E-08
HTP-c	CTUh	4,70E-09	1,94E-11	4,26E-13	1,51E-12	1,50E-11	6,70E-12	1,53E-12	-5,93E-10
HTP-nc	CTUh	5,35E-08	7,74E-10	1,40E-11	1,75E-11	5,98E-10	1,22E-10	1,31E-10	-1,32E-08
IR	kBq U-235 eqv.	8,33E-01	9,58E-04	6,18E-05	7,68E-05	7,40E-04	6,85E-04	2,22E-05	-3,27E-02
SQP	Pt	2,61E+01	8,33E-01	3,14E-03	4,42E-03	6,44E-01	7,27E-02	2,76E-02	-3,37E+00

ETP-fw=Ecotoxicity, freshwater (ETP-fw) | **PM**=Particulate Matter (PM) | **HTP-c**=Human toxicity, cancer (HTP-c) | **HTP-nc**=Human toxicity, non-cancer (HTP-nc) | **IR**=Ionising radiation, human health (IR) | **SQP**=Land use (SQP)

CLASSIFICATION OF DISCLAIMERS TO THE DECLARATION OF CORE AND ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS

ILCD classification	Indicator	Disclaimer
ILCD type / level 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD type / level 2	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial	None
	Formation potential of tropospheric ozone (POCP)	None
	Potential Human exposure efficiency relative to U235 (IRP)	1
ILCD type / level 3	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2
	Potential Soil quality index (SQP)	2

Disclaimer 1 – 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.

Disclaimer 2 – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

5.2 INDICATORS DESCRIBING RESOURCE USE AND ENVIRONMENTAL INFORMATION BASED ON LIFE CYCLE INVENTORY (LCI) PER KILOGRAM

PARAMETERS DESCRIBING RESOURCE USE per 1 kg FBS II R

Abbreviation	Unit	A1 - A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	1,84E+01	1,62E-02	6,72E-04	1,39E-03	1,25E-02	1,02E-02	3,68E-04	-1,92E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,84E+01	1,62E-02	6,72E-04	1,39E-03	1,25E-02	1,02E-02	3,68E-04	-1,92E+00
PENRE	MJ	5,38E+01	1,13E+00	4,55E-03	3,43E-01	8,75E-01	8,27E-01	1,67E-02	-6,39E+00
PENRM	MJ	-1,38E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-6,68E-03
PENRT	MJ	5,38E+01	1,13E+00	4,55E-03	3,43E-01	8,75E-01	8,27E-01	1,67E-02	-6,40E+00
SM	kg	9,85E-01	4,95E-04	1,46E-05	3,32E-05	3,83E-04	3,36E-04	8,51E-06	1,70E-01
RSF	MJ	6,72E-04	6,40E-06	6,39E-08	4,94E-08	4,94E-06	8,96E-07	1,53E-07	-1,85E-04
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	1,20E+00	1,60E-04	2,48E-06	3,46E-05	1,24E-04	6,63E-05	-5,32E-05	-4,51E-03

PERE=renewable primary energy ex. raw materials | **PERM**=renewable primary energy used as raw materials | **PERT**=renewable primary energy total | **PENRE**=non-renewable primary energy ex. raw materials | **PENRM**=non-renewable primary energy used as raw materials | **PENRT**=non-renewable primary energy total | **SM**=use of secondary material | **RSF**=use of renewable secondary fuels | **NRSF**=use of non-renewable secondary fuels | **FW**=use of net fresh water

OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES per 1 kg FBS II R

Abbreviation	Unit	A1 - A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	2,16E+00	2,57E-03	6,72E-05	1,70E-04	1,99E-03	1,13E-03	2,82E-04	-6,44E-01
NHWD	kg	1,57E+01	4,96E-02	2,01E-03	3,10E-03	3,83E-02	1,91E-02	7,04E-02	-3,60E+00
RWD	kg	2,09E-04	2,35E-07	1,58E-08	1,77E-08	1,81E-07	1,68E-07	5,49E-09	-8,37E-06

HWD=hazardous waste disposed | **NHWD**=non-hazardous waste disposed | **RWD**=radioactive waste disposed

ENVIRONMENTAL INFORMATION DESCRIBING OUTPUT FLOWS per 1 kg FBS II R

Abbreviation	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	3,24E-03	1,32E-05	2,70E-02	7,92E-07	1,02E-05	9,18E-01	2,97E-07	-2,59E-04
MER	kg	5,97E-05	7,30E-08	6,69E-10	3,07E-09	5,64E-08	1,43E-08	1,01E-09	-9,89E-06
EET	MJ	4,67E-02	1,37E-04	1,45E-06	6,58E-06	1,06E-04	1,92E-05	2,16E-06	-1,22E-02
EEE	MJ	1,00E-01	9,99E-05	1,02E-05	1,93E-05	7,72E-05	7,51E-05	2,55E-06	-1,14E-03

CRU=Components for re-use | **MFR**=Materials for recycling | **MER**=Materials for energy recovery | **EET**=Exported Energy Thermic | **EEE**=Exported Energy Electric

5.3 INFORMATION ON BIOGENIC CARBON CONTENT PER KILOGRAM

The following information describes the biogenic carbon content in (the main parts of) the product at the factory gate per kilogram:

Biogenic carbon content	Amount	Unit
Biogenic carbon content in the product	-5,70E-03	kg C
Biogenic carbon content in accompanying packaging	1,58E-02	kg C

UPTAKE OF BIOGENIC CARBON DIOXIDE

The following amount carbon dioxide uptake is taken into account. Related uptake and release of carbon dioxide in downstream processes are not taken into account in this number although they do appear in the presented results. One kilogram of biogenic carbon content is equivalent to 44/12 kg of biogenic carbon dioxide uptake.

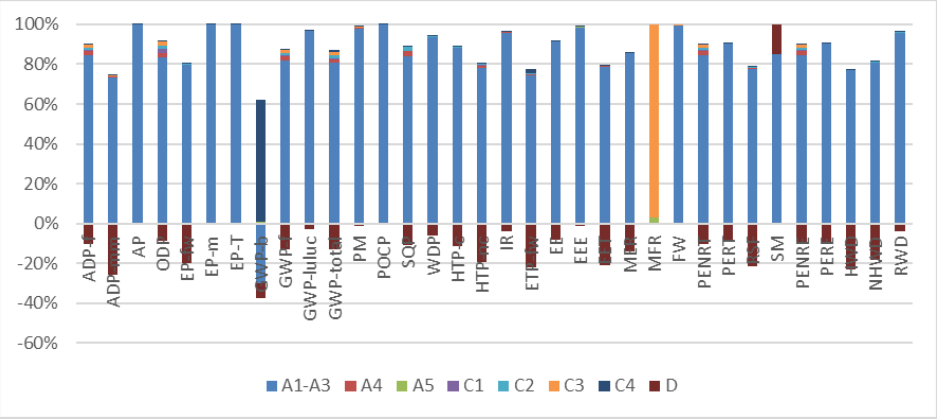
Uptake biogenic carbon dioxide	Amount	Unit
Product	-2,09E-02	kg CO_2 (biogenic)
Packaging	5,80E-02	kg CO_2 (biogenic)

6 Interpretation of results

6.1 CONTRIBUTION ANALYSIS

Many of the indicators on environmental impact and resource use are dominated by the production phase A1-A3. Furthermore, recovery potentials result in benefits outside the system boundaries (Module D).

The following graph shows the relative shares of the modules in the indicator results the declared product (based on 1 kg of FBS II R). The values are scaled in such a way that all bars are the same height. Impact categories with a value of zero show no bar. The graph shows an incineration at the end of life.



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