

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2

Owner of the declaration	TRIQBRIQ AG
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-TRI-20230407-IBC1-DE
Issue date	25 February 2025
Valid to	24 February 2030

TRIQBRIQ WS25
TRIQBRIQ AG

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1. General information

TRIQBRIQ AG

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number

EPD-TRI-20230407-IBC1-DE

This declaration is based on the product category rules:

Solid wood products, 31 May 2023
(PCR checked and approved by the independent expert committee (SVR))

Issue date

25 February 2025

Valid to

24 February 2030



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TRIQBRIQ WS25

Owner of the declaration

TRIQBRIQ AG
Stuttgarter Straße 115
70469 Stuttgart
Germany

Declared product/declared unit

The declared unit is 1 m³ of the products of the TRIQBRIQ WS25 system with an average density of 450 kg/m³. The environmental product declaration covers the products BRIQ50 with a unit weight of 14 kg and BRIQ25 with a unit weight of 7 kg.

Scope:

BRIQs are produced by TRIQBRIQ AG in Tübingen. This EPD applies to the TRIQBRIQ WS25 system with the products BRIQ50 and BRIQ25.

The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidence.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be referred to in simplified form as EN 15804.

Verification

The European standard EN 15804 serves as the core PCR	
Independent verification of the declaration and data according to ISO 14025:2011	
☐	internally ☒ externally



Dr. Niels Jungbluth,
(Independent verifier)

2. Product

2.1 Product description/Product definition

TRIQBRIQ is a micro-modular solid timber building system consisting of standardised modules (BRIQs) in various sizes. The BRIQs are made from low-grade and damaged wood (pine or spruce) without the use of artificial fasteners. For this purpose, squared timbers are sawn to size and joined with beech wood dowels to form the BRIQs. The BRIQs are easy to assemble and disassemble and are suitable for prefabricated and modular building systems.

When laid in bond, the WS25 system forms a solid timber wall 25 cm thick and consists of the standard BRIQ (BRIQ50) with a length of 50 cm, a filler element with a length of 25 cm and a lintel for window and door openings with a length of 200 cm. This EPD takes into account the BRIQ50 and the BRIQ25.

The respective national provisions at the place of use apply to the use of the product, in Germany for example the building codes of the federal states, and the technical provisions based on these regulations.

TRIQBRIQ wall elements are planned and designed in accordance with the technical building rules, in particular EN 1995-1-1, unless otherwise specified below.

For the planning and design of timber connections, the provisions of EN 1995-1-1 apply accordingly, as for solid softwood.

2.2 Application

The TRIQBRIQ WS25 timber building system is suitable for the building shell of all building classes. Its range of application extends from residential and office buildings to schools and hotels as well as the addition of storeys to and the extension of existing buildings. The BRIQs are protected by structural means on the outside and inside.

A coating is not necessary.

2.3 Technical data

In accordance with the conformity mark (Ü mark), the data listed in the declaration of performance must be stated; further data are voluntary.

Technical data

Name	Value	Unit
Wood species	Softwood	
Moisture content	12 (+/- 2)	%
Visual strength grade DIN 4074-1	S10	
Dimensions BRIQ50 volume (L x H x W)	500 x 250 x 250	mm
Dimensions BRIQ25 (L x H x W)	250 x 250 x 250	mm
Mean density	450	kg/m ³
Thermal conductivity	0.12	W/(mK)
Thermal transmittance (U-value)	0.444	W/(m ² K)
Water vapour diffusion resistance factor	20/50 (min/max)	-

Structural design data

Name	Value	Unit
Strength class EN 338	C24	
Self-weight for design	4.2	kN/m ³
Compressive strength	18.9	N/mm ²
Modulus of elasticity E _{0,05}	7842	N/mm ²
Shear stiffness GA _{ef}	0.42 · 10 ³ *	kN/m

* Values are currently being determined and verified at KIT.

Sound insulation according to DIN 4109

Name	Value	Unit
Sound reduction index (R _w)	46	dB*
Mass per unit area (m')	112.5	kg/m ²

(*Mass law for single-leaf solid timber components)

Performance values of the product with respect to its characteristics in accordance with the relevant technical provision (no CE marking).

2.4 Delivery status

The BRIQs, the packaging, the package insert or the delivery note must be marked with the Ü mark (conformity mark) in accordance with the conformity mark ordinances of the federal states.

Dimensions of the BRIQ50 and the BRIQ25 of the TRIQBRIQ WS25 as per the table "Technical data" in section 2.3.

2.5 Base materials/Ancillary materials

The BRIQs consist of squared timbers that are joined together and held together by timber dowels. Both the squared timbers and the dowels are made of untreated solid wood and are connected to form a BRIQ solely by the form fit of the dowels and squared timbers, without additional agents.

Name	Value	Unit
Low-grade and damaged wood spruce/pine	93.5	%
Beech wood (dowels)	6.5	%

For the squared timbers, beams approx. 10 cm long made of low-grade and damaged wood (spruce/pine) are used. The manufacturing process and the short length of the squared timbers make it possible to use even crooked round timber and broken trees for construction.

The product does not contain any CMR substances of category 1A or 1B that are not on the Candidate List, above 0.1 % by mass.

No biocidal products have been added to this construction product, and it has not been treated with biocidal products.

2.6 Manufacture

BRIQs are assembled from squared timbers and dowels. To manufacture the squared timbers, beams made of damaged, low-grade and storm-felled wood (spruce/pine) from nearby PEFC™/FSC®-certified forests are used. The dowels are made from fluted beech wood round rods. The beams and dowels are processed in the plant using green electricity. The delivered beams are dried in the plant to a residual moisture content of 16–18 %, planed, drilled and cut to size. The round rods are cut to length and

rounded (chamfered) at the ends.

2.7 Environment and health during manufacturing

Owing to the natural material wood used and the manufacturing conditions, no environmental and health protection measures are required beyond the provisions of applicable EU regulations and national statutory and other regulations. This includes compliance with or falling below the occupational exposure limits in the manufacturing process. There is no pollution of water or soil. Exhaust air generated by production is cleaned in accordance with the statutory requirements. Noise-intensive equipment such as planing or profiling machines is enclosed by structural measures accordingly.

2.8 Product processing/Installation

For the transport of the product (A4) to the site, the transport distances and the resulting environmental impacts should be considered individually for each construction project. An average transport distance of 400 km was assumed for the declaration. The BRIQS are dimensioned so that cutting for installation (A5) is generally not necessary. Should cutting become necessary, no losses occur; instead, the cut BRIQS can also be used again. The installation of the TRIQBRIQs was described in module A5 using scaffolding and an electrically operated tower crane as an example. The disposal of the packaging is also included in module A5.

2.9 Packaging

The BRIQS are secured on Euro pallets with two tension straps. To protect the BRIQS, the loaded pallets are covered with a plastic pallet cover. The packaging material is collected on site and returned to production for reuse.

2.10 Condition of use

The composition for the period of use corresponds to the base material composition according to section 2.5.

2.11 Environment and health during use

Environmental protection: Hazards to water, air and soil cannot arise, according to current knowledge, when the products described are used as intended.

Health protection: With normal use corresponding to the intended purpose, no damage to health or impairments are to be expected. In addition, TRIQBRIQ does not contain any allergenic or harmful substances.

2.12 Reference service life

The service life of solid timber components depends on many factors, such as the construction of the building, the type of use and maintenance and servicing over time. The average service life of solid timber residential buildings in Europe is approx. 80 to 100 years. Replacement of BRIQs within this

period is not necessary. Thanks to a special drying process, the manufacturer guarantees 50 years of freedom from mould. If the building is converted or demolished, the TRIQBRIQ system can be deconstructed and the BRIQs can be reused in a new building.

2.13 Extraordinary effects

Fire

The declared product is classified according to the national standard DIN 4102-1 as follows:

Fire protection

Name	Value
Reaction to fire	B2 (normally flammable)

Water

On exposure to water, no constituents that could be hazardous to water are washed out.

Mechanical destruction

The fracture pattern of the TRIQBRIQ WS25 system shows an appearance typical of solid wood.

2.14 Re-use phase

Thanks to the patented triaxial connection system, all walls built with TRIQBRIQ can be dismantled by material type and without loss of quality and reused in other new-build projects. An average transport distance of 400 km from the installation site to the plant was assumed.

2.15 Disposal

BRIQs are designed for reuse. If reuse is not an option, residues from deconstruction measures are primarily to be recycled as material. If this is not possible, they must be sent for energy recovery. Landfilling is not permitted. The waste code according to the European Waste Catalogue (EWC) is 17 02 01.

2.16 Further information

Further information on the TRIQBRIQ WS25 system can be found online at <https://triqbriq.de/triqbriq-system>

3. LCA: Calculation rules

3.1 Declared unit

The declared unit is 1 m³ of the TRIQBRIQ WS25 system. Conversion factors are given for calculating the results for the products BRIQ50 and BRIQ25.

Declared unit

Name	Value	Unit
Declared unit	1	m ³
Density	450	kg/m ³
Conversion factor to 1 piece BRIQ50	0.03125	m ³ /piece
Conversion factor to 1 piece BRIQ25	0.015625	m ³ /piece

The TRIQBRIQ plant in Tübingen was newly opened and put into operation in the year of data collection. It is

assumed that the production process will not change significantly in the next year. The life cycle inventory was prepared on the basis of the BRIQ50 and then extrapolated to 1 m³, as it accounts for 90–95% of the building. The energy demand for processing was determined for the entire production and divided by the production volume to obtain the energy demand per declared unit.

3.2 system boundaries

The life cycle assessment of the TRIQBRIQ WS25 comprises a cradle-to-gate (from cradle to factory gate) analysis of the occurring environmental impacts with options. The following life cycle stages are taken into account in the analysis:

Module A1–A3 | Product stage

The product stage comprises the expenditure for the raw material supply (timber beams made of damaged, low-grade and storm-felled wood (spruce/pine) and beech wood round rods) and the associated transport in relation to the Tübingen production site. The supply of electrical energy is taken into account in the product stage in the form of the regional green electricity from Stadtwerke Tübingen.

Module A5 | Installation

Module A5 takes into account the disposal of the packaging and the installation of the BRIQs in the building.

Module C1–C4 | End of life

The declaration contains information on dismantling and deconstruction (C1) and transport to the processing plant (C2). Module C3 declares the recovery and the biogenic carbon dioxide emissions that arise when the product leaves the product system. In addition, in module C3 the renewable and non-renewable primary energy contained in the product (PERM and PENRM) is booked as outflows and the emissions from incineration are accounted for. Two scenarios are described in the end-of-life stage: reuse and energy recovery. BRIQs can be reused several times. Should reuse not be possible, the BRIQs can be sent for energy recovery. Landfilling (C4) of the product is not intended.

Module D | Benefits and loads beyond the system boundaries

Module D describes the reuse of the product at the end of its life. Reuse substitutes the manufacture of identical BRIQs.

3.3 Estimates and assumptions

All assumptions are supported by detailed documentation and represent the best possible reflection of reality with regard to the available data basis. A generic data set from the ecoinvent database for softwood battens was used as the background data set for the beams. The softwood data sets represent average Swiss conditions and are assumed to be representative of German processes. Where no German or Swiss average data were available, European data sets were used as representative.

3.4 Cut-off criteria

All inputs and outputs of a (unit) process for which data are available are included in the calculation. The cut-off criteria of 1% of the renewable and non-renewable primary energy use and 1% of the

total mass of this unit process were complied with. The total of the neglected input flows, e.g. per module A1-A3, A4-A5, B1-B5, B6-B7, C1-C4 or module D, is less than 5% of the energy and mass input. The life cycle of the production plant and infrastructure was not taken into account.

3.5 Background data

The background data sets used are taken from the ecoinvent database version 3.10 with the 15804 add-on.

3.6 Data quality

A consistent and uniform calculation method according to ISO 14044 and EN 15804 was applied. When selecting the background data, attention was paid to the technological, geographical and temporal representativeness of the data basis. In the absence of specific data, generic data sets or a representative average were used.

3.7 Period under review

The data used refer to the period from 1 February 2023 to 31 September 2024.

3.8 Geographic representativeness

Country or region in which the declared product system is manufactured and, where applicable, used and treated at the end of its life: Germany

3.9 Allocation

The carbon content and primary energy content of the products were accounted for on the basis of their material-inherent properties in accordance with the underlying physical relationships. The allocation in the upstream chains is based on the publication by Rüter & Diederichs, 2012. Various TRIQBRIQ products are manufactured at the Tübingen site. The allocation of environmental impacts is based on the volumes of the products.

3.10 Comparability

Basically, a comparison or evaluation of EPD data is only possible if all the data sets to be compared were created according to EN 15804 and the building context or the product-specific performance characteristics are taken into account. The background data sets used are taken from the ecoinvent database version 3.10 with the 15804 add-on from the year 2024. The results were calculated using the openLCA software (version 2.3.0). Comparisons based on EPDs with

different background databases (versions) are generally only possible to a limited extent.

4. LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

Information on describing the biogenic carbon content at the factory gate

The information on the biogenic carbon content refers to the declared unit of 1m³ TRIQBRIQ WS25.

Name	Value	Unit
Biogenic carbon content in product	213.24	kg C
Biogenic carbon content in accompanying packaging	0.44	kg C

As the end of life of the product packaging is not declared in module A5, its carbon uptake is not taken into account in module A1–A3.

The following technical information is the basis for the

declared modules or can be used to develop specific scenarios in the context of a building assessment if modules are not declared (MND).

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO₂.

Two scenarios were created for the end of the life cycle (modules C2–C3) and the benefits and loads beyond the life cycle (module D). The base scenario (C1, C2, C3, D) accounts for the reuse of the TRIQBRIQ system. Scenario 1 (C1/1, C2/1, C3/1, D1/1) describes

thermal recovery in case reuse is not possible.

Reference service life

Name	Value	Unit
Life span according to the manufacturer	100	a

End of life (C1–C4)

Name	Value	Unit
Collected separately waste type 17 02 01	450	kg
Collected as mixed construction waste	-	kg
Reuse (scenario 1)	450	kg
Energy recovery (scenario 2)	450	kg
Recycling	-	kg
Landfilling	-	kg

5. LCA: Results

The following table contains the life cycle assessment results for a declared unit of 1 m³ TRIQBRIQ WS25.

The life cycle assessment results for the products BRIQ50 and BRIQ25 are listed in Annex A.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacture	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction/demolition	Transport	Waste processing	Disposal	Reuse-, recovery- or recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	MND	MNR	MNR	MNR	MND	MND	X	X	X	X	X

RESULTS OF THE LCA – ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m³ TRIQBRIQ WS25

Indicator	Unit	A1	A2	A3	A4	A5	C1	C2	C2/1	C3	C3/1	C4	D	D/1
GWP-total	kg CO ₂ eq.	-892.97	3.99	180.37	0.1	2.68	6.53	0	2.33	721.26	815.81	0	-31.71	-81.34
GWP-fossil	kg CO ₂ eq.	54.27	3.98	24.21	0.1	0.93	6.5	0	2.33	0	8.58	0	-62.98	-75.14
GWP-biogenic	kg CO ₂ eq.	-948.13	0	156.06	0	1.75	0.01	0	0	721.26	807.23	0	32.26	-6.09
GWP-luluc	kg CO ₂ eq.	8.91E-01	1.49E-03	1.01E-01	3.68E-05	8.37E-04	1.66E-02	0	8.27E-04	0	2.1E-03	0	-9.8E-01	-1.1E-01
ODP	kg CFC11 eq.	9.79E-07	8.02E-08	3.57E-07	2.16E-09	5.7E-09	1.72E-07	0	4.86E-08	0	9.62E-08	0	0	0
AP	mol H ⁺ eq.	2.84E-01	8.53E-03	3.65E-01	4.4E-02	2.92E-03	3.98E-02	0	5.5E-03	0	8.9E-02	0	-6.1E-01	-1.2E-01
EP-freshwater	kg P eq.	2.54E-02	3.04E-04	9.79E-03	7.29E-06	6.02E-04	2.32E-03	0	1.64E-04	0	3.71E-03	0	-3E-02	-8E-02
EP-marine	kg N eq.	1.06E-01	2.02E-03	1.51E-01	6.42E-05	7.91E-04	7.01E-03	0	1.44E-03	0	4.72E-02	0	-2.5E-01	-4E-02
EP-terrestrial	mol N eq.	1.1E+00	2.18E-02	1.67E+00	6.94E-04	7.36E-03	7.29E-02	0	1.56E-02	0	4.54E-01	0	-2.66E+00	-3.3E-01
POCP	kg NMVOC eq.	5.89E-01	1.4E-02	4.36E-01	4.25E-04	2.37E-03	2.39E-02	0	9.55E-03	0	1.14E-01	0	-9.6E-01	-1.3E-01
ADPE	kg Sb eq.	1.48E-04	1.54E-05	1.03E-04	2.96E-07	3.93E-06	2.4E-05	0	6.66E-06	0	1.75E-05	0	0	0
ADPF	MJ	827.75	56.98	308.42	1.55	9.9	68.41	0	34.98	0	76	0	-899.61	-1199.2
WDP	m ³ world eq. deprived	24.05	0.31	19.85	0.01	0.26	1.75	0	0.18	0	17.98	0	-42.47	-12.65

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone; ADPE = Abiotic depletion potential for non-fossil resources (ADP – minerals and metals); ADPF = Abiotic depletion potential for fossil resources (ADP – fossil fuels); WDP = Water (user) deprivation potential

RESULTS OF THE LCA – INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m³ TRIQBRIQ WS25

Indicator	Unit	A1	A2	A3	A4	A5	C1	C2	C2/1	C3	C3/1	C4	D	D/1
PERE	MJ	54.22	1.19	1.15E+03	0.02	-18.31	-1	0	0.55	0	6.68E+03	0	-694.84	-212.4
PERM	MJ	7.85E+03	0	-1151.41	0	19.87	34.35	0	0	-6684.6	-6684.6	0	-6684.94	0
PERT	MJ	7.91E+03	1.19	0	0.02	1.56	33.35	0	0.55	-6684.6	0	0	-7379.78	-212.4
PENRE	MJ	828.71	56.99	290.38	1.55	8.16	63.79	0	34.98	0	76.01	0	-885.56	-1199.21
PENRM	MJ	0	0	18.16	0	1.74	4.63	0	0	0	0	0	-15.11	0
PENRT	MJ	828.71	56.99	308.55	1.55	9.9	68.43	0	34.98	0	76.01	0	-900.68	-1199.21
SM	kg	0.67	0.03	0.25	0	0.09	0.18	0	0.02	0	0.18	0	-0.72	-0.17
RSF	MJ	1.99E-02	3.27E-04	1.4E+00	8.47E-06	6.12E-05	5.3E-01	0	1.91E-04	0	4.21E-04	0	-8.5E-01	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0	0
FW	m ³	0.35	0.01	0.38	0	0	0.04	0	0.01	0	0.11	0	-0.69	-0.42

PERE = Renewable primary energy as energy carrier; PERM = Renewable primary energy resources as material utilisation; PERT = Total use of renewable primary energy resources; PENRE = Non-renewable primary energy as energy carrier; PENRM = Non-renewable primary energy as material utilisation; 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

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 m³ TRIQBRIQ WS25

Indicator	Unit	A1	A2	A3	A4	A5	C1	C2	C2/1	C3	C3/1	C4	D	D/1
HWD	kg	2.4	0.09	2.19	0	0.21	1.3	0	0.05	0	3.57	0	-3.96	-2.27
NHWD	kg	84.03	1.97	74.31	0.05	5.37	13.77	0	1.02	0	566.26	0	-150.12	-368.12
RWD	kg	3.9E-04	5.6E-06	1.36E-04	1.2E-07	5.38E-06	1.42E-05	0	2.69E-06	0	6.33E-06	0	0	0

CRU	kg	0	0	0	0	0	0	0	0	450	0	0	0	0
MFR	kg	1.74E-02	4.91E-04	4.34E-02	1.18E-05	3.13E-04	7.57E-03	0	2.65E-04	0	7.95E-04	0	-6E-02	-3E-02
MER	kg	4.11E-05	1.88E-06	5.83E-02	6.8E-08	2.02E-06	4.85E-06	0	1.53E-06	0	4.5E+02	0	-6E-02	0
EEE	MJ	1.05E+00	1.3E-02	3.56E-01	2.33E-04	6.7E-02	7.59E-02	0	5.25E-03	0	9.08E-03	0	-1.37E+00	-3E-02
EET	MJ	1.05	0.01	0.36	0	0.07	0.08	0	0.01	0	0.01	0	-1.37	-0.03

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy – electrical; EET = Exported energy – thermal

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2 (optional): 1 m³ TRIQBRIQ WS25

Indicator	Unit	A1	A2	A3	A4	A5	C1	C2	C2/1	C3	C3/1	C4	D	D/1
PM	Disease incidence	6.08E-06	2.74E-07	3.73E-05	1.01E-08	5.14E-08	5.14E-07	0	2.27E-07	0	9.96E-07	0	0	0
IR	kBq U235 eq.	6.63E+00	9.28E-02	1.88E+00	1.89E-03	8.41E-02	2.15E-01	0	4.25E-02	0	8.76E-02	0	-8.21E+00	-1.35E+01
ETP-fw	CTUe	332.3	16.8	196.51	0.37	18.42	39.14	0	8.29	0	100.31	0	-472.23	-186.87
HTP-c	CTUh	4.73E-07	2.87E-08	2.37E-07	6.63E-10	5.26E-08	7.22E-08	0	1.49E-08	0	1.55E-07	0	0	0
HTP-nc	CTUh	4.92E-07	3.61E-08	7.55E-07	1.03E-09	1.61E-08	6.7E-08	0	2.31E-08	0	1.08E-06	0	0	0
SQP	SQP	9.88E+04	3.64E+01	4.12E+03	1.56E+00	2.52E+00	1.56E+02	0	3.52E+01	0	2.13E+01	0	-1.03E+05	-1.49E+02

PM = Potential incidence of disease due to particulate matter emissions; IR = Potential human exposure efficiency relative to U235; ETP-fw = Potential comparative toxic unit for ecosystems; HTP-c = Potential comparative toxic unit for humans (cancerogenic effects); HTP-nc = Potential comparative toxic unit for humans (non-cancerogenic effects); SQP = Potential soil quality index

Disclaimer 1 – applies to the indicator "Potential human exposure efficiency relative to U235".

This impact category deals mainly with the possible impact of low-dose ionising radiation on human health in the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents and occupational exposure, nor due to the disposal of radioactive waste in underground facilities. Potential ionising radiation from the soil, from radon and from some building materials is also not measured by this indicator.

Disclaimer 2 – applies to the indicators: "Abiotic depletion potential for non-fossil resources", "Abiotic depletion potential for fossil resources", "Water (user) deprivation potential", "Potential comparative toxic unit for ecosystems", "Potential comparative toxic unit for humans – cancerogenic effects", "Potential comparative toxic unit for humans – non-cancerogenic effects", "Potential soil quality index".

The results of this environmental impact indicator must be used with care, as the uncertainties of these results are high or as there is only limited experience with the indicator.

6. LCA: Interpretation



Figure 1 Shares of the life cycle modules in the core indicators of the environmental impact assessment of the TRIQBRIQ WS25, scenario 1: reuse

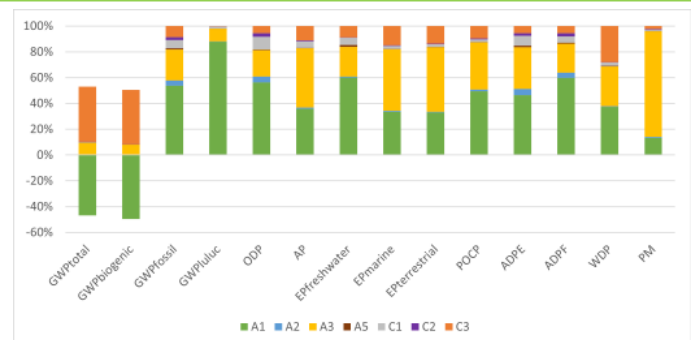


Figure 2 Shares of the life cycle modules in the core indicators of the environmental impact assessment of the TRIQBRIQ WS25, scenario 2: energy recovery

Overall, the use of wood leads to a negative value in the production stage (A1–A3) of -708 kg CO₂ eq. per m³ TRIQBRIQ WS25. During growth, the wood stores carbon dioxide in the form of biogenic carbon, which is included in module A1 of the life cycle assessment as a negative global warming potential. The transport effort (A2) has only a minor effect (<1%) on the results. The incineration of wood residues and the production of packaging materials generates emissions in module A3 with a global warming potential of 156 CO₂ eq. per 1 m³ TRIQBRIQs. As soon as the wood leaves the product system (module C3),

the stored carbon dioxide is released in accordance with the accounting rules of EN 15804. When the BRIQs are reused (module D scenario 1), the storage of the CO₂ is not counted again. If the BRIQs are thermally recovered (scenario 2), the CO₂ is emitted into the atmosphere.

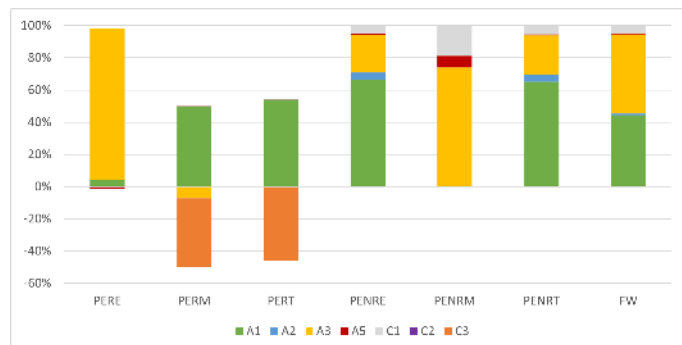


Figure 3 Shares of the life cycle modules in the results of the raw material indicators of the TRIQBRIQ WS25, scenario 1: reuse



Figure 3 Shares of the life cycle modules in the results of the raw material indicators of the TRIQBRIQ WS25, scenario 2: energy recovery

In the use of renewable and non-renewable energy resources in the life cycle of the BRIQs, the material use of energy resources in the form of spruce/pine wood (A1) predominates. The material use of wood falls under the category "Renewable primary energy resources as material utilisation" (PERM). Part of the wood is produced as shavings during further processing and is used on site for energy to dry the wood. In the case of energy (thermal) recovery, the wood becomes a renewable energy carrier (PERE) at the end of its life cycle and is used for energy. Unlike in scenario 1, it is therefore not available for subsequent systems. Reuse can substitute wood as a renewable energy carrier, and thermal recovery can substitute non-renewable energy carriers.

7. Requisite evidence

As the BRIQs, being a shell construction system, are structurally protected by cladding both on the inside and on the outside, no chemical wood preservation measures such as varnishing are required. Evidence of VOC emissions for products in interior spaces not necessary.

7.1 Formaldehyde

When formaldehyde-containing adhesives are used, the subsequent release of formaldehyde must be assessed by testing in accordance with EN 717-1. The measuring method must be stated.

8. References

Standards

DIN 4074-1

DIN 4074-1:2012-06 Strength grading of wood - Part 1: Coniferous sawn timber.

DIN 4102-1

DIN 4102-1:1998-05 Fire behaviour of building materials and building components - Part 1: Building materials; concepts, requirements and tests.

EN 15804

EN 15804:2012+A2:2019+AC:2021, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.

EN 1995-1-1

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timber structures - Part 1-1:

General - Common rules and rules for buildings.

EN 338

EN 338:2016-07 Structural timber - Strength classes.

ISO 10456

ISO 10456 Building materials and products - Hygrothermal properties - Tabulated design values and procedures for determining declared and design thermal values.

ISO 14025

ISO 14025:2011, Environmental labels and declarations – Type III environmental declarations – Principles and procedures.

ISO 14044

ISO 14044:2021-02. Environmental management – Life cycle assessment – Requirements and guidelines.

Further references

EWG

European Waste Catalogue, Ordinance on the European List of Waste (Abfallverzeichnis-Verordnung - AVV), published in BGBl I 2001, 3379.

ecoinvent

ecoinvent Version 3.10, 15804 Addon ecoinvent Association, 2024 <https://www.ecoinvent.org/ecoinvent-v3-10/>.

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Candidate List

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Rüter & Diederichs

Rüter, Sebastian and Diederichs, Stefan: Ökobilanz-Basisdaten für Bauprodukte aus Holz [Life cycle assessment basic data for wood construction products], final report. Hamburg, April 2012

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PCR Part B

Product category rules for building-related products and services. Part B: Requirements on the EPD for solid wood products, version 8. Berlin: Institut Bauen und Umwelt e.V. (ed.), 2024.



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