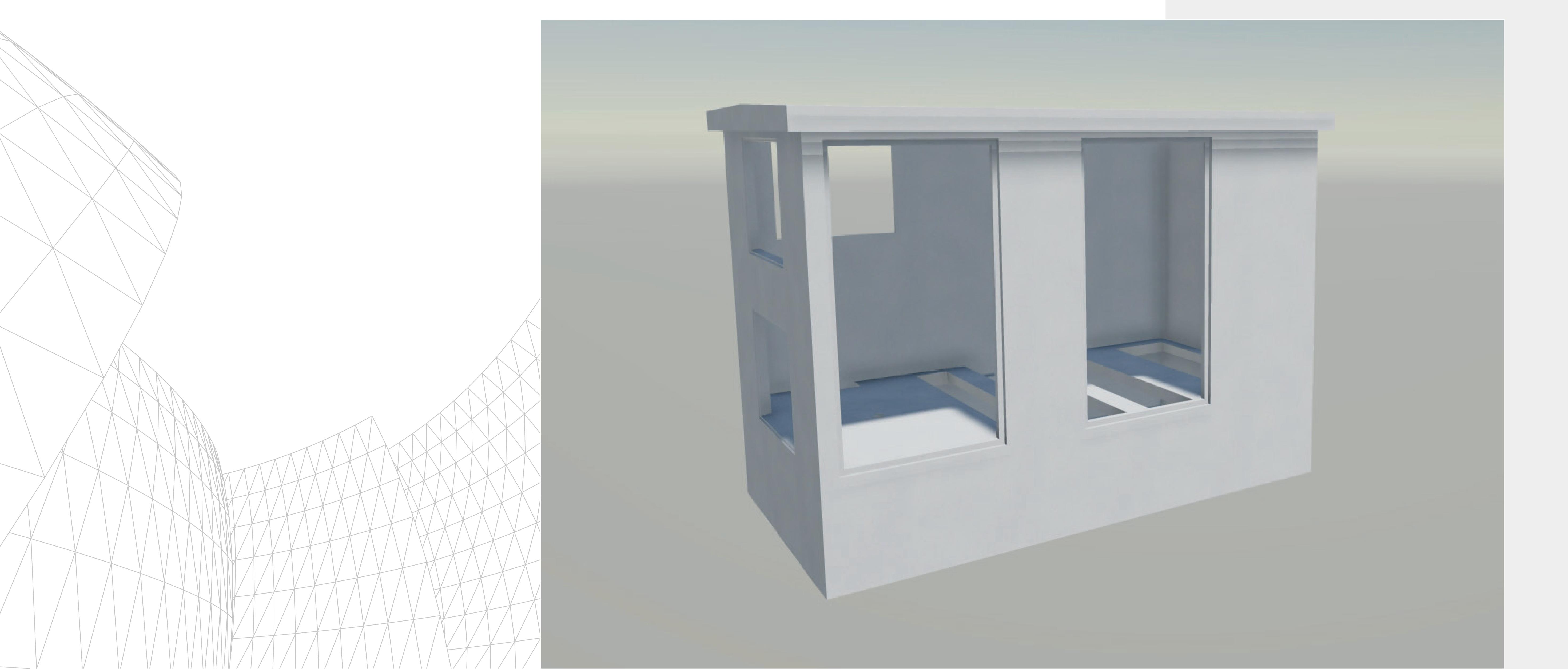
Precast reinforced concrete for transformer house construction













Laura Apilo Managing Director

Precast reinforced concrete for transformer house construction





PROGRAM OPERATOR, PUBLISHER:	Building Information Foundation RTS Malminkatu 16 A 00100 Helsinki cer.rts.fi/en/
OWNER OF THE DECLARATION:	DVB Délmagyarországi Vasbetonipari Kft.
NAME OF THE PRODUCT:	Precast reinforced concrete for transformer house construction
DECLARATION NUMBER:	RTS_317_24
ISSUE DATE:	10.9.2024
VALID TO:	10.9.2029
SCOPE OF THE DECLARATION	This environmental product declaration covers the environmental impacts of the precast reinforced concrete for transformer house production.
	The declaration has been prepared in accordance with EN 15804:2012+A2:2019 and ISO 14025 standards and the additional requirements stated in
	the RTS PCR (English version, 26.8.2020). This declaration covers the life cycle stages from cradle-to-gate with options (modules A1-A3, C1-C4, and D).
	Verified according to the requirements of EN 15804:2012+A2:2019
	Independent verification of the declaration and data, according to ISO 14025:2010
	□ Internal ☑ External
THIRD PARTY VERIFIER	Mari Kirss
	Product LCA/EPD Specialist Rangi Maja OÜ - LCA Support
	www.lcasupport.com mari.kirss@lcasupport.com







Owner of the declaration, manufacturer

DVB Délmagyarországi Vasbetonipari Kft.

Postal address and location: Hungary, Szeged, Budapesti út 8, 6728

Email: dvb@dvb-szeged.hu

Product name and number

Precast reinforced concrete for transformer house construction

Manufacturing plant

Szeged, Hungary

Description of the Product

DVB Délmagyarországi Vasbetonipari Kft. is one of the leading companies in the Hungarian construction market and a significant player in the Central European region. The most diverse references characterize their work in the field of industrial and other investments. Its main profile is the precast reinforced concrete production, with a capacity of more than 22,000 tons per year.

The assessed product is only used for the construction of GALAXI Transformer House products..

Product Category Rules and the scope of the declaration

The declaration has been prepared in accordance with EN 15804:2012+A2:2019 and ISO 14025 and 14040/44 standards and the additional requirements stated in the RTS PCR (English version, 26.8.2020) (SFS-EN 15804:2012+A2:2019).

EPD of construction products may not be comparable if they do not comply with EN15804 and seen in a building context.

Author of the life-cycle assessment and declaration

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Hungary, 1037 Budapest, Seregély st. 6.

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Verification

This EPD has been verified according to the requirements of EN 15804:2012+A2:2019 and RTS PCR by a

third party. The verification has been carried out by:

Mari Kirss, Product LCA/EPD Specialist

Rangi Maja OÜ - LCA Support, www.lcasupport.com

mari.kirss@lcasupport.com

Declaration issue date and validity

Declaration issue date is 15.8.2024. The declaration is valid 5 years.

Product description

The declaration has been conducted for Precast reinforced concrete for transformer house construction, manufactured in Hungary.





Technical specifications, physical properties, and environ- Raw materials of the product and product information mental/hazardous properties

The size and form of the precast reinforced concrete for transformer house construction depend on the end usage. The product includes rebar.

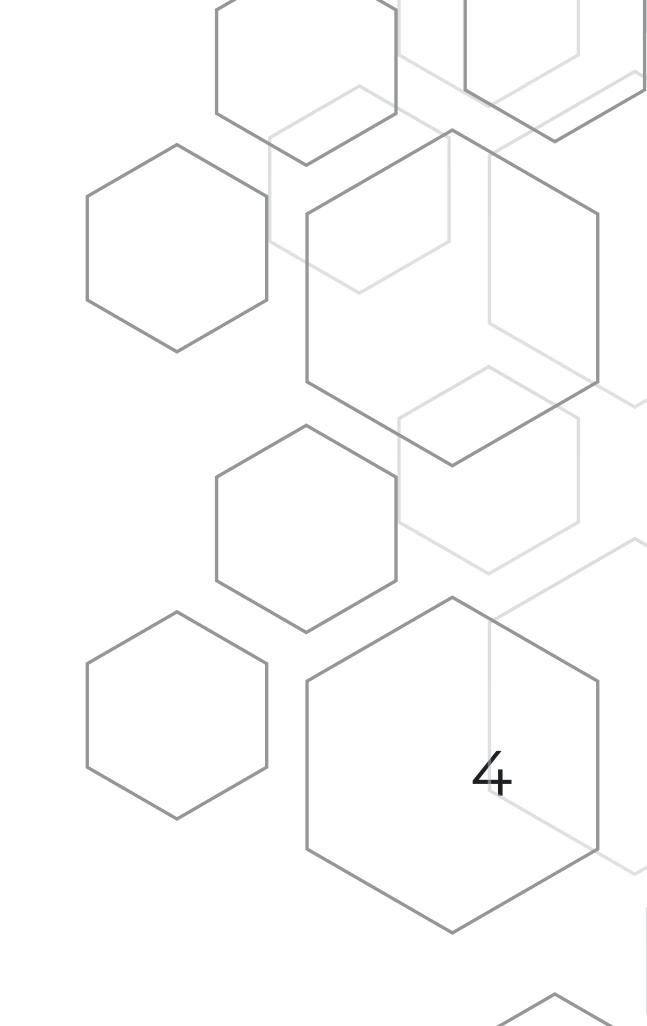
Environmental/hazardous properties

The basic and auxiliary materials used in the production of the product do not contain chemicals that are on the REACH list, the list of very hazardous substances (SVHC). The final product is not expected to produce significant adverse health effects when the recommended instruction for use is followed.



PRODUCT STRUCTURE /			USABILITY		ORIGIN OF
COMPOSITION / RAW-MATERIAL	QUANTITY p%*	RENEWABLE	NON- RENEWABLE	RECYCLED	THE RAW MATERIALS
Reinforcement steel	1%		X		EU
Reinforcement steel (from scrap metal)	1%		X	X	EU
CEM I 52,5 N cement	18%		X		EU
Limestone (crushed)	2%		X		EU
Sand (0-1 mm)	7%		X		EU
Sand (0-4 mm)	24%		X		EU
Gravel (4-8 mm)	16%		X		EU
Gravel (8-16 mm)	24%		X		EU
Water	7%	X			EU

^{*}Order of magnitude, not exact composition







Product main composition, at least metals, stone materials, fossil materials, bio-based materials

PRODUCT STRUCTURE /			USABILITY		ORIGIN OF
COMPOSITION / RAW-MATERIAL	QUANTITY p%*	RENEWABLE	NON- RENEWABLE	RECYCLED	THE RAW MATERIALS
Reinforcement steel (virgin)	46%		X		EU
Reinforcement steel (recycled from scrap metal)	54%		X	X	EU

^{*}Order of magnitude, not exact composition







Functional / declared unit

Indicators are for 1 t of precast reinforced concrete for transformer house construction.

System boundary

This EPD covers the following modules: Cradle-to-gate, module A4, modules C1–C4 and module D (A1–A3 + A4 + C + D).

The scenarios included are currently in use and are representative for one of the most likely scenario alternatives.

PR	ODUCT ST	AGE		RUCTION SS STAGE				USE STAG					END OF	LIFE STAGE		RESOURCE RECOVERY STAGE
Raw material supply	Transport	Manufacturing	Transport	Construction	DSD	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery- Recycling-potential
Al	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	
X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X

Mandatory modules

Mandatory as per the RTS PCR section 6.2.1 rules and terms

Optional modules based on scenarios

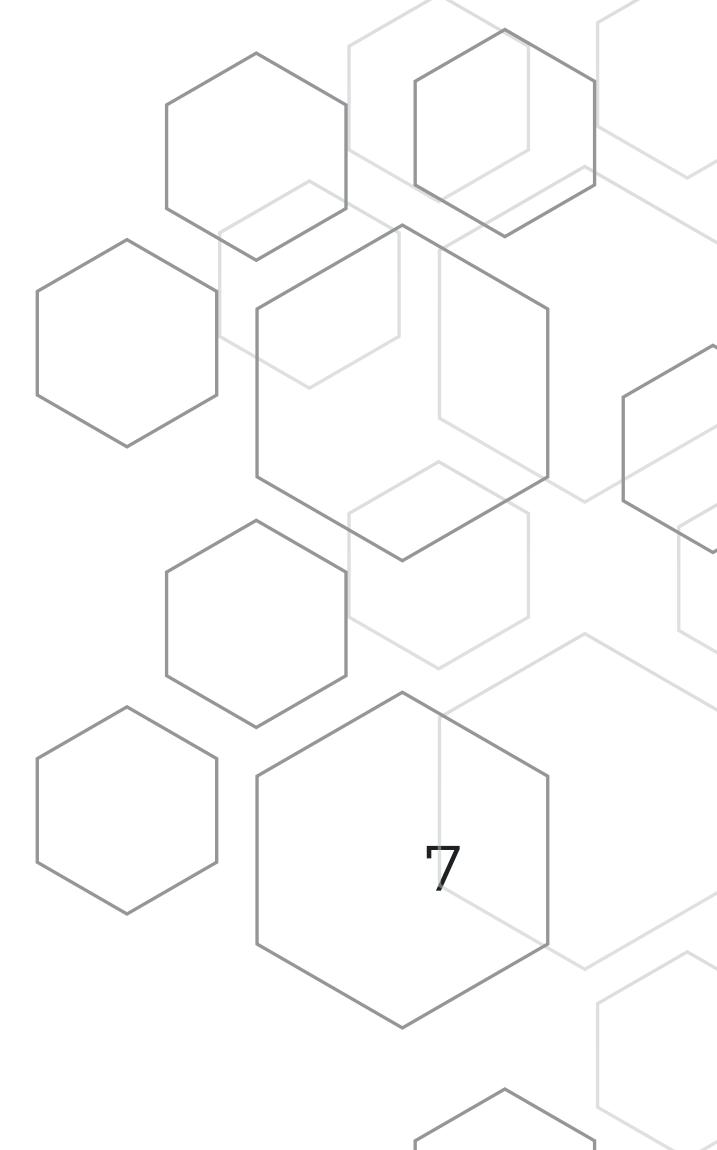






Cut-off criteria

All raw material supply, A2 transportation, A3 manufacturing. All used materials, energy, packaging, and transportation until the end-of-waste state have been included. The information from transportation A4 is included in the LCA-calculation as well. Information from B-module has not been calculated nor included in the LCA-calculations. Modules C1 – C4 have been included. Module D is also included.







Environmental impacts

Precast reinforced concrete for transformer house construction

				RESUL	TS PER FUNCTION	IAL OR DECLARE	DUNIT				
INDICATOR	UNIT	Al	A2	A3	TOT. A1-A3	A4	C1	C2	C3	C4	D
GWP-fossil	kg CO ² eq.	1,85E+02	3,12E+01	7,63E-01	2,17E+02	6,07E+00	8,30E+01	1,11E+O1	4,86E+00	-6,68E+00	2,72E+C
GWP-biogenic	kg CO ² eq.	2,60E+00	2,68E-02	5,90E-04	2,63E+00	1,31E-03	6,88E-02	6,21E-02	2,55E-03	9,73E-03	-1,70E-C
GWP-luluc	kg CO ² eq.	4,82E-02	1,52E-02	1,03E-04	6,35E-02	6,82E-04	4,88E-02	6,45E-03	2,93E-03	-3,93E-03	1,55E-O
GWP-total	kg CO ² eq.	1,88E+02	3,13E+01	7,64E-01	2,20E+02	6,07E+00	8,31E+01	1,11E+O1	4,87E+00	-6,68E+00	2,70E+C
ODP	kg CFC 11 eq.	1,55E-06	6,79E-07	1,24E-08	2,25E-06	9,66E-08	1,81E-06	2,04E-07	1,41E-07	-1,29E-07	5,33E-0
AP	mol H+ eq.	4,84E-01	1,02E-01	6,89E-03	5,93E-01	5,63E-02	3,22E-01	8,76E-02	3,66E-02	-2,93E-02	1,06E-C
EP-freshwater	kg P eq.	3,41E-02	2,18E-03	2,60E-05	3,64E-02	1,86E-04	7,06E-03	2,19E-03	4,04E-04	-2,88E-03	1,25E-0
EP-marine	kg N eq.	1,31E-01	3,50E-02	3,18E-03	1,69E-01	2,61E-02	1,17E-01	3,65E-02	1,41E-02	-7,70E-03	2,65E-0
EP-terrestrial	mol N eq.	1,44E+00	3,70E-01	3,45E-02	1,85E+00	2,84E-01	1,25E+00	3,93E-01	1,51E-01	-8,50E-02	2,75E-C
POCP	kg NMVOC eq.	4,80E-01	1,52E-01	1,03E-02	6,43E-01	8,40E-02	4,59E-01	1,20E-01	5,25E-02	-3,88E-02	1,48E-C
ADP-minerals & metals ¹	kg Sb eq.	5,77E-04	1,02E-04	4,76E-07	6,80E-04	2,12E-06	3,73E-04	2,72E-05	6,85E-06	-2,93E-05	8,78E-0
ADP-fossil ¹	MJ	1,14E+03	4,46E+02	1,02E+01	1,59E+03	8,01E+01	1,18E+03	1,78E+02	1,22E+02	-7,02E+01	2,69E+0
WDP	m^3	3,08E+01	2,19E+00	3,84E-02	3,30E+01	1,98E-01	6,72E+00	1,35E+00	3,79E-01	-5,48E+00	1,15E+C
GWP-GHG ¹	kg CO ² eq.	1,85E+02	3,12E+01	7,63E-01	2,17E+02	6,07E+00	8,31E+01	1,11E+O1	4,86E+00	-6,69E+00	2,72E+0

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 marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = 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 indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus almost equal to the GWP indicator originally defined in EN 15804:2012+A2:2019..





Use of natural resources

Precast reinforced concrete for transformer house construction

	RESULTS PER FUNCTIONAL OR DECLARED UNIT											
INDICATOR	UNIT	AI	A2	A3	TOT. A1-A3	A4	C1	C2	C3	C4	D	
PERE	MJ	9,37E+01	6,86E+00	1,45E-01	1,01E+02	4,51E-01	2,55E+01	8,56E+00	1,02E+00	-1,08E+00	-1,14E+01	
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	0,00E+00	0,00E+00	
PERT	MJ	9,37E+01	6,86E+00	1,45E-01	1,01E+02	4,51E-01	2,55E+01	8,56E+00	1,02E+00	-1,08E+00	-1,14E+01	
PENRE	MJ	1,09E+03	4,46E+02	1,02E+01	1,55E+03	8,01E+01	1,18E+03	1,78E+02	1,22E+02	-7,02E+01	2,69E+02	
PENRM	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	0,00E+00	0,00E+00	
PENRT	MJ	1,09E+03	4,46E+02	1,02E+01	1,55E+03	8,01E+01	1,18E+03	1,78E+02	1,22E+02	-7,02E+01	2,69E+02	
SM	kg	1,36E+01	0,00E+00	0,00E+00	1,36E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,90E+02	1,73E+02	
RSF	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	0,00E+00	0,00E+00	
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	0,00E+00	0,00E+00	
FW	m^3	3,08E+01	2,19E+00	3,84E-02	3,30E+01	1,98E-01	6,72E+00	1,35E+00	3,79E-01	-5,48E+00	1,15E+01	

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 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





End-of-life – Waste

Precast reinforced concrete for transformer house construction

RESULTS PER FUNCTIONAL OR DECLARED UNIT											
INDICATOR	UNIT	Al	A2	A3	TOT. A1-A3	A4	C1	C2	C3	C4	D
Hazardous waste disposed	kg	6,44E+00	2,99E-01	4,88E-03	6,75E+00	3,69E-02	8,87E-01	1,55E-01	5,86E-02	-8,39E-01	3,70E+00
Non-hazardous waste disposed	kg	1,46E+02	9,09E+00	1,03E-01	1,55E+02	7,34E-01	3,13E+01	8,77E+00	1,75E+00	-9,66E+00	4,14E+01
Radioactive waste disposed	kg	2,40E-03	1,44E-04	2,26E-06	2,55E-03	8,70E-06	5,76E-04	2,61E-04	1,79E-05	-5,67E-05	6,79E-05

End-of-life – Output flow

Precast reinforced concrete for transformer house construction

RESULTS PER FUNCTIONAL OR DECLARED UNIT											
INDICATOR	UNIT	AI	A2	A3	TOT. A1-A3	A4	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,34E+02	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,00E+02	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	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	0,00E+00	0,00E+00
Exported energy, electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, thermal	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	0,00E+00	0,00E+00





Key information table

			KEY	INFORMATION T	ABLE (RTS) - KEY I	NFORMATION PI	ER 1 KG OF PROD	UCT			
INDICATOR	UNIT	AI	A2	A3	TOT. A1-A3	A4	C1	C2	C3	C4	D
GWP-total	kg CO ² eq.	1,88E-01	3,13E-02	7,64E-04	2,20E-01	6,07E-03	8,31E-02	1,11E-02	4,87E-03	-6,68E-03	2,70E-02
ADP-minerals & metals	kg Sb eq.	5,77E-07	1,02E-07	4,76E-10	6,80E-07	2,12E-09	3,73E-07	2,72E-08	6,85E-09	-2,93E-08	8,78E-08
ADP-fossil	MJ	1,14E+00	4,46E-01	1,02E-02	1,59E+00	8,01E-02	1,18E+00	1,78E-01	1,22E-01	-7,02E-02	2,69E-01
WDP	m3	3,08E-02	2,19E-03	3,84E-05	3,30E-02	1,98E-04	6,72E-03	1,35E-03	3,79E-04	-5,48E-03	1,15E-02
SM	kg	1,36E-02	0,00E+00	0,00E+00	1,36E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,90E-01	1,73E-01
Biogenic car- bon content in product	kg C	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Biogenic carbon content in accompanying packaging	kg C	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

GWP-total = Global Warming Potential total; ADP-minerals&metals = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption; SM = Use of secondary material





Energy in the manufacturing phase

A3 ELECTRICITY INFORMATION

AND CO₂ EMISSION KG

CO₂-EQ./KWH

ELECTRICITY, LOW VOLTAGE,
MARKET MIX

0,39 KG CO₂-EQ./KWH

End-of-life process description

C1: dismantling is modeled with the usage of generic datasets for the dismantling of reinforced concrete.

C2: the following distances are assumed for the respective waste destinations:

- · To the sorting facility 100 km
- To the recycling facility 50 km and
- · To the landfill plant 50 km

C3 and C4: the precast reinforced concrete product is sold over many European markets with varying levels of waste treatment services. One waste treatment scenario is modelled. It is based on sectoral assumptions. Waste treatment options are considered for broader European context based on official statistics.

- Collection rate: 100%
- Recycling: 20%
- · Landfill: 80%

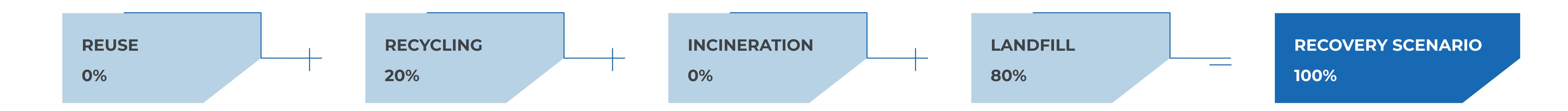
D: for the calculation of module D, the benefits/loads from recycling are accounted.







PROCESSES	UNIT (EXPRESSED PER FUNCTIONAL UNIT)
Collection process specified by type	1,00 t collected separately 0 t collected with mixed construction waste
Recovery system specified by type	0,2 t for recycling
Disposal specified by type	0,8 t for landfill
Assumptions for scenario development, e.g., transportation	The following distances are assumed for the respective waste destinations: • To the sorting facility – 100 km • To the recycling facility – 50 km • To landfill – 50 km



Product	Reuse of components	Recycling	g of material	Fneray content	Disposal of product or
	Reuse of Components	Recycling method	System boundaries (module D)	Energy content	material, including losses
Precast reinforced concrete	Reused if meeting the requirements of the new application.	Concrete is used as a raw material for crushed gravel production, while the reinforcing steel is used as a raw material for steel production	Recycled steel replaces primary steel. Typical application of recycled concrete is in crushed gravel production, as it replaces rocks and minerals.	N/A	80% of the product is landfilled.





Additional information

·emissions to soil

The information is not available

·emissions to water

The information is not available

·emissions to indoor air

The information is not available

Product declaration

The information is available at the web pages, please see link.

Information on biogenic carbon content

Precast reinforced concrete for transformer house construction

RESULTS PER FUNCTIONAL OR DECLARED UNIT									
BIOGENIC CARBON CONTENT	UNIT	QUANTITY							
Biogenic carbon content in product	kg C	0,00E+00							
Biogenic carbon content in packaging	kg C	0,00E+00							

References

Ecoinvent v3.9.1 database, 2022

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

ISO 14040:2006 (E) Environmental management — Life cycle assessment — Principles and framework, 2006-07

ISO 14044:2006 + Amd 1:2017 Environmental management — Life cycle assessment — Requirements and guidelines, 2018

RTS EPD, general rules, 2020

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