Environmental Product Declaration

as per ISO 14025 and EN 15804+A2

Owner of the declaration:	AS BMGS
Publisher:	Kiwa-Ecobility Experts
Program operator:	Kiwa-Ecobility Experts
Registration number:	EPD-BMGS-206-EN
Issue date:	24-05-2022
Valid to:	23-05-2027

Two-layer precast concrete walls

1. General information

AS BMGS

Programme operator
Kiwa-Ecobility Experts
Kiwa GmbH
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Germany

Declaration number
EPD-BMGS-206-EN

This declaration is based on the Product Category Rules
PCR B - Product Category Rules for concrete and concrete elements; German version EN 16757:2017

Issue date
24.05.2022

Valid to
23.05.2027

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(Head of Kiwa-Ecobility Experts)

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Precast concrete elements

Owner of the declaration
AS BMGS
Tvaika iela 27
LV-1005 Riga
Latvia

Declared product / declared unit
1 ton of precast concrete element

Scope
The average EPD (type: Cradle to gate with options, modules C1-C4 and module D (A1-A5, C, D) is about custom made precast concrete element - Two-layer wall, manufactured in Riga and Ventspils, Latvia. The calculation is based on 1 ton of precast concrete element with a share of 7,1 m% reinforcing steel.
Kiwa-Ecobility Experts shall not be liable with respect to manufacturer information, life cycle assessment data and evidence.

Verification
The standard EN 15804+A2:2019 serves as the core PCR

Independent verification of the declaration and data according to ISO 14025:2011-10

☐internally ☒externally

Max Sonnen
(External verifier – Ecomatters)

2. Product

2.1 Product description

The product is precast concrete two-layer wall in which the reinforcing steel constitutes the main reinforcement of the composite slab. The product is produced in various sizes (incl. thicknesses) and applications with concrete compressive strength class of C30/37 to C45/55 (normative minimum concrete compressive strength class is C25/30).

2.2 Application

The product precast concrete two-layer wall is intended to be used as solid wall element for internal and external wall constructions (including residential as well as non-residential buildings).

2.3 Placing on the market / Application rules

The harmonized standard EN 13369 (Common rules for precast concrete products) and product-specific standard EN 14992 (Precast concrete products - Wall elements) apply for production of the product. The CE mark is applied to the finished products.

Additional certifications: the production of AS BMGS of reinforced concrete elements is certified in accordance with the requirements of management system standards ISO 9001:2015, ISO 14001:2015, ISO 45001:2018.

Market: Scandinavian countries – Sweden, Norway, Denmark and Finland. The Swedish market is used for modelling A4-A5 and C1-C4.

2.4 Technical Data

Technical Data – Two-layer wall

Name	Value	Unit
Compressive strength	C30/37 - C45/55	N/mm2
Reinforcing steel	B500B; B500C	-
Mesh	K500AB-W	-
Ultimate tensile strength Re	500 500	MPa
Tensile yield strength Rm	540 575-675	MPa
Durability of product	50 years	
Tolerances Svensk Betong	"Toleranser för betongelement" 2020 Class A; B	

Length – up to 14000 mm, Width – up to 4000 mm, Thickness – up to 500 mm
Average weight around 15 t
Thermal resistance of insulation (R value): Kingspan Therma TW58 130 mm - 5,9 m^2 K/W

2.5 Base materials / Ancillary

Name	Value	Unit
Cement	14,0	m%
Aggregates	71,9	m%
Water	5,7	m%
Admixture	0,1	m%
Steel	7,1	m%
Insulation	1,2	m%

There is no biogenic carbon in the product.

2.6 Manufacturing

The manufacturing contains the following processes:

- Delivery of raw materials;
- Preparation of the molds (plywood formwork, cutting and laying of the probation steel elements, placeholders etc.);
- Concrete mixing and filling into the molds, curing;
- Removal of the formwork, finishing, storage.

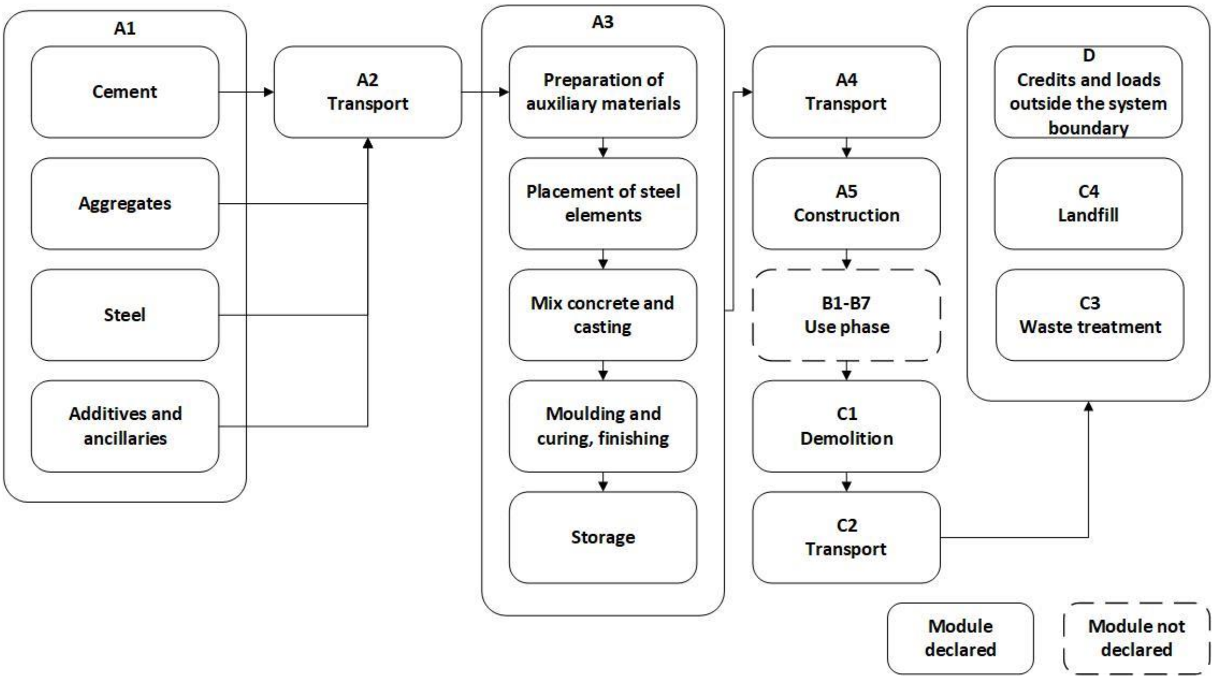

Figure 1: Overview of the production route of precast concrete element (A1-A5, C1-C4, D)

2.7 Packaging

No packaging materials are used. The transportation does not cause any losses as products are secured properly.

2.8 Production waste

The data on generated production waste is recorded as accurately as possible. Thus, the generated production waste is allocated per declared unit. No loses for cement are assumed since filters are used to collect dust in the air of cement storage in silos. The captured cement dust is reused in production. No loses for inert materials are assumed too since materials are stored in open warehouses, which three sides are enclosed by a wall. The same assumptions are made for other components. There is no production waste for scrap metal, because reinforcement mesh, rebars and wires are delivered of the size as in the drawings (no cutting is made).

3. LCA: Calculation rules

3.1 Declared unit

The EPD refers to the declared product system of 1 ton of precast concrete element.

Name	Value	Unit
Declared unit	1	ton
Cement type*	CEM I 42.5R	-
Compressive strength class**	C30/37- C45/55	-
Content of reinforcing steel	7,1	m%
Steel grade	B500B; B500C	-
Insulation thickness***	PIR 130	mm
Thermal resistance	5,9	m2K/W

* CEM I 42.5R is used for LCA calculations. Starting from 2022 AS BMGS intends to use also CEM II A-M (S-LL) 52.5 N and CEM I 42,5 N SR-3. Since the amount and the manufacturer of the cement used will not change it is expected to have less environmental impact in some categories (e.g. GWP - "global warming potential").

** Concrete mixes are produced according to recipes, in compliance with the strictest quality norms and standards in force, as well as the specific purposes for which a particular batch of concrete is intended.

*** The most representative materials and thicknesses are chosen.

3.2 System boundary

This EPD was created in accordance with EN 15804 requirements and include the production stage, transportation to the site and construction, and the end-of-life stage. According to EN 15804 this corresponds to product phases A1-A5, C1-C4 and D (EPD type "Cradle to gate with options, modules C1-C4 and module D" (A1-A3, C, D and additional modules A4 and A5)). All inputs including raw materials, primary products, energy and auxiliary materials as well as the accumulated waste are considered in the assessment. The use of the final product is not within the manufacturer's sphere of influence. Therefore, modules B1-7 have not been considered. The effect of CO_2 absorption through the carbonization process is not taken into account in the LCA. The reference year is 2020. The geographical reference area is Latvia.

3.3 Estimates and assumptions

The raw material data for each of the product produced is recorded to a high standard of accuracy and precision. The energy consumption, ancillary materials and production waste is allocated according to the annual production of the declared unit to the total annual production at the factory (incl. averaging the obtained data depending on the proportion of the total).

3.4 Cut-off criteria

All material flows that contribute to more than 1% of the total mass, energy or environmental impact of the system have been considered in the LCA. It can be assumed that the neglected processes in total contributed less than 5% to the considered impact categories.

The product stage includes materials, energy and waste flows only related to production processes (e.g. energy and water use related to company management and sales activities are excluded where technically possible; production, manufacture, and construction of manufacturing capital goods and infrastructure, other processes which are not directly related to the production of concrete elements).

3.5 Background Data

The background data is taken from Ecoinvent database version 3.6. (2019). The life cycle assessment was modeled with the Rethink tool. Geographical reference space of the background data is Latvia.

Almost all consistent datasets contained in the Ecoinvent database are documented and can be viewed in the online Ecoinvent documentation.

3.6 Data quality

In the operating data survey all relevant process-specific data had been collected. The data relating to the manufacturing phase of the precast concrete element are determined by AS BMGS and refers to production site in Riga, Tvaika street 27 and Ventspils, Fabrikas street 6. The data relating to the manufacturing construction phase are determined also by BMGS and refers to the finished construction project in Sweden.

Secondary data were taken from the Ecoinvent 3.6 (2019) database. The database is regularly checked and thus complies with the requirements of ISO 14040/44 (background data not older than 10 years). The background data meets the requirements of EN 15804. The quantities of raw materials, consumables and supplies used as well as the energy consumption have been recorded and averaged over the entire year of operation.

The general rule has been that specific data from specific production processes or average data derived from specific processes must be given priority when calculating an EPD or Life Cycle Assessment. Data for processes that the manufacturer cannot influence or choose, were backed up with generic data.

EPD of raw material (cement) was available but could not be integrated as it was calculated according to EN 15804:2014 (+A1) and not according to the EN 15804:2020 (+A2) standard used here.

3.7 Period Under review

All process-specific data was collected for the operating year 2020. The quantities of raw and auxiliary materials as well as energy consumption have been recorded and averaged over the entire operating year 2020.

3.8 Allocation

There are no co-products in the raw material supply phase, so no allocation methods were used at this stage. There are no allocations during the manufacturing phase at the plant.

3.9 Calculation methods

For life cycle assessment, the calculation methods described in ISO 14040 have been applied. The evaluation is based on the phases in the system boundaries.

3.10 Mix of electricity and CO_2-Certificates

The electricity mix was chosen according to the energy grid mix in Latvia (reference year 2019). No CO_2 certificates were counted.

3.11 Comparability

Basically, a comparison or an 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, respectively the product-specific characteristics of performance, are considered.

3.12 Reference Service Life (RSL)

The concrete composition limits given in EN 206 are specified for an intended service life of at least 50 years under the respective exposure classes/ environmental conditions.

4. LCA: Scenarios and additional technical information

Module A4: This stage includes transport from the production stockyard to the construction site where the prefabricated product shall be installed. Basic scenario transportation from AS BMGS production sites in Latvia to customer in Sweden, Stockholm with distance radius around 100 km. Transportation is calculated based on data form manufacturer and a scenario with the parameters described in the following table. The transportation does not cause losses as products are secured properly.

Transport from production place to the construction site (A4)

Parameter	Vehicle type	Distance
Truck*	Lorry >32t, EURO5	110 km**
Maritime	Ferry/ Transoceanic freight ship, containers	270 km

* Data for transport is calculated for an average load factor, including empty return trips

** Total distance by truck: from Ventspils factory to the port located in Ventspils city (10 km) and from the port in Sweden to the construction site (100 km)

Modules B1 to B7: For concrete components, maintenance and repair measures are generally not necessary during the reference service life, so that no environmental burdens arise in these modules. In addition, no energy or water is consumed.

C1 Demolition: According to the current state of the art, the demolition of concrete and reinforced concrete structures is mainly carried out with longfront excavators equipped with demolition clamps. The concrete buildings are demolished by so-called "press cutting", i.e. the crushing of concrete by applying a compressive force. It is estimated that one site vehicle is in operation for 30 min per sqm of concrete element (conservative assumption). In addition, based on Bozdağ, Ö & Seçer, M. (2007) energy consumption of a demolition process is on the average 10 kWh/m^2 and an average mass of a reinforced concrete building is about 1000 kg/m^2. Therefore, energy consumption demolition is 10 kWh/1000 kg. The source of energy is diesel fuel used by work machines and based on the statements above can be assumed being 1,009 l (with NCV 42,49 GJ/t).

C2 - C4 and D: It is assumed that concrete and reinforcement material are separated after deconstruction. For both waste groups, a waste scenario according to the Dutch National Environmental Database (NMD) (SBK 2019) is applied:

- Concrete (i.a. elements, brickwork): 99% of concrete is recycled and reused as aggregate.
- Steel, reinforcement: 95% of reinforcing steel is marketed as scrap metal.

At the end-of-life, in the demolition phase 99% of steel and 90% concrete is assumed to be collected as separate construction waste (C1). All of end-of-life product is assumed to be sent to the closest facilities (C2).

The effect of CO2 absorption through the carbonization process in the use and end-of-life phase is not assessed here and taken into account in the LCA.

5. LCA: Results

The following tables show the results of the impact assessment indicators, resource use, waste and other output streams. The results presented here refer to the declared average product.

Description of the system boundary																
Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport from manufacturer to place of use	Construction-installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction / demolition	Transport	Waste processing	Disposal	Reuse-Recovery-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	MND	MND	MND	MND	MND	X	X	X	X	X
X=Module declared | MND=Module not declared																

Disclaimer on ADP-e, ADP-f, WDP, ETP-fw, HTP-c, HTP-nc, SQP: The results of these environmental impact indicators must be used with caution, as the uncertainties in these results are high or as there is limited experience with the indicator.

Disclaimer on IR: This impact category mainly addresses the potential effect of low dose ionizing radiation on human health in the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents and occupational exposures, nor does it consider radioactive waste disposal in underground facilities. Potential ionizing radiation from soil, radon, and some building materials is also not measured by this indicator.

Results of the LCA – Environmental impact: 1 t of two-layer precast concrete wall

Parameter	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Core environmental impact indicators (EN 15804)											
ADP-mm	kg Sb-eqv.	6,25E-03	4,13E-04	5,94E-05	4,27E-04	7,24E-06	5,07E-06	1,67E-04	3,46E-05	8,90E-07	-1,93E-04
ADP-f	MJ	3,05E+03	2,73E+02	2,40E+02	4,04E+02	6,50E+01	4,55E+01	9,94E+01	3,77E+01	2,49E+00	-2,73E+02
AP	mol H+ eqv.	1,17E+00	1,96E-01	4,21E-02	1,79E-01	4,94E-02	3,46E-02	3,82E-02	2,03E-02	8,64E-04	-3,86E-02
EP-fw	kg P eqv.	1,35E-02	1,68E-04	1,60E-04	1,93E-04	1,72E-05	1,20E-05	6,65E-05	1,21E-04	1,22E-06	-1,55E-04
EP-m	kg N eqv.	2,81E-01	5,51E-02	1,20E-02	4,95E-02	2,18E-02	1,53E-02	1,35E-02	6,71E-03	4,04E-04	-1,12E-02
EP-T	mol N eqv.	8,30E+03	2,33E+02	9,93E+01	3,17E+02	3,92E+01	2,74E+01	8,87E+01	3,42E+02	3,52E+00	-8,97E+01
GWP-b	kg CO2 eqv.	3,43E+00	5,04E-03	-1,53E+00	1,67E-02	1,31E-03	9,20E-04	3,04E-03	1,34E-02	3,93E-04	-2,11E-02
GWP-f	kg CO2 eqv.	2,86E+02	1,87E+01	1,62E+01	2,64E+01	4,72E+00	3,31E+00	6,59E+00	2,74E+01	3,80E-01	-1,73E+01
GWP-luluc	kg CO2 eqv.	7,84E-01	8,69E-03	5,70E-03	8,66E-03	3,72E-04	2,61E-04	2,42E-03	2,26E-03	3,18E-05	-4,48E-03
GWP-total	kg CO2 eqv.	2,90E+02	1,87E+01	1,47E+01	2,64E+01	4,72E+00	3,31E+00	6,60E+00	2,74E+01	3,80E-01	-1,73E+01
ODP	kg CFC 11 eqv.	2,18E-05	4,04E-06	2,28E-06	6,12E-06	1,02E-06	7,14E-07	1,46E-06	9,73E-07	3,56E-08	-2,13E-06
POCP	kg NMVOC eqv.	8,71E-01	1,68E-01	4,34E-02	1,63E-01	6,58E-02	4,61E-02	4,24E-02	2,01E-02	1,01E-03	-3,73E-02
WDP	m3 world eqv.	1,67E+02	8,91E-01	8,59E-01	1,26E+00	8,71E-02	6,10E-02	3,56E-01	1,38E+00	1,10E-01	-5,56E+01
Additional environmental impact indicators (EN 15804)											
ETP-fw	CTUe	2,64E+00	6,11E-01	1,22E-01	5,48E-01	2,39E-01	1,68E-01	1,49E-01	7,47E-02	3,24E-03	-1,28E-01
HTP-c	CTUh	1,67E-06	8,99E-09	2,77E-08	8,68E-09	1,37E-09	9,59E-10	2,88E-09	5,12E-09	4,58E-11	-3,68E-09
HTP-nc	CTUh	3,22E-05	2,46E-07	1,66E-07	3,54E-07	3,36E-08	2,36E-08	9,70E-08	1,11E-07	1,58E-09	-9,20E-08
IR	kBq U235 eqv.	9,69E+00	1,15E+00	3,97E-01	1,76E+00	2,78E-01	1,95E-01	4,17E-01	1,39E-01	1,01E-02	-2,64E-01
PM	disease inci-dence	1,81E-05	2,01E-06	3,44E-07	2,24E-06	1,31E-06	9,17E-07	5,81E-07	1,94E-07	1,47E-08	-4,52E-07
SQP	Pt	8,01E+02	2,81E+02	3,47E+02	4,31E+02	8,63E+00	5,81E+00	8,44E+01	3,15E+00	4,67E+00	-5,85E+01

ADP-e=Depletion of abiotic resources-elements | **ADP-f**=Depletion of abiotic resources-fossil fuels | **AP**=Acidification of soil and water | **EP-fw** =Eutrophication, freshwater | **EP-m**=Eutrophication marine | **EP-T**=Eutrophication, terrestrial | **GWP-b**=Global warming potential - Biogenic | **GWP-f**=Global warming potential - Fossil | **GWP-luluc**=Global warming potential - Land use and land use change |**GWP-total**=Global warming potential |**ODP**=Ozone layer depletion |**POCP**=Photochemical oxidants creation | **WDP**=Water use | **ETP-fw**=Ecotoxicity, freshwater | **HTP-c**=Human toxicity, cancer | **HTP-nc**=Human toxicity, non-cancer | **IR**=Ionising radiation, human health | **PM**=Particulate Matter | **SQP**=Land use

Resource use and environmental information: 1 t of two-layer precast concrete wall											
Parameter	**Unit**	**A1**	**A2**	**A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	2,14E+02	3,19E+00	1,32E+01	4,90E+00	3,51E-01	2,46E-01	1,24E+00	3,07E+00	2,62E-02	-3,77E+00
PERM	MJ	0,00E+00	0,00E+00	3,54E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	2,14E+02	3,19E+00	4,85E+01	4,90E+00	3,51E-01	2,46E-01	1,24E+00	3,07E+00	2,62E-02	-3,77E+00
PENRE	MJ	2,85E+03	2,90E+02	2,59E+02	4,29E+02	6,90E+01	4,83E+01	1,06E+02	4,01E+01	2,64E+00	-3,01E+02
PENRM	MJ	4,04E+02	0,00E+00	3,44E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	3,26E+03	2,90E+02	2,63E+02	4,29E+02	6,90E+01	4,83E+01	1,06E+02	4,01E+01	2,64E+00	-3,01E+02
SM	Kg	7,08E+01	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
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	m3	4,50E+00	3,04E-02	3,51E-02	4,41E-02	3,34E-03	2,34E-03	1,21E-02	4,45E-02	2,64E-03	-1,29E+00
HWD	Kg	3,68E-03	6,17E-04	3,19E-04	9,33E-04	1,77E-04	1,24E-04	2,52E-04	6,94E-05	3,73E-06	-3,81E-04
NHWD	Kg	3,33E+01	1,44E+01	9,43E-01	3,25E+01	7,69E-02	5,39E-02	6,31E+00	3,15E+00	1,52E+01	-6,06E-01
RWD	Kg	8,84E-03	1,81E-03	4,93E-04	2,76E-03	4,51E-04	3,16E-04	6,53E-04	1,53E-04	1,59E-05	-3,16E-04
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	0,00E+00	0,00E+00
MFR	Kg	0,00E+00	0,00E+00	1,18E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,75E+02	0,00E+00	0,00E+00
MER	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
EE	MJ	0,00E+00	0,00E+00	1,80E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,59E+02
EET	MJ	0,00E+00	0,00E+00	1,14E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,00E+02
EEE	MJ	0,00E+00	0,00E+00	6,60E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,82E+01

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 | **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 | **EE**=Exported energy | **EET**=Exported Energy Thermic | **EEE**=Exported Energy Electric

6. LCA: Interpretation

The following figure shows the influence of the different life stages on the environmental core indicators for precast concrete massive slab. Since the Global Warming Potential biogen (GWP-b) and Global Warming Potential resulting from land use and land use (GWP-luluc) change have only a minor impact, only total Global Warming Potential (GWP-total) is displayed. As shown in Figure 1 the majority of the environmental impact is attributed to row material processing phase (A1), followed by the transports of raw materials (A2) and production (A3). Results of processing phase (A1) theoretically can be expected lower since the supplier of the main raw material – cement, is implementing environmental policy, for example, for cement manufacturing process different alternatives to fossil fuels are used, as used tires, tire fluffy, NPS: Neutralized Polluted Soil (NPS) and Solid Recovered Fuel (SRF). In addition, this supplier owns the “Powered by green” certificate which confirms that the company is buying electricity produced in Latvia from 100% renewable energy sources. But EPD of cement could not be used because it is still calculated according to the old standard (EN 15804+A1), therefore secondary data had to be used.

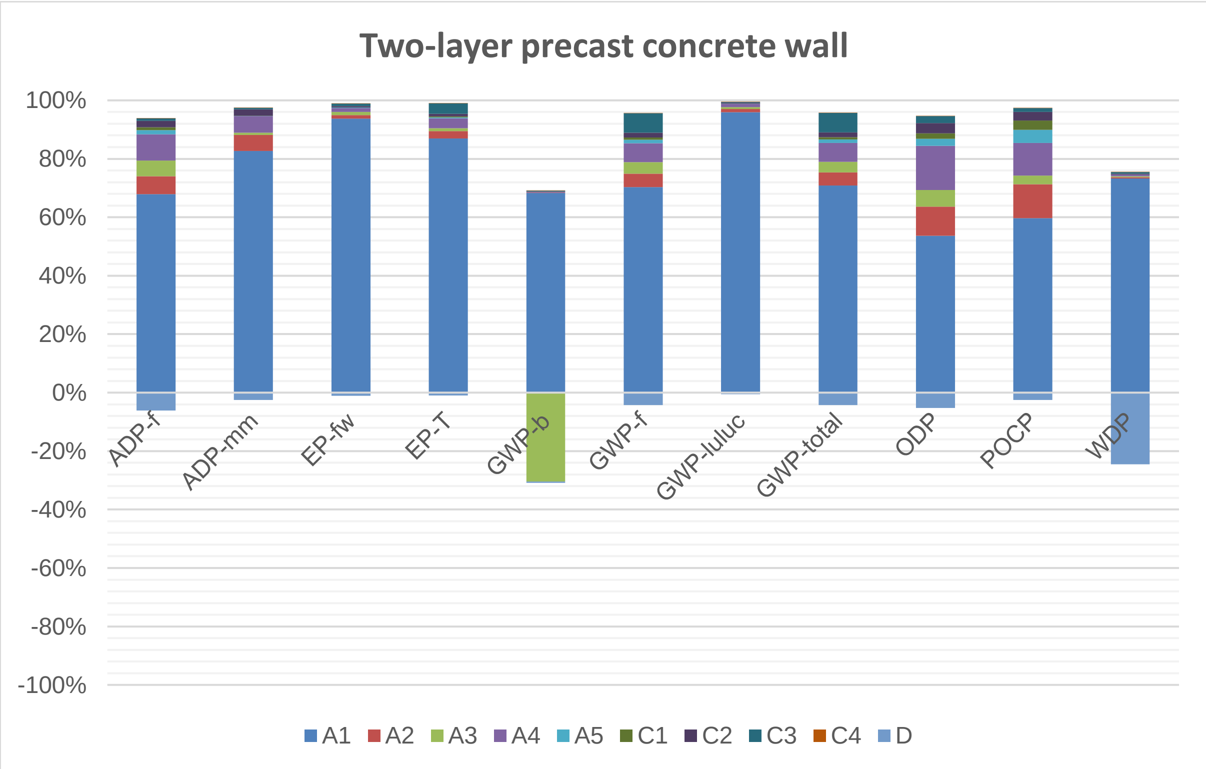

Figure 2: Influence of the modules on the environmental core indicators

Overall, the quality of the data can be considered as good. The primary data collection has been done thoroughly. Data quality was calculated using the Data Quality Rating method according to the PEF approach. The DQRs range from 1,67 to 2,33 for the most abundant inputs in terms of mass.

7. Additional information: Norwegian requirements

Greenhouse gas emissions from the use of electricity mix in the manufacturing phase

Data source	Amount	Unit
Ecoinvent 3.6 (year 2019)	0,146	CO2-eqv/kWh

Dangerous substances disclaimer

- ☒ The product contains no substances given by the REACH Candidate list or the Norwegian priority list
- ☐ The product contains substances given by the REACH Candidate list or the Norwegian priority list that are less than 0,1 % by weight.
- ☐ The product contains dangerous substances, more then 0,1% by weight, given by the REACH Candidate List or the Norwegian Priority list, see table.
- ☐ The product contains no substances given by the REACH Candidate list or the Norwegian priority list. The product is classified as hazardous waste (Avfallsforskiften, Annex III), see table.

Indoor environment

The product has not been tested for emissions to indoor environment. The product contains no dangerous substances on the REACH Candidate list or the Norwegian priority list, and a water-based release agent is used. Based on this it is assumed that the product has a negligible impact on the indoor environment.

Carbon footprint

Carbon footprint has not been worked out for the product.

8. References

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EN 15804:2014 (+A1), Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products

EN 15804:2020 (+A2) Sustainability of construction works - Environmental product declarations - Core rules for ,the product category of construction products

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