

Statement of Verification

BREG EN EPD No.: 000547

Issue 01

This is to verify that the
Environmental Product Declaration
provided by:
Forterra Building Products

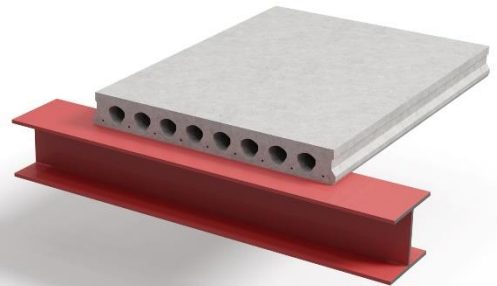


is in accordance with the requirements of:
EN 15804:2012+A2:2019
and
BRE Global Scheme Document SD207

This declaration is for:
1m² of Hollowcore Cem II Flooring Slabs

Company Address

Forterra Building Products
Northampton
5 Grange Park Court, Roman Way
Northamptonshire
NN4 5EA



a Forterra brand

Emma Baker
Operator

16 January 2024
Date of this Issue

16 January 2024
Date of First Issue

15 January 2029
Expiry Date



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Environmental Product Declaration

EPD Number: 000547

General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom	BRE 2021 Product Category Rules (PN 514 Rev 3.0) for Type III environmental product declaration of construction products to EN 15804:2012+A2:2019.
Commissioner of LCA study	LCA consultant/Tool
Forterra Building Products Northampton 5 Grange Park Court, Roman Way Northamptonshire NN4 5EA United Kingdom	LCA consultant: Joseph Gosling Tool: BRE LINA A2
Declared/Functional Unit	Applicability/Coverage
1m ² of Hollowcore Cem II Flooring Slabs	Product Specific.
EPD Type	Background database
Cradle to Grave	ecoinvent v3.8
Demonstration of Verification	
CEN standard EN 15804 serves as the core PCR ^a	
Independent verification of the declaration and data according to EN ISO 14025:2010 <input type="checkbox"/> Internal <input checked="" type="checkbox"/> External	
(Where appropriate ^b)Third party verifier: Pat Hermon	
a: Product category rules b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)	
Comparability	
Environmental product declarations from different programmes may not be comparable if not compliant with EN 15804:2012+A2:2019. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See Clause 5.3 of EN 15804:2012+A2:2019 for further guidance	

Information modules covered

Product			Construction		Use stage							End-of-life				Benefits and loads beyond the system boundary
A1	A2	A3	A4	A5	Related to the building fabric					Related to the building		C1	C2	C3	C4	D
Raw materials supply	Transport	Manufacturing	Transport to site	Construction – Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse, Recovery and/or Recycling potential
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Note: Ticks indicate the Information Modules declared.

Manufacturing site(s)

Hollowcore products manufactured by Forterra Building Products are solely produced at one site.

Hoveringham Works
 Thurgaton Lane
 Nottingham
 NG14 7JX
 United Kingdom

Construction Product:

Product Description

Concrete Hollowcore products are made from limestone, sand, cement, prestressed steel, water, and (if required) admixtures. Hollowcore is a flooring product used in a range of structures and sold in m².

Technical Information

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Property	Value, Unit
Concrete Compressive Strength	C50/60 (N/mm ²)
Wire/Strand Ultimate Tensile Strength	1770 (N/mm ²)
Tensile 0.1% Proof stress	1470 (N/mm ²)
Reaction to fire	Class A1
Dangerous Substances	NPD



Main Product Contents

Material/Chemical Input	%
Limestone	39.5
Sand	32.6
Cement	18.5
Steel	1.7
Water	7.4
Admix	0.3

Manufacturing Process

The process of manufacturing Hollowcore starts with planning and designing the Hollowcore units and procuring the raw materials required.

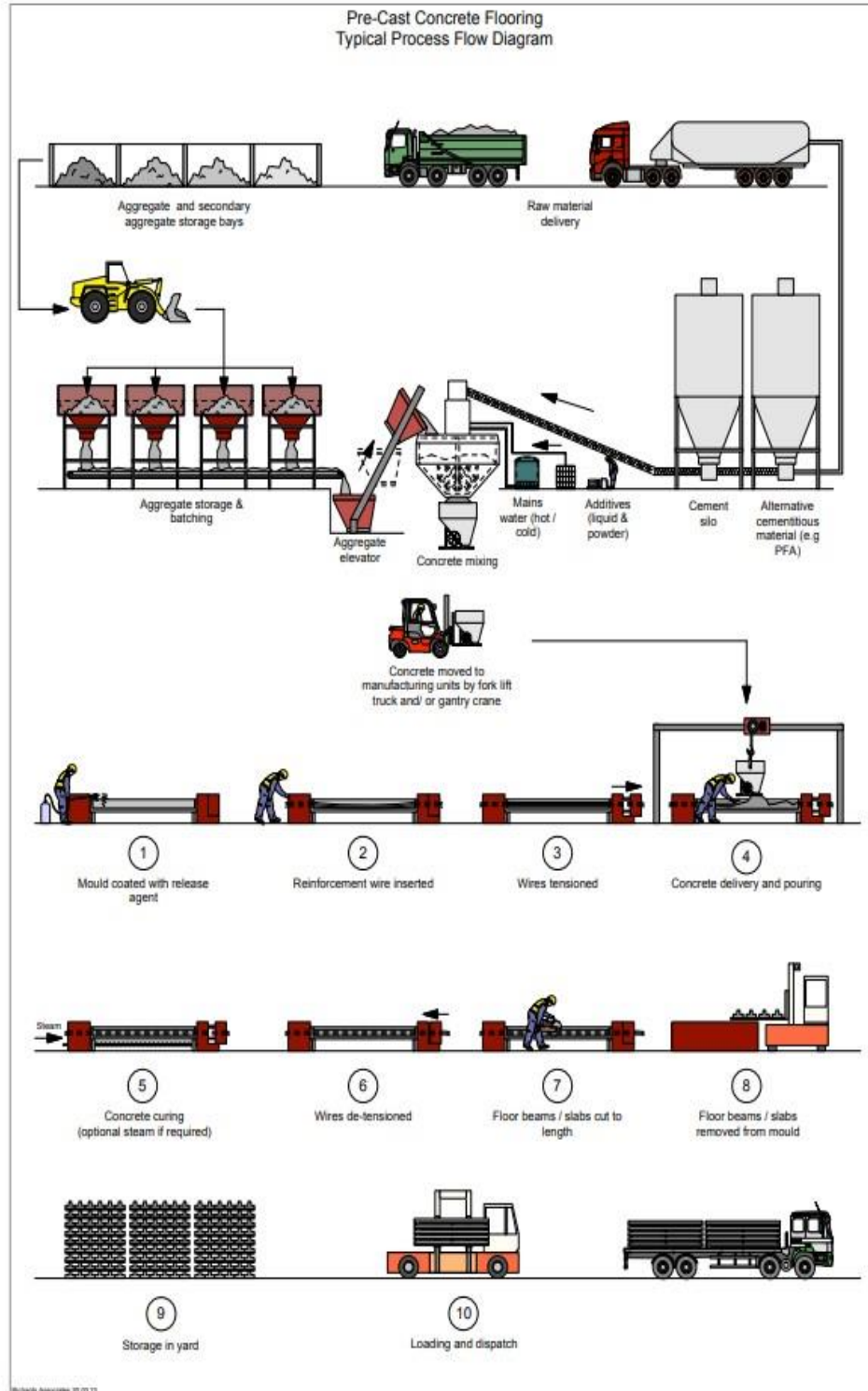
sand, cement, limestone aggregate and gravel aggregates are procured from local suppliers. The raw materials are transported to plant and short term stored on site. The next stage of the process is for the raw materials to be mixed in a concrete mixer, whilst the steel strand/wire is ran down the length of the bed in preparation for tensioning. The strand/wire is tensioned using a hydraulic pump. The concrete mixture will be then transported to a casting machine.

After the concrete is delivered to the casting machine, this will be extruded on the casting bed. The concrete mixture used for this process is a dry concrete mix, with low cement content.

Once cast, this slab will be covered and left for curing for 16-24hrs. When the slab reaches the desired strength, the steel strand/wire will be de-tensioned and wet saw cut to the desired lengths on the bed. An additional cutting station is available on site to cut any product from stock. The slabs will be lifted from the bed and transported to the yard and placed on timber bearers. Here they are stocked until ready for delivery. Tickets are attached on the slabs in the factory for easy identification. The last step of the process is for the product to be loaded on trailers and delivered to site.

Any waste is transported to the designated waste part of the site, where the concrete will be separated from steel and transported to a third-party for recycling.

Process flow diagram



Construction Installation

The Hollowcore flooring slabs are delivered to site by truck. Whilst on the truck, the lifting device will be attached to the product and secured with a chain, the slab is then lifted and set in position. At this point the chains are detached and the Hollowcore slab lowered onto the bearings.

Use Information

Given the nature of the product and its application in the structure of the building, no impacts are associated with use stage of concrete over the lifetime of the building.

End of Life

At the end of life, the concrete products are deconstructed using heavy machinery, placed onto trucks, and transported to the relevant waste processing sites. At the site the waste undergoes crushing to prepare it for disposal where it is assumed that 90% of the waste is recycled and 10% is landfilled.

Life Cycle Assessment Calculation Rules

Declared / Functional unit description

1m² of Hollowcore Cem II Flooring Slabs.

System boundary

This Cradle to Grave EPD has assessed in accordance with the modular approach as defined in EN15804:2012+A2:2019 and includes the processes covered in the manufacturing site and product stage A1 to A3, A4, A5, B, C and D. Life cycle stages B2 - B7 have been omitted as the precast concrete prestressed Hollowcore slab covered by this EPD does not require maintenance, repair, replacement or refurbishment during its lifetime.

Data sources, quality, and allocation

Specific primary data derived from Forterra Building Products' production process in Hoveringham Works, Thurgaton Lane, Nottingham, NG14 7JX factory, have been modelled using the LINA LCA A2 software A2 and the ecoinvent 3.8 database. In accordance with the requirements of EN 15804:2012+A2:2019, the most current available data has been used. The manufacturer-specific data from Forterra Building Products covers a period of one year (01/01/2022 – 31/12/2022). Secondary data has been obtained for all other upstream and downstream processes that are beyond the control of the manufacturer (i.e. raw material production) from the ecoinvent 3.8 database. All ecoinvent datasets are complete within the context used and conform to the system boundary and the criteria for the exclusion of inputs and outputs, according to the requirements specified in EN 15804:2012+A2:2019.

This LCA covers the Hollowcore Cem II series including Hollowcore A150 Cem II, A150H Cem II, A150HN Cem II, A159H Cem II, A200 Cem II and A209 Cem II. Forterra manufactures other products in addition to Hollowcore Cem II series (Forterra Hoveringham), therefore an allocation of fuel, water, material usage, and waste emissions are required. The allocation has been made based on the total production output of Forterra Hoveringham factory and weighted accordingly by mass. All the input and output materials such as, transportation, energy, water use and wastes are included according to the provisions of the BRE PCR PN514 and EN 15804:2012+A2:2019. Only exceptions are packaging and emissions to air, water & soil. Site wide values for energy, water and wastewater have been taken from bills. Figures for the raw materials, ancillary materials were from actual usages.

Quality Level	Geographical representativeness	Technical representativeness	Time representativeness
Very Good	Data from area under study.	Data from processes and products under study. Same state of technology applied as defined in goal and scope (i.e. identical technology).	There is less than 5 years between the ecoinvent LCI reference year, and the time period for which the LCA was undertaken.

Specific UK datasets have been selected from the ecoinvent LCI for this LCA. The quality level of geographical and technical representativeness is therefore good. The quality level of time representativeness is good as the background LCI datasets are based on ecoinvent v3.8 which was compiled in 2021. Therefore, there is less than 5 years between the ecoinvent LCI reference year and the time period for which the LCA was undertaken.

Consumption mix was used for energy with an emissions factor of 0.239kgCO₂e/kWh for electricity. No gas is used in the manufacturing process or for any other processes such as heating.

Cut-off criteria

All processes associated with the manufacturing process have been included. All inputs or outputs have been included and all raw materials, transport, energy, water use and wastes, are included, except for packaging and direct emissions to air, water and soil, which are not measured. Upstream extraction and/or processing of inputs are included within the use of the background datasets within LINA.

LCA Results A150

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts			GWP-total	GWP-fossil	GWP-biogenic	GWP-luluc	ODP	AP	EP-freshwater
			kg CO ₂ eq	kg CO ₂ eq	kg CO ₂ eq	kg CO ₂ eq	kg CFC11 eq	mol H ⁺ eq	kg (PO ₄) ³⁻ eq
Product stage	Raw material supply	A1	4.58E+01	4.53E+01	3.90E-01	1.97E-02	1.82E-06	1.53E-01	8.53E-03
	Transport	A2	2.16E+00	2.16E+00	2.01E-03	8.05E-04	5.11E-07	1.08E-02	1.33E-04
	Manufacturing	A3	2.08E+00	2.05E+00	2.96E-02	6.07E-04	3.76E-07	1.77E-02	1.12E-04
	Total (of product stage)	A1-3	5.00E+01	4.95E+01	4.22E-01	2.11E-02	2.70E-06	1.81E-01	8.78E-03
Construction process stage	Transport	A4	4.16E+00	4.16E+00	4.04E-03	1.50E-03	9.93E-07	1.74E-02	2.59E-04
	Construction	A5	1.26E-04	1.25E-04	4.06E-07	2.73E-08	1.96E-11	9.99E-07	1.04E-08
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	2.33E+00	2.33E+00	4.67E-04	1.32E-04	2.82E-07	1.37E-02	4.10E-05
	Transport	C2	3.32E-01	3.32E-01	3.22E-04	1.19E-04	7.93E-08	1.39E-03	2.07E-05
	Waste processing	C3	9.61E-01	9.61E-01	3.18E-04	8.99E-05	1.92E-07	9.36E-03	2.79E-05
	Disposal	C4	1.28E-01	1.28E-01	1.27E-04	1.21E-04	5.18E-08	1.20E-03	1.17E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-8.79E+00	-8.77E+00	-7.21E-03	-6.93E-03	-4.62E-07	-3.83E-02	-4.06E-03

GWP-total = Global warming potential, total;
 GWP-fossil = Global warming potential, fossil;
 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; and
 EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment

LCA Results (continued) A150

Parameters describing environmental impacts			EP-marine	EP-terrestrial	POCP	ADP-mineral & metals	ADP-fossil	WDP	PM
			kg N eq	mol N eq	kg NMVOC eq	kg Sb eq	MJ, net calorific value	m ³ world eq deprived	disease incidence
Product stage	Raw material supply	A1	4.05E-02	4.67E-01	1.32E-01	1.84E-04	2.76E+02	1.32E+01	1.59E-06
	Transport	A2	3.17E-03	3.47E-02	1.08E-02	5.08E-06	3.34E+01	1.58E-01	2.43E-07
	Manufacturing	A3	7.72E-03	8.42E-02	2.31E-02	3.47E-06	3.33E+01	8.76E-02	4.91E-07
	Total (of product stage)	A1-3	5.13E-02	5.86E-01	1.66E-01	1.93E-04	3.42E+02	1.35E+01	2.32E-06
Construction process stage	Transport	A4	5.29E-03	5.79E-02	1.86E-02	9.54E-06	6.48E+01	3.13E-01	4.89E-07
	Construction	A5	4.16E-07	4.58E-06	1.26E-06	2.14E-10	1.41E-03	1.48E-05	1.73E-10
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	6.07E-03	6.65E-02	1.83E-02	6.86E-07	1.81E+01	4.19E-02	3.67E-07
	Transport	C2	4.22E-04	4.62E-03	1.49E-03	7.61E-07	5.17E+00	2.50E-02	3.90E-08
	Waste processing	C3	4.15E-03	4.54E-02	1.25E-02	4.63E-07	1.24E+01	2.86E-02	2.51E-07
	Disposal	C4	4.18E-04	4.58E-03	1.33E-03	2.92E-07	3.57E+00	1.64E-01	2.42E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-9.08E-03	-9.94E-02	-4.14E-02	-2.64E-05	-9.41E+01	-5.11E+00	-6.76E-07

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;
 EP-terrestrial = Eutrophication potential, accumulated exceedance;
 POCP = Formation potential of tropospheric ozone;
 ADP-mineral&metals = Abiotic depletion potential for non-fossil resources;

ADP-fossil = Depletion potential of the stratospheric ozone layer;
 WDP = Water (user) deprivation potential, deprivation-weighted water consumption; and
 PM = Particulate matter.

LCA Results (continued) A150

Parameters describing environmental impacts			IRP	ETP-fw	HTP-c	HTP-nc	SQP
			kBq U ²³⁵ eq	CTUe	CTUh	CTUh	dimensionless
Product stage	Raw material supply	A1	1.35E+00	9.55E+02	6.68E-08	5.21E-07	1.43E+02
	Transport	A2	1.69E-01	2.59E+01	7.51E-10	2.81E-08	3.63E+01
	Manufacturing	A3	4.69E-01	1.87E+01	6.52E-10	1.30E-08	7.01E+00
	Total (of product stage)	A1-3	1.99E+00	1.00E+03	6.82E-08	5.62E-07	1.86E+02
Construction process stage	Transport	A4	3.28E-01	5.06E+01	1.40E-09	5.54E-08	7.42E+01
	Construction	A5	6.89E-06	1.55E-03	8.63E-14	9.74E-13	3.09E-04
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	8.16E-02	1.06E+01	4.10E-10	7.70E-09	2.33E+00
	Transport	C2	2.62E-02	4.04E+00	1.12E-10	4.42E-09	5.92E+00
	Waste processing	C3	5.57E-02	7.23E+00	2.80E-10	5.24E-09	1.57E+00
	Disposal	C4	1.59E-02	2.26E+00	5.73E-11	1.48E-09	7.50E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-5.79E-01	-2.26E+02	-4.27E-08	-1.77E-07	-4.29E+01

IRP = Potential human exposure efficiency relative to U235;
 ETP-fw = Potential comparative toxic unit for ecosystems;
 HTP-c = Potential comparative toxic unit for humans;

HTP-nc = Potential comparative toxic unit for humans; and
 SQP = Potential soil quality index.

LCA Results (continued) A150

			Parameters describing resource use, primary energy					
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	1.65E+01	0.00E+00	1.65E+01	2.72E+02	1.05E+00	2.73E+02
	Transport	A2	4.17E-01	0.00E+00	4.17E-01	3.20E+01	0.00E+00	3.20E+01
	Manufacturing	A3	2.59E+00	2.33E-01	2.82E+00	3.62E+01	1.65E-01	3.64E+01
	Total (of product stage)	A1-3	1.95E+01	2.33E-01	1.97E+01	3.40E+02	1.21E+00	3.41E+02
Construction process stage	Transport	A4	8.25E-01	0.00E+00	8.25E-01	6.36E+01	0.00E+00	6.36E+01
	Construction	A5	2.37E-05	2.10E-07	2.39E-05	1.39E-03	1.09E-06	1.39E-03
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	1.02E-01	0.00E+00	1.02E-01	1.78E+01	0.00E+00	1.78E+01
	Transport	C2	6.58E-02	0.00E+00	6.58E-02	5.08E+00	0.00E+00	5.08E+00
	Waste processing	C3	6.92E-02	0.00E+00	6.92E-02	1.21E+01	0.00E+00	1.21E+01
	Disposal	C4	3.05E-02	0.00E+00	3.05E-02	3.51E+00	0.00E+00	3.51E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-4.62E+00	0.00E+00	-4.62E+00	-9.32E+01	0.00E+00	-9.32E+01

PERE = Use of renewable primary energy excluding renewable primary energy used as raw materials;
 PERM = Use of renewable primary energy resources used as raw materials;
 PERT = Total use of renewable primary energy resources;

PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials;
 PENRM = Use of non-renewable primary energy resources used as raw materials;
 PENRT = Total use of non-renewable primary energy resource

LCA Results (continued) A150

Parameters describing resource use, secondary materials and fuels, use of water			SM	RSF	NRSF	FW
			kg	MJ net calorific value	MJ net calorific value	m ³
Product stage	Raw material supply	A1	4.36E-03	0.00E+00	0.00E+00	3.17E-01
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	3.90E-03
	Manufacturing	A3	9.61E-03	9.76E-06	0.00E+00	3.97E-03
	Total (of product stage)	A1-3	1.40E-02	9.76E-06	0.00E+00	3.25E-01
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	7.71E-03
	Construction	A5	1.14E-08	0.00E+00	0.00E+00	3.56E-07
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	6.93E-03	0.00E+00	0.00E+00	1.04E-03
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	6.15E-04
	Waste processing	C3	4.74E-03	0.00E+00	0.00E+00	7.05E-04
	Disposal	C4	1.21E-05	0.00E+00	0.00E+00	3.83E-03
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-1.21E-01

SM = Use of secondary material;
RSF = Use of renewable secondary fuels;

NRSF = Use of non-renewable secondary fuels;
FW = Net use of fresh water

LCA Results (continued) A150

Other environmental information describing waste categories			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	3.16E+00	3.60E+01	8.64E-04
	Transport	A2	3.44E-02	5.99E-01	2.02E+02
	Manufacturing	A3	4.66E-02	5.08E-01	2.48E-04
	Total (of product stage)	A1-3	3.24E+00	3.71E+01	2.02E+02
Construction process stage	Transport	A4	6.83E-02	1.19E+00	4.35E+02
	Construction	A5	4.37E-06	4.37E-05	1.82E-04
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	2.38E-02	1.68E-01	1.25E-04
	Transport	C2	5.45E-03	9.47E-02	3.47E+01
	Waste processing	C3	1.62E-02	1.14E-01	8.52E-05
	Disposal	C4	3.72E-03	5.25E-02	2.34E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.45E+00	-1.57E+01	-2.43E-04

HWD = Hazardous waste disposed;
 NHWD = Non-hazardous waste disposed;
 RWD = Radioactive waste disposed

LCA Results (continued) A150

Other environmental information describing output flows – at end of life			CRU	MFR	MER	EE	Biogenic carbon (product)	Biogenic carbon (packaging)
			kg	kg	kg	MJ per energy carrier	kg C	kg C
Product stage	Raw material supply	A1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Manufacturing	A3	0.00E+00	8.77E-02	7.19E-08	7.77E-03	8.61E-03	0.00E+00
	Total (of product stage)	A1-3	0.00E+00	8.77E-02	7.19E-08	7.77E-03	8.61E-03	0.00E+00
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Construction	A5	0.00E+00	7.88E-08	0.00E+00	0.00E+00	7.75E-09	0.00E+00
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Waste processing	C3	0.00E+00	2.19E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

LCA Results A150H

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts			GWP-total	GWP-fossil	GWP-biogenic	GWP-luluc	ODP	AP	EP-freshwater
			kg CO ₂ eq	kg CO ₂ eq	kg CO ₂ eq	kg CO ₂ eq	kg CFC11 eq	mol H ⁺ eq	kg (PO ₄) ³⁻ eq
Product stage	Raw material supply	A1	5.55E+01	5.50E+01	4.93E-01	2.32E-02	2.18E-06	1.83E-01	9.71E-03
	Transport	A2	2.61E+00	2.60E+00	2.46E-03	9.60E-04	6.19E-07	1.27E-02	1.60E-04
	Manufacturing	A3	2.62E+00	2.58E+00	3.72E-02	7.65E-04	4.74E-07	2.22E-02	1.41E-04
	Total (of product stage)	A1-3	6.07E+01	6.01E+01	5.33E-01	2.49E-02	3.27E-06	2.18E-01	1.00E-02
Construction process stage	Transport	A4	5.27E+00	5.26E+00	5.11E-03	1.89E-03	1.26E-06	2.20E-02	3.27E-04
	Construction	A5	1.75E-04	1.75E-04	5.19E-07	3.48E-08	2.87E-11	1.45E-06	1.28E-08
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	2.94E+00	2.93E+00	5.89E-04	1.67E-04	3.56E-07	1.73E-02	5.17E-05
	Transport	C2	4.20E-01	4.20E-01	4.08E-04	1.51E-04	1.00E-07	1.75E-03	2.61E-05
	Waste processing	C3	1.16E+00	1.16E+00	3.82E-04	1.08E-04	2.31E-07	1.12E-02	3.35E-05
	Disposal	C4	1.62E-01	1.62E-01	1.60E-04	1.53E-04	6.54E-08	1.52E-03	1.48E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-9.27E+00	-9.24E+00	-1.33E-02	-7.60E-03	-5.00E-07	-4.14E-02	-4.31E-03

GWP-total = Global warming potential, total;
 GWP-fossil = Global warming potential, fossil;
 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; and
 EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment

LCA Results (continued) A150H

Parameters describing environmental impacts			EP-marine	EP-terrestrial	POCP	ADP-mineral & metals	ADP-fossil	WDP	PM
			kg N eq	mol N eq	kg NMVOC eq	kg Sb eq	MJ, net calorific value	m ³ world eq deprived	disease incidence
Product stage	Raw material supply	A1	4.89E-02	5.67E-01	1.56E-01	2.20E-04	3.24E+02	1.57E+01	1.82E-06
	Transport	A2	3.74E-03	4.10E-02	1.28E-02	5.93E-06	4.04E+01	1.93E-01	3.00E-07
	Manufacturing	A3	9.72E-03	1.06E-01	2.90E-02	4.37E-06	4.19E+01	1.10E-01	6.18E-07
	Total (of product stage)	A1-3	6.23E-02	7.14E-01	1.98E-01	2.30E-04	4.06E+02	1.60E+01	2.74E-06
Construction process stage	Transport	A4	6.70E-03	7.32E-02	2.36E-02	1.21E-05	8.20E+01	3.96E-01	6.19E-07
	Construction	A5	6.11E-07	6.72E-06	1.85E-06	2.68E-10	2.02E-03	1.83E-05	2.59E-10
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	7.65E-03	8.38E-02	2.31E-02	8.66E-07	2.28E+01	5.29E-02	4.63E-07
	Transport	C2	5.34E-04	5.84E-03	1.88E-03	9.62E-07	6.54E+00	3.16E-02	4.94E-08
	Waste processing	C3	4.98E-03	5.46E-02	1.50E-02	5.57E-07	1.49E+01	3.43E-02	3.01E-07
	Disposal	C4	5.29E-04	5.79E-03	1.68E-03	3.69E-07	4.52E+00	2.07E-01	3.06E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-9.78E-03	-1.08E-01	-4.36E-02	-3.09E-05	-1.01E+02	-6.02E+00	-7.15E-07

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;
 EP-terrestrial = Eutrophication potential, accumulated exceedance;
 POCP = Formation potential of tropospheric ozone;
 ADP-mineral&metals = Abiotic depletion potential for non-fossil resources;

ADP-fossil = Depletion potential of the stratospheric ozone layer;
 WDP = Water (user) deprivation potential, deprivation-weighted water consumption; and
 PM = Particulate matter.

LCA Results (continued) A150H

Parameters describing environmental impacts			IRP	ETP-fw	HTP-c	HTP-nc	SQP
			kBq U ²³⁵ eq	CTUe	CTUh	CTUh	dimensionless
Product stage	Raw material supply	A1	1.60E+00	1.14E+03	6.90E-08	5.99E-07	1.73E+02
	Transport	A2	2.04E-01	3.14E+01	8.94E-10	3.41E-08	4.52E+01
	Manufacturing	A3	5.91E-01	2.35E+01	8.22E-10	1.64E-08	8.82E+00
	Total (of product stage)	A1-3	2.39E+00	1.20E+03	7.07E-08	6.50E-07	2.27E+02
Construction process stage	Transport	A4	4.15E-01	6.40E+01	1.77E-09	7.01E-08	9.38E+01
	Construction	A5	9.78E-06	2.05E-03	1.01E-13	1.29E-12	4.17E-04
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	1.03E-01	1.34E+01	5.17E-10	9.71E-09	2.94E+00
	Transport	C2	3.31E-02	5.11E+00	1.41E-10	5.59E-09	7.48E+00
	Waste processing	C3	6.69E-02	8.69E+00	3.36E-10	6.30E-09	1.89E+00
	Disposal	C4	2.01E-02	2.85E+00	7.24E-11	1.88E-09	9.48E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-6.87E-01	-2.34E+02	-4.32E-08	-1.85E-07	-4.93E+01

IRP = Potential human exposure efficiency relative to U235;
 ETP-fw = Potential comparative toxic unit for ecosystems;
 HTP-c = Potential comparative toxic unit for humans;

HTP-nc = Potential comparative toxic unit for humans; and
 SQP = Potential soil quality index.

LCA Results (continued) A150H

			Parameters describing resource use, primary energy					
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	1.94E+01	0.00E+00	1.94E+01	3.19E+02	1.33E+00	3.20E+02
	Transport	A2	5.04E-01	0.00E+00	5.04E-01	3.88E+01	0.00E+00	3.88E+01
	Manufacturing	A3	3.26E+00	2.94E-01	3.55E+00	4.56E+01	2.09E-01	4.59E+01
	Total (of product stage)	A1-3	2.31E+01	2.94E-01	2.34E+01	4.04E+02	1.54E+00	4.05E+02
Construction process stage	Transport	A4	1.04E+00	0.00E+00	1.04E+00	8.05E+01	0.00E+00	8.05E+01
	Construction	A5	3.01E-05	2.64E-07	3.03E-05	1.99E-03	1.38E-06	1.99E-03
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	1.28E-01	0.00E+00	1.28E-01	2.24E+01	0.00E+00	2.24E+01
	Transport	C2	8.32E-02	0.00E+00	8.32E-02	6.42E+00	0.00E+00	6.42E+00
	Waste processing	C3	8.32E-02	0.00E+00	8.32E-02	1.46E+01	0.00E+00	1.46E+01
	Disposal	C4	3.85E-02	0.00E+00	3.85E-02	4.43E+00	0.00E+00	4.43E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-5.28E+00	0.00E+00	-5.28E+00	-1.00E+02	0.00E+00	-1.00E+02

PERE = Use of renewable primary energy excluding renewable primary energy used as raw materials;
 PERM = Use of renewable primary energy resources used as raw materials;
 PERT = Total use of renewable primary energy resources;

PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials;
 PENRM = Use of non-renewable primary energy resources used as raw materials;
 PENRT = Total use of non-renewable primary energy resource

LCA Results (continued) A150H

Parameters describing resource use, secondary materials and fuels, use of water			SM	RSF	NRSF	FW
			kg	MJ net calorific value	MJ net calorific value	m ³
Product stage	Raw material supply	A1	5.51E-03	0.00E+00	0.00E+00	3.77E-01
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	4.75E-03
	Manufacturing	A3	1.21E-02	1.23E-05	0.00E+00	5.00E-03
	Total (of product stage)	A1-3	1.76E-02	1.23E-05	0.00E+00	3.87E-01
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	9.75E-03
	Construction	A5	1.44E-08	0.00E+00	0.00E+00	4.42E-07
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	8.75E-03	0.00E+00	0.00E+00	1.31E-03
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	7.78E-04
	Waste processing	C3	5.69E-03	0.00E+00	0.00E+00	8.47E-04
	Disposal	C4	1.21E-05	0.00E+00	0.00E+00	4.84E-03
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-1.43E-01

SM = Use of secondary material;
RSF = Use of renewable secondary fuels;

NRSF = Use of non-renewable secondary fuels;
FW = Net use of fresh water

LCA Results (continued) A150H

Other environmental information describing waste categories			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	3.35E+00	4.15E+01	1.04E-03
	Transport	A2	4.17E-02	7.25E-01	2.63E+02
	Manufacturing	A3	5.88E-02	6.40E-01	3.12E-04
	Total (of product stage)	A1-3	3.45E+00	4.28E+01	2.63E+02
Construction process stage	Transport	A4	8.64E-02	1.50E+00	5.49E+02
	Construction	A5	5.30E-06	5.40E-05	2.37E-04
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	3.00E-02	2.11E-01	1.57E-04
	Transport	C2	6.89E-03	1.20E-01	4.38E+01
	Waste processing	C3	1.95E-02	1.37E-01	1.02E-04
	Disposal	C4	4.70E-03	6.63E-02	2.96E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.49E+00	-1.69E+01	-2.79E-04

HWD = Hazardous waste disposed;
 NHWD = Non-hazardous waste disposed;
 RWD = Radioactive waste disposed

LCA Results (continued) A150H

Other environmental information describing output flows – at end of life			CRU	MFR	MER	EE	Biogenic carbon (product)	Biogenic carbon (packaging)
			kg	kg	kg	MJ per energy carrier	kg C	kg C
Product stage	Raw material supply	A1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Manufacturing	A3	0.00E+00	8.78E-02	9.06E-08	9.80E-03	1.08E-02	0.00E+00
	Total (of product stage)	A1-3	0.00E+00	8.78E-02	9.06E-08	9.80E-03	1.08E-02	0.00E+00
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Construction	A5	0.00E+00	7.88E-08	0.00E+00	0.00E+00	9.76E-09	0.00E+00
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Waste processing	C3	0.00E+00	2.76E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

LCA Results A159H

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts			GWP-total	GWP-fossil	GWP-biogenic	GWP-luluc	ODP	AP	EP-freshwater
			kg CO ₂ eq	kg CO ₂ eq	kg CO ₂ eq	kg CO ₂ eq	kg CFC11 eq	mol H ⁺ eq	kg (PO ₄) ³⁻ eq
Product stage	Raw material supply	A1	5.18E+01	5.13E+01	4.93E-01	2.04E-02	1.99E-06	1.68E-01	7.98E-03
	Transport	A2	2.55E+00	2.55E+00	2.44E-03	9.31E-04	6.07E-07	1.17E-02	1.58E-04
	Manufacturing	A3	2.61E+00	2.57E+00	3.71E-02	7.61E-04	4.71E-07	2.21E-02	1.41E-04
	Total (of product stage)	A1-3	5.69E+01	5.64E+01	5.33E-01	2.21E-02	3.07E-06	2.02E-01	8.28E-03
Construction process stage	Transport	A4	5.28E+00	5.27E+00	5.12E-03	1.90E-03	1.26E-06	2.20E-02	3.28E-04
	Construction	A5	1.72E-04	1.71E-04	5.19E-07	3.23E-08	2.85E-11	1.44E-06	1.12E-08
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	2.92E+00	2.92E+00	5.87E-04	1.66E-04	3.54E-07	1.72E-02	5.15E-05
	Transport	C2	4.21E-01	4.21E-01	4.09E-04	1.51E-04	1.00E-07	1.76E-03	2.62E-05
	Waste processing	C3	1.07E+00	1.07E+00	3.50E-04	9.91E-05	2.12E-07	1.03E-02	3.07E-05
	Disposal	C4	1.61E-01	1.61E-01	1.59E-04	1.52E-04	6.50E-08	1.51E-03	1.47E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-6.33E+00	-6.31E+00	-2.01E-02	-5.75E-03	-3.67E-07	-3.01E-02	-3.02E-03

GWP-total = Global warming potential, total;
 GWP-fossil = Global warming potential, fossil;
 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; and
 EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment

LCA Results (continued) A159H

Parameters describing environmental impacts			EP-marine	EP-terrestrial	POCP	ADP-mineral & metals	ADP-fossil	WDP	PM
			kg N eq	mol N eq	kg NMVOC eq	kg Sb eq	MJ, net calorific value	m ³ world eq deprived	disease incidence
Product stage	Raw material supply	A1	4.53E-02	5.31E-01	1.39E-01	2.00E-04	2.84E+02	1.41E+01	1.52E-06
	Transport	A2	3.49E-03	3.82E-02	1.21E-02	5.84E-06	3.96E+01	1.90E-01	2.96E-07
	Manufacturing	A3	9.67E-03	1.06E-01	2.89E-02	4.35E-06	4.17E+01	1.10E-01	6.15E-07
	Total (of product stage)	A1-3	5.84E-02	6.75E-01	1.80E-01	2.10E-04	3.66E+02	1.44E+01	2.44E-06
Construction process stage	Transport	A4	6.71E-03	7.34E-02	2.36E-02	1.21E-05	8.22E+01	3.97E-01	6.20E-07
	Construction	A5	6.08E-07	6.69E-06	1.83E-06	2.50E-10	1.99E-03	1.69E-05	2.59E-10
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	7.62E-03	8.35E-02	2.30E-02	8.62E-07	2.28E+01	5.27E-02	4.61E-07
	Transport	C2	5.35E-04	5.85E-03	1.88E-03	9.64E-07	6.56E+00	3.17E-02	4.95E-08
	Waste processing	C3	4.57E-03	5.01E-02	1.38E-02	5.11E-07	1.36E+01	3.15E-02	2.76E-07
	Disposal	C4	5.25E-04	5.75E-03	1.67E-03	3.66E-07	4.49E+00	2.06E-01	3.04E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-7.08E-03	-7.95E-02	-2.96E-02	-2.69E-05	-7.26E+01	-5.32E+00	-4.92E-07

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;
 EP-terrestrial = Eutrophication potential, accumulated exceedance;
 POCP = Formation potential of tropospheric ozone;
 ADP-mineral&metals = Abiotic depletion potential for non-fossil resources;

ADP-fossil = Depletion potential of the stratospheric ozone layer;
 WDP = Water (user) deprivation potential, deprivation-weighted water consumption; and
 PM = Particulate matter.

LCA Results (continued) A159H

Parameters describing environmental impacts			IRP	ETP-fw	HTP-c	HTP-nc	SQP
			kBq U ²³⁵ eq	CTUe	CTUh	CTUh	dimensionless
Product stage	Raw material supply	A1	1.42E+00	1.03E+03	4.40E-08	5.05E-07	1.62E+02
	Transport	A2	2.00E-01	3.09E+01	8.69E-10	3.36E-08	4.47E+01
	Manufacturing	A3	5.89E-01	2.34E+01	8.18E-10	1.63E-08	8.79E+00
	Total (of product stage)	A1-3	2.21E+00	1.09E+03	4.57E-08	5.55E-07	2.16E+02
Construction process stage	Transport	A4	4.16E-01	6.42E+01	1.78E-09	7.02E-08	9.40E+01
	Construction	A5	9.61E-06	1.95E-03	7.86E-14	1.20E-12	4.06E-04
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	1.03E-01	1.33E+01	5.15E-10	9.67E-09	2.92E+00
	Transport	C2	3.32E-02	5.12E+00	1.42E-10	5.60E-09	7.50E+00
	Waste processing	C3	6.14E-02	7.97E+00	3.08E-10	5.78E-09	1.73E+00
	Disposal	C4	1.99E-02	2.83E+00	7.19E-11	1.86E-09	9.42E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-6.16E-01	-1.52E+02	-2.59E-08	-1.24E-07	-4.15E+01

IRP = Potential human exposure efficiency relative to U235;
 ETP-fw = Potential comparative toxic unit for ecosystems;
 HTP-c = Potential comparative toxic unit for humans;

HTP-nc = Potential comparative toxic unit for humans; and
 SQP = Potential soil quality index.

LCA Results (continued) A159H

			Parameters describing resource use, primary energy					
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	1.70E+01	0.00E+00	1.70E+01	2.80E+02	1.33E+00	2.82E+02
	Transport	A2	4.99E-01	0.00E+00	4.99E-01	3.84E+01	0.00E+00	3.84E+01
	Manufacturing	A3	3.25E+00	2.93E-01	3.54E+00	4.54E+01	2.08E-01	4.56E+01
	Total (of product stage)	A1-3	2.08E+01	2.93E-01	2.11E+01	3.64E+02	1.54E+00	3.66E+02
Construction process stage	Transport	A4	1.05E+00	0.00E+00	1.05E+00	8.07E+01	0.00E+00	8.07E+01
	Construction	A5	2.80E-05	2.63E-07	2.82E-05	1.95E-03	1.38E-06	1.95E-03
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	1.28E-01	0.00E+00	1.28E-01	2.23E+01	0.00E+00	2.23E+01
	Transport	C2	8.34E-02	0.00E+00	8.34E-02	6.44E+00	0.00E+00	6.44E+00
	Waste processing	C3	7.63E-02	0.00E+00	7.63E-02	1.34E+01	0.00E+00	1.34E+01
	Disposal	C4	3.82E-02	0.00E+00	3.82E-02	4.40E+00	0.00E+00	4.40E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-4.38E+00	0.00E+00	-4.38E+00	-7.21E+01	0.00E+00	-7.21E+01

PERE = Use of renewable primary energy excluding renewable primary energy used as raw materials;
 PERM = Use of renewable primary energy resources used as raw materials;
 PERT = Total use of renewable primary energy resources;

PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials;
 PENRM = Use of non-renewable primary energy resources used as raw materials;
 PENRT = Total use of non-renewable primary energy resource

LCA Results (continued) A159H

Parameters describing resource use, secondary materials and fuels, use of water			SM	RSF	NRSF	FW
			kg	MJ net calorific value	MJ net calorific value	m ³
Product stage	Raw material supply	A1	5.52E-03	0.00E+00	0.00E+00	3.38E-01
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	4.68E-03
	Manufacturing	A3	1.20E-02	1.22E-05	0.00E+00	4.97E-03
	Total (of product stage)	A1-3	1.76E-02	1.22E-05	0.00E+00	3.48E-01
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	9.77E-03
	Construction	A5	1.44E-08	0.00E+00	0.00E+00	4.08E-07
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	8.71E-03	0.00E+00	0.00E+00	1.30E-03
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	7.80E-04
	Waste processing	C3	5.22E-03	0.00E+00	0.00E+00	7.77E-04
	Disposal	C4	6.06E-06	0.00E+00	0.00E+00	4.81E-03
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-1.26E-01

SM = Use of secondary material;
RSF = Use of renewable secondary fuels;

NRSF = Use of non-renewable secondary fuels;
FW = Net use of fresh water

LCA Results (continued) A159H

Other environmental information describing waste categories			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	2.33E+00	3.51E+01	9.58E-04
	Transport	A2	4.13E-02	7.18E-01	2.60E+02
	Manufacturing	A3	5.85E-02	6.37E-01	3.11E-04
	Total (of product stage)	A1-3	2.43E+00	3.64E+01	2.60E+02
Construction process stage	Transport	A4	8.66E-02	1.50E+00	5.51E+02
	Construction	A5	4.37E-06	4.82E-05	2.34E-04
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	2.99E-02	2.10E-01	1.57E-04
	Transport	C2	6.91E-03	1.20E-01	4.39E+01
	Waste processing	C3	1.79E-02	1.26E-01	9.39E-05
	Disposal	C4	4.67E-03	6.59E-02	2.94E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-9.44E-01	-1.23E+01	-2.33E-04

HWD = Hazardous waste disposed;
 NHWD = Non-hazardous waste disposed;
 RWD = Radioactive waste disposed

LCA Results (continued) A159H

Other environmental information describing output flows – at end of life			CRU	MFR	MER	EE	Biogenic carbon (product)	Biogenic carbon (packaging)
			kg	kg	kg	MJ per energy carrier	kg C	kg C
Product stage	Raw material supply	A1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Manufacturing	A3	0.00E+00	5.03E-02	9.02E-08	9.76E-03	1.08E-02	0.00E+00
	Total (of product stage)	A1-3	0.00E+00	5.03E-02	9.02E-08	9.76E-03	1.08E-02	0.00E+00
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Construction	A5	0.00E+00	4.51E-08	0.00E+00	0.00E+00	9.72E-09	0.00E+00
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Waste processing	C3	0.00E+00	2.75E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

LCA Results A150HN

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts			GWP-total	GWP-fossil	GWP-biogenic	GWP-luluc	ODP	AP	EP-freshwater
			kg CO ₂ eq	kg CO ₂ eq	kg CO ₂ eq	kg CO ₂ eq	kg CFC11 eq	mol H ⁺ eq	kg (PO ₄) ³⁻ eq
Product stage	Raw material supply	A1	4.85E+01	4.80E+01	4.70E-01	1.89E-02	1.85E-06	1.57E-01	7.20E-03
	Transport	A2	2.42E+00	2.42E+00	2.31E-03	8.80E-04	5.76E-07	1.09E-02	1.50E-04
	Manufacturing	A3	2.50E+00	2.47E+00	3.56E-02	7.31E-04	4.53E-07	2.12E-02	1.35E-04
	Total (of product stage)	A1-3	5.34E+01	5.29E+01	5.08E-01	2.05E-02	2.88E-06	1.89E-01	7.49E-03
Construction process stage	Transport	A4	5.03E+00	5.02E+00	4.88E-03	1.81E-03	1.20E-06	2.10E-02	3.13E-04
	Construction	A5	1.69E-04	1.68E-04	4.96E-07	3.08E-08	2.84E-11	1.42E-06	1.05E-08
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	2.80E+00	2.80E+00	5.63E-04	1.60E-04	3.40E-07	1.65E-02	4.94E-05
	Transport	C2	4.01E-01	4.01E-01	3.90E-04	1.44E-04	9.57E-08	1.67E-03	2.50E-05
	Waste processing	C3	1.00E+00	1.00E+00	3.29E-04	9.29E-05	1.99E-07	9.67E-03	2.88E-05
	Disposal	C4	1.55E-01	1.55E-01	1.53E-04	1.46E-04	6.26E-08	1.46E-03	1.42E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-5.33E+00	-5.30E+00	-2.11E-02	-5.05E-03	-3.18E-07	-2.60E-02	-2.56E-03

GWP-total = Global warming potential, total;
 GWP-fossil = Global warming potential, fossil;
 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; and
 EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment

LCA Results (continued) A150HN

Parameters describing environmental impacts			EP-marine	EP-terrestrial	POCP	ADP-mineral & metals	ADP-fossil	WDP	PM
			kg N eq	mol N eq	kg NMVOC eq	kg Sb eq	MJ, net calorific value	m ³ world eq deprived	disease incidence
Product stage	Raw material supply	A1	4.23E-02	4.97E-01	1.28E-01	1.86E-04	2.62E+02	1.31E+01	1.38E-06
	Transport	A2	3.27E-03	3.58E-02	1.13E-02	5.54E-06	3.76E+01	1.81E-01	2.81E-07
	Manufacturing	A3	9.29E-03	1.01E-01	2.77E-02	4.18E-06	4.00E+01	1.05E-01	5.91E-07
	Total (of product stage)	A1-3	5.48E-02	6.34E-01	1.67E-01	1.95E-04	3.40E+02	1.34E+01	2.26E-06
Construction process stage	Transport	A4	6.40E-03	6.99E-02	2.25E-02	1.15E-05	7.83E+01	3.78E-01	5.91E-07
	Construction	A5	6.04E-07	6.65E-06	1.82E-06	2.37E-10	1.96E-03	1.60E-05	2.59E-10
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	7.32E-03	8.02E-02	2.20E-02	8.28E-07	2.18E+01	5.06E-02	4.43E-07
	Transport	C2	5.10E-04	5.58E-03	1.80E-03	9.19E-07	6.25E+00	3.02E-02	4.71E-08
	Waste processing	C3	4.28E-03	4.69E-02	1.29E-02	4.79E-07	1.28E+01	2.95E-02	2.59E-07
	Disposal	C4	5.06E-04	5.54E-03	1.61E-03	3.53E-07	4.32E+00	1.98E-01	2.93E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-6.11E-03	-6.91E-02	-2.49E-02	-2.49E-05	-6.24E+01	-4.93E+00	-4.15E-07

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;
 EP-terrestrial = Eutrophication potential, accumulated exceedance;
 POCP = Formation potential of tropospheric ozone;
 ADP-mineral&metals = Abiotic depletion potential for non-fossil resources;

ADP-fossil = Depletion potential of the stratospheric ozone layer;
 WDP = Water (user) deprivation potential, deprivation-weighted water consumption; and
 PM = Particulate matter.

LCA Results (continued) A150HN

Parameters describing environmental impacts			IRP	ETP-fw	HTP-c	HTP-nc	SQP
			kBq U ²³⁵ eq	CTUe	CTUh	CTUh	dimensionless
Product stage	Raw material supply	A1	1.31E+00	9.61E+02	3.63E-08	4.59E-07	1.52E+02
	Transport	A2	1.90E-01	2.93E+01	8.22E-10	3.19E-08	4.25E+01
	Manufacturing	A3	5.66E-01	2.25E+01	7.85E-10	1.56E-08	8.44E+00
	Total (of product stage)	A1-3	2.07E+00	1.01E+03	3.79E-08	5.07E-07	2.03E+02
Construction process stage	Transport	A4	3.96E-01	6.12E+01	1.69E-09	6.69E-08	8.96E+01
	Construction	A5	9.48E-06	1.88E-03	7.15E-14	1.16E-12	3.95E-04
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	9.85E-02	1.28E+01	4.94E-10	9.29E-09	2.81E+00
	Transport	C2	3.16E-02	4.88E+00	1.35E-10	5.34E-09	7.15E+00
	Waste processing	C3	5.75E-02	7.47E+00	2.89E-10	5.42E-09	1.63E+00
	Disposal	C4	1.92E-02	2.73E+00	6.93E-11	1.80E-09	9.08E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-5.73E-01	-1.24E+02	-2.05E-08	-1.04E-07	-3.79E+01

IRP = Potential human exposure efficiency relative to U235;
 ETP-fw = Potential comparative toxic unit for ecosystems;
 HTP-c = Potential comparative toxic unit for humans;

HTP-nc = Potential comparative toxic unit for humans; and
 SQP = Potential soil quality index.

LCA Results (continued) A150HN

			Parameters describing resource use, primary energy					
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	1.57E+01	0.00E+00	1.57E+01	2.58E+02	1.27E+00	2.59E+02
	Transport	A2	4.74E-01	0.00E+00	4.74E-01	3.65E+01	0.00E+00	3.65E+01
	Manufacturing	A3	3.12E+00	2.81E-01	3.40E+00	4.36E+01	2.00E-01	4.38E+01
	Total (of product stage)	A1-3	1.93E+01	2.81E-01	1.95E+01	3.38E+02	1.47E+00	3.40E+02
Construction process stage	Transport	A4	9.96E-01	0.00E+00	9.96E-01	7.69E+01	0.00E+00	7.69E+01
	Construction	A5	2.66E-05	2.53E-07	2.69E-05	1.93E-03	1.32E-06	1.93E-03
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	1.23E-01	0.00E+00	1.23E-01	2.14E+01	0.00E+00	2.14E+01
	Transport	C2	7.95E-02	0.00E+00	7.95E-02	6.13E+00	0.00E+00	6.13E+00
	Waste processing	C3	7.16E-02	0.00E+00	7.16E-02	1.25E+01	0.00E+00	1.25E+01
	Disposal	C4	3.69E-02	0.00E+00	3.69E-02	4.24E+00	0.00E+00	4.24E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-3.98E+00	0.00E+00	-3.98E+00	-6.20E+01	0.00E+00	-6.20E+01

PERE = Use of renewable primary energy excluding renewable primary energy used as raw materials;
 PERM = Use of renewable primary energy resources used as raw materials;
 PERT = Total use of renewable primary energy resources;

PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials;
 PENRM = Use of non-renewable primary energy resources used as raw materials;
 PENRT = Total use of non-renewable primary energy resource

LCA Results (continued) A150HN

Parameters describing resource use, secondary materials and fuels, use of water			SM	RSF	NRSF	FW
			kg	MJ net calorific value	MJ net calorific value	m ³
Product stage	Raw material supply	A1	5.26E-03	0.00E+00	0.00E+00	3.13E-01
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	4.44E-03
	Manufacturing	A3	1.16E-02	1.18E-05	0.00E+00	4.78E-03
	Total (of product stage)	A1-3	1.68E-02	1.18E-05	0.00E+00	3.23E-01
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	9.32E-03
	Construction	A5	1.38E-08	0.00E+00	0.00E+00	3.85E-07
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	8.36E-03	0.00E+00	0.00E+00	1.25E-03
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	7.43E-04
	Waste processing	C3	4.89E-03	0.00E+00	0.00E+00	7.28E-04
	Disposal	C4	6.06E-06	0.00E+00	0.00E+00	4.63E-03
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-1.17E-01

SM = Use of secondary material;
RSF = Use of renewable secondary fuels;

NRSF = Use of non-renewable secondary fuels;
FW = Net use of fresh water

LCA Results (continued) A150HN

Other environmental information describing waste categories			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	1.98E+00	3.19E+01	8.94E-04
	Transport	A2	3.92E-02	6.82E-01	2.47E+02
	Manufacturing	A3	5.62E-02	6.12E-01	2.98E-04
	Total (of product stage)	A1-3	2.08E+00	3.32E+01	2.47E+02
Construction process stage	Transport	A4	8.25E-02	1.43E+00	5.25E+02
	Construction	A5	4.06E-06	4.53E-05	2.23E-04
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	2.87E-02	2.02E-01	1.51E-04
	Transport	C2	6.58E-03	1.14E-01	4.19E+01
	Waste processing	C3	1.68E-02	1.18E-01	8.80E-05
	Disposal	C4	4.50E-03	6.35E-02	2.83E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-7.66E-01	-1.06E+01	-2.13E-04

HWD = Hazardous waste disposed;
 NHWD = Non-hazardous waste disposed;
 RWD = Radioactive waste disposed

LCA Results (continued) A150HN

Other environmental information describing output flows – at end of life			CRU	MFR	MER	EE	Biogenic carbon (product)	Biogenic carbon (packaging)
			kg	kg	kg	MJ per energy carrier	kg C	kg C
Product stage	Raw material supply	A1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Manufacturing	A3	0.00E+00	3.93E-02	8.67E-08	9.37E-03	1.04E-02	0.00E+00
	Total (of product stage)	A1-3	0.00E+00	3.93E-02	8.67E-08	9.37E-03	1.04E-02	0.00E+00
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Construction	A5	0.00E+00	3.52E-08	0.00E+00	0.00E+00	9.32E-09	0.00E+00
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Waste processing	C3	0.00E+00	2.64E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

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(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts			GWP-total	GWP-fossil	GWP-biogenic	GWP-luluc	ODP	AP	EP-freshwater
			kg CO ₂ eq	kg CO ₂ eq	kg CO ₂ eq	kg CO ₂ eq	kg CFC11 eq	mol H ⁺ eq	kg (PO ₄) ³⁻ eq
Product stage	Raw material supply	A1	5.51E+01	5.46E+01	4.89E-01	2.30E-02	2.16E-06	1.82E-01	9.66E-03
	Transport	A2	2.58E+00	2.58E+00	2.44E-03	9.52E-04	6.14E-07	1.26E-02	1.59E-04
	Manufacturing	A3	2.60E+00	2.56E+00	3.69E-02	7.58E-04	4.69E-07	2.20E-02	1.40E-04
	Total (of product stage)	A1-3	6.03E+01	5.97E+01	5.28E-01	2.47E-02	3.25E-06	2.17E-01	9.96E-03
Construction process stage	Transport	A4	5.22E+00	5.21E+00	5.07E-03	1.87E-03	1.25E-06	2.18E-02	3.25E-04
	Construction	A5	1.75E-04	1.74E-04	5.15E-07	3.46E-08	2.87E-11	1.45E-06	1.27E-08
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	2.91E+00	2.91E+00	5.83E-04	1.65E-04	3.52E-07	1.71E-02	5.12E-05
	Transport	C2	4.17E-01	4.16E-01	4.04E-04	1.50E-04	9.93E-08	1.74E-03	2.59E-05
	Waste processing	C3	1.16E+00	1.16E+00	3.80E-04	1.07E-04	2.30E-07	1.12E-02	3.33E-05
	Disposal	C4	1.60E-01	1.60E-01	1.59E-04	1.51E-04	6.48E-08	1.51E-03	1.47E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-9.25E+00	-9.22E+00	-1.31E-02	-7.57E-03	-4.99E-07	-4.12E-02	-4.30E-03

GWP-total = Global warming potential, total;
 GWP-fossil = Global warming potential, fossil;
 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; and
 EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment

LCA Results (continued) A200

Parameters describing environmental impacts			EP-marine	EP-terrestrial	POCP	ADP-mineral & metals	ADP-fossil	WDP	PM
			kg N eq	mol N eq	kg NMVOC eq	kg Sb eq	MJ, net calorific value	m ³ world eq deprived	disease incidence
Product stage	Raw material supply	A1	4.85E-02	5.63E-01	1.55E-01	2.18E-04	3.22E+02	1.56E+01	1.81E-06
	Transport	A2	3.71E-03	4.07E-02	1.27E-02	5.88E-06	4.00E+01	1.91E-01	2.97E-07
	Manufacturing	A3	9.64E-03	1.05E-01	2.88E-02	4.33E-06	4.15E+01	1.09E-01	6.13E-07
	Total (of product stage)	A1-3	6.19E-02	7.09E-01	1.97E-01	2.29E-04	4.03E+02	1.59E+01	2.72E-06
Construction process stage	Transport	A4	6.64E-03	7.26E-02	2.34E-02	1.20E-05	8.13E+01	3.93E-01	6.13E-07
	Construction	A5	6.11E-07	6.72E-06	1.85E-06	2.67E-10	2.02E-03	1.83E-05	2.59E-10
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	7.58E-03	8.30E-02	2.28E-02	8.57E-07	2.26E+01	5.24E-02	4.58E-07
	Transport	C2	5.30E-04	5.79E-03	1.86E-03	9.54E-07	6.48E+00	3.13E-02	4.89E-08
	Waste processing	C3	4.95E-03	5.42E-02	1.49E-02	5.53E-07	1.48E+01	3.41E-02	2.99E-07
	Disposal	C4	5.23E-04	5.73E-03	1.67E-03	3.65E-07	4.47E+00	2.05E-01	3.03E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-9.75E-03	-1.08E-01	-4.35E-02	-3.07E-05	-1.01E+02	-5.98E+00	-7.13E-07

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;
 EP-terrestrial = Eutrophication potential, accumulated exceedance;
 POCP = Formation potential of tropospheric ozone;
 ADP-mineral&metals = Abiotic depletion potential for non-fossil resources;

ADP-fossil = Depletion potential of the stratospheric ozone layer;
 WDP = Water (user) deprivation potential, deprivation-weighted water consumption; and
 PM = Particulate matter.

LCA Results (continued) A200

Parameters describing environmental impacts			IRP	ETP-fw	HTP-c	HTP-nc	SQP
			kBq U ²³⁵ eq	CTUe	CTUh	CTUh	dimensionless
Product stage	Raw material supply	A1	1.59E+00	1.13E+03	6.89E-08	5.96E-07	1.72E+02
	Transport	A2	2.02E-01	3.11E+01	8.87E-10	3.38E-08	4.49E+01
	Manufacturing	A3	5.86E-01	2.33E+01	8.14E-10	1.62E-08	8.75E+00
	Total (of product stage)	A1-3	2.38E+00	1.19E+03	7.06E-08	6.46E-07	2.26E+02
Construction process stage	Transport	A4	4.11E-01	6.35E+01	1.76E-09	6.95E-08	9.30E+01
	Construction	A5	9.76E-06	2.04E-03	1.01E-13	1.28E-12	4.15E-04
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	1.02E-01	1.32E+01	5.12E-10	9.61E-09	2.91E+00
	Transport	C2	3.28E-02	5.06E+00	1.40E-10	5.54E-09	7.42E+00
	Waste processing	C3	6.65E-02	8.63E+00	3.34E-10	6.26E-09	1.88E+00
	Disposal	C4	1.99E-02	2.82E+00	7.17E-11	1.86E-09	9.38E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-6.83E-01	-2.33E+02	-4.31E-08	-1.85E-07	-4.91E+01

IRP = Potential human exposure efficiency relative to U235;
 ETP-fw = Potential comparative toxic unit for ecosystems;
 HTP-c = Potential comparative toxic unit for humans;

HTP-nc = Potential comparative toxic unit for humans; and
 SQP = Potential soil quality index.

LCA Results (continued) A200

			Parameters describing resource use, primary energy					
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	1.92E+01	0.00E+00	1.92E+01	3.17E+02	1.32E+00	3.19E+02
	Transport	A2	4.99E-01	0.00E+00	4.99E-01	3.85E+01	0.00E+00	3.85E+01
	Manufacturing	A3	3.23E+00	2.91E-01	3.52E+00	4.52E+01	2.07E-01	4.55E+01
	Total (of product stage)	A1-3	2.30E+01	2.91E-01	2.33E+01	4.01E+02	1.52E+00	4.02E+02
Construction process stage	Transport	A4	1.03E+00	0.00E+00	1.03E+00	7.98E+01	0.00E+00	7.98E+01
	Construction	A5	2.99E-05	2.62E-07	3.02E-05	1.98E-03	1.37E-06	1.98E-03
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	1.27E-01	0.00E+00	1.27E-01	2.22E+01	0.00E+00	2.22E+01
	Transport	C2	8.25E-02	0.00E+00	8.25E-02	6.37E+00	0.00E+00	6.37E+00
	Waste processing	C3	8.27E-02	0.00E+00	8.27E-02	1.45E+01	0.00E+00	1.45E+01
	Disposal	C4	3.81E-02	0.00E+00	3.81E-02	4.39E+00	0.00E+00	4.39E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-5.25E+00	0.00E+00	-5.25E+00	-9.99E+01	0.00E+00	-9.99E+01

PERE = Use of renewable primary energy excluding renewable primary energy used as raw materials;
 PERM = Use of renewable primary energy resources used as raw materials;
 PERT = Total use of renewable primary energy resources;

PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials;
 PENRM = Use of non-renewable primary energy resources used as raw materials;
 PENRT = Total use of non-renewable primary energy resource

LCA Results (continued) A200

Parameters describing resource use, secondary materials and fuels, use of water			SM	RSF	NRSF	FW
			kg	MJ net calorific value	MJ net calorific value	m ³
Product stage	Raw material supply	A1	5.46E-03	0.00E+00	0.00E+00	3.74E-01
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	4.71E-03
	Manufacturing	A3	1.20E-02	1.22E-05	0.00E+00	4.95E-03
	Total (of product stage)	A1-3	1.75E-02	1.22E-05	0.00E+00	3.84E-01
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	9.67E-03
	Construction	A5	1.43E-08	0.00E+00	0.00E+00	4.40E-07
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	8.66E-03	0.00E+00	0.00E+00	1.29E-03
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	7.71E-04
	Waste processing	C3	5.65E-03	0.00E+00	0.00E+00	8.42E-04
	Disposal	C4	1.21E-05	0.00E+00	0.00E+00	4.79E-03
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-1.42E-01

SM = Use of secondary material;
RSF = Use of renewable secondary fuels;

NRSF = Use of non-renewable secondary fuels;
FW = Net use of fresh water

LCA Results (continued) A200

Other environmental information describing waste categories			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	3.35E+00	4.13E+01	1.03E-03
	Transport	A2	4.13E-02	7.19E-01	2.61E+02
	Manufacturing	A3	5.83E-02	6.34E-01	3.09E-04
	Total (of product stage)	A1-3	3.45E+00	4.26E+01	2.61E+02
Construction process stage	Transport	A4	8.56E-02	1.49E+00	5.45E+02
	Construction	A5	5.29E-06	5.38E-05	2.35E-04
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	2.97E-02	2.09E-01	1.56E-04
	Transport	C2	6.83E-03	1.19E-01	4.35E+01
	Waste processing	C3	1.94E-02	1.36E-01	1.02E-04
	Disposal	C4	4.65E-03	6.57E-02	2.93E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.49E+00	-1.69E+01	-2.77E-04

HWD = Hazardous waste disposed;
 NHWD = Non-hazardous waste disposed;
 RWD = Radioactive waste disposed

LCA Results (continued) A200

Other environmental information describing output flows – at end of life			CRU	MFR	MER	EE	Biogenic carbon (product)	Biogenic carbon (packaging)
			kg	kg	kg	MJ per energy carrier	kg C	kg C
Product stage	Raw material supply	A1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Manufacturing	A3	0.00E+00	8.78E-02	8.98E-08	9.71E-03	1.07E-02	0.00E+00
	Total (of product stage)	A1-3	0.00E+00	8.78E-02	8.98E-08	9.71E-03	1.07E-02	0.00E+00
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Construction	A5	0.00E+00	7.88E-08	0.00E+00	0.00E+00	9.67E-09	0.00E+00
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Waste processing	C3	0.00E+00	2.74E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

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(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts			GWP-total	GWP-fossil	GWP-biogenic	GWP-luluc	ODP	AP	EP-freshwater
			kg CO ₂ eq	kg CO ₂ eq	kg CO ₂ eq	kg CO ₂ eq	kg CFC11 eq	mol H ⁺ eq	kg (PO ₄) ³⁻ eq
Product stage	Raw material supply	A1	5.13E+01	5.08E+01	4.88E-01	2.03E-02	1.97E-06	1.67E-01	7.92E-03
	Transport	A2	2.53E+00	2.53E+00	2.41E-03	9.22E-04	6.02E-07	1.16E-02	1.56E-04
	Manufacturing	A3	2.58E+00	2.55E+00	3.67E-02	7.55E-04	4.67E-07	2.19E-02	1.39E-04
	Total (of product stage)	A1-3	5.64E+01	5.59E+01	5.28E-01	2.20E-02	3.04E-06	2.00E-01	8.22E-03
Construction process stage	Transport	A4	5.23E+00	5.22E+00	5.07E-03	1.88E-03	1.25E-06	2.18E-02	3.25E-04
	Construction	A5	1.72E-04	1.71E-04	5.14E-07	3.22E-08	2.85E-11	1.43E-06	1.12E-08
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	2.89E+00	2.89E+00	5.81E-04	1.65E-04	3.51E-07	1.70E-02	5.10E-05
	Transport	C2	4.17E-01	4.17E-01	4.05E-04	1.50E-04	9.95E-08	1.74E-03	2.59E-05
	Waste processing	C3	1.07E+00	1.06E+00	3.48E-04	9.83E-05	2.10E-07	1.02E-02	3.05E-05
	Disposal	C4	1.59E-01	1.59E-01	1.58E-04	1.50E-04	6.43E-08	1.50E-03	1.46E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	6.31E+00	6.29E+00	-1.98E-02	-5.72E-03	-3.65E-07	-3.00E-02	-3.01E-03

GWP-total = Global warming potential, total;
 GWP-fossil = Global warming potential, fossil;
 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; and
 EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment

LCA Results (continued) A209

Parameters describing environmental impacts			EP-marine	EP-terrestrial	POCP	ADP-mineral & metals	ADP-fossil	WDP	PM
			kg N eq	mol N eq	kg NMVOC eq	kg Sb eq	MJ, net calorific value	m ³ world eq deprived	disease incidence
Product stage	Raw material supply	A1	4.49E-02	5.26E-01	1.37E-01	1.98E-04	2.82E+02	1.40E+01	1.51E-06
	Transport	A2	3.46E-03	3.79E-02	1.20E-02	5.78E-06	3.93E+01	1.88E-01	2.93E-07
	Manufacturing	A3	9.59E-03	1.05E-01	2.86E-02	4.32E-06	4.13E+01	1.09E-01	6.10E-07
	Total (of product stage)	A1-3	5.79E-02	6.69E-01	1.78E-01	2.08E-04	3.63E+02	1.43E+01	2.42E-06
Construction process stage	Transport	A4	6.65E-03	7.27E-02	2.34E-02	1.20E-05	8.14E+01	3.93E-01	6.14E-07
	Construction	A5	6.07E-07	6.68E-06	1.83E-06	2.48E-10	1.98E-03	1.68E-05	2.59E-10
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	7.55E-03	8.27E-02	2.27E-02	8.54E-07	2.25E+01	5.22E-02	4.57E-07
	Transport	C2	5.30E-04	5.80E-03	1.87E-03	9.55E-07	6.49E+00	3.14E-02	4.90E-08
	Waste processing	C3	4.53E-03	4.97E-02	1.37E-02	5.07E-07	1.35E+01	3.12E-02	2.74E-07
	Disposal	C4	5.20E-04	5.69E-03	1.66E-03	3.63E-07	4.44E+00	2.04E-01	3.01E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-7.05E-03	-7.92E-02	-2.95E-02	-2.67E-05	-7.23E+01	-5.28E+00	-4.90E-07

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;
 EP-terrestrial = Eutrophication potential, accumulated exceedance;
 POCP = Formation potential of tropospheric ozone;
 ADP-mineral&metals = Abiotic depletion potential for non-fossil resources;

ADP-fossil = Depletion potential of the stratospheric ozone layer;
 WDP = Water (user) deprivation potential, deprivation-weighted water consumption; and
 PM = Particulate matter.

LCA Results (continued) A209

			Parameters describing environmental impacts				
			IRP	ETP-fw	HTP-c	HTP-nc	SQP
			kBq U ²³⁵ eq	CTUe	CTUh	CTUh	dimensionless
Product stage	Raw material supply	A1	1.41E+00	1.03E+03	4.39E-08	5.01E-07	1.61E+02
	Transport	A2	1.98E-01	3.06E+01	8.61E-10	3.33E-08	4.43E+01
	Manufacturing	A3	5.84E-01	2.32E+01	8.10E-10	1.61E-08	8.71E+00
	Total (of product stage)	A1-3	2.19E+00	1.08E+03	4.56E-08	5.51E-07	2.14E+02
Construction process stage	Transport	A4	4.12E-01	6.36E+01	1.76E-09	6.96E-08	9.31E+01
	Construction	A5	9.59E-06	1.94E-03	7.85E-14	1.20E-12	4.04E-04
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	1.02E-01	1.32E+01	5.10E-10	9.58E-09	2.90E+00
	Transport	C2	3.28E-02	5.07E+00	1.40E-10	5.55E-09	7.43E+00
	Waste processing	C3	6.09E-02	7.90E+00	3.06E-10	5.73E-09	1.72E+00
	Disposal	C4	1.97E-02	2.81E+00	7.12E-11	1.85E-09	9.32E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-6.11E-01	-1.51E+02	-2.59E-08	-1.24E-07	-4.12E+01

IRP = Potential human exposure efficiency relative to U235;
 ETP-fw = Potential comparative toxic unit for ecosystems;
 HTP-c = Potential comparative toxic unit for humans;

HTP-nc = Potential comparative toxic unit for humans; and
 SQP = Potential soil quality index.

LCA Results (continued) A209

			Parameters describing resource use, primary energy					
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	1.69E+01	0.00E+00	1.69E+01	2.78E+02	1.32E+00	2.79E+02
	Transport	A2	4.94E-01	0.00E+00	4.94E-01	3.81E+01	0.00E+00	3.81E+01
	Manufacturing	A3	3.22E+00	2.90E-01	3.51E+00	4.50E+01	2.06E-01	4.52E+01
	Total (of product stage)	A1-3	2.06E+01	2.90E-01	2.09E+01	3.61E+02	1.52E+00	3.63E+02
Construction process stage	Transport	A4	1.03E+00	0.00E+00	1.03E+00	7.99E+01	0.00E+00	7.99E+01
	Construction	A5	2.78E-05	2.61E-07	2.81E-05	1.95E-03	1.37E-06	1.95E-03
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	1.27E-01	0.00E+00	1.27E-01	2.21E+01	0.00E+00	2.21E+01
	Transport	C2	8.26E-02	0.00E+00	8.26E-02	6.37E+00	0.00E+00	6.37E+00
	Waste processing	C3	7.57E-02	0.00E+00	7.57E-02	1.32E+01	0.00E+00	1.32E+01
	Disposal	C4	3.79E-02	0.00E+00	3.79E-02	4.36E+00	0.00E+00	4.36E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-4.35E+00	0.00E+00	-4.35E+00	-7.18E+01	0.00E+00	-7.18E+01

PERE = Use of renewable primary energy excluding renewable primary energy used as raw materials;
 PERM = Use of renewable primary energy resources used as raw materials;
 PERT = Total use of renewable primary energy resources;

PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials;
 PENRM = Use of non-renewable primary energy resources used as raw materials;
 PENRT = Total use of non-renewable primary energy resource

LCA Results (continued) A209

Parameters describing resource use, secondary materials and fuels, use of water						
			SM	RSF	NRSF	FW
			kg	MJ net calorific value	MJ net calorific value	m ³
Product stage	Raw material supply	A1	5.47E-03	0.00E+00	0.00E+00	3.35E-01
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	4.64E-03
	Manufacturing	A3	1.19E-02	1.21E-05	0.00E+00	4.93E-03
	Total (of product stage)	A1-3	1.74E-02	1.21E-05	0.00E+00	3.45E-01
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	9.68E-03
	Construction	A5	1.43E-08	0.00E+00	0.00E+00	4.05E-07
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	8.62E-03	0.00E+00	0.00E+00	1.29E-03
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	7.72E-04
	Waste processing	C3	5.18E-03	0.00E+00	0.00E+00	7.71E-04
	Disposal	C4	6.06E-06	0.00E+00	0.00E+00	4.76E-03
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-1.25E-01

SM = Use of secondary material;
RSF = Use of renewable secondary fuels;

NRSF = Use of non-renewable secondary fuels;
FW = Net use of fresh water

LCA Results (continued) A209

Other environmental information describing waste categories			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	2.32E+00	3.48E+01	9.50E-04
	Transport	A2	4.09E-02	7.11E-01	2.58E+02
	Manufacturing	A3	5.80E-02	6.31E-01	3.08E-04
	Total (of product stage)	A1-3	2.42E+00	3.61E+01	2.58E+02
Construction process stage	Transport	A4	8.57E-02	1.49E+00	5.45E+02
	Construction	A5	4.36E-06	4.80E-05	2.32E-04
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	2.96E-02	2.08E-01	1.55E-04
	Transport	C2	6.84E-03	1.19E-01	4.35E+01
	Waste processing	C3	1.77E-02	1.25E-01	9.31E-05
	Disposal	C4	4.62E-03	6.52E-02	2.91E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-9.42E-01	-1.22E+01	-2.32E-04

HWD = Hazardous waste disposed;
 NHWD = Non-hazardous waste disposed;
 RWD = Radioactive waste disposed

LCA Results (continued) A209

Other environmental information describing output flows – at end of life			CRU	MFR	MER	EE	Biogenic carbon (product)	Biogenic carbon (packaging)
			kg	kg	kg	MJ per energy carrier	kg C	kg C
Product stage	Raw material supply	A1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Manufacturing	A3	0.00E+00	5.03E-02	8.94E-08	9.67E-03	1.07E-02	0.00E+00
	Total (of product stage)	A1-3	0.00E+00	5.03E-02	8.94E-08	9.67E-03	1.07E-02	0.00E+00
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Construction	A5	0.00E+00	4.51E-08	0.00E+00	0.00E+00	9.63E-09	0.00E+00
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Waste processing	C3	0.00E+00	2.72E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

Scenarios and additional technical information

Scenarios and additional technical information for the A150			
Scenario	Parameter	Units	Results
A4 – Transport to the building site	As a Hollowcore delivery could be to almost anywhere, the distance of 188km has been used from the Precast Flooring Federation EPD for Hollowcore as has the fuel type, capacity utilisation and bulk density of products.		
	Fuel type	Litre of fuel type per distance	0.576 l/100km
	Distance:	km	188
	Capacity utilisation (incl. empty returns)	%	50
A5 – Installation in the building	The material loss factor has been used from the Precast Flooring Federation EPD for Hollowcore		
	Material loss	kg	0.02
B2 – Maintenance	Once installed the Hollowcore flooring slab does not require maintenance. Therefore, this module is not relevant (MNR).		
B3 – Repair	Once installed the Hollowcore flooring slab does not require repair. Therefore, this module is not relevant (MNR).		
B4 – Replacement	Once installed the Hollowcore flooring slab does not require replacement. Therefore, this module is not relevant (MNR).		
B5 – Refurbishment	Once installed the Hollowcore flooring slab does not require refurbishment. Therefore, this module is not relevant (MNR).		
Reference service life	The MPA gives a service life of 100 years for Hollowcore.		
B6 – Use of energy; B7 – Use of water	Once installed the Hollowcore flooring slab does not require energy or water. Therefore, this module is not relevant (MNR).		
C1 to C4 End of life,	At the end of life, the concrete products are deconstructed using heavy machinery, placed onto trucks, and transported to the relevant waste processing sites. At the site the waste undergoes crushing to prepare it for disposal where it is assumed that 90% of the waste is recycled and 10% is landfilled.		
C1 – End-of-life deconstruction	Diesel for deconstruction	kg	0.3
C2 – End-of-life transport	Transport of waste to processing site	km	15
C3 – End-of-life processing	Diesel for crushing	kg	0.179
C4 – End-of-life disposal	10% steel waste to landfill	kg	0.4
C4 – End-of-life disposal	10% concrete waste to landfill	kg	23.9
Module D	As mentioned, 90% of the waste is assumed to be recycled.		
	Steel recovered for recycling	Kg	3.8
	Concrete recovered for recycling	Kg	215.3

Scenarios and additional technical information for A150H

Scenario	Parameter	Units	Results
A4 – Transport to the building site	As a Hollowcore delivery could be to almost anywhere, the distance of 188km has been used from the Precast Flooring Federation EPD for Hollowcore as has the fuel type, capacity utilisation and bulk density of products.		
	Fuel type	Litre of fuel type per distance	0.576 l/100km
	Distance:	km	188
	Capacity utilisation (incl. empty returns)	%	50
	Bulk density of transported products	kg/m ³	2000
A5 – Installation in the building	The material loss factor has been used from the Precast Flooring Federation EPD for Hollowcore		
	Material loss	kg	0.03
B2 – Maintenance	Once installed the Hollowcore flooring slab does not require maintenance. Therefore, this module is not relevant (MNR).		
B3 – Repair	Once installed the Hollowcore flooring slab does not require repair. Therefore, this module is not relevant (MNR).		
B4 – Replacement	Once installed the Hollowcore flooring slab does not require replacement. Therefore, this module is not relevant (MNR).		
B5 – Refurbishment	Once installed the Hollowcore flooring slab does not require refurbishment. Therefore, this module is not relevant (MNR).		
Reference service life	The MPA gives a service life of 100 years for Hollowcore.		
B6 – Use of energy; B7 – Use of water	Once installed the Hollowcore flooring slab does not require energy or water. Therefore, this module is not relevant (MNR).		
C1 to C4 End of life,	At the end of life, the concrete products are deconstructed using heavy machinery, placed onto trucks, and transported to the relevant waste processing sites. At the site the waste undergoes crushing to prepare it for disposal where it is assumed that 90% of the waste is recycled and 10% is landfilled.		
C1 – End-of-life deconstruction	Diesel for deconstruction	kg	0.3
C2 – End-of-life transport	Transport of waste to processing site	km	15
C3 – End-of-life processing	Diesel for crushing	kg	0.227
C4 – End-of-life disposal	10% steel waste to landfill	kg	0.4
C4 – End-of-life disposal	10% concrete waste to landfill	kg	30.3
Module D	As mentioned, 90% of the waste is assumed to be recycled.		
	Steel recovered for recycling	Kg	3.8
	Concrete recovered for recycling	Kg	272.3

Scenarios and additional technical information for the A159H

Scenario	Parameter	Units	Results
A4 – Transport to the building site	As a Hollowcore delivery could be to almost anywhere, the distance of 188km has been used from the Precast Flooring Federation EPD for Hollowcore as has the fuel type, capacity utilisation and bulk density of products.		
	Fuel type	Litre of fuel type per distance	0.576 l/100km
	Distance:	km	188
	Capacity utilisation (incl. empty returns)	%	50
	Bulk density of transported products	kg/m ³	2000
A5 – Installation in the building	The material loss factor has been used from the Precast Flooring Federation EPD for Hollowcore		
	Material loss	kg	0.03
B2 – Maintenance	Once installed the Hollowcore flooring slab does not require maintenance. Therefore, this module is not relevant (MNR).		
B3 – Repair	Once installed the Hollowcore flooring slab does not require repair. Therefore, this module is not relevant (MNR).		
B4 – Replacement	Once installed the Hollowcore flooring slab does not require replacement. Therefore, this module is not relevant (MNR).		
B5 – Refurbishment	Once installed the Hollowcore flooring slab does not require refurbishment. Therefore, this module is not relevant (MNR).		
Reference service life	The MPA gives a service life of 100 years for Hollowcore.		
B6 – Use of energy; B7 – Use of water	Once installed the Hollowcore flooring slab does not require energy or water. Therefore, this module is not relevant (MNR).		
C1 to C4 End of life,	At the end of life, the concrete products are deconstructed using heavy machinery, placed onto trucks, and transported to the relevant waste processing sites. At the site the waste undergoes crushing to prepare it for disposal where it is assumed that 90% of the waste is recycled and 10% is landfilled.		
C1 – End-of-life deconstruction	Diesel for deconstruction	kg	0.3
C2 – End-of-life transport	Transport of waste to processing site	km	15
C3 – End-of-life processing	Diesel for crushing	kg	0.228
C4 – End-of-life disposal	10% steel waste to landfill	kg	0.2
C4 – End-of-life disposal	10% concrete waste to landfill	kg	30.3
Module D	As mentioned, 90% of the waste is assumed to be recycled.		
	Steel recovered for recycling	Kg	2.2
	Concrete recovered for recycling	Kg	272.8

Scenarios and additional technical information for the A150HN

Scenario	Parameter	Units	Results
A4 – Transport to the building site	As a Hollowcore delivery could be to almost anywhere, the distance of 188km has been used from the Precast Flooring Federation EPD for Hollowcore as has the fuel type, capacity utilisation and bulk density of products.		
	Fuel type	Litre of fuel type per distance	0.576 l/100km
	Distance:	km	188
	Capacity utilisation (incl. empty returns)	%	50
	Bulk density of transported products	kg/m ³	2000
A5 – Installation in the building	The material loss factor has been used from the Precast Flooring Federation EPD for Hollowcore		
	Material loss	kg	0.03
B2 – Maintenance	Once installed the Hollowcore flooring slab does not require maintenance. Therefore, this module is not relevant (MNR).		
B3 – Repair	Once installed the Hollowcore flooring slab does not require repair. Therefore, this module is not relevant (MNR).		
B4 – Replacement	Once installed the Hollowcore flooring slab does not require replacement. Therefore, this module is not relevant (MNR).		
B5 – Refurbishment	Once installed the Hollowcore flooring slab does not require refurbishment. Therefore, this module is not relevant (MNR).		
Reference service life	The MPA gives a service life of 100 years for Hollowcore.		
B6 – Use of energy; B7 – Use of water	Once installed the Hollowcore flooring slab does not require energy or water. Therefore, this module is not relevant (MNR).		
C1 to C4 End of life,	At the end of life, the concrete products are deconstructed using heavy machinery, placed onto trucks, and transported to the relevant waste processing sites. At the site the waste undergoes crushing to prepare it for disposal where it is assumed that 90% of the waste is recycled and 10% is landfilled.		
C1 – End-of-life deconstruction	Diesel for deconstruction	kg	0.3
C2 – End-of-life transport	Transport of waste to processing site	km	15
C3 – End-of-life processing	Diesel for crushing	kg	0.219
C4 – End-of-life disposal	10% steel waste to landfill	kg	0.2
C4 – End-of-life disposal	10% concrete waste to landfill	kg	29.2
Module D	As mentioned, 90% of the waste is assumed to be recycled.		
	Steel recovered for recycling	Kg	1.7
	Concrete recovered for recycling	Kg	262.4

Scenarios and additional technical information for the A200

Scenario	Parameter	Units	Results
A4 – Transport to the building site	As a Hollowcore delivery could be to almost anywhere, the distance of 188km has been used from the Precast Flooring Federation EPD for Hollowcore as has the fuel type, capacity utilisation and bulk density of products.		
	Fuel type	Litre of fuel type per distance	0.576 l/100km
	Distance:	km	188
	Capacity utilisation (incl. empty returns)	%	50
	Bulk density of transported products	kg/m ³	2000
A5 – Installation in the building	The material loss factor has been used from the Precast Flooring Federation EPD for Hollowcore		
	Material loss	kg	0.03
B2 – Maintenance	Once installed the Hollowcore flooring slab does not require maintenance. Therefore, this module is not relevant (MNR).		
B3 – Repair	Once installed the Hollowcore flooring slab does not require repair. Therefore, this module is not relevant (MNR).		
B4 – Replacement	Once installed the Hollowcore flooring slab does not require replacement. Therefore, this module is not relevant (MNR).		
B5 – Refurbishment	Once installed the Hollowcore flooring slab does not require refurbishment. Therefore, this module is not relevant (MNR).		
Reference service life	The MPA gives a service life of 100 years for Hollowcore.		
B6 – Use of energy; B7 – Use of water	Once installed the Hollowcore flooring slab does not require energy or water. Therefore, this module is not relevant (MNR).		
C1 to C4 End of life,	At the end of life, the concrete products are deconstructed using heavy machinery, placed onto trucks, and transported to the relevant waste processing sites. At the site the waste undergoes crushing to prepare it for disposal where it is assumed that 90% of the waste is recycled and 10% is landfilled.		
C1 – End-of-life deconstruction	Diesel for deconstruction	kg	0.3
C2 – End-of-life transport	Transport of waste to processing site	km	15
C3 – End-of-life processing	Diesel for crushing	kg	0.225
C4 – End-of-life disposal	10% steel waste to landfill	kg	0.4
C4 – End-of-life disposal	10% concrete waste to landfill	kg	30
Module D	As mentioned, 90% of the waste is assumed to be recycled.		
	Steel recovered for recycling	Kg	3.8
	Concrete recovered for recycling	Kg	269.9

Scenarios and additional technical information for the A209

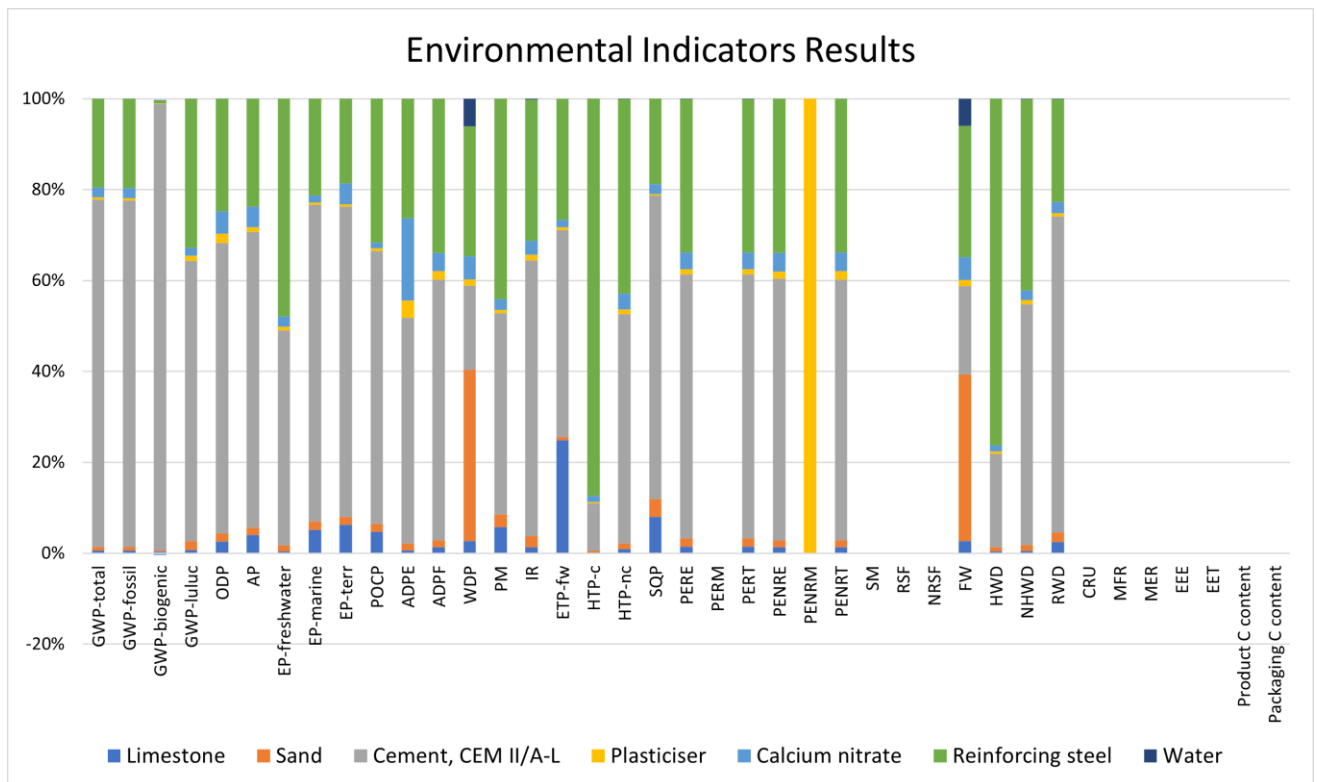
Scenario	Parameter	Units	Results
A4 – Transport to the building site	As a Hollowcore delivery could be to almost anywhere, the distance of 188km has been used from the Precast Flooring Federation EPD for Hollowcore as has the fuel type, capacity utilisation and bulk density of products.		
	Fuel type	Litre of fuel type per distance	0.576 l/100km
	Distance:	km	188
	Capacity utilisation (incl. empty returns)	%	50
	Bulk density of transported products	kg/m ³	2000
A5 – Installation in the building	The material loss factor has been used from the Precast Flooring Federation EPD for Hollowcore		
	Material loss	kg	0.03
B2 – Maintenance	Once installed the Hollowcore flooring slab does not require maintenance. Therefore, this module is not relevant (MNR).		
B3 – Repair	Once installed the Hollowcore flooring slab does not require repair. Therefore, this module is not relevant (MNR).		
B4 – Replacement	Once installed the Hollowcore flooring slab does not require replacement. Therefore, this module is not relevant (MNR).		
B5 – Refurbishment	Once installed the Hollowcore flooring slab does not require refurbishment. Therefore, this module is not relevant (MNR).		
Reference service life	The MPA gives a service life of 100 years for Hollowcore.		
B6 – Use of energy; B7 – Use of water	Once installed the Hollowcore flooring slab does not require energy or water. Therefore, this module is not relevant (MNR).		
C1 to C4 End of life,	At the end of life, the concrete products are deconstructed using heavy machinery, placed onto trucks, and transported to the relevant waste processing sites. At the site the waste undergoes crushing to prepare it for disposal where it is assumed that 90% of the waste is recycled and 10% is landfilled.		
C1 – End-of-life deconstruction	Diesel for deconstruction	kg	0.3
C2 – End-of-life transport	Transport of waste to processing site	km	15
C3 – End-of-life processing	Diesel for crushing	kg	0.225
C4 – End-of-life disposal	10% steel waste to landfill	kg	0.2
C4 – End-of-life disposal	10% concrete waste to landfill	kg	30.3
Module D	As mentioned, 90% of the waste is assumed to be recycled.		
	Steel recovered for recycling	Kg	2.2
	Concrete recovered for recycling	Kg	270.4

Interpretation

The composition and proportions of Hollowcore A150 Cem II, A150H Cem II, A150HN Cem II, A159H Cem II, A200 Cem II and A209 Cem II blocks are similar and differ by less than 1%. Therefore, the average will be used in this interpretation section.

Out of the total mass of input materials, averagely, limestone makes up 40%, followed by sand of 33%, cement make up 19%, water, reinforcing steel, plasticiser and calcium nitrate make up the remaining of 8%. The bulk of the environmental impacts and primary energy demand are attributed to the manufacturing phase, covered by information modules A1-A3 of EN15804:2012+A2:2019.

As a result, Portland cement ranks first in terms of overall environmental impacts and is responsible for the greatest impact on GWP ODP, AP, EP-marine, EP-terr, POCP, ADPE, ADPF, PM, IR, ETP-fw, HTP-nc, SQP, PERE, PERT, PENRE, PENRT, NHWD and RED. Reinforcing steel ranks second in terms of overall environmental impacts and is responsible for the greatest impact on EP-freshwater, HTP-c and HWD. Although the total mass and environmental impact of the plasticiser is very small, it contributes 100% of the impact on PENRM.



References

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

BSI. Environmental labels and declarations – Type III Environmental declarations – Principles and procedures. BS EN ISO 14025:2010 (exactly identical to ISO 14025:2006). London, BSI, 2010.

BSI. Environmental management – Life cycle assessment – Principles and framework. BS EN ISO 14040:2006. London, BSI, 2006.

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