Statement of Verification

BREG EN EPD No.: 000749 Issue 01

This is to verify that the

Environmental Product Declaration

provided by:

Vaillant Group UK Ltd.

BRE Global Verified EPD

is in accordance with the requirements of:

EN 15804:2012+A2:2019

and

BRE Global Scheme Document SD207

This declaration is for:

1 boiler to produce either 80, 100 or 120 kW of heating, according to the reference usage scenario defined in the EN 15502-1 standard and during the 22-year reference lifetime of the product.

Company Address

Vaillant Group UK Ltd.
Nottingham Road
DE56 1JT Belper
UNITED KINGDOM

Signed for BRE Global Ltd	Hayley Thomson Operator	12 January 2026 Date of this Issue
12 January 2026 Date of First Issue		11 January 2031 Expiry Date

BRE Global Verified EPD

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Environmental Product Declaration

EPD Number: **000749**

General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom	BRE Environmental Profiles 2013 Product Category Rules for Type III environmental product declaration of construction products to EN 15804+A2 PN 514 Rev 3.1 (11/2023) PEP ecopassport®. (2023, 19 octobre). PSR-0012-ed2.0-EN-2023-10-19 – Product Specific Rules for gas, fuel oil or biomass boilers for heating only or heating and domestic hot water production
Commissioner of LCA study	**LCA consultant/Tool**
Vaillant Group	Frédéric Assouad/Simapro
Declared/Functional Unit	**Applicability/Coverage**
1 boilerto produce either 80, 100 or 120 kW of heating, according to the reference usage scenario defined in the EN 15502-1 standard and during the 22-year reference lifetime of the product.	Product specific
EPD Type	**Background database**
Cradle to Gate with Module C and D	ecoinvent

Demonstration of Verification
CEN standard EN 15804 serves as the core PCR V3.1 (11/2023)
Independent verification of the declaration and data according to EN ISO 14025:2010 ☒Internal ☐ External
(Where appropriate [b]) Third party verifier: Flavie Lowres
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
					Related to the building fabric					Related to the building							
A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**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
☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑		☑

Note: Ticks indicate the Information Modules declared.

Manufacturing site(s)

The products are manufacturing in Belper:

Vaillant Group UK Ltd.
Nottingham Road
DE56 1JT Belper
UNITED KINGDOM

Construction Product:

Product Description

The data has been calculated for each product. The system studied is a condensing gas boiler (fixed on wall) for space heating for collective domestic use.

Technical Information

Property	ecoTEC Plus 80kW	ecoTEC Plus 100kW	ecoTEC Plus 120kW
Pn (nominal power)	80	100	120
Pa (power output at the arithmetic average of the max and min power output according to EN 15502-1/A1 for a gas boilers by kW)	44,8	56	67,2
Etas (%)	92,4	92,7	92,7
Product Weight without packaging (kg)	77,4	93,9	100,4

Main Product Contents

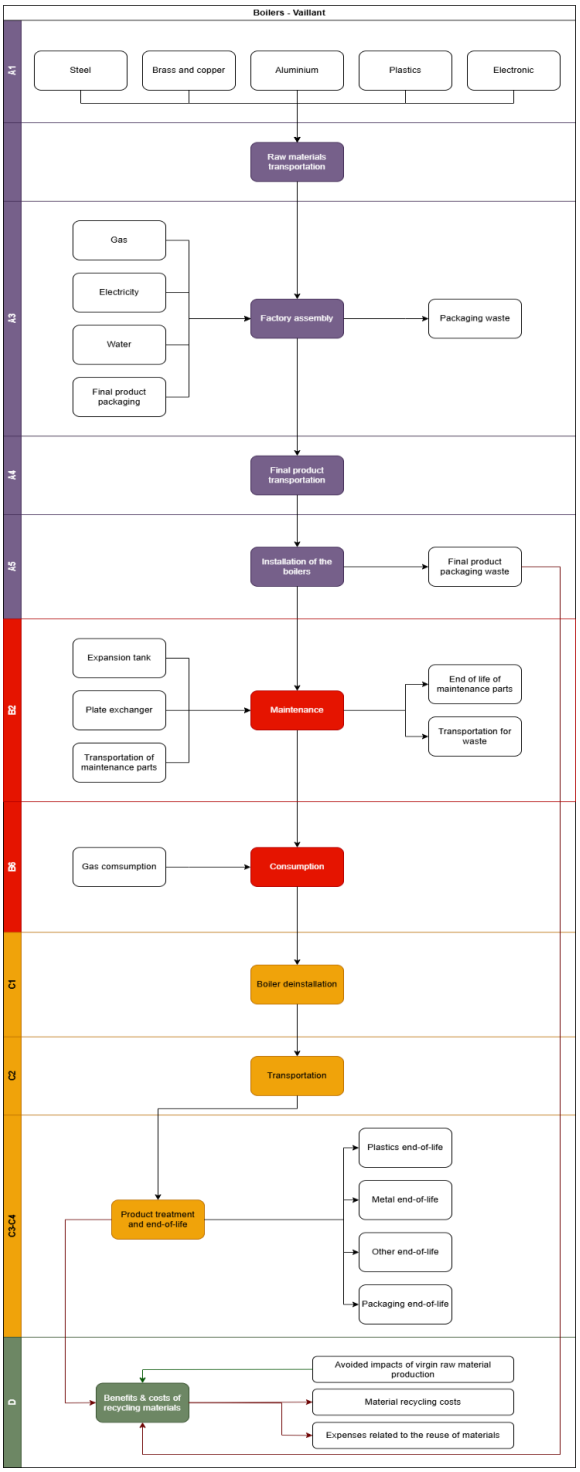
Material/Chemical Input	%
Steel	84-91
Brass	2-7
Electronic	1-3
PP	0-2
PUR	1
Others	1

Manufacturing Process

A boiler is made up of components manufactured and supplied directly by the manufacturer or components ready to be assembled on site. Boilers are assembled in Belper, England, and distributed, installed, and used in the UK.
During stage A1, a default loss quantity is considered in order to take into account the waste produced during the processing of raw materials by the various raw material suppliers. The percentages considered are as follow:

- 5% for plastic injection and elastomer
- 30% for any other processes

Process flow diagram



Construction Installation

Products are manufactured in Belper and distributed in the UK. The longest distance the unit can travel in the UK (1000 km) by lorry has been considered for this scenario.

The installation of the boilers requires no additional components.
The packaging of the units are disposed of during the installation of the combined units. Packaging includes :

- corrugated cardboard: 71% recycled
- plain wood: 44.1% recycled

Use Information

B1 : It was assumed the following liquid discharges:

Subtance	Quantity released into water	Unit
Sulphite	0,05	mg/MJin
Sulphate	0,05	mg/MJin
Nitrate	0,13	mg/MJin
Nitrite	0,003	mg/MJin

B2: An average return trip distance of 100 km covered by an operator is considered every year for visual inspection .
B3: If the boiler is installed and maintained yearly in accordance with the manufacturer's requirements, the boiler should not require repair throughout its reference lifetime.
B4: the boiler has a reference lifetime of 22 years and therefore no replacement is required providing the boiler has been installed and maintained in accordance with the manufacturer's requirement.
B5: the boiler has a reference lifetime of 22 years and therefore no refurbishment is required providing the boiler has been installed and maintained in accordance with the manufacturer's requirement.
B6: the energy required to operate the boiler was considered over 22 years study period
B7: the boiler is sealed. the water runs through the system to be heated and then fed back into the system. there is therefore no water input into the boiler.

End of Life

C3: It was assumed the following: 70% of metal and 50% of the plastics are recycled.
C4: No information was provided, so a conservative estimate was made. All other non-recycled materials are sent to landfill at 100%.

Life Cycle Assessment Calculation Rules

Declared unit description

1 boiler to produce either 80, 100 or 120 kW of heating, according to the reference usage scenario defined in the EN 15502-1 and during the 22-year reference lifetime of the product.

System boundary

The system boundary considered in the LCA study is cradle to grave which covers all production stages (A1-A3), transportation to site (A4), installation (A5), use stages (B1-B7), and end-of-life stages (C1-C4) and D in accordance with EN 15804:2012+A2:2019. Additionally, this EPD complies with EN 50693:2019 PCR for the evaluation of electronic and electrical products and systems.
The study period of this LCA is 22 years which is same as the reference service life of the product for the entire system boundary from A1-C4.
Impacts and losses/wastage in production, transport, use stage and end of life stage are accounted in their respective modules.

Data sources, quality, and allocation

Specific primary data derived from the manufacturing of the boilers tank process in Belper, UK factory have been modelled using Simapro v9.5 LCA software and data collected during the period of 2023. In accordance with the requirements of EN15804, the most current available data has been used. The manufacturer-specific data for one unit of each. 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 3.10 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 EN15804. The quantities of materials have been calculated based on the components used in the unit. The amount of water, energy and waste was allocated to each product based on the total number of boilers manufactured per year.

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 v3.10 (released in 2024).

The English electricity mix (2023) used has an impact on the climate change indicator of 0.252 $kgCO_2eq/kWh$, the gas (2023) used for the boilers has an impact of 0.283 $kgCO_2eq/m^3$.

Cut-off criteria

The cut-off rule used in this study is that defined in PCR edition 4 as follows:

- The mass of intermediate flows not considered must be less than or equal to 5% of the mass of the elements in the reference product corresponding to the Functional unit.
- Energy flows not considered must be less than or equal to 5% of the total primary energy used during the life cycle of the reference product corresponding to the Functional unit,
- The environmental impacts not considered must be less than or equal to 5% of the total environmental impacts generated throughout the life cycle of the reference product corresponding to the Functional unit.

No raw materials are excluded in this study.

LCA Results : ecoTEC Plus VU GB 806/5-5

(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	4,42E+02	4,42E+02	-9,63E-01	1,14E+00	1,00E-05	4,71E+00	3,75E-02
	Transport	A2	5,04E+01	5,03E+01	1,62E-02	2,50E-02	1,10E-06	1,10E-01	4,09E-04
	Manufacturing	A3	1,01E+01	2,41E+01	-1,40E+01	4,03E-02	2,16E-06	9,41E-02	1,11E-03
	Total (Consumption grid)	A1-3	5,02E+02	5,16E+02	-1,50E+01	1,21E+00	1,33E-05	4,92E+00	3,90E-02
Construction process stage	Transport	A4	1,72E+01	1,72E+01	5,54E-03	8,55E-03	3,74E-07	3,76E-02	1,40E-04
	Construction	A5	2,91E+01	1,51E+00	2,76E+01	4,76E-04	1,52E-08	4,22E-03	1,09E-05
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	5,60E+02	5,59E+02	3,34E-01	2,73E-01	1,41E-05	2,37E+00	8,72E-03
	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	2,33E+05	2,33E+05	4,36E+01	3,23E+01	1,03E-02	1,82E+02	8,31E-01
	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Transport	C2	1,44E+00	1,44E+00	4,63E-04	7,15E-04	3,13E-08	3,14E-03	1,17E-05
	Waste processing	C3	2,69E+01	2,67E+01	1,41E-01	3,94E-02	2,26E-06	5,00E-01	2,53E-03
	Disposal	C4	8,43E-01	8,42E-01	4,03E-04	3,58E-04	2,15E-08	2,55E-03	6,41E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2,06E+02	-2,05E+02	-4,03E-01	-5,45E-01	-7,38E-06	-2,87E+00	-1,56E-02

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)

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

Parameters describing environmental impacts									
			EP-marine	EP-terrestrial	POCP	ADP-mineral &metal	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	5,24E-01	6,52E+00	2,12E+00	6,16E-02	5,57E+03	1,33E+02	3,58E-05
	Transport	A2	2,71E-02	2,82E-01	1,71E-01	1,69E-04	7,15E+02	2,99E+00	3,74E-06
	Manufacturing	A3	2,73E-02	2,59E-01	1,27E-01	6,27E-05	8,01E+02	8,46E+00	1,21E-06
	Total (Consumption grid)	A1-3	5,79E-01	7,06E+00	2,42E+00	6,18E-02	7,08E+03	1,45E+02	4,07E-05
Construction process stage	Transport	A4	9,25E-03	9,63E-02	5,83E-02	5,76E-05	2,44E+02	1,02E+00	1,28E-06
	Construction	A5	7,03E-03	1,50E-02	7,26E-03	1,98E-06	1,01E+01	2,55E-01	1,35E-07
Use stage	Use	B1	9,11E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Maintenance	B2	7,14E-01	7,77E+00	2,93E+00	6,17E-03	7,58E+03	5,07E+01	2,65E-05
	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	5,51E+01	6,08E+02	3,99E+02	2,29E-01	3,33E+06	5,02E+03	1,05E-03
	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Transport	C2	7,74E-04	8,06E-03	4,88E-03	4,82E-06	2,04E+01	8,54E-02	1,07E-07
	Waste processing	C3	3,94E-02	4,93E-01	1,50E-01	5,20E-03	4,64E+02	1,66E+01	4,05E-06
	Disposal	C4	1,03E-03	8,77E-03	3,75E-03	2,01E-06	1,16E+01	2,16E-01	6,79E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2,73E-01	-4,37E+00	-1,10E+00	-2,67E-02	-2,43E+03	-5,81E+01	-2,19E-05

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)

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

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	1,49E+01	7,46E+03	2,19E-06	4,16E-05	3,38E+03
	Transport	A2	3,62E-01	3,53E+02	2,29E-08	5,07E-07	4,32E+02
	Manufacturing	A3	1,38E+00	1,19E+02	2,34E-08	1,90E-07	2,14E+03
	Total (Consumption grid)	A1-3	1,66E+01	7,93E+03	2,23E-06	4,23E-05	5,95E+03
Construction process stage	Transport	A4	1,24E-01	1,21E+02	7,84E-09	1,73E-07	1,48E+02
	Construction	A5	1,68E-02	2,75E+01	2,07E-09	3,69E-08	8,70E+00
Use stage	Use	B1	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Maintenance	B2	5,79E+00	4,71E+03	5,55E-07	7,64E-06	2,89E+03
	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	8,99E+02	1,71E+05	4,24E-05	4,58E-04	7,49E+04
	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Transport	C2	1,03E-02	1,01E+01	6,55E-10	1,45E-08	1,23E+01
	Waste processing	C3	2,64E+00	4,23E+02	4,88E-07	2,01E-05	2,79E+02
	Disposal	C4	8,44E-03	1,97E+01	3,49E-10	6,64E-09	1,39E+01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-6,11E+00	-3,53E+03	-2,32E-06	-2,45E-05	-1,33E+03

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)

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

Parameters describing resource use, primary energy								
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	9,85E+02	4,84E+01	1,03E+03	5,44E+03	1,32E+02	5,57E+03
	Transport	A2	1,12E+01	0,00E+00	1,12E+01	7,15E+02	0,00E+00	7,15E+02
	Manufacturing	A3	2,78E+02	1,22E+02	4,00E+02	7,47E+02	6,18E+01	8,09E+02
	Total (Consumption grid)	A1-3	1,27E+03	1,70E+02	1,44E+03	6,90E+03	1,94E+02	7,09E+03
Construction process stage	Transport	A4	3,84E+00	0,00E+00	3,84E+00	2,44E+02	0,00E+00	2,44E+02
	Construction	A5	1,94E+02	-1,94E+02	3,46E-01	1,01E+01	0,00E+00	1,01E+01
Use stage	Use	B1	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Maintenance	B2	2,12E+02	0,00E+00	2,12E+02	7,58E+03	0,00E+00	7,58E+03
	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	2,69E+04	0,00E+00	2,69E+04	3,33E+06	0,00E+00	3,33E+06
	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	3,21E-01	0,00E+00	3,21E-01	2,04E+01	0,00E+00	2,04E+01
	Waste processing	C3	6,33E+01	0,00E+00	6,33E+01	4,64E+02	0,00E+00	4,64E+02
	Disposal	C4	2,60E-01	0,00E+00	2,60E-01	1,16E+01	0,00E+00	1,16E+01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-5,27E+02	0,00E+00	-5,27E+02	-2,37E+03	-6,36E+01	-2,43E+03

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)

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

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	1,28E+00	0,00E+00	0,00E+00	4,90E+00
	Transport	A2	0,00E+00	0,00E+00	0,00E+00	1,03E-01
	Manufacturing	A3	5,35E-01	0,00E+00	0,00E+00	2,46E-01
	Total (Consumption grid)	A1-3	1,81E+00	0,00E+00	0,00E+00	5,24E+00
Construction process stage	Transport	A4	0,00E+00	0,00E+00	0,00E+00	3,51E-02
	Construction	A5	0,00E+00	0,00E+00	0,00E+00	8,39E-03
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	1,68E+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	1,89E+02
	Operational water use	B7	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
	Transport	C2	0,00E+00	0,00E+00	0,00E+00	2,93E-03
	Waste processing	C3	0,00E+00	0,00E+00	0,00E+00	5,45E-01
	Disposal	C4	0,00E+00	0,00E+00	0,00E+00	6,19E-03
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0,00E+00	0,00E+00	0,00E+00	-2,25E+00

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)

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

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	2,08E+02	1,24E+03	1,04E-02
	Transport	A2	6,89E-01	4,13E+01	2,35E-04
	Manufacturing	A3	9,06E-01	1,14E+01	7,91E-04
	Total (Consumption grid)	A1-3	2,10E+02	1,29E+03	1,14E-02
Construction process stage	Transport	A4	2,36E-01	1,41E+01	8,03E-05
	Construction	A5	1,43E-01	8,73E+00	1,60E-05
Use stage	Use	B1	0,00E+00	0,00E+00	0,00E+00
	Maintenance	B2	2,23E+01	3,50E+02	3,81E-03
	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	1,45E+03	1,40E+04	6,79E-01
	Operational water use	B7	0,00E+00	0,00E+00	0,00E+00
End of life	Deconstruction, demolition	C1	0,00E+00	0,00E+00	0,00E+00
	Transport	C2	1,97E-02	1,18E+00	6,71E-06
	Waste processing	C3	6,40E+00	1,31E+02	2,30E-03
	Disposal	C4	9,58E-02	2,66E+01	6,80E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1,28E+02	-7,21E+02	-4,91E-03

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

LCA Results (continued)

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

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	1,80E-01	1,43E+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	2,13E+00	0,00E+00	0,00E+00	0,00E+00	5,62E+00
	Total (Consumption grid)	A1-3	0,00E+00	2,13E+00	0,00E+00	0,00E+00	1,80E-01	7,05E+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	8,38E+00	0,00E+00	0,00E+00	0,00E+00	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	5,17E+01	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 : ecoTEC Plus VU GB 1006/5-5

(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	5,92E+02	5,90E+02	-1,68E+00	2,88E+00	1,22E-05	4,53E+00	3,52E-02
	Transport	A2	6,11E+01	6,10E+01	1,97E-02	3,04E-02	1,33E-06	1,33E-01	4,96E-04
	Manufacturing	A3	1,31E+01	2,43E+01	-1,12E+01	4,04E-02	2,16E-06	9,46E-02	1,12E-03
	Total (Consumption grid)	A1-3	6,66E+02	6,76E+02	-1,29E+01	2,95E+00	1,57E-05	4,76E+00	3,68E-02
Construction process stage	Transport	A4	2,03E+01	2,03E+01	6,53E-03	1,01E-02	4,41E-07	4,43E-02	1,65E-04
	Construction	A5	2,91E+01	1,51E+00	2,76E+01	4,76E-04	1,52E-08	4,22E-03	1,09E-05
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	5,60E+02	5,59E+02	3,34E-01	2,73E-01	1,41E-05	2,37E+00	8,72E-03
	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	2,92E+05	2,92E+05	5,45E+01	4,04E+01	1,28E-02	2,27E+02	1,04E+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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Transport	C2	1,75E+00	1,74E+00	5,62E-04	8,68E-04	3,80E-08	3,81E-03	1,42E-05
	Waste processing	C3	2,96E+01	2,94E+01	1,51E-01	4,28E-02	2,89E-06	3,64E-01	2,39E-03
	Disposal	C4	9,31E-01	9,30E-01	3,76E-04	4,08E-04	2,36E-08	2,84E-03	7,12E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-3,07E+02	-3,05E+02	-6,82E-01	-1,60E+00	-1,19E-05	-3,07E+00	-1,75E-02

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)

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

Parameters describing environmental impacts									
			EP-marine	EP-terrestrial	POCP	ADP-mineral &metal	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	5,96E-01	7,12E+00	2,46E+00	3,92E-02	7,56E+03	1,47E+02	4,66E-05
	Transport	A2	3,28E-02	3,42E-01	2,07E-01	2,04E-04	8,67E+02	3,62E+00	4,54E-06
	Manufacturing	A3	2,81E-02	2,61E-01	1,28E-01	6,29E-05	8,03E+02	8,49E+00	1,23E-06
	Total (Consumption grid)	A1-3	6,57E-01	7,72E+00	2,80E+00	3,95E-02	9,23E+03	1,59E+02	5,23E-05
Construction process stage	Transport	A4	1,09E-02	1,13E-01	6,87E-02	6,79E-05	2,88E+02	1,20E+00	1,51E-06
	Construction	A5	7,04E-03	1,50E-02	7,27E-03	1,98E-06	1,01E+01	2,55E-01	1,35E-07
Use stage	Use	B1	9,11E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Maintenance	B2	7,14E-01	7,77E+00	2,93E+00	6,17E-03	7,58E+03	5,07E+01	2,65E-05
	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	6,89E+01	7,60E+02	5,00E+02	2,86E-01	4,16E+06	6,28E+03	1,31E-03
	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Transport	C2	9,38E-04	9,77E-03	5,92E-03	5,84E-06	2,48E+01	1,04E-01	1,30E-07
	Waste processing	C3	3,88E-02	4,72E-01	1,41E-01	3,14E-03	5,30E+02	1,73E+01	4,62E-06
	Disposal	C4	1,11E-03	9,68E-03	4,18E-03	2,25E-06	1,31E+01	2,49E-01	7,64E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-3,48E-01	-5,88E+00	-1,38E+00	-2,03E-02	-3,71E+03	-6,01E+01	-3,16E-05

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)

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

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	2,27E+01	6,32E+03	2,87E-06	3,15E-05	3,91E+03
	Transport	A2	4,39E-01	4,29E+02	2,78E-08	6,15E-07	5,24E+02
	Manufacturing	A3	1,38E+00	1,22E+02	2,36E-08	1,94E-07	2,15E+03
	Total (Consumption grid)	A1-3	2,45E+01	6,87E+03	2,92E-06	3,23E-05	6,58E+03
Construction process stage	Transport	A4	1,46E-01	1,42E+02	9,23E-09	2,04E-07	1,74E+02
	Construction	A5	1,68E-02	2,75E+01	2,07E-09	3,70E-08	8,70E+00
Use stage	Use	B1	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Maintenance	B2	5,79E+00	4,71E+03	5,55E-07	7,64E-06	2,89E+03
	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	1,12E+03	2,14E+05	5,30E-05	5,73E-04	9,36E+04
	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Transport	C2	1,25E-02	1,22E+01	7,95E-10	1,76E-08	1,50E+01
	Waste processing	C3	3,07E+00	3,31E+02	5,86E-07	2,18E-05	2,58E+02
	Disposal	C4	8,23E-03	1,45E+01	3,74E-10	7,35E-09	1,54E+01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1,12E+01	-3,20E+03	-3,37E-06	-1,83E-05	-1,54E+03

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)

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

Parameters describing resource use, primary energy								
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	1,62E+03	6,82E+01	1,69E+03	7,43E+03	1,34E+02	7,56E+03
	Transport	A2	1,36E+01	0,00E+00	1,36E+01	8,67E+02	0,00E+00	8,67E+02
	Manufacturing	A3	2,98E+02	1,02E+02	4,00E+02	7,48E+02	6,18E+01	8,10E+02
	Total (Consumption grid)	A1-3	1,94E+03	1,70E+02	2,11E+03	9,05E+03	1,96E+02	9,24E+03
Construction process stage	Transport	A4	4,52E+00	0,00E+00	4,52E+00	2,88E+02	0,00E+00	2,88E+02
	Construction	A5	1,94E+02	-1,94E+02	3,47E-01	1,01E+01	0,00E+00	1,01E+01
Use stage	Use	B1	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Maintenance	B2	2,12E+02	0,00E+00	2,12E+02	7,58E+03	0,00E+00	7,58E+03
	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	3,36E+04	0,00E+00	3,36E+04	4,16E+06	0,00E+00	4,16E+06
	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	3,89E-01	0,00E+00	3,89E-01	2,48E+01	0,00E+00	2,48E+01
	Waste processing	C3	6,61E+01	0,00E+00	6,61E+01	5,30E+02	0,00E+00	5,30E+02
	Disposal	C4	2,38E-01	0,00E+00	2,38E-01	1,31E+01	0,00E+00	1,31E+01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-9,43E+02	0,00E+00	-9,43E+02	-3,65E+03	-6,05E+01	-3,71E+03

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)

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

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	1,80E+00	0,00E+00	0,00E+00	8,30E+00
	Transport	A2	0,00E+00	0,00E+00	0,00E+00	1,24E-01
	Manufacturing	A3	5,35E-01	0,00E+00	0,00E+00	2,47E-01
	Total (Consumption grid)	A1-3	2,33E+00	0,00E+00	0,00E+00	8,67E+00
Construction process stage	Transport	A4	0,00E+00	0,00E+00	0,00E+00	4,13E-02
	Construction	A5	0,00E+00	0,00E+00	0,00E+00	8,40E-03
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	1,68E+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	2,37E+02
	Operational water use	B7	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
	Transport	C2	0,00E+00	0,00E+00	0,00E+00	3,56E-03
	Waste processing	C3	0,00E+00	0,00E+00	0,00E+00	5,88E-01
	Disposal	C4	0,00E+00	0,00E+00	0,00E+00	6,72E-03
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0,00E+00	0,00E+00	0,00E+00	-4,20E+00

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)

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

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	3,15E+02	9,88E+02	1,66E-02
	Transport	A2	8,36E-01	5,01E+01	2,85E-04
	Manufacturing	A3	9,22E-01	1,23E+01	7,93E-04
	Total (Consumption grid)	A1-3	3,17E+02	1,05E+03	1,77E-02
Construction process stage	Transport	A4	2,77E-01	1,66E+01	9,46E-05
	Construction	A5	1,43E-01	8,74E+00	1,60E-05
Use stage	Use	B1	0,00E+00	0,00E+00	0,00E+00
	Maintenance	B2	2,23E+01	3,50E+02	3,81E-03
	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	1,82E+03	1,75E+04	8,49E-01
	Operational water use	B7	0,00E+00	0,00E+00	0,00E+00
End of life	Deconstruction, demolition	C1	0,00E+00	0,00E+00	0,00E+00
	Transport	C2	2,39E-02	1,43E+00	8,14E-06
	Waste processing	C3	7,40E+00	8,01E+01	2,73E-03
	Disposal	C4	5,95E-02	3,09E+01	6,68E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1,96E+02	-5,80E+02	-9,26E-03

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

LCA Results (continued)

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

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	1,82E-01	2,01E+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	3,00E+00	0,00E+00	0,00E+00	0,00E+00	5,62E+00
	Total (Consumption grid)	A1-3	0,00E+00	3,00E+00	0,00E+00	0,00E+00	1,82E-01	7,63E+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	8,39E+00	0,00E+00	0,00E+00	0,00E+00	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	6,40E+01	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 : ecoTEC Plus VU GB 1206/5-5

(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	6,50E+02	6,48E+02	-1,67E+00	2,96E+00	1,43E-05	4,54E+00	4,09E-02
	Transport	A2	6,52E+01	6,51E+01	2,10E-02	3,24E-02	1,42E-06	1,42E-01	5,29E-04
	Manufacturing	A3	1,37E+01	2,43E+01	-1,07E+01	4,05E-02	2,16E-06	9,48E-02	1,12E-03
	Total (Consumption grid)	A1-3	7,28E+02	7,38E+02	-1,24E+01	3,04E+00	1,78E-05	4,78E+00	4,26E-02
Construction process stage	Transport	A4	2,14E+01	2,14E+01	6,90E-03	1,07E-02	4,66E-07	4,68E-02	1,74E-04
	Construction	A5	2,92E+01	1,51E+00	2,77E+01	4,78E-04	1,52E-08	4,23E-03	1,09E-05
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	5,60E+02	5,59E+02	3,34E-01	2,73E-01	1,41E-05	2,37E+00	8,72E-03
	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	3,49E+05	3,49E+05	6,51E+01	4,83E+01	1,54E-02	2,72E+02	1,24E+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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Transport	C2	1,86E+00	1,86E+00	6,00E-04	9,26E-04	4,05E-08	4,07E-03	1,51E-05
	Waste processing	C3	3,01E+01	2,99E+01	1,55E-01	4,34E-02	3,07E-06	3,04E-01	2,29E-03
	Disposal	C4	1,01E+00	1,01E+00	4,18E-04	4,47E-04	2,54E-08	3,10E-03	7,78E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-3,20E+02	-3,17E+02	-6,91E-01	-1,60E+00	-1,25E-05	-2,88E+00	-1,69E-02

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)

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

Parameters describing environmental impacts									
			EP-marine	EP-terrestrial	POCP	ADP-mineral &metal	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	6,48E-01	7,65E+00	2,65E+00	4,59E-02	8,29E+03	1,55E+02	4,99E-05
	Transport	A2	3,50E-02	3,65E-01	2,21E-01	2,18E-04	9,25E+02	3,87E+00	4,84E-06
	Manufacturing	A3	2,83E-02	2,61E-01	1,28E-01	6,30E-05	8,03E+02	8,50E+00	1,23E-06
	Total (Consumption grid)	A1-3	7,12E-01	8,27E+00	3,00E+00	4,62E-02	1,00E+04	1,68E+02	5,60E-05
Construction process stage	Transport	A4	1,15E-02	1,20E-01	7,27E-02	7,18E-05	3,04E+02	1,27E+00	1,59E-06
	Construction	A5	7,06E-03	1,50E-02	7,29E-03	1,99E-06	1,01E+01	2,55E-01	1,35E-07
Use stage	Use	B1	9,11E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Maintenance	B2	7,14E-01	7,77E+00	2,93E+00	6,17E-03	7,58E+03	5,07E+01	2,65E-05
	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	8,23E+01	9,08E+02	5,97E+02	3,42E-01	4,97E+06	7,51E+03	1,57E-03
	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Transport	C2	1,00E-03	1,04E-02	6,31E-03	6,23E-06	2,64E+01	1,10E-01	1,38E-07
	Waste processing	C3	3,79E-02	4,55E-01	1,35E-01	2,27E-03	5,46E+02	1,72E+01	4,76E-06
	Disposal	C4	1,20E-03	1,06E-02	4,55E-03	2,44E-06	1,43E+01	2,76E-01	8,33E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-3,50E-01	-5,88E+00	-1,39E+00	-1,67E-02	-3,84E+03	-5,87E+01	-3,25E-05

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)

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

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	2,46E+01	6,85E+03	3,02E-06	2,83E-05	4,19E+03
	Transport	A2	4,69E-01	4,57E+02	2,97E-08	6,56E-07	5,59E+02
	Manufacturing	A3	1,38E+00	1,23E+02	2,37E-08	1,95E-07	2,15E+03
	Total (Consumption grid)	A1-3	2,64E+01	7,43E+03	3,07E-06	2,92E-05	6,90E+03
Construction process stage	Transport	A4	1,54E-01	1,50E+02	9,77E-09	2,16E-07	1,84E+02
	Construction	A5	1,68E-02	2,76E+01	2,08E-09	3,71E-08	8,71E+00
Use stage	Use	B1	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Maintenance	B2	5,79E+00	4,71E+03	5,55E-07	7,64E-06	2,89E+03
	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	1,34E+03	2,55E+05	6,34E-05	6,84E-04	1,12E+05
	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Transport	C2	1,34E-02	1,31E+01	8,48E-10	1,88E-08	1,60E+01
	Waste processing	C3	3,18E+00	2,89E+02	6,12E-07	2,19E-05	2,45E+02
	Disposal	C4	8,55E-03	1,26E+01	4,00E-10	7,94E-09	1,68E+01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1,13E+01	-2,86E+03	-3,54E-06	-1,48E-05	-1,53E+03

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)

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

Parameters describing resource use, primary energy								
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	1,72E+03	7,21E+01	1,79E+03	8,16E+03	1,38E+02	8,29E+03
	Transport	A2	1,45E+01	0,00E+00	1,45E+01	9,25E+02	0,00E+00	9,25E+02
	Manufacturing	A3	3,03E+02	9,85E+01	4,01E+02	7,49E+02	6,16E+01	8,10E+02
	Total (Consumption grid)	A1-3	2,04E+03	1,71E+02	2,21E+03	9,83E+03	2,00E+02	1,00E+04
Construction process stage	Transport	A4	4,78E+00	0,00E+00	4,78E+00	3,04E+02	0,00E+00	3,04E+02
	Construction	A5	1,94E+02	-1,94E+02	3,47E-01	1,01E+01	0,00E+00	1,01E+01
Use stage	Use	B1	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Maintenance	B2	2,12E+02	0,00E+00	2,12E+02	7,58E+03	0,00E+00	7,58E+03
	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	4,02E+04	0,00E+00	4,02E+04	4,97E+06	0,00E+00	4,97E+06
	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	4,15E-01	0,00E+00	4,15E-01	2,64E+01	0,00E+00	2,64E+01
	Waste processing	C3	6,61E+01	0,00E+00	6,61E+01	5,46E+02	0,00E+00	5,46E+02
	Disposal	C4	2,39E-01	0,00E+00	2,39E-01	1,43E+01	0,00E+00	1,43E+01
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-9,67E+02	0,00E+00	-9,67E+02	-3,78E+03	-6,20E+01	-3,84E+03

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)

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

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	1,90E+00	0,00E+00	0,00E+00	8,65E+00
	Transport	A2	0,00E+00	0,00E+00	0,00E+00	1,33E-01
	Manufacturing	A3	5,35E-01	0,00E+00	0,00E+00	2,47E-01
	Total (Consumption grid)	A1-3	2,44E+00	0,00E+00	0,00E+00	9,03E+00
Construction process stage	Transport	A4	0,00E+00	0,00E+00	0,00E+00	4,37E-02
	Construction	A5	0,00E+00	0,00E+00	0,00E+00	8,41E-03
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	1,68E+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	2,83E+02
	Operational water use	B7	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
	Transport	C2	0,00E+00	0,00E+00	0,00E+00	3,80E-03
	Waste processing	C3	0,00E+00	0,00E+00	0,00E+00	5,94E-01
	Disposal	C4	0,00E+00	0,00E+00	0,00E+00	7,28E-03
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0,00E+00	0,00E+00	0,00E+00	-4,18E+00

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)

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

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	3,36E+02	9,46E+02	1,79E-02
	Transport	A2	8,92E-01	5,34E+01	3,04E-04
	Manufacturing	A3	9,27E-01	1,25E+01	7,94E-04
	Total (Consumption grid)	A1-3	3,38E+02	1,01E+03	1,90E-02
Construction process stage	Transport	A4	2,94E-01	1,76E+01	1,00E-04
	Construction	A5	1,43E-01	8,75E+00	1,60E-05
Use stage	Use	B1	0,00E+00	0,00E+00	0,00E+00
	Maintenance	B2	2,23E+01	3,50E+02	3,81E-03
	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	2,17E+03	2,09E+04	1,01E+00
	Operational water use	B7	0,00E+00	0,00E+00	0,00E+00
End of life	Deconstruction, demolition	C1	0,00E+00	0,00E+00	0,00E+00
	Transport	C2	2,55E-02	1,53E+00	8,69E-06
	Waste processing	C3	7,64E+00	5,85E+01	2,84E-03
	Disposal	C4	4,53E-02	3,36E+01	7,00E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2,08E+02	-5,00E+02	-9,44E-03

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

LCA Results (continued)

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

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	1,35E-01	2,13E+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	3,18E+00	0,00E+00	0,00E+00	0,00E+00	5,63E+00
	Total (Consumption grid)	A1-3	0,00E+00	3,18E+00	0,00E+00	0,00E+00	1,35E-01	7,76E+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	8,40E+00	0,00E+00	0,00E+00	0,00E+00	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	6,76E+01	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			
Scenario	Parameter	Units	Results
A4 – Transport to the building site	Products are manufactured in Livingston and distributed in the UK. The longest distance the unit can travel in the UK (1000 km) by lorry has been considered for this scenario.		
	Fuel type / Vehicle type	Litre of fuel type per distance or vehicle type	16-32 metric ton, EURO6
	Distance:	km	1000
	Capacity utilisation (incl. empty returns)	%	36,2
	Average load	t	5,8
	Weight of vehicle + load	t	15,8
	Maximum payload	t	16,0
A5 – Installation in the building	For this study, it was assumed that no unit were damaged on installation. The installation of the boilers requires no additional component. The packaging of the unit is disposed of during installation. Packaging includes:		
	Corrugated cardboard and paper	Recycled	82%
	Plastic	Recycled	41%
B2 – Maintenance	The boiler is maintained once a year repair throughout its reference lifetime. This maintenance requires a check of electrical circuits and the removal of any obstructions. No parts are removed or replaced during this maintenance - providing the boiler has been installed and maintained in accordance with the manufacturer's guidance.		
B3 – Repair	The boiler should not require repair throughout its reference lifetime - providing the boiler has been installed and maintained in accordance with the manufacturer's guidance.		
B4 – Replacement	The boiler has a reference lifetime of 22 years. No replacements are required - providing the boiler has been installed and maintained in accordance with the manufacturer's guidance.		
B5 – Refurbishment	The boiler has a reference lifetime of 22 years. No refurbishment is required - providing the boiler has been installed and maintained in accordance with the manufacturer's guidance.		
B6 – Operational energy use	Total energy consumption of the boiler per functional unit over 22 years study period		
	ecoTEC Plus VU GB 806/5-5	kWh	8,36E+05
	ecoTEC Plus VU GB 1006/5-5	kWh	1,05E+06
	ecoTEC Plus VU GB 1206/5-5	kWh	1,25E+06
B7 – Use of water	The boiler is sealed. Water runs through the system to be heated and is then fed back into the system. There is therefore no water consumed by the unit throughout its reference lifetime.		
C1 to C4 End of life,	Conservative figures were used for the disposal of the various components		
	Recycled metal	%	60-80%
	Recycled plastic	%	0-20%
	Landfill of other components	%	100

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
Module D	According to the PCR PN 514 Rev 3.1		

References

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.

BSI. Environmental management – Life cycle assessment – requirements and guidelines. BS EN ISO 14044:2006. London, BSI, 2006.

AFNOR. (2023, décembre). NF EN 15502-1+A1: Chaudières de chauffage central utilisant les combustibles gazeux – Partie 1 : Exigences générales et essais. Association Française de Normalisation.

PEP ecopassport®. (2023, 19 octobre). PSR-0012-ed2.0-EN-2023-10-19 – Product Specific Rules for gas, fuel oil or biomass boilers for heating only or heating and domestic hot water production.

PEP ecopassport®. (2021, 6 septembre). PEP-PCR-ed4-EN-2021 09 06 – Product Category Rules for Electrical, Electronic and HVAC-R Products.