Statement of Verification

BREG EN EPD No.: 000643 Issue 02

This is to verify that the

Environmental Product Declaration

provided by:

Apollo Fire Detectors 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 Unit of Detector (Soteria Heat Detector, Soteria Optical Smoke Detector, Soteria Multi-Sensor Detector (Optical/Heat)- White & Black)

Company Address

Apollo Fire Detectors Ltd,
36 Brookside Road,
Havant,
Hampshire,
United Kingdom,
PO9 1JR

apollo

SOTERIA®

Signed for BRE Global Ltd	Emma Baker Operator	26 November 2024 Date of this Issue
12 November 2024 Date of First Issue		11 November 2029 Expiry Date

BRE Global Verified EPD

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ECO PLATFORM EPD VERIFIED

Environmental Product Declaration

EPD Number: 000643

General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom	BRE 2023 Product Category Rules (PN 514 Rev 3.1) for Type III environmental product declaration of construction products to EN 15804:2012+A2:2019
Commissioner of LCA study	**LCA consultant/Tool**
Apollo Fire Detectors Ltd, 36 Brookside Road, Havant, Hampshire, United Kingdom, PO9 1JR	BRE LINA A2/ Apollo Fire Detectors Limited
Declared/Functional Unit	**Applicability/Coverage**
1 Unit of Detector (Soteria Heat Detector, Soteria Optical smoke detector, Soteria Multi-Sensor Detector (optical/Heat)- White & Black)	Product specific
EPD Type	**Background database**
Cradle to Grave	Ecoinvent 3.8

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 ☐Internal ☒ External
(Where appropriate [b])Third party verifier: Roger Connick
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)

Apollo Fire Detectors Ltd,
36 Brookside Road,
Havant,
Hampshire,
United Kingdom,
PO9 1JR

Construction Product:

Product Description

The Soteria® range of addressable fire detectors is Apollo's next generation in fire recognition technology. With integrated isolation to increase loop integrity and PureLight® technology to reduce unwanted alarms, Soteria delivers reliable, and advanced protection for a wide range of applications.

Following the completion of a Life Cycle Assessment (LCA), it was determined that the range represented by this EPD exhibits environmental variance of less than 10% in terms of GWP total A1-A3 and GWP total Cradle to Grave. Consequently, this EPD represents 1 unit of the products:

SA5100-400APO: Soteria Heat Detector
The Soteria Heat Detector features two heat sensors located laterally to ensure accurate heat detection in all orientations.

SA5100-600APO: Soteria Optical Smoke Detector
The Soteria Optical Smoke Detector uses advanced optical sensing technology, PureLight, to provide advanced false alarm management and increased detector reliability.

SA5100-700APO: Soteria Multi-Sensor Detector (Optical/ Heat)
SA5100-760APO: Soteria Multi-Sensor Detector (Optical/ Heat) – Black
The Soteria Multi-Sensor Detector uses advanced optical sensing technology, PureLight, to detect smoke particles entering the chamber and is fitted with two thermistors for detecting heat. It easily discriminates against false alarm stimuli and is a great environmentally friendly alternative to ionisation detectors.

Technical Information

The below table covers the basic technical properties of the Soteria Heat Detector, Soteria Optical Smoke Detector and Soteria (Optical/Heat) Multi-sensor Detector. For further properties, please see the products' pages on Apollo's website: https://www.apollo-fire.co.uk/products/soteria/

Properties/Standards	Value, Unit
Weight	Soteria Heat Detector: 0.09kg Soteria Optical Smoke Detector: 0.095kg Soteria (Optional/Heat) Multisensor Detector: 0.096kg
Quiescent Current	350 µA
Supply Voltage (V_{min}- V_{max})	17 V – 35 V dc
IP Rating	IP44
Standards	Soteria Heat Detector: EN 54-5:2017, EN 54-17:2005 Soteria Optical Smoke Detector: EN 54-7:2018, EN 54-17:2005 Soteria (Optical/Heat) Multisensor Detector: EN 54-5:2017, EN 54-7:2018, EN 54-17:2005

SOTERIA®

Main Product Contents

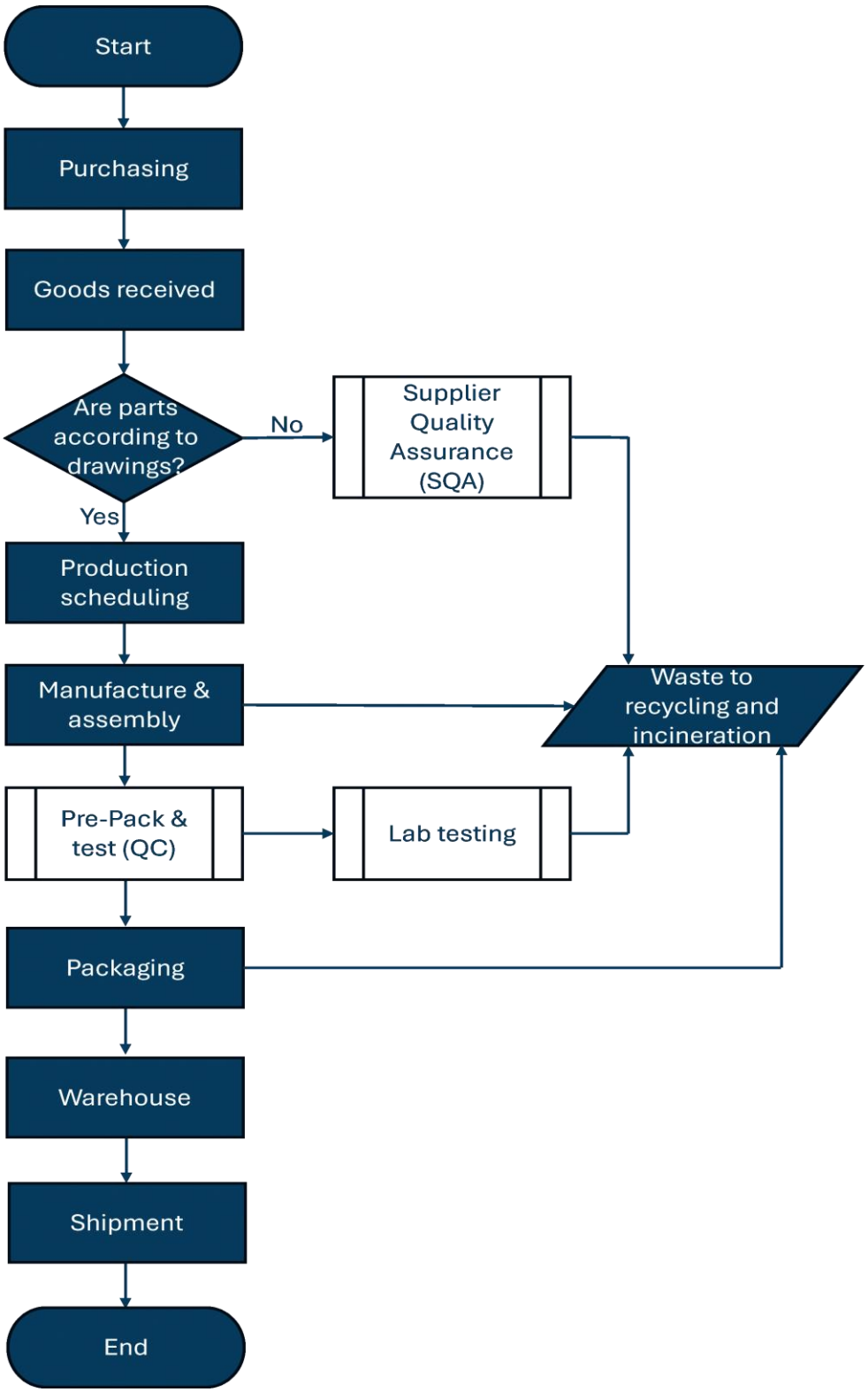
Material/Chemical Input	%
Plastic Components	77-78
Electronics components	16-17
Metal Components	5-7

Manufacturing Process

The manufacturing process of Apollo Fire Detectors Ltd involves the assembly of various purchased components and the integration of sophisticated technology to create devices capable of detecting and alerting individuals to the presence of Fire. These detectors play a crucial role in safeguarding lives and property by providing early warning in the event of a fire emergency. Our Fire Detection systems are sold around the world and comply with a variety of different approval bodies, to do so.

The assembly process is made up of 3 different value streams which are fully automated, semi-automated and manual assembly. Each process is driven by Apollo's drawings, SOP's and flow charts and 100% of our products are quality tested inline. A set of samples from each batch go through a vigorous lab test to ensure that we are always compliant with various regulatory bodies.

Process flow diagram



Construction Installation

The transport distance to the construction site was set at 120 km by road, based on UK manufacturing, as referenced in the Royal Institution of Chartered Surveyors' 2023 Whole Life Carbon Assessments for the Built Environment. To install the product, only standard tools are necessary. Before proceeding with installation, it is essential to refer to safety, installation and maintenance instructions identified on or with the product. Furthermore, installation must be done by a competent person and adhere to applicable installation codes and standards, such as BS5839-1 in the UK.

Use Information

Under typical usage conditions, the individual product has a life span of 10 years. It remains in quiescent mode over 99% of the time and requires no repairs, part replacements, or refurbishments. Routine maintenance testing is typically the responsibility of the premises' occupier.

However, this product is part of a fire detection and alarm system, for which system maintenance is required. As well as routine testing, Grade A systems should be inspected and serviced at periods not exceeding 6 months in accordance with the recommendations of BS 5839. Typically, this responsibility falls to an external fire alarm servicing organisation, in which case a competent person with specialist knowledge of fire detection and fire alarm systems, will visit the fire system for maintenance twice a year.

End of Life

This product comes with a 10-year warranty. After this period, in accordance with UK regulations, waste from this product is classified as WEEE (Waste Electrical and Electronic Equipment). Apollo has partnered with a producer compliance scheme to manage all logistics associated with this. When end users reach out to Apollo for product returns, they are directed to the contact details of the compliance scheme we are affiliated with, and arrangements are made for the recycling of the product.

Life Cycle Assessment Calculation Rules

Declared unit description

1 Unit of Detector (Soteria Heat Detector, Soteria Optical Smoke Detector, Soteria Multi- Sensor Detector (Optical/Heat)- White & Black)

System boundary

This cradle-to-grave LCA covers all production stages (A1-A3), use stages (B1-B7), and end- of-life stages (C1-C4 and D) in accordance with EN 15804:2012+A2:2019 and BRE 2023 PCR (PN 514 Rev 3.1). No relevant processes were excluded. Additionally, this EPD complies with the requirements for electronic and electrical equipment as per BS EN 50693:2019, Product Category Rules for life cycle assessments of electronic and electrical products and systems.

LCAs have been completed for each model. As their environmental differences are less than 10% in terms of GWP total A1-A3 and GWP total Cradle to Grave, they've been combined into a single EPD. The results for each model are displayed, with the black and white Soteria Multi-Sensor Detectors (Optical/Heat) presented together, as they are identical. The Soteria Multi-Sensor Detector (Optical/Heat) shows the highest environmental impact.

Data sources and allocation

For the Life Cycle Assessment (LCA) and Environmental Product Declaration (EPD), Apollo Fire Detectors utilised specific primary data extracted from its production operations at the Havant, Hampshire factory, modelled using the LINA A2 LCA and the ecoinvent 3.8 database. In accordance with the requirements of EN15804:2012 + A2:2019, the most current available data has been used. The manufacturer-specific data from Apollo covers a period of one year (01/04/2023 - 31/03/2024).

LCAs have been completed for each model. As their environmental differences are less than 10% in terms of GWP total A1-A3 and GWP total Cradle to Grave, they've been combined into a single EPD. The results for each model are displayed, with the black and white Soteria Multi-Sensor Detectors (Optical/Heat) presented together, as they are identical.

Specific data has also been used for upstream processes (raw material production) where available. We used primary data from suppliers whose Cradle-to-Gate LCA was externally reviewed by a recognised third-party verifier, and the data quality was certified as 'very good.' The assessments were based on the supplier's production data, information sourced from their suppliers, and average processes from the GaBi database (Sphera, version 10.7.0.183). The suppliers' input data came from public/commercial databases, industry averages, specific supplier data, and appropriate proxy data. These were based on industry-standard (or third party defined) assumptions and approximations. The suppliers' assessment was conducted in line with ISO 14040:2021/14044:2021, intended for the creation of an Environmental Product Declaration (EPD) by a third party or customer. As a result, the certified scope included a detailed evaluation of environmental impacts, with impact categories assessed according to EN 15804+A2 and EF3.0, which have been used in this EPD.

Secondary data was obtained for all upstream and downstream processes outside the manufacturer's control, such as raw material production, where supplier-specific certified data was unavailable. This data was sourced from the ecoinvent 3.8 database. All ecoinvent datasets utilised are carefully selected to be as relevant and precise as possible, incorporating specific elements such as the UK grid for electricity where available.

Manufacturer uses solar panels and the national grid electricity for production, so therefore the national grid electricity dataset has been used for the LCA modelling (Ecoinvent 3.8). The GWP carbon footprint for using 1 kWh of electricity, GB kWh is 0.239 in kgCO2eq/kWh, for using 1 kWh of on-site solar electricity generation is 0.077 kgCo2eq/kWh and for using 1 kWh of natural gas for office heating is 0.265 kgCO2eq/kWh.
As Apollo Fire Detectors produces other products alongside Soteria Detectors, allocation of fuel consumption, waste production and water consumption were necessary. Due to the nature of their waste collection and handling process, they were unable to distinguish between production and non-production waste.

Consequently, all waste is categorized as “Other,” represented in A3, and included in the waste allocation calculation. This allocation was carried out in accordance with the provisions of BRE PCR PN514 and EN 15804 by using Unit allocation. Actual usage figures were employed for raw materials, ancillary materials, and packaging. Upon data review, it was noted that the mass balance is within the acceptable range, and no data uplift has been performed. Additionally, no proxy datasets have been used. The fuel consumption, waste, and water data are based on the specified period (01/04/2023 - 31/03/2024). The values for these process in this EPD represent an average, calculated by dividing the total data from that period by the total quantity of products manufactured during that period. Figures for upstream and downstream processes were based on industry regulations, accepted industry-specific assumptions permitted by BRE PCR PN514 EN 15804+A2 PCR, and ecoinvent data. The datasets used for the modelling are comprehensive and meticulously align with the system boundary and exclusion criteria outlined in EN15804:2012+A2:2019.

Data quality

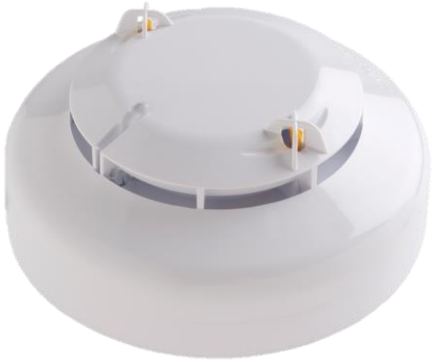
Specific European and the UK datasets have been selected from the ecoinvent LCI for this LCA. The quality level of time representativeness is also Very Good as the background LCI datasets are based on ecoinvent v3.8 which was compiled in 2021. Therefore, there is less than 5 years between the ecoinvent LCI reference year and the time period for which the LCA was undertaken. All primary supplier data used was third-party verified, and the data quality was certified as 'very good’.

Cut-off criteria

The inventory process within this LCA encompasses comprehensive data pertaining to raw materials, packaging materials, consumables, and their transportation to the manufacturing site. It also accounts for process energy consumption, water usage, and general waste generation. Furthermore, it considers transportation throughout the product's lifecycle, as well as impact from construction, use, and at end-of-life disposal. Upstream extraction and processing of inputs are factored into the inventory through the utilization of background datasets within LINA and ecoinvent data, aligning with industry-established standards and practices. No relevant processes were excluded.

Results Summary

SA5100-400APO: Soteria Heat Detector



1.68 KgCO2eq
GWP total Cradle to Grave
Modules: A1-A5, B1-B7, C1-C4

1.49 KgCO2eq
GWP total Cradle to Gate
Modules: A1-A3

0.74 kWh
Total operational energy use during life of the product

SA5100-600APO: Soteria Optical Detector

1.72 KgCO2eq
GWP total Cradle to Grave
Modules: A1-A5, B1-B7, C1-C4

1.52 KgCO2eq
GWP total Cradle to Gate
Modules: A1-A3

0.74 kWh
Total operational energy use during life of the product

SA5100-700APO: Soteria Multi-Sensor Detector (Optical/ Heat)
SA5100-760APO: Soteria Multi-Sensor Detector (Optical/ Heat) Black

1.72 KgCO2eq
GWP total Cradle to Grave
Modules: A1-A5, B1-B7, C1-C4

1.52 KgCO2eq
GWP total Cradle to Gate
Modules: A1-A3

0.74 kWh
Total operational energy use during life of the product

LCA Results for 1 Unit of Soteria Heat Detector

(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	1.34E+00	1.33E+00	6.96E-03	2.05E-03	8.93E-08	1.09E-02	9.97E-04
	Transport	A2	2.39E-03	2.39E-03	1.39E-06	1.16E-06	5.31E-10	2.85E-05	1.33E-07
	Manufacturing	A3	1.52E-01	1.52E-01	-5.99E-05	2.46E-04	1.80E-08	4.01E-04	2.90E-05
	Total (Consumption grid)	A1-3	1.49E+00	1.48E+00	6.90E-03	2.29E-03	1.08E-07	1.13E-02	1.03E-03
Construction process stage	Transport	A4	1.80E-03	1.79E-03	1.53E-06	7.05E-07	4.15E-10	7.29E-06	1.16E-07
	Construction	A5	2.55E-03	2.55E-03	-3.79E-06	1.23E-06	2.81E-10	9.59E-06	2.56E-07
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	1.76E-01	1.74E-01	1.58E-03	1.83E-04	1.32E-08	3.86E-04	2.38E-05
	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
55% recycling and 45% landfill									
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	1.80E-03	1.79E-03	1.53E-06	7.05E-07	4.15E-10	7.29E-06	1.16E-07
	Waste processing	C3	2.48E-03	2.48E-03	-6.38E-09	4.54E-06	8.81E-11	1.38E-05	1.23E-06
	Disposal	C4	5.51E-03	5.50E-03	4.85E-06	4.64E-07	1.30E-10	3.82E-06	1.72E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.58E+00	-1.58E+00	1.14E-03	-2.74E-03	-1.34E-07	-1.29E-02	-2.10E-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)

(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 &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	1.47E-03	1.55E-02	5.38E-03	2.00E-04	2.08E+01	6.47E-01	1.02E-07
	Transport	A2	7.40E-06	8.19E-05	2.23E-05	6.91E-09	3.46E-02	1.37E-04	1.70E-10
	Manufacturing	A3	1.41E-04	1.15E-03	2.99E-04	9.77E-07	3.18E+00	3.56E-02	3.92E-09
	Total (Consumption grid)	A1-3	1.62E-03	1.67E-02	5.70E-03	2.01E-04	2.40E+01	6.83E-01	1.06E-07
Construction process stage	Transport	A4	2.19E-06	2.40E-05	7.34E-06	6.24E-09	2.71E-02	1.22E-04	1.55E-10
	Construction	A5	3.77E-06	3.51E-05	1.20E-05	9.84E-09	2.77E-02	4.42E-04	2.05E-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	1.16E-04	1.29E-03	3.15E-04	1.08E-06	4.61E+00	1.06E-02	2.68E-09
	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
55% recycling and 45% landfill									
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	2.19E-06	2.40E-05	7.34E-06	6.24E-09	2.71E-02	1.22E-04	1.55E-10
	Waste processing	C3	2.45E-06	2.63E-05	6.76E-06	3.83E-08	3.18E-02	6.97E-04	1.11E-10
	Disposal	C4	1.84E-04	1.43E-05	5.19E-06	1.57E-09	1.01E-02	4.54E-04	7.44E-11
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.21E-03	-2.43E-02	-6.77E-03	-5.85E-04	-2.08E+01	-6.48E-01	-9.33E-08

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	1.45E-01	8.20E+01	1.73E-09	6.39E-08	4.69E+00
	Transport	A2	1.72E-04	2.55E-02	1.06E-12	2.47E-11	1.91E-02
	Manufacturing	A3	7.43E-02	2.16E+00	6.01E-11	1.39E-09	1.82E+00
	Total (Consumption grid)	A1-3	2.19E-01	8.41E+01	1.79E-09	6.53E-08	6.52E+00
Construction process stage	Transport	A4	1.40E-04	2.12E-02	6.86E-13	2.22E-11	1.86E-02
	Construction	A5	1.40E-04	2.35E-02	2.33E-12	2.34E-11	1.59E-02
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	1.53E-01	2.00E+00	5.65E-11	1.33E-09	1.72E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55% recycling and 45% landfill							
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.40E-04	2.12E-02	6.86E-13	2.22E-11	1.86E-02
	Waste processing	C3	3.49E-04	6.89E-02	1.66E-12	9.01E-11	9.98E-03
	Disposal	C4	4.82E-05	4.65E-02	4.94E-13	1.68E-11	2.40E-02
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.88E-01	-1.50E+02	-2.37E-09	-8.90E-08	-1.02E+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)

(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	1.71E+00	4.20E+00	5.90E+00	1.86E+01	6.92E-01	1.93E+01
	Transport	A2	4.25E-04	0.00E+00	4.25E-04	3.39E-02	0.00E+00	3.39E-02
	Manufacturing	A3	3.26E-01	4.81E-01	8.07E-01	3.64E+00	8.28E-02	3.72E+00
	Total (Consumption grid)	A1-3	2.03E+00	4.68E+00	6.71E+00	2.23E+01	7.75E-01	2.30E+01
Construction process stage	Transport	A4	3.82E-04	0.00E+00	3.82E-04	2.66E-02	0.00E+00	2.66E-02
	Construction	A5	-2.89E-01	2.90E-01	7.73E-04	-1.97E-01	2.12E-01	1.52E-02
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	1.11E+00	0.00E+00	1.11E+00	6.09E+00	0.00E+00	6.09E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55% recycling and 45% landfill								
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	3.82E-04	0.00E+00	3.82E-04	2.66E-02	0.00E+00	2.66E-02
	Waste processing	C3	-4.05E-03	0.00E+00	-4.05E-03	-3.18E-02	0.00E+00	-3.18E-02
	Disposal	C4	1.97E-04	0.00E+00	1.97E-04	-1.40E+00	1.41E+00	9.92E-03
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.41E+00	0.00E+00	-2.41E+00	-2.08E+01	0.00E+00	-2.08E+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)

(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	7.52E-03	0.00E+00	0.00E+00	1.53E-02
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	3.40E-06
	Manufacturing	A3	2.00E-02	1.84E-06	0.00E+00	1.20E-03
	Total (Consumption grid)	A1-3	2.75E-02	1.84E-06	0.00E+00	1.65E-02
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	3.02E-06
	Construction	A5	0.00E+00	0.00E+00	0.00E+00	1.07E-05
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	5.19E-04	4.02E-06	0.00E+00	1.01E-03
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55% recycling and 45% landfill						
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	3.02E-06
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	1.84E-05
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	1.07E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-1.63E-02

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	1.53E-01	2.93E+00	4.45E-05
	Transport	A2	4.01E-05	6.03E-04	2.35E-07
	Manufacturing	A3	6.50E-03	1.19E-01	1.97E-05
	Total (Consumption grid)	A1-3	1.59E-01	3.05E+00	6.44E-05
Construction process stage	Transport	A4	2.99E-05	5.31E-04	1.84E-07
	Construction	A5	1.10E-04	1.93E-03	9.43E-08
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	6.22E-03	1.07E-01	3.94E-05
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00
55% recycling and 45% landfill					
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	2.99E-05	5.31E-04	1.84E-07
	Waste processing	C3	-2.20E-04	-5.74E-03	-9.85E-08
	Disposal	C4	2.06E-05	2.98E-04	5.99E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.75E-01	-4.09E+00	-5.94E-05

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	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	2.29E-02	1.41E-08	1.47E-03	-2.06E-03	-2.69E-04
	Total (Consumption grid)	A1-3	0.00E+00	2.29E-02	1.41E-08	1.47E-03	-2.06E-03	-2.69E-04
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-02	6.83E-10	0.00E+00	0.00E+00	9.21E-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	6.97E-05	2.97E-08	3.21E-03	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
55% recycling and 45% landfill								
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	0.00E+00	0.00E+00	0.00E+00	2.40E-05	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	-6.65E-06	0.00E+00

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

LCA Results for 1 Unit of Soteria Optical Smoke Detector

(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	1.37E+00	1.36E+00	7.09E-03	2.11E-03	9.18E-08	1.11E-02	1.03E-03
	Transport	A2	2.40E-03	2.40E-03	1.40E-06	1.16E-06	5.33E-10	2.86E-05	1.33E-07
	Manufacturing	A3	1.52E-01	1.52E-01	-5.99E-05	2.46E-04	1.80E-08	4.01E-04	2.90E-05
	Total (Consumption grid)	A1-3	1.52E+00	1.51E+00	7.04E-03	2.36E-03	1.10E-07	1.16E-02	1.06E-03
Construction process stage	Transport	A4	1.90E-03	1.89E-03	1.62E-06	7.44E-07	4.38E-10	7.69E-06	1.22E-07
	Construction	A5	2.55E-03	2.55E-03	-3.79E-06	1.23E-06	2.81E-10	9.59E-06	2.56E-07
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	1.76E-01	1.74E-01	1.58E-03	1.83E-04	1.32E-08	3.86E-04	2.38E-05
	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
55% recycling and 45% landfill									
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	1.90E-03	1.89E-03	1.62E-06	7.44E-07	4.38E-10	7.69E-06	1.22E-07
	Waste processing	C3	2.62E-03	2.61E-03	-6.73E-09	4.79E-06	9.30E-11	1.46E-05	1.30E-06
	Disposal	C4	5.82E-03	5.81E-03	5.12E-06	4.90E-07	1.37E-10	4.04E-06	1.82E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.67E+00	-1.67E+00	1.20E-03	-2.89E-03	-1.42E-07	-1.37E-02	-2.22E-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)

(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 &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	1.50E-03	1.59E-02	5.70E-03	2.07E-04	2.20E+01	6.76E-01	1.16E-07
	Transport	A2	7.41E-06	8.20E-05	2.23E-05	6.94E-09	3.47E-02	1.38E-04	1.70E-10
	Manufacturing	A3	1.41E-04	1.15E-03	2.99E-04	9.77E-07	3.18E+00	3.56E-02	3.92E-09
	Total (Consumption grid)	A1-3	1.65E-03	1.72E-02	6.02E-03	2.08E-04	2.52E+01	7.12E-01	1.20E-07
Construction process stage	Transport	A4	2.32E-06	2.53E-05	7.75E-06	6.59E-09	2.86E-02	1.29E-04	1.64E-10
	Construction	A5	3.77E-06	3.51E-05	1.20E-05	9.84E-09	2.77E-02	4.42E-04	2.05E-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	1.16E-04	1.29E-03	3.15E-04	1.08E-06	4.61E+00	1.06E-02	2.68E-09
	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
55% recycling and 45% landfill									
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	2.32E-06	2.53E-05	7.75E-06	6.59E-09	2.86E-02	1.29E-04	1.64E-10
	Waste processing	C3	2.58E-06	2.77E-05	7.14E-06	4.04E-08	3.36E-02	7.35E-04	1.18E-10
	Disposal	C4	1.94E-04	1.51E-05	5.48E-06	1.66E-09	1.07E-02	4.79E-04	7.86E-11
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.33E-03	-2.57E-02	-7.15E-03	-6.17E-04	-2.20E+01	-6.84E-01	-9.85E-08

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	1.54E-01	8.70E+01	1.77E-09	6.78E-08	4.90E+00
	Transport	A2	1.73E-04	2.56E-02	1.06E-12	2.48E-11	1.91E-02
	Manufacturing	A3	7.43E-02	2.16E+00	6.01E-11	1.39E-09	1.82E+00
	Total (Consumption grid)	A1-3	2.28E-01	8.92E+01	1.84E-09	6.92E-08	6.73E+00
Construction process stage	Transport	A4	1.47E-04	2.24E-02	7.24E-13	2.34E-11	1.97E-02
	Construction	A5	1.40E-04	2.35E-02	2.33E-12	2.34E-11	1.59E-02
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	1.53E-01	2.00E+00	5.65E-11	1.33E-09	1.72E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55% recycling and 45% landfill							
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.47E-04	2.24E-02	7.24E-13	2.34E-11	1.97E-02
	Waste processing	C3	3.69E-04	7.27E-02	1.75E-12	9.51E-11	1.05E-02
	Disposal	C4	5.09E-05	4.91E-02	5.21E-13	1.77E-11	2.54E-02
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.99E-01	-1.59E+02	-2.50E-09	-9.40E-08	-1.08E+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)

(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	1.79E+00	5.72E+00	7.51E+00	1.97E+01	2.08E-01	1.99E+01
	Transport	A2	4.26E-04	0.00E+00	4.26E-04	3.40E-02	0.00E+00	3.40E-02
	Manufacturing	A3	3.26E-01	4.81E-01	8.07E-01	3.64E+00	8.28E-02	3.72E+00
	Total (Consumption grid)	A1-3	2.12E+00	6.20E+00	8.32E+00	2.34E+01	2.91E-01	2.37E+01
Construction process stage	Transport	A4	4.04E-04	0.00E+00	4.04E-04	2.81E-02	0.00E+00	2.81E-02
	Construction	A5	-2.89E-01	2.90E-01	7.73E-04	-1.97E-01	2.12E-01	1.52E-02
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	1.11E+00	0.00E+00	1.11E+00	6.09E+00	0.00E+00	6.09E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55% recycling and 45% landfill								
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	4.04E-04	0.00E+00	4.04E-04	2.81E-02	0.00E+00	2.81E-02
	Waste processing	C3	-4.28E-03	0.00E+00	-4.28E-03	-3.36E-02	0.00E+00	-3.36E-02
	Disposal	C4	2.08E-04	0.00E+00	2.08E-04	-1.48E+00	1.49E+00	1.05E-02
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.54E+00	0.00E+00	-2.54E+00	-2.19E+01	0.00E+00	-2.19E+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)

(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	7.57E-03	0.00E+00	0.00E+00	1.58E-02
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	3.41E-06
	Manufacturing	A3	2.00E-02	1.84E-06	0.00E+00	1.20E-03
	Total (Consumption grid)	A1-3	2.75E-02	1.84E-06	0.00E+00	1.70E-02
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	3.19E-06
	Construction	A5	0.00E+00	0.00E+00	0.00E+00	1.07E-05
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	5.19E-04	4.02E-06	0.00E+00	1.01E-03
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55% recycling and 45% landfill						
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	3.19E-06
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	1.94E-05
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	1.13E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-1.72E-02

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	1.52E-01	3.02E+00	4.71E-05
	Transport	A2	4.02E-05	6.05E-04	2.36E-07
	Manufacturing	A3	6.50E-03	1.19E-01	1.97E-05
	Total (Consumption grid)	A1-3	1.58E-01	3.14E+00	6.70E-05
Construction process stage	Transport	A4	3.16E-05	5.61E-04	1.94E-07
	Construction	A5	1.10E-04	1.93E-03	9.43E-08
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	6.22E-03	1.07E-01	3.94E-05
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00
55% recycling and 45% landfill					
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	3.16E-05	5.61E-04	1.94E-07
	Waste processing	C3	-2.32E-04	-6.06E-03	-1.04E-07
	Disposal	C4	2.18E-05	3.14E-04	6.33E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.84E-01	-4.32E+00	-6.27E-05

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	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	2.29E-02	1.41E-08	1.47E-03	-2.06E-03	-2.69E-04
	Total (Consumption grid)	A1-3	0.00E+00	2.29E-02	1.41E-08	1.47E-03	-2.06E-03	-2.69E-04
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-02	6.83E-10	0.00E+00	0.00E+00	9.21E-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	6.97E-05	2.97E-08	3.21E-03	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
55% recycling and 45% landfill								
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	0.00E+00	0.00E+00	0.00E+00	2.53E-05	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	-7.02E-06	0.00E+00

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

LCA Results for 1 Unit of Soteria (Optical/Heat) Multi-Sensor Detector

(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	1.37E+00	1.36E+00	7.11E-03	2.11E-03	9.19E-08	1.11E-02	1.03E-03
	Transport	A2	2.40E-03	2.40E-03	1.40E-06	1.17E-06	5.34E-10	2.86E-05	1.34E-07
	Manufacturing	A3	1.52E-01	1.52E-01	-5.99E-05	2.46E-04	1.80E-08	4.01E-04	2.90E-05
	Total (Consumption grid)	A1-3	1.52E+00	1.52E+00	7.05E-03	2.36E-03	1.10E-07	1.16E-02	1.06E-03
Construction process stage	Transport	A4	1.92E-03	1.91E-03	1.63E-06	7.52E-07	4.43E-10	7.77E-06	1.23E-07
	Construction	A5	2.55E-03	2.55E-03	-3.79E-06	1.23E-06	2.81E-10	9.59E-06	2.56E-07
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	1.76E-01	1.74E-01	1.58E-03	1.83E-04	1.32E-08	3.86E-04	2.38E-05
	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
55% recycling and 45% landfill									
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	1.92E-03	1.91E-03	1.63E-06	7.52E-07	4.43E-10	7.77E-06	1.23E-07
	Waste processing	C3	2.65E-03	2.64E-03	-6.80E-09	4.84E-06	9.39E-11	1.47E-05	1.31E-06
	Disposal	C4	5.88E-03	5.87E-03	5.17E-06	4.95E-07	1.39E-10	4.08E-06	1.84E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.69E+00	-1.69E+00	1.22E-03	-2.92E-03	-1.43E-07	-1.38E-02	-2.24E-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)

(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 &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	1.51E-03	1.60E-02	5.71E-03	2.07E-04	2.21E+01	6.77E-01	1.16E-07
	Transport	A2	7.42E-06	8.20E-05	2.23E-05	6.95E-09	3.48E-02	1.38E-04	1.71E-10
	Manufacturing	A3	1.41E-04	1.15E-03	2.99E-04	9.77E-07	3.18E+00	3.56E-02	3.92E-09
	Total (Consumption grid)	A1-3	1.66E-03	1.72E-02	6.03E-03	2.08E-04	2.53E+01	7.13E-01	1.20E-07
Construction process stage	Transport	A4	2.34E-06	2.56E-05	7.83E-06	6.66E-09	2.89E-02	1.30E-04	1.65E-10
	Construction	A5	3.77E-06	3.51E-05	1.20E-05	9.84E-09	2.77E-02	4.42E-04	2.05E-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	1.16E-04	1.29E-03	3.15E-04	1.08E-06	4.61E+00	1.06E-02	2.68E-09
	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
55% recycling and 45% landfill									
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	2.34E-06	2.56E-05	7.83E-06	6.66E-09	2.89E-02	1.30E-04	1.65E-10
	Waste processing	C3	2.61E-06	2.80E-05	7.21E-06	4.08E-08	3.40E-02	7.43E-04	1.19E-10
	Disposal	C4	1.97E-04	1.53E-05	5.54E-06	1.67E-09	1.08E-02	4.84E-04	7.94E-11
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.36E-03	-2.60E-02	-7.23E-03	-6.24E-04	-2.22E+01	-6.91E-01	-9.96E-08

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	1.54E-01	8.71E+01	1.78E-09	6.78E-08	4.90E+00
	Transport	A2	1.73E-04	2.57E-02	1.06E-12	2.49E-11	1.92E-02
	Manufacturing	A3	7.43E-02	2.16E+00	6.01E-11	1.39E-09	1.82E+00
	Total (Consumption grid)	A1-3	2.28E-01	8.93E+01	1.84E-09	6.92E-08	6.74E+00
Construction process stage	Transport	A4	1.49E-04	2.26E-02	7.32E-13	2.37E-11	1.99E-02
	Construction	A5	1.40E-04	2.35E-02	2.33E-12	2.34E-11	1.59E-02
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	1.53E-01	2.00E+00	5.65E-11	1.33E-09	1.72E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55% recycling and 45% landfill							
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.49E-04	2.26E-02	7.32E-13	2.37E-11	1.99E-02
	Waste processing	C3	3.73E-04	7.35E-02	1.77E-12	9.61E-11	1.06E-02
	Disposal	C4	5.14E-05	4.96E-02	5.26E-13	1.79E-11	2.56E-02
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.01E-01	-1.60E+02	-2.52E-09	-9.50E-08	-1.09E+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)

(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	1.80E+00	5.72E+00	7.52E+00	1.98E+01	2.08E-01	2.00E+01
	Transport	A2	4.27E-04	0.00E+00	4.27E-04	3.41E-02	0.00E+00	3.41E-02
	Manufacturing	A3	3.26E-01	4.81E-01	8.07E-01	3.64E+00	8.28E-02	3.72E+00
	Total (Consumption grid)	A1-3	2.12E+00	6.20E+00	8.32E+00	2.34E+01	2.91E-01	2.37E+01
Construction process stage	Transport	A4	4.08E-04	0.00E+00	4.08E-04	2.84E-02	0.00E+00	2.84E-02
	Construction	A5	-2.89E-01	2.90E-01	7.73E-04	-1.97E-01	2.12E-01	1.52E-02
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	1.11E+00	0.00E+00	1.11E+00	6.09E+00	0.00E+00	6.09E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55% recycling and 45% landfill								
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	4.08E-04	0.00E+00	4.08E-04	2.84E-02	0.00E+00	2.84E-02
	Waste processing	C3	-4.32E-03	0.00E+00	-4.32E-03	-3.40E-02	0.00E+00	-3.40E-02
	Disposal	C4	2.10E-04	0.00E+00	2.10E-04	-1.49E+00	1.50E+00	1.06E-02
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.57E+00	0.00E+00	-2.57E+00	-2.22E+01	0.00E+00	-2.22E+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)

(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	7.57E-03	0.00E+00	0.00E+00	1.58E-02
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	3.42E-06
	Manufacturing	A3	2.00E-02	1.84E-06	0.00E+00	1.20E-03
	Total (Consumption grid)	A1-3	2.75E-02	1.84E-06	0.00E+00	1.70E-02
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	3.23E-06
	Construction	A5	0.00E+00	0.00E+00	0.00E+00	1.07E-05
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	5.19E-04	4.02E-06	0.00E+00	1.01E-03
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55% recycling and 45% landfill						
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	3.23E-06
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	1.96E-05
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	1.14E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-1.73E-02

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	1.52E-01	3.02E+00	4.72E-05
	Transport	A2	4.03E-05	6.07E-04	2.37E-07
	Manufacturing	A3	6.50E-03	1.19E-01	1.97E-05
	Total (Consumption grid)	A1-3	1.59E-01	3.14E+00	6.71E-05
Construction process stage	Transport	A4	3.19E-05	5.67E-04	1.96E-07
	Construction	A5	1.10E-04	1.93E-03	9.43E-08
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	6.22E-03	1.07E-01	3.94E-05
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00
55% recycling and 45% landfill					
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	3.19E-05	5.67E-04	1.96E-07
	Waste processing	C3	-2.34E-04	-6.12E-03	-1.05E-07
	Disposal	C4	2.20E-05	3.18E-04	6.39E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.86E-01	-4.36E+00	-6.34E-05

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	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	2.29E-02	1.41E-08	1.47E-03	-2.06E-03	-2.69E-04
	Total (Consumption grid)	A1-3	0.00E+00	2.29E-02	1.41E-08	1.47E-03	-2.06E-03	-2.69E-04
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-02	6.83E-10	0.00E+00	0.00E+00	9.21E-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	6.97E-05	2.97E-08	3.21E-03	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
55% recycling and 45% landfill								
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	0.00E+00	0.00E+00	0.00E+00	2.56E-05	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	-7.10E-06	0.00E+00

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

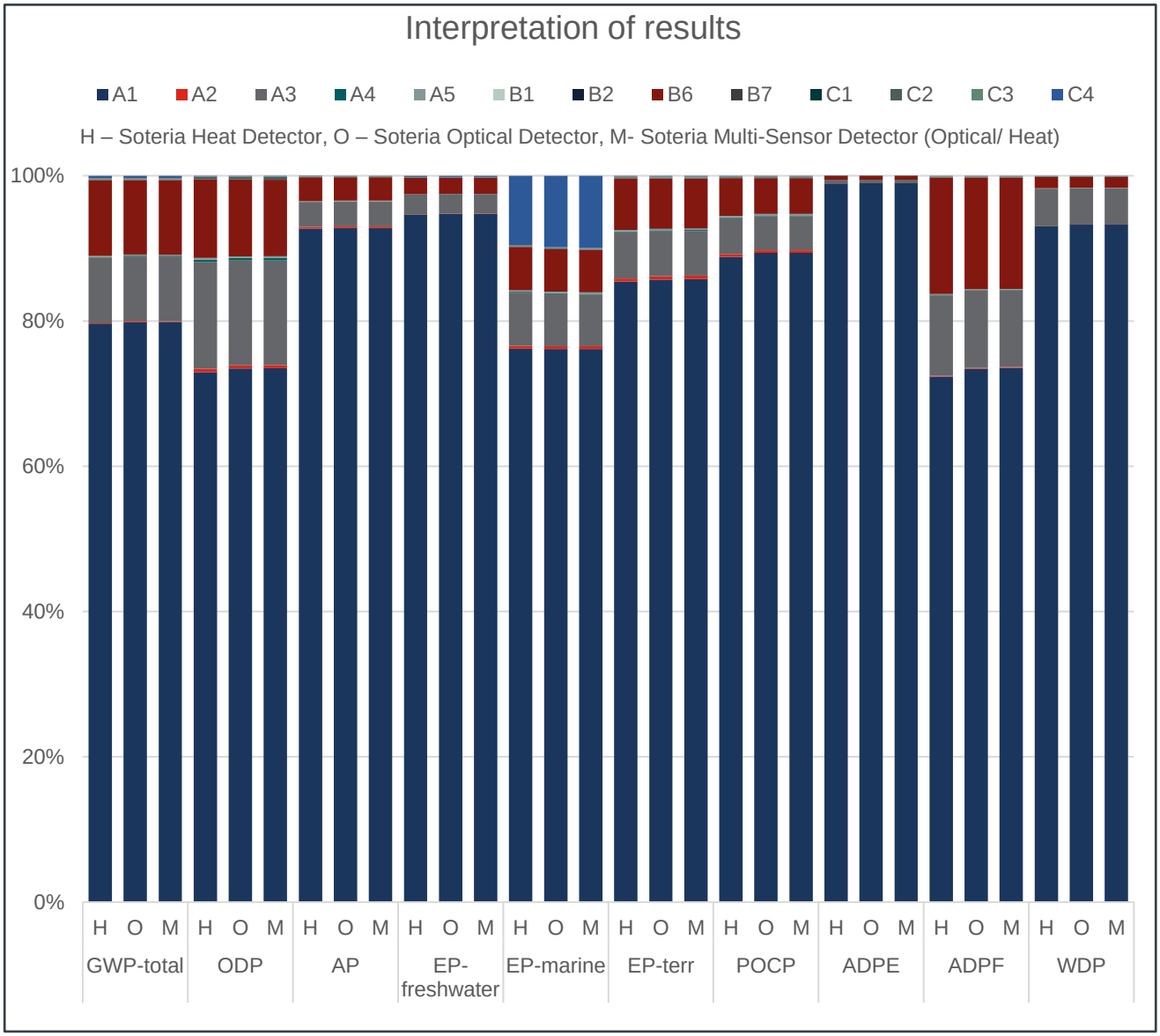
Scenarios and additional technical information

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
A4 – Transport to the building site	The transport distance to the construction site was set at 120 km by road, based on UK manufacturing, as referenced in the Royal Institution of Chartered Surveyors' 2023 Whole Life Carbon Assessments for the Built Environment.		
	Fuel type / Vehicle type	Diesel	Lorry, 16-32 tonne
	Distance:	km	120
	Capacity utilisation (incl. empty returns)	%	26
	Weight of the transported products - Soteria Heat Detector	kg/unit	0.09
	Weight of the transported products - Soteria Optical Smoke Detector	kg/unit	0.095
	Weight of the transported products - Soteria (Optional/Heat) Multisensor Detector	kg/unit	0.096
A5 – Installation in the building	To install the product, only standard tools are necessary. Before proceeding with installation, it is essential to refer to safety, installation and maintenance instructions identified on or with the product. Furthermore, installation must be done by a competent person and adhere to applicable installation codes and standards, such as BS5839-1 in the UK.		
B2 – Maintenance	This product is part of a fire detection and alarm system, for which system maintenance is required. As well as routine testing, Grade A systems should be inspected and serviced at periods not exceeding 6 months in accordance with the recommendations of BS 5839. Typically, this responsibility falls to an external fire alarm servicing organisation, in which case a competent person with specialist knowledge of fire detection and fire alarm systems, will visit the fire system for maintenance twice a year. Due to standard and approvals, if a product was not up to standard the maintenance would change the whole device. No known emissions.		
	Number of maintenance cycles	Per year	2
B3 – Repair	N/A - Repairing the device could invalidate approvals on the product.		
B4 – Replacement	N/A - Repairing the device could invalidate approvals on the product.		
B5 – Refurbishment	N/A - Repairing the device could invalidate approvals on the product.		
Reference service life	10 years		
B6 – Use of energy	Product is in use 10 years; it is powered via the fire panel. Over 99.9% of the time product runs of Quiescent current Protocol voltage: 5 to 13V peak to peak Quiescent current: 350µA Quiescent current tested at: 24V DC Power-up surge current 0.56mA		
	Electricity	kWh	0.7358
B7 – Use of water	N/A		
C1 - Deconstruction	At the end of its life, it will be dismantled by hand using standard tools. Therefore, no impacts during the deconstruction		
C2 – Transportation	As an electronic, the product will go to an approved authorised treatment facility partnered with the producer compliance scheme that Apollo is partnered with (this may be anywhere in the UK). The transport distance to the waste processing facility was set at 120 km by road, assuming it could take place anywhere nationwide, aligning with A4 assumptions		

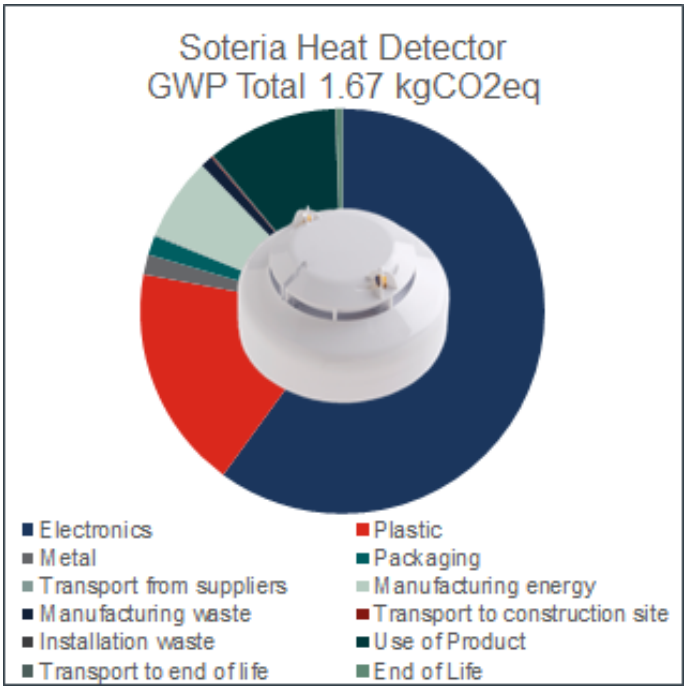
Scenarios and additional technical information			
Scenario	Parameter	Units	Results
	Fuel type / Vehicle type	Diesel	Lorry, 16-32 tonne
	Distance:	km	120
C3- Waste processing & Module D Recycling Potential:	In accordance with UK regulations, waste from this product is classified as WEEE (Waste Electrical and Electronic Equipment). This product falls under category 9, Monitoring and Control Instruments, with a UK target recycling rate of 55%.		
	Soteria Heat Detector to recycling	kg	0.0495
	Soteria Optical Smoke Detector to recycling	kg	0.05225
	Soteria (Optional/Heat) Multisensor Detector to recycling	kg	0.0528
C4 - Disposal	Some of the products won't be recycled at the waste processing facility. Based on the UK target recycling rate 45% of the electronic waste will be end up in landfill.		
	Soteria Heat Detector to landfill	kg	0.0405
	Soteria Optical Smoke Detector to landfill	kg	0.04275
	Soteria (Optional/Heat) Multisensor Detector to landfill	kg	0.0432

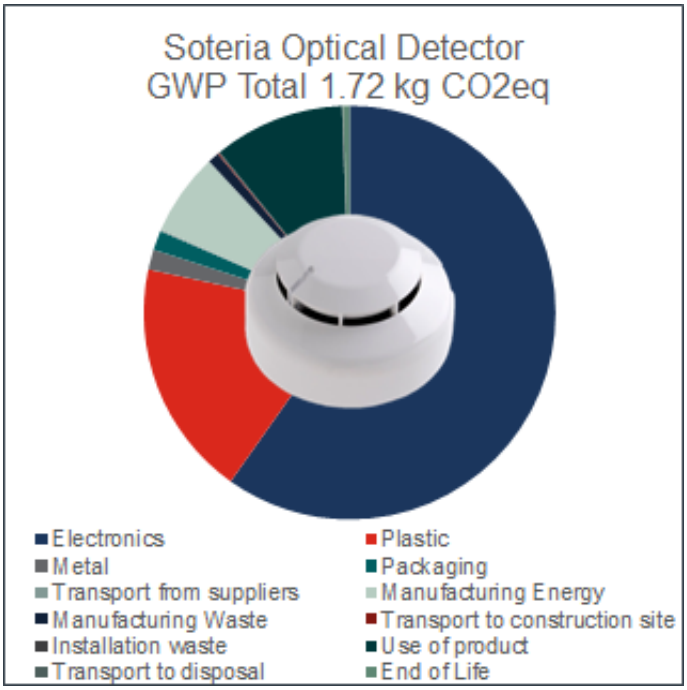
Interpretation of results

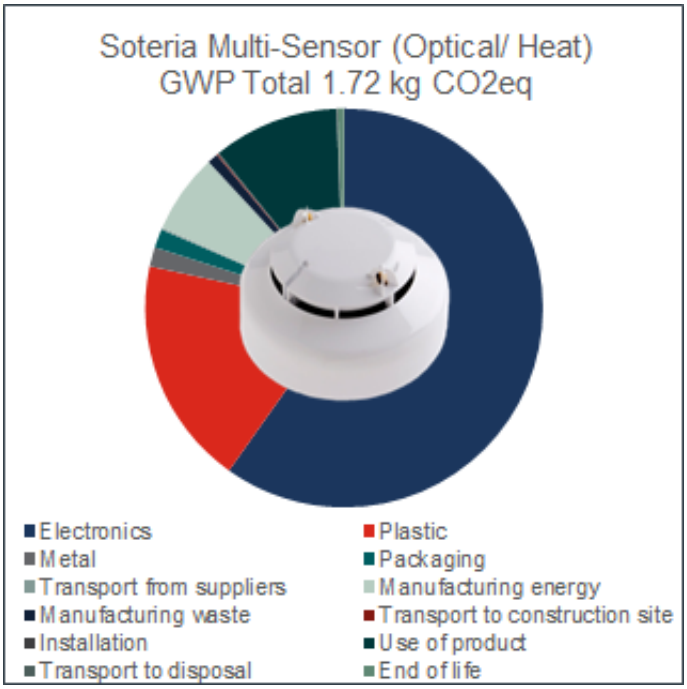
The bulk of the environmental impacts are attributed to the raw material supply, covered by information module A1 of EN 15804:2012+A2:2019. When assessing environmental impacts, electronics have the highest contribution, followed by plastics. The Soteria Multi- Sensor Detector (Optical/Heat) has the greatest impact, with the Soteria Optical Detector close behind, and the Soteria Heat Detector the lowest.

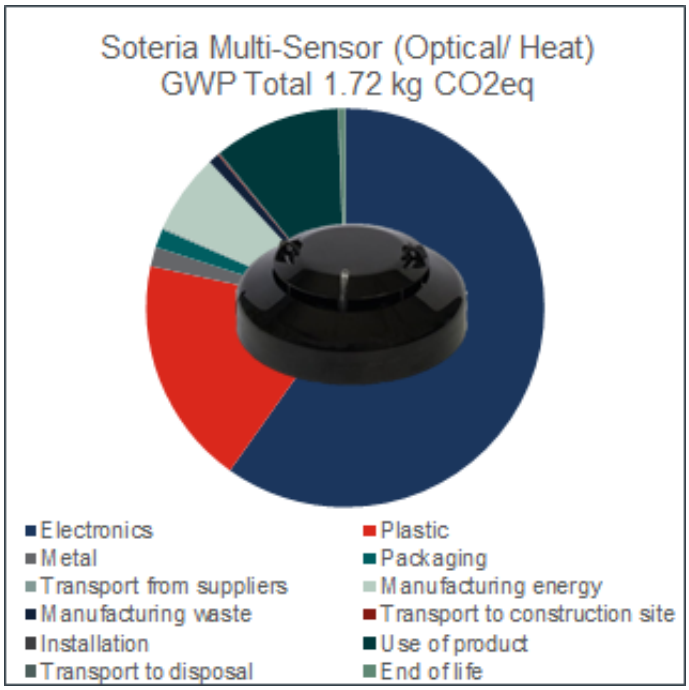


Interpretation of results (continued)









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BS EN 54-5:2017+A1:2018 - specifies the requirements, test methods and performance criteria for point heat detectors intended for use in fire detection and fire alarm systems installed in and around buildings.

BS EN 54-7:2018 – TC Fire detection and fire alarm systems - Smoke detectors. Point smoke detectors that operate using scattered light, transmitted light, or ionization

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