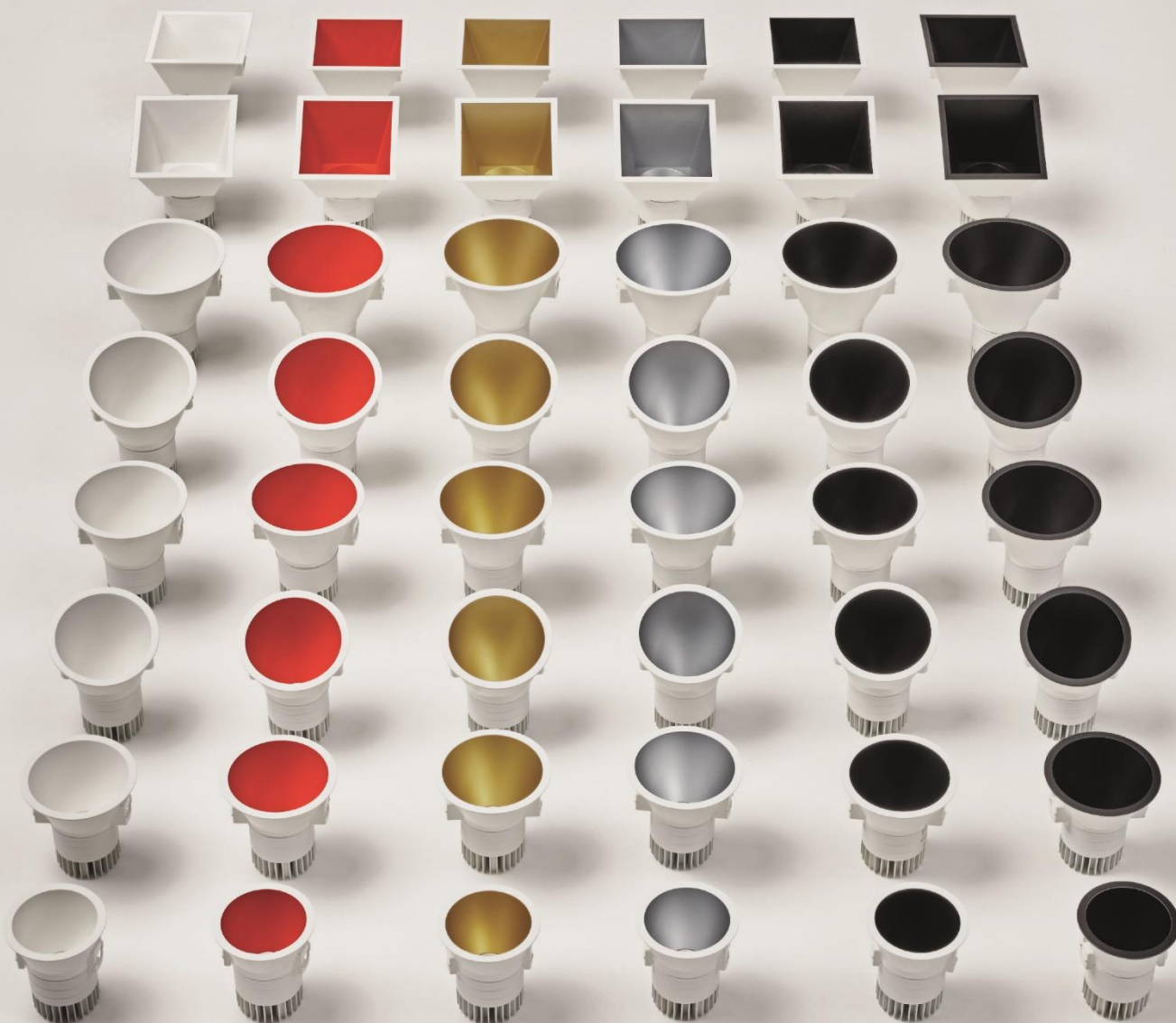




SWAP

Environmental Product Declaration

ARKOSLIGHT®

Environmental Product Declaration (EPD) in accordance with ISO 14025	
This EPD is property of the manufacturer company: ARKOSLIGHT S.L. Calle N – Pol. Ind. EL OLIVERAL 46394 Ribarroja del Turia – VALENCIA (Spain) Tel.: +34 961 667 207 Fax: +34 961 667 054 info@arkoslight.com Contact person: <i>Juan Górriz Lafuente</i> <i>Quality and Environmental Director</i> Email: juangorriz@arkoslight.com	
Geographical scope: Global	
EPD produced by: Patricia Boquera. AIDIMME	
Independent verification of the declaration and data, according to ISO 14025: Ana M ^a Hurtado. AIDIMME	☒ Internal ☐ External

COMPANY OVERVIEW

ARKOSLIGHT was founded in 1984 centred to the production of ornamental classic lamps. Encouraged by the success and our initial experience, since 1990 our company is devoted to designing and manufacturing high quality technical luminaires which meet the lighting needs in architecture, decoration and interior design. We aim to offer technical solutions for high quality lighting combining design, effectiveness and efficiency.

ARKOSLIGHT is aware that the quality of its products, as well as customer satisfaction and respect for the environment, are key factors for the development and continuity of its activity.

That is why we have made a commitment to apply environmental criteria throughout the life cycle of our luminaires, promoting prevention of pollution and protection of the environment, as well as the sustainable use of material and energy resources.

ARKOSLIGHT Management Systems are certified by AENOR according to the standards ISO 9.001 (ES-0148/2000) and ISO 14.001 (ES-2008/0547).

PRODUCTS COVERED

The objective of this EPD is to offer environmental information on environmental aspects and impacts of Swap products.

Swap is a family of recessed LED spots that comes in 4 sizes (S, M, L, XL), two formats (round and square) and two light beam directions (symmetrical or asymmetrical).

These features are embodied in 8 models and, through them, the Swap range offers a very extensive variety of color options, luminous flux, color temperatures, chromatic reproduction, sealing and dimming protocols. Minimalist design and easy fitting make it an unbeatable offer.



Technical features:

- Luminous efficiency up to 150 lm/W (Same light with less consumption).
- Better energy efficiency (up to A++).
- CCT: 2700K – 3000K – 4000K.
- Super CRI 97 (optional).
- IP54 optional accessory.
- New Regulation DALI & Push Protocols.
- ENEC Certified.
- Class II.
- Cut out from 62 to 126mm

Product references

The environmental product declaration of SWAP family is represented by its 8 models in two different powers 5W and 7W. The other technical properties do not affect the environmental profile results. Next table summarizes the commercial product references represented by these 16 SWAP product variants. References inside each reference product and power, are related to other lighting parameters not affecting the life cycle environmental impact.

There is also considered the IP accessory which should be provided with the luminary in case the client wants it.

Power	SWAP S	SWAP M	SWAP L	SWAP XL	SWAP M ASYM	SWAP L ASYM	SWAP SQ	SWAP SQ ASYM
5W	A2121110	A2122110	A2123110	A2124110	A2162110	A2163110	A2543110	A2553110
	A2121111	A2122111	A2123111	A2124111	A2162111	A2163111	A2543111	A2553111
	A2121112	A2122112	A2123112	A2124112	A2162112	A2163112	A2543112	A2553112
7W	A2121210	A2122210	A2123210	A2124210	A2162210	A2163210	A2543210	A2553210
	A2121211	A2122211	A2123211	A2124211	A2162211	A2163211	A2543211	A2553211
	A2121212	A2122212	A2123212	A2124212	A2162212	A2163212	A2543212	A2553212
	A2121220*	A2122220*	A2123220*	A2124220*	A2162220*	A2163220*	A2543220*	A2553220*
	A2121221*	A2122221*	A2123221*	A2124221*	A2162221*	A2163221*	A2543221*	A2553221*
	A2121222*	A2122222*	A2123222*	A2124222*	A2162222*	A2163222*	A2543222*	A2553222*
	A2121230	A2122230	A2123230	A2124230	A2162230	A2163230	A2543230	A2553230
	A2121231	A2122231	A2123231	A2124231	A2162231	A2163231	A2543231	A2553231
	A2121232	A2122232	A2123232	A2124232	A2162232	A2163232	A2543232	A2553232
	A3121210	A3122210	A3123210	A3124210	A3162210	A3163210	A3543210	A3553210
	A3121211	A3122211	A3123211	A3124211	A3162211	A3163211	A3543211	A3553211
	A3121212	A3122212	A3123212	A3124212	A3162212	A3163212	A3543212	A3553212
	A3121220	A3122220	A3123220	A3124220	A3162220	A3163220	A3543220	A3553220
	A3121221	A3122221	A3123221	A3124221	A3162221	A3163221	A3543221	A3553221
	A3121222	A3122222	A3123222	A3124222	A3162222	A3163222	A3543222	A3553222
	A3121230	A3122230	A3123230	A3124230	A3162230	A3163230	A3543230	A3553230
	A3121231	A3122231	A3123231	A3124231	A3162231	A3163231	A3543231	A3553231
	A3121232	A3122232	A3123232	A3124232	A3162232	A3163232	A3543232	A3553232
IP54	A2121054	A2122054	A2123054	A2124054	A2122054	A2123054	A2543054	A2543054

*These references can work with light regulation by using a dimmer. This piece it is not provided with the lighting system and it is not considered under the scope of this study.

ADDITIONAL INFORMATION

Standards and regulations.

- Directive 2004/12/EC of the European Parliament and of the Council of 11 February 2004 amending Directive 94/62/EC on packaging and packaging waste.
- Directive 2009/125/EC of the European Parliament and of the Council, of 21 October 2009, establishing a framework for the setting of eco-design requirements for energy-related products.
- Directive 2010/30/EU of the European Parliament and of the Council, of 19 May 2010, on the indication by labelling and standard product information of the consumption of energy and other resources by energy-related products.
- Directive 2011/65/EU of the European Parliament and of the Council, of 8 June 2011, on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
- Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE).
- Directive 2014/30/EU of the European Parliament and of the Council, of 26 February 2014, on the harmonisation of the laws of the Member States relating to electromagnetic compatibility.
- Directive 2014/35/EU of the European Parliament and of the Council, of 26 February 2014, on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits.
- EN 60598-1 General requirements and tests.
- EN 60598-2-2 Recessed luminaires.
- EN 55015 Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment

Additional environmental information: applied eco-design strategies.

Regarding design process of the SWAP family, environmental aspects and impacts have been considered throughout the life cycle.

Materials: ARKOSLIGHT has thermal simulation software to design the heatsinks with the minimum amount of aluminum required for the LED to work in the optimum conditions and ensure its life. Moreover, most of the used materials are recyclable.

Manufacturing: the luminary is assembled without needing machinery thanks to the clipping of the pieces, so only the energy intended to illuminate the workstation is consumed.

Distribution: in order to guarantee protection against breakage in transport, cardboard-based packaging is used. All the packaging materials are easily separable and recyclable. To prevent movement inside the box, the PET bubble or polystyrene has been replaced by internal cores of the same material, which are also punched together with the box, minimizing waste and processes. This material is lightweight, recycled and recyclable. The boxes, foldable, are also mounted without the need for staples or adhesive.

Packaging is compliant with European Directive 2004/12/EC concerning packaging and packaging waste.

Use: the choice of LED technology as a light source has a significant impact on energy consumption during the use phase of the product. In addition, our efforts to improve the family's environmental performance have led us to move from the initial 11W to the current 7W (and from 8W to 5W, too) offering the same flux with a 36% consumption reduction.

End of life: The number of components has been reduced to the maximum in order to facilitate later disassembly and recycling.

CONSTITUENT MATERIALS

The products of SWAP lighting family contain no substances prohibited by the regulations applicable at the time of its introduction to the market.

	SWAP S		SWAP M		SWAP L		SWAP XL		SWAP M ASYM.		SWAP L ASYM.		SWAP SQ.		SWAP SQ. ASYM.	
	gr	%	gr	%	gr	%	gr	%	gr	%	gr	%	gr	%	gr	%
Metals																
Aluminum	48,00	23,2%	48,00	20,9%	48,00	18,6%	48,00	14,5%	48,00	20,2%	48,00	17,7%	48,00	17,8%	48,00	17,0%
Steel Inox.	2,00	1,0%	2,00	0,9%	2,00	0,8%	2,00	0,6%	2,00	0,8%	2,00	0,7%	2,00	0,7%	2,00	0,7%
Steel	3,60	1,7%	3,60	1,6%	3,60	1,4%	3,60	1,1%	3,60	1,5%	3,60	1,3%	3,60	1,3%	3,60	1,3%
Copper	3,65	1,8%	3,65	1,6%	3,65	1,4%	3,65	1,1%	3,65	1,5%	3,65	1,3%	3,65	1,4%	3,65	1,3%
Plastics																
PVC	1,35	0,7%	1,35	0,6%	1,35	0,5%	1,35	0,4%	1,35	0,6%	1,35	0,5%	1,35	0,5%	1,35	0,5%
Polycarbonate	49,30	23,9%	56,10	24,4%	67,20	26,1%	87,40	26,5%	57,40	24,1%	67,50	24,9%	79,50	29,4%	79,50	28,1%
Polyester	0,05	0,0%	0,05	0,0%	0,05	0,0%	0,05	0,0%	0,05	0,0%	0,05	0,0%	0,05	0,0%	0,05	0,0%
Others																
LED	1,00	0,5%	1,00	0,4%	1,00	0,4%	1,00	0,3%	1,00	0,4%	1,00	0,4%	1,00	0,4%	1,00	0,4%
Printed circuit board	20,00	9,7%	20,00	8,7%	20,00	7,8%	20,00	6,1%	20,00	8,4%	20,00	7,4%	20,00	7,4%	20,00	7,1%
Packaging																
Cardboard	69,63	33,7%	86,45	37,6%	102,83	39,9%	155,05	47,0%	92,73	39,0%	116,03	42,8%	102,83	38,1%	116,03	41,0%
Paper	7,50	3,6%	7,50	3,3%	7,50	2,9%	7,50	2,3%	7,50	3,2%	7,50	2,8%	7,50	2,8%	7,50	2,6%
LDPE	0,50	0,2%	0,50	0,2%	0,50	0,2%	0,50	0,2%	0,50	0,2%	0,50	0,2%	0,50	0,2%	0,50	0,2%
TOTAL	206,58	100%	230,20	100%	257,68	100%	330,10	100%	237,78	100%	271,18	100%	269,98	100%	283,18	100%

Accessories IP54 (optional)

Accessory IP54	SWAP S	SWAP M SWAP M ASYM	SWAP L SWAP L ASYM	SWAP XL	SWAP SQ SWAP SQ ASYM
Plastics (g)					
Polycarbonate	1,30	1,30	1,30	1,30	1,30
Silicon	0,80	1,10	1,40	1,60	1,20
TOTAL	2,10	2,40	2,70	2,90	2,50



ENVIRONMENTAL IMPACTS

Methodology:

Following elements of this EPD the are based on PCR Product Category Rules for Electrical, Electronic and HVAC-R products from PEP ecopassport® Program (PCR-ed3-EN-2015 04 02):

- Functional unit, considering the service provided and quantifying the useful life time.
- System boundaries (see figure), and following reference scenarios or parameters: distribution distance, reference end of life scenarios.
- Basic series of environmental indicators, calculated according CML-IA baseline methodology plus total water consume and total energy (calculated from SimaPro 8 software).
 - Abiotic depletion kg Sb eq
 - Abiotic depletion (fossil fuels) MJ
 - Global warming (GWP100a) kg CO₂ eq
 - Ozone layer depletion (ODP) kg CFC-11 eq
 - Human toxicity kg 1,4-DB eq
 - Fresh water aquatic ecotox. kg 1,4-DB eq
 - Marine aquatic ecotoxicity kg 1,4-DB eq
 - Terrestrial ecotoxicity kg 1,4-DB eq
 - Photochemical oxidation kg C₂H₄ eq
 - Acidification kg SO₂ eq
 - Eutrophication kg PO₄⁻³ eq
 - Water use m³
 - Total energy MJ

There are provided by ARKOSLIGHT the data on composition based on 2017 design and production, including life time of components, bill of materials (weight, material and finishing coating if there is, of each component. 100% of the packaging and lighting system provided by ARKOSLIGHT to the customer are covered. Also, they have provided 2017 energy demand calculation on assembly (there are no waste generation at this process), distribution distance and vehicle used to their main client and use parameters.

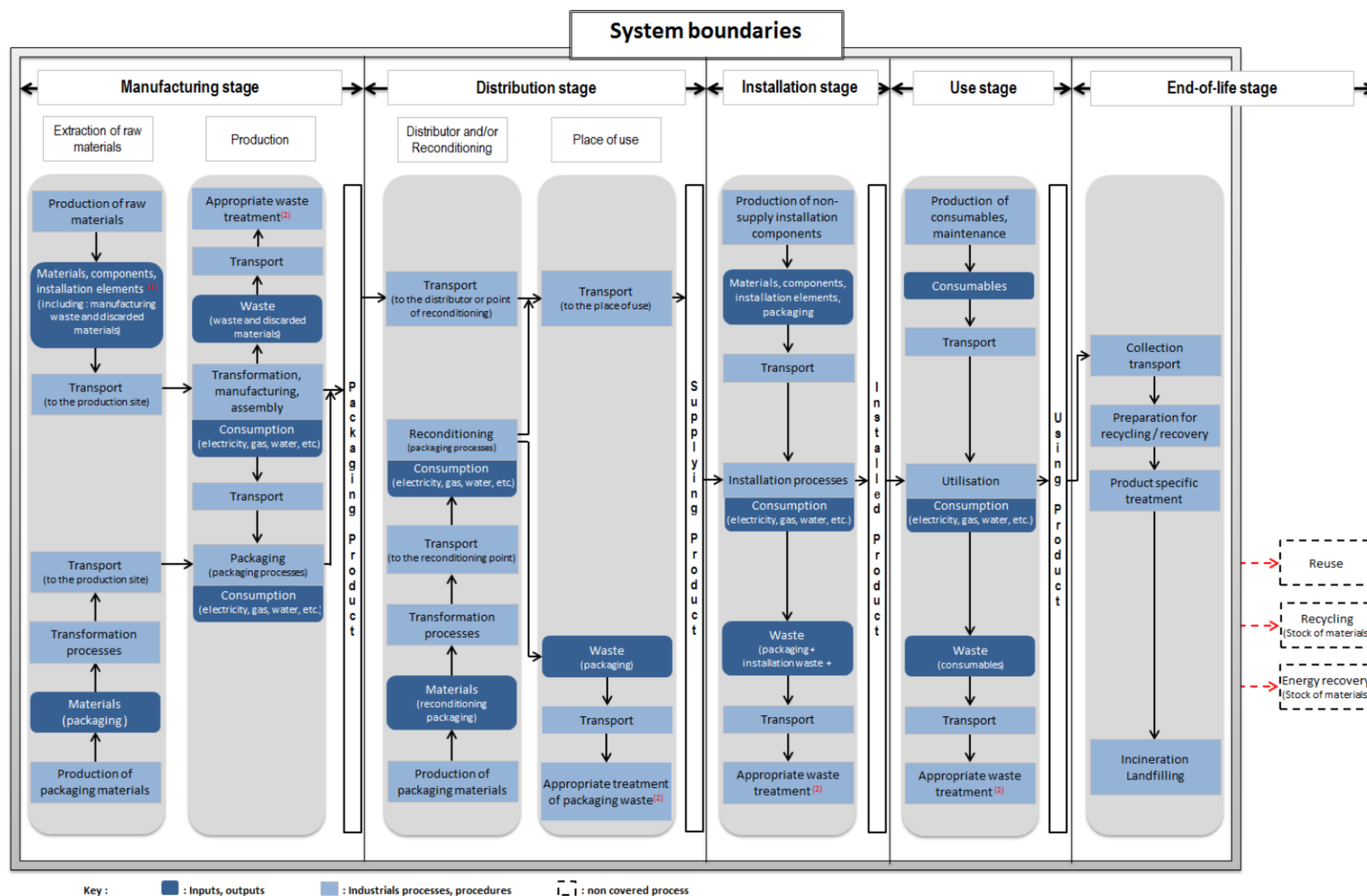
To make comparison with other lighting systems, functional unit, and following described parameters to model the LCA have to been taken into consideration, besides the life cycle assessment methodology and system boundaries should be the same. There should be also considered that the use phase has been model considering France electric mix (from Ecoinvent 3 database) because it is the main user market, and related impacts would vary if other country mix is considered.

Software used:

SimaPro 8 software and included databases (mainly ELCD and Ecoinvent 3) are used to model the life cycle.

System boundaries:

The evaluation of environmental impacts examines the stages of the Reference Product life cycle: manufacturing, distribution, installation, use and end of life.



Source: PCR-ed3-EN-2015 04 02

Figure. System boundaries considered under the study.

The details of modelling elements taken into account are explained below:

Functional unit and main life cycle parameters considered:

Functional unit: Indoor LED lighting system with a useful life time of 50.000 hr.

Manufacturing: Components are manufactured all over the world and mounted in Spain. Components and packaging elements raw materials production include: raw materials obtaining and transport, and main production process of the part including powder paint recovering in bigger aluminum parts and printing in paper and cardboard packaging elements. Inventories are obtained from LCA databases while specific quantities are obtained from the company (2017) and valid until the design is changed. Besides vehicle and distance transport to Spain is considered from the main international provider (16127 km by freight ship plus 44 km by truck). Finally, assembly energy demand at ARKOSLIGHT is considered.

Distribution: Transport to France by truck (1.387 km).

Installation: No required components, products, parts nor processes for installation. No electricity is required for installing the product. Packaging end of life is considered. Though recyclability potential of packaging components it is 100%, Eurostat statistics¹ from France (2015), to the different packaging waste materials are considered to determine the end of life treatments. 100 km of collection transport to the packaging waste is considered.

Use: LED use has an estimated life time of 60.000h, but the limiting factor is the driver with an estimated life time of 50.000h. The product is guaranteed to a use of 4.000h./year, consequently this is the basis to estimate a reference life time of 12,5 years. Energy demand is calculated to 50.000h to the two different powers supplied. France energy model has been used.

End of life:

Recyclability/recovery potential has been determined by each material according to Joint Research Centre (European Commission) Technical report on EEE recyclability calculation². Obtained results to SWAP series excluding packaging are:

Recyclability or re-use:	92,5% - 92,7%
Incineration with energy recovery:	1,9% - 2,5%
Landfill:	4,8% - 5,5%

The inputs and outputs associated with the following aspects are included in the end of life stage³:

1. Transportation to collect the end-of-life product and transport it from the installation site to the final treatment site: 1000 km by truck.
2. Treatment processes (landfilling or incineration without waste-to-energy recovery), including depollution treatment of items (for example items covered by WEEE Directive

¹ <http://ec.europa.eu/eurostat/>

² Feasibility study for setting-up reference values to support the calculation of recyclability / recoverability rates of electronic products. Authors: Perrine Chancerel, Max Marwede (Technische Universität Berlin). August 2016

³ PEP ecopassport® PROGRAM. Product Category Rules for Electrical, Electronic and HVAC-R Products PCR-ed3-EN-2015 04 02 ©



2012/19/EU) to be sent to special end-of-life product treatment centers, up to final treatment.

System expansion is not allowed at end-of-life stage (i.e. environmental benefits from energy recovering and recycling are excluded). The end-of-life of the product under study therefore corresponds to a disposal and/or storage process in the case of waste recovery. Default scenarios from ELCD database have been considered to landfilled fractions: ferro (to all metal parts), plastics (to plastics and electronics) and paper (packaging paper and cardboard).

NOTE: The optional accessory IP54 is not considered at the calculated recyclability. The optional accessory IP54 life cycle environmental impact is calculated separately. It does not require installation, so only production and end of life are considered.

Results to each 16 representative models are shown in following tables:

		SWAP S 5W											
		Total for life cycle	Production	%	Distribution	%	Installation	%	Use	%	End of life	%	
Abiotic depletion	kg Sb eq	1,11E-04	1,01E-04	92%	4,08E-10	0%	6,24E-11	0%	9,17E-06	8%	1,04E-09	0%	
Abiotic depletion (fossil fuels)	MJ	4,00E+02	4,84E+01	12%	6,04E-01	0%	1,46E-01	0%	3,49E+02	87%	2,42E+00	1%	
Global warming (GWP100a)	kg CO2 eq	3,45E+01	3,76E+00	11%	3,92E-02	0%	9,60E-03	0%	3,05E+01	88%	1,59E-01	0%	
Ozone layer depletion (ODP)	kg CFC-11 eq	4,39E-05	2,88E-07	1%	7,36E-09	0%	1,78E-09	0%	4,36E-05	99%	2,95E-08	0%	
Human toxicity	kg 1,4-DB eq	3,06E+00	1,02E+00	33%	1,71E-02	1%	1,36E-03	0%	2,00E+00	65%	2,25E-02	1%	
Fresh water aquatic ecotox.	kg 1,4-DB eq	4,78E-01	5,22E-02	11%	5,51E-04	0%	3,74E-05	0%	4,24E-01	89%	6,27E-04	0%	
Marine aquatic ecotoxicity	kg 1,4-DB eq	9,27E+03	6,24E+03	67%	2,89E+00	0%	2,57E-01	0%	3,02E+03	33%	4,28E+00	0%	
Terrestrial ecotoxicity	kg 1,4-DB eq	1,83E-02	7,28E-03	40%	4,63E-05	0%	1,57E-06	0%	1,09E-02	60%	2,69E-05	0%	
Photochemical oxidation	kg C2H4 eq	1,45E-02	7,90E-03	54%	5,15E-06	0%	1,74E-06	0%	6,57E-03	45%	2,89E-05	0%	
Acidification	kg SO2 eq	1,35E-01	2,11E-02	16%	1,39E-04	0%	4,53E-05	0%	1,13E-01	84%	7,52E-04	1%	
Eutrophication	kg PO4--- eq	1,26E-02	3,24E-03	26%	2,59E-05	0%	8,99E-06	0%	9,21E-03	73%	1,50E-04	1%	
Water use	m3	8,20E+02	9,79E+01	12%	4,77E-03	0%	9,58E-04	0%	7,23E+02	88%	1,59E-02	0%	
Total energy	MJ	6,24E+02	7,01E+01	11%	6,05E-01	0%	1,46E-01	0%	5,51E+02	88%	2,42E+00	0%	
		SWAP S 7W											
		Total for life cycle	Production	%	Distribution	%	Installation	%	Use	%	End of life	%	
Abiotic depletion	kg Sb eq	1,14E-04	1,01E-04	89%	4,08E-10	0%	6,24E-11	0%	1,24E-05	11%	1,04E-09	0%	
Abiotic depletion (fossil fuels)	MJ	5,23E+02	4,84E+01	9%	6,04E-01	0%	1,46E-01	0%	4,72E+02	90%	2,42E+00	0%	
Global warming (GWP100a)	kg CO2 eq	4,52E+01	3,76E+00	8%	3,92E-02	0%	9,60E-03	0%	4,13E+01	91%	1,59E-01	0%	
Ozone layer depletion (ODP)	kg CFC-11 eq	5,93E-05	2,88E-07	0%	7,36E-09	0%	1,78E-09	0%	5,90E-05	99%	2,95E-08	0%	
Human toxicity	kg 1,4-DB eq	3,76E+00	1,02E+00	27%	1,71E-02	0%	1,36E-03	0%	2,70E+00	72%	2,25E-02	1%	
Fresh water aquatic ecotox.	kg 1,4-DB eq	6,27E-01	5,22E-02	8%	5,51E-04	0%	3,74E-05	0%	5,74E-01	91%	6,27E-04	0%	
Marine aquatic ecotoxicity	kg 1,4-DB eq	1,03E+04	6,24E+03	60%	2,89E+00	0%	2,57E-01	0%	4,09E+03	40%	4,28E+00	0%	
Terrestrial ecotoxicity	kg 1,4-DB eq	2,21E-02	7,28E-03	33%	4,63E-05	0%	1,57E-06	0%	1,48E-02	67%	2,69E-05	0%	
Photochemical oxidation	kg C2H4 eq	1,68E-02	7,90E-03	47%	5,15E-06	0%	1,74E-06	0%	8,88E-03	53%	2,89E-05	0%	
Acidification	kg SO2 eq	1,75E-01	2,11E-02	12%	1,39E-04	0%	4,53E-05	0%	1,53E-01	87%	7,52E-04	0%	
Eutrophication	kg PO4--- eq	1,59E-02	3,24E-03	20%	2,59E-05	0%	8,99E-06	0%	1,25E-02	78%	1,50E-04	1%	
Water use	m3	2,95E+02	2,17E+01	7%	1,44E-03	0%	2,30E-04	0%	2,73E+02	93%	3,82E-03	0%	
Total energy	MJ	1,08E+03	9,79E+01	9%	4,77E-03	0%	9,58E-04	0%	9,78E+02	91%	1,59E-02	0%	



		SWAP M 5W										
		Total for life cycle	Production	%	Distribution	%	Installation	%	Use	%	End of life	%
Abiotic depletion	kg Sb eq	1,107E-04	1,016E-04	92%	4,552E-10	0%	2,781E-13	0%	9,172E-06	8%	1,092E-09	0%
Abiotic depletion (fossil fuels)	MJ	4,017E+02	4,966E+01	12%	6,731E-01	0%	6,028E-04	0%	3,488E+02	87%	2,546E+00	1%
Global warming (GWP100a)	kg CO2 eq	3,458E+01	3,860E+00	11%	4,374E-02	0%	4,275E-05	0%	3,051E+01	88%	1,678E-01	0%
Ozone layer depletion (ODP)	kg CFC-11 eq	4,393E-05	2,917E-07	1%	8,202E-09	0%	7,321E-12	0%	4,359E-05	99%	3,108E-08	0%
Human toxicity	kg 1,4-DB eq	3,070E+00	1,031E+00	34%	1,902E-02	1%	5,586E-06	0%	1,996E+00	65%	2,371E-02	1%
Fresh water aquatic ecotox.	kg 1,4-DB eq	4,786E-01	5,308E-02	11%	6,135E-04	0%	1,543E-07	0%	4,243E-01	89%	6,600E-04	0%
Marine aquatic ecotoxicity	kg 1,4-DB eq	9,299E+03	6,270E+03	67%	3,217E+00	0%	1,090E-03	0%	3,021E+03	32%	4,509E+00	0%
Terrestrial ecotoxicity	kg 1,4-DB eq	1,858E-02	7,594E-03	41%	5,164E-05	0%	6,517E-09	0%	1,090E-02	59%	2,823E-05	0%
Photochemical oxidation	kg C2H4 eq	1,452E-02	7,922E-03	55%	5,743E-06	0%	7,878E-09	0%	6,566E-03	45%	3,040E-05	0%
Acidification	kg SO2 eq	1,360E-01	2,156E-02	16%	1,550E-04	0%	1,876E-07	0%	1,134E-01	83%	7,914E-04	1%
Eutrophication	kg PO4--- eq	1,269E-02	3,287E-03	26%	2,883E-05	0%	3,951E-08	0%	9,215E-03	73%	1,576E-04	1%
Water use	m3	8,206E+02	9,805E+01	12%	5,311E-03	0%	3,937E-06	0%	7,225E+02	88%	1,675E-02	0%
Total energy	MJ	6,254E+02	7,161E+01	11%	6,747E-01	0%	6,039E-04	0%	5,506E+02	88%	2,550E+00	0%
		SWAP M 7W										
		Total for life cycle	Production	%	Distribution	%	Installation	%	Use	%	End of life	%
Abiotic depletion	kg Sb eq	1,140E-04	1,016E-04	89%	4,552E-10	0%	2,781E-13	0%	1,241E-05	11%	1,092E-09	0%
Abiotic depletion (fossil fuels)	MJ	5,248E+02	4,966E+01	9%	6,731E-01	0%	6,028E-04	0%	4,719E+02	90%	2,546E+00	0%
Global warming (GWP100a)	kg CO2 eq	4,534E+01	3,860E+00	9%	4,374E-02	0%	4,275E-05	0%	4,127E+01	91%	1,678E-01	0%
Ozone layer depletion (ODP)	kg CFC-11 eq	5,931E-05	2,917E-07	0%	8,202E-09	0%	7,321E-12	0%	5,898E-05	99%	3,108E-08	0%
Human toxicity	kg 1,4-DB eq	3,775E+00	1,031E+00	27%	1,902E-02	1%	5,586E-06	0%	2,701E+00	72%	2,371E-02	1%
Fresh water aquatic ecotox.	kg 1,4-DB eq	6,284E-01	5,308E-02	8%	6,135E-04	0%	1,543E-07	0%	5,740E-01	91%	6,600E-04	0%
Marine aquatic ecotoxicity	kg 1,4-DB eq	1,036E+04	6,270E+03	60%	3,217E+00	0%	1,090E-03	0%	4,087E+03	39%	4,509E+00	0%
Terrestrial ecotoxicity	kg 1,4-DB eq	2,243E-02	7,594E-03	34%	5,164E-05	0%	6,517E-09	0%	1,475E-02	66%	2,823E-05	0%
Photochemical oxidation	kg C2H4 eq	1,684E-02	7,922E-03	47%	5,743E-06	0%	7,878E-09	0%	8,884E-03	53%	3,040E-05	0%
Acidification	kg SO2 eq	1,760E-01	2,156E-02	12%	1,550E-04	0%	1,876E-07	0%	1,535E-01	87%	7,914E-04	0%
Eutrophication	kg PO4--- eq	1,594E-02	3,287E-03	21%	2,883E-05	0%	3,951E-08	0%	1,247E-02	78%	1,576E-04	1%
Water use	m3	2,950E+02	2,195E+01	7%	1,608E-03	0%	1,070E-06	0%	2,730E+02	93%	4,018E-03	0%
Total energy	MJ	1,076E+03	9,805E+01	9%	5,311E-03	0%	3,937E-06	0%	9,775E+02	91%	1,675E-02	0%



		SWAP L 5W											
		Total for life cycle	Production	%	Distribution	%	Installation	%	Use	%	End of life	%	
Abiotic depletion	kg Sb eq	1,153E-04	1,017E-04	88%	4,435E-06	4%	2,872E-09	0%	9,172E-06	8%	1,181E-09	0%	
Abiotic depletion (fossil fuels)	MJ	5,783E+02	5,138E+01	9%	1,687E+02	29%	6,703E+00	1%	3,488E+02	60%	2,754E+00	0%	
Global warming (GWP100a)	kg CO2 eq	4,987E+01	3,992E+00	8%	1,475E+01	30%	4,417E-01	1%	3,051E+01	61%	1,815E-01	0%	
Ozone layer depletion (ODP)	kg CFC-11 eq	6,508E-05	2,959E-07	0%	2,108E-05	32%	8,182E-08	0%	4,359E-05	67%	3,362E-08	0%	
Human toxicity	kg 1,4-DB eq	4,091E+00	1,042E+00	25%	9,652E-01	24%	6,243E-02	2%	1,996E+00	49%	2,565E-02	1%	
Fresh water aquatic ecotox.	kg 1,4-DB eq	6,860E-01	5,411E-02	8%	2,052E-01	30%	1,722E-03	0%	4,243E-01	62%	7,134E-04	0%	
Marine aquatic ecotoxicity	kg 1,4-DB eq	1,080E+04	6,301E+03	58%	1,461E+03	14%	1,185E+01	0%	3,021E+03	28%	4,877E+00	0%	
Terrestrial ecotoxicity	kg 1,4-DB eq	2,430E-02	8,016E-03	33%	5,273E-03	22%	7,222E-05	0%	1,090E-02	45%	3,047E-05	0%	
Photochemical oxidation	kg C2H4 eq	1,781E-02	7,952E-03	45%	3,175E-03	18%	8,003E-05	0%	6,566E-03	37%	3,289E-05	0%	
Acidification	kg SO2 eq	1,934E-01	2,216E-02	11%	5,486E-02	28%	2,083E-03	1%	1,134E-01	59%	8,561E-04	0%	
Eutrophication	kg PO4--- eq	1,760E-02	3,345E-03	19%	4,456E-03	25%	4,138E-04	2%	9,215E-03	52%	1,705E-04	1%	
Water use	m3	1,170E+03	9,823E+01	8%	3,494E+02	30%	4,411E-02	0%	7,225E+02	62%	1,813E-02	0%	
Total energy	MJ	8,999E+02	7,357E+01	8%	2,662E+02	30%	6,714E+00	1%	5,506E+02	61%	2,759E+00	0%	
		SWAP L 7W											
		Total for life cycle	Production	%	Distribution	%	Installation	%	Use	%	End of life	%	
Abiotic depletion	kg Sb eq	1,185E-04	1,017E-04	86%	4,435E-06	4%	2,872E-09	0%	1,241E-05	10%	1,181E-09	0%	
Abiotic depletion (fossil fuels)	MJ	7,014E+02	5,138E+01	7%	1,687E+02	24%	6,703E+00	1%	4,719E+02	67%	2,754E+00	0%	
Global warming (GWP100a)	kg CO2 eq	6,064E+01	3,992E+00	7%	1,475E+01	24%	4,417E-01	1%	4,127E+01	68%	1,815E-01	0%	
Ozone layer depletion (ODP)	kg CFC-11 eq	8,047E-05	2,959E-07	0%	2,108E-05	26%	8,182E-08	0%	5,898E-05	73%	3,362E-08	0%	
Human toxicity	kg 1,4-DB eq	4,796E+00	1,042E+00	22%	9,652E-01	20%	6,243E-02	1%	2,701E+00	56%	2,565E-02	1%	
Fresh water aquatic ecotox.	kg 1,4-DB eq	8,357E-01	5,411E-02	6%	2,052E-01	25%	1,722E-03	0%	5,740E-01	69%	7,134E-04	0%	
Marine aquatic ecotoxicity	kg 1,4-DB eq	1,187E+04	6,301E+03	53%	1,461E+03	12%	1,185E+01	0%	4,087E+03	34%	4,877E+00	0%	
Terrestrial ecotoxicity	kg 1,4-DB eq	2,814E-02	8,016E-03	28%	5,273E-03	19%	7,222E-05	0%	1,475E-02	52%	3,047E-05	0%	
Photochemical oxidation	kg C2H4 eq	2,012E-02	7,952E-03	40%	3,175E-03	16%	8,003E-05	0%	8,884E-03	44%	3,289E-05	0%	
Acidification	kg SO2 eq	2,334E-01	2,216E-02	9%	5,486E-02	23%	2,083E-03	1%	1,535E-01	66%	8,561E-04	0%	
Eutrophication	kg PO4--- eq	2,085E-02	3,345E-03	16%	4,456E-03	21%	4,138E-04	2%	1,247E-02	60%	1,705E-04	1%	
Water use	m3	3,928E+02	2,219E+01	6%	9,757E+01	25%	1,057E-02	0%	2,730E+02	70%	4,346E-03	0%	
Total energy	MJ	1,425E+03	9,823E+01	7%	3,494E+02	25%	4,411E-02	0%	9,775E+02	69%	1,813E-02	0%	



		SWAP XL 5W											
		Total for life cycle	Production	%	Distribution	%	Installation	%	Use	%	End of life	%	
Abiotic depletion	kg Sb eq	1,113E-04	1,021E-04	92%	5,986E-10	0%	3,374E-09	0%	9,172E-06	8%	1,343E-09	0%	
Abiotic depletion (fossil fuels)	MJ	4,156E+02	5,493E+01	13%	8,850E-01	0%	7,874E+00	2%	3,488E+02	84%	3,133E+00	1%	
Global warming (GWP100a)	kg CO2 eq	3,555E+01	4,267E+00	12%	5,751E-02	0%	5,189E-01	1%	3,051E+01	86%	2,065E-01	1%	
Ozone layer depletion (ODP)	kg CFC-11 eq	4,405E-05	3,059E-07	1%	1,078E-08	0%	9,612E-08	0%	4,359E-05	99%	3,824E-08	0%	
Human toxicity	kg 1,4-DB eq	3,190E+00	1,067E+00	33%	2,501E-02	1%	7,334E-02	2%	1,996E+00	63%	2,918E-02	1%	
Fresh water aquatic ecotox.	kg 1,4-DB eq	4,846E-01	5,668E-02	12%	8,067E-04	0%	2,023E-03	0%	4,243E-01	88%	8,108E-04	0%	
Marine aquatic ecotoxicity	kg 1,4-DB eq	9,426E+03	6,381E+03	68%	4,230E+00	0%	1,393E+01	0%	3,021E+03	32%	5,547E+00	0%	
Terrestrial ecotoxicity	kg 1,4-DB eq	2,000E-02	8,905E-03	45%	6,791E-05	0%	8,483E-05	0%	1,090E-02	55%	3,455E-05	0%	
Photochemical oxidation	kg C2H4 eq	1,472E-02	8,015E-03	54%	7,552E-06	0%	9,402E-05	1%	6,566E-03	45%	3,741E-05	0%	
Acidification	kg SO2 eq	1,405E-01	2,340E-02	17%	2,039E-04	0%	2,447E-03	2%	1,134E-01	81%	9,738E-04	1%	
Eutrophication	kg PO4--- eq	1,341E-02	3,475E-03	26%	3,791E-05	0%	4,861E-04	4%	9,215E-03	69%	1,939E-04	1%	
Water use	m3	8,213E+02	9,868E+01	12%	6,983E-03	0%	5,182E-02	0%	7,225E+02	88%	2,062E-02	0%	
Total energy	MJ	6,403E+02	7,783E+01	12%	8,872E-01	0%	7,887E+00	1%	5,506E+02	86%	3,138E+00	0%	
		SWAP XL 7W											
		Total for life cycle	Production	%	Distribution	%	Installation	%	Use	%	End of life	%	
Abiotic depletion	kg Sb eq	1,145E-04	1,021E-04	89%	5,986E-10	0%	3,374E-09	0%	1,241E-05	11%	1,343E-09	0%	
Abiotic depletion (fossil fuels)	MJ	5,387E+02	5,493E+01	10%	8,850E-01	0%	7,874E+00	1%	4,719E+02	88%	3,133E+00	1%	
Global warming (GWP100a)	kg CO2 eq	4,632E+01	4,267E+00	9%	5,751E-02	0%	5,189E-01	1%	4,127E+01	89%	2,065E-01	0%	
Ozone layer depletion (ODP)	kg CFC-11 eq	5,943E-05	3,059E-07	1%	1,078E-08	0%	9,612E-08	0%	5,898E-05	99%	3,824E-08	0%	
Human toxicity	kg 1,4-DB eq	3,895E+00	1,067E+00	27%	2,501E-02	1%	7,334E-02	2%	2,701E+00	69%	2,918E-02	1%	
Fresh water aquatic ecotox.	kg 1,4-DB eq	6,344E-01	5,668E-02	9%	8,067E-04	0%	2,023E-03	0%	5,740E-01	90%	8,108E-04	0%	
Marine aquatic ecotoxicity	kg 1,4-DB eq	1,049E+04	6,381E+03	61%	4,230E+00	0%	1,393E+01	0%	4,087E+03	39%	5,547E+00	0%	
Terrestrial ecotoxicity	kg 1,4-DB eq	2,385E-02	8,905E-03	37%	6,791E-05	0%	8,483E-05	0%	1,475E-02	62%	3,455E-05	0%	
Photochemical oxidation	kg C2H4 eq	1,704E-02	8,015E-03	47%	7,552E-06	0%	9,402E-05	1%	8,884E-03	52%	3,741E-05	0%	
Acidification	kg SO2 eq	1,805E-01	2,340E-02	13%	2,039E-04	0%	2,447E-03	1%	1,535E-01	85%	9,738E-04	1%	
Eutrophication	kg PO4--- eq	1,666E-02	3,475E-03	21%	3,791E-05	0%	4,861E-04	3%	1,247E-02	75%	1,939E-04	1%	
Water use	m3	2,959E+02	2,290E+01	8%	2,115E-03	0%	1,241E-02	0%	2,730E+02	92%	4,943E-03	0%	
Total energy	MJ	1,076E+03	9,868E+01	9%	6,983E-03	0%	5,182E-02	0%	9,775E+02	91%	2,062E-02	0%	



		SWAP M ASYM 5W											
		Total for life cycle	Production	%	Distribution	%	Installation	%	Use	%	End of life	%	
Abiotic depletion	kg Sb eq	1,108E-04	1,016E-04	92%	4,702E-10	0%	2,650E-09	0%	9,172E-06	8%	1,102E-09	0%	
Abiotic depletion (fossil fuels)	MJ	4,082E+02	4,995E+01	12%	6,952E-01	0%	6,185E+00	2%	3,488E+02	85%	2,571E+00	1%	
Global warming (GWP100a)	kg CO2 eq	3,501E+01	3,883E+00	11%	4,518E-02	0%	4,076E-01	1%	3,051E+01	87%	1,694E-01	0%	
Ozone layer depletion (ODP)	kg CFC-11 eq	4,400E-05	2,928E-07	1%	8,471E-09	0%	7,550E-08	0%	4,359E-05	99%	3,138E-08	0%	
Human toxicity	kg 1,4-DB eq	3,131E+00	1,034E+00	33%	1,965E-02	1%	5,761E-02	2%	1,996E+00	64%	2,394E-02	1%	
Fresh water aquatic ecotox.	kg 1,4-DB eq	4,805E-01	5,334E-02	11%	6,337E-04	0%	1,589E-03	0%	4,243E-01	88%	6,662E-04	0%	
Marine aquatic ecotoxicity	kg 1,4-DB eq	9,318E+03	6,278E+03	67%	3,322E+00	0%	1,094E+01	0%	3,021E+03	32%	4,552E+00	0%	
Terrestrial ecotoxicity	kg 1,4-DB eq	1,872E-02	7,670E-03	41%	5,334E-05	0%	6,664E-05	0%	1,090E-02	58%	2,849E-05	0%	
Photochemical oxidation	kg C2H4 eq	1,460E-02	7,928E-03	54%	5,932E-06	0%	7,385E-05	1%	6,566E-03	45%	3,070E-05	0%	
Acidification	kg SO2 eq	1,380E-01	2,168E-02	16%	1,601E-04	0%	1,922E-03	1%	1,134E-01	82%	7,989E-04	1%	
Eutrophication	kg PO4--- eq	1,309E-02	3,301E-03	25%	2,978E-05	0%	3,818E-04	3%	9,215E-03	70%	1,591E-04	1%	
Water use	m3	8,207E+02	9,810E+01	12%	5,485E-03	0%	4,071E-02	0%	7,225E+02	88%	1,692E-02	0%	
Total energy	MJ	6,320E+02	7,199E+01	11%	6,969E-01	0%	6,195E+00	1%	5,506E+02	87%	2,575E+00	0%	
		SWAP M ASYM 7W											
		Total for life cycle	Production	%	Distribution	%	Installation	%	Use	%	End of life	%	
Abiotic depletion	kg Sb eq	1,140E-04	1,016E-04	89%	4,702E-10	0%	2,650E-09	0%	1,241E-05	11%	1,102E-09	0%	
Abiotic depletion (fossil fuels)	MJ	5,313E+02	4,995E+01	9%	6,952E-01	0%	6,185E+00	1%	4,719E+02	89%	2,571E+00	0%	
Global warming (GWP100a)	kg CO2 eq	4,578E+01	3,883E+00	8%	4,518E-02	0%	4,076E-01	1%	4,127E+01	90%	1,694E-01	0%	
Ozone layer depletion (ODP)	kg CFC-11 eq	5,939E-05	2,928E-07	0%	8,471E-09	0%	7,550E-08	0%	5,898E-05	99%	3,138E-08	0%	
Human toxicity	kg 1,4-DB eq	3,836E+00	1,034E+00	27%	1,965E-02	1%	5,761E-02	2%	2,701E+00	70%	2,394E-02	1%	
Fresh water aquatic ecotox.	kg 1,4-DB eq	6,303E-01	5,334E-02	8%	6,337E-04	0%	1,589E-03	0%	5,740E-01	91%	6,662E-04	0%	
Marine aquatic ecotoxicity	kg 1,4-DB eq	1,038E+04	6,278E+03	60%	3,322E+00	0%	1,094E+01	0%	4,087E+03	39%	4,552E+00	0%	
Terrestrial ecotoxicity	kg 1,4-DB eq	2,257E-02	7,670E-03	34%	5,334E-05	0%	6,664E-05	0%	1,475E-02	65%	2,849E-05	0%	
Photochemical oxidation	kg C2H4 eq	1,692E-02	7,928E-03	47%	5,932E-06	0%	7,385E-05	0%	8,884E-03	52%	3,070E-05	0%	
Acidification	kg SO2 eq	1,781E-01	2,168E-02	12%	1,601E-04	0%	1,922E-03	1%	1,535E-01	86%	7,989E-04	0%	
Eutrophication	kg PO4--- eq	1,634E-02	3,301E-03	20%	2,978E-05	0%	3,818E-04	2%	1,247E-02	76%	1,591E-04	1%	
Water use	m3	2,950E+02	2,203E+01	7%	1,661E-03	0%	9,751E-03	0%	2,730E+02	93%	4,056E-03	0%	
Total energy	MJ	1,076E+03	9,810E+01	9%	5,485E-03	0%	4,071E-02	0%	9,775E+02	91%	1,692E-02	0%	



		SWAP L ASYM 5W											
		Total for life cycle	Production	%	Distribution	%	Installation	%	Use	%	End of life	%	
Abiotic depletion	kg Sb eq	1,110E-04	1,018E-04	92%	5,362E-10	0%	3,023E-09	0%	9,172E-06	8%	1,183E-09	0%	
Abiotic depletion (fossil fuels)	MJ	4,111E+02	5,170E+01	13%	7,929E-01	0%	7,054E+00	2%	3,488E+02	85%	2,760E+00	1%	
Global warming (GWP100a)	kg CO2 eq	3,522E+01	4,018E+00	11%	5,152E-02	0%	4,649E-01	1%	3,051E+01	87%	1,819E-01	1%	
Ozone layer depletion (ODP)	kg CFC-11 eq	4,402E-05	2,978E-07	1%	9,661E-09	0%	8,611E-08	0%	4,359E-05	99%	3,369E-08	0%	
Human toxicity	kg 1,4-DB eq	3,156E+00	1,046E+00	33%	2,241E-02	1%	6,570E-02	2%	1,996E+00	63%	2,571E-02	1%	
Fresh water aquatic ecotox.	kg 1,4-DB eq	4,821E-01	5,455E-02	11%	7,227E-04	0%	1,812E-03	0%	4,243E-01	88%	7,149E-04	0%	
Marine aquatic ecotoxicity	kg 1,4-DB eq	9,358E+03	6,316E+03	67%	3,789E+00	0%	1,248E+01	0%	3,021E+03	32%	4,887E+00	0%	
Terrestrial ecotoxicity	kg 1,4-DB eq	1,917E-02	8,101E-03	42%	6,084E-05	0%	7,600E-05	0%	1,090E-02	57%	3,053E-05	0%	
Photochemical oxidation	kg C2H4 eq	1,465E-02	7,960E-03	54%	6,766E-06	0%	8,423E-05	1%	6,566E-03	45%	3,296E-05	0%	
Acidification	kg SO2 eq	1,390E-01	2,232E-02	16%	1,826E-04	0%	2,192E-03	2%	1,134E-01	82%	8,578E-04	1%	
Eutrophication	kg PO4--- eq	1,322E-02	3,366E-03	25%	3,397E-05	0%	4,354E-04	3%	9,215E-03	70%	1,708E-04	1%	
Water use	m3	8,209E+02	9,831E+01	12%	6,256E-03	0%	4,642E-02	0%	7,225E+02	88%	1,816E-02	0%	
Total energy	MJ	6,353E+02	7,406E+01	12%	7,948E-01	0%	7,065E+00	1%	5,506E+02	87%	2,764E+00	0%	
		SWAP L ASYM 7W											
		Total for life cycle	Production	%	Distribution	%	Installation	%	Use	%	End of life	%	
Abiotic depletion	kg Sb eq	1,142E-04	1,018E-04	89%	5,362E-10	0%	3,023E-09	0%	1,241E-05	11%	1,183E-09	0%	
Abiotic depletion (fossil fuels)	MJ	5,342E+02	5,170E+01	10%	7,929E-01	0%	7,054E+00	1%	4,719E+02	88%	2,760E+00	1%	
Global warming (GWP100a)	kg CO2 eq	4,599E+01	4,018E+00	9%	5,152E-02	0%	4,649E-01	1%	4,127E+01	90%	1,819E-01	0%	
Ozone layer depletion (ODP)	kg CFC-11 eq	5,941E-05	2,978E-07	1%	9,661E-09	0%	8,611E-08	0%	5,898E-05	99%	3,369E-08	0%	
Human toxicity	kg 1,4-DB eq	3,861E+00	1,046E+00	27%	2,241E-02	1%	6,570E-02	2%	2,701E+00	70%	2,571E-02	1%	
Fresh water aquatic ecotox.	kg 1,4-DB eq	6,318E-01	5,455E-02	9%	7,227E-04	0%	1,812E-03	0%	5,740E-01	91%	7,149E-04	0%	
Marine aquatic ecotoxicity	kg 1,4-DB eq	1,042E+04	6,316E+03	61%	3,789E+00	0%	1,248E+01	0%	4,087E+03	39%	4,887E+00	0%	
Terrestrial ecotoxicity	kg 1,4-DB eq	2,302E-02	8,101E-03	35%	6,084E-05	0%	7,600E-05	0%	1,475E-02	64%	3,053E-05	0%	
Photochemical oxidation	kg C2H4 eq	1,697E-02	7,960E-03	47%	6,766E-06	0%	8,423E-05	0%	8,884E-03	52%	3,296E-05	0%	
Acidification	kg SO2 eq	1,790E-01	2,232E-02	12%	1,826E-04	0%	2,192E-03	1%	1,535E-01	86%	8,578E-04	0%	
Eutrophication	kg PO4--- eq	1,647E-02	3,366E-03	20%	3,397E-05	0%	4,354E-04	3%	1,247E-02	76%	1,708E-04	1%	
Water use	m3	2,954E+02	2,235E+01	8%	1,894E-03	0%	1,112E-02	0%	2,730E+02	92%	4,355E-03	0%	
Total energy	MJ	1,076E+03	9,831E+01	9%	6,256E-03	0%	4,642E-02	0%	9,775E+02	91%	1,816E-02	0%	



		SWAP SQ 5W											
		Total for life cycle	Production	%	Distribution	%	Installation	%	Use	%	End of life	%	
Abiotic depletion	kg Sb eq	1,109E-04	1,017E-04	92%	5,339E-10	0%	3,009E-09	0%	9,172E-06	8%	1,280E-09	0%	
Abiotic depletion (fossil fuels)	MJ	4,054E+02	5,286E+01	13%	7,894E-01	0%	4,654E-06	0%	3,488E+02	86%	2,985E+00	1%	
Global warming (GWP100a)	kg CO2 eq	3,486E+01	4,106E+00	12%	5,130E-02	0%	3,859E-06	0%	3,051E+01	88%	1,967E-01	1%	
Ozone layer depletion (ODP)	kg CFC-11 eq	4,394E-05	2,979E-07	1%	9,619E-09	0%	1,361E-14	0%	4,359E-05	99%	3,644E-08	0%	
Human toxicity	kg 1,4-DB eq	3,093E+00	1,047E+00	34%	2,231E-02	1%	9,739E-09	0%	1,996E+00	65%	2,780E-02	1%	
Fresh water aquatic ecotox.	kg 1,4-DB eq	4,804E-01	5,466E-02	11%	7,195E-04	0%	5,324E-10	0%	4,243E-01	88%	7,727E-04	0%	
Marine aquatic ecotoxicity	kg 1,4-DB eq	9,356E+03	6,314E+03	67%	3,772E+00	0%	1,242E+01	0%	3,021E+03	32%	5,285E+00	0%	
Terrestrial ecotoxicity	kg 1,4-DB eq	1,936E-02	8,363E-03	43%	6,057E-05	0%	7,624E-11	0%	1,090E-02	56%	3,295E-05	0%	
Photochemical oxidation	kg C2H4 eq	1,458E-02	7,975E-03	55%	6,736E-06	0%	8,545E-10	0%	6,566E-03	45%	3,564E-05	0%	
Acidification	kg SO2 eq	1,371E-01	2,259E-02	16%	1,818E-04	0%	1,704E-09	0%	1,134E-01	83%	9,278E-04	1%	
Eutrophication	kg PO4--- eq	1,281E-02	3,380E-03	26%	3,382E-05	0%	2,970E-09	0%	9,215E-03	72%	1,847E-04	1%	
Water use	m3	8,209E+02	9,833E+01	12%	6,228E-03	0%	-4,381E-09	0%	7,225E+02	88%	1,964E-02	0%	
Total energy	MJ	6,295E+02	7,509E+01	12%	7,912E-01	0%	4,801E-06	0%	5,506E+02	87%	2,990E+00	0%	
		SWAP SQ 7W											
		Total for life cycle	Production	%	Distribution	%	Installation	%	Use	%	End of life	%	
Abiotic depletion	kg Sb eq	1,141E-04	1,017E-04	89%	5,339E-10	0%	3,009E-09	0%	1,241E-05	11%	1,280E-09	0%	
Abiotic depletion (fossil fuels)	MJ	5,285E+02	5,286E+01	10%	7,894E-01	0%	4,654E-06	0%	4,719E+02	89%	2,985E+00	1%	
Global warming (GWP100a)	kg CO2 eq	4,563E+01	4,106E+00	9%	5,130E-02	0%	3,859E-06	0%	4,127E+01	90%	1,967E-01	0%	
Ozone layer depletion (ODP)	kg CFC-11 eq	5,932E-05	2,979E-07	1%	9,619E-09	0%	1,361E-14	0%	5,898E-05	99%	3,644E-08	0%	
Human toxicity	kg 1,4-DB eq	3,798E+00	1,047E+00	28%	2,231E-02	1%	9,739E-09	0%	2,701E+00	71%	2,780E-02	1%	
Fresh water aquatic ecotox.	kg 1,4-DB eq	6,302E-01	5,466E-02	9%	7,195E-04	0%	5,324E-10	0%	5,740E-01	91%	7,727E-04	0%	
Marine aquatic ecotoxicity	kg 1,4-DB eq	1,042E+04	6,314E+03	61%	3,772E+00	0%	1,242E+01	0%	4,087E+03	39%	5,285E+00	0%	
Terrestrial ecotoxicity	kg 1,4-DB eq	2,321E-02	8,363E-03	36%	6,057E-05	0%	7,624E-11	0%	1,475E-02	64%	3,295E-05	0%	
Photochemical oxidation	kg C2H4 eq	1,690E-02	7,975E-03	47%	6,736E-06	0%	8,545E-10	0%	8,884E-03	53%	3,564E-05	0%	
Acidification	kg SO2 eq	1,772E-01	2,259E-02	13%	1,818E-04	0%	1,704E-09	0%	1,535E-01	87%	9,278E-04	1%	
Eutrophication	kg PO4--- eq	1,607E-02	3,380E-03	21%	3,382E-05	0%	2,970E-09	0%	1,247E-02	78%	1,847E-04	1%	
Water use	m3	2,952E+02	2,223E+01	8%	1,886E-03	0%	1,467E-07	0%	2,730E+02	92%	4,710E-03	0%	
Total energy	MJ	1,076E+03	9,833E+01	9%	6,228E-03	0%	-4,381E-09	0%	9,775E+02	91%	1,964E-02	0%	



		SWAP SQ ASYM 5W											
		Total for life cycle	Production	%	Distribution	%	Installation	%	Use	%	End of life	%	
Abiotic depletion	kg Sb eq	1,110E-04	1,018E-04	92%	5,600E-10	0%	3,156E-09	0%	9,172E-06	8%	2,606E-21	0%	
Abiotic depletion (fossil fuels)	MJ	4,175E+02	5,315E+01	13%	8,280E-01	0%	7,366E+00	2%	3,488E+02	84%	1,291E-03	0%	
Global warming (GWP100a)	kg CO2 eq	3,566E+01	4,128E+00	12%	5,380E-02	0%	4,855E-01	1%	3,051E+01	86%	8,361E-06	0%	
Ozone layer depletion (ODP)	kg CFC-11 eq	4,408E-05	2,998E-07	1%	1,009E-08	0%	8,992E-08	0%	4,359E-05	99%	3,434E-20	0%	
Human toxicity	kg 1,4-DB eq	3,208E+00	1,051E+00	33%	2,340E-02	1%	6,861E-02	2%	1,996E+00	62%	5,417E-08	0%	
Fresh water aquatic ecotox.	kg 1,4-DB eq	4,839E-01	5,509E-02	11%	7,547E-04	0%	1,892E-03	0%	4,243E-01	88%	1,136E-08	0%	
Marine aquatic ecotoxicity	kg 1,4-DB eq	9,379E+03	6,328E+03	67%	3,957E+00	0%	1,303E+01	0%	3,021E+03	32%	7,698E-02	0%	
Terrestrial ecotoxicity	kg 1,4-DB eq	1,957E-02	8,440E-03	43%	6,353E-05	0%	7,936E-05	0%	1,090E-02	56%	6,322E-11	0%	
Photochemical oxidation	kg C2H4 eq	1,473E-02	7,982E-03	54%	7,065E-06	0%	8,795E-05	1%	6,566E-03	45%	4,693E-13	0%	
Acidification	kg SO2 eq	1,410E-01	2,274E-02	16%	1,907E-04	0%	2,289E-03	2%	1,134E-01	80%	1,321E-10	0%	
Eutrophication	kg PO4--- eq	1,356E-02	3,400E-03	25%	3,547E-05	0%	4,547E-04	3%	9,215E-03	68%	2,101E-10	0%	
Water use	m3	8,210E+02	9,840E+01	12%	6,533E-03	0%	4,848E-02	0%	7,225E+02	88%	-6,894E-09	0%	
Total energy	MJ	6,417E+02	7,554E+01	12%	8,299E-01	0%	7,378E+00	1%	5,506E+02	86%	1,291E-03	0%	
		SWAP SQ ASYM 7W											
		Total for life cycle	Production	%	Distribution	%	Installation	%	Use	%	End of life	%	
Abiotic depletion	kg Sb eq	1,142E-04	1,018E-04	89%	5,600E-10	0%	3,156E-09	0%	1,241E-05	11%	2,606E-21	0%	
Abiotic depletion (fossil fuels)	MJ	5,333E+02	5,315E+01	10%	8,280E-01	0%	7,366E+00	1%	4,719E+02	88%	1,291E-03	0%	
Global warming (GWP100a)	kg CO2 eq	4,594E+01	4,128E+00	9%	5,380E-02	0%	4,855E-01	1%	4,127E+01	90%	8,361E-06	0%	
Ozone layer depletion (ODP)	kg CFC-11 eq	5,938E-05	2,998E-07	1%	1,009E-08	0%	8,992E-08	0%	5,898E-05	99%	3,434E-20	0%	
Human toxicity	kg 1,4-DB eq	3,844E+00	1,051E+00	27%	2,340E-02	1%	6,861E-02	2%	2,701E+00	70%	5,417E-08	0%	
Fresh water aquatic ecotox.	kg 1,4-DB eq	6,318E-01	5,509E-02	9%	7,547E-04	0%	1,892E-03	0%	5,740E-01	91%	1,136E-08	0%	
Marine aquatic ecotoxicity	kg 1,4-DB eq	1,043E+04	6,328E+03	61%	3,957E+00	0%	1,303E+01	0%	4,087E+03	39%	7,698E-02	0%	
Terrestrial ecotoxicity	kg 1,4-DB eq	2,334E-02	8,440E-03	36%	6,353E-05	0%	7,936E-05	0%	1,475E-02	63%	6,322E-11	0%	
Photochemical oxidation	kg C2H4 eq	1,696E-02	7,982E-03	47%	7,065E-06	0%	8,795E-05	1%	8,884E-03	52%	4,693E-13	0%	
Acidification	kg SO2 eq	1,787E-01	2,274E-02	13%	1,907E-04	0%	2,289E-03	1%	1,535E-01	86%	1,321E-10	0%	
Eutrophication	kg PO4--- eq	1,636E-02	3,400E-03	21%	3,547E-05	0%	4,547E-04	3%	1,247E-02	76%	2,101E-10	0%	
Water use	m3	2,954E+02	2,239E+01	8%	1,978E-03	0%	1,161E-02	0%	2,730E+02	92%	4,771E-08	0%	
Total energy	MJ	1,076E+03	9,840E+01	9%	6,533E-03	0%	4,848E-02	0%	9,775E+02	91%	-6,894E-09	0%	



IP54 accessories are installed under demand at the lighting system, do not have installation or use impacts, and considering the end of life relevance, it can be assumed that practically all the impact it is concentrated at the production phase:

		IP54 S	IP54 M	IP54 L	IP54 XL	IP54 SQ
Abiotic depletion	kg Sb eq	1,142E-04	5,600E-10	3,156E-09	1,241E-05	2,606E-21
Abiotic depletion (fossil fuels)	MJ	5,333E+02	8,280E-01	7,366E+00	4,719E+02	1,291E-03
Global warming (GWP100a)	kg CO2 eq	4,594E+01	5,380E-02	4,855E-01	4,127E+01	8,361E-06
Ozone layer depletion (ODP)	kg CFC-11 eq	5,938E-05	1,009E-08	8,992E-08	5,898E-05	3,434E-20
Human toxicity	kg 1,4-DB eq	3,844E+00	2,340E-02	6,861E-02	2,701E+00	5,417E-08
Fresh water aquatic ecotox.	kg 1,4-DB eq	6,318E-01	7,547E-04	1,892E-03	5,740E-01	1,136E-08
Marine aquatic ecotoxicity	kg 1,4-DB eq	1,043E+04	3,957E+00	1,303E+01	4,087E+03	7,698E-02
Terrestrial ecotoxicity	kg 1,4-DB eq	2,334E-02	6,353E-05	7,936E-05	1,475E-02	6,322E-11
Photochemical oxidation	kg C2H4 eq	1,696E-02	7,065E-06	8,795E-05	8,884E-03	4,693E-13
Acidification	kg SO2 eq	1,787E-01	1,907E-04	2,289E-03	1,535E-01	1,321E-10
Eutrophication	kg PO4--- eq	1,636E-02	3,547E-05	4,547E-04	1,247E-02	2,101E-10
Water use	m3	2,954E+02	1,978E-03	1,161E-02	2,730E+02	4,771E-08
Total energy	MJ	1,076E+03	6,533E-03	4,848E-02	9,775E+02	-6,894E-09