Environmental Fact Sheet

EDU Roller 100

The aim of this document is to provide relevant and reliable information on the environmental performance of the EDU Roller 100. Results reported in this Environmental Fact Sheet are based on a Life Cycle Assessment (LCA) carried out by an independent company (Sphera).

This environmental information sheet uses the PSR-0006-ed1.1-EN-2015 10 16 - Drives for blinds & closures from the PEP ecopassport® Program as a reference and is based on a Life Cycle Assessment (LCA) study conducted according to DIN ISO 14040/44. All relevant environmental data relating to climate change (carbon footprint) as well as an overview of other environmental impact categories applying EN 15804+A2 methodology is disclosed in this information sheet.

Manufacturer

Lutron Electronics Co., Inc.
7200 Suter Rd, Coopersburg, PA 18036

Study conducted by

Sphera Solutions GmbH
Hauptstraße 111-113, 70771 Leinfel-den-Echterdingen, Germany

Product description

The ultra-quiet, precision controlled Sivoia QS roller 100 Electronic Drive Unit (EDU) controls movement of a shade, keeps track of the shade's position, and adjusts the shade to the user's desired preset positions.

- Ultra-quiet operation: will not exceed 38 dBA measured 3 ft (1 m) from the EDU
- Moves in unison and maintains alignment with like drives; accurate within 0.125 in (3 mm)
- Smooth, silent starts and stops in both roller shade and Roman shade applications
- Offers programmable stop points, tracks the position of the shade, and adjusts it to predetermined positions at the touch of a button
- Low-voltage power
- Power failure memory for the lifetime of the product
- Available individually and in cartons of 10

System description

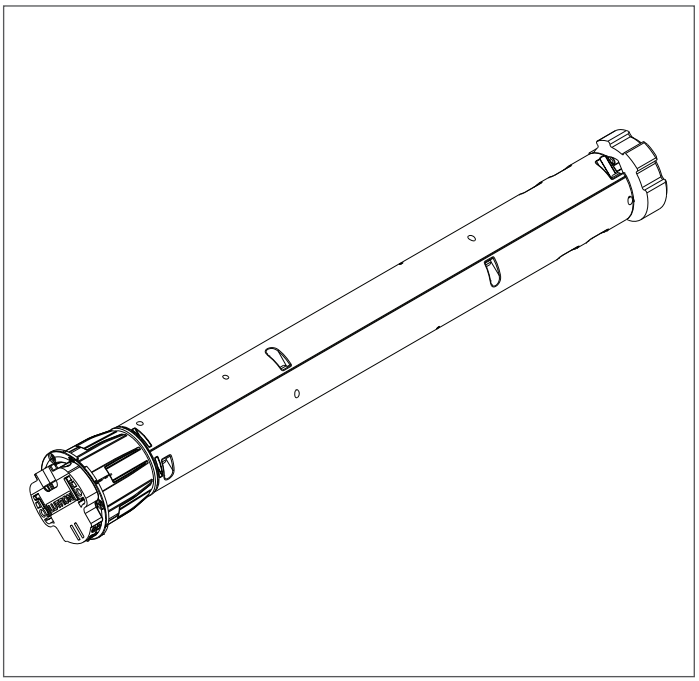
The product system for this study considers one device during its entire lifetime.

The functional unit is defined according to the PSR standard mentioned previously, and the reference unit for this study is one piece of the EDU Roller 100.

Product reference

EDU Roller 100

The functional unit as defined by the PSR meets specific standards for one piece of EDU Roller 100: "Ensure the closing and opening action by performing 10,220 operating cycles, on a reference service life of 14 years, with a torque of 2.825 Nm, on a length of 2.78 meters, corresponding to 9 winding turns per half-cycle, with a tube diameter of 635 mm."



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Material content

Plastics	Mass [kg]	% of Total weight	Metals and others	Mass [kg]	% of Total weight	Mixed parts (plastics and others)	Mass [kg]	% of Total weight	Printed circuit board assembly	Mass [kg]	% of Total weight
BUNA-N (NBR Rubber)	0.001	0.07%	Stainless steel	0.034	2.3%		0.057	3.8%		0.056	3.8%
Polyoxymethylene (POM)	0.362	24.5%	Steel	0.008	0.5%						
Polypropylene (PP)	0.001	0.07%	Galvanized steel	0.096	6.5%						
Polycarbonate (PC)	0.002	0.15%	Zinc die cast (Zamak)	0.144	9.7%						
Neoprene	0.057	3.9%	Motor 24V	0.360	24.3%						
Glass fiber reinforced polyamide	0.011	0.8%	Electrical parts (cables and connectors)	0.014	0.9%						
Polyamide 6 (PA 6)	0.001	0.04%	Power cable and plug*	0.273	18.4%						
Total plastics	**0.44**	**29%**	**Total metals and others**	**0.93**	**63%**	**Total mixed parts**	**0.06**	**4%**	**Total PCBA**	**0.06**	**4%**
									Packaging	**0.20**	

Table 1: Material content for EDU Roller 100

*Power cable 2.5 m long required as part of Reference Flow according to the PSR

Scope of the LCA

A Cradle-to-Grave LCA study was carried out according to DIN ISO 14040/44 using LCA for Experts software. The Use Stage was considered in the US, and End-of-Life (EoL) as landfilling for base scenarios.

Environmental impacts of the system were calculated following EN 15804+A2 with a focus on climate change (kg CO_2 eq.), while also addressing other midpoint impact categories.

Figure 1

Two scenarios were analyzed:

Scenario 1: Use Stage scenario — scenarios considering other locations of users. For each scenario, transportation from the manufacturing site to the customer and the electricity mix of the location were assumed. (Figure 4)

Scenario 2: End-of-Life scenario — scenarios considering different End-of-Life destinations were calculated, including incineration with energy recovery, incineration without energy recovery, and recycling.

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Climate change results for the base scenario

The carbon footprint of one EDU Roller 100 (1.68 kg, including packaging and power cable) is 33.5 kg CO_2 eq.

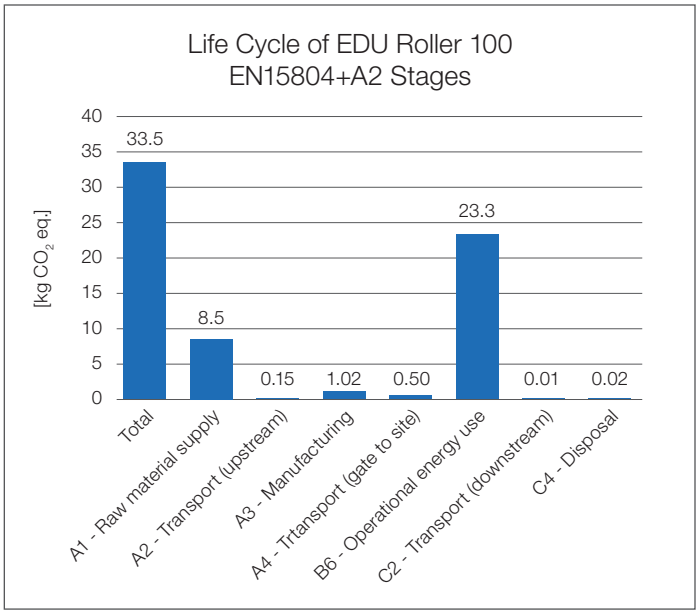

Figure 2: Climate change potential of one piece of EDU Roller 100

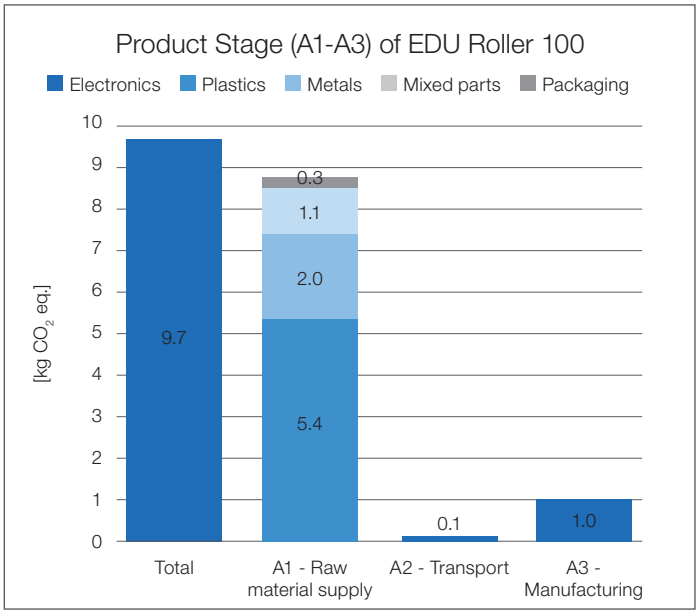

Figure 3: Climate change potential in the Product Stage of one piece of EDU Roller 100

The climate change results show that the Operational Energy Use (B6) in the Use Stage is the main contributor to the overall impact of the Roller 100, representing approximately 71% of potential impacts. The Use Stage is followed by the Product Stage (A1-A3) with approximately 28%, while the Transport (A4) and End-of-Life Stage (C1-D) have negligible impact.

In the Product Stage, the main contributors to CO_2 emissions are the raw material supplies (A1) of electronics followed by plastic parts and steel parts. Upstream transportation (A2) contributes to 1% of the climate change results of the Product Stage, while the electricity used in the manufacturing process (A3) sums 10% of the Stage's results.

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Climate change results comparing the base scenario with Use Stage in different locations

Utilizing other energy mixes as an alternative to the base scenario in the US during the Use Stage can increase the total climate change results of the Roller 100 by almost two times (e.g., scenarios of users located in Kuwait and India) or reduce it to 60% (scenario with users located in Canada).

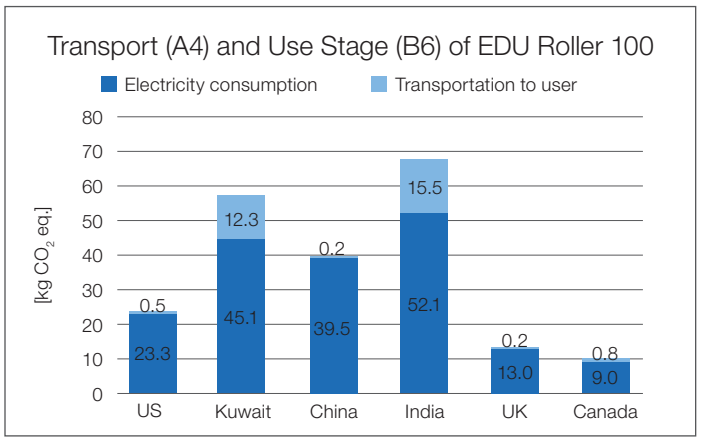

Figure 4: Climate change potential in the Transport and Use Stages of one piece of EDU Roller 100

Additional environmental impact indicators

Impact category	A1 - Raw material supply	A2 – Transport (upstream)	A3 - Manufacturing	A4 - Transport (gate to site)	B6 - Operational energy use	C2 - Transport (downstream)	C3 - Waste processing	C4 - Disposal	D - Reuse/recovery/ recycling potential
GWP - Climate Change - total [kg CO_2 eq.]	8.51E+00	1.46E-01	1.02E+00	5.01E-01	2.33E+01	8.35E-03	0.00E+00	2.45E-02	0.00E+00
ODP - Ozone depletion [kg CFC-11 eq.]	3.70E-11	1.78E-14	3.37E-12	6.18E-14	1.13E-10	1.03E-15	0.00E+00	6.41E-14	0.00E+00
AP - Acidification [Mole of H+ eq.]	5.26E-02	1.63E-04	9.50E-03	4.99E-04	3.25E-02	8.31E-06	0.00E+00	1.79E-04	0.00E+00
EPf - Eutrophication, freshwater [kg P eq.]	3.71E-05	6.94E-07	2.91E-07	2.48E-06	1.38E-05	4.13E-08	0.00E+00	5.07E-08	0.00E+00
EPm - Eutrophication, marine [kg N eq.]	7.18E-03	7.05E-05	9.32E-04	2.13E-04	7.23E-03	3.54E-06	0.00E+00	4.62E-05	0.00E+00
EPt - Eutrophication, terrestrial [Mole of N eq.]	7.63E-02	7.90E-04	1.03E-02	2.39E-03	7.85E-02	3.99E-05	0.00E+00	5.08E-04	0.00E+00
POCP - Photochemical ozone formation, human health [kg NMVOC eq.]	2.23E-02	1.66E-04	3.05E-03	4.83E-04	2.07E-02	8.05E-06	0.00E+00	1.39E-04	0.00E+00
ADPm - Resource use, mineral and metals [kg Sb eq.]	2.15E-03	9.61E-09	4.84E-08	3.30E-08	1.48E-06	5.51E-10	0.00E+00	1.16E-09	0.00E+00
ADPe - Resource use, fossils [MJ]	1.36E+02	1.93E+00	1.47E+01	6.61E+00	3.91E+02	1.10E-01	0.00E+00	3.35E-01	0.00E+00
W - Water use [m^3 world equiv.]	1.86E+00	8.24E-03	2.11E-01	2.94E-02	5.20E+00	4.90E-04	0.00E+00	2.77E-03	0.00E+00

Table 2: Life Cycle impact of one piece of EDU Roller 100 in EN 15804+A2 categories

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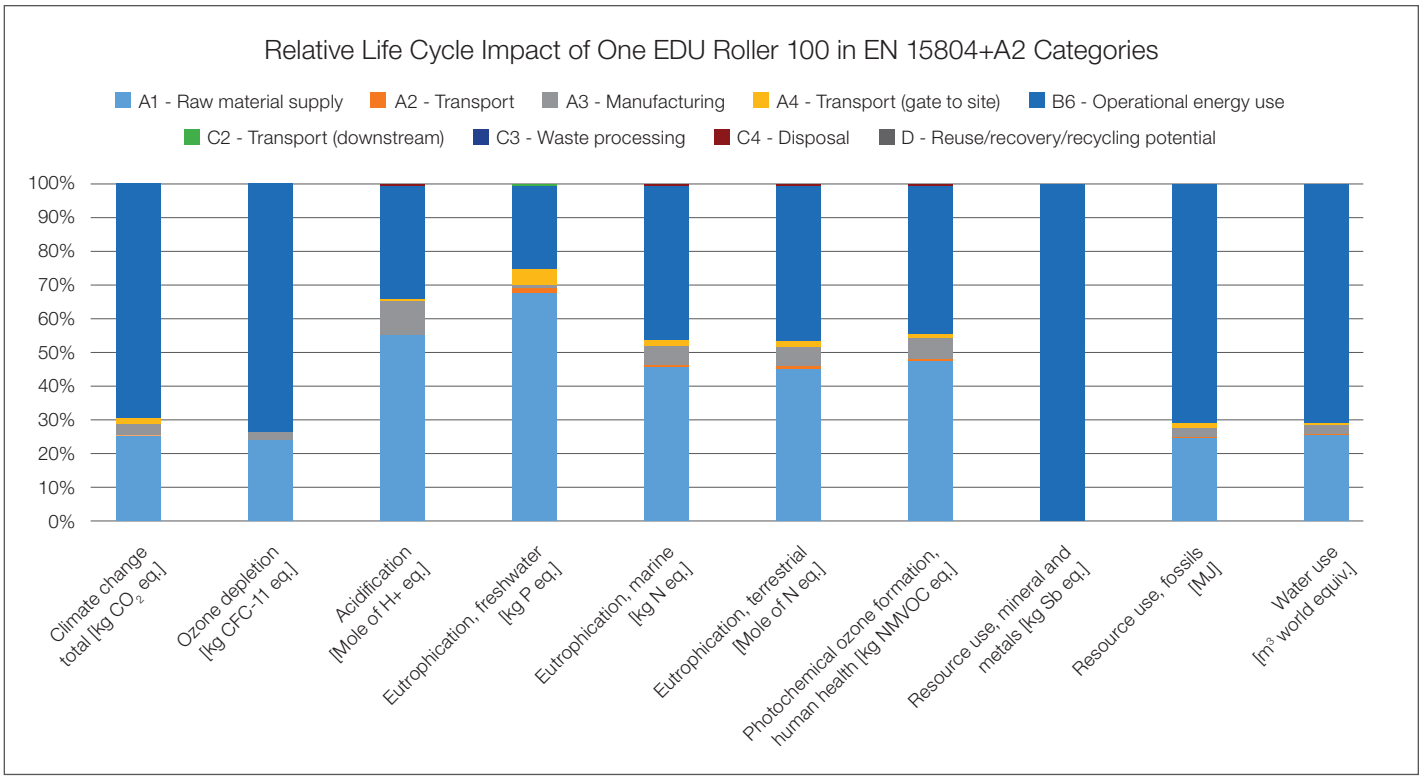

Figure 5: Relative Life Cycle impact of one EDU Roller 100 in EN 15804+A2 categories

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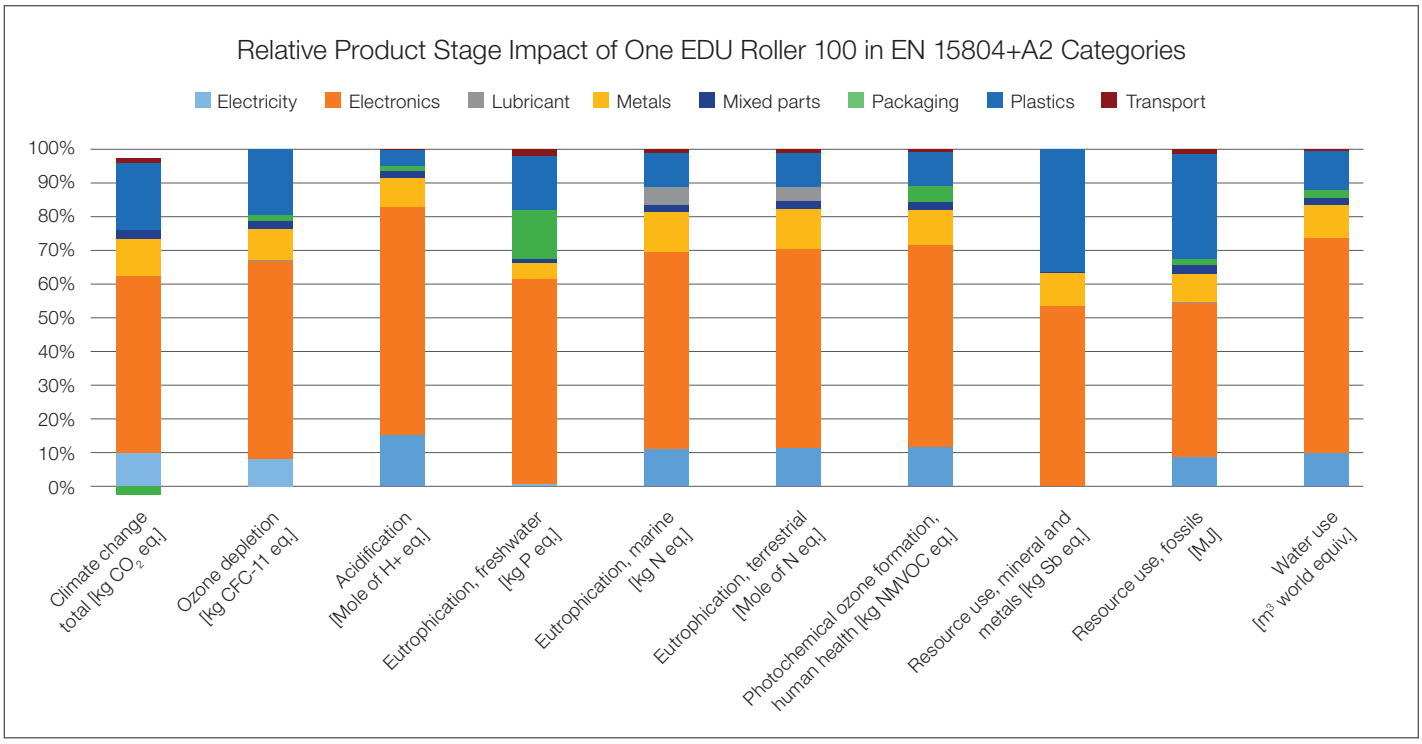

Figure 6: Relative impact of the Product Stage of one EDU Roller 100 in EN 15804+A2 categories

Summary and conclusion

With the aim to assess the environmental impact of the EDU Roller 100 produced by Lutron, climate change potential was used as a reference indicator in this study due to its stability and global importance.

Within the Cradle-to-Grave system boundary of the device, the LCA study shows electricity consumption during the Use Stage as the main hotspot for climate change. The observation of the hotspot is seen as a trend in most other environmental categories as well.

With recycling of electronics at EoL, the burden associated to the waste processing increases, but it can provide lower net results for this Life Cycle stage. However, due to its low contribution to the overall impact of the product, this does not affect the overall conclusion of the study in terms of the hotspots.

LUTRON

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