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Product Environmental Profile

Independent verification of the declaration and data in compliance with ISO 14025: 2006

SYLVANIA Novella family

Registration number	SYLV-00023-V01.01-EN	Drafting rules	PCR–ed4-EN-2021 09 06
Verifier accreditation number	VH44	Supplemented by	PSR-0014-ed2.0-EN-2023 07 13
Date of issue	01-2026	Information and reference documents	www.pep-ecopassport.org
PEP prepared by	Feilo Sylvania International Group Kft.	Validity period	5 years
Independent verification of the declaration and data in compliance with ISO 14025: 2006			
Internal		External	X
The PCR review was conducted by a panel of experts chaired by Julie Orgelet (DDemain)			
PEPs are compliant with XP C08-100-1:2016 and EN 50693:2019 or NF E38-500:2022			
The components of the present PEP may not be compared with components from any other program.			
Document complies with ISO 14025: 2006 “Environmental labels and declarations. Type III environmental declarations”			

1 General information

1.1 Product information

The Sylvania Novella is a range of surface mounted luminaires developed for residential and commercial entrance ways and corridors. With an IP66 rating and Sensor Dim or DALI version, which enables additional energy savings, these luminaires are perfect for interior and exterior applications. Novella benefits from a robust design that meets IK10 requirements. Easy selection between 3 different light output levels by using the integrated DIP switches. Integrated switch allows to choose between warm white (3000K) and neutral white (4000K) colour temperatures.

Applicable product standards:

- EN 60598-1
- EN 61347-1, 2-13
- EN 62717
- EN 55015
- EN 61547
- EN 61000-3-2

The function of SYLVANIA Novella family with its different series are descripted below:

- Non dimmable: Without dimming function, only power on and off.
- MW: Integrated with Microwave (MW) sensor, which can detect movement and ambient luminous.
- DALI: which can be connected to DALI lighting management system.

The SYLVANIA Novella reference product:

0040153 Novella IP66 1050-2800lm 830/840 MW White

belongs to MW series, which can turn on or off the lamp based on the human presence status and the ambient luminous level.

Its key technological data are listed below:

Table 1: Key technological data for reference product

Information	Unit	
Product code	-	0040153
Light source	-	LED
Power supply	-	External
Colour temperature	K	4000/3000
Protection index for water and dust (IP)	-	66
Impact resistance index (IK)	-	10
Nominal operating voltage	V	220-240V
Declared lifetime of the luminaire (L70B50)	h	100,000
Declaration lifetime of the light source	h	100,000
Useful output flux	lm	2,800
Total power consumption	W	20.3
Luminous efficiency	lm/W	142
Length	mm	NA
Width/Diameter	mm	300
Height	mm	67
Reference use scenario	-	Industry, Logistics

SYLVANIA Novella family are declared with below lifetime:

- L70B50 100,000hrs
- L80B20 62,000hrs
- L90B10 24,000hrs

L70B50 100,000hrs is used for LCA analysis.

For industry using scenario 4,000 annual operating hours, resulting in a lifetime of 25 years.

1.2 Overview

The general information used for the PEP are listed below:

Table 2: Basic PEP information

Information	
Functional unit	Provide lighting that delivers an outgoing artificial luminous flux of 1,000 lumens during a reference lifetime of 35,000 hours
Reference flow / declared unit*	0.125 pieces of product
Life cycle stages cover (according to EN15804+A2)	Cradle-to-grave and Module D
Product category according to PSR	Luminaires
Product family name	Sylvania Novella
All products of the product family	Table 19 - Table 21
Extrapolation rules	Table 22 - Table 24

* The reference flow is calculated as: (1,000/outgoing luminous flux of the analyzed product in lumens) x (35,000/declared product lifetime of the analyzed product in hours)

Consequently, the reference flow of the following products corresponds to:

(1,000/2,800) x (3,5000/100,000) = 0.125

2 Constituent materials

2.1 Overview

Table 3: Product composition

Information	Weight/product [kg]	Weight/functional unit [kg]	Share [%]
Total weight	1.324	1.65E-01	100.0%
Product	0.874	1.09E-01	66.0%
Packaging	0.450	5.63E-02	34.0%

2.2 Product

Table 4: Material composition - product

Information	Weight/product [kg]	Weight/functional unit [kg]	Share [%]
Total weight	0.874	1.09E-01	100.0%
Metals	0.020	2.46E-03	2.26%
- Steel	0.020	2.46E-03	2.26%
Plastics	0.603	7.54E-02	69.03%
- Polycarbonate (PC)	0.584	7.30E-02	66.9%
- Silica gel	0.019	2.38E-03	2.2%
Electronics	0.251	3.14E-02	28.71%

Note: The total weight in this table differs slightly from the total weight of the product due to rounding inaccuracies.

2.3 Packaging

Table 5: Material composition - packaging

Information	Weight/product [kg]	Weight/functional unit [kg]	Share [%]
Total weight	0.450	5.63E-02	100.0%
Paper/cardboard	0.440	5.50E-02	97.7%
Plastics	0.006	8.07E-04	1.4%
Wood	0.004	4.96E-04	0.9%

3 Information on life cycle stages

3.1 Manufacturing (A1-A3)

For the manufacturer sources all parts come from international and Chinese suppliers. The final products are assembled and tested in Chinese factory, under the quality control of Feilo Sylvania International Group Kft.. The manufacturer is certified to ISO 9001:2015 / 14001:2015.

Metal scrap, plastic, waste carton/paper of the production side are mostly recycled, whereas electronic scrap is 100% incinerated with energy recovery and the waste wood is mostly considered as incinerated and landfilled.

The energy model used in manufacturing is based on Sphera's Managed LCA Content V.10:

CN: Electricity grid mix Sphera

3.2 Distribution (A4)

The main market for the product is Europe. For this reason, an intercontinental and intracontinental transport, following PEP-PCR–ed4-EN-2021 09 06, is considered in the following model:

- 18,000km by ship (heavy fuel oil driven, container ship, 5,000 to 200,000 dwt payload capacity, deep sea)
- 1,400 km by truck (diesel driven, EURO 0-6, >27t payload).

The background assumptions for transportation are listed below.

Table 6: Background information distribution

Information	Unit	Truck	Ship
Fuel type	-	Diesel	Heavy fuel oil
Fuel consumption	l/(kg*km)	2.00E-05	3.24E-06
Total distance	km	1,400	18,000
Capacity utilisation (including empty runs)	%	85	70

3.3 Installation (A5)

The product can be easily mounted to the surface of the buildings with simple tools. No energy or material input is required. Packaging waste is treated with reference to chapter 3.5.3.1 of PSR-0014-ed 2.0-2023 07 13.

3.4 Use stage (B1-B7)

During the use stage of the product, the product only consumes electricity (B6). The main market for the product is Europe. Consequently, an average European electricity grid mix (database from Sphera) has been used for the calculations.

According to PSR-0014-ED2.0-EN- 2023 07 13, the theoretical energy saving coefficients for the 3 series of SYLVANIA Novella family are:

- Non dimmable: 1
- MW: 0.55
- DALI : 0.5

The SYLVANIA Novella reference product 0040153 is grouped under MW series, which can turn on or off the lamp based on the human presence status and the ambient luminous level. Therefore, the theoretical energy saving coefficient of the reference product is 0.55.

The declared power consumption of the reference product is 20.3 Watts, and its declared lifetime is 100,000 hours (L70B50).

Combining all these information leads to a total power consumption of 1,116.5 kWh.

All other modules of the life cycle stage have no environmental impact, since the product has no direct emissions (B1), no maintenance (B2), and no replacement (B4), repair (B3), or refurbishment activities (B5). The luminaire does not consume water during its use (B7).

3.5 End of life (C1-C4)

The product falls under the Waste from Electrical and Electronic Equipment (WEEE) directive 2012/19/EU subcategory 4. EOL model is created referring to chapter 2.5.6 End of life treatment scenarios of PCR-ed4-EN-2021 09 06.

The share of the different end of life pathways are shown below. For the energy consumed in material separation, an average European grid mix has been used.

- Incineration with energy recovery: 61.4%
- Landfilling: 36.8%
- Recycling: 1.8%

3.6 Benefits and loads beyond the system boundaries (D)

Incineration with energy recovery and recycling of the product, packaging, and manufacturing scrap generate environmental benefits by avoiding the production of primary materials or energy. The amount and type of waste streams are listed in Table 7.

Table 7: Material flows for Benefits and loads beyond the system boundaries.

Information	Unit	Value
Total weight going into reuse	kg/functional unit	0.000
Total weight going into recycling	kg/functional unit	0.0508
- Share from product	%	3.9
- Share from packaging	%	90.1
- Share from upstream packaging & manufacturing scrap	%	6.0
Total weight going into incineration with energy recovery	kg/functional unit	0.0739
- Share from product	%	90.8
- Share from packaging	%	7.3
- Share from upstream packaging & manufacturing scrap	%	1.9

4 Environmental impacts

4.1 Introduction

The following table summarizes the key information for the calculation of the environmental impacts:

Table 8: Basic information LCA model

Information	Value
Used LCA software	LCA for Experts 10
Used LCI database	LCA Managed Content Professional 2025.1
PCR version	PEP-PCR-ED4-EN-2021 09 06
PSR version	PEP-PSR-0014-ED2.0-EN-2023 07 13
Functional unit	Provide lighting that delivers an outgoing artificial luminous flux of 1,000 lumens during a reference lifetime of 35,000 hours

4.2 Results per functional unit

The following results of the environmental declaration have been developed by considering an outgoing artificial luminous flux of 1,000 lumens over a reference lifetime of 35,000 hours. The results refer to the core environmental impact indicators and indicators describing resource use, waste categories, and output flows according to EN 15804:2012+A2:2019.

Table 9: Results core environmental impact indicators per functional unit (0.1655 kg product incl. packaging)

	Total (Excl.D)	Manufacturing				Distribution	Installation	Use				End of life					Benefits and loads beyond the system boundaries
		A1	A2	A3	Tot. A1-A3	A4	A5	B1-B5	B6	B7	Tot. B1-B7	C1	C2	C3	C4	Tot. C1-C4	D
GWP - total [kg CO2 eq.]	4.68E+01	1.76E+00	5.77E-04	1.44E-01	1.91E+00	5.12E-02	4.61E-02	0.00E+00	4.47E+01	0.00E+00	4.47E+01	0.00E+00	7.37E-03	1.20E-01	1.21E-03	1.29E-01	-1.05E-02
GWP - fossil [kg CO2 eq.]	4.63E+01	1.85E+00	5.51E-04	1.41E-01	1.99E+00	5.05E-02	2.80E-02	0.00E+00	4.41E+01	0.00E+00	4.41E+01	0.00E+00	7.05E-03	1.20E-01	1.21E-03	1.28E-01	-7.63E-02
GWP - biogenic [kg CO2 eq.]	3.80E-01	-9.47E-02	1.95E-05	2.23E-03	-9.24E-02	6.05E-04	1.80E-02	0.00E+00	4.53E-01	0.00E+00	4.53E-01	0.00E+00	2.49E-04	1.48E-05	3.42E-06	2.67E-04	6.60E-02
GWP - luluc [kg CO2 eq.]	1.50E-01	4.12E-03	5.67E-06	4.39E-04	4.56E-03	1.67E-04	9.81E-05	0.00E+00	1.46E-01	0.00E+00	1.46E-01	0.00E+00	7.24E-05	7.03E-06	3.31E-06	8.27E-05	-2.13E-04
ODP [kg CFC-11 eq.]	1.02E-09	1.90E-11	9.13E-17	8.23E-13	1.99E-11	5.93E-15	7.34E-14	0.00E+00	1.00E-09	0.00E+00	1.00E-09	0.00E+00	1.17E-15	5.13E-14	4.12E-15	5.66E-14	-5.73E-13
AP [Mole of H+ eq.]	1.06E-01	8.36E-03	7.54E-07	5.00E-04	8.86E-03	6.54E-04	7.14E-05	0.00E+00	9.66E-02	0.00E+00	9.66E-02	0.00E+00	9.63E-06	3.33E-05	7.20E-06	5.01E-05	-1.75E-04
EP - freshwater [kg P eq.]	1.12E-04	1.59E-05	1.48E-09	8.51E-08	1.60E-05	5.23E-08	6.15E-07	0.00E+00	9.43E-05	0.00E+00	9.43E-05	0.00E+00	1.90E-08	1.32E-08	6.68E-07	7.00E-07	-7.75E-07
EP - marine [kg N eq.]	2.52E-02	1.61E-03	3.03E-07	1.08E-04	1.72E-03	2.76E-04	3.80E-05	0.00E+00	2.32E-02	0.00E+00	2.32E-02	0.00E+00	3.88E-06	1.11E-05	1.56E-06	1.65E-05	-6.36E-05
EP - terrestrial [Mole of N eq.]	2.81E-01	1.71E-02	3.14E-06	1.18E-03	1.83E-02	3.01E-03	3.22E-04	0.00E+00	2.60E-01	0.00E+00	2.60E-01	0.00E+00	4.01E-05	1.62E-04	1.70E-05	2.19E-04	-6.38E-04
POCP [kg NMVOC eq.]	6.34E-02	4.74E-03	6.81E-07	3.20E-04	5.06E-03	7.53E-04	5.90E-05	0.00E+00	5.75E-02	0.00E+00	5.75E-02	0.00E+00	8.70E-06	2.99E-05	4.94E-06	4.36E-05	-1.76E-04
ADPE [kg Sb eq.]	3.78E-04	3.69E-04	3.66E-11	9.56E-09	3.69E-04	1.93E-09	1.88E-08	0.00E+00	9.16E-06	0.00E+00	9.16E-06	0.00E+00	4.68E-10	4.71E-10	8.20E-11	1.02E-09	-1.48E-08
ADPF [MJ]	9.28E+02	2.61E+01	7.05E-03	1.51E+00	2.77E+01	6.09E-01	3.68E-01	0.00E+00	9.00E+02	0.00E+00	9.00E+02	0.00E+00	9.01E-02	7.78E-02	2.00E-02	1.88E-01	-1.22E+00
WDP [m³ world equiv.]	1.16E+01	4.69E-01	2.52E-06	4.30E-02	5.12E-01	1.38E-04	3.78E-03	0.00E+00	1.11E+01	0.00E+00	1.11E+01	0.00E+00	3.22E-05	1.38E-02	1.49E-04	1.40E-02	-8.91E-03

Table 10: Results indicators describing resource use, waste categories, and output flows per functional unit (0.1655 kg product incl. packaging)

	Total (Excl.D)	Manufacturing				Distribution	Installation	Use				End of life					Benefits and loads beyond the system boundaries
		A1	A2	A3	Tot. A1-A3	A4	A5	B1-B5	B6	B7	Tot. B1-B7	C1	C2	C3	C4	Tot. C1-C4	D
PERE [MJ]	6.23E+02	7.96E+00	5.32E-04	4.93E-01	8.46E+00	1.76E-02	1.10E-01	0.00E+00	6.15E+02	0.00E+00	6.15E+02	0.00E+00	6.79E-03	2.81E-02	3.33E-03	3.83E-02	-1.53E+00
PERM [MJ]	8.33E-01	8.33E-01	0.00E+00	0.00E+00	8.33E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT [MJ]	6.24E+02	8.80E+00	5.32E-04	4.93E-01	9.29E+00	1.76E-02	1.10E-01	0.00E+00	6.15E+02	0.00E+00	6.15E+02	0.00E+00	6.79E-03	2.81E-02	3.33E-03	3.83E-02	-1.53E+00
PENRE [MJ]	9.26E+02	2.35E+01	7.05E-03	1.51E+00	2.50E+01	6.09E-01	3.68E-01	0.00E+00	9.00E+02	0.00E+00	9.00E+02	0.00E+00	9.01E-02	7.78E-02	2.00E-02	1.88E-01	2.75E-01
PENRM [MJ]	2.63E+00	2.63E+00	0.00E+00	0.00E+00	2.63E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.49E+00
PENRT [MJ]	9.28E+02	2.61E+01	7.05E-03	1.51E+00	2.77E+01	6.09E-01	3.68E-01	0.00E+00	9.00E+02	0.00E+00	9.00E+02	0.00E+00	9.01E-02	7.78E-02	2.00E-02	1.88E-01	-1.22E+00
SM [kg]	1.75E-02	1.75E-02	0.00E+00	0.00E+00	1.75E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-2.02E-03
RSF [MJ]	1.64E-02	0.00E+00	3.74E-04	0.00E+00	3.74E-04	1.10E-02	2.46E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.78E-03	0.00E+00	0.00E+00	4.78E-03	0.00E+00
NRSF [MJ]	6.18E-01	0.00E+00	5.87E-03	0.00E+00	5.87E-03	5.33E-01	3.86E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.50E-02	0.00E+00	0.00E+00	7.50E-02	0.00E+00
FW [m3]	4.98E-01	1.87E-02	2.63E-07	1.03E-03	1.98E-02	1.02E-05	2.48E-04	0.00E+00	4.77E-01	0.00E+00	4.77E-01	0.00E+00	3.36E-06	3.31E-04	4.36E-06	3.39E-04	-3.52E-04
HWD [kg]	1.21E-06	2.73E-08	2.83E-13	1.23E-09	2.85E-08	2.22E-11	6.15E-09	0.00E+00	1.18E-06	0.00E+00	1.18E-06	0.00E+00	3.62E-12	2.30E-11	4.47E-12	3.11E-11	-8.38E-09
NHWD [kg]	8.35E-01	7.48E-02	9.85E-07	1.70E-03	7.65E-02	6.13E-05	5.22E-03	0.00E+00	6.97E-01	0.00E+00	6.97E-01	0.00E+00	1.26E-05	1.70E-02	4.00E-02	5.70E-02	-2.12E-03
RWD [kg]	1.43E-01	7.47E-04	1.33E-08	3.84E-05	7.85E-04	8.67E-07	9.96E-06	0.00E+00	1.42E-01	0.00E+00	1.42E-01	0.00E+00	1.70E-07	3.15E-06	2.88E-07	3.61E-06	-7.18E-05
CRU [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR [kg]	5.08E-02	6.12E-06	0.00E+00	3.03E-03	3.03E-03	0.00E+00	4.57E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.97E-03	0.00E+00	1.97E-03	0.00E+00
MER [kg]	7.39E-02	0.00E+00	0.00E+00	1.38E-03	1.38E-03	0.00E+00	5.40E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.71E-02	0.00E+00	6.71E-02	0.00E+00
EEE [MJ]	2.09E-01	1.39E-04	0.00E+00	0.00E+00	1.39E-04	0.00E+00	1.43E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.94E-01	0.00E+00	1.94E-01	-9.18E-03
EET [MJ]	4.55E-01	3.23E-04	0.00E+00	0.00E+00	3.23E-04	0.00E+00	2.26E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.32E-01	0.00E+00	4.32E-01	-2.13E-02
Biog. C in product [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biog. C in packaging [kg]	0.00E+00	-2.39E-02	0.00E+00	0.00E+00	-2.39E-02	0.00E+00	2.39E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 11: Additional environmental impact indicators per functional unit (0.1655 kg product incl. packaging)

	Total (Excl.D)	Manufacturing				Distribution	Installation	Use				End of life					Benefits and loads beyond the system boundaries
		A1	A2	A3	Tot. A1-A3	A4	A5	B1-B5	B6	B7	Tot. B1-B7	C1	C2	C3	C4	Tot. C1-C7	D
PM [Disease in- idences]	9.16E-07	9.30E-08	7.11E-12	6.81E-09	9.99E-08	1.70E-08	5.24E-10	0.00E+00	7.98E-07	0.00E+00	7.98E-07	0.00E+00	9.09E-11	3.98E-10	7.41E-11	5.63E-10	-2.42E-09
IRP [kBq. U235 eq.]	2.35E+01	7.63E-02	1.91E-06	2.41E-03	7.87E-02	1.21E-04	1.63E-03	0.00E+00	2.34E+01	0.00E+00	2.34E+01	0.00E+00	2.44E-05	3.60E-04	3.86E-05	4.23E-04	-1.16E-02
ETP-fw [CTUe]	1.72E+02	1.93E+01	9.17E-03	2.21E-01	1.96E+01	5.62E-01	1.11E-01	0.00E+00	1.52E+02	0.00E+00	1.52E+02	0.00E+00	1.17E-01	3.49E-02	4.55E-02	1.98E-01	-2.44E-01
HTP-c [CTUh]	1.49E-08	5.44E-10	1.24E-13	2.99E-11	5.74E-10	8.11E-12	5.03E-12	0.00E+00	1.43E-08	0.00E+00	1.43E-08	0.00E+00	1.58E-12	3.02E-12	6.26E-13	5.23E-12	-2.02E-11
HTP-nc [CTUh]	3.27E-07	2.42E-08	6.92E-12	4.89E-10	2.47E-08	2.77E-10	4.12E-10	0.00E+00	3.01E-07	0.00E+00	3.01E-07	0.00E+00	8.84E-11	2.07E-10	1.11E-11	3.06E-10	-3.49E-10
SQP [dimen- sionsless]	3.78E+02	1.70E+01	3.12E-03	2.39E-01	1.73E+01	9.25E-02	4.26E-01	0.00E+00	3.60E+02	0.00E+00	3.60E+02	0.00E+00	3.98E-02	2.47E-02	3.09E-03	6.76E-02	-7.32E+00

4.3 Results per unit of product

The following results of the environmental declaration have been developed by considering the entire life cycle of one product with the technical properties described in Table 1. The results refer to the core environmental impact indicators and indicators describing resource use, waste categories, and output flows according to EN 15804:2012+A2:2019.

Table 12: Results core environmental impact indicators per unit of product

	Total (Excl.D)	Manufacturing				Distribution	Installation	Use				End of life					Benefits and loads beyond the system boundaries
		A1	A2	A3	Tot. A1-A3	A4	A5	B1-B5	B6	B7	Tot. B1-B7	C1	C2	C3	C4	Tot. C1-C7	D
GWP - total [kg CO2 eq.]	3.74E+02	1.41E+01	4.61E-03	1.15E+00	1.52E+01	4.10E-01	3.69E-01	0.00E+00	3.57E+02	0.00E+00	3.57E+02	0.00E+00	5.89E-02	9.62E-01	9.71E-03	1.03E+00	-8.36E-02
GWP - fossil [kg CO2 eq.]	3.70E+02	1.48E+01	4.41E-03	1.13E+00	1.59E+01	4.04E-01	2.24E-01	0.00E+00	3.53E+02	0.00E+00	3.53E+02	0.00E+00	5.64E-02	9.62E-01	9.66E-03	1.03E+00	-6.10E-01
GWP - biogenic [kg CO2 eq.]	3.04E+00	-7.58E-01	1.56E-04	1.79E-02	-7.40E-01	4.84E-03	1.44E-01	0.00E+00	3.63E+00	0.00E+00	3.63E+00	0.00E+00	1.99E-03	1.18E-04	2.74E-05	2.14E-03	5.28E-01
GWP - luluc [kg CO2 eq.]	1.20E+00	3.30E-02	4.53E-05	3.51E-03	3.65E-02	1.34E-03	7.85E-04	0.00E+00	1.16E+00	0.00E+00	1.16E+00	0.00E+00	5.79E-04	5.62E-05	2.65E-05	6.62E-04	-1.70E-03
ODP [kg CFC-11 eq.]	8.19E-09	1.52E-10	7.31E-16	6.58E-12	1.59E-10	4.74E-14	5.87E-13	0.00E+00	8.03E-09	0.00E+00	8.03E-09	0.00E+00	9.34E-15	4.10E-13	3.29E-14	4.52E-13	-4.59E-12
AP [Mole of H+ eq.]	8.50E-01	6.68E-02	6.03E-06	4.00E-03	7.08E-02	5.24E-03	5.72E-04	0.00E+00	7.72E-01	0.00E+00	7.72E-01	0.00E+00	7.70E-05	2.67E-04	5.76E-05	4.01E-04	-1.40E-03
EP - freshwater [kg P eq.]	8.93E-04	1.27E-04	1.19E-08	6.80E-07	1.28E-04	4.18E-07	4.92E-06	0.00E+00	7.54E-04	0.00E+00	7.54E-04	0.00E+00	1.52E-07	1.05E-07	5.34E-06	5.60E-06	-6.20E-06
EP - marine [kg N eq.]	2.02E-01	1.29E-02	2.43E-06	8.65E-04	1.37E-02	2.21E-03	3.04E-04	0.00E+00	1.85E-01	0.00E+00	1.85E-01	0.00E+00	3.10E-05	8.86E-05	1.25E-05	1.32E-04	-5.09E-04
EP - terrestrial [Mole of N eq.]	2.25E+00	1.37E-01	2.51E-05	9.40E-03	1.46E-01	2.41E-02	2.57E-03	0.00E+00	2.08E+00	0.00E+00	2.08E+00	0.00E+00	3.21E-04	1.29E-03	1.36E-04	1.75E-03	-5.11E-03
POCP [kg NMVOC eq.]	5.07E-01	3.79E-02	5.45E-06	2.56E-03	4.05E-02	6.02E-03	4.72E-04	0.00E+00	4.60E-01	0.00E+00	4.60E-01	0.00E+00	6.96E-05	2.39E-04	3.95E-05	3.49E-04	-1.41E-03
ADPE [kg Sb eq.]	3.02E-03	2.95E-03	2.93E-10	7.65E-08	2.95E-03	1.55E-08	1.50E-07	0.00E+00	7.33E-05	0.00E+00	7.33E-05	0.00E+00	3.74E-09	3.77E-09	6.56E-10	8.16E-09	-1.18E-07
ADPF [MJ]	7.43E+03	2.09E+02	5.64E-02	1.21E+01	2.21E+02	4.87E+00	2.94E+00	0.00E+00	7.20E+03	0.00E+00	7.20E+03	0.00E+00	7.21E-01	6.22E-01	1.60E-01	1.50E+00	-9.73E+00
WDP [m³ world equiv.]	9.26E+01	3.75E+00	2.01E-05	3.44E-01	4.09E+00	1.10E-03	3.02E-02	0.00E+00	8.84E+01	0.00E+00	8.84E+01	0.00E+00	2.57E-04	1.10E-01	1.19E-03	1.12E-01	-7.12E-02

Table 13: Results indicators describing resource use, waste categories, and output flows per unit of product.

	Total (Excl.D)	Manufacturing				Distribution	Installation	Use				End of life					Benefits and loads beyond the system boundaries
		A1	A2	A3	Tot. A1-A3	A4	A5	B1-B5	B6	B7	Tot. B1-B7	C1	C2	C3	C4	Tot. C1-C4	D
PERE [MJ]	4.99E+03	6.37E+01	4.25E-03	3.94E+00	6.77E+01	1.41E-01	8.76E-01	0.00E+00	4.92E+03	0.00E+00	4.92E+03	0.00E+00	5.44E-02	2.25E-01	2.67E-02	3.06E-01	-1.22E+01
PERM [MJ]	6.66E+00	6.66E+00	0.00E+00	0.00E+00	6.66E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT [MJ]	4.99E+03	7.04E+01	4.25E-03	3.94E+00	7.43E+01	1.41E-01	8.76E-01	0.00E+00	4.92E+03	0.00E+00	4.92E+03	0.00E+00	5.44E-02	2.25E-01	2.67E-02	3.06E-01	-1.22E+01
PENRE [MJ]	7.41E+03	1.88E+02	5.64E-02	1.21E+01	2.00E+02	4.87E+00	2.94E+00	0.00E+00	7.20E+03	0.00E+00	7.20E+03	0.00E+00	7.21E-01	6.22E-01	1.60E-01	1.50E+00	2.20E+00
PENRM [MJ]	2.10E+01	2.10E+01	0.00E+00	0.00E+00	2.10E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.19E+01
PENRT [MJ]	7.43E+03	2.09E+02	5.64E-02	1.21E+01	2.21E+02	4.87E+00	2.94E+00	0.00E+00	7.20E+03	0.00E+00	7.20E+03	0.00E+00	7.21E-01	6.22E-01	1.60E-01	1.50E+00	-9.73E+00
SM [kg]	1.40E-01	1.40E-01	0.00E+00	0.00E+00	1.40E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.62E-02
RSF [MJ]	1.31E-01	0.00E+00	2.99E-03	0.00E+00	2.99E-03	8.76E-02	1.97E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.82E-02	0.00E+00	0.00E+00	3.82E-02	0.00E+00
NRSF [MJ]	4.94E+00	0.00E+00	4.69E-02	0.00E+00	4.69E-02	4.27E+00	3.09E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.00E-01	0.00E+00	0.00E+00	6.00E-01	0.00E+00
FW [m3]	3.98E+00	1.50E-01	2.10E-06	8.22E-03	1.58E-01	8.13E-05	1.98E-03	0.00E+00	3.82E+00	0.00E+00	3.82E+00	0.00E+00	2.69E-05	2.65E-03	3.49E-05	2.71E-03	-2.81E-03
HWD [kg]	9.68E-06	2.18E-07	2.26E-12	9.86E-09	2.28E-07	1.78E-10	4.92E-08	0.00E+00	9.40E-06	0.00E+00	9.40E-06	0.00E+00	2.89E-11	1.84E-10	3.58E-11	2.49E-10	-6.70E-08
NHWD [kg]	6.68E+00	5.98E-01	7.88E-06	1.36E-02	6.12E-01	4.91E-04	4.18E-02	0.00E+00	5.57E+00	0.00E+00	5.57E+00	0.00E+00	1.01E-04	1.36E-01	3.20E-01	4.56E-01	-1.69E-02
RWD [kg]	1.14E+00	5.97E-03	1.07E-07	3.07E-04	6.28E-03	6.93E-06	7.96E-05	0.00E+00	1.14E+00	0.00E+00	1.14E+00	0.00E+00	1.36E-06	2.52E-05	2.30E-06	2.89E-05	-5.75E-04
CRU [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR [kg]	4.06E-01	4.90E-05	0.00E+00	2.42E-02	2.42E-02	0.00E+00	3.66E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.58E-02	0.00E+00	1.58E-02	0.00E+00
MER [kg]	5.91E-01	0.00E+00	0.00E+00	1.11E-02	1.11E-02	0.00E+00	4.32E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.37E-01	0.00E+00	5.37E-01	0.00E+00
EEE [MJ]	1.67E+00	1.11E-03	0.00E+00	0.00E+00	1.11E-03	0.00E+00	1.14E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.55E+00	0.00E+00	1.55E+00	-7.34E-02
EET [MJ]	3.64E+00	2.58E-03	0.00E+00	0.00E+00	2.58E-03	0.00E+00	1.80E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.46E+00	0.00E+00	3.46E+00	-1.70E-01
Biog. C in product [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biog. C in packaging [kg]	0.00E+00	-1.91E-01	0.00E+00	0.00E+00	-1.91E-01	0.00E+00	1.91E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 14: Additional environmental impact indicators per unit of product

	Total (Excl.D)	Manufacturing				Distribution	Installation	Use				End of life					Benefits and loads beyond the system boundaries
		A1	A2	A3	Tot. A1-A3	A4	A5	B1-B5	B6	B7	Tot. B1-B7	C1	C2	C3	C4	Tot. C1-C7	D
PM [Disease in- idences]	7.33E-06	7.44E-07	5.69E-11	5.45E-08	7.99E-07	1.36E-07	4.19E-09	0.00E+00	6.38E-06	0.00E+00	6.38E-06	0.00E+00	7.27E-10	3.18E-09	5.93E-10	4.50E-09	-1.94E-08
IRP [kBq. U235 eq.]	1.88E+02	6.10E-01	1.53E-05	1.93E-02	6.30E-01	9.71E-04	1.30E-02	0.00E+00	1.87E+02	0.00E+00	1.87E+02	0.00E+00	1.95E-04	2.88E-03	3.09E-04	3.39E-03	-9.29E-02
ETP-fw [CTUe]	1.38E+03	1.55E+02	7.34E-02	1.77E+00	1.57E+02	4.49E+00	8.87E-01	0.00E+00	1.21E+03	0.00E+00	1.21E+03	0.00E+00	9.38E-01	2.79E-01	3.64E-01	1.58E+00	-1.96E+00
HTP-c [CTUh]	1.19E-07	4.35E-09	9.90E-13	2.39E-10	4.59E-09	6.49E-11	4.03E-11	0.00E+00	1.15E-07	0.00E+00	1.15E-07	0.00E+00	1.26E-11	2.42E-11	5.01E-12	4.18E-11	-1.62E-10
HTP-nc [CTUh]	2.62E-06	1.93E-07	5.53E-11	3.91E-09	1.97E-07	2.22E-09	3.30E-09	0.00E+00	2.41E-06	0.00E+00	2.41E-06	0.00E+00	7.07E-10	1.65E-09	8.92E-11	2.45E-09	-2.80E-09
SQP [dimen-sionsless]	3.03E+03	1.36E+02	2.49E-02	1.91E+00	1.38E+02	7.40E-01	3.41E+00	0.00E+00	2.88E+03	0.00E+00	2.88E+03	0.00E+00	3.19E-01	1.97E-01	2.47E-02	5.41E-01	-5.85E+01

4.4 Data comparison

The environmental profile especially for use stage B6 is very sensitive to the region of input electricity which relies on in which country the luminaires are used. Table 16 (per FU) and Table 17 (per product unit) give a comparison for Global Warming Potential GWP total [kg CO2 eq.] of reference product for use stage B6 with electricity used from different countries of Europe. Table 15 shows the scaling factor for GWP total of energy grid mixes for different countries.

For example:

For the reference model 0040153, Multiple GWP total B6 for EU (4.47E+01/functional unit) with Scaling factor for B6 for Belgium (0.507), The GWP total result for B6 for Belgium (2.26E+01) per functional unit can be worked out.

For other concerned models, first step, need to work out the GWP total of B6 for EU per functional unit or unit of product, based on the extrapolation rules provided in chapter 5 of this report, then by the same way provided above, the GWP total of B6 for different countries can be worked out.

Table 15: Scaling factor of use stage B6 for GWP total of energy grid mixes for different countries

Electricity grid	Scaling Factor for use stage
EU	1.000
AUSTRIA	0.784
BELGIUM	0.507
DENMARK	0.584
FINLAND	0.507
FRANCE	0.250
GERMANY	1.442
HUNGARY	1.016
IRELAND	1.255
ITALY	1.245
NETHERLANDS	1.141
NORWAY	0.147
POLAND	2.668
PORTUGUAL	0.786
ROMANIA	1.165
SPAN	0.740
SWEDEN	0.153
SWITZERLAND	0.430
UK	0.813

Table 16: GWP total [kg CO2 eq.] results for use stage B6 for different country per functional unit (0.1655kg product incl. packaging)

Electricity grid	GWP - total [kg CO2 eq.] B6
EU	4.47E+01
AUSTRIA	3.50E+01
BELGIUM	2.26E+01
DENMARK	2.61E+01
FINLAND	2.27E+01
FRANCE	1.12E+01
GERMANY	6.44E+01
HUNGARY	4.54E+01
IRELAND	5.61E+01
ITALY	5.56E+01
NETHERLANDS	5.10E+01
NORWAY	6.56E+00
POLAND	1.19E+02
POTUGAL	3.51E+01
ROMANIA	5.20E+01
SPAIN	3.30E+01
SWEDEN	6.85E+00
SWITZERLAND	1.92E+01
UK	3.63E+01

Note: The result in this table would be slightly different due to rounding inaccuracies.

Table 17: GWP total [kg CO2 eq.] results for use stage B6 for different country per unit of product

Electricity grid	GWP - total [kg CO2 eq.] B6
EU	3.57E+02
AUSTRIA	2.80E+02
BELGIUM	1.81E+02
DENMARK	2.09E+02
FINLAND	1.81E+02
FRANCE	8.95E+01
GERMANY	5.15E+02
HUNGARY	3.63E+02
IRELAND	4.49E+02
ITALY	4.45E+02
NETHERLANDS	4.08E+02
NORWAY	5.25E+01
POLAND	9.54E+02
POTUGAL	2.81E+02
ROMANIA	4.16E+02
SPAIN	2.64E+02
SWEDEN	5.48E+01
SWITZERLAND	1.54E+02
UK	2.91E+02

Note: The result in this table would be slightly different due to rounding inaccuracies.

4.5 Data quality

The underlying LCA model has been developed in Sphera's LCA software LCA for Experts V.10 and with datasets from Sphera's Managed LCA Content. The overall DQR for the representativeness has been calculated as average of the individual ratings according to the PCR respectively the Product Environmental Footprint Guide, version 6.3. Consequently, the overall representativeness is assessed as very good (DQR = 1.68).

The individual rating for technological, time and geographical representativeness is assessed as good, excellent and very good (DQR = 2.01, 1.00 and 2.04).

5 Extrapolation Rules

The extrapolation coefficients in the PEP Eco-passport have been developed according to the valid PCR & PSR. Below shows the key properties of the reference product, with function as extrapolation basis.

Table 18: Reference values for the extrapolations.

Parameter	Unit	Reference value
Weight of structural/ mechanical parts	kg	0.649
Weight of power equipment	kg	0.058
Weight of light source	kg	0.152
Weight of light management system	kg	0.0149
Weight of product (excl. packaging)	kg	0.874
Weight of packaging	kg	0.45
Weight of product (incl. packaging)	kg	1.324
Typical power consumption	W	20.3
Lumen output	lm	2,800
Energy saving	-	0.55

The extrapolation at the level of the functional unit needs to be done according to the following formula:

$$Extrapolation\ coefficient\ at\ the\ product\ level\ x\ \frac{Lighting\ output\ of\ reference\ product(lumen)}{Lighting\ output\ of\ product\ concerned(lumen)}$$

Lumen output of each product variant and other important properties are listed in the tables below.

Table 19: Information for product family: Non dimmable

Product code	Product name	Power (W)	Lighting output (lm)	Lumi-naire structure weight (kg)	Product packag-ing weight (kg)	Power equip-ment weight (kg)	Light source weight (kg)	Light man-agement weight (kg)	Total weight (kg)	Energy saving coeffi-cient
0040050	Novella IP66 720-1525lm 830/840 Black	12	1525	0.515	0.249	0.055	0.086	0.000	0.904	1
0040051	Novella IP66 1025-2750lm 830/840 Black	20	2750	0.652	0.449	0.058	0.152	0.000	1.310	1
0040150	Novella IP66 740-1550lm 830/840 White	12	1550	0.515	0.249	0.055	0.086	0.000	0.904	1
0040151	Novella IP66 1050-2800lm 830/840 White	20	2800	0.652	0.449	0.058	0.152	0.000	1.310	1

Table 20：Information for product family: MW

Product code	Product name	Power (W)	Lighting output (lm)	Lumi-naire structure weight (kg)	Product packag-ing weight (kg)	Power equip-ment weight (kg)	Light source weight (kg)	Light man-agement weight (kg)	Total weight (kg)	Energy saving coeffi-cient
0040052	Novella IP66 720-1525lm 830/840 MW Black	12.3	1525	0.515	0.249	0.055	0.086	0.015	0.919	0.55
0040053	Novella IP66 1025-2750lm 830/840 MW Black	20.3	2750	0.649	0.450	0.058	0.152	0.015	1.324	0.55
0040152	Novella IP66 740-1550lm 830/840 MW White	12.3	1550	0.515	0.249	0.055	0.086	0.015	0.919	0.55
0040153	Novella IP66 1050-2800lm 830/840 MW White	20.3	2800	0.649	0.450	0.058	0.152	0.015	1.324	0.55

Table 21: Information for product family: DALI

Product code	Product name	Power (W)	Lighting output (lm)	Lumi-naire structure weight (kg)	Product packag-ing weight (kg)	Power equip-ment weight (kg)	Light source weight (kg)	Light man-agement weight (kg)	Total weight (kg)	Energy saving coeffi-cient
0040054	Novella IP66 1600/1725lm 830/840 DALI Black	13.5	1725	0.4967	0.249	0.112	0.086	0.000	0.943	0.5
0040055	Novella IP66 2575/2800lm 830/840 DALI Black	20	2800	0.6648	0.449	0.112	0.166	0.000	1.391	0.5
0040154	Novella IP66 1625/1750lm 830/840 DALI White	13.5	1750	0.497	0.249	0.112	0.086	0.000	0.943	0.5
0040155	Novella IP66 2600/2850lm 830/840 DALI White	20	2850	0.665	0.449	0.112	0.166	0.000	1.391	0.5

The required extrapolation coefficients at the product level are listed in the following tables.

Table 22: Extrapolation coefficients at product level for Non dimmable

Product code	Product name	Power (W)	Lighting output (lm)	Manufacturing stage (A1-A3)	distribution stage (A4)	installation stage (A5)	use stage (B6)	EOL stage (C1 to C4)	Benefits stage (D)
0040050	Novella IP66 720-1525lm 830/840 Black	12	1525	0.71	0.68	0.55	1.07	0.75	0.71
0040051	Novella IP66 1025-2750lm 830/840 Black	20	2750	1.00	0.99	1.00	1.79	0.99	1.00
0040150	Novella IP66 740-1550lm 830/840 White	12	1550	0.71	0.68	0.55	1.07	0.75	0.71
0040151	Novella IP66 1050-2800lm 830/840 White	20	2800	1.00	0.99	1.00	1.79	0.99	1.00

Table 23：Extrapolation coefficients at product level for MW

Product code	Product name	Power (W)	Lighting output (lm)	Manufacturing stage (A1-A3)	distribution stage (A4)	installation stage (A5)	use stage (B6)	EOL stage (C1 to C4)	Benefits stage (D)
0040052	Novella IP66 720-1525lm 830/840 MW Black	12.3	1525	0.72	0.69	0.55	0.61	0.77	0.72
0040053	Novella IP66 1025-2750lm 830/840 MW Black	20.3	2750	1.00	1.00	1.00	1.00	1.00	1.00
0040152	Novella IP66 740-1550lm 830/840 MW White	12.3	1550	0.72	0.69	0.55	0.61	0.77	0.72
0040153	Novella IP66 1050-2800lm 830/840 MW White	20.3	2800	1.00	1.00	1.00	1.00	1.00	1.00

Table 24: Extrapolation coefficients at product level for DALI

Product code	Product name	Power (W)	Lighting output (lm)	Manufacturing stage (A1-A3)	distribution stage (A4)	installation stage (A5)	use stage (B6)	EOL stage (C1 to C4)	Benefits stage (D)
0040054	Novella IP66 1600/1725lm 830/840 DALI Black	13.5	1725	0.83	0.71	0.55	0.60	0.79	0.83
0040055	Novella IP66 2575/2800lm 830/840 DALI Black	20	2800	1.10	1.05	1.00	0.90	1.08	1.10
0040154	Novella IP66 1625/1750lm 830/840 DALI White	13.5	1750	0.83	0.71	0.55	0.60	0.79	0.83
0040155	Novella IP66 2600/2850lm 830/840 DALI White	20	2850	1.10	1.05	1.00	0.90	1.08	1.10

MW Microwave

DALI Digital Addressable Lighting Interface