ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

Metronomis LED Sharp

BDS660
Signify N.V.

EPD HUB
Publishing 2024-07-04

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Signify N.V.
Address	High Tech Campus 48, 5656 AE Eindhoven, The Netherlands
Contact details	sustainability@signify.com
Website	https://www.signify.com/global

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804+A2:2019 and ISO 14025
PCR	EPD Hub Core PCR version 1.0, 1 Feb 2022
Sector	Electrical product
Category of EPD	Pre-verified EPD
Scope of the EPD	Cradle to gate with options, A4-B7, and modules C1-C4, D
EPD author	Sustainability Signify
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☑ Internal certification □External verification

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of lighting products may not be comparable if they do not comply with EN 15804 and if they are not compared in a lighting context.

PRODUCT

Product name	Metronomis LED
Additional labels	BDS660 LW10 LED30-4S/830 I MDS CLO STD 7
Product reference	910770230983
Place of production	Poland
Period for data	2022
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	%

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 unit of 2430 lumens over 100000 hours
Declared unit mass	14.0162 kg
GWP-fossil, A1-A3 (kgCO2e)	1,33E+02
GWP-total, A1-A3 (kgCO2e)	1,29E+02
Secondary material, inputs (%)	43.9
Secondary material, outputs (%)	57.3
Total energy use, A1-A3 (kWh)	474
Total water use, A1-A3 (m3e)	0.92

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Signify is the world leader in lighting for professionals, consumers and lighting for the Internet of Things. Our energy efficient lighting products, systems and services enable our customers to enjoy a superior quality of light, and make people's lives safer and more comfortable, businesses more productive and cities more liveable.

For more information, please visit: https://www.signify.com/global

PRODUCT DESCRIPTION

Metronomis LED is the first post-top luminaire range in the world to offer a palette of lighting effects to give projects a unique contextual or aesthetic touch. An innovative play of reflection, light and shadow that casts a pattern on the ground, or in the bowl, to create additional ambience. Four iconic designs are available: Metronomis LED Torch (BDS650), Metronomis LED Torch with hat (BDS651), Metronomis LED Sharp (BDS660), and Metronomis LED Fluid (BDS670). Each luminaire design has a visual and modular link to Metronomis I, reduced to its essential elements. During the day, the discreet, transparent design blends into its urban context, whether that be contemporary or classical architecture and surroundings, while its night-time appearance is both functional and decorative. Flexible and modular, the Metronomis LED family comes with a range of columns and a wide variety of effects. This enables architects and lighting designers to create a unified, consistent lighting design across any cityscape, while still reflecting the differences in urban culture and history. Metronomis LED also offers all the benefits of LEDGINE. Energy saving, serviceable and upgradable, this luminaire range is designed to maintain excellent light quality over its lifetime.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	60.23	EUR, ASIA
Minerals	1.14	EU
Fossil materials	38.62	EUR, ASIA
Bio-based materials	0	Not applicable

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	1.013

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 Product
Mass per declared unit	14.0162 kg
Functional unit	1 unit of 2430 lumens over 100000 hours
Reference service life	100000 hours

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
x	x	x	x	x	MNR	MNR	MNR	MNR	MNR	x	MNR	MNR	x	x	x	x		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not relevant = MNR.

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, electricity, and waste formed in the production processes at Signify's manufacturing facilities are included in this stage.

The product is made of metals, plastics, and electronic components. All components are transported to Signify's production facility, where the main manufacturing processes primarily are associated with assembly. The finished product is packaged with polyethylene, cardboard, and/or paper as packaging material before being sent to customers. Manufacturing loss, ancillaries and wastes are calculated according to the data that each manufacturing site is sharing with Signify. The total annual amount of waste in kg is allocated to the total annual production in kg at the specific manufacturing site responsible for the production of the studied luminaire.

Thus, it is possible to allocate it according to the weight of the product analysed in this study. Some of the wastes are due to ancillary materials used during manufacturing while the rest is due to material losses.

TRANSPORT AND INSTALLATION (A4-A5)

Transport distances were calculated on the base of the supplier location and manufacturing location and then made a cumulative group choosing the conservative scenario. Environmental impacts from installation include waste packaging materials (A5). The impacts of energy consumption and the used ancillary materials during installation are considered negligible.

PRODUCT USE AND MAINTENANCE (B1-B7)

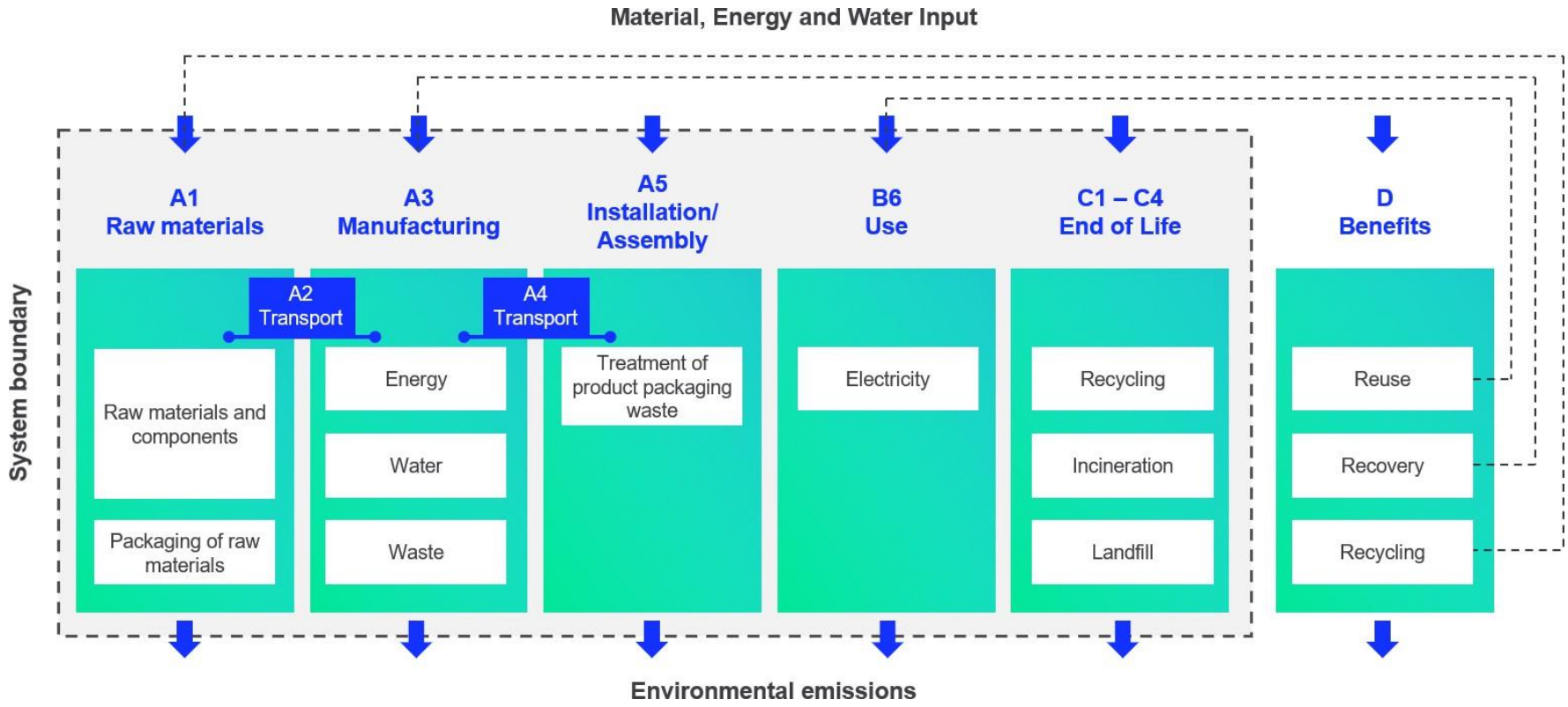
During the use phase, the product consumes electricity from Europe's electricity grid mix (B6). The total power consumption of the reference product is calculated as follows: Wattage x Reference lifetime = kWh consumed throughout the entire use phase B6.

PRODUCT END OF LIFE (C1-C4, D)

Consumption of energy and natural resources in demolition process is assumed to be negligible. It is assumed that the waste is collected separately and transported to the waste treatment centre. Transportation distance to treatment is assumed as 150 km and the transportation method is assumed to be lorry (C2). According to EN 50693:2019, the sequence of treatment operations occurring to the product shall include de-pollution, fractions separation and preparation (dismantling, crushing, shredding, sorting), recycling, other material recovery, energy recovery and disposal. In this study, the default values from table G.4 of EN 50693 is used for treating materials in different waste treatment methods. Due to the material and energy recovery potential of parts in the lighting system, the end-of-life product is converted into recycled raw materials, while the energy recovered from incineration displaces electricity and heat

production (D). The benefits and loads of incineration and recycling are included in Module D.

SYSTEM BOUNDARY



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, ancillary materials, energy & water consumption, material loss and waste generation at the manufacturing site are attributed to the bill of materials of the products, therefore, they are allocated by partitioning the quantities on the base of the total production in kg throughout the year. Thus, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
No allocation	No allocation
No allocation	Allocated by mass or volume
Allocated by mass or volume	Allocated by mass or volume

This EPD is created with a most conservative scenario in A1-A3 in terms of material composition.

AVERAGES AND VARIABILITY

Type of average	No averaging
Averaging method	Not applicable
Variation in GWP-fossil for A1-A3	Not applicable

This EPD is product and factory specific and does not contain average calculations. It is created with a most conservative scenario in A1-A3 in terms of material composition.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. EcoInvent 3.8 database was used as the source of environmental data.

ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	1,26E+02	3,14E+00	-3,34E-02	1,29E+02	3,14E+00	4,16E+00	MNR	MNR	MNR	MNR	MNR	9,51E+02	MNR	MNR	1,88E-01	5,88E+00	4,52E+00	-2,31E+01
GWP – fossil	kg CO_2e	1,27E+02	3,14E+00	3,60E+00	1,33E+02	3,14E+00	5,10E-01	MNR	MNR	MNR	MNR	MNR	9,48E+02	MNR	MNR	1,88E-01	5,88E+00	3,53E+00	-2,31E+01
GWP – biogenic	kg CO_2e	-9,95E-01	0,00E+00	-3,65E+00	-4,65E+00	1,21E-03	3,65E+00	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	0,00E+00	9,95E-01	-6,05E-03
GWP – LULUC	kg CO_2e	2,00E-01	1,21E-03	1,69E-02	2,18E-01	1,16E-03	3,43E-05	MNR	MNR	MNR	MNR	MNR	2,22E+00	MNR	MNR	6,93E-05	2,97E-04	1,83E-04	-4,06E-03
Ozone depletion pot.	kg CFC_{-11}e	8,05E-06	7,17E-07	3,45E-07	9,12E-06	7,22E-07	1,00E-08	MNR	MNR	MNR	MNR	MNR	4,82E-05	MNR	MNR	4,32E-08	3,00E-08	2,39E-08	-5,97E-07
Acidification potential	mol H^+e	7,87E-01	1,76E-02	1,65E-02	8,21E-01	1,33E-02	8,31E-04	MNR	MNR	MNR	MNR	MNR	5,42E+00	MNR	MNR	7,95E-04	3,21E-03	1,44E-03	-2,55E-01
EP-freshwater[2)]	kg Pe	1,01E-02	2,50E-05	1,69E-04	1,03E-02	2,57E-05	1,06E-06	MNR	MNR	MNR	MNR	MNR	1,00E-01	MNR	MNR	1,54E-06	9,41E-06	4,92E-06	-1,42E-03
EP-marine	kg Ne	1,26E-01	4,97E-03	7,18E-03	1,39E-01	3,95E-03	3,59E-04	MNR	MNR	MNR	MNR	MNR	7,18E-01	MNR	MNR	2,36E-04	1,02E-03	8,77E-04	-2,58E-02
EP-terrestrial	mol Ne	1,38E+00	5,50E-02	4,63E-02	1,49E+00	4,36E-02	3,71E-03	MNR	MNR	MNR	MNR	MNR	8,17E+00	MNR	MNR	2,61E-03	1,09E-02	5,66E-03	-3,01E-01
POCP ("smog")[3)]	kg NMVOCe	4,33E-01	1,68E-02	1,21E-02	4,62E-01	1,39E-02	9,24E-04	MNR	MNR	MNR	MNR	MNR	2,24E+00	MNR	MNR	8,34E-04	2,80E-03	1,55E-03	-8,74E-02
ADP-minerals & metals[4)]	kg Sbe	4,00E-03	7,21E-06	1,96E-05	4,02E-03	7,36E-06	3,33E-07	MNR	MNR	MNR	MNR	MNR	8,86E-03	MNR	MNR	4,40E-07	1,84E-05	7,65E-07	-1,37E-03
ADP-fossil resources	MJ	1,63E+03	4,68E+01	5,57E+01	1,73E+03	4,71E+01	8,00E-01	MNR	MNR	MNR	MNR	MNR	2,02E+04	MNR	MNR	2,82E+00	3,19E+00	2,26E+00	-2,31E+02
Water use[5)]	m^3e depr.	4,69E+01	2,06E-01	1,72E+00	4,88E+01	2,11E-01	1,90E-01	MNR	MNR	MNR	MNR	MNR	5,52E+02	MNR	MNR	1,26E-02	2,64E-01	1,85E-01	-2,08E+00

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	8,72E-06	3,49E-07	2,78E-07	9,35E-06	3,62E-07	7,42E-09	MNR	MNR	MNR	MNR	MNR	1,78E-05	MNR	MNR	2,16E-08	3,67E-08	1,66E-08	-1,56E-06
Ionizing radiation[6)]	kBq U235e	7,01E+00	2,22E-01	1,61E-01	7,39E+00	2,25E-01	2,79E-03	MNR	MNR	MNR	MNR	MNR	5,46E+02	MNR	MNR	1,34E-02	1,72E-02	1,06E-02	-1,29E+00

Ecotoxicity (freshwater)	CTUe	5,51E+03	4,16E+01	1,32E+02	5,69E+03	4,24E+01	5,29E+00	MNR	MNR	MNR	MNR	MNR	1,37E+04	MNR	MNR	2,54E+00	2,17E+01	7,47E+02	-7,47E+02
Human toxicity, cancer	CTUh	3,28E-07	1,08E-09	2,37E-09	3,32E-07	1,04E-09	2,49E-10	MNR	MNR	MNR	MNR	MNR	4,50E-07	MNR	MNR	6,23E-11	8,32E-10	3,91E-09	-7,56E-09
Human tox. non-cancer	CTUh	5,34E-06	4,07E-08	4,27E-08	5,42E-06	4,20E-08	1,08E-08	MNR	MNR	MNR	MNR	MNR	1,48E-05	MNR	MNR	2,51E-09	3,14E-08	8,06E-08	-1,09E-06
SQP[7)]	-	5,17E+02	5,20E+01	1,02E+02	6,71E+02	5,43E+01	4,19E-01	MNR	MNR	MNR	MNR	MNR	3,65E+03	MNR	MNR	3,25E+00	4,20E+00	2,93E+00	-6,85E+01

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator; 7) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy[8)]	MJ	1,16E+02	5,19E-01	2,97E+01	1,46E+02	5,31E-01	2,57E-02	MNR	MNR	MNR	MNR	MNR	4,11E+03	MNR	MNR	3,18E-02	3,60E-01	9,42E-02	-7,90E+00
Renew. PER as material	MJ	1,05E+01	0,00E+00	3,20E+01	4,25E+01	0,00E+00	-3,20E+01	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	-5,07E-01	-9,96E+00	0,00E+00
Total use of renew. PER	MJ	1,26E+02	5,19E-01	6,17E+01	1,88E+02	5,31E-01	-3,20E+01	MNR	MNR	MNR	MNR	MNR	4,11E+03	MNR	MNR	3,18E-02	-1,48E-01	-9,87E+00	-7,90E+00
Non-re. PER as energy	MJ	1,47E+03	4,68E+01	4,64E+01	1,56E+03	4,71E+01	8,00E-01	MNR	MNR	MNR	MNR	MNR	2,01E+04	MNR	MNR	2,82E+00	3,19E+00	2,26E+00	-2,26E+02
Non-re. PER as material	MJ	1,61E+02	0,00E+00	8,77E+00	1,69E+02	0,00E+00	-8,77E+00	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	-8,18E+01	-7,87E+01	7,17E+00
Total use of non-re. PER	MJ	1,63E+03	4,68E+01	5,52E+01	1,73E+03	4,71E+01	-7,97E+00	MNR	MNR	MNR	MNR	MNR	2,01E+04	MNR	MNR	2,82E+00	-7,86E+01	-7,65E+01	-2,19E+02
Secondary materials	kg	6,15E+00	1,33E-02	2,49E+00	8,65E+00	1,31E-02	9,66E-04	MNR	MNR	MNR	MNR	MNR	2,08E+00	MNR	MNR	7,83E-04	3,37E-03	4,41E-03	9,58E-01
Renew. secondary fuels	MJ	2,04E-01	1,28E-04	1,83E-01	3,87E-01	1,32E-04	1,51E-05	MNR	MNR	MNR	MNR	MNR	1,69E-02	MNR	MNR	7,90E-06	1,47E-04	4,37E-05	-2,98E-03
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	8,72E-01	5,93E-03	4,12E-02	9,19E-01	6,11E-03	3,12E-03	MNR	MNR	MNR	MNR	MNR	1,74E+01	MNR	MNR	3,65E-04	9,49E-03	5,09E-03	-8,70E-02

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	1,85E+01	6,21E-02	1,87E-01	1,87E+01	6,25E-02	8,69E-04	MNR	MNR	MNR	MNR	MNR	7,25E+01	MNR	MNR	3,74E-03	1,70E-02	1,97E-01	-3,30E+00
Non-hazardous waste	kg	1,72E+02	9,99E-01	3,49E+00	1,77E+02	1,03E+00	2,70E+00	MNR	MNR	MNR	MNR	MNR	4,58E+03	MNR	MNR	6,14E-02	2,81E+00	5,38E+00	-7,25E+01
Radioactive waste	kg	2,57E-03	3,14E-04	8,66E-05	2,97E-03	3,15E-04	1,19E-06	MNR	MNR	MNR	MNR	MNR	1,47E-01	MNR	MNR	1,89E-05	8,99E-06	0,00E+00	-4,79E-04

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	5,91E+00	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	2,12E+00	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	4,81E-01	4,81E-01	0,00E+00	0,00E+00	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	5,35E+01	0,00E+00	0,00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	1,23E+02	3,11E+00	3,71E+00	1,30E+02	3,11E+00	5,05E-01	MNR	MNR	MNR	MNR	MNR	9,39E+02	MNR	MNR	1,86E-01	5,87E+00	3,58E+00	-2,26E+01
Ozone depletion Pot.	kg CFC_{-11}e	7,14E-06	5,68E-07	2,90E-07	8,00E-06	5,72E-07	8,77E-09	MNR	MNR	MNR	MNR	MNR	4,18E-05	MNR	MNR	3,42E-08	2,54E-08	1,97E-08	-5,05E-07
Acidification	kg SO_2e	6,56E-01	1,38E-02	1,22E-02	6,82E-01	1,03E-02	6,03E-04	MNR	MNR	MNR	MNR	MNR	4,60E+00	MNR	MNR	6,18E-04	2,46E-03	1,08E-03	-2,21E-01
Eutrophication	kg PO_4^{3}e	2,71E-01	2,68E-03	8,18E-03	2,81E-01	2,35E-03	4,55E-04	MNR	MNR	MNR	MNR	MNR	3,54E+00	MNR	MNR	1,41E-04	1,31E-03	1,11E-02	-5,77E-02
POCP (“smog”)	kg C_2H_4e	4,72E-02	4,85E-04	9,77E-04	4,87E-02	4,03E-04	1,81E-05	MNR	MNR	MNR	MNR	MNR	1,88E-01	MNR	MNR	2,41E-05	8,19E-05	8,60E-05	-1,05E-02
ADP-elements	kg Sbe	3,95E-03	6,99E-06	1,72E-05	3,97E-03	7,13E-06	2,63E-07	MNR	MNR	MNR	MNR	MNR	8,84E-03	MNR	MNR	4,26E-07	1,82E-05	5,95E-07	-1,37E-03
ADP-fossil	MJ	1,60E+03	4,68E+01	5,54E+01	1,71E+03	4,71E+01	8,00E-01	MNR	MNR	MNR	MNR	MNR	2,01E+04	MNR	MNR	2,82E+00	3,19E+00	2,26E+00	-2,31E+02

APPENDIX (EPD HUB ALIGNED)

This section represents the scaling method for the **B6 module**, following the PEP EcoPassport PSR for luminaries (PSR-0014-ed2.0-EN-2023 07 13). The GWP results were scaled from a refernce variant of a product family, based on various light management scenarios and power inputs of the luminaires within the same product familiy

To calculate the Scaled Impact (*SI*), we have followed the below methods:

1. Calculate the power scaling factor (PSF), which is the ratio of the power input of the variant in questions P_{in} and the power input of the base variant P_{base}.

$$PSF = \frac{P_{in}}{P_{base}}$$

2. Calculate the Total Scaling factor by multiplying the PSF by the control scaling factor (CSF), where the CSF is determined according the relevant control factor scenario (e.g. if the luminaire has a presence detection system). The presented controls factors values in Table A1 are based on BS EN 15193-1:2017. Please refer to this publication or contact Signify directly for more information.

$$TSF = PSF * CSF$$

Table A1: Light management function (PEP EcoPassport aligned)

Scenario	Abbrev.	CSF
No control	NC	1
Daylight dependency factor	DD	0.75
Presence sensing	PS	0.75
Daylight dependency and presence sensing	DD+PS	0.55

3. Lastly, the GWP of the base variant is then scaled by the TSF.

$$Scaled\ Impact = GWP_{case} * TSF$$

Table A2 Scaled GWP per scaling factor (EPD Hub aligned)

Configuration	Flux [lm]	Power [W]	Efficacy [lm/W]	PSF	Total Scaling Factor (TSF)				Scaled Impacts (GWP100 B6 - kg CO2eq.)			
					NC	DD	PS	DD+PS	NC	DD	PS	DD+PS
BDS660 LED20/740	1640.0	12.8	128.1	0.533	0.533	0.4	0.4	0.293	506.9	380.4	380.4	278.6
BDS660 LED25/740	2050.0	15.8	129.7	0.658	0.658	0.494	0.494	0.362	625.8	469.8	469.8	344.3
BDS660 LED30/740	2430.0	18.6	130.6	0.775	0.775	0.581	0.581	0.426	737.0	552.5	552.5	405.1
BDS660 LED40/740	3240.0	25.0	129.6	1.042	1.042	0.782	0.782	0.573	990.9	743.7	743.7	544.9
BDS660 LED50/740	4100.0	29.5	139.0	1.229	1.229	0.922	0.922	0.676	1168.8	876.8	876.8	642.9
BDS660 LED60/740	4920.0	35.5	138.6	1.479	1.479	1.109	1.109	0.813	1406.5	1054.7	1054.7	773.2
BDS660 LED70/740	5740.0	41.0	140.0	1.708	1.708	1.281	1.281	0.939	1624.3	1218.2	1218.2	893.0
BDS660 LED80/740	6560.0	46.0	142.6	1.917	1.917	1.438	1.438	1.054	1823.1	1367.5	1367.5	1002.4
BDS660 LED90/740	7380.0	52.0	141.9	2.167	2.167	1.625	1.625	1.192	2060.8	1545.4	1545.4	1133.6
BDS660 LED100/740	8100.0	58.0	139.7	2.417	2.417	1.813	1.813	1.329	2298.6	1724.2	1724.2	1263.9
BDS660 LED110/740	8910.0	63.0	141.4	2.625	2.625	1.969	1.969	1.444	2496.4	1872.5	1872.5	1373.2
BDS660 LED120/740	9720.0	69.0	140.9	2.875	2.875	2.156	2.156	1.581	2734.1	2050.4	2050.4	1503.5

BDS660 LED15/840	1230.0	11.8	104.2	0.492	0.492	0.369	0.369	0.271	467.9	350.9	350.9	257.7
BDS660 LED20/840	1640.0	15.6	105.1	0.65	0.65	0.488	0.488	0.358	618.2	464.1	464.1	340.5
BDS660 LED25/840	2025.0	19.2	105.5	0.8	0.8	0.6	0.6	0.44	760.8	570.6	570.6	418.4
BDS660 LED30/840	2430.0	23.0	105.7	0.958	0.958	0.718	0.718	0.527	911.1	682.8	682.8	501.2
BDS660 LED40/840	3240.0	31.5	102.9	1.312	1.312	0.984	0.984	0.722	1247.7	935.8	935.8	686.6
BDS660 LED50/840	4100.0	36.5	112.3	1.521	1.521	1.141	1.141	0.837	1446.5	1085.1	1085.1	796.0
BDS660 LED60/840	4920.0	43.5	113.1	1.812	1.812	1.359	1.359	0.997	1723.2	1292.4	1292.4	948.1
BDS660 LED70/840	5670.0	51.0	111.2	2.125	2.125	1.594	1.594	1.169	2020.9	1515.9	1515.9	1111.7
BDS660 LED80/840	6480.0	57.0	113.7	2.375	2.375	1.781	1.781	1.306	2258.6	1693.7	1693.7	1242.0
BDS660 LED90/840	7290.0	64.0	113.9	2.667	2.667	2.0	2.0	1.467	2536.3	1902.0	1902.0	1395.1
BDS660 LED100/840	8100.0	71.0	114.1	2.958	2.958	2.218	2.218	1.627	2813.1	2109.3	2109.3	1547.3
BDS660 LED110/840	8910.0	79.0	112.8	3.292	3.292	2.469	2.469	1.811	3130.7	2348.0	2348.0	1722.3
BDS660 LED120/840	9720.0	87.0	111.7	3.625	3.625	2.719	2.719	1.994	3447.4	2585.8	2585.8	1896.3
BDS660 LED15/722	1230.0	13.0	94.6	0.542	0.542	0.406	0.406	0.298	515.4	386.1	386.1	283.4
BDS660 LED20/722	1640.0	17.2	95.3	0.717	0.717	0.538	0.538	0.394	681.9	511.6	511.6	374.7
BDS660 LED25/722	2025.0	21.5	94.2	0.896	0.896	0.672	0.672	0.493	852.1	639.1	639.1	468.8
BDS660 LED30/722	2430.0	26.0	93.5	1.083	1.083	0.812	0.812	0.596	1029.9	772.2	772.2	566.8
BDS660 LED40/722	3280.0	32.5	100.9	1.354	1.354	1.016	1.016	0.745	1287.7	966.2	966.2	708.5
BDS660 LED50/722	4100.0	40.5	101.2	1.688	1.688	1.266	1.266	0.928	1605.3	1204.0	1204.0	882.5
BDS660 LED60/722	4860.0	48.5	100.2	2.021	2.021	1.516	1.516	1.112	1922.0	1441.7	1441.7	1057.5
BDS660 LED70/722	5670.0	57.0	99.5	2.375	2.375	1.781	1.781	1.306	2258.6	1693.7	1693.7	1242.0
BDS660 LED80/722	6480.0	63.0	102.9	2.625	2.625	1.969	1.969	1.444	2496.4	1872.5	1872.5	1373.2
BDS660 LED90/722	7290.0	71.0	102.7	2.958	2.958	2.218	2.218	1.627	2813.1	2109.3	2109.3	1547.3
BDS660 LED100/722	8100.0	80.0	101.2	3.333	3.333	2.5	2.5	1.833	3169.7	2377.5	2377.5	1743.2
BDS660 LED110/722	8910.0	88.0	101.2	3.667	3.667	2.75	2.75	2.017	3487.3	2615.2	2615.2	1918.2

BDS660 LED120/722	9720.0	97.0	100.2	4.042	4.042	3.032	3.032	2.223	3843.9	2883.4	2883.4	2114.1
BDS660 LED15/727	1230.0	11.4	107.9	0.475	0.475	0.356	0.356	0.261	451.7	338.6	338.6	248.2
BDS660 LED20/727	1640.0	14.8	110.8	0.617	0.617	0.463	0.463	0.339	586.8	440.3	440.3	322.4
BDS660 LED25/727	2025.0	18.2	111.3	0.758	0.758	0.568	0.568	0.417	720.9	540.2	540.2	396.6
BDS660 LED30/727	2430.0	22.0	110.5	0.917	0.917	0.688	0.688	0.504	872.1	654.3	654.3	479.3
BDS660 LED40/727	3240.0	30.0	108.0	1.25	1.25	0.938	0.938	0.688	1188.8	892.0	892.0	654.3
BDS660 LED50/727	4100.0	34.5	118.8	1.438	1.438	1.078	1.078	0.791	1367.5	1025.2	1025.2	752.2
BDS660 LED60/727	4860.0	41.5	117.1	1.729	1.729	1.297	1.297	0.951	1644.3	1233.4	1233.4	904.4
BDS660 LED70/727	5670.0	48.5	116.9	2.021	2.021	1.516	1.516	1.112	1922.0	1441.7	1441.7	1057.5
BDS660 LED80/727	6480.0	54.0	120.0	2.25	2.25	1.688	1.688	1.238	2139.8	1605.3	1605.3	1177.3
BDS660 LED90/727	7290.0	61.0	119.5	2.542	2.542	1.906	1.906	1.398	2417.4	1812.6	1812.6	1329.5
BDS660 LED100/727	8100.0	68.0	119.1	2.833	2.833	2.125	2.125	1.558	2694.2	2020.9	2020.9	1481.7
BDS660 LED110/727	8910.0	75.0	118.8	3.125	3.125	2.344	2.344	1.719	2971.9	2229.1	2229.1	1634.8
BDS660 LED120/727	9720.0	82.0	118.5	3.417	3.417	2.563	2.563	1.879	3249.6	2437.4	2437.4	1786.9
BDS660 LED20/730	1640.0	13.4	122.4	0.558	0.558	0.419	0.419	0.307	530.7	398.5	398.5	292.0
BDS660 LED25/730	2050.0	16.6	123.5	0.692	0.692	0.519	0.519	0.381	658.1	493.6	493.6	362.3
BDS660 LED30/730	2430.0	19.8	122.7	0.825	0.825	0.619	0.619	0.454	784.6	588.7	588.7	431.8
BDS660 LED40/730	3240.0	26.5	122.3	1.104	1.104	0.828	0.828	0.607	1049.9	787.4	787.4	577.3
BDS660 LED50/730	4100.0	31.5	130.2	1.312	1.312	0.984	0.984	0.722	1247.7	935.8	935.8	686.6
BDS660 LED60/730	4920.0	37.5	131.2	1.562	1.562	1.172	1.172	0.859	1485.5	1114.6	1114.6	816.9
BDS660 LED70/730	5740.0	43.5	132.0	1.812	1.812	1.359	1.359	0.997	1723.2	1292.4	1292.4	948.1
BDS660 LED80/730	6560.0	48.5	135.3	2.021	2.021	1.516	1.516	1.112	1922.0	1441.7	1441.7	1057.5
BDS660 LED90/730	7290.0	55.0	132.5	2.292	2.292	1.719	1.719	1.261	2179.7	1634.8	1634.8	1199.2
BDS660 LED100/730	8100.0	61.0	132.8	2.542	2.542	1.906	1.906	1.398	2417.4	1812.6	1812.6	1329.5
BDS660 LED110/730	8910.0	67.0	133.0	2.792	2.792	2.094	2.094	1.536	2655.2	1991.4	1991.4	1460.7

BDS660 LED120/730	9720.0	74.0	131.4	3.083	3.083	2.312	2.312	1.696	2931.9	2198.7	2198.7	1612.9
BDS660 LED15/827	1230.0	13.0	94.6	0.542	0.542	0.406	0.406	0.298	515.4	386.1	386.1	283.4
BDS660 LED20/827	1640.0	17.2	95.3	0.717	0.717	0.538	0.538	0.394	681.9	511.6	511.6	374.7
BDS660 LED25/827	2025.0	21.5	94.2	0.896	0.896	0.672	0.672	0.493	852.1	639.1	639.1	468.8
BDS660 LED30/827	2430.0	26.0	93.5	1.083	1.083	0.812	0.812	0.596	1029.9	772.2	772.2	566.8
BDS660 LED50/827	4100.0	40.5	101.2	1.688	1.688	1.266	1.266	0.928	1605.3	1204.0	1204.0	882.5
BDS660 LED60/827	4860.0	48.5	100.2	2.021	2.021	1.516	1.516	1.112	1922.0	1441.7	1441.7	1057.5
BDS660 LED70/827	5670.0	57.0	99.5	2.375	2.375	1.781	1.781	1.306	2258.6	1693.7	1693.7	1242.0
BDS660 LED80/827	6480.0	63.0	102.9	2.625	2.625	1.969	1.969	1.444	2496.4	1872.5	1872.5	1373.2
BDS660 LED90/827	7290.0	71.0	102.7	2.958	2.958	2.218	2.218	1.627	2813.1	2109.3	2109.3	1547.3
BDS660 LED100/827	8100.0	80.0	101.2	3.333	3.333	2.5	2.5	1.833	3169.7	2377.5	2377.5	1743.2
BDS660 LED110/827	8910.0	88.0	101.2	3.667	3.667	2.75	2.75	2.017	3487.3	2615.2	2615.2	1918.2
BDS660 LED120/827	9720.0	97.0	100.2	4.042	4.042	3.032	3.032	2.223	3843.9	2883.4	2883.4	2114.1
BDS660 LED15/830	1230.0	12.2	100.8	0.508	0.508	0.381	0.381	0.279	483.1	362.3	362.3	265.3
BDS660 LED20/830	1640.0	16.0	102.5	0.667	0.667	0.5	0.5	0.367	634.3	475.5	475.5	349.0
BDS660 LED25/830	2025.0	19.8	102.3	0.825	0.825	0.619	0.619	0.454	784.6	588.7	588.7	431.8
BDS660 LED30/830	2430.0	24.0	101.2	1.0	1.0	0.75	0.75	0.55	951.0	713.2	713.2	523.1
BDS660 LED40/830	3240.0	32.5	99.7	1.354	1.354	1.016	1.016	0.745	1287.7	966.2	966.2	708.5
BDS660 LED50/830	4100.0	37.5	109.3	1.562	1.562	1.172	1.172	0.859	1485.5	1114.6	1114.6	816.9
BDS660 LED60/830	4920.0	45.0	109.3	1.875	1.875	1.406	1.406	1.031	1783.1	1337.1	1337.1	980.5
BDS660 LED70/830	5670.0	53.0	107.0	2.208	2.208	1.656	1.656	1.214	2099.8	1574.9	1574.9	1154.5
BDS660 LED80/830	6480.0	59.0	109.8	2.458	2.458	1.844	1.844	1.352	2337.6	1753.6	1753.6	1285.8
BDS660 LED90/830	7290.0	66.0	110.5	2.75	2.75	2.062	2.062	1.513	2615.2	1961.0	1961.0	1438.9
BDS660 LED100/830	8100.0	74.0	109.5	3.083	3.083	2.312	2.312	1.696	2931.9	2198.7	2198.7	1612.9
BDS660 LED110/830	8910.0	82.0	108.7	3.417	3.417	2.563	2.563	1.879	3249.6	2437.4	2437.4	1786.9

BDS660 LED120/830	9720.0	90.0	108.0	3.75	3.75	2.812	2.812	2.062	3566.2	2674.2	2674.2	1961.0

** Note that if the product is non-dimmable, only the values for "NC (No Control)" are valid; if the driver type is PSU, only the values for "NC (No Control)"and "PS (presence sensing)" for are valid.*

APPENDIX (PEP ECOPASSPORT ALIGNED)

This section represents the scaling method for the **B6 module**, following the PEP EcoPassport PSR for luminaries (PSR-0014-ed2.0-EN-2023 07 13). The GWP results were scaled from a refernce variant of a product family, based on various light management functions, the lumen output (O_{lum}) and reference service life (*RSL*) of each product within the same product familiy.

To calculate the Scaled Impact (SI_{pep}), we have followed the below methods:

1. Calculate the power scaling factor (PSF), which is the ratio of the power input of the variant in questions P_{in} and the power input of the base variant P_{base}.

$$PSF = \frac{P_{in}}{P_{base}}$$

2. Using this scaled GWP, we then can apply the PEP Ecopassport method for calculating the environmental impact of the functional unit for a luminary (1000 lumens over 35000 hours), applied to B6, where the Functional Unit application considers the lumen output (Olum) and reference service lifetime (RSL) of the product to estimate the final environmental impact. The scaled impact (SIpep) is presented in Table A4.

$$GSF = \frac{FU_{pep}}{FU_p} = \frac{1{,}000}{O_{lum}} * \frac{35{,}000}{RSL}$$

3. Calculate the GWP scaling factor (P*GSF*), by multiplying the PSF by the GSF.

$$PGSF = PSF * GSF$$

4. Calculate the Total Scaling factor by multiplying the PSF by the control scaling factor (CSF), where the CSF is determined according the relevant control factor scenario (e.g. if the luminaire has a presence detection system), as presented in Table A1.

$$TSF = PGSF * CSF$$

Table A3: Light management functions (PEP EcoPassport aligned)

Scenario	Abbrev.	CSF
No control	NC	1
Daylight dependency factor	DD	0.75
Presence sensing	PS	0.75
Daylight dependency and presence sensing	DD+PS	0.55

5. Lastly, the GWP of the base variant is then scaled by the TSF.

$$Scaled\ GWP = GWP_{case} * TSF$$

As described in the EPD, calculations are made based on dataset describing electricity available on the low voltage level in Europe for year 2022 (source Ecoinvent 3.8 database). This value should be adjusted depending on specific project requirements. Presented controls factors and functional unit conversion values are based on the PEP EcoPassport PSR for luminaries (PSR-0014-ed2.0-EN-2023 07 13). Please refer to this publication or contact Signify directly for more information.

Table A4 Scale impact per scaling factor (PEP EcoPassport aligned)

Configuration	Flux [lm]	Power [W]	Efficacy [lm/W]	PSF	Total Scaling Factor (TSF)				Scaled Impacts (GWP100 B6 - kg CO2eq.)			
					NC	DD	PS	DD+PS	NC	DD	PS	DD+PS
BDS660 LED20/740	1640.0	12.8	128.1	0.533	0.114	0.086	0.086	0.063	108.4	81.8	81.8	59.9
BDS660 LED25/740	2050.0	15.8	129.7	0.658	0.112	0.084	0.084	0.062	106.5	79.9	79.9	59.0
BDS660 LED30/740	2430.0	18.6	130.6	0.775	0.112	0.084	0.084	0.062	106.5	79.9	79.9	59.0
BDS660 LED40/740	3240.0	25.0	129.6	1.042	0.113	0.085	0.085	0.062	107.5	80.8	80.8	59.0
BDS660 LED50/740	4100.0	29.5	139.0	1.229	0.105	0.079	0.079	0.058	99.9	75.1	75.1	55.2
BDS660 LED60/740	4920.0	35.5	138.6	1.479	0.105	0.079	0.079	0.058	99.9	75.1	75.1	55.2
BDS660 LED70/740	5740.0	41.0	140.0	1.708	0.104	0.078	0.078	0.057	98.9	74.2	74.2	54.2
BDS660 LED80/740	6560.0	46.0	142.6	1.917	0.102	0.076	0.076	0.056	97.0	72.3	72.3	53.3
BDS660 LED90/740	7380.0	52.0	141.9	2.167	0.103	0.077	0.077	0.057	98.0	73.2	73.2	54.2
BDS660 LED100/740	8100.0	58.0	139.7	2.417	0.104	0.078	0.078	0.057	98.9	74.2	74.2	54.2
BDS660 LED110/740	8910.0	63.0	141.4	2.625	0.103	0.077	0.077	0.057	98.0	73.2	73.2	54.2
BDS660 LED120/740	9720.0	69.0	140.9	2.875	0.104	0.078	0.078	0.057	98.9	74.2	74.2	54.2
BDS660 LED15/840	1230.0	11.8	104.2	0.492	0.14	0.105	0.105	0.077	133.1	99.9	99.9	73.2
BDS660 LED20/840	1640.0	15.6	105.1	0.65	0.139	0.104	0.104	0.076	132.2	98.9	98.9	72.3

BDS660 LED25/840	2025.0	19.2	105.5	0.8	0.138	0.104	0.104	0.076	131.2	98.9	98.9	72.3
BDS660 LED30/840	2430.0	23.0	105.7	0.958	0.138	0.104	0.104	0.076	131.2	98.9	98.9	72.3
BDS660 LED40/840	3240.0	31.5	102.9	1.312	0.142	0.106	0.106	0.078	135.0	100.8	100.8	74.2
BDS660 LED50/840	4100.0	36.5	112.3	1.521	0.13	0.098	0.098	0.072	123.6	93.2	93.2	68.5
BDS660 LED60/840	4920.0	43.5	113.1	1.812	0.129	0.097	0.097	0.071	122.7	92.2	92.2	67.5
BDS660 LED70/840	5670.0	51.0	111.2	2.125	0.131	0.098	0.098	0.072	124.6	93.2	93.2	68.5
BDS660 LED80/840	6480.0	57.0	113.7	2.375	0.128	0.096	0.096	0.07	121.7	91.3	91.3	66.6
BDS660 LED90/840	7290.0	64.0	113.9	2.667	0.128	0.096	0.096	0.07	121.7	91.3	91.3	66.6
BDS660 LED100/840	8100.0	71.0	114.1	2.958	0.128	0.096	0.096	0.07	121.7	91.3	91.3	66.6
BDS660 LED110/840	8910.0	79.0	112.8	3.292	0.129	0.097	0.097	0.071	122.7	92.2	92.2	67.5
BDS660 LED120/840	9720.0	87.0	111.7	3.625	0.131	0.098	0.098	0.072	124.6	93.2	93.2	68.5
BDS660 LED15/722	1230.0	13.0	94.6	0.542	0.154	0.115	0.115	0.085	146.5	109.4	109.4	80.8
BDS660 LED20/722	1640.0	17.2	95.3	0.717	0.153	0.115	0.115	0.084	145.5	109.4	109.4	79.9
BDS660 LED25/722	2025.0	21.5	94.2	0.896	0.155	0.116	0.116	0.085	147.4	110.3	110.3	80.8
BDS660 LED30/722	2430.0	26.0	93.5	1.083	0.156	0.117	0.117	0.086	148.4	111.3	111.3	81.8
BDS660 LED40/722	3280.0	32.5	100.9	1.354	0.144	0.108	0.108	0.079	136.9	102.7	102.7	75.1
BDS660 LED50/722	4100.0	40.5	101.2	1.688	0.144	0.108	0.108	0.079	136.9	102.7	102.7	75.1
BDS660 LED60/722	4860.0	48.5	100.2	2.021	0.146	0.109	0.109	0.08	138.8	103.7	103.7	76.1
BDS660 LED70/722	5670.0	57.0	99.5	2.375	0.147	0.11	0.11	0.081	139.8	104.6	104.6	77.0
BDS660 LED80/722	6480.0	63.0	102.9	2.625	0.142	0.106	0.106	0.078	135.0	100.8	100.8	74.2
BDS660 LED90/722	7290.0	71.0	102.7	2.958	0.142	0.106	0.106	0.078	135.0	100.8	100.8	74.2
BDS660 LED100/722	8100.0	80.0	101.2	3.333	0.144	0.108	0.108	0.079	136.9	102.7	102.7	75.1
BDS660 LED110/722	8910.0	88.0	101.2	3.667	0.144	0.108	0.108	0.079	136.9	102.7	102.7	75.1
BDS660 LED120/722	9720.0	97.0	100.2	4.042	0.146	0.109	0.109	0.08	138.8	103.7	103.7	76.1
BDS660 LED15/727	1230.0	11.4	107.9	0.475	0.135	0.101	0.101	0.074	128.4	96.1	96.1	70.4

BDS660 LED20/727	1640.0	14.8	110.8	0.617	0.132	0.099	0.099	0.073	125.5	94.1	94.1	69.4
BDS660 LED25/727	2025.0	18.2	111.3	0.758	0.131	0.098	0.098	0.072	124.6	93.2	93.2	68.5
BDS660 LED30/727	2430.0	22.0	110.5	0.917	0.132	0.099	0.099	0.073	125.5	94.1	94.1	69.4
BDS660 LED40/727	3240.0	30.0	108.0	1.25	0.135	0.101	0.101	0.074	128.4	96.1	96.1	70.4
BDS660 LED50/727	4100.0	34.5	118.8	1.438	0.123	0.092	0.092	0.068	117.0	87.5	87.5	64.7
BDS660 LED60/727	4860.0	41.5	117.1	1.729	0.125	0.094	0.094	0.069	118.9	89.4	89.4	65.6
BDS660 LED70/727	5670.0	48.5	116.9	2.021	0.125	0.094	0.094	0.069	118.9	89.4	89.4	65.6
BDS660 LED80/727	6480.0	54.0	120.0	2.25	0.122	0.092	0.092	0.067	116.0	87.5	87.5	63.7
BDS660 LED90/727	7290.0	61.0	119.5	2.542	0.122	0.092	0.092	0.067	116.0	87.5	87.5	63.7
BDS660 LED100/727	8100.0	68.0	119.1	2.833	0.122	0.092	0.092	0.067	116.0	87.5	87.5	63.7
BDS660 LED110/727	8910.0	75.0	118.8	3.125	0.123	0.092	0.092	0.068	117.0	87.5	87.5	64.7
BDS660 LED120/727	9720.0	82.0	118.5	3.417	0.123	0.092	0.092	0.068	117.0	87.5	87.5	64.7
BDS660 LED20/730	1640.0	13.4	122.4	0.558	0.119	0.089	0.089	0.065	113.2	84.6	84.6	61.8
BDS660 LED25/730	2050.0	16.6	123.5	0.692	0.118	0.088	0.088	0.065	112.2	83.7	83.7	61.8
BDS660 LED30/730	2430.0	19.8	122.7	0.825	0.119	0.089	0.089	0.065	113.2	84.6	84.6	61.8
BDS660 LED40/730	3240.0	26.5	122.3	1.104	0.119	0.089	0.089	0.065	113.2	84.6	84.6	61.8
BDS660 LED50/730	4100.0	31.5	130.2	1.312	0.112	0.084	0.084	0.062	106.5	79.9	79.9	59.0
BDS660 LED60/730	4920.0	37.5	131.2	1.562	0.111	0.083	0.083	0.061	105.6	78.9	78.9	58.0
BDS660 LED70/730	5740.0	43.5	132.0	1.812	0.11	0.082	0.082	0.061	104.6	78.0	78.0	58.0
BDS660 LED80/730	6560.0	48.5	135.3	2.021	0.108	0.081	0.081	0.059	102.7	77.0	77.0	56.1
BDS660 LED90/730	7290.0	55.0	132.5	2.292	0.11	0.082	0.082	0.061	104.6	78.0	78.0	58.0
BDS660 LED100/730	8100.0	61.0	132.8	2.542	0.11	0.082	0.082	0.061	104.6	78.0	78.0	58.0
BDS660 LED110/730	8910.0	67.0	133.0	2.792	0.11	0.082	0.082	0.061	104.6	78.0	78.0	58.0
BDS660 LED120/730	9720.0	74.0	131.4	3.083	0.111	0.083	0.083	0.061	105.6	78.9	78.9	58.0
BDS660 LED15/827	1230.0	13.0	94.6	0.542	0.154	0.115	0.115	0.085	146.5	109.4	109.4	80.8

BDS660 LED20/827	1640.0	17.2	95.3	0.717	0.153	0.115	0.115	0.084	145.5	109.4	109.4	79.9
BDS660 LED25/827	2025.0	21.5	94.2	0.896	0.155	0.116	0.116	0.085	147.4	110.3	110.3	80.8
BDS660 LED30/827	2430.0	26.0	93.5	1.083	0.156	0.117	0.117	0.086	148.4	111.3	111.3	81.8
BDS660 LED50/827	4100.0	40.5	101.2	1.688	0.144	0.108	0.108	0.079	136.9	102.7	102.7	75.1
BDS660 LED60/827	4860.0	48.5	100.2	2.021	0.146	0.109	0.109	0.08	138.8	103.7	103.7	76.1
BDS660 LED70/827	5670.0	57.0	99.5	2.375	0.147	0.11	0.11	0.081	139.8	104.6	104.6	77.0
BDS660 LED80/827	6480.0	63.0	102.9	2.625	0.142	0.106	0.106	0.078	135.0	100.8	100.8	74.2
BDS660 LED90/827	7290.0	71.0	102.7	2.958	0.142	0.106	0.106	0.078	135.0	100.8	100.8	74.2
BDS660 LED100/827	8100.0	80.0	101.2	3.333	0.144	0.108	0.108	0.079	136.9	102.7	102.7	75.1
BDS660 LED110/827	8910.0	88.0	101.2	3.667	0.144	0.108	0.108	0.079	136.9	102.7	102.7	75.1
BDS660 LED120/827	9720.0	97.0	100.2	4.042	0.146	0.109	0.109	0.08	138.8	103.7	103.7	76.1
BDS660 LED15/830	1230.0	12.2	100.8	0.508	0.145	0.109	0.109	0.08	137.9	103.7	103.7	76.1
BDS660 LED20/830	1640.0	16.0	102.5	0.667	0.142	0.106	0.106	0.078	135.0	100.8	100.8	74.2
BDS660 LED25/830	2025.0	19.8	102.3	0.825	0.143	0.107	0.107	0.079	136.0	101.8	101.8	75.1
BDS660 LED30/830	2430.0	24.0	101.2	1.0	0.144	0.108	0.108	0.079	136.9	102.7	102.7	75.1
BDS660 LED40/830	3240.0	32.5	99.7	1.354	0.146	0.109	0.109	0.08	138.8	103.7	103.7	76.1
BDS660 LED50/830	4100.0	37.5	109.3	1.562	0.133	0.1	0.1	0.073	126.5	95.1	95.1	69.4
BDS660 LED60/830	4920.0	45.0	109.3	1.875	0.133	0.1	0.1	0.073	126.5	95.1	95.1	69.4
BDS660 LED70/830	5670.0	53.0	107.0	2.208	0.136	0.102	0.102	0.075	129.3	97.0	97.0	71.3
BDS660 LED80/830	6480.0	59.0	109.8	2.458	0.133	0.1	0.1	0.073	126.5	95.1	95.1	69.4
BDS660 LED90/830	7290.0	66.0	110.5	2.75	0.132	0.099	0.099	0.073	125.5	94.1	94.1	69.4
BDS660 LED100/830	8100.0	74.0	109.5	3.083	0.133	0.1	0.1	0.073	126.5	95.1	95.1	69.4
BDS660 LED110/830	8910.0	82.0	108.7	3.417	0.134	0.1	0.1	0.074	127.4	95.1	95.1	70.4
BDS660 LED120/830	9720.0	90.0	108.0	3.75	0.135	0.101	0.101	0.074	128.4	96.1	96.1	70.4

** Note that if the product is non-dimmable, only the values for "NC (No Control)" are valid; if the driver type is PSU, only the values for "NC (No Control)"and "PS (presence sensing)" for are valid.*

ANNEX

USE PHASE (B6) VALUES FOR DIFFERENT COUNTRY MIX

The table in this annex is useful for conversion and comparison of B6 values with other energy country mix. The Global Warming Potential Total (GWP tot) value is illustrated for each country. The value refers to 1 kwh.

Example on how to use the table:

This EPD was done according to a specific customer use location that can be read in the paragraph **PRODUCT USE AND MAINTENANCE (B1-B7).**

If for example the EPD was done according to EU energy mix and you want to see how the GWP total changes according to a Finland country energy mix, you can take the original value in the results table here highlighed in yellow:

ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO2e	5,88E+00	2,61E-01	-1,25E-01	6,02E+00	3,02E-01	5,41E-01	MND	MND	MND	MND	MND	4,06E+02	MND	MNR	1,77E-02	2,62E-01	1,88E-01	-1,09E+01

Divide that value according to the EU value from the following table (EU = 3,96E-01) and then multilplying for the Finland value from the same table (FINLAND = 2,70E-01).

Thus, the calculation of this example would be:

New B6 GWP tot for Finland = (4,06E+02 / 3,96E-01) x 2,70E-01 = 2,76 E+02

Country	GWP tot (kg CO2 eq. per kwh)
AUSTRALIA	9,59E-01
AUSTRIA	3,37E-01
BELGIUM	2,63E-01
CHINA	1,14E+00
DENMARK	2,91E-01
EU	3,96E-01
FINLAND	2,70E-01
FRANCE	8,77E-02
GERMANY	5,32E-01
HUNGARY	4,67E-01
IRELAND	4,26E-01
ITALY	3,94E-01
LATAM	3,50E-01
NAM	4,83E-01
NETHERLANDS	5,88E-01
NORWAY	2,59E-02
POLAND	1,05E+00

PORTUGAL	4,22E-01
ROW	7,32E-01
SPAIN	3,34E-01
SWEDEN	4,95E-02
SWITZERLAND	5,38E-02
UK	3,17E-01

Source Ecoinvent 3.8