

ENVIRONMENTAL PRODUCT DECLARATION

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

Philips TownTune Central Post-Top DTD

BDP263
Signify N.V.



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	Philips TownTune Central Post-Top DTD
Additional labels	BDP263 LED50-4S/830 PSU II DM10 62P
Product reference	912300024453
Place of production	Spain
Period for data	2022
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	%

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 unit
Declared unit mass	8.0519 kg
GWP-fossil, A1-A3 (kgCO ₂ e)	7,68E+01
GWP-total, A1-A3 (kgCO ₂ e)	7,67E+01
Secondary material, inputs (%)	57.4
Secondary material, outputs (%)	62
Total energy use, A1-A3 (kWh)	263
Total water use, A1-A3 (m ³ e)	0.45

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

Designed to enhance existing and scalable urban spaces, the Philips TownTune family offers all the latest lighting innovations in terms of performance, quality of light and connectivity. The family consists of four solutions: a Central Post Top (CPT), an Asymmetric Spigot Post Top / Side Entry version (ASY), a version with an extending Lyre post top bracket (Lyre), and a Central Post Top with a Conical Comfort Bowl (CCB). Each TownTune luminaire can be customized with a choice of different shapes on top of the housing, plus there's the option to add a decorative ring, which comes in two colors (excluding CCB). Design options that enable you to create your very own lighting signature and bring a distinctive identity to districts and cities. In addition, every luminaire in the TownTune family is uniquely identifiable, thanks to the Signify Service tag app. By simply scanning a QR code, placed inside the door of the mast or directly on the luminaire, you can instantly access the configuration of the luminaire. This makes maintenance and programming operations faster and easier and enables you to create your digital library of lighting assets and spare parts. TownTune also uses the Philips LEDGINE-O lighting platform, ensuring you always have the right amount and direction of light on your street. Furthermore, thanks to being system ready (SR), TownTune is also future proof. A solution that's ready to be paired with

both standalone and advanced control and lighting software applications such as Interact City.

For more information, please visit

<https://www.lighting.philips.com/link/BDP263/fam/aa/en>

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	78.08	EUR, ASIA
Minerals	0.02	EU
Fossil materials	21.9	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	0.06

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 Product
Mass per declared unit	8.0519 kg
Functional unit	1 unit of 3500 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	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.

Philips TownTune Central Post-Top DTD-BDP263

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)

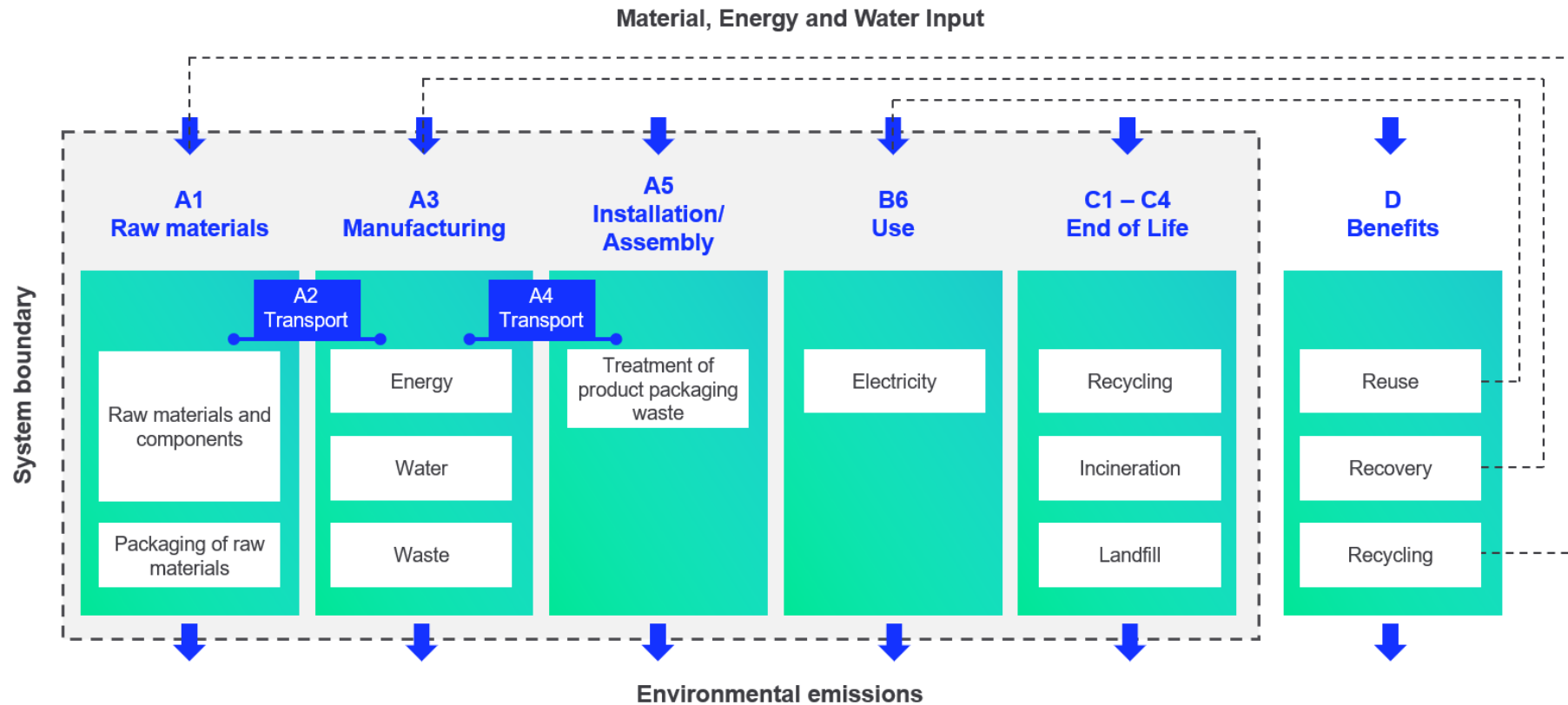
During the use phase, the product consumes electricity from Europe's electricity grid mix (B6). The total power consumption of the reference product is calculated as follows: Wattage x Reference lifetime = kWh consumed throughout the entire use phase B6.

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 ₂ e	7,49E+01	1,54E+00	1,84E-01	7,67E+01	1,54E+00	2,23E-01	MNR	MNR	MNR	MNR	MNR	1,60E+03	MNR	MNR	1,13E-01	1,58E+00	9,07E-01	-1,41E+01
GWP – fossil	kg CO ₂ e	7,49E+01	1,54E+00	3,99E-01	7,68E+01	1,54E+00	6,15E-03	MNR	MNR	MNR	MNR	MNR	1,60E+03	MNR	MNR	1,13E-01	1,58E+00	8,50E-01	-1,41E+01
GWP – biogenic	kg CO ₂ e	-5,68E-02	0,00E+00	-2,17E-01	-2,74E-01	5,95E-04	2,17E-01	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	0,00E+00	5,68E-02	-3,47E-03
GWP – LULUC	kg CO ₂ e	1,22E-01	5,74E-04	2,48E-03	1,26E-01	5,68E-04	2,14E-06	MNR	MNR	MNR	MNR	MNR	3,74E+00	MNR	MNR	4,18E-05	1,83E-04	1,03E-04	-1,73E-03
Ozone depletion pot.	kg CFC ₁₁ e	3,96E-06	3,54E-07	4,74E-08	4,36E-06	3,54E-07	5,73E-10	MNR	MNR	MNR	MNR	MNR	8,13E-05	MNR	MNR	2,61E-08	1,58E-08	1,15E-08	-3,80E-07
Acidification potential	mol H ⁺ e	5,56E-01	6,99E-03	1,64E-03	5,65E-01	6,52E-03	4,74E-05	MNR	MNR	MNR	MNR	MNR	9,14E+00	MNR	MNR	4,80E-04	1,70E-03	6,08E-04	-1,59E-01
EP-freshwater ²⁾	kg Pe	4,80E-03	1,25E-05	1,73E-05	4,83E-03	1,26E-05	6,14E-08	MNR	MNR	MNR	MNR	MNR	1,70E-01	MNR	MNR	9,28E-07	5,97E-06	3,87E-06	-9,11E-04
EP-marine	kg Ne	7,92E-02	2,05E-03	6,18E-04	8,19E-02	1,94E-03	2,05E-05	MNR	MNR	MNR	MNR	MNR	1,21E+00	MNR	MNR	1,43E-04	4,42E-04	7,53E-04	-1,60E-02
EP-terrestrial	mol Ne	8,30E-01	2,26E-02	4,38E-03	8,57E-01	2,14E-02	2,12E-04	MNR	MNR	MNR	MNR	MNR	1,38E+01	MNR	MNR	1,57E-03	4,91E-03	2,10E-03	-1,87E-01
POCP (“smog”) ³⁾	kg NMVOCe	2,64E-01	7,15E-03	1,93E-03	2,73E-01	6,84E-03	5,28E-05	MNR	MNR	MNR	MNR	MNR	3,78E+00	MNR	MNR	5,03E-04	1,29E-03	6,78E-04	-5,43E-02
ADP-minerals & metals ⁴⁾	kg Sbe	2,38E-03	3,59E-06	2,16E-06	2,39E-03	3,61E-06	1,85E-08	MNR	MNR	MNR	MNR	MNR	1,49E-02	MNR	MNR	2,66E-07	1,32E-05	2,48E-07	-7,15E-04
ADP-fossil resources	MJ	8,91E+02	2,31E+01	5,79E+00	9,20E+02	2,31E+01	4,67E-02	MNR	MNR	MNR	MNR	MNR	3,41E+04	MNR	MNR	1,70E+00	1,78E+00	1,14E+00	-1,38E+02
Water use ⁵⁾	m ³ e depr.	2,58E+01	1,03E-01	2,29E-01	2,62E+01	1,03E-01	1,05E-02	MNR	MNR	MNR	MNR	MNR	9,31E+02	MNR	MNR	7,62E-03	8,37E-02	7,34E-02	-1,05E+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	5,55E-06	1,76E-07	3,10E-08	5,75E-06	1,77E-07	4,33E-10	MNR	MNR	MNR	MNR	MNR	3,00E-05	MNR	MNR	1,31E-08	1,99E-08	9,14E-09	-8,44E-07
Ionizing radiation ⁶⁾	kBq U235e	4,40E+00	1,10E-01	1,88E-02	4,53E+00	1,10E-01	1,61E-04	MNR	MNR	MNR	MNR	MNR	9,22E+02	MNR	MNR	8,11E-03	1,07E-02	5,91E-03	-8,18E-01

Ecotoxicity (freshwater)	CTUe	3,58E+03	2,07E+01	1,23E+01	3,61E+03	2,08E+01	2,79E-01	MNR	MNR	MNR	MNR	MNR	2,32E+04	MNR	MNR	1,53E+00	9,82E+00	5,79E+02	-4,12E+02
Human toxicity, cancer	CTUh	2,11E-07	5,15E-10	2,70E-10	2,12E-07	5,11E-10	1,60E-11	MNR	MNR	MNR	MNR	MNR	7,59E-07	MNR	MNR	3,76E-11	3,27E-10	6,96E-10	-3,46E-09
Human tox. non-cancer	CTUh	2,89E-06	2,05E-08	5,18E-09	2,91E-06	2,06E-08	6,46E-10	MNR	MNR	MNR	MNR	MNR	2,49E-05	MNR	MNR	1,52E-09	1,36E-08	4,16E-08	-6,29E-07
SQP ⁷⁾	-	2,40E+02	2,64E+01	1,35E+01	2,80E+02	2,66E+01	2,72E-02	MNR	MNR	MNR	MNR	MNR	6,16E+03	MNR	MNR	1,96E+00	2,84E+00	1,60E+00	-3,53E+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	7,01E+01	2,59E-01	4,68E+00	7,50E+01	2,61E-01	1,39E-03	MNR	MNR	MNR	MNR	MNR	6,93E+03	MNR	MNR	1,92E-02	2,40E-01	5,18E-02	-3,08E+00
Renew. PER as material	MJ	1,26E+00	0,00E+00	1,98E+00	3,24E+00	0,00E+00	-1,98E+00	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	-2,58E-01	-1,01E+00	0,00E+00
Total use of renew. PER	MJ	7,13E+01	2,59E-01	6,65E+00	7,82E+01	2,61E-01	-1,98E+00	MNR	MNR	MNR	MNR	MNR	6,93E+03	MNR	MNR	1,92E-02	-1,79E-02	-9,54E-01	-3,08E+00
Non-re. PER as energy	MJ	8,42E+02	2,31E+01	5,32E+00	8,70E+02	2,31E+01	4,67E-02	MNR	MNR	MNR	MNR	MNR	3,40E+04	MNR	MNR	1,70E+00	1,78E+00	1,14E+00	-1,38E+02
Non-re. PER as material	MJ	4,33E+01	0,00E+00	2,85E-02	4,33E+01	0,00E+00	-2,85E-02	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	-2,15E+01	-2,18E+01	0,00E+00
Total use of non-re. PER	MJ	8,85E+02	2,31E+01	5,35E+00	9,13E+02	2,31E+01	1,82E-02	MNR	MNR	MNR	MNR	MNR	3,40E+04	MNR	MNR	1,70E+00	-1,97E+01	-2,07E+01	-1,38E+02
Secondary materials	kg	4,62E+00	6,45E-03	1,05E-01	4,73E+00	6,42E-03	5,39E-05	MNR	MNR	MNR	MNR	MNR	3,51E+00	MNR	MNR	4,73E-04	1,73E-03	2,95E-03	5,67E-01
Renew. secondary fuels	MJ	2,96E-02	6,43E-05	7,42E-03	3,71E-02	6,48E-05	7,54E-07	MNR	MNR	MNR	MNR	MNR	2,84E-02	MNR	MNR	4,77E-06	8,97E-05	2,26E-05	-8,74E-04
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	4,36E-01	2,98E-03	5,44E-03	4,45E-01	3,00E-03	1,39E-04	MNR	MNR	MNR	MNR	MNR	2,93E+01	MNR	MNR	2,21E-04	2,89E-03	1,52E-03	-4,92E-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	1,24E+01	3,06E-02	2,49E-02	1,25E+01	3,07E-02	1,81E-03	MNR	MNR	MNR	MNR	MNR	1,22E+02	MNR	MNR	2,26E-03	1,15E-02	2,54E-02	-2,18E+00
Non-hazardous waste	kg	1,19E+02	5,01E-01	4,50E-01	1,20E+02	5,04E-01	1,06E-01	MNR	MNR	MNR	MNR	MNR	7,74E+03	MNR	MNR	3,71E-02	9,02E-01	3,04E+00	-4,58E+01
Radioactive waste	kg	1,76E-03	1,55E-04	1,24E-05	1,93E-03	1,55E-04	1,03E-07	MNR	MNR	MNR	MNR	MNR	2,48E-01	MNR	MNR	1,14E-05	6,47E-06	0,00E+00	-3,02E-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	4,38E+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	6,09E-01	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	4,47E-01	4,47E-01	0,00E+00	0,00E+00	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	1,34E+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 ₂ e	7,31E+01	1,52E+00	4,07E-01	7,51E+01	1,52E+00	5,86E-03	MNR	MNR	MNR	MNR	MNR	1,58E+03	MNR	MNR	1,12E-01	1,57E+00	1,07E+00	-1,38E+01
Ozone depletion Pot.	kg CFC ₁₁ e	3,52E-06	2,80E-07	3,97E-08	3,84E-06	2,81E-07	4,96E-10	MNR	MNR	MNR	MNR	MNR	7,05E-05	MNR	MNR	2,07E-08	1,30E-08	9,37E-09	-3,22E-07
Acidification	kg SO ₂ e	4,73E-01	5,44E-03	1,26E-03	4,80E-01	5,06E-03	3,43E-05	MNR	MNR	MNR	MNR	MNR	7,75E+00	MNR	MNR	3,73E-04	1,34E-03	4,66E-04	-1,37E-01
Eutrophication	kg PO ₄ ³ e	1,59E-01	1,19E-03	7,62E-04	1,61E-01	1,15E-03	2,62E-05	MNR	MNR	MNR	MNR	MNR	5,97E+00	MNR	MNR	8,49E-05	5,23E-04	4,28E-03	-3,67E-02
POCP ("smog")	kg C ₂ H ₄ e	2,99E-02	2,07E-04	1,41E-04	3,03E-02	1,98E-04	1,02E-06	MNR	MNR	MNR	MNR	MNR	3,17E-01	MNR	MNR	1,46E-05	4,74E-05	8,40E-05	-6,59E-03
ADP-elements	kg Sbe	2,36E-03	3,48E-06	2,01E-06	2,36E-03	3,50E-06	1,46E-08	MNR	MNR	MNR	MNR	MNR	1,49E-02	MNR	MNR	2,57E-07	1,32E-05	2,24E-07	-7,14E-04
ADP-fossil	MJ	8,83E+02	2,31E+01	5,77E+00	9,12E+02	2,31E+01	4,67E-02	MNR	MNR	MNR	MNR	MNR	3,40E+04	MNR	MNR	1,70E+00	1,78E+00	1,14E+00	-1,38E+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 reference variant of a product family, based on various light management scenarios and power inputs of the luminaires within the same product family

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.

$$\text{Scaled Impact} = \text{GWP}_{\text{case}} * \text{TSF}$$

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
BDP261,262,263,260 LED8-4S/740	544.0	5.7	95.4	0.158	0.158	0.118	0.118	0.087	252.8	188.8	188.8	139.2
BDP261,262,263,260 LED10-4S/740	680.0	6.9	98.6	0.192	0.192	0.144	0.144	0.106	307.2	230.4	230.4	169.6
BDP261,262,263,260 LED12-4S/740	816.0	7.9	103.3	0.219	0.219	0.164	0.164	0.12	350.4	262.4	262.4	192.0
BDP261,262,263,260 LED14-4S/740	952.0	8.9	107.0	0.247	0.247	0.185	0.185	0.136	395.2	296.0	296.0	217.6
BDP261,262,263,260 LED16-4S/740	1088.0	10.0	108.8	0.278	0.278	0.209	0.209	0.153	444.8	334.4	334.4	244.8
BDP261,262,263,260 LED18-4S/740	1224.0	11.2	109.3	0.311	0.311	0.233	0.233	0.171	497.6	372.8	372.8	273.6
BDP261,262,263,260 LED20-4S/740	1360.0	12.4	109.7	0.344	0.344	0.258	0.258	0.189	550.4	412.8	412.8	302.4
BDP261,262,263,260 LED22-4S/740	1496.0	13.4	111.6	0.372	0.372	0.279	0.279	0.205	595.2	446.4	446.4	328.0
BDP261,262,263,260 LED24-4S/740	1632.0	14.8	110.3	0.411	0.411	0.308	0.308	0.226	657.6	492.8	492.8	361.6
BDP261,262,263,260 LED27-4S/740	1836.0	16.6	110.6	0.461	0.461	0.346	0.346	0.254	737.6	553.6	553.6	406.4
BDP261,262,263,260 LED30-4S/740	2040.0	18.6	109.7	0.517	0.517	0.388	0.388	0.284	827.2	620.8	620.8	454.4
BDP261,262,263,260 LED35-4S/740	2380.0	22.0	108.2	0.611	0.611	0.458	0.458	0.336	977.6	732.8	732.8	537.6

BDP261,262,263,260 LED39-4S/740	2613.0	23.0	113.6	0.639	0.639	0.479	0.479	0.351	1022.4	766.4	766.4	561.6
BDP261,262,263,260 LED45-4S/740	3015.0	27.0	111.7	0.75	0.75	0.562	0.562	0.413	1200.0	899.2	899.2	660.8
BDP261,262,263,260 LED50-4S/740	3350.0	30.0	111.7	0.833	0.833	0.625	0.625	0.458	1332.8	1000.0	1000.0	732.8
BDP261,262,263,260 LED55-4S/740	3752.0	33.0	113.7	0.917	0.917	0.688	0.688	0.504	1467.2	1100.8	1100.8	806.4
BDP261,262,263,260 LED59-4S/740	4020.0	36.0	111.7	1.0	1.0	0.75	0.75	0.55	1600.0	1200.0	1200.0	880.0
BDP261,262,263,260 LED64-4S/740	4288.0	39.5	108.6	1.097	1.097	0.823	0.823	0.603	1755.2	1316.8	1316.8	964.8
BDP261,262,263,260 LED69-4S/740	4690.0	38.5	121.8	1.069	1.069	0.802	0.802	0.588	1710.4	1283.2	1283.2	940.8
BDP261,262,263,260 LED74-4S/740	4958.0	41.5	119.5	1.153	1.153	0.865	0.865	0.634	1844.8	1384.0	1384.0	1014.4
BDP261,262,263,260 LED79-4S/740	5226.0	44.5	117.4	1.236	1.236	0.927	0.927	0.68	1977.6	1483.2	1483.2	1088.0
BDP261,262,263,260 LED84-4S/740	5544.0	47.5	116.7	1.319	1.319	0.989	0.989	0.725	2110.4	1582.4	1582.4	1160.0
BDP261,262,263,260 LED90-4S/740	5940.0	51.0	116.5	1.417	1.417	1.063	1.063	0.779	2267.2	1700.8	1700.8	1246.4
BDP261,262,263,260 LED94-4S/740	6204.0	53.0	117.1	1.472	1.472	1.104	1.104	0.81	2355.2	1766.4	1766.4	1296.0
BDP261,262,263,260 LED100-4S/740	6500.0	57.0	114.0	1.583	1.583	1.187	1.187	0.871	2532.8	1899.2	1899.2	1393.6
BDP261,262,263,260 LED8-4S/730	544.0	6.0	90.7	0.167	0.167	0.125	0.125	0.092	267.2	200.0	200.0	147.2
BDP261,262,263,260 LED10-4S/730	680.0	7.2	94.4	0.2	0.2	0.15	0.15	0.11	320.0	240.0	240.0	176.0
BDP261,262,263,260 LED12-4S/730	816.0	8.2	99.5	0.228	0.228	0.171	0.171	0.125	364.8	273.6	273.6	200.0
BDP261,262,263,260 LED14-4S/730	952.0	9.4	101.3	0.261	0.261	0.196	0.196	0.144	417.6	313.6	313.6	230.4
BDP261,262,263,260 LED16-4S/730	1088.0	10.6	102.6	0.294	0.294	0.22	0.22	0.162	470.4	352.0	352.0	259.2
BDP261,262,263,260 LED18-4S/730	1224.0	11.8	103.7	0.328	0.328	0.246	0.246	0.18	524.8	393.6	393.6	288.0
BDP261,262,263,260 LED20-4S/730	1360.0	13.0	104.6	0.361	0.361	0.271	0.271	0.199	577.6	433.6	433.6	318.4
BDP261,262,263,260 LED22-4S/730	1496.0	14.2	105.4	0.394	0.394	0.296	0.296	0.217	630.4	473.6	473.6	347.2
BDP261,262,263,260 LED24-4S/730	1632.0	15.6	104.6	0.433	0.433	0.325	0.325	0.238	692.8	520.0	520.0	380.8
BDP261,262,263,260 LED27-4S/730	1836.0	17.6	104.3	0.489	0.489	0.367	0.367	0.269	782.4	587.2	587.2	430.4
BDP261,262,263,260 LED30-4S/730	2040.0	19.8	103.0	0.55	0.55	0.413	0.413	0.303	880.0	660.8	660.8	484.8
BDP261,262,263,260 LED35-4S/730	2380.0	23.5	101.3	0.653	0.653	0.49	0.49	0.359	1044.8	784.0	784.0	574.4

BDP261,262,263,260 LED39-4S/730	2613.0	24.5	106.7	0.681	0.681	0.511	0.511	0.375	1089.6	817.6	817.6	600.0
BDP261,262,263,260 LED45-4S/730	3015.0	28.5	105.8	0.792	0.792	0.594	0.594	0.436	1267.2	950.4	950.4	697.6
BDP261,262,263,260 LED50-4S/730	3350.0	32.0	104.7	0.889	0.889	0.667	0.667	0.489	1422.4	1067.2	1067.2	782.4
BDP261,262,263,260 LED55-4S/730	3752.0	35.5	105.7	0.986	0.986	0.74	0.74	0.542	1577.6	1184.0	1184.0	867.2
BDP261,262,263,260 LED59-4S/730	4020.0	38.5	104.4	1.069	1.069	0.802	0.802	0.588	1710.4	1283.2	1283.2	940.8
BDP261,262,263,260 LED64-4S/730	4288.0	38.0	112.8	1.056	1.056	0.792	0.792	0.581	1689.6	1267.2	1267.2	929.6
BDP261,262,263,260 LED69-4S/730	4690.0	41.0	114.4	1.139	1.139	0.854	0.854	0.626	1822.4	1366.4	1366.4	1001.6
BDP261,262,263,260 LED74-4S/730	4958.0	44.0	112.7	1.222	1.222	0.916	0.916	0.672	1955.2	1465.6	1465.6	1075.2
BDP261,262,263,260 LED79-4S/730	5280.0	47.5	111.2	1.319	1.319	0.989	0.989	0.725	2110.4	1582.4	1582.4	1160.0
BDP261,262,263,260 LED84-4S/730	5544.0	51.0	108.7	1.417	1.417	1.063	1.063	0.779	2267.2	1700.8	1700.8	1246.4
BDP261,262,263,260 LED90-4S/730	5940.0	54.0	110.0	1.5	1.5	1.125	1.125	0.825	2400.0	1800.0	1800.0	1320.0
BDP261,262,263,260 LED94-4S/730	6110.0	57.0	107.2	1.583	1.583	1.187	1.187	0.871	2532.8	1899.2	1899.2	1393.6
BDP261,262,263,260 LED100-4S/730	6500.0	61.0	106.6	1.694	1.694	1.27	1.27	0.932	2710.4	2032.0	2032.0	1491.2
BDP261,262,263,260 LED7-4S/727	476.0	5.9	80.7	0.164	0.164	0.123	0.123	0.09	262.4	196.8	196.8	144.0
BDP261,262,263,260 LED9-4S/727	612.0	7.2	85.0	0.2	0.2	0.15	0.15	0.11	320.0	240.0	240.0	176.0
BDP261,262,263,260 LED11-4S/727	748.0	8.4	89.0	0.233	0.233	0.175	0.175	0.128	372.8	280.0	280.0	204.8
BDP261,262,263,260 LED13-4S/727	884.0	9.7	91.1	0.269	0.269	0.202	0.202	0.148	430.4	323.2	323.2	236.8
BDP261,262,263,260 LED14-4S/727	952.0	10.4	91.5	0.289	0.289	0.217	0.217	0.159	462.4	347.2	347.2	254.4
BDP261,262,263,260 LED16-4S/727	1088.0	11.8	92.2	0.328	0.328	0.246	0.246	0.18	524.8	393.6	393.6	288.0
BDP261,262,263,260 LED18-4S/727	1224.0	13.2	92.7	0.367	0.367	0.275	0.275	0.202	587.2	440.0	440.0	323.2
BDP261,262,263,260 LED20-4S/727	1360.0	14.6	93.2	0.406	0.406	0.304	0.304	0.223	649.6	486.4	486.4	356.8
BDP261,262,263,260 LED22-4S/727	1496.0	16.0	93.5	0.444	0.444	0.333	0.333	0.244	710.4	532.8	532.8	390.4
BDP261,262,263,260 LED24-4S/727	1632.0	17.6	92.7	0.489	0.489	0.367	0.367	0.269	782.4	587.2	587.2	430.4
BDP261,262,263,260 LED27-4S/727	1836.0	20.0	91.8	0.556	0.556	0.417	0.417	0.306	889.6	667.2	667.2	489.6
BDP261,262,263,260 LED30-4S/727	2040.0	22.5	90.7	0.625	0.625	0.469	0.469	0.344	1000.0	750.4	750.4	550.4

BDP261,262,263,260 LED35-4S/727	2345.0	26.5	88.5	0.736	0.736	0.552	0.552	0.405	1177.6	883.2	883.2	648.0
BDP261,262,263,260 LED39-4S/727	2613.0	27.5	95.0	0.764	0.764	0.573	0.573	0.42	1222.4	916.8	916.8	672.0
BDP261,262,263,260 LED45-4S/727	3015.0	32.0	94.2	0.889	0.889	0.667	0.667	0.489	1422.4	1067.2	1067.2	782.4
BDP261,262,263,260 LED50-4S/727	3350.0	36.0	93.1	1.0	1.0	0.75	0.75	0.55	1600.0	1200.0	1200.0	880.0
BDP261,262,263,260 LED55-4S/727	3696.0	40.5	91.3	1.125	1.125	0.844	0.844	0.619	1800.0	1350.4	1350.4	990.4
BDP261,262,263,260 LED59-4S/727	4020.0	39.5	101.8	1.097	1.097	0.823	0.823	0.603	1755.2	1316.8	1316.8	964.8
BDP261,262,263,260 LED64-4S/727	4288.0	42.5	100.9	1.181	1.181	0.886	0.886	0.65	1889.6	1417.6	1417.6	1040.0
BDP261,262,263,260 LED69-4S/727	4690.0	46.5	100.9	1.292	1.292	0.969	0.969	0.711	2067.2	1550.4	1550.4	1137.6
BDP261,262,263,260 LED74-4S/727	4884.0	50.0	97.7	1.389	1.389	1.042	1.042	0.764	2222.4	1667.2	1667.2	1222.4
BDP261,262,263,260 LED79-4S/727	5280.0	53.0	99.6	1.472	1.472	1.104	1.104	0.81	2355.2	1766.4	1766.4	1296.0
BDP261,262,263,260 LED84-4S/727	5460.0	57.0	95.8	1.583	1.583	1.187	1.187	0.871	2532.8	1899.2	1899.2	1393.6
BDP261,262,263,260 LED90-4S/727	5850.0	62.0	94.4	1.722	1.722	1.292	1.292	0.947	2755.2	2067.2	2067.2	1515.2
BDP261,262,263,260 LED94-4S/727	6110.0	65.0	94.0	1.806	1.806	1.354	1.354	0.993	2889.6	2166.4	2166.4	1588.8
BDP261,262,263,260 LED100-4S/727	6500.0	69.0	94.2	1.917	1.917	1.438	1.438	1.054	3067.2	2300.8	2300.8	1686.4
BDP261,262,263,260 LED7-4S/722	476.0	6.5	73.2	0.181	0.181	0.136	0.136	0.1	289.6	217.6	217.6	160.0
BDP261,262,263,260 LED9-4S/722	612.0	7.8	78.5	0.217	0.217	0.163	0.163	0.119	347.2	260.8	260.8	190.4
BDP261,262,263,260 LED11-4S/722	748.0	9.2	81.3	0.256	0.256	0.192	0.192	0.141	409.6	307.2	307.2	225.6
BDP261,262,263,260 LED12-4S/722	816.0	10.0	81.6	0.278	0.278	0.209	0.209	0.153	444.8	334.4	334.4	244.8
BDP261,262,263,260 LED14-4S/722	952.0	11.6	82.1	0.322	0.322	0.242	0.242	0.177	515.2	387.2	387.2	283.2
BDP261,262,263,260 LED16-4S/722	1088.0	13.0	83.7	0.361	0.361	0.271	0.271	0.199	577.6	433.6	433.6	318.4
BDP261,262,263,260 LED18-4S/722	1224.0	14.6	83.8	0.406	0.406	0.304	0.304	0.223	649.6	486.4	486.4	356.8
BDP261,262,263,260 LED20-4S/722	1360.0	16.4	82.9	0.456	0.456	0.342	0.342	0.251	729.6	547.2	547.2	401.6
BDP261,262,263,260 LED22-4S/722	1496.0	18.0	83.1	0.5	0.5	0.375	0.375	0.275	800.0	600.0	600.0	440.0
BDP261,262,263,260 LED24-4S/722	1632.0	19.8	82.4	0.55	0.55	0.413	0.413	0.303	880.0	660.8	660.8	484.8
BDP261,262,263,260 LED27-4S/722	1836.0	22.5	81.6	0.625	0.625	0.469	0.469	0.344	1000.0	750.4	750.4	550.4

BDP261,262,263,260 LED30-4S/722	2010.0	25.5	78.8	0.708	0.708	0.531	0.531	0.389	1132.8	849.6	849.6	622.4
BDP261,262,263,260 LED35-4S/722	2345.0	27.5	85.3	0.764	0.764	0.573	0.573	0.42	1222.4	916.8	916.8	672.0
BDP261,262,263,260 LED39-4S/722	2613.0	31.0	84.3	0.861	0.861	0.646	0.646	0.474	1377.6	1033.6	1033.6	758.4
BDP261,262,263,260 LED45-4S/722	3015.0	36.5	82.6	1.014	1.014	0.76	0.76	0.558	1622.4	1216.0	1216.0	892.8
BDP261,262,263,260 LED50-4S/722	3350.0	37.0	90.5	1.028	1.028	0.771	0.771	0.565	1644.8	1233.6	1233.6	904.0
BDP261,262,263,260 LED55-4S/722	3618.0	41.0	88.2	1.139	1.139	0.854	0.854	0.626	1822.4	1366.4	1366.4	1001.6
BDP261,262,263,260 LED59-4S/722	4020.0	44.0	91.4	1.222	1.222	0.916	0.916	0.672	1955.2	1465.6	1465.6	1075.2
BDP261,262,263,260 LED64-4S/722	4224.0	48.0	88.0	1.333	1.333	1.0	1.0	0.733	2132.8	1600.0	1600.0	1172.8
BDP261,262,263,260 LED69-4S/722	4620.0	52.0	88.8	1.444	1.444	1.083	1.083	0.794	2310.4	1732.8	1732.8	1270.4
BDP261,262,263,260 LED74-4S/722	4884.0	56.0	87.2	1.556	1.556	1.167	1.167	0.856	2489.6	1867.2	1867.2	1369.6
BDP261,262,263,260 LED7-4S/830	476.0	5.9	80.7	0.164	0.164	0.123	0.123	0.09	262.4	196.8	196.8	144.0
BDP261,262,263,260 LED9-4S/830	612.0	7.2	85.0	0.2	0.2	0.15	0.15	0.11	320.0	240.0	240.0	176.0
BDP261,262,263,260 LED11-4S/830	748.0	8.4	89.0	0.233	0.233	0.175	0.175	0.128	372.8	280.0	280.0	204.8
BDP261,262,263,260 LED12-4S/830	816.0	9.0	90.7	0.25	0.25	0.188	0.188	0.138	400.0	300.8	300.8	220.8
BDP261,262,263,260 LED14-4S/830	952.0	10.4	91.5	0.289	0.289	0.217	0.217	0.159	462.4	347.2	347.2	254.4
BDP261,262,263,260 LED16-4S/830	1088.0	11.8	92.2	0.328	0.328	0.246	0.246	0.18	524.8	393.6	393.6	288.0
BDP261,262,263,260 LED18-4S/830	1224.0	13.2	92.7	0.367	0.367	0.275	0.275	0.202	587.2	440.0	440.0	323.2
BDP261,262,263,260 LED20-4S/830	1360.0	14.6	93.2	0.406	0.406	0.304	0.304	0.223	649.6	486.4	486.4	356.8
BDP261,262,263,260 LED22-4S/830	1496.0	16.0	93.5	0.444	0.444	0.333	0.333	0.244	710.4	532.8	532.8	390.4
BDP261,262,263,260 LED24-4S/830	1632.0	17.6	92.7	0.489	0.489	0.367	0.367	0.269	782.4	587.2	587.2	430.4
BDP261,262,263,260 LED27-4S/830	1836.0	20.0	91.8	0.556	0.556	0.417	0.417	0.306	889.6	667.2	667.2	489.6
BDP261,262,263,260 LED30-4S/830	2040.0	22.5	90.7	0.625	0.625	0.469	0.469	0.344	1000.0	750.4	750.4	550.4
BDP261,262,263,260 LED35-4S/830	2345.0	24.5	95.7	0.681	0.681	0.511	0.511	0.375	1089.6	817.6	817.6	600.0
BDP261,262,263,260 LED39-4S/830	2613.0	27.5	95.0	0.764	0.764	0.573	0.573	0.42	1222.4	916.8	916.8	672.0
BDP261,262,263,260 LED45-4S/830	3015.0	32.0	94.2	0.889	0.889	0.667	0.667	0.489	1422.4	1067.2	1067.2	782.4

BDP261,262,263,260 LED50-4S/830	3350.0	36.0	93.1	1.0	1.0	0.75	0.75	0.55	1600.0	1200.0	1200.0	880.0
BDP261,262,263,260 LED55-4S/830	3618.0	36.5	99.1	1.014	1.014	0.76	0.76	0.558	1622.4	1216.0	1216.0	892.8
BDP261,262,263,260 LED59-4S/830	4020.0	39.5	101.8	1.097	1.097	0.823	0.823	0.603	1755.2	1316.8	1316.8	964.8
BDP261,262,263,260 LED64-4S/830	4288.0	42.5	100.9	1.181	1.181	0.886	0.886	0.65	1889.6	1417.6	1417.6	1040.0
BDP261,262,263,260 LED69-4S/830	4690.0	46.5	100.9	1.292	1.292	0.969	0.969	0.711	2067.2	1550.4	1550.4	1137.6
BDP261,262,263,260 LED74-4S/830	4884.0	50.0	97.7	1.389	1.389	1.042	1.042	0.764	2222.4	1667.2	1667.2	1222.4
BDP261,262,263,260 LED79-4S/830	5280.0	53.0	99.6	1.472	1.472	1.104	1.104	0.81	2355.2	1766.4	1766.4	1296.0
BDP261,262,263,260 LED84-4S/830	5460.0	57.0	95.8	1.583	1.583	1.187	1.187	0.871	2532.8	1899.2	1899.2	1393.6
BDP261,262,263,260 LED90-4S/830	5850.0	62.0	94.4	1.722	1.722	1.292	1.292	0.947	2755.2	2067.2	2067.2	1515.2
BDP261,262,263,260 LED94-4S/830	6110.0	65.0	94.0	1.806	1.806	1.354	1.354	0.993	2889.6	2166.4	2166.4	1588.8
BDP261,262,263,260 LED100-4S/830	6500.0	69.0	94.2	1.917	1.917	1.438	1.438	1.054	3067.2	2300.8	2300.8	1686.4

* 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.

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 reference 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 family.

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 (O_{lum}) and reference service lifetime (RSL) of the product to estimate the final environmental impact. The scaled impact (SI_{pep}) 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 ($PGSF$), 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
BDP261,262,263,260 LED8-4S/740	544.0	5.7	95.4	0.158	0.102	0.076	0.076	0.056	163.2	121.6	121.6	89.6
BDP261,262,263,260 LED10-4S/740	680.0	6.9	98.6	0.192	0.099	0.074	0.074	0.054	158.4	118.4	118.4	86.4
BDP261,262,263,260 LED12-4S/740	816.0	7.9	103.3	0.219	0.094	0.07	0.07	0.052	150.4	112.0	112.0	83.2
BDP261,262,263,260 LED14-4S/740	952.0	8.9	107.0	0.247	0.091	0.068	0.068	0.05	145.6	108.8	108.8	80.0
BDP261,262,263,260 LED16-4S/740	1088.0	10.0	108.8	0.278	0.089	0.067	0.067	0.049	142.4	107.2	107.2	78.4

BDP261,262,263,260 LED18-4S/740	1224.0	11.2	109.3	0.311	0.089	0.067	0.067	0.049	142.4	107.2	107.2	78.4
BDP261,262,263,260 LED20-4S/740	1360.0	12.4	109.7	0.344	0.089	0.067	0.067	0.049	142.4	107.2	107.2	78.4
BDP261,262,263,260 LED22-4S/740	1496.0	13.4	111.6	0.372	0.087	0.065	0.065	0.048	139.2	104.0	104.0	76.8
BDP261,262,263,260 LED24-4S/740	1632.0	14.8	110.3	0.411	0.088	0.066	0.066	0.048	140.8	105.6	105.6	76.8
BDP261,262,263,260 LED27-4S/740	1836.0	16.6	110.6	0.461	0.088	0.066	0.066	0.048	140.8	105.6	105.6	76.8
BDP261,262,263,260 LED30-4S/740	2040.0	18.6	109.7	0.517	0.089	0.067	0.067	0.049	142.4	107.2	107.2	78.4
BDP261,262,263,260 LED35-4S/740	2380.0	22.0	108.2	0.611	0.09	0.068	0.068	0.05	144.0	108.8	108.8	80.0
BDP261,262,263,260 LED39-4S/740	2613.0	23.0	113.6	0.639	0.086	0.064	0.064	0.047	137.6	102.4	102.4	75.2
BDP261,262,263,260 LED45-4S/740	3015.0	27.0	111.7	0.75	0.087	0.065	0.065	0.048	139.2	104.0	104.0	76.8
BDP261,262,263,260 LED50-4S/740	3350.0	30.0	111.7	0.833	0.087	0.065	0.065	0.048	139.2	104.0	104.0	76.8
BDP261,262,263,260 LED55-4S/740	3752.0	33.0	113.7	0.917	0.086	0.064	0.064	0.047	137.6	102.4	102.4	75.2
BDP261,262,263,260 LED59-4S/740	4020.0	36.0	111.7	1.0	0.087	0.065	0.065	0.048	139.2	104.0	104.0	76.8
BDP261,262,263,260 LED64-4S/740	4288.0	39.5	108.6	1.097	0.09	0.068	0.068	0.05	144.0	108.8	108.8	80.0
BDP261,262,263,260 LED69-4S/740	4690.0	38.5	121.8	1.069	0.08	0.06	0.06	0.044	128.0	96.0	96.0	70.4
BDP261,262,263,260 LED74-4S/740	4958.0	41.5	119.5	1.153	0.081	0.061	0.061	0.045	129.6	97.6	97.6	72.0
BDP261,262,263,260 LED79-4S/740	5226.0	44.5	117.4	1.236	0.083	0.062	0.062	0.046	132.8	99.2	99.2	73.6
BDP261,262,263,260 LED84-4S/740	5544.0	47.5	116.7	1.319	0.083	0.062	0.062	0.046	132.8	99.2	99.2	73.6
BDP261,262,263,260 LED90-4S/740	5940.0	51.0	116.5	1.417	0.083	0.062	0.062	0.046	132.8	99.2	99.2	73.6
BDP261,262,263,260 LED94-4S/740	6204.0	53.0	117.1	1.472	0.083	0.062	0.062	0.046	132.8	99.2	99.2	73.6
BDP261,262,263,260 LED100-4S/740	6500.0	57.0	114.0	1.583	0.085	0.064	0.064	0.047	136.0	102.4	102.4	75.2
BDP261,262,263,260 LED8-4S/730	544.0	6.0	90.7	0.167	0.107	0.08	0.08	0.059	171.2	128.0	128.0	94.4
BDP261,262,263,260 LED10-4S/730	680.0	7.2	94.4	0.2	0.103	0.077	0.077	0.057	164.8	123.2	123.2	91.2
BDP261,262,263,260 LED12-4S/730	816.0	8.2	99.5	0.228	0.098	0.074	0.074	0.054	156.8	118.4	118.4	86.4
BDP261,262,263,260 LED14-4S/730	952.0	9.4	101.3	0.261	0.096	0.072	0.072	0.053	153.6	115.2	115.2	84.8
BDP261,262,263,260 LED16-4S/730	1088.0	10.6	102.6	0.294	0.095	0.071	0.071	0.052	152.0	113.6	113.6	83.2

BDP261,262,263,260 LED18-4S/730	1224.0	11.8	103.7	0.328	0.094	0.07	0.07	0.052	150.4	112.0	112.0	83.2
BDP261,262,263,260 LED20-4S/730	1360.0	13.0	104.6	0.361	0.093	0.07	0.07	0.051	148.8	112.0	112.0	81.6
BDP261,262,263,260 LED22-4S/730	1496.0	14.2	105.4	0.394	0.092	0.069	0.069	0.051	147.2	110.4	110.4	81.6
BDP261,262,263,260 LED24-4S/730	1632.0	15.6	104.6	0.433	0.093	0.07	0.07	0.051	148.8	112.0	112.0	81.6
BDP261,262,263,260 LED27-4S/730	1836.0	17.6	104.3	0.489	0.093	0.07	0.07	0.051	148.8	112.0	112.0	81.6
BDP261,262,263,260 LED30-4S/730	2040.0	19.8	103.0	0.55	0.094	0.07	0.07	0.052	150.4	112.0	112.0	83.2
BDP261,262,263,260 LED35-4S/730	2380.0	23.5	101.3	0.653	0.096	0.072	0.072	0.053	153.6	115.2	115.2	84.8
BDP261,262,263,260 LED39-4S/730	2613.0	24.5	106.7	0.681	0.091	0.068	0.068	0.05	145.6	108.8	108.8	80.0
BDP261,262,263,260 LED45-4S/730	3015.0	28.5	105.8	0.792	0.092	0.069	0.069	0.051	147.2	110.4	110.4	81.6
BDP261,262,263,260 LED50-4S/730	3350.0	32.0	104.7	0.889	0.093	0.07	0.07	0.051	148.8	112.0	112.0	81.6
BDP261,262,263,260 LED55-4S/730	3752.0	35.5	105.7	0.986	0.092	0.069	0.069	0.051	147.2	110.4	110.4	81.6
BDP261,262,263,260 LED59-4S/730	4020.0	38.5	104.4	1.069	0.093	0.07	0.07	0.051	148.8	112.0	112.0	81.6
BDP261,262,263,260 LED64-4S/730	4288.0	38.0	112.8	1.056	0.086	0.064	0.064	0.047	137.6	102.4	102.4	75.2
BDP261,262,263,260 LED69-4S/730	4690.0	41.0	114.4	1.139	0.085	0.064	0.064	0.047	136.0	102.4	102.4	75.2
BDP261,262,263,260 LED74-4S/730	4958.0	44.0	112.7	1.222	0.086	0.064	0.064	0.047	137.6	102.4	102.4	75.2
BDP261,262,263,260 LED79-4S/730	5280.0	47.5	111.2	1.319	0.087	0.065	0.065	0.048	139.2	104.0	104.0	76.8
BDP261,262,263,260 LED84-4S/730	5544.0	51.0	108.7	1.417	0.089	0.067	0.067	0.049	142.4	107.2	107.2	78.4
BDP261,262,263,260 LED90-4S/730	5940.0	54.0	110.0	1.5	0.088	0.066	0.066	0.048	140.8	105.6	105.6	76.8
BDP261,262,263,260 LED94-4S/730	6110.0	57.0	107.2	1.583	0.091	0.068	0.068	0.05	145.6	108.8	108.8	80.0
BDP261,262,263,260 LED100-4S/730	6500.0	61.0	106.6	1.694	0.091	0.068	0.068	0.05	145.6	108.8	108.8	80.0
BDP261,262,263,260 LED7-4S/727	476.0	5.9	80.7	0.164	0.121	0.091	0.091	0.067	193.6	145.6	145.6	107.2
BDP261,262,263,260 LED9-4S/727	612.0	7.2	85.0	0.2	0.114	0.086	0.086	0.063	182.4	137.6	137.6	100.8
BDP261,262,263,260 LED11-4S/727	748.0	8.4	89.0	0.233	0.109	0.082	0.082	0.06	174.4	131.2	131.2	96.0
BDP261,262,263,260 LED13-4S/727	884.0	9.7	91.1	0.269	0.107	0.08	0.08	0.059	171.2	128.0	128.0	94.4
BDP261,262,263,260 LED14-4S/727	952.0	10.4	91.5	0.289	0.106	0.08	0.08	0.058	169.6	128.0	128.0	92.8

BDP261,262,263,260 LED16-4S/727	1088.0	11.8	92.2	0.328	0.106	0.08	0.08	0.058	169.6	128.0	128.0	92.8
BDP261,262,263,260 LED18-4S/727	1224.0	13.2	92.7	0.367	0.105	0.079	0.079	0.058	168.0	126.4	126.4	92.8
BDP261,262,263,260 LED20-4S/727	1360.0	14.6	93.2	0.406	0.104	0.078	0.078	0.057	166.4	124.8	124.8	91.2
BDP261,262,263,260 LED22-4S/727	1496.0	16.0	93.5	0.444	0.104	0.078	0.078	0.057	166.4	124.8	124.8	91.2
BDP261,262,263,260 LED24-4S/727	1632.0	17.6	92.7	0.489	0.105	0.079	0.079	0.058	168.0	126.4	126.4	92.8
BDP261,262,263,260 LED27-4S/727	1836.0	20.0	91.8	0.556	0.106	0.08	0.08	0.058	169.6	128.0	128.0	92.8
BDP261,262,263,260 LED30-4S/727	2040.0	22.5	90.7	0.625	0.107	0.08	0.08	0.059	171.2	128.0	128.0	94.4
BDP261,262,263,260 LED35-4S/727	2345.0	26.5	88.5	0.736	0.11	0.082	0.082	0.061	176.0	131.2	131.2	97.6
BDP261,262,263,260 LED39-4S/727	2613.0	27.5	95.0	0.764	0.102	0.076	0.076	0.056	163.2	121.6	121.6	89.6
BDP261,262,263,260 LED45-4S/727	3015.0	32.0	94.2	0.889	0.103	0.077	0.077	0.057	164.8	123.2	123.2	91.2
BDP261,262,263,260 LED50-4S/727	3350.0	36.0	93.1	1.0	0.104	0.078	0.078	0.057	166.4	124.8	124.8	91.2
BDP261,262,263,260 LED55-4S/727	3696.0	40.5	91.3	1.125	0.107	0.08	0.08	0.059	171.2	128.0	128.0	94.4
BDP261,262,263,260 LED59-4S/727	4020.0	39.5	101.8	1.097	0.096	0.072	0.072	0.053	153.6	115.2	115.2	84.8
BDP261,262,263,260 LED64-4S/727	4288.0	42.5	100.9	1.181	0.096	0.072	0.072	0.053	153.6	115.2	115.2	84.8
BDP261,262,263,260 LED69-4S/727	4690.0	46.5	100.9	1.292	0.096	0.072	0.072	0.053	153.6	115.2	115.2	84.8
BDP261,262,263,260 LED74-4S/727	4884.0	50.0	97.7	1.389	0.1	0.075	0.075	0.055	160.0	120.0	120.0	88.0
BDP261,262,263,260 LED79-4S/727	5280.0	53.0	99.6	1.472	0.098	0.074	0.074	0.054	156.8	118.4	118.4	86.4
BDP261,262,263,260 LED84-4S/727	5460.0	57.0	95.8	1.583	0.101	0.076	0.076	0.056	161.6	121.6	121.6	89.6
BDP261,262,263,260 LED90-4S/727	5850.0	62.0	94.4	1.722	0.103	0.077	0.077	0.057	164.8	123.2	123.2	91.2
BDP261,262,263,260 LED94-4S/727	6110.0	65.0	94.0	1.806	0.103	0.077	0.077	0.057	164.8	123.2	123.2	91.2
BDP261,262,263,260 LED100-4S/727	6500.0	69.0	94.2	1.917	0.103	0.077	0.077	0.057	164.8	123.2	123.2	91.2
BDP261,262,263,260 LED7-4S/722	476.0	6.5	73.2	0.181	0.133	0.1	0.1	0.073	212.8	160.0	160.0	116.8
BDP261,262,263,260 LED9-4S/722	612.0	7.8	78.5	0.217	0.124	0.093	0.093	0.068	198.4	148.8	148.8	108.8
BDP261,262,263,260 LED11-4S/722	748.0	9.2	81.3	0.256	0.12	0.09	0.09	0.066	192.0	144.0	144.0	105.6
BDP261,262,263,260 LED12-4S/722	816.0	10.0	81.6	0.278	0.119	0.089	0.089	0.065	190.4	142.4	142.4	104.0

BDP261,262,263,260 LED14-4S/722	952.0	11.6	82.1	0.322	0.118	0.088	0.088	0.065	188.8	140.8	140.8	104.0
BDP261,262,263,260 LED16-4S/722	1088.0	13.0	83.7	0.361	0.116	0.087	0.087	0.064	185.6	139.2	139.2	102.4
BDP261,262,263,260 LED18-4S/722	1224.0	14.6	83.8	0.406	0.116	0.087	0.087	0.064	185.6	139.2	139.2	102.4
BDP261,262,263,260 LED20-4S/722	1360.0	16.4	82.9	0.456	0.117	0.088	0.088	0.064	187.2	140.8	140.8	102.4
BDP261,262,263,260 LED22-4S/722	1496.0	18.0	83.1	0.5	0.117	0.088	0.088	0.064	187.2	140.8	140.8	102.4
BDP261,262,263,260 LED24-4S/722	1632.0	19.8	82.4	0.55	0.118	0.088	0.088	0.065	188.8	140.8	140.8	104.0
BDP261,262,263,260 LED27-4S/722	1836.0	22.5	81.6	0.625	0.119	0.089	0.089	0.065	190.4	142.4	142.4	104.0
BDP261,262,263,260 LED30-4S/722	2010.0	25.5	78.8	0.708	0.123	0.092	0.092	0.068	196.8	147.2	147.2	108.8
BDP261,262,263,260 LED35-4S/722	2345.0	27.5	85.3	0.764	0.114	0.086	0.086	0.063	182.4	137.6	137.6	100.8
BDP261,262,263,260 LED39-4S/722	2613.0	31.0	84.3	0.861	0.115	0.086	0.086	0.063	184.0	137.6	137.6	100.8
BDP261,262,263,260 LED45-4S/722	3015.0	36.5	82.6	1.014	0.118	0.088	0.088	0.065	188.8	140.8	140.8	104.0
BDP261,262,263,260 LED50-4S/722	3350.0	37.0	90.5	1.028	0.107	0.08	0.08	0.059	171.2	128.0	128.0	94.4
BDP261,262,263,260 LED55-4S/722	3618.0	41.0	88.2	1.139	0.11	0.082	0.082	0.061	176.0	131.2	131.2	97.6
BDP261,262,263,260 LED59-4S/722	4020.0	44.0	91.4	1.222	0.106	0.08	0.08	0.058	169.6	128.0	128.0	92.8
BDP261,262,263,260 LED64-4S/722	4224.0	48.0	88.0	1.333	0.11	0.082	0.082	0.061	176.0	131.2	131.2	97.6
BDP261,262,263,260 LED69-4S/722	4620.0	52.0	88.8	1.444	0.109	0.082	0.082	0.06	174.4	131.2	131.2	96.0
BDP261,262,263,260 LED74-4S/722	4884.0	56.0	87.2	1.556	0.112	0.084	0.084	0.062	179.2	134.4	134.4	99.2
BDP261,262,263,260 LED7-4S/830	476.0	5.9	80.7	0.164	0.121	0.091	0.091	0.067	193.6	145.6	145.6	107.2
BDP261,262,263,260 LED9-4S/830	612.0	7.2	85.0	0.2	0.114	0.086	0.086	0.063	182.4	137.6	137.6	100.8
BDP261,262,263,260 LED11-4S/830	748.0	8.4	89.0	0.233	0.109	0.082	0.082	0.06	174.4	131.2	131.2	96.0
BDP261,262,263,260 LED12-4S/830	816.0	9.0	90.7	0.25	0.107	0.08	0.08	0.059	171.2	128.0	128.0	94.4
BDP261,262,263,260 LED14-4S/830	952.0	10.4	91.5	0.289	0.106	0.08	0.08	0.058	169.6	128.0	128.0	92.8
BDP261,262,263,260 LED16-4S/830	1088.0	11.8	92.2	0.328	0.106	0.08	0.08	0.058	169.6	128.0	128.0	92.8
BDP261,262,263,260 LED18-4S/830	1224.0	13.2	92.7	0.367	0.105	0.079	0.079	0.058	168.0	126.4	126.4	92.8
BDP261,262,263,260 LED20-4S/830	1360.0	14.6	93.2	0.406	0.104	0.078	0.078	0.057	166.4	124.8	124.8	91.2

BDP261,262,263,260 LED22-4S/830	1496.0	16.0	93.5	0.444	0.104	0.078	0.078	0.057	166.4	124.8	124.8	91.2
BDP261,262,263,260 LED24-4S/830	1632.0	17.6	92.7	0.489	0.105	0.079	0.079	0.058	168.0	126.4	126.4	92.8
BDP261,262,263,260 LED27-4S/830	1836.0	20.0	91.8	0.556	0.106	0.08	0.08	0.058	169.6	128.0	128.0	92.8
BDP261,262,263,260 LED30-4S/830	2040.0	22.5	90.7	0.625	0.107	0.08	0.08	0.059	171.2	128.0	128.0	94.4
BDP261,262,263,260 LED35-4S/830	2345.0	24.5	95.7	0.681	0.102	0.076	0.076	0.056	163.2	121.6	121.6	89.6
BDP261,262,263,260 LED39-4S/830	2613.0	27.5	95.0	0.764	0.102	0.076	0.076	0.056	163.2	121.6	121.6	89.6
BDP261,262,263,260 LED45-4S/830	3015.0	32.0	94.2	0.889	0.103	0.077	0.077	0.057	164.8	123.2	123.2	91.2
BDP261,262,263,260 LED50-4S/830	3350.0	36.0	93.1	1.0	0.104	0.078	0.078	0.057	166.4	124.8	124.8	91.2
BDP261,262,263,260 LED55-4S/830	3618.0	36.5	99.1	1.014	0.098	0.074	0.074	0.054	156.8	118.4	118.4	86.4
BDP261,262,263,260 LED59-4S/830	4020.0	39.5	101.8	1.097	0.096	0.072	0.072	0.053	153.6	115.2	115.2	84.8
BDP261,262,263,260 LED64-4S/830	4288.0	42.5	100.9	1.181	0.096	0.072	0.072	0.053	153.6	115.2	115.2	84.8
BDP261,262,263,260 LED69-4S/830	4690.0	46.5	100.9	1.292	0.096	0.072	0.072	0.053	153.6	115.2	115.2	84.8
BDP261,262,263,260 LED74-4S/830	4884.0	50.0	97.7	1.389	0.1	0.075	0.075	0.055	160.0	120.0	120.0	88.0
BDP261,262,263,260 LED79-4S/830	5280.0	53.0	99.6	1.472	0.098	0.074	0.074	0.054	156.8	118.4	118.4	86.4
BDP261,262,263,260 LED84-4S/830	5460.0	57.0	95.8	1.583	0.101	0.076	0.076	0.056	161.6	121.6	121.6	89.6
BDP261,262,263,260 LED90-4S/830	5850.0	62.0	94.4	1.722	0.103	0.077	0.077	0.057	164.8	123.2	123.2	91.2
BDP261,262,263,260 LED94-4S/830	6110.0	65.0	94.0	1.806	0.103	0.077	0.077	0.057	164.8	123.2	123.2	91.2
BDP261,262,263,260 LED100-4S/830	6500.0	69.0	94.2	1.917	0.103	0.077	0.077	0.057	164.8	123.2	123.2	91.2

* 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 highlighted 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 CO ₂ e	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 multiplying 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