ENVIRONMENTAL PRODUCT DECLARATION

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

Philips TownTune Central Post-Top DR

BDP261,262,263,260
Signify N.V.

signify

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 DR
Additional labels	BDP261 LED50-4S/740 DS50 CLO DDF2 62P
Product reference	912300024156
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 of 3430 lumens over 100000 hours
Declared unit mass	7.704 kg
GWP-fossil, A1-A3 (kgCO2e)	7,11E+01
GWP-total, A1-A3 (kgCO2e)	7,10E+01
Secondary material, inputs (%)	49.8
Secondary material, outputs (%)	59.8
Total energy use, A1-A3 (kWh)	251
Total water use, A1-A3 (m3e)	0.49

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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 programing 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/BDP261/fam/aa/en

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	68.1	EUR, ASIA
Minerals	0.02	EU
Fossil materials	31.88	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

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Declared unit	1 Product
Mass per declared unit	7.704 kg
Functional unit	1 unit of 3430 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.

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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.
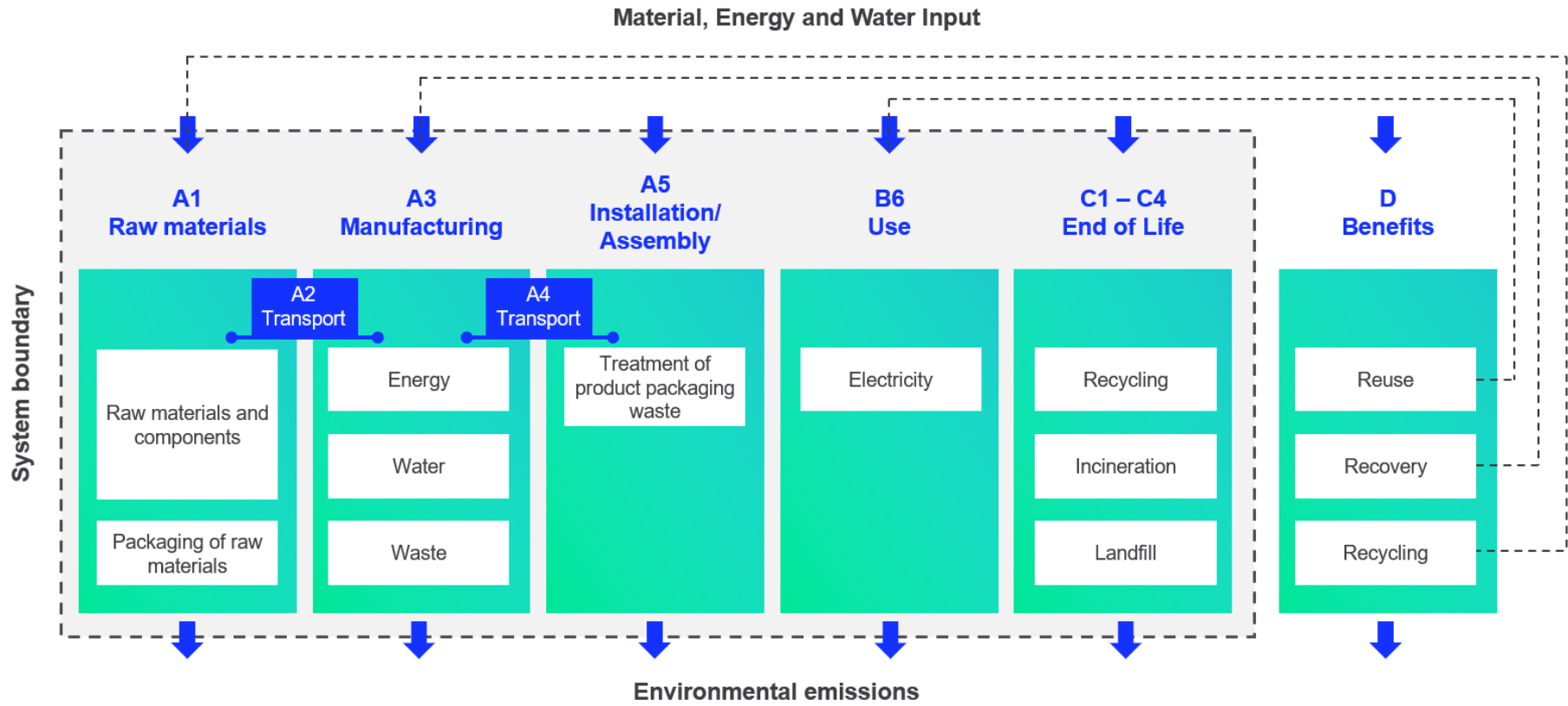
PRODUCT USE AND MAINTENANCE (B1-B7)

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

Material, Energy and Water Input

A1 Raw materials	A3 Manufacturing	A5 Installation/Assembly	B6 Use	C1 – C4 End of Life	D Benefits
A2 Transport	A4 Transport				
Raw materials and components	Energy	Treatment of product packaging waste	Electricity	Recycling	Reuse
	Water			Incineration	Recovery
Packaging of raw materials	Waste			Landfill	Recycling

System boundary

Environmental emissions

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.

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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	6,93E+01	1,47E+00	1,78E-01	7,10E+01	1,48E+00	2,23E-01	MNR	MNR	MNR	MNR	MNR	1,21E+03	MNR	MNR	1,08E-01	2,39E+00	1,33E+00	-1,24E+01
GWP – fossil	kg CO_2e	6,93E+01	1,47E+00	3,92E-01	7,11E+01	1,47E+00	6,15E-03	MNR	MNR	MNR	MNR	MNR	1,21E+03	MNR	MNR	1,08E-01	2,39E+00	1,28E+00	-1,24E+01
GWP – biogenic	kg CO_2e	-5,44E-02	0,00E+00	-2,17E-01	-2,72E-01	5,70E-04	2,17E-01	MNR	MNR	MNR	MNR	MNR	-8,88E-16	MNR	MNR	0,00E+00	0,00E+00	5,44E-02	-4,53E-03
GWP – LULUC	kg CO_2e	1,09E-01	5,49E-04	2,48E-03	1,12E-01	5,44E-04	2,14E-06	MNR	MNR	MNR	MNR	MNR	2,82E+00	MNR	MNR	4,00E-05	1,65E-04	9,49E-05	-2,03E-03
Ozone depletion pot.	kg CFC-11e	3,92E-06	3,39E-07	4,63E-08	4,31E-06	3,39E-07	5,73E-10	MNR	MNR	MNR	MNR	MNR	6,12E-05	MNR	MNR	2,49E-08	1,56E-08	1,18E-08	-3,34E-07
Acidification potential	mol H+e	5,26E-01	6,65E-03	1,63E-03	5,34E-01	6,24E-03	4,74E-05	MNR	MNR	MNR	MNR	MNR	6,89E+00	MNR	MNR	4,59E-04	1,67E-03	6,65E-04	-1,56E-01
EP-freshwater[2]	kg Pe	5,44E-03	1,20E-05	1,73E-05	5,47E-03	1,21E-05	6,14E-08	MNR	MNR	MNR	MNR	MNR	1,28E-01	MNR	MNR	8,88E-07	5,36E-06	3,76E-06	-8,33E-04
EP-marine	kg Ne	7,25E-02	1,95E-03	6,15E-04	7,50E-02	1,86E-03	2,05E-05	MNR	MNR	MNR	MNR	MNR	9,13E-01	MNR	MNR	1,36E-04	4,86E-04	8,10E-04	-1,45E-02
EP-terrestrial	mol Ne	7,63E-01	2,15E-02	4,35E-03	7,89E-01	2,05E-02	2,12E-04	MNR	MNR	MNR	MNR	MNR	1,04E+01	MNR	MNR	1,51E-03	5,30E-03	2,46E-03	-1,71E-01
POCP ("smog")[3]	kg NMVOCe	2,50E-01	6,81E-03	1,91E-03	2,59E-01	6,55E-03	5,28E-05	MNR	MNR	MNR	MNR	MNR	2,84E+00	MNR	MNR	4,82E-04	1,37E-03	7,64E-04	-4,97E-02
ADP-minerals & metals[4]	kg Sbe	2,52E-03	3,44E-06	2,13E-06	2,53E-03	3,46E-06	1,85E-08	MNR	MNR	MNR	MNR	MNR	1,13E-02	MNR	MNR	2,54E-07	1,12E-05	2,69E-07	-1,17E-03
ADP-fossil resources	MJ	8,76E+02	2,21E+01	5,67E+00	9,03E+02	2,21E+01	4,67E-02	MNR	MNR	MNR	MNR	MNR	2,57E+04	MNR	MNR	1,63E+00	1,71E+00	1,14E+00	-1,21E+02
Water use[5]	m^3e depr.	2,63E+01	9,87E-02	2,28E-01	2,67E+01	9,91E-02	1,05E-02	MNR	MNR	MNR	MNR	MNR	7,01E+02	MNR	MNR	7,29E-03	1,13E-01	8,32E-02	-1,04E+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	4,97E-06	1,69E-07	3,09E-08	5,17E-06	1,70E-07	4,33E-10	MNR	MNR	MNR	MNR	MNR	2,26E-05	MNR	MNR	1,25E-08	1,78E-08	8,80E-09	-8,09E-07
Ionizing radiation[6]	kBq U235e	4,24E+00	1,05E-01	1,86E-02	4,36E+00	1,05E-01	1,61E-04	MNR	MNR	MNR	MNR	MNR	6,94E+02	MNR	MNR	7,76E-03	9,83E-03	5,67E-03	-7,17E-01

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Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Ecotoxicity (freshwater)	CTUe	3,43E+03	1,98E+01	1,22E+01	3,47E+03	1,99E+01	2,79E-01	MNR	MNR	MNR	MNR	MNR	1,74E+04	MNR	MNR	1,47E+00	1,05E+01	4,78E+02	-4,97E+02
Human toxicity, cancer	CTUh	1,90E-07	4,93E-10	2,67E-10	1,90E-07	4,89E-10	1,60E-11	MNR	MNR	MNR	MNR	MNR	5,71E-07	MNR	MNR	3,60E-11	3,70E-10	8,97E-10	-6,65E-09
Human tox. non-cancer	CTUh	3,10E-06	1,96E-08	5,15E-09	3,12E-06	1,97E-08	6,46E-10	MNR	MNR	MNR	MNR	MNR	1,88E-05	MNR	MNR	1,45E-09	1,50E-08	5,47E-08	-8,83E-07
SQP[7]	-	2,29E+02	2,53E+01	1,35E+01	2,68E+02	2,55E+01	2,72E-02	MNR	MNR	MNR	MNR	MNR	4,64E+03	MNR	MNR	1,88E+00	2,44E+00	1,56E+00	-3,94E+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	6,54E+01	2,48E-01	4,58E+00	7,02E+01	2,49E-01	1,39E-03	MNR	MNR	MNR	MNR	MNR	5,22E+03	MNR	MNR	1,84E-02	2,11E-01	4,91E-02	-3,72E+00
Renew. PER as material	MJ	9,22E-01	0,00E+00	1,98E+00	2,90E+00	0,00E+00	-1,98E+00	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	-1,46E-01	-7,76E-01	0,00E+00
Total use of renew. PER	MJ	6,63E+01	2,48E-01	6,56E+00	7,31E+01	2,49E-01	-1,98E+00	MNR	MNR	MNR	MNR	MNR	5,22E+03	MNR	MNR	1,84E-02	6,46E-02	-7,27E-01	-3,72E+00
Non-re. PER as energy	MJ	8,06E+02	2,21E+01	5,23E+00	8,33E+02	2,21E+01	4,67E-02	MNR	MNR	MNR	MNR	MNR	2,56E+04	MNR	MNR	1,63E+00	1,71E+00	1,14E+00	-1,21E+02
Non-re. PER as material	MJ	6,35E+01	0,00E+00	2,85E-02	6,35E+01	0,00E+00	-2,85E-02	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	-3,16E+01	-3,18E+01	0,00E+00
Total use of non-re. PER	MJ	8,69E+02	2,21E+01	5,26E+00	8,97E+02	2,21E+01	1,82E-02	MNR	MNR	MNR	MNR	MNR	2,56E+04	MNR	MNR	1,63E+00	-2,99E+01	-3,07E+01	-1,21E+02
Secondary materials	kg	3,83E+00	6,17E-03	1,05E-01	3,95E+00	6,15E-03	5,39E-05	MNR	MNR	MNR	MNR	MNR	2,64E+00	MNR	MNR	4,52E-04	1,62E-03	2,59E-03	4,97E-01
Renew. secondary fuels	MJ	3,91E-02	6,17E-05	7,42E-03	4,65E-02	6,20E-05	7,54E-07	MNR	MNR	MNR	MNR	MNR	2,14E-02	MNR	MNR	4,56E-06	8,21E-05	2,30E-05	-1,11E-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	4,78E-01	2,85E-03	5,43E-03	4,86E-01	2,87E-03	1,39E-04	MNR	MNR	MNR	MNR	MNR	2,21E+01	MNR	MNR	2,11E-04	4,01E-03	2,15E-03	-4,94E-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	1,07E+01	2,93E-02	2,46E-02	1,08E+01	2,94E-02	1,81E-03	MNR	MNR	MNR	MNR	MNR	9,21E+01	MNR	MNR	2,16E-03	9,77E-03	3,26E-02	-1,91E+00
Non-hazardous waste	kg	1,09E+02	4,80E-01	4,48E-01	1,10E+02	4,82E-01	1,06E-01	MNR	MNR	MNR	MNR	MNR	5,83E+03	MNR	MNR	3,55E-02	1,21E+00	3,06E+00	-4,58E+01
Radioactive waste	kg	1,60E-03	1,48E-04	1,22E-05	1,76E-03	1,48E-04	1,03E-07	MNR	MNR	MNR	MNR	MNR	1,87E-01	MNR	MNR	1,09E-05	5,46E-06	0,00E+00	-2,65E-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	3,65E+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	9,59E-01	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	4,27E-01	4,27E-01	0,00E+00	0,00E+00	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	2,11E+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	6,75E+01	1,46E+00	4,00E-01	6,94E+01	1,46E+00	5,86E-03	MNR	MNR	MNR	MNR	MNR	1,19E+03	MNR	MNR	1,07E-01	2,38E+00	1,49E+00	-1,22E+01
Ozone depletion Pot.	kg $CFC_{-11}e$	3,53E-06	2,68E-07	3,87E-08	3,84E-06	2,69E-07	4,96E-10	MNR	MNR	MNR	MNR	MNR	5,31E-05	MNR	MNR	1,98E-08	1,30E-08	9,70E-09	-2,83E-07
Acidification	kg SO_2e	4,48E-01	5,17E-03	1,25E-03	4,55E-01	4,85E-03	3,43E-05	MNR	MNR	MNR	MNR	MNR	5,84E+00	MNR	MNR	3,57E-04	1,30E-03	5,04E-04	-1,36E-01
Eutrophication	kg PO_4^3e	1,58E-01	1,14E-03	7,57E-04	1,60E-01	1,10E-03	2,62E-05	MNR	MNR	MNR	MNR	MNR	4,49E+00	MNR	MNR	8,13E-05	5,68E-04	5,39E-03	-3,47E-02
POCP ("smog")	kg C_2H_4e	2,94E-02	1,97E-04	1,40E-04	2,98E-02	1,89E-04	1,02E-06	MNR	MNR	MNR	MNR	MNR	2,39E-01	MNR	MNR	1,39E-05	4,37E-05	8,52E-05	-6,33E-03
ADP-elements	kg Sbe	2,50E-03	3,33E-06	1,98E-06	2,50E-03	3,35E-06	1,46E-08	MNR	MNR	MNR	MNR	MNR	1,12E-02	MNR	MNR	2,46E-07	1,11E-05	2,38E-07	-1,17E-03
ADP-fossil	MJ	8,63E+02	2,21E+01	5,66E+00	8,91E+02	2,21E+01	4,67E-02	MNR	MNR	MNR	MNR	MNR	2,56E+04	MNR	MNR	1,63E+00	1,71E+00	1,13E+00	-1,21E+02

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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
BDP261,262,263,260 LED8-4S/740	544.0	5.7	95.4	0.19	0.19	0.143	0.143	0.105	229.9	173.0	173.0	127.0
BDP261,262,263,260 LED10-4S/740	680.0	6.9	98.6	0.23	0.23	0.173	0.173	0.127	278.3	209.3	209.3	153.7
BDP261,262,263,260 LED12-4S/740	816.0	7.9	103.3	0.263	0.263	0.197	0.197	0.145	318.2	238.4	238.4	175.4
BDP261,262,263,260 LED14-4S/740	952.0	8.9	107.0	0.297	0.297	0.223	0.223	0.163	359.4	269.8	269.8	197.2
BDP261,262,263,260 LED16-4S/740	1088.0	10.0	108.8	0.333	0.333	0.25	0.25	0.183	402.9	302.5	302.5	221.4
BDP261,262,263,260 LED18-4S/740	1224.0	11.2	109.3	0.373	0.373	0.28	0.28	0.205	451.3	338.8	338.8	248.0
BDP261,262,263,260 LED20-4S/740	1360.0	12.4	109.7	0.413	0.413	0.31	0.31	0.227	499.7	375.1	375.1	274.7
BDP261,262,263,260 LED22-4S/740	1496.0	13.4	111.6	0.447	0.447	0.335	0.335	0.246	540.9	405.4	405.4	297.7
BDP261,262,263,260 LED24-4S/740	1632.0	14.8	110.3	0.493	0.493	0.37	0.37	0.271	596.5	447.7	447.7	327.9
BDP261,262,263,260 LED27-4S/740	1836.0	16.6	110.6	0.553	0.553	0.415	0.415	0.304	669.1	502.2	502.2	367.8
BDP261,262,263,260 LED30-4S/740	2040.0	18.6	109.7	0.62	0.62	0.465	0.465	0.341	750.2	562.6	562.6	412.6
BDP261,262,263,260 LED35-4S/740	2380.0	22.0	108.2	0.733	0.733	0.55	0.55	0.403	886.9	665.5	665.5	487.6

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BDP261,262,263,260 LED39-4S/740	2613.0	23.0	113.6	0.767	0.767	0.575	0.575	0.422	928.1	695.8	695.8	510.6
BDP261,262,263,260 LED45-4S/740	3015.0	27.0	111.7	0.9	0.9	0.675	0.675	0.495	1089.0	816.8	816.8	599.0
BDP261,262,263,260 LED50-4S/740	3350.0	30.0	111.7	1.0	1.0	0.75	0.75	0.55	1210.0	907.5	907.5	665.5
BDP261,262,263,260 LED55-4S/740	3752.0	33.0	113.7	1.1	1.1	0.825	0.825	0.605	1331.0	998.2	998.2	732.0
BDP261,262,263,260 LED59-4S/740	4020.0	36.0	111.7	1.2	1.2	0.9	0.9	0.66	1452.0	1089.0	1089.0	798.6
BDP261,262,263,260 LED64-4S/740	4288.0	39.5	108.6	1.317	1.317	0.988	0.988	0.724	1593.6	1195.5	1195.5	876.0
BDP261,262,263,260 LED69-4S/740	4690.0	38.5	121.8	1.283	1.283	0.962	0.962	0.706	1552.4	1164.0	1164.0	854.3
BDP261,262,263,260 LED74-4S/740	4958.0	41.5	119.5	1.383	1.383	1.037	1.037	0.761	1673.4	1254.8	1254.8	920.8
BDP261,262,263,260 LED79-4S/740	5226.0	44.5	117.4	1.483	1.483	1.112	1.112	0.816	1794.4	1345.5	1345.5	987.4
BDP261,262,263,260 LED84-4S/740	5544.0	47.5	116.7	1.583	1.583	1.187	1.187	0.871	1915.4	1436.3	1436.3	1053.9
BDP261,262,263,260 LED90-4S/740	5940.0	51.0	116.5	1.7	1.7	1.275	1.275	0.935	2057.0	1542.8	1542.8	1131.4
BDP261,262,263,260 LED94-4S/740	6204.0	53.0	117.1	1.767	1.767	1.325	1.325	0.972	2138.1	1603.2	1603.2	1176.1
BDP261,262,263,260 LED100-4S/740	6500.0	57.0	114.0	1.9	1.9	1.425	1.425	1.045	2299.0	1724.2	1724.2	1264.4
BDP261,262,263,260 LED8-4S/730	544.0	6.0	90.7	0.2	0.2	0.15	0.15	0.11	242.0	181.5	181.5	133.1
BDP261,262,263,260 LED10-4S/730	680.0	7.2	94.4	0.24	0.24	0.18	0.18	0.132	290.4	217.8	217.8	159.7
BDP261,262,263,260 LED12-4S/730	816.0	8.2	99.5	0.273	0.273	0.205	0.205	0.15	330.3	248.0	248.0	181.5
BDP261,262,263,260 LED14-4S/730	952.0	9.4	101.3	0.313	0.313	0.235	0.235	0.172	378.7	284.3	284.3	208.1
BDP261,262,263,260 LED16-4S/730	1088.0	10.6	102.6	0.353	0.353	0.265	0.265	0.194	427.1	320.7	320.7	234.7
BDP261,262,263,260 LED18-4S/730	1224.0	11.8	103.7	0.393	0.393	0.295	0.295	0.216	475.5	357.0	357.0	261.4
BDP261,262,263,260 LED20-4S/730	1360.0	13.0	104.6	0.433	0.433	0.325	0.325	0.238	523.9	393.2	393.2	288.0
BDP261,262,263,260 LED22-4S/730	1496.0	14.2	105.4	0.473	0.473	0.355	0.355	0.26	572.3	429.6	429.6	314.6
BDP261,262,263,260 LED24-4S/730	1632.0	15.6	104.6	0.52	0.52	0.39	0.39	0.286	629.2	471.9	471.9	346.1
BDP261,262,263,260 LED27-4S/730	1836.0	17.6	104.3	0.587	0.587	0.44	0.44	0.323	710.3	532.4	532.4	390.8
BDP261,262,263,260 LED30-4S/730	2040.0	19.8	103.0	0.66	0.66	0.495	0.495	0.363	798.6	599.0	599.0	439.2
BDP261,262,263,260 LED35-4S/730	2380.0	23.5	101.3	0.783	0.783	0.587	0.587	0.431	947.4	710.3	710.3	521.5

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BDP261,262,263,260 LED39-4S/730	2613.0	24.5	106.7	0.817	0.817	0.613	0.613	0.449	988.6	741.7	741.7	543.3
BDP261,262,263,260 LED45-4S/730	3015.0	28.5	105.8	0.95	0.95	0.712	0.712	0.522	1149.5	861.5	861.5	631.6
BDP261,262,263,260 LED50-4S/730	3350.0	32.0	104.7	1.067	1.067	0.8	0.8	0.587	1291.1	968.0	968.0	710.3
BDP261,262,263,260 LED55-4S/730	3752.0	35.5	105.7	1.183	1.183	0.887	0.887	0.651	1431.4	1073.3	1073.3	787.7
BDP261,262,263,260 LED59-4S/730	4020.0	38.5	104.4	1.283	1.283	0.962	0.962	0.706	1552.4	1164.0	1164.0	854.3
BDP261,262,263,260 LED64-4S/730	4288.0	38.0	112.8	1.267	1.267	0.95	0.95	0.697	1533.1	1149.5	1149.5	843.4
BDP261,262,263,260 LED69-4S/730	4690.0	41.0	114.4	1.367	1.367	1.025	1.025	0.752	1654.1	1240.2	1240.2	909.9
BDP261,262,263,260 LED74-4S/730	4958.0	44.0	112.7	1.467	1.467	1.1	1.1	0.807	1775.1	1331.0	1331.0	976.5
BDP261,262,263,260 LED79-4S/730	5280.0	47.5	111.2	1.583	1.583	1.187	1.187	0.871	1915.4	1436.3	1436.3	1053.9
BDP261,262,263,260 LED84-4S/730	5544.0	51.0	108.7	1.7	1.7	1.275	1.275	0.935	2057.0	1542.8	1542.8	1131.4
BDP261,262,263,260 LED90-4S/730	5940.0	54.0	110.0	1.8	1.8	1.35	1.35	0.99	2178.0	1633.5	1633.5	1197.9
BDP261,262,263,260 LED94-4S/730	6110.0	57.0	107.2	1.9	1.9	1.425	1.425	1.045	2299.0	1724.2	1724.2	1264.4
BDP261,262,263,260 LED100-4S/730	6500.0	61.0	106.6	2.033	2.033	1.525	1.525	1.118	2459.9	1845.2	1845.2	1352.8
BDP261,262,263,260 LED7-4S/727	476.0	5.9	80.7	0.197	0.197	0.148	0.148	0.108	238.4	179.1	179.1	130.7
BDP261,262,263,260 LED9-4S/727	612.0	7.2	85.0	0.24	0.24	0.18	0.18	0.132	290.4	217.8	217.8	159.7
BDP261,262,263,260 LED11-4S/727	748.0	8.4	89.0	0.28	0.28	0.21	0.21	0.154	338.8	254.1	254.1	186.3
BDP261,262,263,260 LED13-4S/727	884.0	9.7	91.1	0.323	0.323	0.242	0.242	0.178	390.8	292.8	292.8	215.4
BDP261,262,263,260 LED14-4S/727	952.0	10.4	91.5	0.347	0.347	0.26	0.26	0.191	419.9	314.6	314.6	231.1
BDP261,262,263,260 LED16-4S/727	1088.0	11.8	92.2	0.393	0.393	0.295	0.295	0.216	475.5	357.0	357.0	261.4
BDP261,262,263,260 LED18-4S/727	1224.0	13.2	92.7	0.44	0.44	0.33	0.33	0.242	532.4	399.3	399.3	292.8
BDP261,262,263,260 LED20-4S/727	1360.0	14.6	93.2	0.487	0.487	0.365	0.365	0.268	589.3	441.6	441.6	324.3
BDP261,262,263,260 LED22-4S/727	1496.0	16.0	93.5	0.533	0.533	0.4	0.4	0.293	644.9	484.0	484.0	354.5
BDP261,262,263,260 LED24-4S/727	1632.0	17.6	92.7	0.587	0.587	0.44	0.44	0.323	710.3	532.4	532.4	390.8
BDP261,262,263,260 LED27-4S/727	1836.0	20.0	91.8	0.667	0.667	0.5	0.5	0.367	807.1	605.0	605.0	444.1
BDP261,262,263,260 LED30-4S/727	2040.0	22.5	90.7	0.75	0.75	0.562	0.562	0.413	907.5	680.0	680.0	499.7

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BDP261,262,263,260 LED35-4S/727	2345.0	26.5	88.5	0.883	0.883	0.662	0.662	0.486	1068.4	801.0	801.0	588.1
BDP261,262,263,260 LED39-4S/727	2613.0	27.5	95.0	0.917	0.917	0.688	0.688	0.504	1109.6	832.5	832.5	609.8
BDP261,262,263,260 LED45-4S/727	3015.0	32.0	94.2	1.067	1.067	0.8	0.8	0.587	1291.1	968.0	968.0	710.3
BDP261,262,263,260 LED50-4S/727	3350.0	36.0	93.1	1.2	1.2	0.9	0.9	0.66	1452.0	1089.0	1089.0	798.6
BDP261,262,263,260 LED55-4S/727	3696.0	40.5	91.3	1.35	1.35	1.013	1.013	0.743	1633.5	1225.7	1225.7	899.0
BDP261,262,263,260 LED59-4S/727	4020.0	39.5	101.8	1.317	1.317	0.988	0.988	0.724	1593.6	1195.5	1195.5	876.0
BDP261,262,263,260 LED64-4S/727	4288.0	42.5	100.9	1.417	1.417	1.063	1.063	0.779	1714.6	1286.2	1286.2	942.6
BDP261,262,263,260 LED69-4S/727	4690.0	46.5	100.9	1.55	1.55	1.162	1.162	0.853	1875.5	1406.0	1406.0	1032.1
BDP261,262,263,260 LED74-4S/727	4884.0	50.0	97.7	1.667	1.667	1.25	1.25	0.917	2017.1	1512.5	1512.5	1109.6
BDP261,262,263,260 LED79-4S/727	5280.0	53.0	99.6	1.767	1.767	1.325	1.325	0.972	2138.1	1603.2	1603.2	1176.1
BDP261,264,263,260 LED84-4S/727	5460.0	57.0	95.8	1.9	1.9	1.425	1.425	1.045	2299.0	1724.2	1724.2	1264.4
BDP261,262,263,260 LED90-4S/727	5850.0	62.0	94.4	2.067	2.067	1.55	1.55	1.137	2501.1	1875.5	1875.5	1375.8
BDP261,262,263,260 LED94-4S/727	6110.0	65.0	94.0	2.167	2.167	1.625	1.625	1.192	2622.1	1966.2	1966.2	1442.3
BDP261,262,263,260 LED100-4S/727	6500.0	69.0	94.2	2.3	2.3	1.725	1.725	1.265	2783.0	2087.2	2087.2	1530.6
BDP261,262,263,260 LED7-4S/722	476.0	6.5	73.2	0.217	0.217	0.163	0.163	0.119	262.6	197.2	197.2	144.0
BDP261,262,263,260 LED9-4S/722	612.0	7.8	78.5	0.26	0.26	0.195	0.195	0.143	314.6	236.0	236.0	173.0
BDP261,262,263,260 LED11-4S/722	748.0	9.2	81.3	0.307	0.307	0.23	0.23	0.169	371.5	278.3	278.3	204.5
BDP261,262,263,260 LED12-4S/722	816.0	10.0	81.6	0.333	0.333	0.25	0.25	0.183	402.9	302.5	302.5	221.4
BDP261,262,263,260 LED14-4S/722	952.0	11.6	82.1	0.387	0.387	0.29	0.29	0.213	468.3	350.9	350.9	257.7
BDP261,262,263,260 LED16-4S/722	1088.0	13.0	83.7	0.433	0.433	0.325	0.325	0.238	523.9	393.2	393.2	288.0
BDP261,262,263,260 LED18-4S/722	1224.0	14.6	83.8	0.487	0.487	0.365	0.365	0.268	589.3	441.6	441.6	324.3
BDP261,262,263,260 LED20-4S/722	1360.0	16.4	82.9	0.547	0.547	0.41	0.41	0.301	661.9	496.1	496.1	364.2
BDP261,262,263,260 LED22-4S/722	1496.0	18.0	83.1	0.6	0.6	0.45	0.45	0.33	726.0	544.5	544.5	399.3
BDP261,262,263,260 LED24-4S/722	1632.0	19.8	82.4	0.66	0.66	0.495	0.495	0.363	798.6	599.0	599.0	439.2
BDP261,262,263,260 LED27-4S/722	1836.0	22.5	81.6	0.75	0.75	0.562	0.562	0.413	907.5	680.0	680.0	499.7

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BDP261,262,263,260 LED30-4S/722	2010.0	25.5	78.8	0.85	0.85	0.638	0.638	0.468	1028.5	772.0	772.0	566.3
BDP261,262,263,260 LED35-4S/722	2345.0	27.5	85.3	0.917	0.917	0.688	0.688	0.504	1109.6	832.5	832.5	609.8
BDP261,262,263,260 LED39-4S/722	2613.0	31.0	84.3	1.033	1.033	0.775	0.775	0.568	1249.9	937.8	937.8	687.3
BDP261,262,263,260 LED45-4S/722	3015.0	36.5	82.6	1.217	1.217	0.913	0.913	0.669	1472.6	1104.7	1104.7	809.5
BDP261,262,263,260 LED50-4S/722	3350.0	37.0	90.5	1.233	1.233	0.925	0.925	0.678	1491.9	1119.2	1119.2	820.4
BDP261,262,263,260 LED55-4S/722	3618.0	41.0	88.2	1.367	1.367	1.025	1.025	0.752	1654.1	1240.2	1240.2	909.9
BDP261,262,263,260 LED59-4S/722	4020.0	44.0	91.4	1.467	1.467	1.1	1.1	0.807	1775.1	1331.0	1331.0	976.5
BDP261,262,263,260 LED64-4S/722	4224.0	48.0	88.0	1.6	1.6	1.2	1.2	0.88	1936.0	1452.0	1452.0	1064.8
BDP261,262,263,260 LED69-4S/722	4620.0	52.0	88.8	1.733	1.733	1.3	1.3	0.953	2096.9	1573.0	1573.0	1153.1
BDP261,262,263,260 LED74-4S/722	4884.0	56.0	87.2	1.867	1.867	1.4	1.4	1.027	2259.1	1694.0	1694.0	1242.7
BDP261,262,263,260 LED7-4S/830	476.0	5.9	80.7	0.197	0.197	0.148	0.148	0.108	238.4	179.1	179.1	130.7
BDP261,262,263,260 LED9-4S/830	612.0	7.2	85.0	0.24	0.24	0.18	0.18	0.132	290.4	217.8	217.8	159.7
BDP261,262,263,260 LED11-4S/830	748.0	8.4	89.0	0.28	0.28	0.21	0.21	0.154	338.8	254.1	254.1	186.3
BDP261,262,263,260 LED12-4S/830	816.0	9.0	90.7	0.3	0.3	0.225	0.225	0.165	363.0	272.2	272.2	199.6
BDP261,262,263,260 LED14-4S/830	952.0	10.4	91.5	0.347	0.347	0.26	0.26	0.191	419.9	314.6	314.6	231.1
BDP261,262,263,260 LED16-4S/830	1088.0	11.8	92.2	0.393	0.393	0.295	0.295	0.216	475.5	357.0	357.0	261.4
BDP261,262,263,260 LED18-4S/830	1224.0	13.2	92.7	0.44	0.44	0.33	0.33	0.242	532.4	399.3	399.3	292.8
BDP261,262,263,260 LED20-4S/830	1360.0	14.6	93.2	0.487	0.487	0.365	0.365	0.268	589.3	441.6	441.6	324.3
BDP261,262,263,260 LED22-4S/830	1496.0	16.0	93.5	0.533	0.533	0.4	0.4	0.293	644.9	484.0	484.0	354.5
BDP261,262,263,260 LED24-4S/830	1632.0	17.6	92.7	0.587	0.587	0.44	0.44	0.323	710.3	532.4	532.4	390.8
BDP261,262,263,260 LED27-4S/830	1836.0	20.0	91.8	0.667	0.667	0.5	0.5	0.367	807.1	605.0	605.0	444.1
BDP261,262,263,260 LED30-4S/830	2040.0	22.5	90.7	0.75	0.75	0.562	0.562	0.413	907.5	680.0	680.0	499.7
BDP261,262,263,260 LED35-4S/830	2345.0	24.5	95.7	0.817	0.817	0.613	0.613	0.449	988.6	741.7	741.7	543.3
BDP261,262,263,260 LED39-4S/830	2613.0	27.5	95.0	0.917	0.917	0.688	0.688	0.504	1109.6	832.5	832.5	609.8
BDP261,262,263,260 LED45-4S/830	3015.0	32.0	94.2	1.067	1.067	0.8	0.8	0.587	1291.1	968.0	968.0	710.3

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BDP261,262,263,260 LED50-4S/830	3350.0	36.0	93.1	1.2	1.2	0.9	0.9	0.66	1452.0	1089.0	1089.0	798.6
BDP261,262,263,260 LED55-4S/830	3618.0	36.5	99.1	1.217	1.217	0.913	0.913	0.669	1472.6	1104.7	1104.7	809.5
BDP261,262,263,260 LED59-4S/830	4020.0	39.5	101.8	1.317	1.317	0.988	0.988	0.724	1593.6	1195.5	1195.5	876.0
BDP261,262,263,260 LED64-4S/830	4288.0	42.5	100.9	1.417	1.417	1.063	1.063	0.779	1714.6	1286.2	1286.2	942.6
BDP261,262,263,260 LED69-4S/830	4690.0	46.5	100.9	1.55	1.55	1.162	1.162	0.853	1875.5	1406.0	1406.0	1032.1
BDP261,262,263,260 LED74-4S/830	4884.0	50.0	97.7	1.667	1.667	1.25	1.25	0.917	2017.1	1512.5	1512.5	1109.6
BDP261,262,263,260 LED79-4S/830	5280.0	53.0	99.6	1.767	1.767	1.325	1.325	0.972	2138.1	1603.2	1603.2	1176.1
BDP261,264,263,260 LED84-4S/830	5460.0	57.0	95.8	1.9	1.9	1.425	1.425	1.045	2299.0	1724.2	1724.2	1264.4
BDP261,262,263,260 LED90-4S/830	5850.0	62.0	94.4	2.067	2.067	1.55	1.55	1.137	2501.1	1875.5	1875.5	1375.8
BDP261,262,263,260 LED94-4S/830	6110.0	65.0	94.0	2.167	2.167	1.625	1.625	1.192	2622.1	1966.2	1966.2	1442.3
BDP261,262,263,260 LED100-4S/830	6500.0	69.0	94.2	2.3	2.3	1.725	1.725	1.265	2783.0	2087.2	2087.2	1530.6

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.

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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 (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	0.19	0.122	0.092	0.092	0.067	147.6	111.3	111.3	81.1
BDP261,262,263,260 LED10-4S/740	680.0	6.9	98.6	0.23	0.118	0.088	0.088	0.065	142.8	106.5	106.5	78.6
BDP261,262,263,260 LED12-4S/740	816.0	7.9	103.3	0.263	0.113	0.085	0.085	0.062	136.7	102.8	102.8	75.0
BDP261,262,263,260 LED14-4S/740	952.0	8.9	107.0	0.297	0.109	0.082	0.082	0.06	131.9	99.2	99.2	72.6
BDP261,262,263,260 LED16-4S/740	1088.0	10.0	108.8	0.333	0.107	0.08	0.08	0.059	129.5	96.8	96.8	71.4

BDP261,262,263,260 LED18-4S/740	1224.0	11.2	109.3	0.373	0.107	0.08	0.08	0.059	129.5	96.8	96.8	71.4
BDP261,262,263,260 LED20-4S/740	1360.0	12.4	109.7	0.413	0.106	0.08	0.08	0.058	128.3	96.8	96.8	70.2
BDP261,262,263,260 LED22-4S/740	1496.0	13.4	111.6	0.447	0.105	0.079	0.079	0.058	127.0	95.6	95.6	70.2
BDP261,262,263,260 LED24-4S/740	1632.0	14.8	110.3	0.493	0.106	0.08	0.08	0.058	128.3	96.8	96.8	70.2
BDP261,262,263,260 LED27-4S/740	1836.0	16.6	110.6	0.553	0.105	0.079	0.079	0.058	127.0	95.6	95.6	70.2
BDP261,262,263,260 LED30-4S/740	2040.0	18.6	109.7	0.62	0.106	0.08	0.08	0.058	128.3	96.8	96.8	70.2
BDP261,262,263,260 LED35-4S/740	2380.0	22.0	108.2	0.733	0.108	0.081	0.081	0.059	130.7	98.0	98.0	71.4
BDP261,262,263,260 LED39-4S/740	2613.0	23.0	113.6	0.767	0.103	0.077	0.077	0.057	124.6	93.2	93.2	69.0
BDP261,262,263,260 LED45-4S/740	3015.0	27.0	111.7	0.9	0.104	0.078	0.078	0.057	125.8	94.4	94.4	69.0
BDP261,262,263,260 LED50-4S/740	3350.0	30.0	111.7	1.0	0.104	0.078	0.078	0.057	125.8	94.4	94.4	69.0
BDP261,262,263,260 LED55-4S/740	3752.0	33.0	113.7	1.1	0.103	0.077	0.077	0.057	124.6	93.2	93.2	69.0
BDP261,262,263,260 LED59-4S/740	4020.0	36.0	111.7	1.2	0.104	0.078	0.078	0.057	125.8	94.4	94.4	69.0
BDP261,262,263,260 LED64-4S/740	4288.0	39.5	108.6	1.317	0.107	0.08	0.08	0.059	129.5	96.8	96.8	71.4
BDP261,262,263,260 LED69-4S/740	4690.0	38.5	121.8	1.283	0.096	0.072	0.072	0.053	116.2	87.1	87.1	64.1
BDP261,262,263,260 LED74-4S/740	4958.0	41.5	119.5	1.383	0.098	0.074	0.074	0.054	118.6	89.5	89.5	65.3
BDP261,262,263,260 LED79-4S/740	5226.0	44.5	117.4	1.483	0.099	0.074	0.074	0.054	119.8	89.5	89.5	65.3
BDP261,262,263,260 LED84-4S/740	5544.0	47.5	116.7	1.583	0.1	0.075	0.075	0.055	121.0	90.8	90.8	66.6
BDP261,262,263,260 LED90-4S/740	5940.0	51.0	116.5	1.7	0.1	0.075	0.075	0.055	121.0	90.8	90.8	66.6
BDP261,262,263,260 LED94-4S/740	6204.0	53.0	117.1	1.767	0.1	0.075	0.075	0.055	121.0	90.8	90.8	66.6
BDP261,262,263,260 LED100-4S/740	6500.0	57.0	114.0	1.9	0.102	0.076	0.076	0.056	123.4	92.0	92.0	67.8
BDP261,262,263,260 LED8-4S/730	544.0	6.0	90.7	0.2	0.129	0.097	0.097	0.071	156.1	117.4	117.4	85.9
BDP261,262,263,260 LED10-4S/730	680.0	7.2	94.4	0.24	0.124	0.093	0.093	0.068	150.0	112.5	112.5	82.3
BDP261,262,263,260 LED12-4S/730	816.0	8.2	99.5	0.273	0.117	0.088	0.088	0.064	141.6	106.5	106.5	77.4
BDP261,262,263,260 LED14-4S/730	952.0	9.4	101.3	0.313	0.115	0.086	0.086	0.063	139.2	104.1	104.1	76.2
BDP261,262,263,260 LED16-4S/730	1088.0	10.6	102.6	0.353	0.114	0.086	0.086	0.063	137.9	104.1	104.1	76.2

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BDP261,262,263,260 LED18-4S/730	1224.0	11.8	103.7	0.393	0.112	0.084	0.084	0.062	135.5	101.6	101.6	75.0
BDP261,262,263,260 LED20-4S/730	1360.0	13.0	104.6	0.433	0.111	0.083	0.083	0.061	134.3	100.4	100.4	73.8
BDP261,262,263,260 LED22-4S/730	1496.0	14.2	105.4	0.473	0.111	0.083	0.083	0.061	134.3	100.4	100.4	73.8
BDP261,262,263,260 LED24-4S/730	1632.0	15.6	104.6	0.52	0.112	0.084	0.084	0.062	135.5	101.6	101.6	75.0
BDP261,262,263,260 LED27-4S/730	1836.0	17.6	104.3	0.587	0.112	0.084	0.084	0.062	135.5	101.6	101.6	75.0
BDP261,262,263,260 LED30-4S/730	2040.0	19.8	103.0	0.66	0.113	0.085	0.085	0.062	136.7	102.8	102.8	75.0
BDP261,262,263,260 LED35-4S/730	2380.0	23.5	101.3	0.783	0.115	0.086	0.086	0.063	139.2	104.1	104.1	76.2
BDP261,262,263,260 LED39-4S/730	2613.0	24.5	106.7	0.817	0.109	0.082	0.082	0.06	131.9	99.2	99.2	72.6
BDP261,262,263,260 LED45-4S/730	3015.0	28.5	105.8	0.95	0.11	0.082	0.082	0.061	133.1	99.2	99.2	73.8
BDP261,262,263,260 LED50-4S/730	3350.0	32.0	104.7	1.067	0.111	0.083	0.083	0.061	134.3	100.4	100.4	73.8
BDP261,262,263,260 LED55-4S/730	3752.0	35.5	105.7	1.183	0.11	0.082	0.082	0.061	133.1	99.2	99.2	73.8
BDP261,262,263,260 LED59-4S/730	4020.0	38.5	104.4	1.283	0.112	0.084	0.084	0.062	135.5	101.6	101.6	75.0
BDP261,262,263,260 LED64-4S/730	4288.0	38.0	112.8	1.267	0.103	0.077	0.077	0.057	124.6	93.2	93.2	69.0
BDP261,262,263,260 LED69-4S/730	4690.0	41.0	114.4	1.367	0.102	0.076	0.076	0.056	123.4	92.0	92.0	67.8
BDP261,262,263,260 LED74-4S/730	4958.0	44.0	112.7	1.467	0.104	0.078	0.078	0.057	125.8	94.4	94.4	69.0
BDP261,262,263,260 LED79-4S/730	5280.0	47.5	111.2	1.583	0.105	0.079	0.079	0.058	127.0	95.6	95.6	70.2
BDP261,262,263,260 LED84-4S/730	5544.0	51.0	108.7	1.7	0.107	0.08	0.08	0.059	129.5	96.8	96.8	71.4
BDP261,262,263,260 LED90-4S/730	5940.0	54.0	110.0	1.8	0.106	0.08	0.08	0.058	128.3	96.8	96.8	70.2
BDP261,262,263,260 LED94-4S/730	6110.0	57.0	107.2	1.9	0.109	0.082	0.082	0.06	131.9	99.2	99.2	72.6
BDP261,262,263,260 LED100-4S/730	6500.0	61.0	106.6	2.033	0.109	0.082	0.082	0.06	131.9	99.2	99.2	72.6
BDP261,262,263,260 LED7-4S/727	476.0	5.9	80.7	0.197	0.145	0.109	0.109	0.08	175.4	131.9	131.9	96.8
BDP261,262,263,260 LED9-4S/727	612.0	7.2	85.0	0.24	0.137	0.103	0.103	0.075	165.8	124.6	124.6	90.8
BDP261,262,263,260 LED11-4S/727	748.0	8.4	89.0	0.28	0.131	0.098	0.098	0.072	158.5	118.6	118.6	87.1
BDP261,262,263,260 LED13-4S/727	884.0	9.7	91.1	0.323	0.128	0.096	0.096	0.07	154.9	116.2	116.2	84.7
BDP261,262,263,260 LED14-4S/727	952.0	10.4	91.5	0.347	0.128	0.096	0.096	0.07	154.9	116.2	116.2	84.7

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BDP261,262,263,260 LED16-4S/727	1088.0	11.8	92.2	0.393	0.126	0.094	0.094	0.069	152.5	113.7	113.7	83.5
BDP261,262,263,260 LED18-4S/727	1224.0	13.2	92.7	0.44	0.126	0.094	0.094	0.069	152.5	113.7	113.7	83.5
BDP261,262,263,260 LED20-4S/727	1360.0	14.6	93.2	0.487	0.125	0.094	0.094	0.069	151.2	113.7	113.7	83.5
BDP261,262,263,260 LED22-4S/727	1496.0	16.0	93.5	0.533	0.125	0.094	0.094	0.069	151.2	113.7	113.7	83.5
BDP261,262,263,260 LED24-4S/727	1632.0	17.6	92.7	0.587	0.126	0.094	0.094	0.069	152.5	113.7	113.7	83.5
BDP261,262,263,260 LED27-4S/727	1836.0	20.0	91.8	0.667	0.127	0.095	0.095	0.07	153.7	115.0	115.0	84.7
BDP261,262,263,260 LED30-4S/727	2040.0	22.5	90.7	0.75	0.129	0.097	0.097	0.071	156.1	117.4	117.4	85.9
BDP261,262,263,260 LED35-4S/727	2345.0	26.5	88.5	0.883	0.132	0.099	0.099	0.073	159.7	119.8	119.8	88.3
BDP261,262,263,260 LED39-4S/727	2613.0	27.5	95.0	0.917	0.123	0.092	0.092	0.068	148.8	111.3	111.3	82.3
BDP261,262,263,260 LED45-4S/727	3015.0	32.0	94.2	1.067	0.124	0.093	0.093	0.068	150.0	112.5	112.5	82.3
BDP261,262,263,260 LED50-4S/727	3350.0	36.0	93.1	1.2	0.125	0.094	0.094	0.069	151.2	113.7	113.7	83.5
BDP261,262,263,260 LED55-4S/727	3696.0	40.5	91.3	1.35	0.128	0.096	0.096	0.07	154.9	116.2	116.2	84.7
BDP261,262,263,260 LED59-4S/727	4020.0	39.5	101.8	1.317	0.115	0.086	0.086	0.063	139.2	104.1	104.1	76.2
BDP261,262,263,260 LED64-4S/727	4288.0	42.5	100.9	1.417	0.116	0.087	0.087	0.064	140.4	105.3	105.3	77.4
BDP261,262,263,260 LED69-4S/727	4690.0	46.5	100.9	1.55	0.116	0.087	0.087	0.064	140.4	105.3	105.3	77.4
BDP261,262,263,260 LED74-4S/727	4884.0	50.0	97.7	1.667	0.119	0.089	0.089	0.065	144.0	107.7	107.7	78.6
BDP261,262,263,260 LED79-4S/727	5280.0	53.0	99.6	1.767	0.117	0.088	0.088	0.064	141.6	106.5	106.5	77.4
BDP261,262,263,260 LED84-4S/727	5460.0	57.0	95.8	1.9	0.122	0.092	0.092	0.067	147.6	111.3	111.3	81.1
BDP261,262,263,260 LED90-4S/727	5850.0	62.0	94.4	2.067	0.124	0.093	0.093	0.068	150.0	112.5	112.5	82.3
BDP261,262,263,260 LED94-4S/727	6110.0	65.0	94.0	2.167	0.124	0.093	0.093	0.068	150.0	112.5	112.5	82.3
BDP261,262,263,260 LED100-4S/727	6500.0	69.0	94.2	2.3	0.124	0.093	0.093	0.068	150.0	112.5	112.5	82.3
BDP261,262,263,260 LED7-4S/722	476.0	6.5	73.2	0.217	0.16	0.12	0.12	0.088	193.6	145.2	145.2	106.5
BDP261,262,263,260 LED9-4S/722	612.0	7.8	78.5	0.26	0.149	0.112	0.112	0.082	180.3	135.5	135.5	99.2
BDP261,262,263,260 LED11-4S/722	748.0	9.2	81.3	0.307	0.144	0.108	0.108	0.079	174.2	130.7	130.7	95.6
BDP261,262,263,260 LED12-4S/722	816.0	10.0	81.6	0.333	0.143	0.107	0.107	0.079	173.0	129.5	129.5	95.6

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BDP261,262,263,260 LED14-4S/722	952.0	11.6	82.1	0.387	0.142	0.106	0.106	0.078	171.8	128.3	128.3	94.4
BDP261,262,263,260 LED16-4S/722	1088.0	13.0	83.7	0.433	0.139	0.104	0.104	0.076	168.2	125.8	125.8	92.0
BDP261,262,263,260 LED18-4S/722	1224.0	14.6	83.8	0.487	0.139	0.104	0.104	0.076	168.2	125.8	125.8	92.0
BDP261,262,263,260 LED20-4S/722	1360.0	16.4	82.9	0.547	0.141	0.106	0.106	0.078	170.6	128.3	128.3	94.4
BDP261,262,263,260 LED22-4S/722	1496.0	18.0	83.1	0.6	0.14	0.105	0.105	0.077	169.4	127.0	127.0	93.2
BDP261,262,263,260 LED24-4S/722	1632.0	19.8	82.4	0.66	0.142	0.106	0.106	0.078	171.8	128.3	128.3	94.4
BDP261,262,263,260 LED27-4S/722	1836.0	22.5	81.6	0.75	0.143	0.107	0.107	0.079	173.0	129.5	129.5	95.6
BDP261,262,263,260 LED30-4S/722	2010.0	25.5	78.8	0.85	0.148	0.111	0.111	0.081	179.1	134.3	134.3	98.0
BDP261,262,263,260 LED35-4S/722	2345.0	27.5	85.3	0.917	0.137	0.103	0.103	0.075	165.8	124.6	124.6	90.8
BDP261,262,263,260 LED39-4S/722	2613.0	31.0	84.3	1.033	0.138	0.104	0.104	0.076	167.0	125.8	125.8	92.0
BDP261,262,263,260 LED45-4S/722	3015.0	36.5	82.6	1.217	0.141	0.106	0.106	0.078	170.6	128.3	128.3	94.4
BDP261,262,263,260 LED50-4S/722	3350.0	37.0	90.5	1.233	0.129	0.097	0.097	0.071	156.1	117.4	117.4	85.9
BDP261,262,263,260 LED55-4S/722	3618.0	41.0	88.2	1.367	0.132	0.099	0.099	0.073	159.7	119.8	119.8	88.3
BDP261,262,263,260 LED59-4S/722	4020.0	44.0	91.4	1.467	0.128	0.096	0.096	0.07	154.9	116.2	116.2	84.7
BDP261,262,263,260 LED64-4S/722	4224.0	48.0	88.0	1.6	0.133	0.1	0.1	0.073	160.9	121.0	121.0	88.3
BDP261,262,263,260 LED69-4S/722	4620.0	52.0	88.8	1.733	0.131	0.098	0.098	0.072	158.5	118.6	118.6	87.1
BDP261,262,263,260 LED74-4S/722	4884.0	56.0	87.2	1.867	0.134	0.1	0.1	0.074	162.1	121.0	121.0	89.5
BDP261,262,263,260 LED7-4S/830	476.0	5.9	80.7	0.197	0.145	0.109	0.109	0.08	175.4	131.9	131.9	96.8
BDP261,262,263,260 LED9-4S/830	612.0	7.2	85.0	0.24	0.137	0.103	0.103	0.075	165.8	124.6	124.6	90.8
BDP261,262,263,260 LED11-4S/830	748.0	8.4	89.0	0.28	0.131	0.098	0.098	0.072	158.5	118.6	118.6	87.1
BDP261,262,263,260 LED12-4S/830	816.0	9.0	90.7	0.3	0.129	0.097	0.097	0.071	156.1	117.4	117.4	85.9
BDP261,262,263,260 LED14-4S/830	952.0	10.4	91.5	0.347	0.128	0.096	0.096	0.07	154.9	116.2	116.2	84.7
BDP261,262,263,260 LED16-4S/830	1088.0	11.8	92.2	0.393	0.126	0.094	0.094	0.069	152.5	113.7	113.7	83.5
BDP261,262,263,260 LED18-4S/830	1224.0	13.2	92.7	0.44	0.126	0.094	0.094	0.069	152.5	113.7	113.7	83.5
BDP261,262,263,260 LED20-4S/830	1360.0	14.6	93.2	0.487	0.125	0.094	0.094	0.069	151.2	113.7	113.7	83.5

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BDP261,262,263,260 LED22-4S/830	1496.0	16.0	93.5	0.533	0.125	0.094	0.094	0.069	151.2	113.7	113.7	83.5
BDP261,262,263,260 LED24-4S/830	1632.0	17.6	92.7	0.587	0.126	0.094	0.094	0.069	152.5	113.7	113.7	83.5
BDP261,262,263,260 LED27-4S/830	1836.0	20.0	91.8	0.667	0.127	0.095	0.095	0.07	153.7	115.0	115.0	84.7
BDP261,262,263,260 LED30-4S/830	2040.0	22.5	90.7	0.75	0.129	0.097	0.097	0.071	156.1	117.4	117.4	85.9
BDP261,262,263,260 LED35-4S/830	2345.0	24.5	95.7	0.817	0.122	0.092	0.092	0.067	147.6	111.3	111.3	81.1
BDP261,262,263,260 LED39-4S/830	2613.0	27.5	95.0	0.917	0.123	0.092	0.092	0.068	148.8	111.3	111.3	82.3
BDP261,262,263,260 LED45-4S/830	3015.0	32.0	94.2	1.067	0.124	0.093	0.093	0.068	150.0	112.5	112.5	82.3
BDP261,262,263,260 LED50-4S/830	3350.0	36.0	93.1	1.2	0.125	0.094	0.094	0.069	151.2	113.7	113.7	83.5
BDP261,262,263,260 LED55-4S/830	3618.0	36.5	99.1	1.217	0.118	0.088	0.088	0.065	142.8	106.5	106.5	78.6
BDP261,262,263,260 LED59-4S/830	4020.0	39.5	101.8	1.317	0.115	0.086	0.086	0.063	139.2	104.1	104.1	76.2
BDP261,262,263,260 LED64-4S/830	4288.0	42.5	100.9	1.417	0.116	0.087	0.087	0.064	140.4	105.3	105.3	77.4
BDP261,262,263,260 LED69-4S/830	4690.0	46.5	100.9	1.55	0.116	0.087	0.087	0.064	140.4	105.3	105.3	77.4
BDP261,262,263,260 LED74-4S/830	4884.0	50.0	97.7	1.667	0.119	0.089	0.089	0.065	144.0	107.7	107.7	78.6
BDP261,262,263,260 LED79-4S/830	5280.0	53.0	99.6	1.767	0.117	0.088	0.088	0.064	141.6	106.5	106.5	77.4
BDP261,262,263,260 LED84-4S/830	5460.0	57.0	95.8	1.9	0.122	0.092	0.092	0.067	147.6	111.3	111.3	81.1
BDP261,262,263,260 LED90-4S/830	5850.0	62.0	94.4	2.067	0.124	0.093	0.093	0.068	150.0	112.5	112.5	82.3
BDP261,262,263,260 LED94-4S/830	6110.0	65.0	94.0	2.167	0.124	0.093	0.093	0.068	150.0	112.5	112.5	82.3
BDP261,262,263,260 LED100-4S/830	6500.0	69.0	94.2	2.3	0.124	0.093	0.093	0.068	150.0	112.5	112.5	82.3

* 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.

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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 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

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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

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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