

ENVIRONMENTAL PRODUCT DECLARATION

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

Philips MileWide LED gen2 small

BRP435/BPP435

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: <input checked="" type="checkbox"/> Internal certification <input type="checkbox"/> 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 MileWide LED gen2 small
Additional labels	BRP435 LED100-/830 II DM11 7023 MSP D9 S
Product reference	910770236458
Place of production	Poland
Period for data	2022
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	%

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 unit
Declared unit mass	8.443 kg
GWP-fossil, A1-A3 (kgCO ₂ e)	6,27E+01
GWP-total, A1-A3 (kgCO ₂ e)	6,10E+01
Secondary material, inputs (%)	29.6
Secondary material, outputs (%)	56.6
Total energy use, A1-A3 (kWh)	253
Total water use, A1-A3 (m ³ e)	1.15

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

Philips MileWide LED Gen2, developed together with Holscher Design, is the latest generation of our highly popular MileWide lighting family that features a range of dedicated masts and brackets. The pure, clean design of MileWide LED Gen2 integrates perfectly with the cityscapes of today and tomorrow. Available in two sizes, BPP435 (small) and BPP436 (large), this MileWide pole light will bring a touch of elegance and fluidity to any urban application (side entry versions: BRP435 and BRP436). Thanks to its advanced LED engine, and use of application-tailored optics, MileWide LED Gen2 delivers outstanding quality of light and light performance, enabling significant energy savings, yet still providing perfectly uniform light on the road. The luminaire is available with one or two Zhaga-D4i (ZD4i) System Ready (SR) sockets, which makes the luminaire future ready. This means MileWide LED Gen2 is ready to pair with advanced controls and lighting software applications such as Interact, or sensors such as the Philips Outdoor Sensor Bundle (OSB). Furthermore, each MileWide LED Gen2 luminaire 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 a digital library of

Philips MileWide LED gen2 small-BRP435/BPP435

lighting assets and spare parts. In order to reduce the impact on the environment, main metal parts are manufactured using 88% recycled aluminum.

For more information, please visit

<https://www.lighting.philips.com/link/BPP435/fam/aa/en>

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	52.67	EUR, ASIA
Minerals	16.87	EU , APAC
Fossil materials	30.46	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	0.285

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 Product
Mass per declared unit	8.443 kg
Functional unit	1 unit of 6700 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

Philips MileWide LED gen2 small-BRP435/BPP435

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

TRANSPORT AND INSTALLATION (A4-A5)

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

PRODUCT USE AND MAINTENANCE (B1-B7)

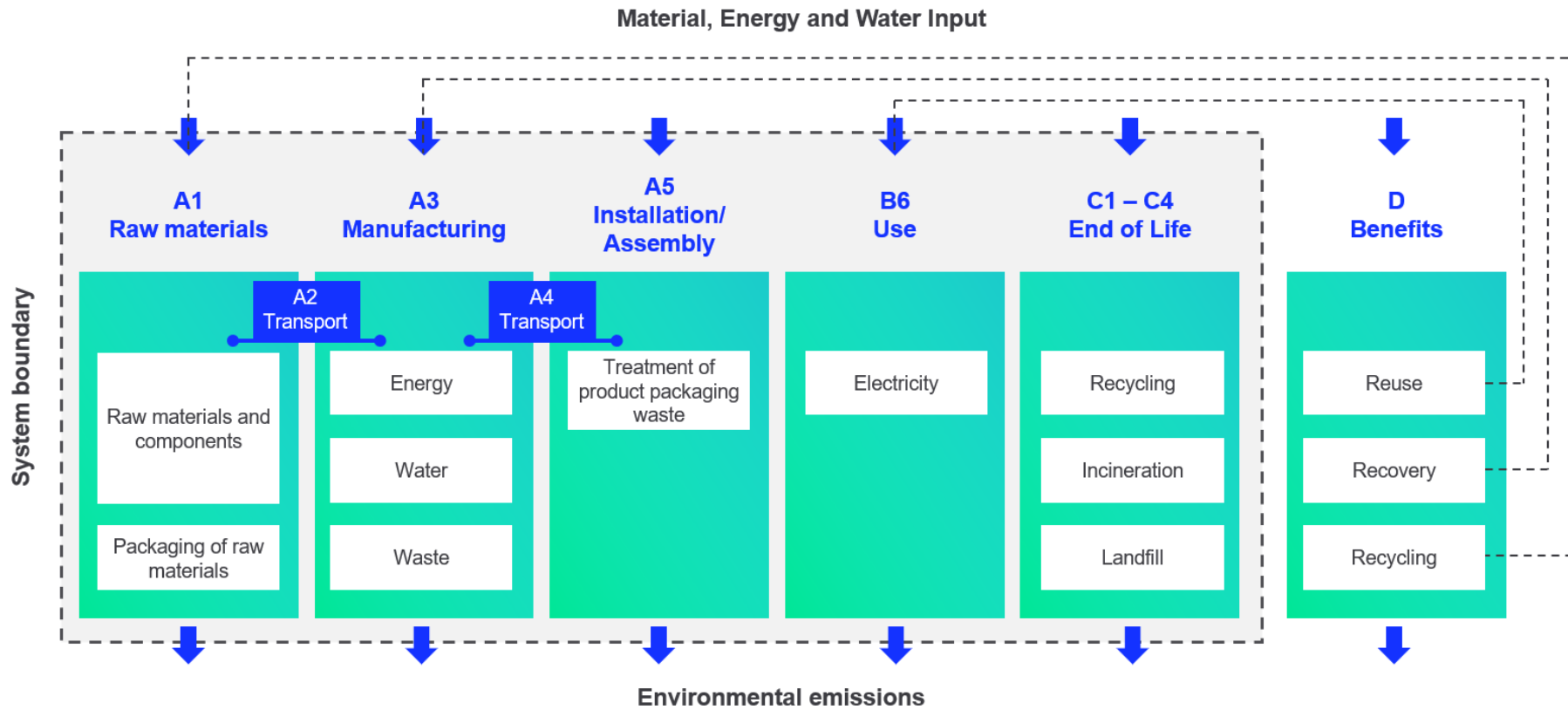
During the use phase, the product consumes electricity from Europe's electricity grid mix (B6). The total power consumption of the reference product is calculated as follows: Wattage x Reference lifetime = kWh consumed throughout the entire use phase B6.

PRODUCT END OF LIFE (C1-C4, D)

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

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

SYSTEM BOUNDARY



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

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

ALLOCATION, ESTIMATES AND ASSUMPTIONS

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

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

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

AVERAGES AND VARIABILITY

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

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

LCA SOFTWARE AND BIBLIOGRAPHY

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

ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total ¹⁾	kg CO ₂ e	5,89E+01	1,72E+00	2,82E-01	6,10E+01	1,72E+00	1,08E+00	MNR	MNR	MNR	MNR	MNR	3,05E+03	MNR	MNR	1,19E-01	2,89E+00	2,43E+00	-1,09E+01
GWP – fossil	kg CO ₂ e	5,97E+01	1,72E+00	1,31E+00	6,27E+01	1,72E+00	4,96E-02	MNR	MNR	MNR	MNR	MNR	3,04E+03	MNR	MNR	1,19E-01	2,89E+00	1,56E+00	-1,09E+01
GWP – biogenic	kg CO ₂ e	-8,74E-01	0,00E+00	-1,03E+00	-1,90E+00	6,65E-04	1,03E+00	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	0,00E+00	8,74E-01	-1,38E-02
GWP – LULUC	kg CO ₂ e	9,91E-02	7,04E-04	4,70E-03	1,05E-01	6,34E-04	9,28E-06	MNR	MNR	MNR	MNR	MNR	7,12E+00	MNR	MNR	4,38E-05	1,38E-04	1,02E-04	-7,34E-03
Ozone depletion pot.	kg CFC ₁₁ e	3,77E-06	3,90E-07	1,79E-07	4,33E-06	3,95E-07	2,72E-09	MNR	MNR	MNR	MNR	MNR	1,55E-04	MNR	MNR	2,73E-08	1,48E-08	1,39E-08	-3,69E-07
Acidification potential	mol H ⁺ e	8,27E-01	1,27E-02	4,90E-03	8,45E-01	7,28E-03	2,15E-04	MNR	MNR	MNR	MNR	MNR	1,74E+01	MNR	MNR	5,03E-04	1,54E-03	7,34E-04	-5,01E-01
EP-freshwater ²⁾	kg Pe	3,65E-03	1,32E-05	4,59E-05	3,71E-03	1,41E-05	2,85E-07	MNR	MNR	MNR	MNR	MNR	3,22E-01	MNR	MNR	9,72E-07	4,27E-06	4,58E-06	-1,62E-03
EP-marine	kg Ne	7,64E-02	3,46E-03	2,08E-03	8,20E-02	2,16E-03	9,13E-05	MNR	MNR	MNR	MNR	MNR	2,30E+00	MNR	MNR	1,49E-04	4,94E-04	1,09E-03	-2,17E-02
EP-terrestrial	mol Ne	8,55E-01	3,83E-02	1,36E-02	9,07E-01	2,39E-02	9,47E-04	MNR	MNR	MNR	MNR	MNR	2,62E+01	MNR	MNR	1,65E-03	5,31E-03	2,83E-03	-3,04E-01
POCP (“smog”) ³⁾	kg NMVOCe	2,71E-01	1,12E-02	3,90E-03	2,86E-01	7,63E-03	2,37E-04	MNR	MNR	MNR	MNR	MNR	7,18E+00	MNR	MNR	5,27E-04	1,36E-03	8,97E-04	-9,06E-02
ADP-minerals & metals ⁴⁾	kg Sbe	1,46E-02	3,85E-06	6,58E-06	1,46E-02	4,03E-06	8,97E-08	MNR	MNR	MNR	MNR	MNR	2,84E-02	MNR	MNR	2,78E-07	8,78E-06	2,99E-07	-1,23E-02
ADP-fossil resources	MJ	7,81E+02	2,54E+01	1,84E+01	8,24E+02	2,58E+01	2,12E-01	MNR	MNR	MNR	MNR	MNR	6,48E+04	MNR	MNR	1,78E+00	1,52E+00	1,24E+00	-1,11E+02
Water use ⁵⁾	m ³ e depr.	5,04E+01	1,10E-01	4,26E-01	5,09E+01	1,16E-01	5,03E-02	MNR	MNR	MNR	MNR	MNR	1,77E+03	MNR	MNR	7,98E-03	1,28E-01	9,74E-02	-2,93E+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	4,88E-06	1,82E-07	8,19E-08	5,14E-06	1,98E-07	1,98E-09	MNR	MNR	MNR	MNR	MNR	5,71E-05	MNR	MNR	1,37E-08	1,54E-08	9,56E-09	-1,21E-06
Ionizing radiation ⁶⁾	kBq U235e	5,11E+00	1,20E-01	4,13E-02	5,28E+00	1,23E-01	7,64E-04	MNR	MNR	MNR	MNR	MNR	1,75E+03	MNR	MNR	8,49E-03	7,81E-03	5,94E-03	-7,18E-01

Ecotoxicity (freshwater)	CTUe	5,17E+03	2,22E+01	3,96E+01	5,23E+03	2,32E+01	1,46E+00	MNR	MNR	MNR	MNR	MNR	4,41E+04	MNR	MNR	1,60E+00	1,03E+01	2,97E+02	-3,04E+03
Human toxicity, cancer	CTUh	2,70E-07	6,22E-10	8,43E-10	2,71E-07	5,71E-10	6,59E-11	MNR	MNR	MNR	MNR	MNR	1,44E-06	MNR	MNR	3,94E-11	3,80E-10	5,03E-09	-7,74E-08
Human tox. non-cancer	CTUh	8,17E-06	2,14E-08	1,31E-08	8,20E-06	2,30E-08	2,77E-09	MNR	MNR	MNR	MNR	MNR	4,74E-05	MNR	MNR	1,59E-09	1,51E-08	3,39E-07	-7,64E-06
SQP ⁷⁾	-	4,46E+02	2,68E+01	2,90E+01	5,01E+02	2,97E+01	1,15E-01	MNR	MNR	MNR	MNR	MNR	1,17E+04	MNR	MNR	2,05E+00	2,04E+00	1,88E+00	-1,60E+02

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

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy ⁸⁾	MJ	1,49E+02	2,75E-01	1,45E+01	1,64E+02	2,91E-01	6,98E-03	MNR	MNR	MNR	MNR	MNR	1,32E+04	MNR	MNR	2,01E-02	1,66E-01	4,53E-02	-1,15E+01
Renew. PER as material	MJ	8,60E+00	0,00E+00	9,00E+00	1,76E+01	0,00E+00	-9,00E+00	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	-2,26E-01	-8,37E+00	0,00E+00
Total use of renew. PER	MJ	1,58E+02	2,75E-01	2,35E+01	1,82E+02	2,91E-01	-8,99E+00	MNR	MNR	MNR	MNR	MNR	1,32E+04	MNR	MNR	2,01E-02	-5,91E-02	-8,33E+00	-1,15E+01
Non-re. PER as energy	MJ	7,03E+02	2,54E+01	1,71E+01	7,46E+02	2,58E+01	2,12E-01	MNR	MNR	MNR	MNR	MNR	6,46E+04	MNR	MNR	1,78E+00	1,52E+00	1,24E+00	-1,11E+02
Non-re. PER as material	MJ	7,80E+01	0,00E+00	5,41E-01	7,85E+01	0,00E+00	-5,41E-01	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	-3,82E+01	-3,98E+01	1,04E-01
Total use of non-re. PER	MJ	7,81E+02	2,54E+01	1,76E+01	8,24E+02	2,58E+01	-3,29E-01	MNR	MNR	MNR	MNR	MNR	6,46E+04	MNR	MNR	1,78E+00	-3,67E+01	-3,85E+01	-1,11E+02
Secondary materials	kg	2,50E+00	7,47E-03	7,02E-01	3,21E+00	7,17E-03	2,54E-04	MNR	MNR	MNR	MNR	MNR	6,67E+00	MNR	MNR	4,95E-04	1,45E-03	2,56E-03	7,41E-01
Renew. secondary fuels	MJ	1,89E-01	6,72E-05	4,99E-02	2,39E-01	7,23E-05	4,17E-06	MNR	MNR	MNR	MNR	MNR	5,41E-02	MNR	MNR	5,00E-06	6,72E-05	2,51E-05	-2,10E-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	1,14E+00	3,13E-03	1,24E-02	1,15E+00	3,34E-03	8,76E-04	MNR	MNR	MNR	MNR	MNR	5,57E+01	MNR	MNR	2,31E-04	4,65E-03	2,58E-03	-1,67E-01

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	9,85E+00	3,37E-02	5,94E-02	9,94E+00	3,42E-02	2,42E-04	MNR	MNR	MNR	MNR	MNR	2,32E+02	MNR	MNR	2,36E-03	7,39E-03	2,09E-01	-2,41E+00
Non-hazardous waste	kg	2,21E+02	5,27E-01	9,16E-01	2,22E+02	5,62E-01	7,13E-01	MNR	MNR	MNR	MNR	MNR	1,47E+04	MNR	MNR	3,89E-02	1,46E+00	3,45E+00	-1,65E+02
Radioactive waste	kg	2,30E-03	1,71E-04	2,69E-05	2,50E-03	1,73E-04	3,36E-07	MNR	MNR	MNR	MNR	MNR	4,71E-01	MNR	MNR	1,19E-05	4,34E-06	0,00E+00	-2,71E-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	3,60E+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	1,18E+00	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	2,90E-01	2,90E-01	0,00E+00	0,00E+00	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	2,60E+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	5,81E+01	1,70E+00	1,33E+00	6,12E+01	1,70E+00	4,84E-02	MNR	MNR	MNR	MNR	MNR	3,01E+03	MNR	MNR	1,18E-01	2,89E+00	1,88E+00	-1,07E+01
Ozone depletion Pot.	kg CFC ₁₁ e	3,19E-06	3,08E-07	1,54E-07	3,65E-06	3,13E-07	2,38E-09	MNR	MNR	MNR	MNR	MNR	1,34E-04	MNR	MNR	2,16E-08	1,25E-08	1,14E-08	-3,09E-07
Acidification	kg SO ₂ e	7,17E-01	1,00E-02	3,63E-03	7,30E-01	5,66E-03	1,57E-04	MNR	MNR	MNR	MNR	MNR	1,47E+01	MNR	MNR	3,91E-04	1,18E-03	5,51E-04	-4,44E-01
Eutrophication	kg PO ₄ ³ e	1,78E-01	1,70E-03	2,39E-03	1,82E-01	1,29E-03	1,17E-04	MNR	MNR	MNR	MNR	MNR	1,13E+01	MNR	MNR	8,90E-05	5,64E-04	5,96E-03	-9,00E-02
POCP (“smog”)	kg C ₂ H ₄ e	3,50E-02	3,24E-04	2,59E-04	3,56E-02	2,21E-04	4,87E-06	MNR	MNR	MNR	MNR	MNR	6,03E-01	MNR	MNR	1,52E-05	3,76E-05	1,10E-04	-1,77E-02
ADP-elements	kg Sbe	1,45E-02	3,73E-06	5,90E-06	1,45E-02	3,90E-06	7,05E-08	MNR	MNR	MNR	MNR	MNR	2,83E-02	MNR	MNR	2,70E-07	8,72E-06	2,64E-07	-1,23E-02
ADP-fossil	MJ	7,80E+02	2,54E+01	1,83E+01	8,24E+02	2,58E+01	2,12E-01	MNR	MNR	MNR	MNR	MNR	6,46E+04	MNR	MNR	1,78E+00	1,52E+00	1,24E+00	-1,11E+02

Philips MileWide LED gen2 small-BRP435/BPP435

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.

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

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
BRP435, BPP435 LED13/740	910.0	8.7	104.6	0.113	0.113	0.085	0.085	0.062	344.7	259.2	259.2	189.1
BRP435, BPP435 LED20/740	1380.0	13.0	106.2	0.169	0.169	0.127	0.127	0.093	515.4	387.4	387.4	283.6
BRP435, BPP435 LED22/740	1518.0	14.2	106.9	0.184	0.184	0.138	0.138	0.101	561.2	420.9	420.9	308.0
BRP435, BPP435 LED25/740	1725.0	15.6	110.6	0.203	0.203	0.152	0.152	0.112	619.2	463.6	463.6	341.6
BRP435, BPP435 LED30/740	2070.0	18.6	111.3	0.242	0.242	0.182	0.182	0.133	738.1	555.1	555.1	405.7
BRP435, BPP435 LED35/740	2415.0	21.5	112.3	0.279	0.279	0.209	0.209	0.153	851.0	637.4	637.4	466.6
BRP435, BPP435 LED45/740	3105.0	27.5	112.9	0.357	0.357	0.268	0.268	0.196	1088.8	817.4	817.4	597.8
BRP435, BPP435 LED55/740	3864.0	32.0	120.8	0.416	0.416	0.312	0.312	0.229	1268.8	951.6	951.6	698.4
BRP435, BPP435 LED65/740	4554.0	38.0	119.8	0.494	0.494	0.37	0.37	0.272	1506.7	1128.5	1128.5	829.6
BRP435, BPP435 LED75/740	5244.0	44.0	119.2	0.571	0.571	0.428	0.428	0.314	1741.6	1305.4	1305.4	957.7
BRP435, BPP435 LED85/740	5934.0	50.0	118.7	0.649	0.649	0.487	0.487	0.357	1979.4	1485.4	1485.4	1088.8
BRP435, BPP435 LED95/740	6624.0	56.0	118.3	0.727	0.727	0.545	0.545	0.4	2217.4	1662.3	1662.3	1220.0

BRP435, BPP435 LED105/740	7140.0	62.0	115.2	0.805	0.805	0.604	0.604	0.443	2455.2	1842.2	1842.2	1351.2
BRP435, BPP435 LED115/740	7705.0	69.0	111.7	0.896	0.896	0.672	0.672	0.493	2732.8	2049.6	2049.6	1503.6
BRP435, BPP435 LED13/730	910.0	9.1	100.0	0.118	0.118	0.088	0.088	0.065	359.9	268.4	268.4	198.2
BRP435, BPP435 LED20/730	1380.0	13.6	101.5	0.177	0.177	0.133	0.133	0.097	539.8	405.7	405.7	295.8
BRP435, BPP435 LED22/730	1518.0	15.0	101.2	0.195	0.195	0.146	0.146	0.107	594.8	445.3	445.3	326.3
BRP435, BPP435 LED25/730	1725.0	16.4	105.2	0.213	0.213	0.16	0.16	0.117	649.6	488.0	488.0	356.8
BRP435, BPP435 LED30/730	2070.0	19.6	105.6	0.255	0.255	0.191	0.191	0.14	777.8	582.6	582.6	427.0
BRP435, BPP435 LED35/730	2415.0	22.5	107.3	0.292	0.292	0.219	0.219	0.161	890.6	668.0	668.0	491.0
BRP435, BPP435 LED45/730	3060.0	29.5	103.7	0.383	0.383	0.287	0.287	0.211	1168.2	875.4	875.4	643.6
BRP435, BPP435 LED55/730	3864.0	34.0	113.6	0.442	0.442	0.332	0.332	0.243	1348.1	1012.6	1012.6	741.2
BRP435, BPP435 LED65/730	4554.0	40.0	113.8	0.519	0.519	0.389	0.389	0.285	1583.0	1186.4	1186.4	869.2
BRP435, BPP435 LED75/730	5244.0	46.5	112.8	0.604	0.604	0.453	0.453	0.332	1842.2	1381.6	1381.6	1012.6
BRP435, BPP435 LED85/730	5934.0	53.0	112.0	0.688	0.688	0.516	0.516	0.378	2098.4	1573.8	1573.8	1152.9
BRP435, BPP435 LED95/730	6528.0	60.0	108.8	0.779	0.779	0.584	0.584	0.428	2376.0	1781.2	1781.2	1305.4
BRP435, BPP435 LED105/730	7140.0	67.0	106.6	0.87	0.87	0.652	0.652	0.479	2653.5	1988.6	1988.6	1461.0
BRP435, BPP435 LED115/730	7705.0	74.0	104.1	0.961	0.961	0.721	0.721	0.529	2931.0	2199.0	2199.0	1613.4
BRP435, BPP435 LED13/727	897.0	10.0	89.7	0.13	0.13	0.098	0.098	0.072	396.5	298.9	298.9	219.6
BRP435, BPP435 LED20/727	1380.0	15.2	90.8	0.197	0.197	0.148	0.148	0.108	600.8	451.4	451.4	329.4
BRP435, BPP435 LED22/727	1518.0	16.6	91.4	0.216	0.216	0.162	0.162	0.119	658.8	494.1	494.1	363.0
BRP435, BPP435 LED25/727	1725.0	18.2	94.8	0.236	0.236	0.177	0.177	0.13	719.8	539.8	539.8	396.5
BRP435, BPP435 LED30/727	2070.0	21.5	96.3	0.279	0.279	0.209	0.209	0.153	851.0	637.4	637.4	466.6
BRP435, BPP435 LED35/727	2415.0	25.0	96.6	0.325	0.325	0.244	0.244	0.179	991.2	744.2	744.2	545.9
BRP435, BPP435 LED45/727	3015.0	32.5	92.8	0.422	0.422	0.316	0.316	0.232	1287.1	963.8	963.8	707.6
BRP435, BPP435 LED55/727	3726.0	38.0	98.1	0.494	0.494	0.37	0.37	0.272	1506.7	1128.5	1128.5	829.6
BRP435, BPP435 LED65/727	4554.0	44.5	102.3	0.578	0.578	0.434	0.434	0.318	1762.9	1323.7	1323.7	969.9

BRP435, BPP435 LED75/727	5168.0	52.0	99.4	0.675	0.675	0.506	0.506	0.371	2058.8	1543.3	1543.3	1131.6
BRP435, BPP435 LED85/727	5762.0	59.0	97.7	0.766	0.766	0.574	0.574	0.421	2336.3	1750.7	1750.7	1284.0
BRP435, BPP435 LED95/727	6432.0	67.0	96.0	0.87	0.87	0.652	0.652	0.479	2653.5	1988.6	1988.6	1461.0
BRP435, BPP435 LED105/727	7035.0	75.0	93.8	0.974	0.974	0.73	0.73	0.536	2970.7	2226.5	2226.5	1634.8
BRP435, BPP435 LED115/727	7475.0	84.0	89.0	1.091	1.091	0.818	0.818	0.6	3327.6	2494.9	2494.9	1830.0
BRP435, BPP435 LED13/830	897.0	10.8	83.1	0.14	0.14	0.105	0.105	0.077	427.0	320.2	320.2	234.8
BRP435, BPP435 LED20/830	1380.0	16.4	84.1	0.213	0.213	0.16	0.16	0.117	649.6	488.0	488.0	356.8
BRP435, BPP435 LED22/830	1518.0	18.2	83.4	0.236	0.236	0.177	0.177	0.13	719.8	539.8	539.8	396.5
BRP435, BPP435 LED25/830	1725.0	19.6	88.0	0.255	0.255	0.191	0.191	0.14	777.8	582.6	582.6	427.0
BRP435, BPP435 LED30/830	2070.0	23.5	88.1	0.305	0.305	0.229	0.229	0.168	930.2	698.4	698.4	512.4
BRP435, BPP435 LED35/830	2415.0	27.5	87.8	0.357	0.357	0.268	0.268	0.196	1088.8	817.4	817.4	597.8
BRP435, BPP435 LED40/830	2720.0	31.5	86.3	0.409	0.409	0.307	0.307	0.225	1247.4	936.4	936.4	686.2
BRP435, BPP435 LED50/830	3450.0	37.5	92.0	0.487	0.487	0.365	0.365	0.268	1485.4	1113.2	1113.2	817.4
BRP435, BPP435 LED60/830	4140.0	44.5	93.0	0.578	0.578	0.434	0.434	0.318	1762.9	1323.7	1323.7	969.9
BRP435, BPP435 LED70/830	4830.0	53.0	91.1	0.688	0.688	0.516	0.516	0.378	2098.4	1573.8	1573.8	1152.9
BRP435, BPP435 LED80/830	5440.0	61.0	89.2	0.792	0.792	0.594	0.594	0.436	2415.6	1811.7	1811.7	1329.8
BRP435, BPP435 LED90/830	6030.0	69.0	87.4	0.896	0.896	0.672	0.672	0.493	2732.8	2049.6	2049.6	1503.6
BRP435, BPP435 LED100/830	6700.0	77.0	87.0	1.0	1.0	0.75	0.75	0.55	3050.0	2287.5	2287.5	1677.5
BRP435, BPP435 LED13/722	897.0	11.6	77.3	0.151	0.151	0.113	0.113	0.083	460.6	344.7	344.7	253.2
BRP435, BPP435 LED20/722	1380.0	17.8	77.5	0.231	0.231	0.173	0.173	0.127	704.6	527.6	527.6	387.4
BRP435, BPP435 LED22/722	1518.0	19.6	77.4	0.255	0.255	0.191	0.191	0.14	777.8	582.6	582.6	427.0
BRP435, BPP435 LED25/722	1725.0	21.0	82.1	0.273	0.273	0.205	0.205	0.15	832.6	625.2	625.2	457.5
BRP435, BPP435 LED30/722	2070.0	25.0	82.8	0.325	0.325	0.244	0.244	0.179	991.2	744.2	744.2	545.9
BRP435, BPP435 LED35/722	2380.0	29.5	80.7	0.383	0.383	0.287	0.287	0.211	1168.2	875.4	875.4	643.6
BRP435, BPP435 LED40/722	2720.0	34.0	80.0	0.442	0.442	0.332	0.332	0.243	1348.1	1012.6	1012.6	741.2

BRP435, BPP435 LED50/722	3450.0	40.0	86.2	0.519	0.519	0.389	0.389	0.285	1583.0	1186.4	1186.4	869.2
BRP435, BPP435 LED60/722	4140.0	48.0	86.2	0.623	0.623	0.467	0.467	0.343	1900.2	1424.4	1424.4	1046.2
BRP435, BPP435 LED70/722	4760.0	57.0	83.5	0.74	0.74	0.555	0.555	0.407	2257.0	1692.8	1692.8	1241.4
BRP435, BPP435 LED80/722	5440.0	66.0	82.4	0.857	0.857	0.643	0.643	0.471	2613.8	1961.2	1961.2	1436.6
BRP435, BPP435 LED90/722	6030.0	75.0	80.4	0.974	0.974	0.73	0.73	0.536	2970.7	2226.5	2226.5	1634.8
BRP435, BPP435 LED100/722	6700.0	84.0	79.8	1.091	1.091	0.818	0.818	0.6	3327.6	2494.9	2494.9	1830.0
BRP435, BPP435 LED13/840	910.0	10.6	85.8	0.138	0.138	0.104	0.104	0.076	420.9	317.2	317.2	231.8
BRP435, BPP435 LED20/840	1380.0	15.8	87.3	0.205	0.205	0.154	0.154	0.113	625.2	469.7	469.7	344.7
BRP435, BPP435 LED22/840	1518.0	17.6	86.2	0.229	0.229	0.172	0.172	0.126	698.4	524.6	524.6	384.3
BRP435, BPP435 LED25/840	1725.0	19.0	90.8	0.247	0.247	0.185	0.185	0.136	753.4	564.2	564.2	414.8
BRP435, BPP435 LED30/840	2070.0	22.5	92.0	0.292	0.292	0.219	0.219	0.161	890.6	668.0	668.0	491.0
BRP435, BPP435 LED35/840	2415.0	26.5	91.1	0.344	0.344	0.258	0.258	0.189	1049.2	786.9	786.9	576.4
BRP435, BPP435 LED40/840	2720.0	30.5	89.2	0.396	0.396	0.297	0.297	0.218	1207.8	905.8	905.8	664.9
BRP435, BPP435 LED50/840	3450.0	36.0	95.8	0.468	0.468	0.351	0.351	0.257	1427.4	1070.6	1070.6	783.8
BRP435, BPP435 LED60/840	4140.0	43.5	95.2	0.565	0.565	0.424	0.424	0.311	1723.2	1293.2	1293.2	948.6
BRP435, BPP435 LED70/840	4830.0	51.0	94.7	0.662	0.662	0.497	0.497	0.364	2019.1	1515.8	1515.8	1110.2
BRP435, BPP435 LED80/840	5440.0	58.0	93.8	0.753	0.753	0.565	0.565	0.414	2296.6	1723.2	1723.2	1262.7
BRP435, BPP435 LED90/840	6120.0	67.0	91.3	0.87	0.87	0.652	0.652	0.479	2653.5	1988.6	1988.6	1461.0
BRP435, BPP435 LED100/840	6700.0	75.0	89.3	0.974	0.974	0.73	0.73	0.536	2970.7	2226.5	2226.5	1634.8
BRP435, BPP435 LED13/827	897.0	11.6	77.3	0.151	0.151	0.113	0.113	0.083	460.6	344.7	344.7	253.2
BRP435, BPP435 LED20/827	1380.0	17.8	77.5	0.231	0.231	0.173	0.173	0.127	704.6	527.6	527.6	387.4
BRP435, BPP435 LED22/827	1518.0	19.6	77.4	0.255	0.255	0.191	0.191	0.14	777.8	582.6	582.6	427.0
BRP435, BPP435 LED25/827	1725.0	21.0	82.1	0.273	0.273	0.205	0.205	0.15	832.6	625.2	625.2	457.5
BRP435, BPP435 LED30/827	2070.0	25.0	82.8	0.325	0.325	0.244	0.244	0.179	991.2	744.2	744.2	545.9
BRP435, BPP435 LED35/827	2380.0	29.5	80.7	0.383	0.383	0.287	0.287	0.211	1168.2	875.4	875.4	643.6

BRP435, BPP435 LED40/827	2720.0	34.0	80.0	0.442	0.442	0.332	0.332	0.243	1348.1	1012.6	1012.6	741.2
BRP435, BPP435 LED50/827	3450.0	40.0	86.2	0.519	0.519	0.389	0.389	0.285	1583.0	1186.4	1186.4	869.2
BRP435, BPP435 LED60/827	4140.0	48.0	86.2	0.623	0.623	0.467	0.467	0.343	1900.2	1424.4	1424.4	1046.2
BRP435, BPP435 LED70/827	4760.0	57.0	83.5	0.74	0.74	0.555	0.555	0.407	2257.0	1692.8	1692.8	1241.4
BRP435, BPP435 LED80/827	5440.0	66.0	82.4	0.857	0.857	0.643	0.643	0.471	2613.8	1961.2	1961.2	1436.6
BRP435, BPP435 LED90/827	6030.0	75.0	80.4	0.974	0.974	0.73	0.73	0.536	2970.7	2226.5	2226.5	1634.8

** 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.

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

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
BRP435, BPP435 LED13/740	910.0	8.7	104.6	0.113	0.043	0.032	0.032	0.024	131.1	97.6	97.6	73.2
BRP435, BPP435 LED20/740	1380.0	13.0	106.2	0.169	0.043	0.032	0.032	0.024	131.1	97.6	97.6	73.2
BRP435, BPP435 LED22/740	1518.0	14.2	106.9	0.184	0.042	0.032	0.032	0.023	128.1	97.6	97.6	70.2
BRP435, BPP435 LED25/740	1725.0	15.6	110.6	0.203	0.041	0.031	0.031	0.023	125.0	94.6	94.6	70.2
BRP435, BPP435 LED30/740	2070.0	18.6	111.3	0.242	0.041	0.031	0.031	0.023	125.0	94.6	94.6	70.2

Philips MileWide LED gen2 small-BRP435/BPP435

BRP435, BPP435 LED35/740	2415.0	21.5	112.3	0.279	0.04	0.03	0.03	0.022	122.0	91.5	91.5	67.1
BRP435, BPP435 LED45/740	3105.0	27.5	112.9	0.357	0.04	0.03	0.03	0.022	122.0	91.5	91.5	67.1
BRP435, BPP435 LED55/740	3864.0	32.0	120.8	0.416	0.038	0.028	0.028	0.021	115.9	85.4	85.4	64.0
BRP435, BPP435 LED65/740	4554.0	38.0	119.8	0.494	0.038	0.028	0.028	0.021	115.9	85.4	85.4	64.0
BRP435, BPP435 LED75/740	5244.0	44.0	119.2	0.571	0.038	0.028	0.028	0.021	115.9	85.4	85.4	64.0
BRP435, BPP435 LED85/740	5934.0	50.0	118.7	0.649	0.038	0.028	0.028	0.021	115.9	85.4	85.4	64.0
BRP435, BPP435 LED95/740	6624.0	56.0	118.3	0.727	0.038	0.028	0.028	0.021	115.9	85.4	85.4	64.0
BRP435, BPP435 LED105/740	7140.0	62.0	115.2	0.805	0.039	0.029	0.029	0.021	119.0	88.4	88.4	64.0
BRP435, BPP435 LED115/740	7705.0	69.0	111.7	0.896	0.041	0.031	0.031	0.023	125.0	94.6	94.6	70.2
BRP435, BPP435 LED13/730	910.0	9.1	100.0	0.118	0.045	0.034	0.034	0.025	137.2	103.7	103.7	76.2
BRP435, BPP435 LED20/730	1380.0	13.6	101.5	0.177	0.045	0.034	0.034	0.025	137.2	103.7	103.7	76.2
BRP435, BPP435 LED22/730	1518.0	15.0	101.2	0.195	0.045	0.034	0.034	0.025	137.2	103.7	103.7	76.2
BRP435, BPP435 LED25/730	1725.0	16.4	105.2	0.213	0.043	0.032	0.032	0.024	131.1	97.6	97.6	73.2
BRP435, BPP435 LED30/730	2070.0	19.6	105.6	0.255	0.043	0.032	0.032	0.024	131.1	97.6	97.6	73.2
BRP435, BPP435 LED35/730	2415.0	22.5	107.3	0.292	0.042	0.032	0.032	0.023	128.1	97.6	97.6	70.2
BRP435, BPP435 LED45/730	3060.0	29.5	103.7	0.383	0.044	0.033	0.033	0.024	134.2	100.6	100.6	73.2
BRP435, BPP435 LED55/730	3864.0	34.0	113.6	0.442	0.04	0.03	0.03	0.022	122.0	91.5	91.5	67.1
BRP435, BPP435 LED65/730	4554.0	40.0	113.8	0.519	0.04	0.03	0.03	0.022	122.0	91.5	91.5	67.1
BRP435, BPP435 LED75/730	5244.0	46.5	112.8	0.604	0.04	0.03	0.03	0.022	122.0	91.5	91.5	67.1
BRP435, BPP435 LED85/730	5934.0	53.0	112.0	0.688	0.041	0.031	0.031	0.023	125.0	94.6	94.6	70.2
BRP435, BPP435 LED95/730	6528.0	60.0	108.8	0.779	0.042	0.032	0.032	0.023	128.1	97.6	97.6	70.2
BRP435, BPP435 LED105/730	7140.0	67.0	106.6	0.87	0.043	0.032	0.032	0.024	131.1	97.6	97.6	73.2
BRP435, BPP435 LED115/730	7705.0	74.0	104.1	0.961	0.044	0.033	0.033	0.024	134.2	100.6	100.6	73.2
BRP435, BPP435 LED13/727	897.0	10.0	89.7	0.13	0.051	0.038	0.038	0.028	155.5	115.9	115.9	85.4
BRP435, BPP435 LED20/727	1380.0	15.2	90.8	0.197	0.05	0.038	0.038	0.028	152.5	115.9	115.9	85.4

BRP435, BPP435 LED22/727	1518.0	16.6	91.4	0.216	0.05	0.038	0.038	0.028	152.5	115.9	115.9	85.4
BRP435, BPP435 LED25/727	1725.0	18.2	94.8	0.236	0.048	0.036	0.036	0.026	146.4	109.8	109.8	79.3
BRP435, BPP435 LED30/727	2070.0	21.5	96.3	0.279	0.047	0.035	0.035	0.026	143.4	106.8	106.8	79.3
BRP435, BPP435 LED35/727	2415.0	25.0	96.6	0.325	0.047	0.035	0.035	0.026	143.4	106.8	106.8	79.3
BRP435, BPP435 LED45/727	3015.0	32.5	92.8	0.422	0.049	0.037	0.037	0.027	149.5	112.8	112.8	82.4
BRP435, BPP435 LED55/727	3726.0	38.0	98.1	0.494	0.046	0.034	0.034	0.025	140.3	103.7	103.7	76.2
BRP435, BPP435 LED65/727	4554.0	44.5	102.3	0.578	0.044	0.033	0.033	0.024	134.2	100.6	100.6	73.2
BRP435, BPP435 LED75/727	5168.0	52.0	99.4	0.675	0.046	0.034	0.034	0.025	140.3	103.7	103.7	76.2
BRP435, BPP435 LED85/727	5762.0	59.0	97.7	0.766	0.047	0.035	0.035	0.026	143.4	106.8	106.8	79.3
BRP435, BPP435 LED95/727	6432.0	67.0	96.0	0.87	0.047	0.035	0.035	0.026	143.4	106.8	106.8	79.3
BRP435, BPP435 LED105/727	7035.0	75.0	93.8	0.974	0.048	0.036	0.036	0.026	146.4	109.8	109.8	79.3
BRP435, BPP435 LED115/727	7475.0	84.0	89.0	1.091	0.051	0.038	0.038	0.028	155.5	115.9	115.9	85.4
BRP435, BPP435 LED13/830	897.0	10.8	83.1	0.14	0.055	0.041	0.041	0.03	167.8	125.0	125.0	91.5
BRP435, BPP435 LED20/830	1380.0	16.4	84.1	0.213	0.054	0.04	0.04	0.03	164.7	122.0	122.0	91.5
BRP435, BPP435 LED22/830	1518.0	18.2	83.4	0.236	0.054	0.04	0.04	0.03	164.7	122.0	122.0	91.5
BRP435, BPP435 LED25/830	1725.0	19.6	88.0	0.255	0.052	0.039	0.039	0.029	158.6	119.0	119.0	88.4
BRP435, BPP435 LED30/830	2070.0	23.5	88.1	0.305	0.052	0.039	0.039	0.029	158.6	119.0	119.0	88.4
BRP435, BPP435 LED35/830	2415.0	27.5	87.8	0.357	0.052	0.039	0.039	0.029	158.6	119.0	119.0	88.4
BRP435, BPP435 LED40/830	2720.0	31.5	86.3	0.409	0.053	0.04	0.04	0.029	161.6	122.0	122.0	88.4
BRP435, BPP435 LED50/830	3450.0	37.5	92.0	0.487	0.049	0.037	0.037	0.027	149.5	112.8	112.8	82.4
BRP435, BPP435 LED60/830	4140.0	44.5	93.0	0.578	0.049	0.037	0.037	0.027	149.5	112.8	112.8	82.4
BRP435, BPP435 LED70/830	4830.0	53.0	91.1	0.688	0.05	0.038	0.038	0.028	152.5	115.9	115.9	85.4
BRP435, BPP435 LED80/830	5440.0	61.0	89.2	0.792	0.051	0.038	0.038	0.028	155.5	115.9	115.9	85.4
BRP435, BPP435 LED90/830	6030.0	69.0	87.4	0.896	0.052	0.039	0.039	0.029	158.6	119.0	119.0	88.4
BRP435, BPP435 LED100/830	6700.0	77.0	87.0	1.0	0.052	0.039	0.039	0.029	158.6	119.0	119.0	88.4

BRP435, BPP435 LED13/722	897.0	11.6	77.3	0.151	0.059	0.044	0.044	0.032	180.0	134.2	134.2	97.6
BRP435, BPP435 LED20/722	1380.0	17.8	77.5	0.231	0.059	0.044	0.044	0.032	180.0	134.2	134.2	97.6
BRP435, BPP435 LED22/722	1518.0	19.6	77.4	0.255	0.059	0.044	0.044	0.032	180.0	134.2	134.2	97.6
BRP435, BPP435 LED25/722	1725.0	21.0	82.1	0.273	0.055	0.041	0.041	0.03	167.8	125.0	125.0	91.5
BRP435, BPP435 LED30/722	2070.0	25.0	82.8	0.325	0.055	0.041	0.041	0.03	167.8	125.0	125.0	91.5
BRP435, BPP435 LED35/722	2380.0	29.5	80.7	0.383	0.056	0.042	0.042	0.031	170.8	128.1	128.1	94.6
BRP435, BPP435 LED40/722	2720.0	34.0	80.0	0.442	0.057	0.043	0.043	0.031	173.8	131.1	131.1	94.6
BRP435, BPP435 LED50/722	3450.0	40.0	86.2	0.519	0.053	0.04	0.04	0.029	161.6	122.0	122.0	88.4
BRP435, BPP435 LED60/722	4140.0	48.0	86.2	0.623	0.053	0.04	0.04	0.029	161.6	122.0	122.0	88.4
BRP435, BPP435 LED70/722	4760.0	57.0	83.5	0.74	0.054	0.04	0.04	0.03	164.7	122.0	122.0	91.5
BRP435, BPP435 LED80/722	5440.0	66.0	82.4	0.857	0.055	0.041	0.041	0.03	167.8	125.0	125.0	91.5
BRP435, BPP435 LED90/722	6030.0	75.0	80.4	0.974	0.057	0.043	0.043	0.031	173.8	131.1	131.1	94.6
BRP435, BPP435 LED100/722	6700.0	84.0	79.8	1.091	0.057	0.043	0.043	0.031	173.8	131.1	131.1	94.6
BRP435, BPP435 LED13/840	910.0	10.6	85.8	0.138	0.053	0.04	0.04	0.029	161.6	122.0	122.0	88.4
BRP435, BPP435 LED20/840	1380.0	15.8	87.3	0.205	0.052	0.039	0.039	0.029	158.6	119.0	119.0	88.4
BRP435, BPP435 LED22/840	1518.0	17.6	86.2	0.229	0.053	0.04	0.04	0.029	161.6	122.0	122.0	88.4
BRP435, BPP435 LED25/840	1725.0	19.0	90.8	0.247	0.05	0.038	0.038	0.028	152.5	115.9	115.9	85.4
BRP435, BPP435 LED30/840	2070.0	22.5	92.0	0.292	0.049	0.037	0.037	0.027	149.5	112.8	112.8	82.4
BRP435, BPP435 LED35/840	2415.0	26.5	91.1	0.344	0.05	0.038	0.038	0.028	152.5	115.9	115.9	85.4
BRP435, BPP435 LED40/840	2720.0	30.5	89.2	0.396	0.051	0.038	0.038	0.028	155.5	115.9	115.9	85.4
BRP435, BPP435 LED50/840	3450.0	36.0	95.8	0.468	0.047	0.035	0.035	0.026	143.4	106.8	106.8	79.3
BRP435, BPP435 LED60/840	4140.0	43.5	95.2	0.565	0.048	0.036	0.036	0.026	146.4	109.8	109.8	79.3
BRP435, BPP435 LED70/840	4830.0	51.0	94.7	0.662	0.048	0.036	0.036	0.026	146.4	109.8	109.8	79.3
BRP435, BPP435 LED80/840	5440.0	58.0	93.8	0.753	0.048	0.036	0.036	0.026	146.4	109.8	109.8	79.3
BRP435, BPP435 LED90/840	6120.0	67.0	91.3	0.87	0.05	0.038	0.038	0.028	152.5	115.9	115.9	85.4

BRP435, BPP435 LED100/840	6700.0	75.0	89.3	0.974	0.051	0.038	0.038	0.028	155.5	115.9	115.9	85.4
BRP435, BPP435 LED13/827	897.0	11.6	77.3	0.151	0.059	0.044	0.044	0.032	180.0	134.2	134.2	97.6
BRP435, BPP435 LED20/827	1380.0	17.8	77.5	0.231	0.059	0.044	0.044	0.032	180.0	134.2	134.2	97.6
BRP435, BPP435 LED22/827	1518.0	19.6	77.4	0.255	0.059	0.044	0.044	0.032	180.0	134.2	134.2	97.6
BRP435, BPP435 LED25/827	1725.0	21.0	82.1	0.273	0.055	0.041	0.041	0.03	167.8	125.0	125.0	91.5
BRP435, BPP435 LED30/827	2070.0	25.0	82.8	0.325	0.055	0.041	0.041	0.03	167.8	125.0	125.0	91.5
BRP435, BPP435 LED35/827	2380.0	29.5	80.7	0.383	0.056	0.042	0.042	0.031	170.8	128.1	128.1	94.6
BRP435, BPP435 LED40/827	2720.0	34.0	80.0	0.442	0.057	0.043	0.043	0.031	173.8	131.1	131.1	94.6
BRP435, BPP435 LED50/827	3450.0	40.0	86.2	0.519	0.053	0.04	0.04	0.029	161.6	122.0	122.0	88.4
BRP435, BPP435 LED60/827	4140.0	48.0	86.2	0.623	0.053	0.04	0.04	0.029	161.6	122.0	122.0	88.4
BRP435, BPP435 LED70/827	4760.0	57.0	83.5	0.74	0.054	0.04	0.04	0.03	164.7	122.0	122.0	91.5
BRP435, BPP435 LED80/827	5440.0	66.0	82.4	0.857	0.055	0.041	0.041	0.03	167.8	125.0	125.0	91.5
BRP435, BPP435 LED90/827	6030.0	75.0	80.4	0.974	0.057	0.043	0.043	0.031	173.8	131.1	131.1	94.6

** 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.*

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 ²⁾	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:

$$\text{New B6 GWP tot for Finland} = (4,06E+02 / 3,96E-01) \times 2,70E-01 = 2,76 E+02$$

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