ENVIRONMENTAL PRODUCT DECLARATION

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

Philips Villa LED gen2

BDP/BSP768
Signify N.V.

EPD HUB
Publishing 2024-05-31

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 Villa LED gen2
Additional labels	BDP768 LED50/830 II DM50 MK-BK FG BALL 6
Product reference	912300024527
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 3450 lumens over 100000 hours
Declared unit mass	8.847 kg
GWP-fossil, A1-A3 (kgCO2e)	1,74E+02
GWP-total, A1-A3 (kgCO2e)	1,74E+02
Secondary material, inputs (%)	6.03
Secondary material, outputs (%)	58.5
Total energy use, A1-A3 (kWh)	526
Total water use, A1-A3 (m3e)	0.69

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 Villa LED gen2 is designed to offer the perfect balance between heritage preservation and performance. Designed with the specific proportions and shape of the traditional four-sided luminaires originally used in Madrid in the 19th century, Villa LED gen2 is now widely used for street lighting in historical environments and traditional towns and villages across the Iberian Peninsula. Thanks to the Philips LEDGINE-O engine, and the wide range of application-tailored optics, Villa LED gen2 delivers the right amount light precisely where it is needed, enabling further energy savings. This urban lamp can even be equipped with our dedicated light recipe that preserves dark skies. Villa LED gen2 is also future ready with a choice of one or two Philips System Ready (SR) sockets that enable the luminaire to be paired with both standalone and advanced control and lighting software applications such as Interact from Signify. In addition, every Villa 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 programing operations faster and easier, and enables you to create a digital library of lighting assets and spare parts.

For more information, please visit
Philips Villa LED gen2-BDP/BSP768
https://www.lighting.philips.com/link/BDP768/fam/aa/en

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	73.44	EUR, ASIA
Minerals	16.78	EU
Fossil materials	9.79	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	0.078

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 Product
Mass per declared unit	8.847 kg
Functional unit	1 unit of 3450 lumens over 100000 hours

Reference service life	100000 hours

SUBSTANCES, REACH - VERY HIGH CONCERN

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

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

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

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

Modules not relevant = MNR.

MANUFACTURING AND PACKAGING (A1-A3)

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

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

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

TRANSPORT AND INSTALLATION (A4-A5)

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

PRODUCT USE AND MAINTENANCE (B1-B7)

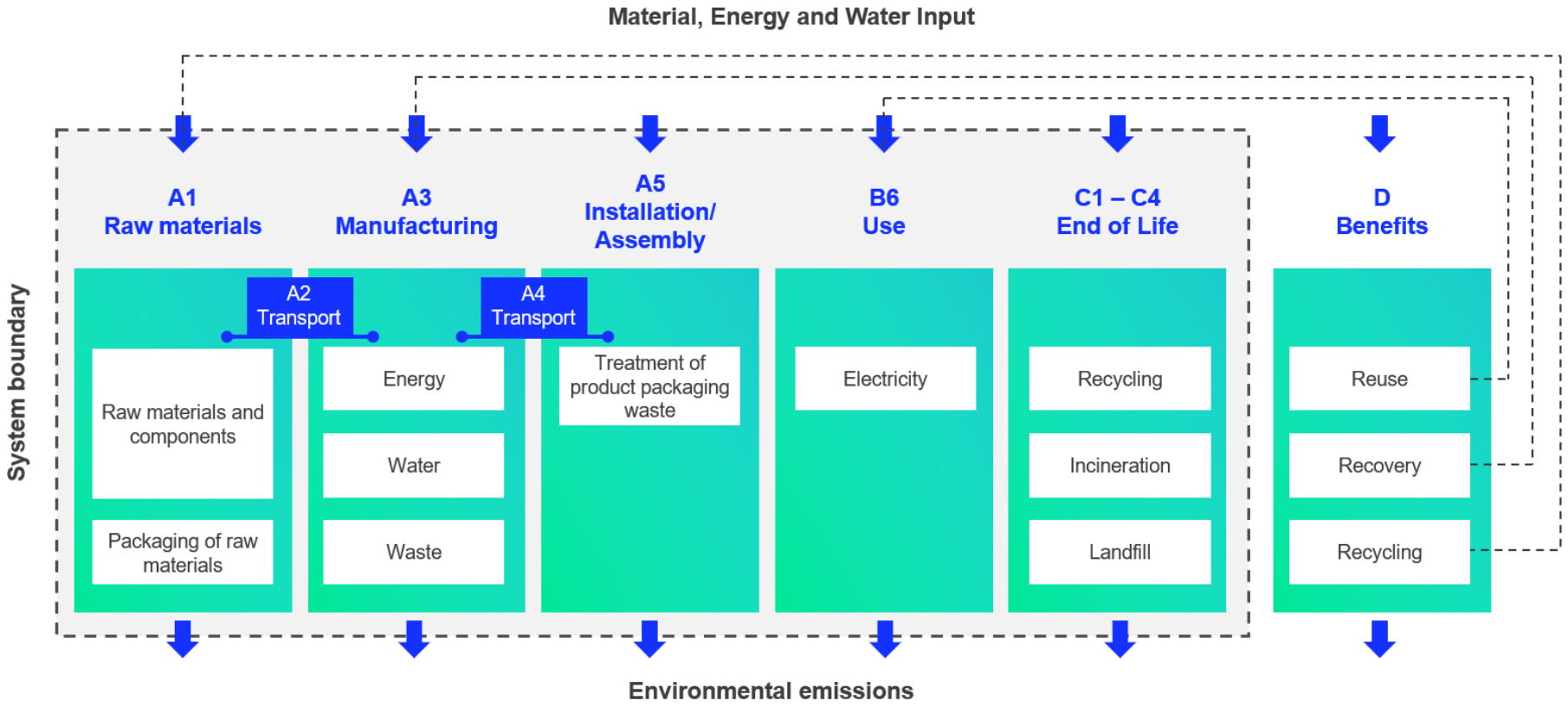
During the use phase, the product consumes electricity from Europe's electricity grid mix (B6). The total power consumption of the reference product is calculated as follows: Wattage x Reference lifetime = kWh consumed throughout the entire use phase B6.

PRODUCT END OF LIFE (C1-C4, D)

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

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

SYSTEM BOUNDARY



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

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

ALLOCATION, ESTIMATES AND ASSUMPTIONS

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

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

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

AVERAGES AND VARIABILITY

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

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

LCA SOFTWARE AND BIBLIOGRAPHY

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

ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	1,72E+02	1,70E+00	2,81E-01	1,74E+02	1,70E+00	2,90E-01	MNR	MNR	MNR	MNR	MNR	1,51E+03	MNR	MNR	1,20E-01	4,56E-01	2,93E-01	-8,44E+01
GWP – fossil	kg CO_2e	1,72E+02	1,70E+00	5,59E-01	1,74E+02	1,70E+00	8,33E-03	MNR	MNR	MNR	MNR	MNR	1,50E+03	MNR	MNR	1,20E-01	4,56E-01	2,93E-01	-8,43E+01
GWP – biogenic	kg CO_2e	-6,25E-02	0,00E+00	-2,82E-01	-3,44E-01	6,56E-04	2,82E-01	MNR	MNR	MNR	MNR	MNR	-1,78E-15	MNR	MNR	0,00E+00	0,00E+00	0,00E+00	-9,05E-03
GWP – LULUC	kg CO_2e	1,13E-01	6,30E-04	4,26E-03	1,18E-01	6,26E-04	2,92E-06	MNR	MNR	MNR	MNR	MNR	3,51E+00	MNR	MNR	4,44E-05	1,68E-04	1,24E-04	-6,30E-03
Ozone depletion pot.	kg CFC_{-11}e	6,59E-06	3,90E-07	6,20E-08	7,04E-06	3,90E-07	7,47E-10	MNR	MNR	MNR	MNR	MNR	7,63E-05	MNR	MNR	2,77E-08	1,36E-08	1,29E-08	-2,28E-06
Acidification potential	mol H^+e	1,56E+00	7,50E-03	2,53E-03	1,57E+00	7,19E-03	6,35E-05	MNR	MNR	MNR	MNR	MNR	8,58E+00	MNR	MNR	5,09E-04	1,42E-03	5,95E-04	-8,43E-01
EP-freshwater[2)]	kg Pe	1,02E-02	1,38E-05	2,74E-05	1,03E-02	1,39E-05	8,11E-08	MNR	MNR	MNR	MNR	MNR	1,59E-01	MNR	MNR	9,85E-07	5,30E-06	6,81E-06	-5,27E-03
EP-marine	kg Ne	1,91E-01	2,21E-03	9,09E-04	1,94E-01	2,14E-03	2,79E-05	MNR	MNR	MNR	MNR	MNR	1,14E+00	MNR	MNR	1,51E-04	3,23E-04	1,40E-03	-9,37E-02
EP-terrestrial	mol Ne	2,11E+00	2,44E-02	6,59E-03	2,14E+00	2,36E-02	2,87E-04	MNR	MNR	MNR	MNR	MNR	1,29E+01	MNR	MNR	1,67E-03	3,67E-03	1,82E-03	-1,08E+00
POCP ("smog")[3)]	kg NMVOCe	6,27E-01	7,75E-03	3,16E-03	6,38E-01	7,54E-03	7,14E-05	MNR	MNR	MNR	MNR	MNR	3,54E+00	MNR	MNR	5,34E-04	9,95E-04	7,39E-04	-3,12E-01
ADP-minerals & metals[4)]	kg Sbe	2,77E-03	3,97E-06	3,19E-06	2,78E-03	3,98E-06	2,38E-08	MNR	MNR	MNR	MNR	MNR	1,40E-02	MNR	MNR	2,82E-07	1,31E-05	2,47E-07	-2,90E-04
ADP-fossil resources	MJ	1,80E+03	2,55E+01	7,95E+00	1,83E+03	2,55E+01	6,23E-02	MNR	MNR	MNR	MNR	MNR	3,20E+04	MNR	MNR	1,81E+00	1,52E+00	1,28E+00	-8,24E+02
Water use[5)]	m^3e depr.	2,94E+01	1,14E-01	3,92E-01	2,99E+01	1,14E-01	1,36E-02	MNR	MNR	MNR	MNR	MNR	8,73E+02	MNR	MNR	8,09E-03	3,79E-02	6,18E-02	-5,41E+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	1,05E-05	1,95E-07	4,99E-08	1,08E-05	1,96E-07	5,75E-10	MNR	MNR	MNR	MNR	MNR	2,82E-05	MNR	MNR	1,39E-08	1,87E-08	1,04E-08	-4,53E-06
Ionizing radiation[6)]	kBq U235e	1,06E+01	1,21E-01	2,92E-02	1,08E+01	1,21E-01	2,10E-04	MNR	MNR	MNR	MNR	MNR	8,65E+02	MNR	MNR	8,61E-03	9,12E-03	6,97E-03	-4,94E+00

Ecotoxicity (freshwater)	CTUe	4,92E+03	2,29E+01	1,78E+01	4,97E+03	2,29E+01	3,44E-01	MNR	MNR	MNR	MNR	MNR	2,17E+04	MNR	MNR	1,63E+00	7,26E+00	5,82E+02	-1,51E+03
Human toxicity, cancer	CTUh	2,08E-07	5,66E-10	4,01E-10	2,09E-07	5,63E-10	2,23E-11	MNR	MNR	MNR	MNR	MNR	7,12E-07	MNR	MNR	3,99E-11	2,25E-10	2,30E-10	3,38E-09
Human tox. non-cancer	CTUh	4,22E-06	2,26E-08	8,16E-09	4,25E-06	2,27E-08	8,90E-10	MNR	MNR	MNR	MNR	MNR	2,34E-05	MNR	MNR	1,61E-09	9,51E-09	1,14E-08	-1,53E-06
SQP[7)]	-	4,14E+02	2,92E+01	2,26E+01	4,66E+02	2,94E+01	3,74E-02	MNR	MNR	MNR	MNR	MNR	5,78E+03	MNR	MNR	2,08E+00	2,83E+00	1,96E+00	-1,51E+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	7,82E+01	2,86E-01	6,60E+00	8,51E+01	2,87E-01	1,76E-03	MNR	MNR	MNR	MNR	MNR	6,51E+03	MNR	MNR	2,04E-02	2,20E-01	5,68E-02	-1,06E+01
Renew. PER as material	MJ	1,05E+00	0,00E+00	2,62E+00	3,67E+00	0,00E+00	-2,62E+00	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	-1,64E-01	-3,05E-01	0,00E+00
Total use of renew. PER	MJ	7,93E+01	2,86E-01	9,22E+00	8,88E+01	2,87E-01	-2,62E+00	MNR	MNR	MNR	MNR	MNR	6,51E+03	MNR	MNR	2,04E-02	5,60E-02	-2,48E-01	-1,06E+01
Non-re. PER as energy	MJ	1,77E+03	2,55E+01	7,43E+00	1,81E+03	2,55E+01	6,24E-02	MNR	MNR	MNR	MNR	MNR	3,19E+04	MNR	MNR	1,81E+00	1,52E+00	1,28E+00	-8,25E+02
Non-re. PER as material	MJ	1,54E+01	0,00E+00	4,60E-02	1,55E+01	0,00E+00	-4,60E-02	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	-5,60E+00	-5,91E+00	0,00E+00
Total use of non-re. PER	MJ	1,79E+03	2,55E+01	7,47E+00	1,82E+03	2,55E+01	1,64E-02	MNR	MNR	MNR	MNR	MNR	3,19E+04	MNR	MNR	1,81E+00	-4,08E+00	-4,63E+00	-8,25E+02
Secondary materials	kg	5,33E-01	7,10E-03	1,07E-01	6,47E-01	7,08E-03	7,07E-05	MNR	MNR	MNR	MNR	MNR	3,29E+00	MNR	MNR	5,02E-04	1,54E-03	3,12E-03	3,44E+00
Renew. secondary fuels	MJ	2,54E-02	7,11E-05	7,50E-03	3,30E-02	7,14E-05	8,93E-07	MNR	MNR	MNR	MNR	MNR	2,67E-02	MNR	MNR	5,06E-06	7,81E-05	2,32E-05	-1,32E-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	6,72E-01	3,29E-03	9,29E-03	6,85E-01	3,30E-03	1,48E-04	MNR	MNR	MNR	MNR	MNR	2,75E+01	MNR	MNR	2,34E-04	1,22E-03	8,14E-04	-2,51E-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	2,82E+01	3,38E-02	3,68E-02	2,83E+01	3,38E-02	3,58E-03	MNR	MNR	MNR	MNR	MNR	1,15E+02	MNR	MNR	2,40E-03	1,10E-02	5,42E-03	-1,33E+01
Non-hazardous waste	kg	4,22E+02	5,53E-01	7,46E-01	4,23E+02	5,55E-01	1,08E-01	MNR	MNR	MNR	MNR	MNR	7,26E+03	MNR	MNR	3,94E-02	5,14E-01	3,53E+00	-2,39E+02
Radioactive waste	kg	4,15E-03	1,70E-04	1,77E-05	4,34E-03	1,71E-04	1,57E-07	MNR	MNR	MNR	MNR	MNR	2,33E-01	MNR	MNR	1,21E-05	6,40E-06	0,00E+00	-1,81E-03

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	5,17E+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	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	4,90E-01	4,90E-01	0,00E+00	0,00E+00	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	3,10E+00	0,00E+00	0,00E+00

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

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	1,69E+02	1,68E+00	5,70E-01	1,71E+02	1,68E+00	7,91E-03	MNR	MNR	MNR	MNR	MNR	1,49E+03	MNR	MNR	1,19E-01	4,54E-01	8,47E-01	-8,27E+01
Ozone depletion Pot.	kg CFC_{-11}e	5,73E-06	3,09E-07	5,18E-08	6,09E-06	3,09E-07	6,43E-10	MNR	MNR	MNR	MNR	MNR	6,61E-05	MNR	MNR	2,19E-08	1,11E-08	1,04E-08	-1,94E-06
Acidification	kg SO_2e	1,33E+00	5,84E-03	1,97E-03	1,34E+00	5,58E-03	4,59E-05	MNR	MNR	MNR	MNR	MNR	7,28E+00	MNR	MNR	3,96E-04	1,14E-03	4,66E-04	-7,26E-01
Eutrophication	kg PO_4^3e	4,00E-01	1,30E-03	1,14E-03	4,02E-01	1,27E-03	3,54E-05	MNR	MNR	MNR	MNR	MNR	5,60E+00	MNR	MNR	9,01E-05	3,79E-04	3,62E-03	-2,05E-01
POCP (“smog”)	kg C_2H_4e	7,10E-02	2,24E-04	2,42E-04	7,14E-02	2,18E-04	1,33E-06	MNR	MNR	MNR	MNR	MNR	2,98E-01	MNR	MNR	1,55E-05	4,25E-05	1,56E-04	-3,60E-02
ADP-elements	kg Sbe	2,74E-03	3,84E-06	2,99E-06	2,75E-03	3,85E-06	1,88E-08	MNR	MNR	MNR	MNR	MNR	1,40E-02	MNR	MNR	2,73E-07	1,31E-05	2,33E-07	-2,82E-04
ADP-fossil	MJ	1,80E+03	2,55E+01	7,94E+00	1,83E+03	2,55E+01	6,23E-02	MNR	MNR	MNR	MNR	MNR	3,19E+04	MNR	MNR	1,81E+00	1,52E+00	1,28E+00	-8,24E+02

APPENDIX (EPD HUB ALIGNED)

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

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

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

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

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

$$TSF = PSF * CSF$$

Table A1: Light management function (PEP EcoPassport aligned)

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

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

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

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

Configuration	Flux [lm]	Power [W]	Efficacy [lm/W]	PSF	Total Scaling Factor (TSF)				Scaled Impacts (GWP100 B6 - kg CO2eq.)			
					NC	DD	PS	DD+PS	NC	DD	PS	DD+PS
BDP/BSP768 LED14/740	1008.0	9.4	107.2	0.247	0.247	0.185	0.185	0.136	373.0	279.4	279.4	205.4
BDP/BSP768 LED18/740	1296.0	11.6	111.7	0.305	0.305	0.229	0.229	0.168	460.6	345.8	345.8	253.7
BDP/BSP768 LED24/740	1728.0	15.0	115.2	0.395	0.395	0.296	0.296	0.217	596.4	447.0	447.0	327.7
BDP/BSP768 LED27/740	1917.0	16.8	114.1	0.442	0.442	0.332	0.332	0.243	667.4	501.3	501.3	366.9
BDP/BSP768 LED34/740	2414.0	21.0	115.0	0.553	0.553	0.415	0.415	0.304	835.0	626.6	626.6	459.0
BDP/BSP768 LED40/740	2840.0	24.0	118.3	0.632	0.632	0.474	0.474	0.348	954.3	715.7	715.7	525.5
BDP/BSP768 LED44/740	3124.0	26.5	117.9	0.697	0.697	0.523	0.523	0.383	1052.5	789.7	789.7	578.3
BDP/BSP768 LED50/740	3500.0	29.5	118.6	0.776	0.776	0.582	0.582	0.427	1171.8	878.8	878.8	644.8
BDP/BSP768 LED55/740	3920.0	32.5	120.6	0.855	0.855	0.641	0.641	0.47	1291.0	967.9	967.9	709.7
BDP/BSP768 LED60/740	4200.0	35.0	120.0	0.921	0.921	0.691	0.691	0.507	1390.7	1043.4	1043.4	765.6
BDP/BSP768 LED69/740	4900.0	40.0	122.5	1.053	1.053	0.79	0.79	0.579	1590.0	1192.9	1192.9	874.3
BDP/BSP768 LED74/740	5180.0	43.0	120.5	1.132	1.132	0.849	0.849	0.623	1709.3	1282.0	1282.0	940.7

BDP/BSP768 LED80/740	5520.0	46.5	118.7	1.224	1.224	0.918	0.918	0.673	1848.2	1386.2	1386.2	1016.2
BDP/BSP768 LED90/740	6210.0	53.0	117.2	1.395	1.395	1.046	1.046	0.767	2106.4	1579.5	1579.5	1158.2
BDP/BSP768 LED99/740	6900.0	58.0	119.0	1.526	1.526	1.144	1.144	0.839	2304.3	1727.4	1727.4	1266.9
BDP/BSP768 LED109/740	7480.0	64.0	116.9	1.684	1.684	1.263	1.263	0.926	2542.8	1907.1	1907.1	1398.3
BDP/BSP768 LED119/740	8040.0	71.0	113.2	1.868	1.868	1.401	1.401	1.027	2820.7	2115.5	2115.5	1550.8
BDP/BSP768 LED14/730	1008.0	9.7	103.9	0.255	0.255	0.191	0.191	0.14	385.0	288.4	288.4	211.4
BDP/BSP768 LED18/730	1296.0	12.2	106.2	0.321	0.321	0.241	0.241	0.177	484.7	363.9	363.9	267.3
BDP/BSP768 LED24/730	1704.0	15.8	107.8	0.416	0.416	0.312	0.312	0.229	628.2	471.1	471.1	345.8
BDP/BSP768 LED27/730	1917.0	17.8	107.7	0.468	0.468	0.351	0.351	0.257	706.7	530.0	530.0	388.1
BDP/BSP768 LED34/730	2414.0	22.0	109.7	0.579	0.579	0.434	0.434	0.318	874.3	655.3	655.3	480.2
BDP/BSP768 LED40/730	2840.0	25.5	111.4	0.671	0.671	0.503	0.503	0.369	1013.2	759.5	759.5	557.2
BDP/BSP768 LED44/730	3124.0	28.0	111.6	0.737	0.737	0.553	0.553	0.405	1112.9	835.0	835.0	611.6
BDP/BSP768 LED50/730	3500.0	31.5	111.1	0.829	0.829	0.622	0.622	0.456	1251.8	939.2	939.2	688.6
BDP/BSP768 LED55/730	3920.0	34.5	113.6	0.908	0.908	0.681	0.681	0.499	1371.1	1028.3	1028.3	753.5
BDP/BSP768 LED60/730	4200.0	37.0	113.5	0.974	0.974	0.73	0.73	0.536	1470.7	1102.3	1102.3	809.4
BDP/BSP768 LED69/730	4900.0	42.5	115.3	1.118	1.118	0.838	0.838	0.615	1688.2	1265.4	1265.4	928.6
BDP/BSP768 LED74/730	5106.0	45.5	112.2	1.197	1.197	0.898	0.898	0.658	1807.5	1356.0	1356.0	993.6
BDP/BSP768 LED80/730	5520.0	49.5	111.5	1.303	1.303	0.977	0.977	0.717	1967.5	1475.3	1475.3	1082.7
BDP/BSP768 LED90/730	6210.0	56.0	110.9	1.474	1.474	1.106	1.106	0.811	2225.7	1670.1	1670.1	1224.6
BDP/BSP768 LED99/730	6800.0	62.0	109.7	1.632	1.632	1.224	1.224	0.898	2464.3	1848.2	1848.2	1356.0
BDP/BSP768 LED109/730	7370.0	69.0	106.8	1.816	1.816	1.362	1.362	0.999	2742.2	2056.6	2056.6	1508.5
BDP/BSP768 LED119/730	8040.0	76.0	105.8	2.0	2.0	1.5	1.5	1.1	3020.0	2265.0	2265.0	1661.0
BDP/BSP768 LED14/727	1008.0	11.0	91.6	0.289	0.289	0.217	0.217	0.159	436.4	327.7	327.7	240.1
BDP/BSP768 LED18/727	1278.0	13.4	95.4	0.353	0.353	0.265	0.265	0.194	533.0	400.2	400.2	292.9
BDP/BSP768 LED24/727	1704.0	17.4	97.9	0.458	0.458	0.344	0.344	0.252	691.6	519.4	519.4	380.5

BDP/BSP768 LED27/727	1917.0	19.6	97.8	0.516	0.516	0.387	0.387	0.284	779.2	584.4	584.4	428.8
BDP/BSP768 LED34/727	2380.0	24.5	97.1	0.645	0.645	0.484	0.484	0.355	974.0	730.8	730.8	536.0
BDP/BSP768 LED40/727	2800.0	28.0	100.0	0.737	0.737	0.553	0.553	0.405	1112.9	835.0	835.0	611.6
BDP/BSP768 LED44/727	3080.0	30.5	101.0	0.803	0.803	0.602	0.602	0.442	1212.5	909.0	909.0	667.4
BDP/BSP768 LED50/727	3450.0	35.0	98.6	0.921	0.921	0.691	0.691	0.507	1390.7	1043.4	1043.4	765.6
BDP/BSP768 LED55/727	3864.0	38.5	100.4	1.013	1.013	0.76	0.76	0.557	1529.6	1147.6	1147.6	841.1
BDP/BSP768 LED60/727	4140.0	41.0	101.0	1.079	1.079	0.809	0.809	0.593	1629.3	1221.6	1221.6	895.4
BDP/BSP768 LED69/727	4692.0	47.0	99.8	1.237	1.237	0.928	0.928	0.68	1867.9	1401.3	1401.3	1026.8
BDP/BSP768 LED74/727	5106.0	51.0	100.1	1.342	1.342	1.006	1.006	0.738	2026.4	1519.1	1519.1	1114.4
BDP/BSP768 LED80/727	5440.0	55.0	98.9	1.447	1.447	1.085	1.085	0.796	2185.0	1638.4	1638.4	1202.0
BDP/BSP768 LED90/727	6030.0	63.0	95.7	1.658	1.658	1.244	1.244	0.912	2503.6	1878.4	1878.4	1377.1
BDP/BSP768 LED99/727	6700.0	70.0	95.7	1.842	1.842	1.382	1.382	1.013	2781.4	2086.8	2086.8	1529.6
BDP/BSP768 LED109/727	7150.0	78.0	91.7	2.053	2.053	1.54	1.54	1.129	3100.0	2325.4	2325.4	1704.8
BDP/BSP768 LED14/722	1008.0	12.4	81.3	0.326	0.326	0.244	0.244	0.179	492.3	368.4	368.4	270.3
BDP/BSP768 LED18/722	1278.0	15.4	83.0	0.405	0.405	0.304	0.304	0.223	611.6	459.0	459.0	336.7
BDP/BSP768 LED24/722	1704.0	20.5	83.1	0.539	0.539	0.404	0.404	0.296	813.9	610.0	610.0	447.0
BDP/BSP768 LED27/722	1917.0	22.5	85.2	0.592	0.592	0.444	0.444	0.326	893.9	670.4	670.4	492.3
BDP/BSP768 LED34/722	2380.0	28.5	83.5	0.75	0.75	0.562	0.562	0.413	1132.5	848.6	848.6	623.6
BDP/BSP768 LED40/722	2800.0	32.5	86.2	0.855	0.855	0.641	0.641	0.47	1291.0	967.9	967.9	709.7
BDP/BSP768 LED44/722	3080.0	36.0	85.6	0.947	0.947	0.71	0.71	0.521	1430.0	1072.1	1072.1	786.7
BDP/BSP768 LED50/722	3450.0	41.0	84.1	1.079	1.079	0.809	0.809	0.593	1629.3	1221.6	1221.6	895.4
BDP/BSP768 LED55/722	3864.0	45.0	85.9	1.184	1.184	0.888	0.888	0.651	1787.8	1340.9	1340.9	983.0
BDP/BSP768 LED60/722	4140.0	48.0	86.2	1.263	1.263	0.947	0.947	0.695	1907.1	1430.0	1430.0	1049.4
BDP/BSP768 LED69/722	4830.0	55.0	87.8	1.447	1.447	1.085	1.085	0.796	2185.0	1638.4	1638.4	1202.0
BDP/BSP768 LED74/722	5032.0	59.0	85.3	1.553	1.553	1.165	1.165	0.854	2345.0	1759.2	1759.2	1289.5

BDP/BSP768 LED80/722	5440.0	65.0	83.7	1.711	1.711	1.283	1.283	0.941	2583.6	1937.3	1937.3	1420.9
BDP/BSP768 LED90/722	6030.0	74.0	81.5	1.947	1.947	1.46	1.46	1.071	2940.0	2204.6	2204.6	1617.2
BDP/BSP768 LED14/840	1008.0	11.2	90.0	0.295	0.295	0.221	0.221	0.162	445.4	333.7	333.7	244.6
BDP/BSP768 LED18/840	1296.0	13.8	93.9	0.363	0.363	0.272	0.272	0.2	548.1	410.7	410.7	302.0
BDP/BSP768 LED24/840	1704.0	18.4	92.6	0.484	0.484	0.363	0.363	0.266	730.8	548.1	548.1	401.7
BDP/BSP768 LED27/840	1917.0	20.5	93.5	0.539	0.539	0.404	0.404	0.296	813.9	610.0	610.0	447.0
BDP/BSP768 LED34/840	2380.0	26.0	91.5	0.684	0.684	0.513	0.513	0.376	1032.8	774.6	774.6	567.8
BDP/BSP768 LED40/840	2800.0	29.5	94.9	0.776	0.776	0.582	0.582	0.427	1171.8	878.8	878.8	644.8
BDP/BSP768 LED44/840	3080.0	32.0	96.2	0.842	0.842	0.632	0.632	0.463	1271.4	954.3	954.3	699.1
BDP/BSP768 LED50/840	3500.0	36.5	95.9	0.961	0.961	0.721	0.721	0.529	1451.1	1088.7	1088.7	798.8
BDP/BSP768 LED55/840	3864.0	40.5	95.4	1.066	1.066	0.8	0.8	0.586	1609.7	1208.0	1208.0	884.9
BDP/BSP768 LED60/840	4140.0	43.0	96.3	1.132	1.132	0.849	0.849	0.623	1709.3	1282.0	1282.0	940.7
BDP/BSP768 LED69/840	4830.0	49.5	97.6	1.303	1.303	0.977	0.977	0.717	1967.5	1475.3	1475.3	1082.7
BDP/BSP768 LED74/840	5106.0	53.0	96.3	1.395	1.395	1.046	1.046	0.767	2106.4	1579.5	1579.5	1158.2
BDP/BSP768 LED80/840	5520.0	58.0	95.2	1.526	1.526	1.144	1.144	0.839	2304.3	1727.4	1727.4	1266.9
BDP/BSP768 LED90/840	6120.0	66.0	92.7	1.737	1.737	1.303	1.303	0.955	2622.9	1967.5	1967.5	1442.0
BDP/BSP768 LED99/840	6700.0	73.0	91.8	1.921	1.921	1.441	1.441	1.057	2900.7	2175.9	2175.9	1596.1
BDP/BSP768 LED14/830	1008.0	11.6	86.9	0.305	0.305	0.229	0.229	0.168	460.6	345.8	345.8	253.7
BDP/BSP768 LED18/830	1296.0	14.4	90.0	0.379	0.379	0.284	0.284	0.208	572.3	428.8	428.8	314.1
BDP/BSP768 LED24/830	1704.0	19.0	89.7	0.5	0.5	0.375	0.375	0.275	755.0	566.2	566.2	415.3
BDP/BSP768 LED27/830	1917.0	21.0	91.3	0.553	0.553	0.415	0.415	0.304	835.0	626.6	626.6	459.0
BDP/BSP768 LED34/830	2380.0	26.5	89.8	0.697	0.697	0.523	0.523	0.383	1052.5	789.7	789.7	578.3
BDP/BSP768 LED40/830	2800.0	30.5	91.8	0.803	0.803	0.602	0.602	0.442	1212.5	909.0	909.0	667.4
BDP/BSP768 LED44/830	3080.0	33.0	93.3	0.868	0.868	0.651	0.651	0.477	1310.7	983.0	983.0	720.3
BDP/BSP768 LED50/830	3450.0	38.0	90.8	1.0	1.0	0.75	0.75	0.55	1510.0	1132.5	1132.5	830.5

BDP/BSP768 LED55/830	3864.0	42.0	92.0	1.105	1.105	0.829	0.829	0.608	1668.6	1251.8	1251.8	918.1
BDP/BSP768 LED60/830	4140.0	44.5	93.0	1.171	1.171	0.878	0.878	0.644	1768.2	1325.8	1325.8	972.4
BDP/BSP768 LED69/830	4830.0	51.0	94.7	1.342	1.342	1.006	1.006	0.738	2026.4	1519.1	1519.1	1114.4
BDP/BSP768 LED74/830	5106.0	55.0	92.8	1.447	1.447	1.085	1.085	0.796	2185.0	1638.4	1638.4	1202.0
BDP/BSP768 LED80/830	5440.0	60.0	90.7	1.579	1.579	1.184	1.184	0.868	2384.3	1787.8	1787.8	1310.7
BDP/BSP768 LED90/830	6030.0	68.0	88.7	1.789	1.789	1.342	1.342	0.984	2701.4	2026.4	2026.4	1485.8
BDP/BSP768 LED99/830	6700.0	76.0	88.2	2.0	2.0	1.5	1.5	1.1	3020.0	2265.0	2265.0	1661.0
BDP/BSP768 LED14/827	1008.0	12.4	81.3	0.326	0.326	0.244	0.244	0.179	492.3	368.4	368.4	270.3
BDP/BSP768 LED18/827	1278.0	15.4	83.0	0.405	0.405	0.304	0.304	0.223	611.6	459.0	459.0	336.7
BDP/BSP768 LED24/827	1704.0	20.5	83.1	0.539	0.539	0.404	0.404	0.296	813.9	610.0	610.0	447.0
BDP/BSP768 LED27/827	1917.0	22.5	85.2	0.592	0.592	0.444	0.444	0.326	893.9	670.4	670.4	492.3
BDP/BSP768 LED34/827	2380.0	28.5	83.5	0.75	0.75	0.562	0.562	0.413	1132.5	848.6	848.6	623.6
BDP/BSP768 LED40/827	2800.0	32.5	86.2	0.855	0.855	0.641	0.641	0.47	1291.0	967.9	967.9	709.7
BDP/BSP768 LED44/827	3080.0	36.0	85.6	0.947	0.947	0.71	0.71	0.521	1430.0	1072.1	1072.1	786.7
BDP/BSP768 LED50/827	3450.0	41.0	84.1	1.079	1.079	0.809	0.809	0.593	1629.3	1221.6	1221.6	895.4
BDP/BSP768 LED55/827	3864.0	45.0	85.9	1.184	1.184	0.888	0.888	0.651	1787.8	1340.9	1340.9	983.0
BDP/BSP768 LED60/827	4140.0	48.0	86.2	1.263	1.263	0.947	0.947	0.695	1907.1	1430.0	1430.0	1049.4
BDP/BSP768 LED69/827	4830.0	55.0	87.8	1.447	1.447	1.085	1.085	0.796	2185.0	1638.4	1638.4	1202.0
BDP/BSP768 LED74/827	5032.0	59.0	85.3	1.553	1.553	1.165	1.165	0.854	2345.0	1759.2	1759.2	1289.5
BDP/BSP768 LED80/827	5440.0	65.0	83.7	1.711	1.711	1.283	1.283	0.941	2583.6	1937.3	1937.3	1420.9
BDP/BSP768 LED90/827	6030.0	74.0	81.5	1.947	1.947	1.46	1.46	1.071	2940.0	2204.6	2204.6	1617.2

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

APPENDIX (PEP ECOPASSPORT ALIGNED)

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

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

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

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

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

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

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

$$PGSF = PSF * GSF$$

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

$$TSF = PGSF * CSF$$

Table A3: Light management functions (PEP EcoPassport aligned)

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

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

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

As described in the EPD, calculations are made based on dataset describing electricity available on the low voltage level in Europe for year 2022 (source Ecoinvent 3.8 database). This value should be adjusted depending on specific project requirements. Presented controls factors and functional unit conversion

values are based on the PEP EcoPassport PSR for luminaries (PSR-0014-ed2.0-EN-2023 07 13). Please refer to this publication or contact Signify directly for more information.

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

Configuration	Flux [lm]	Power [W]	Efficacy [lm/W]	PSF	Total Scaling Factor (TSF)				Scaled Impacts (GWP100 B6 - kg CO2eq.)			
					NC	DD	PS	DD+PS	NC	DD	PS	DD+PS
BDP/BSP768 LED14/740	1008.0	9.4	107.2	0.247	0.086	0.064	0.064	0.047	129.9	96.6	96.6	71.0
BDP/BSP768 LED18/740	1296.0	11.6	111.7	0.305	0.082	0.062	0.062	0.045	123.8	93.6	93.6	68.0
BDP/BSP768 LED24/740	1728.0	15.0	115.2	0.395	0.08	0.06	0.06	0.044	120.8	90.6	90.6	66.4
BDP/BSP768 LED27/740	1917.0	16.8	114.1	0.442	0.081	0.061	0.061	0.045	122.3	92.1	92.1	68.0
BDP/BSP768 LED34/740	2414.0	21.0	115.0	0.553	0.08	0.06	0.06	0.044	120.8	90.6	90.6	66.4
BDP/BSP768 LED40/740	2840.0	24.0	118.3	0.632	0.078	0.058	0.058	0.043	117.8	87.6	87.6	64.9
BDP/BSP768 LED44/740	3124.0	26.5	117.9	0.697	0.078	0.058	0.058	0.043	117.8	87.6	87.6	64.9
BDP/BSP768 LED50/740	3500.0	29.5	118.6	0.776	0.078	0.058	0.058	0.043	117.8	87.6	87.6	64.9
BDP/BSP768 LED55/740	3920.0	32.5	120.6	0.855	0.076	0.057	0.057	0.042	114.8	86.1	86.1	63.4
BDP/BSP768 LED60/740	4200.0	35.0	120.0	0.921	0.077	0.058	0.058	0.042	116.3	87.6	87.6	63.4
BDP/BSP768 LED69/740	4900.0	40.0	122.5	1.053	0.075	0.056	0.056	0.041	113.2	84.6	84.6	61.9
BDP/BSP768 LED74/740	5180.0	43.0	120.5	1.132	0.076	0.057	0.057	0.042	114.8	86.1	86.1	63.4
BDP/BSP768 LED80/740	5520.0	46.5	118.7	1.224	0.078	0.058	0.058	0.043	117.8	87.6	87.6	64.9
BDP/BSP768 LED90/740	6210.0	53.0	117.2	1.395	0.079	0.059	0.059	0.043	119.3	89.1	89.1	64.9
BDP/BSP768 LED99/740	6900.0	58.0	119.0	1.526	0.077	0.058	0.058	0.042	116.3	87.6	87.6	63.4
BDP/BSP768 LED109/740	7480.0	64.0	116.9	1.684	0.079	0.059	0.059	0.043	119.3	89.1	89.1	64.9
BDP/BSP768 LED119/740	8040.0	71.0	113.2	1.868	0.081	0.061	0.061	0.045	122.3	92.1	92.1	68.0
BDP/BSP768 LED14/730	1008.0	9.7	103.9	0.255	0.089	0.067	0.067	0.049	134.4	101.2	101.2	74.0
BDP/BSP768 LED18/730	1296.0	12.2	106.2	0.321	0.087	0.065	0.065	0.048	131.4	98.2	98.2	72.5

BDP/BSP768 LED24/730	1704.0	15.8	107.8	0.416	0.085	0.064	0.064	0.047	128.4	96.6	96.6	71.0
BDP/BSP768 LED27/730	1917.0	17.8	107.7	0.468	0.085	0.064	0.064	0.047	128.4	96.6	96.6	71.0
BDP/BSP768 LED34/730	2414.0	22.0	109.7	0.579	0.084	0.063	0.063	0.046	126.8	95.1	95.1	69.5
BDP/BSP768 LED40/730	2840.0	25.5	111.4	0.671	0.083	0.062	0.062	0.046	125.3	93.6	93.6	69.5
BDP/BSP768 LED44/730	3124.0	28.0	111.6	0.737	0.083	0.062	0.062	0.046	125.3	93.6	93.6	69.5
BDP/BSP768 LED50/730	3500.0	31.5	111.1	0.829	0.083	0.062	0.062	0.046	125.3	93.6	93.6	69.5
BDP/BSP768 LED55/730	3920.0	34.5	113.6	0.908	0.081	0.061	0.061	0.045	122.3	92.1	92.1	68.0
BDP/BSP768 LED60/730	4200.0	37.0	113.5	0.974	0.081	0.061	0.061	0.045	122.3	92.1	92.1	68.0
BDP/BSP768 LED69/730	4900.0	42.5	115.3	1.118	0.08	0.06	0.06	0.044	120.8	90.6	90.6	66.4
BDP/BSP768 LED74/730	5106.0	45.5	112.2	1.197	0.082	0.062	0.062	0.045	123.8	93.6	93.6	68.0
BDP/BSP768 LED80/730	5520.0	49.5	111.5	1.303	0.083	0.062	0.062	0.046	125.3	93.6	93.6	69.5
BDP/BSP768 LED90/730	6210.0	56.0	110.9	1.474	0.083	0.062	0.062	0.046	125.3	93.6	93.6	69.5
BDP/BSP768 LED99/730	6800.0	62.0	109.7	1.632	0.084	0.063	0.063	0.046	126.8	95.1	95.1	69.5
BDP/BSP768 LED109/730	7370.0	69.0	106.8	1.816	0.086	0.064	0.064	0.047	129.9	96.6	96.6	71.0
BDP/BSP768 LED119/730	8040.0	76.0	105.8	2.0	0.087	0.065	0.065	0.048	131.4	98.2	98.2	72.5
BDP/BSP768 LED14/727	1008.0	11.0	91.6	0.289	0.1	0.075	0.075	0.055	151.0	113.2	113.2	83.0
BDP/BSP768 LED18/727	1278.0	13.4	95.4	0.353	0.097	0.073	0.073	0.053	146.5	110.2	110.2	80.0
BDP/BSP768 LED24/727	1704.0	17.4	97.9	0.458	0.094	0.07	0.07	0.052	141.9	105.7	105.7	78.5
BDP/BSP768 LED27/727	1917.0	19.6	97.8	0.516	0.094	0.07	0.07	0.052	141.9	105.7	105.7	78.5
BDP/BSP768 LED34/727	2380.0	24.5	97.1	0.645	0.095	0.071	0.071	0.052	143.4	107.2	107.2	78.5
BDP/BSP768 LED40/727	2800.0	28.0	100.0	0.737	0.092	0.069	0.069	0.051	138.9	104.2	104.2	77.0
BDP/BSP768 LED44/727	3080.0	30.5	101.0	0.803	0.091	0.068	0.068	0.05	137.4	102.7	102.7	75.5
BDP/BSP768 LED50/727	3450.0	35.0	98.6	0.921	0.093	0.07	0.07	0.051	140.4	105.7	105.7	77.0
BDP/BSP768 LED55/727	3864.0	38.5	100.4	1.013	0.092	0.069	0.069	0.051	138.9	104.2	104.2	77.0
BDP/BSP768 LED60/727	4140.0	41.0	101.0	1.079	0.091	0.068	0.068	0.05	137.4	102.7	102.7	75.5

BDP/BSP768 LED69/727	4692.0	47.0	99.8	1.237	0.092	0.069	0.069	0.051	138.9	104.2	104.2	77.0
BDP/BSP768 LED74/727	5106.0	51.0	100.1	1.342	0.092	0.069	0.069	0.051	138.9	104.2	104.2	77.0
BDP/BSP768 LED80/727	5440.0	55.0	98.9	1.447	0.093	0.07	0.07	0.051	140.4	105.7	105.7	77.0
BDP/BSP768 LED90/727	6030.0	63.0	95.7	1.658	0.096	0.072	0.072	0.053	145.0	108.7	108.7	80.0
BDP/BSP768 LED99/727	6700.0	70.0	95.7	1.842	0.096	0.072	0.072	0.053	145.0	108.7	108.7	80.0
BDP/BSP768 LED109/727	7150.0	78.0	91.7	2.053	0.1	0.075	0.075	0.055	151.0	113.2	113.2	83.0
BDP/BSP768 LED14/722	1008.0	12.4	81.3	0.326	0.113	0.085	0.085	0.062	170.6	128.4	128.4	93.6
BDP/BSP768 LED18/722	1278.0	15.4	83.0	0.405	0.111	0.083	0.083	0.061	167.6	125.3	125.3	92.1
BDP/BSP768 LED24/722	1704.0	20.5	83.1	0.539	0.111	0.083	0.083	0.061	167.6	125.3	125.3	92.1
BDP/BSP768 LED27/722	1917.0	22.5	85.2	0.592	0.108	0.081	0.081	0.059	163.1	122.3	122.3	89.1
BDP/BSP768 LED34/722	2380.0	28.5	83.5	0.75	0.11	0.082	0.082	0.061	166.1	123.8	123.8	92.1
BDP/BSP768 LED40/722	2800.0	32.5	86.2	0.855	0.107	0.08	0.08	0.059	161.6	120.8	120.8	89.1
BDP/BSP768 LED44/722	3080.0	36.0	85.6	0.947	0.108	0.081	0.081	0.059	163.1	122.3	122.3	89.1
BDP/BSP768 LED50/722	3450.0	41.0	84.1	1.079	0.109	0.082	0.082	0.06	164.6	123.8	123.8	90.6
BDP/BSP768 LED55/722	3864.0	45.0	85.9	1.184	0.107	0.08	0.08	0.059	161.6	120.8	120.8	89.1
BDP/BSP768 LED60/722	4140.0	48.0	86.2	1.263	0.107	0.08	0.08	0.059	161.6	120.8	120.8	89.1
BDP/BSP768 LED69/722	4830.0	55.0	87.8	1.447	0.105	0.079	0.079	0.058	158.5	119.3	119.3	87.6
BDP/BSP768 LED74/722	5032.0	59.0	85.3	1.553	0.108	0.081	0.081	0.059	163.1	122.3	122.3	89.1
BDP/BSP768 LED80/722	5440.0	65.0	83.7	1.711	0.11	0.082	0.082	0.061	166.1	123.8	123.8	92.1
BDP/BSP768 LED90/722	6030.0	74.0	81.5	1.947	0.113	0.085	0.085	0.062	170.6	128.4	128.4	93.6
BDP/BSP768 LED14/840	1008.0	11.2	90.0	0.295	0.102	0.076	0.076	0.056	154.0	114.8	114.8	84.6
BDP/BSP768 LED18/840	1296.0	13.8	93.9	0.363	0.098	0.074	0.074	0.054	148.0	111.7	111.7	81.5
BDP/BSP768 LED24/840	1704.0	18.4	92.6	0.484	0.099	0.074	0.074	0.054	149.5	111.7	111.7	81.5
BDP/BSP768 LED27/840	1917.0	20.5	93.5	0.539	0.098	0.074	0.074	0.054	148.0	111.7	111.7	81.5
BDP/BSP768 LED34/840	2380.0	26.0	91.5	0.684	0.101	0.076	0.076	0.056	152.5	114.8	114.8	84.6

BDP/BSP768 LED40/840	2800.0	29.5	94.9	0.776	0.097	0.073	0.073	0.053	146.5	110.2	110.2	80.0
BDP/BSP768 LED44/840	3080.0	32.0	96.2	0.842	0.096	0.072	0.072	0.053	145.0	108.7	108.7	80.0
BDP/BSP768 LED50/840	3500.0	36.5	95.9	0.961	0.096	0.072	0.072	0.053	145.0	108.7	108.7	80.0
BDP/BSP768 LED55/840	3864.0	40.5	95.4	1.066	0.097	0.073	0.073	0.053	146.5	110.2	110.2	80.0
BDP/BSP768 LED60/840	4140.0	43.0	96.3	1.132	0.096	0.072	0.072	0.053	145.0	108.7	108.7	80.0
BDP/BSP768 LED69/840	4830.0	49.5	97.6	1.303	0.094	0.07	0.07	0.052	141.9	105.7	105.7	78.5
BDP/BSP768 LED74/840	5106.0	53.0	96.3	1.395	0.096	0.072	0.072	0.053	145.0	108.7	108.7	80.0
BDP/BSP768 LED80/840	5520.0	58.0	95.2	1.526	0.097	0.073	0.073	0.053	146.5	110.2	110.2	80.0
BDP/BSP768 LED90/840	6120.0	66.0	92.7	1.737	0.099	0.074	0.074	0.054	149.5	111.7	111.7	81.5
BDP/BSP768 LED99/840	6700.0	73.0	91.8	1.921	0.1	0.075	0.075	0.055	151.0	113.2	113.2	83.0
BDP/BSP768 LED14/830	1008.0	11.6	86.9	0.305	0.106	0.08	0.08	0.058	160.1	120.8	120.8	87.6
BDP/BSP768 LED18/830	1296.0	14.4	90.0	0.379	0.102	0.076	0.076	0.056	154.0	114.8	114.8	84.6
BDP/BSP768 LED24/830	1704.0	19.0	89.7	0.5	0.103	0.077	0.077	0.057	155.5	116.3	116.3	86.1
BDP/BSP768 LED27/830	1917.0	21.0	91.3	0.553	0.101	0.076	0.076	0.056	152.5	114.8	114.8	84.6
BDP/BSP768 LED34/830	2380.0	26.5	89.8	0.697	0.102	0.076	0.076	0.056	154.0	114.8	114.8	84.6
BDP/BSP768 LED40/830	2800.0	30.5	91.8	0.803	0.1	0.075	0.075	0.055	151.0	113.2	113.2	83.0
BDP/BSP768 LED44/830	3080.0	33.0	93.3	0.868	0.099	0.074	0.074	0.054	149.5	111.7	111.7	81.5
BDP/BSP768 LED50/830	3450.0	38.0	90.8	1.0	0.101	0.076	0.076	0.056	152.5	114.8	114.8	84.6
BDP/BSP768 LED55/830	3864.0	42.0	92.0	1.105	0.1	0.075	0.075	0.055	151.0	113.2	113.2	83.0
BDP/BSP768 LED60/830	4140.0	44.5	93.0	1.171	0.099	0.074	0.074	0.054	149.5	111.7	111.7	81.5
BDP/BSP768 LED69/830	4830.0	51.0	94.7	1.342	0.097	0.073	0.073	0.053	146.5	110.2	110.2	80.0
BDP/BSP768 LED74/830	5106.0	55.0	92.8	1.447	0.099	0.074	0.074	0.054	149.5	111.7	111.7	81.5
BDP/BSP768 LED80/830	5440.0	60.0	90.7	1.579	0.102	0.076	0.076	0.056	154.0	114.8	114.8	84.6
BDP/BSP768 LED90/830	6030.0	68.0	88.7	1.789	0.104	0.078	0.078	0.057	157.0	117.8	117.8	86.1
BDP/BSP768 LED99/830	6700.0	76.0	88.2	2.0	0.104	0.078	0.078	0.057	157.0	117.8	117.8	86.1

BDP/BSP768 LED14/827	1008.0	12.4	81.3	0.326	0.113	0.085	0.085	0.062	170.6	128.4	128.4	93.6
BDP/BSP768 LED18/827	1278.0	15.4	83.0	0.405	0.111	0.083	0.083	0.061	167.6	125.3	125.3	92.1
BDP/BSP768 LED24/827	1704.0	20.5	83.1	0.539	0.111	0.083	0.083	0.061	167.6	125.3	125.3	92.1
BDP/BSP768 LED27/827	1917.0	22.5	85.2	0.592	0.108	0.081	0.081	0.059	163.1	122.3	122.3	89.1
BDP/BSP768 LED34/827	2380.0	28.5	83.5	0.75	0.11	0.082	0.082	0.061	166.1	123.8	123.8	92.1
BDP/BSP768 LED40/827	2800.0	32.5	86.2	0.855	0.107	0.08	0.08	0.059	161.6	120.8	120.8	89.1
BDP/BSP768 LED44/827	3080.0	36.0	85.6	0.947	0.108	0.081	0.081	0.059	163.1	122.3	122.3	89.1
BDP/BSP768 LED50/827	3450.0	41.0	84.1	1.079	0.109	0.082	0.082	0.06	164.6	123.8	123.8	90.6
BDP/BSP768 LED55/827	3864.0	45.0	85.9	1.184	0.107	0.08	0.08	0.059	161.6	120.8	120.8	89.1
BDP/BSP768 LED60/827	4140.0	48.0	86.2	1.263	0.107	0.08	0.08	0.059	161.6	120.8	120.8	89.1
BDP/BSP768 LED69/827	4830.0	55.0	87.8	1.447	0.105	0.079	0.079	0.058	158.5	119.3	119.3	87.6
BDP/BSP768 LED74/827	5032.0	59.0	85.3	1.553	0.108	0.081	0.081	0.059	163.1	122.3	122.3	89.1
BDP/BSP768 LED80/827	5440.0	65.0	83.7	1.711	0.11	0.082	0.082	0.061	166.1	123.8	123.8	92.1
BDP/BSP768 LED90/827	6030.0	74.0	81.5	1.947	0.113	0.085	0.085	0.062	170.6	128.4	128.4	93.6

** 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 highlighed in yellow:

ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

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

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

Thus, the calculation of this example would be:

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

Country	GWP tot (kg CO2 eq. per kwh)
AUSTRALIA	9,59E-01
AUSTRIA	3,37E-01
BELGIUM	2,63E+02
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+02
IRELAND	4,26E+02
ITALY	3,94E-01
LATAM	3,50E-01
NAM	4,83E-01
NETHERLANDS	5,88E-01
NORWAY	2,59E-02
POLAND	1,05E+03

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