ENVIRONMENTAL PRODUCT DECLARATION

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

UniStreet/LumiStreet Pro gen2 Micro
BGP281/291/391
Signify N.V.

EPD HUB
Publishing 2024-05-29

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	UniStreet/LumiStreet Pro gen2 Micro
Additional labels	BGP391 LED64-4S/730 II DN09 DDF2 D24 SRT
Product reference	910770232001
Place of production	Poland
Period for data	2022
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	Not Applicable

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 unit
Declared unit mass	5.0905 kg
GWP-fossil, A1-A3 (kgCO2e)	4.76E+01
GWP-total, A1-A3 (kgCO2e)	4.73E+01
Secondary material, inputs (%)	45
Secondary material, outputs (%)	61.4
Total energy use, A1-A3 (kWh)	160
Net fresh water use, A1-A3 (m3)	0.32

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 for large-scale ledification projects, the UniStreet/LumiStreet gen2 is the ideal 1:1 luminaire replacement for municipalities. Thanks to its high efficiency and low initial cost, the UniStreet/LumiStreet gen2 luminaire enables a fast payback and significant savings in terms of energy consumption within a short period of time. The ease of installation and maintenance is enabled by the Service tag and the SR (System Ready socket makes it future-ready and you can pair this luminaire with lighting control and software applications such as Interact City. Available with a number of different optics and lumen packages that can even be tuned further to fit exact project requirements, UniStreet/LumiStreet gen2 is a true point-to-point replacement solution for conventional light sources. The compact luminaire, using high-quality materials is also easy to dismantle and recycle at the end of its lifetime.

Further information can be found at https://www.signify.com/global.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	63.37	EU , APAC
Minerals	12.18	EU
Fossil materials	24.45	EU , APAC
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	0.001

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 unit
Mass per declared unit	5.0905 kg
Functional unit	5632 Lumens over 100000 hours
Reference service life	100000

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.

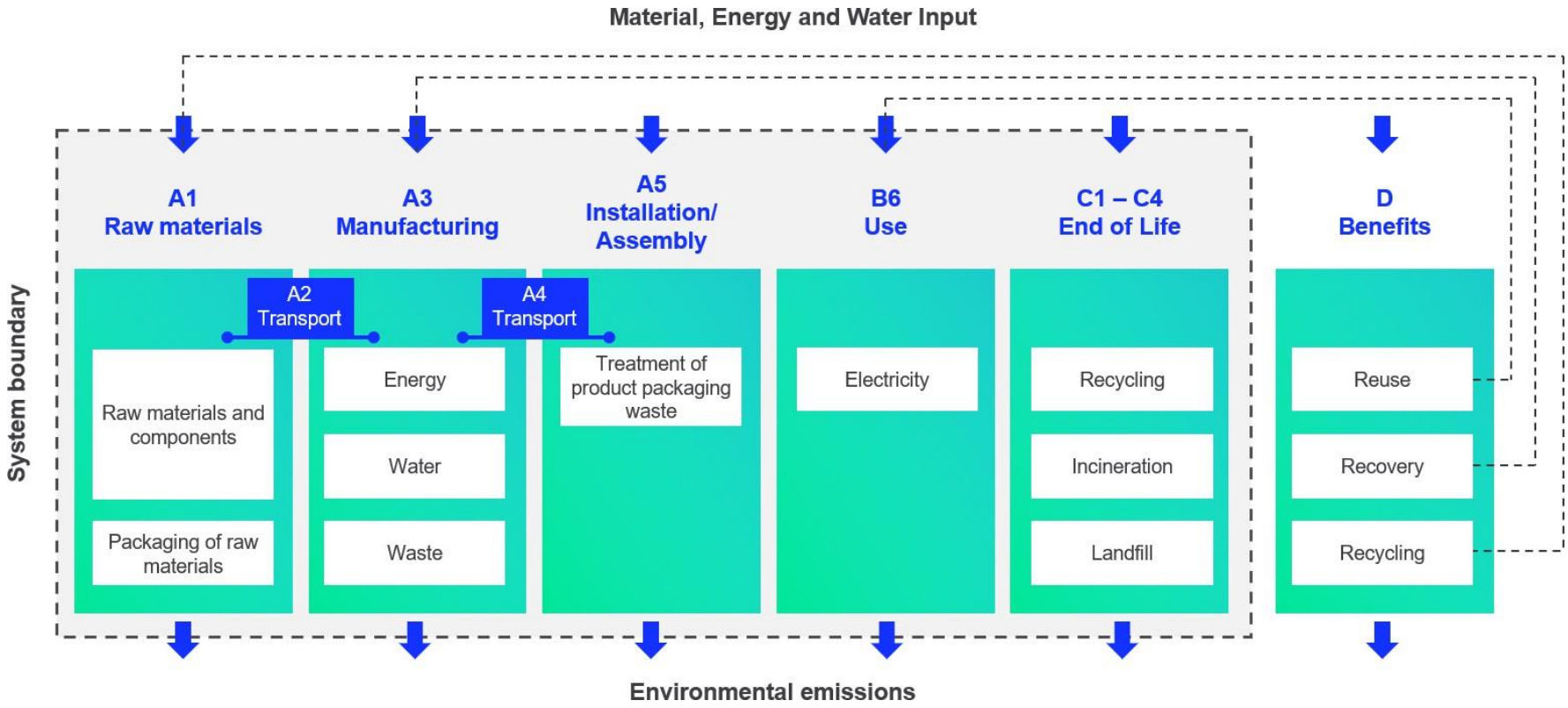
PRODUCT USE AND MAINTENANCE (B1-B7)

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	4,61E+01	9,57E-01	2,19E-01	4,73E+01	9,57E-01	4,17E-03	MNR	MNR	MNR	MNR	MNR	1,60E+03	MNR	MNR	7,16E-02	1,30E+00	7,36E-01	-7,34E+00
GWP – fossil	kg CO_2e	4,64E+01	9,57E-01	2,22E-01	4,76E+01	9,56E-01	8,54E-04	MNR	MNR	MNR	MNR	MNR	1,60E+03	MNR	MNR	7,16E-02	1,30E+00	7,36E-01	-7,33E+00
GWP – biogenic	kg CO_2e	-3,64E-01	0,00E+00	-3,01E-03	-3,67E-01	3,70E-04	3,31E-03	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	0,00E+00	0,00E+00	-3,39E-03
GWP – LULUC	kg CO_2e	6,95E-02	4,65E-04	1,30E-04	7,01E-02	3,53E-04	4,18E-08	MNR	MNR	MNR	MNR	MNR	3,74E+00	MNR	MNR	2,64E-05	1,15E-04	6,01E-05	-1,59E-03
Ozone depletion pot.	kg CFC_{-11}e	5,63E-06	2,10E-07	4,11E-08	5,88E-06	2,20E-07	9,65E-12	MNR	MNR	MNR	MNR	MNR	8,13E-05	MNR	MNR	1,65E-08	9,65E-09	7,37E-09	-2,04E-07
Acidification potential	mol H^+e	4,08E-01	1,29E-02	4,96E-04	4,22E-01	4,05E-03	9,60E-07	MNR	MNR	MNR	MNR	MNR	9,14E+00	MNR	MNR	3,03E-04	1,03E-03	3,75E-04	-1,11E-01
EP-freshwater[2)]	kg Pe	2,55E-03	6,39E-06	2,13E-06	2,56E-03	7,83E-06	1,11E-09	MNR	MNR	MNR	MNR	MNR	1,70E-01	MNR	MNR	5,86E-07	3,59E-06	1,11E-06	-5,55E-04
EP-marine	kg Ne	5,30E-02	3,30E-03	1,17E-04	5,64E-02	1,20E-03	4,45E-07	MNR	MNR	MNR	MNR	MNR	1,21E+00	MNR	MNR	9,00E-05	2,88E-04	2,10E-04	-9,17E-03
EP-terrestrial	mol Ne	5,77E-01	3,66E-02	1,16E-03	6,15E-01	1,33E-02	4,53E-06	MNR	MNR	MNR	MNR	MNR	1,38E+01	MNR	MNR	9,93E-04	3,16E-03	1,42E-03	-1,12E-01
POCP ("smog")[3)]	kg NMVOCe	1,81E-01	1,00E-02	5,18E-04	1,91E-01	4,25E-03	1,12E-06	MNR	MNR	MNR	MNR	MNR	3,78E+00	MNR	MNR	3,18E-04	8,21E-04	4,00E-04	-3,23E-02
ADP-minerals & metals[4)]	kg Sbe	3,42E-03	1,94E-06	1,02E-06	3,42E-03	2,24E-06	3,03E-10	MNR	MNR	MNR	MNR	MNR	1,49E-02	MNR	MNR	1,68E-07	6,92E-06	1,54E-07	-1,31E-03
ADP-fossil resources	MJ	5,41E+02	1,36E+01	3,17E+00	5,57E+02	1,44E+01	8,92E-04	MNR	MNR	MNR	MNR	MNR	3,41E+04	MNR	MNR	1,07E+00	1,12E+00	6,81E-01	-7,21E+01
Water use[5)]	m^3e depr.	1,67E+01	5,50E-02	3,02E-02	1,68E+01	6,42E-02	1,85E-04	MNR	MNR	MNR	MNR	MNR	9,31E+02	MNR	MNR	4,81E-03	6,42E-02	5,25E-02	-7,73E-01

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	3,37E-06	8,41E-08	8,13E-09	3,46E-06	1,10E-07	8,02E-12	MNR	MNR	MNR	MNR	MNR	3,00E-05	MNR	MNR	8,25E-09	1,12E-08	5,54E-09	-5,00E-07
Ionizing radiation[6)]	kBq U235e	2,68E+00	6,41E-02	3,99E-03	2,75E+00	6,84E-02	2,66E-06	MNR	MNR	MNR	MNR	MNR	9,22E+02	MNR	MNR	5,12E-03	6,92E-03	3,26E-03	-4,38E-01
Ecotoxicity (freshwater)	CTUe	2,51E+03	1,12E+01	3,64E+00	2,52E+03	1,29E+01	3,66E-03	MNR	MNR	MNR	MNR	MNR	2,32E+04	MNR	MNR	9,67E-01	6,33E+00	2,74E+02	-4,64E+02
Human toxicity, cancer	CTUh	1,21E-07	4,01E-10	1,61E-10	1,21E-07	3,17E-10	3,47E-13	MNR	MNR	MNR	MNR	MNR	7,59E-07	MNR	MNR	2,38E-11	2,17E-10	1,08E-09	-6,52E-09
Human tox. non-cancer	CTUh	1,90E-06	1,02E-08	1,49E-09	1,91E-06	1,28E-08	1,43E-11	MNR	MNR	MNR	MNR	MNR	2,49E-05	MNR	MNR	9,57E-10	8,86E-09	6,74E-08	-8,34E-07
SQP[7)]	-	1,96E+02	1,17E+01	9,75E-01	2,09E+02	1,65E+01	5,39E-04	MNR	MNR	MNR	MNR	MNR	6,16E+03	MNR	MNR	1,24E+00	1,55E+00	9,87E-01	-2,94E+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	4,84E+01	1,36E-01	3,41E+00	5,19E+01	1,62E-01	2,09E-05	MNR	MNR	MNR	MNR	MNR	6,93E+03	MNR	MNR	1,21E-02	1,39E-01	2,64E-02	-2,75E+00
Renew. PER as material	MJ	3,67E+00	0,00E+00	3,26E-02	3,71E+00	0,00E+00	-3,26E-02	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	-1,36E-01	-2,52E-01	0,00E+00
Total use of renew. PER	MJ	5,21E+01	1,36E-01	3,44E+00	5,56E+01	1,62E-01	-3,26E-02	MNR	MNR	MNR	MNR	MNR	6,93E+03	MNR	MNR	1,21E-02	3,18E-03	-2,25E-01	-2,75E+00
Non-re. PER as energy	MJ	5,07E+02	1,36E+01	2,98E+00	5,23E+02	1,44E+01	8,92E-04	MNR	MNR	MNR	MNR	MNR	3,40E+04	MNR	MNR	1,07E+00	1,12E+00	6,82E-01	-7,21E+01
Non-re. PER as material	MJ	3,40E+01	0,00E+00	8,44E-04	3,40E+01	0,00E+00	-8,44E-04	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	-1,38E+01	-1,45E+01	0,00E+00
Total use of non-re. PER	MJ	5,41E+02	1,36E+01	2,98E+00	5,57E+02	1,44E+01	4,74E-05	MNR	MNR	MNR	MNR	MNR	3,40E+04	MNR	MNR	1,07E+00	-1,27E+01	-1,38E+01	-7,21E+01
Secondary materials	kg	2,29E+00	4,48E-03	2,13E-03	2,30E+00	3,99E-03	1,00E-06	MNR	MNR	MNR	MNR	MNR	3,51E+00	MNR	MNR	2,98E-04	9,94E-04	1,70E-03	3,29E-01
Renew. secondary fuels	MJ	6,30E-02	3,19E-05	2,76E-05	6,30E-02	4,02E-05	8,13E-09	MNR	MNR	MNR	MNR	MNR	2,84E-02	MNR	MNR	3,01E-06	5,26E-05	1,43E-05	-8,88E-04
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water	m^3	3,21E-01	1,50E-03	7,19E-04	3,23E-01	1,86E-03	6,53E-07	MNR	MNR	MNR	MNR	MNR	2,93E+01	MNR	MNR	1,39E-04	2,27E-03	1,15E-03	-3,77E-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	7,09E+00	1,82E-02	1,09E-02	7,12E+00	1,90E-02	8,37E-05	MNR	MNR	MNR	MNR	MNR	1,22E+02	MNR	MNR	1,43E-03	6,59E-03	4,19E-02	-1,15E+00
Non-hazardous waste	kg	7,95E+01	2,55E-01	7,49E-02	7,98E+01	3,13E-01	6,36E-04	MNR	MNR	MNR	MNR	MNR	7,74E+03	MNR	MNR	2,34E-02	7,30E-01	1,92E+00	-3,30E+01
Radioactive waste	kg	1,09E-03	9,25E-05	3,37E-06	1,19E-03	9,61E-05	2,61E-09	MNR	MNR	MNR	MNR	MNR	2,48E-01	MNR	MNR	7,19E-06	3,72E-06	0,00E+00	-1,62E-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	2,61E+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	5,16E-01	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00	1,74E-01	1,74E-01	0,00E+00	0,00E+00	MNR	MNR	MNR	MNR	MNR	0,00E+00	MNR	MNR	0,00E+00	1,13E+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	4,52E+01	9,48E-01	2,20E-01	4,63E+01	9,46E-01	8,47E-04	MNR	MNR	MNR	MNR	MNR	1,58E+03	MNR	MNR	7,08E-02	1,30E+00	7,37E-01	-7,18E+00
Ozone depletion Pot.	kg CFC_{-11}e	4,23E-06	1,67E-07	3,57E-08	4,43E-06	1,74E-07	8,20E-12	MNR	MNR	MNR	MNR	MNR	7,05E-05	MNR	MNR	1,30E-08	8,04E-09	6,02E-09	-1,73E-07
Acidification	kg SO_2e	3,48E-01	1,02E-02	4,04E-04	3,58E-01	3,14E-03	6,86E-07	MNR	MNR	MNR	MNR	MNR	7,75E+00	MNR	MNR	2,35E-04	8,05E-04	2,83E-04	-9,67E-02
Eutrophication	kg PO_4^{3}e	9,85E-02	1,39E-03	2,31E-04	1,00E-01	7,16E-04	5,49E-07	MNR	MNR	MNR	MNR	MNR	5,97E+00	MNR	MNR	5,36E-05	3,42E-04	3,01E-03	-2,48E-02
POCP (“smog”)	kg C_2H_4e	2,18E-02	2,91E-04	3,38E-05	2,21E-02	1,23E-04	1,75E-08	MNR	MNR	MNR	MNR	MNR	3,17E-01	MNR	MNR	9,19E-06	2,76E-05	2,30E-05	-4,35E-03
ADP-elements	kg Sbe	3,41E-03	1,89E-06	1,00E-06	3,41E-03	2,17E-06	2,45E-10	MNR	MNR	MNR	MNR	MNR	1,49E-02	MNR	MNR	1,62E-07	6,89E-06	1,36E-07	-1,31E-03
ADP-fossil	MJ	5,40E+02	1,36E+01	3,17E+00	5,56E+02	1,44E+01	8,92E-04	MNR	MNR	MNR	MNR	MNR	3,40E+04	MNR	MNR	1,07E+00	1,12E+00	6,81E-01	-7,21E+01

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
BGP281/291/391 LED10-4S/740	890,000	6,8	130,9	0,168	0,168	0,126	0,126	0,092	268,6	201,5	201,5	147,8
BGP281/291/391 LED10-4S/730	890,000	7,1	125,4	0,175	0,175	0,131	0,131	0,096	280,5	210,4	210,4	154,3
BGP281/291/391 LED10-4S/727	890,000	7,9	112,7	0,195	0,195	0,146	0,146	0,107	312,1	234,1	234,1	171,7
BGP281/291/391 LED10-4S/722	890,000	8,8	101,1	0,217	0,217	0,163	0,163	0,120	347,7	260,7	260,7	191,2
BGP281/291/391 LED10-4S/830	890,000	7,9	112,7	0,195	0,195	0,146	0,146	0,107	312,1	234,1	234,1	171,7
BGP281/291/391 LED14-4S/740	1246,000	9,3	134,0	0,230	0,230	0,172	0,172	0,126	367,4	275,6	275,6	202,1
BGP281/291/391 LED14-4S/730	1246,000	9,9	125,9	0,244	0,244	0,183	0,183	0,134	391,1	293,3	293,3	215,1
BGP281/291/391 LED14-4S/727	1232,000	11,0	112,0	0,272	0,272	0,204	0,204	0,149	434,6	325,9	325,9	239,0
BGP281/291/391 LED14-4S/722	1232,000	12,4	99,4	0,306	0,306	0,230	0,230	0,168	489,9	367,4	367,4	269,4
BGP281/291/391 LED14-4S/830	1246,000	11,0	113,3	0,272	0,272	0,204	0,204	0,149	434,6	325,9	325,9	239,0
BGP281/291/391 LED16-4S/740	1424,000	10,6	134,3	0,262	0,262	0,196	0,196	0,144	418,8	314,1	314,1	230,3

BGP281/291/391 LED16-4S/730	1424,000	11,4	124,9	0,281	0,281	0,211	0,211	0,155	450,4	337,8	337,8	247,7
BGP281/291/391 LED16-4S/727	1408,000	12,8	110,0	0,316	0,316	0,237	0,237	0,174	505,7	379,3	379,3	278,1
BGP281/291/391 LED16-4S/722	1424,000	13,2	107,9	0,326	0,326	0,244	0,244	0,179	521,5	391,1	391,1	286,8
BGP281/291/391 LED16-4S/830	1408,000	12,8	110,0	0,316	0,316	0,237	0,237	0,174	505,7	379,3	379,3	278,1
BGP281/291/391 LED18-4S/740	1602,000	12,0	133,5	0,296	0,296	0,222	0,222	0,163	474,1	355,6	355,6	260,7
BGP281/291/391 LED18-4S/730	1602,000	13,0	123,2	0,321	0,321	0,241	0,241	0,177	513,6	385,2	385,2	282,5
BGP281/291/391 LED18-4S/727	1602,000	13,4	119,6	0,331	0,331	0,248	0,248	0,182	529,4	397,0	397,0	291,2
BGP281/291/391 LED18-4S/722	1602,000	15,0	106,8	0,370	0,370	0,278	0,278	0,204	592,6	444,4	444,4	325,9
BGP281/291/391 LED18-4S/830	1602,000	13,4	119,6	0,331	0,331	0,248	0,248	0,182	529,4	397,0	397,0	291,2
BGP281/291/391 LED20-4S/740	1760,000	13,6	129,4	0,336	0,336	0,252	0,252	0,185	537,3	403,0	403,0	295,5
BGP281/291/391 LED20-4S/730	1780,000	13,2	134,8	0,326	0,326	0,244	0,244	0,179	521,5	391,1	391,1	286,8
BGP281/291/391 LED20-4S/727	1780,000	15,0	118,7	0,370	0,370	0,278	0,278	0,204	592,6	444,4	444,4	325,9
BGP281/291/391 LED20-4S/722	1760,000	16,6	106,0	0,410	0,410	0,307	0,307	0,225	655,8	491,9	491,9	360,7
BGP281/291/391 LED20-4S/830	1760,000	14,8	118,9	0,365	0,365	0,274	0,274	0,201	584,7	438,5	438,5	321,6
BGP281/291/391 LED22-4S/740	1958,000	13,8	141,9	0,341	0,341	0,256	0,256	0,187	545,2	408,9	408,9	299,9
BGP281/291/391 LED22-4S/730	1936,000	14,6	132,6	0,360	0,360	0,270	0,270	0,198	576,8	432,6	432,6	317,2
BGP281/291/391 LED22-4S/727	1936,000	16,4	118,0	0,405	0,405	0,304	0,304	0,223	647,9	485,9	485,9	356,3
BGP281/291/391 LED22-4S/722	1936,000	18,6	104,1	0,459	0,459	0,344	0,344	0,253	734,8	551,1	551,1	404,1
BGP281/291/391 LED22-4S/830	1936,000	16,4	118,0	0,405	0,405	0,304	0,304	0,223	647,9	485,9	485,9	356,3
BGP281/291/391 LED25-4S/740	2200,000	15,8	139,2	0,390	0,390	0,293	0,293	0,215	624,2	468,1	468,1	343,3

BGP281/291/391 LED25-4S/730	2200,000	16,6	132,5	0,410	0,410	0,307	0,307	0,225	655,8	491,9	491,9	360,7
BGP281/291/391 LED25-4S/727	2200,000	19,0	115,8	0,469	0,469	0,352	0,352	0,258	750,6	563,0	563,0	412,8
BGP281/291/391 LED25-4S/722	2225,000	19,8	112,4	0,489	0,489	0,367	0,367	0,269	782,2	586,7	586,7	430,2
BGP281/291/391 LED25-4S/830	2200,000	19,0	115,8	0,469	0,469	0,352	0,352	0,258	750,6	563,0	563,0	412,8
BGP281/291/391 LED27-4S/740	2376,000	17,0	139,8	0,420	0,420	0,315	0,315	0,231	671,6	503,7	503,7	369,4
BGP281/291/391 LED27-4S/730	2376,000	18,2	130,5	0,449	0,449	0,337	0,337	0,247	719,0	539,3	539,3	395,5
BGP281/291/391 LED27-4S/727	2376,000	20,5	115,9	0,506	0,506	0,380	0,380	0,278	809,9	607,4	607,4	445,4
BGP281/291/391 LED27-4S/722	2403,000	21,0	114,4	0,519	0,519	0,389	0,389	0,285	829,6	622,2	622,2	456,3
BGP281/291/391 LED27-4S/830	2376,000	20,5	115,9	0,506	0,506	0,380	0,380	0,278	809,9	607,4	607,4	445,4
BGP281/291/391 LED30-4S/740	2640,000	19,2	137,5	0,474	0,474	0,356	0,356	0,261	758,5	568,9	568,9	417,2
BGP281/291/391 LED30-4S/730	2640,000	20,5	128,8	0,506	0,506	0,380	0,380	0,278	809,9	607,4	607,4	445,4
BGP281/291/391 LED30-4S/727	2670,000	21,0	127,1	0,519	0,519	0,389	0,389	0,285	829,6	622,2	622,2	456,3
BGP281/291/391 LED30-4S/722	2670,000	23,5	113,6	0,580	0,580	0,435	0,435	0,319	928,4	696,3	696,3	510,6
BGP281/291/391 LED30-4S/830	2640,000	21,0	125,7	0,519	0,519	0,389	0,389	0,285	829,6	622,2	622,2	456,3
BGP281/291/391 LED35-4S/740	3080,000	22,5	136,9	0,556	0,556	0,417	0,417	0,306	888,9	666,7	666,7	488,9
BGP281/291/391 LED35-4S/730	3080,000	22,0	140,0	0,543	0,543	0,407	0,407	0,299	869,1	651,9	651,9	478,0
BGP281/291/391 LED35-4S/727	3080,000	24,5	125,7	0,605	0,605	0,454	0,454	0,333	967,9	725,9	725,9	532,3
BGP281/291/391 LED35-4S/722	3080,000	28,0	110,0	0,691	0,691	0,519	0,519	0,380	1106,2	829,6	829,6	608,4
BGP281/291/391 LED35-4S/830	3080,000	24,5	125,7	0,605	0,605	0,454	0,454	0,333	967,9	725,9	725,9	532,3
BGP281/291/391 LED40-4S/740	3520,000	23,5	149,8	0,580	0,580	0,435	0,435	0,319	928,4	696,3	696,3	510,6

BGP281/291/391 LED40-4S/730	3520,000	25,0	140,8	0,617	0,617	0,463	0,463	0,340	987,7	740,7	740,7	543,2
BGP281/291/391 LED40-4S/727	3520,000	28,5	123,5	0,704	0,704	0,528	0,528	0,387	1125,9	844,4	844,4	619,3
BGP281/291/391 LED40-4S/722	3520,000	32,0	110,0	0,790	0,790	0,593	0,593	0,435	1264,2	948,1	948,1	695,3
BGP281/291/391 LED40-4S/830	3520,000	28,5	123,5	0,704	0,704	0,528	0,528	0,387	1125,9	844,4	844,4	619,3
BGP281/291/391 LED45-4S/740	3960,000	27,0	146,7	0,667	0,667	0,500	0,500	0,367	1066,7	800,0	800,0	586,7
BGP281/291/391 LED45-4S/730	3960,000	28,5	138,9	0,704	0,704	0,528	0,528	0,387	1125,9	844,4	844,4	619,3
BGP281/291/391 LED45-4S/727	3960,000	32,5	121,8	0,802	0,802	0,602	0,602	0,441	1284,0	963,0	963,0	706,2
BGP281/291/391 LED45-4S/722	3915,000	36,5	107,3	0,901	0,901	0,676	0,676	0,496	1442,0	1081,5	1081,5	793,1
BGP281/291/391 LED45-4S/830	3915,000	32,0	122,3	0,790	0,790	0,593	0,593	0,435	1264,2	948,1	948,1	695,3
BGP281/291/391 LED50-4S/740	4350,000	30,0	145,0	0,741	0,741	0,556	0,556	0,407	1185,2	888,9	888,9	651,9
BGP281/291/391 LED50-4S/730	4350,000	32,0	135,9	0,790	0,790	0,593	0,593	0,435	1264,2	948,1	948,1	695,3
BGP281/291/391 LED50-4S/727	4350,000	36,5	119,2	0,901	0,901	0,676	0,676	0,496	1442,0	1081,5	1081,5	793,1
BGP281/291/391 LED50-4S/722	4350,000	41,0	106,1	1,012	1,012	0,759	0,759	0,557	1619,8	1214,8	1214,8	890,9
BGP281/291/391 LED50-4S/830	4350,000	36,0	120,8	0,889	0,889	0,667	0,667	0,489	1422,2	1066,7	1066,7	782,2
BGP281/291/391 LED54-4S/740	4698,000	32,5	144,6	0,802	0,802	0,602	0,602	0,441	1284,0	963,0	963,0	706,2
BGP281/291/391 LED54-4S/730	4698,000	34,5	136,2	0,852	0,852	0,639	0,639	0,469	1363,0	1022,2	1022,2	749,6
BGP281/291/391 LED54-4S/727	4698,000	39,5	118,9	0,975	0,975	0,731	0,731	0,536	1560,5	1170,4	1170,4	858,3
BGP281/291/391 LED54-4S/722	4698,000	44,5	105,6	1,099	1,099	0,824	0,824	0,604	1758,0	1318,5	1318,5	966,9
BGP281/291/391 LED54-4S/830	4644,000	39,5	117,6	0,975	0,975	0,731	0,731	0,536	1560,5	1170,4	1170,4	858,3
BGP281/291/391 LED56-4S/740	4872,000	34,0	143,3	0,840	0,840	0,630	0,630	0,462	1343,2	1007,4	1007,4	738,8

BGP281/291/391 LED56-4S/730	4872,000	36,0	135,3	0,889	0,889	0,667	0,667	0,489	1422,2	1066,7	1066,7	782,2
BGP281/291/391 LED56-4S/727	4872,000	41,0	118,8	1,012	1,012	0,759	0,759	0,557	1619,8	1214,8	1214,8	890,9
BGP281/291/391 LED56-4S/722	4816,000	46,5	103,6	1,148	1,148	0,861	0,861	0,631	1837,0	1377,8	1377,8	1010,4
BGP281/291/391 LED56-4S/830	4816,000	41,0	117,5	1,012	1,012	0,759	0,759	0,557	1619,8	1214,8	1214,8	890,9
BGP281/291/391 LED60-4S/740	5220,000	36,5	143,0	0,901	0,901	0,676	0,676	0,496	1442,0	1081,5	1081,5	793,1
BGP281/291/391 LED60-4S/730	5160,000	39,0	132,3	0,963	0,963	0,722	0,722	0,530	1540,7	1155,6	1155,6	847,4
BGP281/291/391 LED60-4S/727	5220,000	44,5	117,3	1,099	1,099	0,824	0,824	0,604	1758,0	1318,5	1318,5	966,9
BGP281/291/391 LED60-4S/722	5160,000	50,0	103,2	1,235	1,235	0,926	0,926	0,679	1975,3	1481,5	1481,5	1086,4
BGP281/291/391 LED64-4S/740	5504,000	39,0	141,1	0,963	0,963	0,722	0,722	0,530	1540,7	1155,6	1155,6	847,4
BGP281/291/391 LED64-4S/730	5504,000	41,5	132,6	1,025	1,025	0,769	0,769	0,564	1639,5	1229,6	1229,6	901,7
BGP281/291/391 LED64-4S/727	5504,000	47,5	115,9	1,173	1,173	0,880	0,880	0,645	1876,5	1407,4	1407,4	1032,1
BGP281/291/391 LED64-4S/830	5440,000	47,5	114,5	1,173	1,173	0,880	0,880	0,645	1876,5	1407,4	1407,4	1032,1
BGP281/291/391 LED70-4S/730	5950,000	46,0	129,3	1,136	1,136	0,852	0,852	0,625	1817,3	1363,0	1363,0	999,5
BGP281/291/391 LED70-4S/727	5950,000	53,0	112,3	1,309	1,309	0,981	0,981	0,720	2093,8	1570,4	1570,4	1151,6
BGP281/291/391 LED70-4S/830	5880,000	53,0	110,9	1,309	1,309	0,981	0,981	0,720	2093,8	1570,4	1570,4	1151,6
BGP281/291/391 LED74-4S/740	6290,000	46,0	136,7	1,136	1,136	0,852	0,852	0,625	1817,3	1363,0	1363,0	999,5
BGP281/291/391 LED74-4S/730	6290,000	49,0	128,4	1,210	1,210	0,907	0,907	0,665	1935,8	1451,9	1451,9	1064,7
BGP281/291/391 LED74-4S/727	6290,000	57,0	110,4	1,407	1,407	1,056	1,056	0,774	2251,9	1688,9	1688,9	1238,5
BGP281/291/391 LED74-4S/830	6142,000	56,0	109,7	1,383	1,383	1,037	1,037	0,760	2212,3	1659,3	1659,3	1216,8
BGP281/291/391 LED7-4S/727	623,000	5,8	107,4	0,143	0,143	0,107	0,107	0,079	229,1	171,9	171,9	126,0

BGP281/291/391 LED7-4S/722	623,000	6,4	97,3	0,158	0,158	0,119	0,119	0,087	252,8	189,6	189,6	139,1
BGP281/291/391 LED7-4S/830	623,000	5,8	107,4	0,143	0,143	0,107	0,107	0,079	229,1	171,9	171,9	126,0
BGP281/291/391 LED75-4S/740	6460,000	46,5	138,9	1,148	1,148	0,861	0,861	0,631	1837,0	1377,8	1377,8	1010,4
BGP281/291/391 LED75-4S/730	6460,000	50,0	129,2	1,235	1,235	0,926	0,926	0,679	1975,3	1481,5	1481,5	1086,4
BGP281/291/391 LED75-4S/727	6460,000	57,0	113,3	1,407	1,407	1,056	1,056	0,774	2251,9	1688,9	1688,9	1238,5
BGP281/291/391 LED75-4S/830	6308,000	57,0	110,7	1,407	1,407	1,056	1,056	0,774	2251,9	1688,9	1688,9	1238,5
BGP281/291/391 LED80-4S/740	6800,000	50,0	136,0	1,235	1,235	0,926	0,926	0,679	1975,3	1481,5	1481,5	1086,4
BGP281/291/391 LED80-4S/730	6720,000	54,0	124,4	1,333	1,333	1,000	1,000	0,733	2133,3	1600,0	1600,0	1173,3
BGP281/291/391 LED80-4S/830	6480,000	61,0	106,2	1,506	1,506	1,130	1,130	0,828	2409,9	1807,4	1807,4	1325,4
BGP281/291/391 LED85-4S/740	7224,000	54,0	133,8	1,333	1,333	1,000	1,000	0,733	2133,3	1600,0	1600,0	1173,3
BGP281/291/391 LED85-4S/730	7138,000	58,0	123,1	1,432	1,432	1,074	1,074	0,788	2291,4	1718,5	1718,5	1260,2
BGP281/291/391 LED90-4S/740	7470,000	58,0	128,8	1,432	1,432	1,074	1,074	0,788	2291,4	1718,5	1718,5	1260,2
BGP281/291/391 LED93-4S/740	7708,000	60,0	128,5	1,481	1,481	1,111	1,111	0,815	2370,4	1777,8	1777,8	1303,7
BGP281/291/391 LED10-4S/740	890,000	6,8	130,9	0,168	0,168	0,126	0,126	0,092	268,6	201,5	201,5	147,8
BGP281/291/391 LED10-4S/730	890,000	7,1	125,4	0,175	0,175	0,131	0,131	0,096	280,5	210,4	210,4	154,3
BGP281/291/391 LED10-4S/727	890,000	7,9	112,7	0,195	0,195	0,146	0,146	0,107	312,1	234,1	234,1	171,7
BGP281/291/391 LED10-4S/722	890,000	8,8	101,1	0,217	0,217	0,163	0,163	0,120	347,7	260,7	260,7	191,2
BGP281/291/391 LED10-4S/830	890,000	7,9	112,7	0,195	0,195	0,146	0,146	0,107	312,1	234,1	234,1	171,7
BGP281/291/391 LED14-4S/740	1246,000	9,3	134,0	0,230	0,230	0,172	0,172	0,126	367,4	275,6	275,6	202,1
BGP281/291/391 LED14-4S/730	1246,000	9,9	125,9	0,244	0,244	0,183	0,183	0,134	391,1	293,3	293,3	215,1

BGP281/291/391 LED14-4S/727	1232,000	11,0	112,0	0,272	0,272	0,204	0,204	0,149	434,6	325,9	325,9	239,0
BGP281/291/391 LED14-4S/722	1232,000	12,4	99,4	0,306	0,306	0,230	0,230	0,168	489,9	367,4	367,4	269,4
BGP281/291/391 LED14-4S/830	1246,000	11,0	113,3	0,272	0,272	0,204	0,204	0,149	434,6	325,9	325,9	239,0
BGP281/291/391 LED16-4S/740	1424,000	10,6	134,3	0,262	0,262	0,196	0,196	0,144	418,8	314,1	314,1	230,3
BGP281/291/391 LED16-4S/730	1424,000	11,4	124,9	0,281	0,281	0,211	0,211	0,155	450,4	337,8	337,8	247,7
BGP281/291/391 LED16-4S/727	1408,000	12,8	110,0	0,316	0,316	0,237	0,237	0,174	505,7	379,3	379,3	278,1
BGP281/291/391 LED16-4S/722	1424,000	13,2	107,9	0,326	0,326	0,244	0,244	0,179	521,5	391,1	391,1	286,8
BGP281/291/391 LED16-4S/830	1408,000	12,8	110,0	0,316	0,316	0,237	0,237	0,174	505,7	379,3	379,3	278,1
BGP281/291/391 LED18-4S/740	1602,000	12,0	133,5	0,296	0,296	0,222	0,222	0,163	474,1	355,6	355,6	260,7
BGP281/291/391 LED18-4S/730	1602,000	13,0	123,2	0,321	0,321	0,241	0,241	0,177	513,6	385,2	385,2	282,5
BGP281/291/391 LED18-4S/727	1602,000	13,4	119,6	0,331	0,331	0,248	0,248	0,182	529,4	397,0	397,0	291,2
BGP281/291/391 LED18-4S/722	1602,000	15,0	106,8	0,370	0,370	0,278	0,278	0,204	592,6	444,4	444,4	325,9
BGP281/291/391 LED18-4S/830	1602,000	13,4	119,6	0,331	0,331	0,248	0,248	0,182	529,4	397,0	397,0	291,2
BGP281/291/391 LED20-4S/740	1760,000	13,6	129,4	0,336	0,336	0,252	0,252	0,185	537,3	403,0	403,0	295,5
BGP281/291/391 LED20-4S/730	1780,000	13,2	134,8	0,326	0,326	0,244	0,244	0,179	521,5	391,1	391,1	286,8
BGP281/291/391 LED20-4S/727	1780,000	15,0	118,7	0,370	0,370	0,278	0,278	0,204	592,6	444,4	444,4	325,9
BGP281/291/391 LED20-4S/722	1760,000	16,6	106,0	0,410	0,410	0,307	0,307	0,225	655,8	491,9	491,9	360,7
BGP281/291/391 LED20-4S/830	1760,000	14,8	118,9	0,365	0,365	0,274	0,274	0,201	584,7	438,5	438,5	321,6
BGP281/291/391 LED22-4S/740	1958,000	13,8	141,9	0,341	0,341	0,256	0,256	0,187	545,2	408,9	408,9	299,9
BGP281/291/391 LED22-4S/730	1936,000	14,6	132,6	0,360	0,360	0,270	0,270	0,198	576,8	432,6	432,6	317,2

BGP281/291/391 LED22-4S/727	1936,000	16,4	118,0	0,405	0,405	0,304	0,304	0,223	647,9	485,9	485,9	356,3
BGP281/291/391 LED22-4S/722	1936,000	18,6	104,1	0,459	0,459	0,344	0,344	0,253	734,8	551,1	551,1	404,1
BGP281/291/391 LED22-4S/830	1936,000	16,4	118,0	0,405	0,405	0,304	0,304	0,223	647,9	485,9	485,9	356,3
BGP281/291/391 LED25-4S/740	2200,000	15,8	139,2	0,390	0,390	0,293	0,293	0,215	624,2	468,1	468,1	343,3
BGP281/291/391 LED25-4S/730	2200,000	16,6	132,5	0,410	0,410	0,307	0,307	0,225	655,8	491,9	491,9	360,7
BGP281/291/391 LED25-4S/727	2200,000	19,0	115,8	0,469	0,469	0,352	0,352	0,258	750,6	563,0	563,0	412,8
BGP281/291/391 LED25-4S/722	2225,000	19,8	112,4	0,489	0,489	0,367	0,367	0,269	782,2	586,7	586,7	430,2
BGP281/291/391 LED25-4S/830	2200,000	19,0	115,8	0,469	0,469	0,352	0,352	0,258	750,6	563,0	563,0	412,8
BGP281/291/391 LED27-4S/740	2376,000	17,0	139,8	0,420	0,420	0,315	0,315	0,231	671,6	503,7	503,7	369,4
BGP281/291/391 LED27-4S/730	2376,000	18,2	130,5	0,449	0,449	0,337	0,337	0,247	719,0	539,3	539,3	395,5
BGP281/291/391 LED27-4S/727	2376,000	20,5	115,9	0,506	0,506	0,380	0,380	0,278	809,9	607,4	607,4	445,4
BGP281/291/391 LED27-4S/722	2403,000	21,0	114,4	0,519	0,519	0,389	0,389	0,285	829,6	622,2	622,2	456,3
BGP281/291/391 LED27-4S/830	2376,000	20,5	115,9	0,506	0,506	0,380	0,380	0,278	809,9	607,4	607,4	445,4
BGP281/291/391 LED30-4S/740	2640,000	19,2	137,5	0,474	0,474	0,356	0,356	0,261	758,5	568,9	568,9	417,2
BGP281/291/391 LED30-4S/730	2640,000	20,5	128,8	0,506	0,506	0,380	0,380	0,278	809,9	607,4	607,4	445,4
BGP281/291/391 LED30-4S/727	2670,000	21,0	127,1	0,519	0,519	0,389	0,389	0,285	829,6	622,2	622,2	456,3
BGP281/291/391 LED30-4S/722	2670,000	23,5	113,6	0,580	0,580	0,435	0,435	0,319	928,4	696,3	696,3	510,6
BGP281/291/391 LED30-4S/830	2640,000	21,0	125,7	0,519	0,519	0,389	0,389	0,285	829,6	622,2	622,2	456,3
BGP281/291/391 LED35-4S/740	3080,000	22,5	136,9	0,556	0,556	0,417	0,417	0,306	888,9	666,7	666,7	488,9
BGP281/291/391 LED35-4S/730	3080,000	22,0	140,0	0,543	0,543	0,407	0,407	0,299	869,1	651,9	651,9	478,0

BGP281/291/391 LED35-4S/727	3080,000	24,5	125,7	0,605	0,605	0,454	0,454	0,333	967,9	725,9	725,9	532,3
BGP281/291/391 LED35-4S/722	3080,000	28,0	110,0	0,691	0,691	0,519	0,519	0,380	1106,2	829,6	829,6	608,4
BGP281/291/391 LED35-4S/830	3080,000	24,5	125,7	0,605	0,605	0,454	0,454	0,333	967,9	725,9	725,9	532,3
BGP281/291/391 LED40-4S/740	3520,000	23,5	149,8	0,580	0,580	0,435	0,435	0,319	928,4	696,3	696,3	510,6
BGP281/291/391 LED40-4S/730	3520,000	25,0	140,8	0,617	0,617	0,463	0,463	0,340	987,7	740,7	740,7	543,2
BGP281/291/391 LED40-4S/727	3520,000	28,5	123,5	0,704	0,704	0,528	0,528	0,387	1125,9	844,4	844,4	619,3
BGP281/291/391 LED40-4S/722	3520,000	32,0	110,0	0,790	0,790	0,593	0,593	0,435	1264,2	948,1	948,1	695,3
BGP281/291/391 LED40-4S/830	3520,000	28,5	123,5	0,704	0,704	0,528	0,528	0,387	1125,9	844,4	844,4	619,3
BGP281/291/391 LED45-4S/740	3960,000	27,0	146,7	0,667	0,667	0,500	0,500	0,367	1066,7	800,0	800,0	586,7
BGP281/291/391 LED45-4S/730	3960,000	28,5	138,9	0,704	0,704	0,528	0,528	0,387	1125,9	844,4	844,4	619,3
BGP281/291/391 LED45-4S/727	3960,000	32,5	121,8	0,802	0,802	0,602	0,602	0,441	1284,0	963,0	963,0	706,2
BGP281/291/391 LED45-4S/722	3915,000	36,5	107,3	0,901	0,901	0,676	0,676	0,496	1442,0	1081,5	1081,5	793,1
BGP281/291/391 LED45-4S/830	3915,000	32,0	122,3	0,790	0,790	0,593	0,593	0,435	1264,2	948,1	948,1	695,3
BGP281/291/391 LED50-4S/740	4350,000	30,0	145,0	0,741	0,741	0,556	0,556	0,407	1185,2	888,9	888,9	651,9
BGP281/291/391 LED50-4S/730	4350,000	32,0	135,9	0,790	0,790	0,593	0,593	0,435	1264,2	948,1	948,1	695,3
BGP281/291/391 LED50-4S/727	4350,000	36,5	119,2	0,901	0,901	0,676	0,676	0,496	1442,0	1081,5	1081,5	793,1
BGP281/291/391 LED50-4S/722	4350,000	41,0	106,1	1,012	1,012	0,759	0,759	0,557	1619,8	1214,8	1214,8	890,9
BGP281/291/391 LED50-4S/830	4350,000	36,0	120,8	0,889	0,889	0,667	0,667	0,489	1422,2	1066,7	1066,7	782,2
BGP281/291/391 LED54-4S/740	4698,000	32,5	144,6	0,802	0,802	0,602	0,602	0,441	1284,0	963,0	963,0	706,2
BGP281/291/391 LED54-4S/730	4698,000	34,5	136,2	0,852	0,852	0,639	0,639	0,469	1363,0	1022,2	1022,2	749,6

BGP281/291/391 LED54-4S/727	4698,000	39,5	118,9	0,975	0,975	0,731	0,731	0,536	1560,5	1170,4	1170,4	858,3
BGP281/291/391 LED54-4S/722	4698,000	44,5	105,6	1,099	1,099	0,824	0,824	0,604	1758,0	1318,5	1318,5	966,9
BGP281/291/391 LED54-4S/830	4644,000	39,5	117,6	0,975	0,975	0,731	0,731	0,536	1560,5	1170,4	1170,4	858,3
BGP281/291/391 LED56-4S/740	4872,000	34,0	143,3	0,840	0,840	0,630	0,630	0,462	1343,2	1007,4	1007,4	738,8
BGP281/291/391 LED56-4S/730	4872,000	36,0	135,3	0,889	0,889	0,667	0,667	0,489	1422,2	1066,7	1066,7	782,2
BGP281/291/391 LED56-4S/727	4872,000	41,0	118,8	1,012	1,012	0,759	0,759	0,557	1619,8	1214,8	1214,8	890,9
BGP281/291/391 LED56-4S/722	4816,000	46,5	103,6	1,148	1,148	0,861	0,861	0,631	1837,0	1377,8	1377,8	1010,4
BGP281/291/391 LED56-4S/830	4816,000	41,0	117,5	1,012	1,012	0,759	0,759	0,557	1619,8	1214,8	1214,8	890,9
BGP281/291/391 LED60-4S/740	5220,000	36,5	143,0	0,901	0,901	0,676	0,676	0,496	1442,0	1081,5	1081,5	793,1
BGP281/291/391 LED60-4S/730	5160,000	39,0	132,3	0,963	0,963	0,722	0,722	0,530	1540,7	1155,6	1155,6	847,4
BGP281/291/391 LED60-4S/727	5220,000	44,5	117,3	1,099	1,099	0,824	0,824	0,604	1758,0	1318,5	1318,5	966,9
BGP281/291/391 LED60-4S/722	5160,000	50,0	103,2	1,235	1,235	0,926	0,926	0,679	1975,3	1481,5	1481,5	1086,4
BGP281/291/391 LED64-4S/740	5504,000	39,0	141,1	0,963	0,963	0,722	0,722	0,530	1540,7	1155,6	1155,6	847,4
BGP281/291/391 LED64-4S/730	5504,000	41,5	132,6	1,025	1,025	0,769	0,769	0,564	1639,5	1229,6	1229,6	901,7
BGP281/291/391 LED64-4S/727	5504,000	47,5	115,9	1,173	1,173	0,880	0,880	0,645	1876,5	1407,4	1407,4	1032,1
BGP281/291/391 LED64-4S/830	5440,000	47,5	114,5	1,173	1,173	0,880	0,880	0,645	1876,5	1407,4	1407,4	1032,1
BGP281/291/391 LED70-4S/730	5950,000	46,0	129,3	1,136	1,136	0,852	0,852	0,625	1817,3	1363,0	1363,0	999,5
BGP281/291/391 LED70-4S/727	5950,000	53,0	112,3	1,309	1,309	0,981	0,981	0,720	2093,8	1570,4	1570,4	1151,6
BGP281/291/391 LED70-4S/830	5880,000	53,0	110,9	1,309	1,309	0,981	0,981	0,720	2093,8	1570,4	1570,4	1151,6
BGP281/291/391 LED74-4S/740	6290,000	46,0	136,7	1,136	1,136	0,852	0,852	0,625	1817,3	1363,0	1363,0	999,5

BGP281/291/391 LED74-4S/730	6290,000	49,0	128,4	1,210	1,210	0,907	0,907	0,665	1935,8	1451,9	1451,9	1064,7
BGP281/291/391 LED74-4S/727	6290,000	57,0	110,4	1,407	1,407	1,056	1,056	0,774	2251,9	1688,9	1688,9	1238,5
BGP281/291/391 LED74-4S/830	6142,000	56,0	109,7	1,383	1,383	1,037	1,037	0,760	2212,3	1659,3	1659,3	1216,8
BGP281/291/391 LED7-4S/727	623,000	5,8	107,4	0,143	0,143	0,107	0,107	0,079	229,1	171,9	171,9	126,0
BGP281/291/391 LED7-4S/722	623,000	6,4	97,3	0,158	0,158	0,119	0,119	0,087	252,8	189,6	189,6	139,1
BGP281/291/391 LED7-4S/830	623,000	5,8	107,4	0,143	0,143	0,107	0,107	0,079	229,1	171,9	171,9	126,0
BGP281/291/391 LED75-4S/740	6460,000	46,5	138,9	1,148	1,148	0,861	0,861	0,631	1837,0	1377,8	1377,8	1010,4
BGP281/291/391 LED75-4S/730	6460,000	50,0	129,2	1,235	1,235	0,926	0,926	0,679	1975,3	1481,5	1481,5	1086,4
BGP281/291/391 LED75-4S/727	6460,000	57,0	113,3	1,407	1,407	1,056	1,056	0,774	2251,9	1688,9	1688,9	1238,5
BGP281/291/391 LED75-4S/830	6308,000	57,0	110,7	1,407	1,407	1,056	1,056	0,774	2251,9	1688,9	1688,9	1238,5
BGP281/291/391 LED80-4S/740	6800,000	50,0	136,0	1,235	1,235	0,926	0,926	0,679	1975,3	1481,5	1481,5	1086,4
BGP281/291/391 LED80-4S/730	6720,000	54,0	124,4	1,333	1,333	1,000	1,000	0,733	2133,3	1600,0	1600,0	1173,3
BGP281/291/391 LED80-4S/830	6480,000	61,0	106,2	1,506	1,506	1,130	1,130	0,828	2409,9	1807,4	1807,4	1325,4
BGP281/291/391 LED85-4S/740	7224,000	54,0	133,8	1,333	1,333	1,000	1,000	0,733	2133,3	1600,0	1600,0	1173,3
BGP281/291/391 LED85-4S/730	7138,000	58,0	123,1	1,432	1,432	1,074	1,074	0,788	2291,4	1718,5	1718,5	1260,2
BGP281/291/391 LED90-4S/740	7470,000	58,0	128,8	1,432	1,432	1,074	1,074	0,788	2291,4	1718,5	1718,5	1260,2
BGP281/291/391 LED93-4S/740	7708,000	60,0	128,5	1,481	1,481	1,111	1,111	0,815	2370,4	1777,8	1777,8	1303,7

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
BGP281/291/391 LED10-4S/740	890	6,8	130,9	0,168	0,066	0,050	0,050	0,036	105,6	79,2	79,2	58,1
BGP281/291/391 LED10-4S/730	890	7,1	125,4	0,175	0,069	0,052	0,052	0,038	110,3	82,7	82,7	60,7
BGP281/291/391 LED10-4S/727	890	7,9	112,7	0,195	0,077	0,058	0,058	0,042	122,7	92,1	92,1	67,5
BGP281/291/391 LED10-4S/722	890	8,8	101,1	0,217	0,085	0,064	0,064	0,047	136,7	102,5	102,5	75,2

BGP281/291/391 LED10-4S/830	890	7,9	112,7	0,195	0,077	0,058	0,058	0,042	122,7	92,1	92,1	67,5
BGP281/291/391 LED14-4S/740	1246	9,3	134,0	0,230	0,065	0,048	0,048	0,035	103,2	77,4	77,4	56,8
BGP281/291/391 LED14-4S/730	1246	9,9	125,9	0,244	0,069	0,051	0,051	0,038	109,9	82,4	82,4	60,4
BGP281/291/391 LED14-4S/727	1232	11	112,0	0,272	0,077	0,058	0,058	0,042	123,5	92,6	92,6	67,9
BGP281/291/391 LED14-4S/722	1232	12,4	99,4	0,306	0,087	0,065	0,065	0,048	139,2	104,4	104,4	76,5
BGP281/291/391 LED14-4S/830	1246	11	113,3	0,272	0,076	0,057	0,057	0,042	122,1	91,6	91,6	67,1
BGP281/291/391 LED16-4S/740	1424	10,6	134,3	0,262	0,064	0,048	0,048	0,035	102,9	77,2	77,2	56,6
BGP281/291/391 LED16-4S/730	1424	11,4	124,9	0,281	0,069	0,052	0,052	0,038	110,7	83,0	83,0	60,9
BGP281/291/391 LED16-4S/727	1408	12,8	110,0	0,316	0,079	0,059	0,059	0,043	125,7	94,3	94,3	69,1
BGP281/291/391 LED16-4S/722	1424	13,2	107,9	0,326	0,080	0,060	0,060	0,044	128,2	96,1	96,1	70,5
BGP281/291/391 LED16-4S/830	1408	12,8	110,0	0,316	0,079	0,059	0,059	0,043	125,7	94,3	94,3	69,1
BGP281/291/391 LED18-4S/740	1602	12	133,5	0,296	0,065	0,049	0,049	0,036	103,6	77,7	77,7	57,0
BGP281/291/391 LED18-4S/730	1602	13	123,2	0,321	0,070	0,053	0,053	0,039	112,2	84,2	84,2	61,7
BGP281/291/391 LED18-4S/727	1602	13,4	119,6	0,331	0,072	0,054	0,054	0,040	115,7	86,7	86,7	63,6
BGP281/291/391 LED18-4S/722	1602	15	106,8	0,370	0,081	0,061	0,061	0,045	129,5	97,1	97,1	71,2
BGP281/291/391 LED18-4S/830	1602	13,4	119,6	0,331	0,072	0,054	0,054	0,040	115,7	86,7	86,7	63,6
BGP281/291/391 LED20-4S/740	1760	13,6	129,4	0,336	0,067	0,050	0,050	0,037	106,8	80,1	80,1	58,8
BGP281/291/391 LED20-4S/730	1780	13,2	134,8	0,326	0,064	0,048	0,048	0,035	102,5	76,9	76,9	56,4
BGP281/291/391 LED20-4S/727	1780	15	118,7	0,370	0,073	0,055	0,055	0,040	116,5	87,4	87,4	64,1
BGP281/291/391 LED20-4S/722	1760	16,6	106,0	0,410	0,082	0,061	0,061	0,045	130,4	97,8	97,8	71,7

BGP281/291/391 LED20-4S/830	1760	14,8	118,9	0,365	0,073	0,055	0,055	0,040	116,3	87,2	87,2	64,0
BGP281/291/391 LED22-4S/740	1958	13,8	141,9	0,341	0,061	0,046	0,046	0,033	97,5	73,1	73,1	53,6
BGP281/291/391 LED22-4S/730	1936	14,6	132,6	0,360	0,065	0,049	0,049	0,036	104,3	78,2	78,2	57,4
BGP281/291/391 LED22-4S/727	1936	16,4	118,0	0,405	0,073	0,055	0,055	0,040	117,1	87,8	87,8	64,4
BGP281/291/391 LED22-4S/722	1936	18,6	104,1	0,459	0,083	0,062	0,062	0,046	132,8	99,6	99,6	73,1
BGP281/291/391 LED22-4S/830	1936	16,4	118,0	0,405	0,073	0,055	0,055	0,040	117,1	87,8	87,8	64,4
BGP281/291/391 LED25-4S/740	2200	15,8	139,2	0,390	0,062	0,047	0,047	0,034	99,3	74,5	74,5	54,6
BGP281/291/391 LED25-4S/730	2200	16,6	132,5	0,410	0,065	0,049	0,049	0,036	104,3	78,2	78,2	57,4
BGP281/291/391 LED25-4S/727	2200	19	115,8	0,469	0,075	0,056	0,056	0,041	119,4	89,6	89,6	65,7
BGP281/291/391 LED25-4S/722	2225	19,8	112,4	0,489	0,077	0,058	0,058	0,042	123,0	92,3	92,3	67,7
BGP281/291/391 LED25-4S/830	2200	19	115,8	0,469	0,075	0,056	0,056	0,041	119,4	89,6	89,6	65,7
BGP281/291/391 LED27-4S/740	2376	17	139,8	0,420	0,062	0,046	0,046	0,034	98,9	74,2	74,2	54,4
BGP281/291/391 LED27-4S/730	2376	18,2	130,5	0,449	0,066	0,050	0,050	0,036	105,9	79,4	79,4	58,3
BGP281/291/391 LED27-4S/727	2376	20,5	115,9	0,506	0,075	0,056	0,056	0,041	119,3	89,5	89,5	65,6
BGP281/291/391 LED27-4S/722	2403	21	114,4	0,519	0,076	0,057	0,057	0,042	120,8	90,6	90,6	66,5
BGP281/291/391 LED27-4S/830	2376	20,5	115,9	0,506	0,075	0,056	0,056	0,041	119,3	89,5	89,5	65,6
BGP281/291/391 LED30-4S/740	2640	19,2	137,5	0,474	0,063	0,047	0,047	0,035	100,6	75,4	75,4	55,3
BGP281/291/391 LED30-4S/730	2640	20,5	128,8	0,506	0,067	0,050	0,050	0,037	107,4	80,5	80,5	59,1
BGP281/291/391 LED30-4S/727	2670	21	127,1	0,519	0,068	0,051	0,051	0,037	108,8	81,6	81,6	59,8
BGP281/291/391 LED30-4S/722	2670	23,5	113,6	0,580	0,076	0,057	0,057	0,042	121,7	91,3	91,3	66,9

BGP281/291/391 LED30-4S/830	2640	21	125,7	0,519	0,069	0,052	0,052	0,038	110,0	82,5	82,5	60,5
BGP281/291/391 LED35-4S/740	3080	22,5	136,9	0,556	0,063	0,047	0,047	0,035	101,0	75,8	75,8	55,6
BGP281/291/391 LED35-4S/730	3080	22	140,0	0,543	0,062	0,046	0,046	0,034	98,8	74,1	74,1	54,3
BGP281/291/391 LED35-4S/727	3080	24,5	125,7	0,605	0,069	0,052	0,052	0,038	110,0	82,5	82,5	60,5
BGP281/291/391 LED35-4S/722	3080	28	110,0	0,691	0,079	0,059	0,059	0,043	125,7	94,3	94,3	69,1
BGP281/291/391 LED35-4S/830	3080	24,5	125,7	0,605	0,069	0,052	0,052	0,038	110,0	82,5	82,5	60,5
BGP281/291/391 LED40-4S/740	3520	23,5	149,8	0,580	0,058	0,043	0,043	0,032	92,3	69,2	69,2	50,8
BGP281/291/391 LED40-4S/730	3520	25	140,8	0,617	0,061	0,046	0,046	0,034	98,2	73,7	73,7	54,0
BGP281/291/391 LED40-4S/727	3520	28,5	123,5	0,704	0,070	0,052	0,052	0,038	112,0	84,0	84,0	61,6
BGP281/291/391 LED40-4S/722	3520	32	110,0	0,790	0,079	0,059	0,059	0,043	125,7	94,3	94,3	69,1
BGP281/291/391 LED40-4S/830	3520	28,5	123,5	0,704	0,070	0,052	0,052	0,038	112,0	84,0	84,0	61,6
BGP281/291/391 LED45-4S/740	3960	27	146,7	0,667	0,059	0,044	0,044	0,032	94,3	70,7	70,7	51,9
BGP281/291/391 LED45-4S/730	3960	28,5	138,9	0,704	0,062	0,047	0,047	0,034	99,5	74,6	74,6	54,7
BGP281/291/391 LED45-4S/727	3960	32,5	121,8	0,802	0,071	0,053	0,053	0,039	113,5	85,1	85,1	62,4
BGP281/291/391 LED45-4S/722	3915	36,5	107,3	0,901	0,081	0,060	0,060	0,044	128,9	96,7	96,7	70,9
BGP281/291/391 LED45-4S/830	3915	32	122,3	0,790	0,071	0,053	0,053	0,039	113,0	84,8	84,8	62,2
BGP281/291/391 LED50-4S/740	4350	30	145,0	0,741	0,060	0,045	0,045	0,033	95,4	71,5	71,5	52,4
BGP281/291/391 LED50-4S/730	4350	32	135,9	0,790	0,064	0,048	0,048	0,035	101,7	76,3	76,3	55,9
BGP281/291/391 LED50-4S/727	4350	36,5	119,2	0,901	0,073	0,054	0,054	0,040	116,0	87,0	87,0	63,8
BGP281/291/391 LED50-4S/722	4350	41	106,1	1,012	0,081	0,061	0,061	0,045	130,3	97,7	97,7	71,7

BGP281/291/391 LED50-4S/830	4350	36	120,8	0,889	0,072	0,054	0,054	0,039	114,4	85,8	85,8	62,9
BGP281/291/391 LED54-4S/740	4698	32,5	144,6	0,802	0,060	0,045	0,045	0,033	95,7	71,7	71,7	52,6
BGP281/291/391 LED54-4S/730	4698	34,5	136,2	0,852	0,063	0,048	0,048	0,035	101,5	76,2	76,2	55,8
BGP281/291/391 LED54-4S/727	4698	39,5	118,9	0,975	0,073	0,054	0,054	0,040	116,3	87,2	87,2	63,9
BGP281/291/391 LED54-4S/722	4698	44,5	105,6	1,099	0,082	0,061	0,061	0,045	131,0	98,2	98,2	72,0
BGP281/291/391 LED54-4S/830	4644	39,5	117,6	0,975	0,074	0,055	0,055	0,040	117,6	88,2	88,2	64,7
BGP281/291/391 LED56-4S/740	4872	34	143,3	0,840	0,060	0,045	0,045	0,033	96,5	72,4	72,4	53,1
BGP281/291/391 LED56-4S/730	4872	36	135,3	0,889	0,064	0,048	0,048	0,035	102,2	76,6	76,6	56,2
BGP281/291/391 LED56-4S/727	4872	41	118,8	1,012	0,073	0,055	0,055	0,040	116,4	87,3	87,3	64,0
BGP281/291/391 LED56-4S/722	4816	46,5	103,6	1,148	0,083	0,063	0,063	0,046	133,5	100,1	100,1	73,4
BGP281/291/391 LED56-4S/830	4816	41	117,5	1,012	0,074	0,055	0,055	0,040	117,7	88,3	88,3	64,7
BGP281/291/391 LED60-4S/740	5220	36,5	143,0	0,901	0,060	0,045	0,045	0,033	96,7	72,5	72,5	53,2
BGP281/291/391 LED60-4S/730	5160	39	132,3	0,963	0,065	0,049	0,049	0,036	104,5	78,4	78,4	57,5
BGP281/291/391 LED60-4S/727	5220	44,5	117,3	1,099	0,074	0,055	0,055	0,041	117,9	88,4	88,4	64,8
BGP281/291/391 LED60-4S/722	5160	50	103,2	1,235	0,084	0,063	0,063	0,046	134,0	100,5	100,5	73,7
BGP281/291/391 LED64-4S/740	5504	39	141,1	0,963	0,061	0,046	0,046	0,034	98,0	73,5	73,5	53,9
BGP281/291/391 LED64-4S/730	5504	41,5	132,6	1,025	0,065	0,049	0,049	0,036	104,3	78,2	78,2	57,3
BGP281/291/391 LED64-4S/727	5504	47,5	115,9	1,173	0,075	0,056	0,056	0,041	119,3	89,5	89,5	65,6
BGP281/291/391 LED64-4S/830	5440	47,5	114,5	1,173	0,075	0,057	0,057	0,042	120,7	90,6	90,6	66,4
BGP281/291/391 LED70-4S/730	5950	46	129,3	1,136	0,067	0,050	0,050	0,037	106,9	80,2	80,2	58,8

BGP281/291/391 LED70-4S/727	5950	53	112,3	1,309	0,077	0,058	0,058	0,042	123,2	92,4	92,4	67,7
BGP281/291/391 LED70-4S/830	5880	53	110,9	1,309	0,078	0,058	0,058	0,043	124,6	93,5	93,5	68,5
BGP281/291/391 LED74-4S/740	6290	46	136,7	1,136	0,063	0,047	0,047	0,035	101,1	75,8	75,8	55,6
BGP281/291/391 LED74-4S/730	6290	49	128,4	1,210	0,067	0,050	0,050	0,037	107,7	80,8	80,8	59,2
BGP281/291/391 LED74-4S/727	6290	57	110,4	1,407	0,078	0,059	0,059	0,043	125,3	94,0	94,0	68,9
BGP281/291/391 LED74-4S/830	6142	56	109,7	1,383	0,079	0,059	0,059	0,043	126,1	94,6	94,6	69,3
BGP281/291/391 LED7-4S/727	623	5,8	107,4	0,143	0,080	0,060	0,060	0,044	128,7	96,5	96,5	70,8
BGP281/291/391 LED7-4S/722	623	6,4	97,3	0,158	0,089	0,067	0,067	0,049	142,0	106,5	106,5	78,1
BGP281/291/391 LED7-4S/830	623	5,8	107,4	0,143	0,080	0,060	0,060	0,044	128,7	96,5	96,5	70,8
BGP281/291/391 LED75-4S/740	6460	46,5	138,9	1,148	0,062	0,047	0,047	0,034	99,5	74,6	74,6	54,7
BGP281/291/391 LED75-4S/730	6460	50	129,2	1,235	0,067	0,050	0,050	0,037	107,0	80,3	80,3	58,9
BGP281/291/391 LED75-4S/727	6460	57	113,3	1,407	0,076	0,057	0,057	0,042	122,0	91,5	91,5	67,1
BGP281/291/391 LED75-4S/830	6308	57	110,7	1,407	0,078	0,059	0,059	0,043	124,9	93,7	93,7	68,7
BGP281/291/391 LED80-4S/740	6800	50	136,0	1,235	0,064	0,048	0,048	0,035	101,7	76,3	76,3	55,9
BGP281/291/391 LED80-4S/730	6720	54	124,4	1,333	0,069	0,052	0,052	0,038	111,1	83,3	83,3	61,1
BGP281/291/391 LED80-4S/830	6480	61	106,2	1,506	0,081	0,061	0,061	0,045	130,2	97,6	97,6	71,6
BGP281/291/391 LED85-4S/740	7224	54	133,8	1,333	0,065	0,048	0,048	0,036	103,4	77,5	77,5	56,8
BGP281/291/391 LED85-4S/730	7138	58	123,1	1,432	0,070	0,053	0,053	0,039	112,4	84,3	84,3	61,8
BGP281/291/391 LED90-4S/740	7470	58	128,8	1,432	0,067	0,050	0,050	0,037	107,4	80,5	80,5	59,0
BGP281/291/391 LED93-4S/740	7708	60	128,5	1,481	0,067	0,050	0,050	0,037	107,6	80,7	80,7	59,2

BGP281/291/391 LED10-4S/740	890	6,8	130,9	0,168	0,066	0,050	0,050	0,036	105,6	79,2	79,2	58,1
BGP281/291/391 LED10-4S/730	890	7,1	125,4	0,175	0,069	0,052	0,052	0,038	110,3	82,7	82,7	60,7
BGP281/291/391 LED10-4S/727	890	7,9	112,7	0,195	0,077	0,058	0,058	0,042	122,7	92,1	92,1	67,5
BGP281/291/391 LED10-4S/722	890	8,8	101,1	0,217	0,085	0,064	0,064	0,047	136,7	102,5	102,5	75,2
BGP281/291/391 LED10-4S/830	890	7,9	112,7	0,195	0,077	0,058	0,058	0,042	122,7	92,1	92,1	67,5
BGP281/291/391 LED14-4S/740	1246	9,3	134,0	0,230	0,065	0,048	0,048	0,035	103,2	77,4	77,4	56,8
BGP281/291/391 LED14-4S/730	1246	9,9	125,9	0,244	0,069	0,051	0,051	0,038	109,9	82,4	82,4	60,4
BGP281/291/391 LED14-4S/727	1232	11	112,0	0,272	0,077	0,058	0,058	0,042	123,5	92,6	92,6	67,9
BGP281/291/391 LED14-4S/722	1232	12,4	99,4	0,306	0,087	0,065	0,065	0,048	139,2	104,4	104,4	76,5
BGP281/291/391 LED14-4S/830	1246	11	113,3	0,272	0,076	0,057	0,057	0,042	122,1	91,6	91,6	67,1
BGP281/291/391 LED16-4S/740	1424	10,6	134,3	0,262	0,064	0,048	0,048	0,035	102,9	77,2	77,2	56,6
BGP281/291/391 LED16-4S/730	1424	11,4	124,9	0,281	0,069	0,052	0,052	0,038	110,7	83,0	83,0	60,9
BGP281/291/391 LED16-4S/727	1408	12,8	110,0	0,316	0,079	0,059	0,059	0,043	125,7	94,3	94,3	69,1
BGP281/291/391 LED16-4S/722	1424	13,2	107,9	0,326	0,080	0,060	0,060	0,044	128,2	96,1	96,1	70,5
BGP281/291/391 LED16-4S/830	1408	12,8	110,0	0,316	0,079	0,059	0,059	0,043	125,7	94,3	94,3	69,1
BGP281/291/391 LED18-4S/740	1602	12	133,5	0,296	0,065	0,049	0,049	0,036	103,6	77,7	77,7	57,0
BGP281/291/391 LED18-4S/730	1602	13	123,2	0,321	0,070	0,053	0,053	0,039	112,2	84,2	84,2	61,7
BGP281/291/391 LED18-4S/727	1602	13,4	119,6	0,331	0,072	0,054	0,054	0,040	115,7	86,7	86,7	63,6
BGP281/291/391 LED18-4S/722	1602	15	106,8	0,370	0,081	0,061	0,061	0,045	129,5	97,1	97,1	71,2
BGP281/291/391 LED18-4S/830	1602	13,4	119,6	0,331	0,072	0,054	0,054	0,040	115,7	86,7	86,7	63,6

BGP281/291/391 LED20-4S/740	1760	13,6	129,4	0,336	0,067	0,050	0,050	0,037	106,8	80,1	80,1	58,8
BGP281/291/391 LED20-4S/730	1780	13,2	134,8	0,326	0,064	0,048	0,048	0,035	102,5	76,9	76,9	56,4
BGP281/291/391 LED20-4S/727	1780	15	118,7	0,370	0,073	0,055	0,055	0,040	116,5	87,4	87,4	64,1
BGP281/291/391 LED20-4S/722	1760	16,6	106,0	0,410	0,082	0,061	0,061	0,045	130,4	97,8	97,8	71,7
BGP281/291/391 LED20-4S/830	1760	14,8	118,9	0,365	0,073	0,055	0,055	0,040	116,3	87,2	87,2	64,0
BGP281/291/391 LED22-4S/740	1958	13,8	141,9	0,341	0,061	0,046	0,046	0,033	97,5	73,1	73,1	53,6
BGP281/291/391 LED22-4S/730	1936	14,6	132,6	0,360	0,065	0,049	0,049	0,036	104,3	78,2	78,2	57,4
BGP281/291/391 LED22-4S/727	1936	16,4	118,0	0,405	0,073	0,055	0,055	0,040	117,1	87,8	87,8	64,4
BGP281/291/391 LED22-4S/722	1936	18,6	104,1	0,459	0,083	0,062	0,062	0,046	132,8	99,6	99,6	73,1
BGP281/291/391 LED22-4S/830	1936	16,4	118,0	0,405	0,073	0,055	0,055	0,040	117,1	87,8	87,8	64,4
BGP281/291/391 LED25-4S/740	2200	15,8	139,2	0,390	0,062	0,047	0,047	0,034	99,3	74,5	74,5	54,6
BGP281/291/391 LED25-4S/730	2200	16,6	132,5	0,410	0,065	0,049	0,049	0,036	104,3	78,2	78,2	57,4
BGP281/291/391 LED25-4S/727	2200	19	115,8	0,469	0,075	0,056	0,056	0,041	119,4	89,6	89,6	65,7
BGP281/291/391 LED25-4S/722	2225	19,8	112,4	0,489	0,077	0,058	0,058	0,042	123,0	92,3	92,3	67,7
BGP281/291/391 LED25-4S/830	2200	19	115,8	0,469	0,075	0,056	0,056	0,041	119,4	89,6	89,6	65,7
BGP281/291/391 LED27-4S/740	2376	17	139,8	0,420	0,062	0,046	0,046	0,034	98,9	74,2	74,2	54,4
BGP281/291/391 LED27-4S/730	2376	18,2	130,5	0,449	0,066	0,050	0,050	0,036	105,9	79,4	79,4	58,3
BGP281/291/391 LED27-4S/727	2376	20,5	115,9	0,506	0,075	0,056	0,056	0,041	119,3	89,5	89,5	65,6
BGP281/291/391 LED27-4S/722	2403	21	114,4	0,519	0,076	0,057	0,057	0,042	120,8	90,6	90,6	66,5
BGP281/291/391 LED27-4S/830	2376	20,5	115,9	0,506	0,075	0,056	0,056	0,041	119,3	89,5	89,5	65,6

BGP281/291/391 LED30-4S/740	2640	19,2	137,5	0,474	0,063	0,047	0,047	0,035	100,6	75,4	75,4	55,3
BGP281/291/391 LED30-4S/730	2640	20,5	128,8	0,506	0,067	0,050	0,050	0,037	107,4	80,5	80,5	59,1
BGP281/291/391 LED30-4S/727	2670	21	127,1	0,519	0,068	0,051	0,051	0,037	108,8	81,6	81,6	59,8
BGP281/291/391 LED30-4S/722	2670	23,5	113,6	0,580	0,076	0,057	0,057	0,042	121,7	91,3	91,3	66,9
BGP281/291/391 LED30-4S/830	2640	21	125,7	0,519	0,069	0,052	0,052	0,038	110,0	82,5	82,5	60,5
BGP281/291/391 LED35-4S/740	3080	22,5	136,9	0,556	0,063	0,047	0,047	0,035	101,0	75,8	75,8	55,6
BGP281/291/391 LED35-4S/730	3080	22	140,0	0,543	0,062	0,046	0,046	0,034	98,8	74,1	74,1	54,3
BGP281/291/391 LED35-4S/727	3080	24,5	125,7	0,605	0,069	0,052	0,052	0,038	110,0	82,5	82,5	60,5
BGP281/291/391 LED35-4S/722	3080	28	110,0	0,691	0,079	0,059	0,059	0,043	125,7	94,3	94,3	69,1
BGP281/291/391 LED35-4S/830	3080	24,5	125,7	0,605	0,069	0,052	0,052	0,038	110,0	82,5	82,5	60,5
BGP281/291/391 LED40-4S/740	3520	23,5	149,8	0,580	0,058	0,043	0,043	0,032	92,3	69,2	69,2	50,8
BGP281/291/391 LED40-4S/730	3520	25	140,8	0,617	0,061	0,046	0,046	0,034	98,2	73,7	73,7	54,0
BGP281/291/391 LED40-4S/727	3520	28,5	123,5	0,704	0,070	0,052	0,052	0,038	112,0	84,0	84,0	61,6
BGP281/291/391 LED40-4S/722	3520	32	110,0	0,790	0,079	0,059	0,059	0,043	125,7	94,3	94,3	69,1
BGP281/291/391 LED40-4S/830	3520	28,5	123,5	0,704	0,070	0,052	0,052	0,038	112,0	84,0	84,0	61,6
BGP281/291/391 LED45-4S/740	3960	27	146,7	0,667	0,059	0,044	0,044	0,032	94,3	70,7	70,7	51,9
BGP281/291/391 LED45-4S/730	3960	28,5	138,9	0,704	0,062	0,047	0,047	0,034	99,5	74,6	74,6	54,7
BGP281/291/391 LED45-4S/727	3960	32,5	121,8	0,802	0,071	0,053	0,053	0,039	113,5	85,1	85,1	62,4
BGP281/291/391 LED45-4S/722	3915	36,5	107,3	0,901	0,081	0,060	0,060	0,044	128,9	96,7	96,7	70,9
BGP281/291/391 LED45-4S/830	3915	32	122,3	0,790	0,071	0,053	0,053	0,039	113,0	84,8	84,8	62,2

BGP281/291/391 LED50-4S/740	4350	30	145,0	0,741	0,060	0,045	0,045	0,033	95,4	71,5	71,5	52,4
BGP281/291/391 LED50-4S/730	4350	32	135,9	0,790	0,064	0,048	0,048	0,035	101,7	76,3	76,3	55,9
BGP281/291/391 LED50-4S/727	4350	36,5	119,2	0,901	0,073	0,054	0,054	0,040	116,0	87,0	87,0	63,8
BGP281/291/391 LED50-4S/722	4350	41	106,1	1,012	0,081	0,061	0,061	0,045	130,3	97,7	97,7	71,7
BGP281/291/391 LED50-4S/830	4350	36	120,8	0,889	0,072	0,054	0,054	0,039	114,4	85,8	85,8	62,9
BGP281/291/391 LED54-4S/740	4698	32,5	144,6	0,802	0,060	0,045	0,045	0,033	95,7	71,7	71,7	52,6
BGP281/291/391 LED54-4S/730	4698	34,5	136,2	0,852	0,063	0,048	0,048	0,035	101,5	76,2	76,2	55,8
BGP281/291/391 LED54-4S/727	4698	39,5	118,9	0,975	0,073	0,054	0,054	0,040	116,3	87,2	87,2	63,9
BGP281/291/391 LED54-4S/722	4698	44,5	105,6	1,099	0,082	0,061	0,061	0,045	131,0	98,2	98,2	72,0
BGP281/291/391 LED54-4S/830	4644	39,5	117,6	0,975	0,074	0,055	0,055	0,040	117,6	88,2	88,2	64,7
BGP281/291/391 LED56-4S/740	4872	34	143,3	0,840	0,060	0,045	0,045	0,033	96,5	72,4	72,4	53,1
BGP281/291/391 LED56-4S/730	4872	36	135,3	0,889	0,064	0,048	0,048	0,035	102,2	76,6	76,6	56,2
BGP281/291/391 LED56-4S/727	4872	41	118,8	1,012	0,073	0,055	0,055	0,040	116,4	87,3	87,3	64,0
BGP281/291/391 LED56-4S/722	4816	46,5	103,6	1,148	0,083	0,063	0,063	0,046	133,5	100,1	100,1	73,4
BGP281/291/391 LED56-4S/830	4816	41	117,5	1,012	0,074	0,055	0,055	0,040	117,7	88,3	88,3	64,7
BGP281/291/391 LED60-4S/740	5220	36,5	143,0	0,901	0,060	0,045	0,045	0,033	96,7	72,5	72,5	53,2
BGP281/291/391 LED60-4S/730	5160	39	132,3	0,963	0,065	0,049	0,049	0,036	104,5	78,4	78,4	57,5
BGP281/291/391 LED60-4S/727	5220	44,5	117,3	1,099	0,074	0,055	0,055	0,041	117,9	88,4	88,4	64,8
BGP281/291/391 LED60-4S/722	5160	50	103,2	1,235	0,084	0,063	0,063	0,046	134,0	100,5	100,5	73,7
BGP281/291/391 LED64-4S/740	5504	39	141,1	0,963	0,061	0,046	0,046	0,034	98,0	73,5	73,5	53,9

BGP281/291/391 LED64-4S/730	5504	41,5	132,6	1,025	0,065	0,049	0,049	0,036	104,3	78,2	78,2	57,3
BGP281/291/391 LED64-4S/727	5504	47,5	115,9	1,173	0,075	0,056	0,056	0,041	119,3	89,5	89,5	65,6
BGP281/291/391 LED64-4S/830	5440	47,5	114,5	1,173	0,075	0,057	0,057	0,042	120,7	90,6	90,6	66,4
BGP281/291/391 LED70-4S/730	5950	46	129,3	1,136	0,067	0,050	0,050	0,037	106,9	80,2	80,2	58,8
BGP281/291/391 LED70-4S/727	5950	53	112,3	1,309	0,077	0,058	0,058	0,042	123,2	92,4	92,4	67,7
BGP281/291/391 LED70-4S/830	5880	53	110,9	1,309	0,078	0,058	0,058	0,043	124,6	93,5	93,5	68,5
BGP281/291/391 LED74-4S/740	6290	46	136,7	1,136	0,063	0,047	0,047	0,035	101,1	75,8	75,8	55,6
BGP281/291/391 LED74-4S/730	6290	49	128,4	1,210	0,067	0,050	0,050	0,037	107,7	80,8	80,8	59,2
BGP281/291/391 LED74-4S/727	6290	57	110,4	1,407	0,078	0,059	0,059	0,043	125,3	94,0	94,0	68,9
BGP281/291/391 LED74-4S/830	6142	56	109,7	1,383	0,079	0,059	0,059	0,043	126,1	94,6	94,6	69,3
BGP281/291/391 LED7-4S/727	623	5,8	107,4	0,143	0,080	0,060	0,060	0,044	128,7	96,5	96,5	70,8
BGP281/291/391 LED7-4S/722	623	6,4	97,3	0,158	0,089	0,067	0,067	0,049	142,0	106,5	106,5	78,1
BGP281/291/391 LED7-4S/830	623	5,8	107,4	0,143	0,080	0,060	0,060	0,044	128,7	96,5	96,5	70,8
BGP281/291/391 LED75-4S/740	6460	46,5	138,9	1,148	0,062	0,047	0,047	0,034	99,5	74,6	74,6	54,7
BGP281/291/391 LED75-4S/730	6460	50	129,2	1,235	0,067	0,050	0,050	0,037	107,0	80,3	80,3	58,9
BGP281/291/391 LED75-4S/727	6460	57	113,3	1,407	0,076	0,057	0,057	0,042	122,0	91,5	91,5	67,1
BGP281/291/391 LED75-4S/830	6308	57	110,7	1,407	0,078	0,059	0,059	0,043	124,9	93,7	93,7	68,7
BGP281/291/391 LED80-4S/740	6800	50	136,0	1,235	0,064	0,048	0,048	0,035	101,7	76,3	76,3	55,9
BGP281/291/391 LED80-4S/730	6720	54	124,4	1,333	0,069	0,052	0,052	0,038	111,1	83,3	83,3	61,1
BGP281/291/391 LED80-4S/830	6480	61	106,2	1,506	0,081	0,061	0,061	0,045	130,2	97,6	97,6	71,6

BGP281/291/391 LED85-4S/740	7224	54	133,8	1,333	0,065	0,048	0,048	0,036	103,4	77,5	77,5	56,8
BGP281/291/391 LED85-4S/730	7138	58	123,1	1,432	0,070	0,053	0,053	0,039	112,4	84,3	84,3	61,8
BGP281/291/391 LED90-4S/740	7470	58	128,8	1,432	0,067	0,050	0,050	0,037	107,4	80,5	80,5	59,0
BGP281/291/391 LED93-4S/740	7708	60	128,5	1,481	0,067	0,050	0,050	0,037	107,6	80,7	80,7	59,2

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 CO_2e	5,88E+00	2,61E-01	-1,25E-01	6,02E+00	3,02E-01	5,41E-01	MND	MND	MND	MND	MND	4,06E+02	MND	MNR	1,77E-02	2,62E-01	1,88E-01	-1,09E+01

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

Thus, the calculation of this example would be:

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

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

POLAND	1,05E+00
PORTUGAL	4,22E-01
ROW	7,32E-01
SPAIN	3,34E-01
SWEDEN	4,95E-02
SWITZERLAND	5,38E-02
UK	3,17E-01

Source Ecoinvent 3.8