ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

CoreLine Panel gen6 RC133V

Signify N.V.

EPD HUB, HUB-3676

Published on 31.07.2025, last updated on 31.07.2025, valid until 31.07.2030

MANUFACTURER AND SITE

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
Place of production	ZHEJIANG, CHINA
Period for data	Calendar year 2023

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804+A2 and ISO 14025
PCR	EPD Hub Core PCR version 1.1, 5 Dec 2023
Sector	Electrical product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with options, A4-A5, B6, and modules C1-C4, D
EPD author	Signify / Sustainability
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	EPD Hub Limited

PRODUCT SPECIFICATION

Product name	CoreLine Panel gen6 RC133V
Product number / reference	911401890685 / RC133V G6 36S/840 PSU W62L62 OC
Product description	CoreLine panel Gen6 delivers on the CoreLine promise of innovation, easy installation, and excellent illumination. Designed as a direct replacement for functional luminaires in general lighting applications, this LED panel light's innovative All-in feature offers a choice of three lumen packages and three-color temperatures in a single luminaire. This makes it easy to select the right product, gives you the flexibility respond to customer preferences on site, and means fewer product codes on stock. Installing the CoreLine RC132V LED panel is quick and easy, using the product's quick connector or flywire. The CoreLine range includes Interact Ready luminaires with integrated wireless communications, ready to be used with Interact gateways, sensors, and software.

PRODUCT CLASSIFICATION

Declared operating voltage, Volt	220-240
Light source colour temperature, Kelvin	4000
Protection index for water and dust (IP)	20/44
Impact resistance index (IK)	2
Luminous flux, Lumens	3600
Electrical power, Watt	26
Luminous efficiency, Lm/W	138.462
Additional characteristic	Not applicable

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 RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	52.31	APAC
Minerals	0.01	APAC
Fossil materials	47.67	APAC
Bio-based materials	0	

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 unit
Declared unit mass, kg	2.25
Mass of packaging, kg	0.5
Functional unit (from PEP PSR0014)	Provide lighting that delivers an outgoing artificial luminous flux of 1000 lumens during a reference lifetime of 35000 hours
Reference service life (years)	20
Assigned lifetime (hours)	100000
GWP-total, A1-A3 (kg CO_2e)	2.73E+01
GWP-fossil, A1-A3 (kg CO_2e)	2.79E+01
Secondary material, inputs (%)	9.33
Secondary material, outputs (%)	9.6
Total energy use, A1-A3 (kWh)	76.5
Net freshwater use, A1-A3 (m^3)	1.89E-01

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	0.213

SUBSTANCES, REACH - VERY HIGH CONCERN

Substances of very high concern	EC	CAS
LEAD	231-100-4	7439-92-1

LIFE CYCLE ASSESSMENT

SYSTEM BOUNDARY

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

Product stage			Installation 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	X	X	X	X	X
Raw materials	Transport	Manufacturing	Transport	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demo.	Transport	Waste processing	Disposal	Reuse, Recovery, Recycling

Modules not relevant = MNR.

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. 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
Packaging materials	No allocation
Ancillary materials	Allocated by mass
Manufacturing energy and waste	Allocated by mass

AVERAGES AND VARIABILITY

This EPD is product and factory-specific and does not contain average calculations.

LCA SOFTWARE AND BIBLIOGRAPHY

The LCA and EPD have been prepared according to the reference standards, EN 50693, and ISO 14040/14044. Ecoinvent v 3.10.1 and One Click LCA databases were used as sources of environmental data.

PRODUCT LIFE CYCLE

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. Electricity used and waste formed in the production processes at the manufacturing facilities are included too.

The product is made of metals, plastics, and electronic components. All components are transported to the production facility, where the main manufacturing processes primarily are associated with assembly. The finished product can be packaged with polyethylene, cardboard, and/or paper as packaging material before shipment 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 to produce the studied product. Thus, it is possible to allocate it according to the weight of the product analysed in this study.

Co-product allocation is neglected as revenue of co-product is very low, hence, the waste undergoes a conservative waste treatment.

Signify uses 100% renewable energy in its manufacturing sites and commits to do so for the entire validity of this EPD. In the eventuality of products manufactured by external suppliers, this may not be the case.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation distances from manufacturing sites to the selected customer location are based on average region distances. Customer is selected based on Country where the majority of sales is present. In the absence of exact data, conservative assumptions are made (A4). The transportation method is a combination of lorry and container ship where needed. To be conservative, empty returns are included in this study as implemented through an average load factor in the Ecoinvent transport datapoints. Environmental impacts from installation include waste packaging materials (A5). The packaging waste treatment is assumed to be conservative with incineration without energy recovery. The impacts of energy consumption and the used ancillary materials during installation are considered negligible.

PRODUCT USE AND MAINTENANCE (B1-B7)

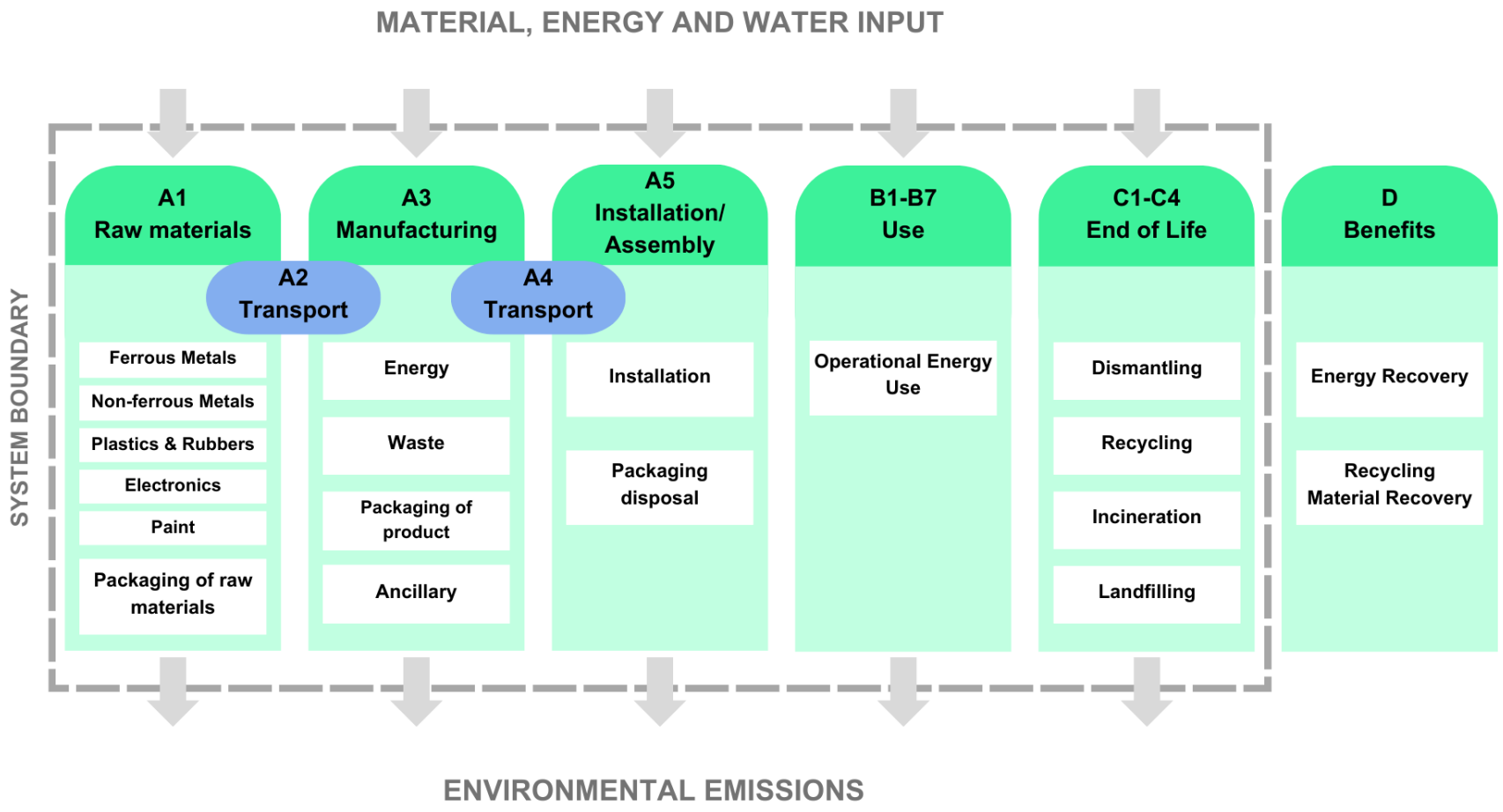
During the use phase, the product consumes electricity (B6), which is calculated multiplying the Wattage x Assigned lifetime (hours) x Country energy mix factor. To know which Country energy mix was used in this EPD, please refer to Annex 2.

The Reference service life in years is calculated according to the main application type of the product, based on annual operating hours. Impacts due to electricity production include direct emissions to air, transformation, and transmission losses.

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. The transport distance is 150 km while 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.

LIFE CYCLE FLOW DIAGRAM - SYSTEM BOUNDARY



ENVIRONMENTAL IMPACT DATA, RESULTS PER DECLARED UNIT

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	2.58E+01	3.53E-01	1.12E+00	2.73E+01	7.04E-01	8.78E-01	MNR	MNR	MNR	MNR	MNR	8.56E+02	MNR	0.00E+00	6.62E-02	9.50E-01	5.32E-01	-7.54E+00
GWP – fossil	kg CO_2e	2.58E+01	3.52E-01	1.76E+00	2.79E+01	7.04E-01	1.03E-01	MNR	MNR	MNR	MNR	MNR	8.51E+02	MNR	0.00E+00	6.62E-02	9.52E-01	5.32E-01	-7.54E+00
GWP – biogenic	kg CO_2e	1.03E-02	7.98E-05	-6.54E-01	-6.44E-01	1.18E-04	7.75E-01	MNR	MNR	MNR	MNR	MNR	1.91E+00	MNR	0.00E+00	1.44E-05	-2.67E-03	-4.81E-05	3.40E-03
GWP – LULUC	kg CO_2e	2.49E-02	1.58E-04	1.75E-02	4.26E-02	3.69E-04	1.32E-05	MNR	MNR	MNR	MNR	MNR	2.61E+00	MNR	0.00E+00	2.93E-05	7.27E-05	1.39E-05	-3.89E-03
Ozone depletion pot.	kg CFC_{-11}e	1.25E-05	5.20E-09	2.81E-08	1.26E-05	1.02E-08	4.96E-10	MNR	MNR	MNR	MNR	MNR	1.57E-05	MNR	0.00E+00	9.25E-10	7.24E-10	3.44E-10	-3.43E-08
Acidification potential	mol H^+e	1.28E-01	1.20E-03	9.13E-03	1.39E-01	1.76E-02	2.17E-04	MNR	MNR	MNR	MNR	MNR	5.00E+00	MNR	0.00E+00	2.21E-04	5.72E-04	1.61E-04	-8.03E-02
EP-freshwater[2)]	kg Pe	7.82E-03	2.74E-05	5.58E-04	8.40E-03	2.76E-05	3.64E-06	MNR	MNR	MNR	MNR	MNR	7.92E-01	MNR	0.00E+00	5.15E-06	2.32E-05	5.20E-06	-4.47E-03
EP-marine	kg Ne	2.10E-02	3.95E-04	2.57E-03	2.40E-02	4.41E-03	1.03E-04	MNR	MNR	MNR	MNR	MNR	7.85E-01	MNR	0.00E+00	7.15E-05	2.27E-04	2.27E-04	-9.08E-03
EP-terrestrial	mol Ne	2.20E-01	4.30E-03	1.94E-02	2.44E-01	4.90E-02	9.31E-04	MNR	MNR	MNR	MNR	MNR	7.04E+00	MNR	0.00E+00	7.78E-04	1.92E-03	7.43E-04	-9.73E-02
POCP ("smog")[3)]	kg NMVOCe	7.68E-02	1.77E-03	6.62E-03	8.52E-02	1.35E-02	2.64E-04	MNR	MNR	MNR	MNR	MNR	2.32E+00	MNR	0.00E+00	3.07E-04	5.25E-04	2.10E-04	-3.00E-02
ADP-minerals & metals[4)]	kg Sbe	6.78E-04	9.83E-07	4.60E-06	6.83E-04	9.01E-07	1.07E-07	MNR	MNR	MNR	MNR	MNR	1.15E-02	MNR	0.00E+00	2.17E-07	1.72E-06	5.44E-08	-3.47E-04
ADP-fossil resources	MJ	2.66E+02	5.11E+00	2.27E+01	2.94E+02	8.88E+00	3.71E-01	MNR	MNR	MNR	MNR	MNR	1.98E+04	MNR	0.00E+00	9.28E-01	6.62E-01	2.44E-01	-8.71E+01
Water use[5)]	m^3e depr.	7.11E+00	2.53E-02	5.90E+00	1.30E+01	2.85E-02	4.46E-02	MNR	MNR	MNR	MNR	MNR	5.40E+02	MNR	0.00E+00	4.31E-03	6.90E-02	3.19E-02	-1.09E+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	1.47E-06	3.53E-08	1.11E-07	1.62E-06	2.92E-08	2.62E-09	MNR	MNR	MNR	MNR	MNR	1.78E-05	MNR	0.00E+00	5.25E-09	7.10E-09	1.80E-09	-4.32E-07
Ionizing radiation[6)]	kBq U235e	8.20E-01	4.45E-03	6.54E-02	8.90E-01	4.72E-03	4.52E-04	MNR	MNR	MNR	MNR	MNR	5.47E+02	MNR	0.00E+00	7.51E-04	2.69E-03	3.36E-04	-4.72E-01
Ecotoxicity (freshwater)	CTUe	1.27E+02	7.23E-01	7.16E+00	1.35E+02	7.71E-01	1.09E+00	MNR	MNR	MNR	MNR	MNR	3.02E+03	MNR	0.00E+00	1.47E-01	2.09E+00	1.03E+01	-3.10E+01
Human toxicity, cancer	CTUh	1.50E-08	5.82E-11	6.13E-10	1.56E-08	1.44E-10	5.21E-11	MNR	MNR	MNR	MNR	MNR	2.88E-07	MNR	0.00E+00	1.12E-11	1.26E-10	1.12E-10	-4.38E-09
Human tox. non-cancer	CTUh	3.41E-07	3.31E-09	1.74E-08	3.62E-07	2.86E-09	2.09E-09	MNR	MNR	MNR	MNR	MNR	1.49E-05	MNR	0.00E+00	5.81E-10	4.50E-09	2.44E-09	-2.90E-07
SQP[7)]	-	7.43E+01	5.15E+00	5.38E+01	1.33E+02	2.29E+00	1.80E-01	MNR	MNR	MNR	MNR	MNR	4.41E+03	MNR	0.00E+00	5.54E-01	8.11E-01	3.01E-01	-2.13E+01

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy[8)]	MJ	1.94E+01	7.01E-02	2.66E+00	2.22E+01	7.83E-02	-9.46E+00	MNR	MNR	MNR	MNR	MNR	5.43E+03	MNR	0.00E+00	1.27E-02	7.73E-02	6.55E-03	-4.48E+00
Renew. PER as material	MJ	1.08E+00	0.00E+00	5.85E+00	6.93E+00	0.00E+00	-6.90E+00	MNR	MNR	MNR	MNR	MNR	0.00E+00	MNR	0.00E+00	0.00E+00	-8.96E-03	-1.66E-02	0.00E+00
Total use of renew. PER	MJ	2.05E+01	7.01E-02	8.51E+00	2.91E+01	7.83E-02	-1.64E+01	MNR	MNR	MNR	MNR	MNR	5.43E+03	MNR	0.00E+00	1.27E-02	6.83E-02	-1.01E-02	-4.48E+00
Non-re. PER as energy	MJ	2.28E+02	5.11E+00	2.00E+01	2.53E+02	8.88E+00	-6.83E-01	MNR	MNR	MNR	MNR	MNR	1.98E+04	MNR	0.00E+00	9.28E-01	-2.04E+01	-1.54E+01	-8.22E+01
Non-re. PER as material	MJ	3.76E+00	0.00E+00	9.55E-02	3.85E+00	0.00E+00	-1.31E+00	MNR	MNR	MNR	MNR	MNR	0.00E+00	MNR	0.00E+00	0.00E+00	-1.19E+00	-1.35E+00	0.00E+00
Total use of non-re. PER	MJ	2.32E+02	5.11E+00	2.01E+01	2.57E+02	8.88E+00	-2.00E+00	MNR	MNR	MNR	MNR	MNR	1.98E+04	MNR	0.00E+00	9.28E-01	-2.16E+01	-1.67E+01	-8.22E+01
Secondary materials	kg	2.10E-01	0.00E+00	0.00E+00	2.10E-01	0.00E+00	0.00E+00	MNR	MNR	MNR	MNR	MNR	0.00E+00	MNR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Renew. secondary fuels	MJ	1.47E-02	2.76E-05	4.92E-02	6.39E-02	1.67E-05	4.77E-06	MNR	MNR	MNR	MNR	MNR	2.61E-02	MNR	0.00E+00	5.31E-06	3.00E-05	4.51E-06	-4.50E-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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m^3	1.66E-01	7.56E-04	2.26E-02	1.89E-01	7.41E-04	7.28E-04	MNR	MNR	MNR	MNR	MNR	1.71E+01	MNR	0.00E+00	1.23E-04	1.26E-03	-4.30E-04	-4.89E-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	3.37E+00	8.66E-03	6.92E-02	3.45E+00	1.24E-02	1.17E-02	MNR	MNR	MNR	MNR	MNR	5.01E+01	MNR	0.00E+00	1.62E-03	2.02E-02	3.25E-02	-1.42E+00
Non-hazardous waste	kg	4.78E+01	1.60E-01	3.82E+00	5.18E+01	1.82E-01	6.02E-01	MNR	MNR	MNR	MNR	MNR	3.88E+03	MNR	0.00E+00	3.03E-02	5.41E-01	1.89E+00	-1.50E+01
Radioactive waste	kg	2.03E-04	1.09E-06	1.49E-05	2.19E-04	1.15E-06	1.13E-07	MNR	MNR	MNR	MNR	MNR	1.41E-01	MNR	0.00E+00	1.84E-07	6.65E-07	8.39E-08	-1.15E-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 reuse	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	0.00E+00	0.00E+00	2.04E-03	2.04E-03	0.00E+00	0.00E+00	MNR	MNR	MNR	MNR	MNR	0.00E+00	MNR	0.00E+00	0.00E+00	2.16E-01	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	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	0.00E+00	0.00E+00	4.99E+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	2.50E+01	3.50E-01	1.82E+00	2.72E+01	7.00E-01	1.03E-01	MNR	MNR	MNR	MNR	MNR	8.51E+02	MNR	0.00E+00	6.58E-02	9.54E-01	5.31E-01	-7.49E+00
Ozone depletion Pot.	kg CFC_{-11}e	1.51E-05	4.15E-09	2.65E-08	1.51E-05	8.06E-09	4.22E-10	MNR	MNR	MNR	MNR	MNR	1.31E-05	MNR	0.00E+00	7.39E-10	6.23E-10	2.90E-10	-3.07E-08
Acidification	kg SO_2e	1.08E-01	9.17E-04	7.16E-03	1.16E-01	1.40E-02	1.59E-04	MNR	MNR	MNR	MNR	MNR	4.26E+00	MNR	0.00E+00	1.69E-04	4.40E-04	1.16E-04	-6.93E-02
Eutrophication	kg PO_4^3e	2.14E-02	2.24E-04	3.88E-03	2.55E-02	1.58E-03	4.98E-05	MNR	MNR	MNR	MNR	MNR	5.51E-01	MNR	0.00E+00	4.11E-05	1.00E-04	5.06E-05	-9.25E-03
POCP (“smog”)	kg C_2H_4e	9.18E-03	8.18E-05	6.62E-04	9.93E-03	7.08E-04	1.20E-05	MNR	MNR	MNR	MNR	MNR	2.32E-01	MNR	0.00E+00	1.51E-05	3.07E-05	1.22E-05	-3.98E-03
ADP-elements	kg Sbe	6.74E-04	9.59E-07	4.47E-06	6.79E-04	8.86E-07	8.92E-08	MNR	MNR	MNR	MNR	MNR	1.15E-02	MNR	0.00E+00	2.12E-07	1.70E-06	4.32E-08	-3.46E-04
ADP-fossil	MJ	2.50E+02	5.04E+00	2.17E+01	2.77E+02	8.81E+00	3.64E-01	MNR	MNR	MNR	MNR	MNR	1.02E+04	MNR	0.00E+00	9.16E-01	6.19E-01	2.39E-01	-7.91E+01

ENVIRONMENTAL IMPACT DATA, RESULTS PER FUNCTIONAL UNIT

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2 éq/FU	2.51E+00	3.43E-02	1.09E-01	2.65E+00	6.85E-02	8.54E-02	MNR	MNR	MNR	MNR	MNR	8.32E+01	MNR	0.00E+00	6.44E-03	9.23E-02	5.17E-02	-7.33E-01
GWP – fossil	kg CO_2 éq/FU	2.51E+00	3.43E-02	1.71E-01	2.71E+00	6.84E-02	1.00E-02	MNR	MNR	MNR	MNR	MNR	8.27E+01	MNR	0.00E+00	6.43E-03	9.26E-02	5.17E-02	-7.33E-01
GWP – biogenic	kg CO_2 éq/FU	1.00E-03	7.76E-06	-6.36E-02	-6.26E-02	1.15E-05	7.53E-02	MNR	MNR	MNR	MNR	MNR	1.86E-01	MNR	0.00E+00	1.40E-06	-2.59E-04	-4.68E-06	3.31E-04
GWP – LULUC	kg CO_2 éq/FU	2.42E-03	1.53E-05	1.71E-03	4.14E-03	3.59E-05	1.29E-06	MNR	MNR	MNR	MNR	MNR	2.54E-01	MNR	0.00E+00	2.85E-06	7.07E-06	1.35E-06	-3.78E-04
Ozone depletion pot.	kg CFC_{-11}e/FU	1.22E-06	5.06E-10	2.74E-09	1.22E-06	9.87E-10	4.83E-11	MNR	MNR	MNR	MNR	MNR	1.53E-06	MNR	0.00E+00	9.00E-11	7.04E-11	3.34E-11	-3.33E-09
Acidification potential	mole H^+e/FU	1.25E-02	1.17E-04	8.87E-04	1.35E-02	1.71E-03	2.11E-05	MNR	MNR	MNR	MNR	MNR	4.86E-01	MNR	0.00E+00	2.14E-05	5.56E-05	1.56E-05	-7.81E-03
EP-freshwater[2)]	kg Pe/FU	7.60E-04	2.67E-06	5.43E-05	8.17E-04	2.68E-06	3.54E-07	MNR	MNR	MNR	MNR	MNR	7.70E-02	MNR	0.00E+00	5.00E-07	2.26E-06	5.06E-07	-4.34E-04
EP-marine	kg Ne/FU	2.05E-03	3.84E-05	2.50E-04	2.33E-03	4.29E-04	9.97E-06	MNR	MNR	MNR	MNR	MNR	7.63E-02	MNR	0.00E+00	6.95E-06	2.20E-05	2.20E-05	-8.82E-04
EP-terrestrial	mol Ne/FU	2.14E-02	4.18E-04	1.89E-03	2.37E-02	4.76E-03	9.05E-05	MNR	MNR	MNR	MNR	MNR	6.84E-01	MNR	0.00E+00	7.56E-05	1.87E-04	7.22E-05	-9.46E-03
POCP ("smog")[3)]	kg NMVOCe/	7.47E-03	1.72E-04	6.43E-04	8.28E-03	1.31E-03	2.56E-05	MNR	MNR	MNR	MNR	MNR	2.25E-01	MNR	0.00E+00	2.99E-05	5.10E-05	2.04E-05	-2.92E-03
ADP-minerals & metals[4)]	kg Sbe/FU	6.59E-05	9.56E-08	4.48E-07	6.64E-05	8.76E-08	1.04E-08	MNR	MNR	MNR	MNR	MNR	1.12E-03	MNR	0.00E+00	2.11E-08	1.68E-07	5.29E-09	-3.37E-05
ADP-fossil resources	MJ/FU	2.59E+01	4.97E-01	2.21E+00	2.86E+01	8.64E-01	3.60E-02	MNR	MNR	MNR	MNR	MNR	1.93E+03	MNR	0.00E+00	9.02E-02	6.43E-02	2.38E-02	-8.47E+00
Water use[5)]	m^3e priv. /FU	6.91E-01	2.46E-03	5.74E-01	1.27E+00	2.77E-03	4.33E-03	MNR	MNR	MNR	MNR	MNR	5.25E+01	MNR	0.00E+00	4.19E-04	6.71E-03	3.10E-03	-1.06E-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 /FU	1.43E-07	3.43E-09	1.08E-08	1.57E-07	2.84E-09	2.55E-10	MNR	MNR	MNR	MNR	MNR	1.74E-06	MNR	0.00E+00	5.11E-10	6.90E-10	1.75E-10	-4.20E-08
Ionizing radiation[6)]	kBq U235e/FU	7.97E-02	4.33E-04	6.36E-03	8.65E-02	4.59E-04	4.40E-05	MNR	MNR	MNR	MNR	MNR	5.32E+01	MNR	0.00E+00	7.30E-05	2.62E-04	3.27E-05	-4.59E-02
Ecotoxicity (freshwater)	CTUe/FU	1.24E+01	7.03E-02	6.96E-01	1.31E+01	7.50E-02	1.06E-01	MNR	MNR	MNR	MNR	MNR	2.93E+02	MNR	0.00E+00	1.43E-02	2.03E-01	9.98E-01	-3.01E+00
Human toxicity, cancer	CTUh/FU	1.45E-09	5.65E-12	5.96E-11	1.52E-09	1.40E-11	5.06E-12	MNR	MNR	MNR	MNR	MNR	2.80E-08	MNR	0.00E+00	1.09E-12	1.23E-11	1.08E-11	-4.26E-10
Human tox. non-cancer	CTUh/FU	3.32E-08	3.22E-10	1.69E-09	3.52E-08	2.78E-10	2.04E-10	MNR	MNR	MNR	MNR	MNR	1.45E-06	MNR	0.00E+00	5.65E-11	4.37E-10	2.38E-10	-2.82E-08
SQP[7)]	-/FU	7.22E+00	5.01E-01	5.23E+00	1.30E+01	2.23E-01	1.75E-02	MNR	MNR	MNR	MNR	MNR	4.28E+02	MNR	0.00E+00	5.39E-02	7.89E-02	2.92E-02	-2.07E+00

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/FU	1.89E+00	6.81E-03	2.59E-01	2.16E+00	7.61E-03	-9.20E-01	MNR	MNR	MNR	MNR	MNR	5.28E+02	MNR	0.00E+00	1.24E-03	7.51E-03	6.37E-04	-4.36E-01
Renew. PER as material	MJ/FU	1.05E-01	0.00E+00	5.69E-01	6.74E-01	0.00E+00	-6.71E-01	MNR	MNR	MNR	MNR	MNR	0.00E+00	MNR	0.00E+00	0.00E+00	-8.71E-04	-1.62E-03	0.00E+00
Total use of renew. PER	MJ/FU	1.99E+00	6.81E-03	8.28E-01	2.83E+00	7.61E-03	-1.59E+00	MNR	MNR	MNR	MNR	MNR	5.28E+02	MNR	0.00E+00	1.24E-03	6.64E-03	-9.80E-04	-4.36E-01
Non-re. PER as energy	MJ/FU	2.22E+01	4.97E-01	1.95E+00	2.46E+01	8.64E-01	-6.64E-02	MNR	MNR	MNR	MNR	MNR	1.93E+03	MNR	0.00E+00	9.02E-02	-1.99E+00	-1.50E+00	-7.99E+00
Non-re. PER as material	MJ/FU	3.65E-01	0.00E+00	9.29E-03	3.74E-01	0.00E+00	-1.28E-01	MNR	MNR	MNR	MNR	MNR	0.00E+00	MNR	0.00E+00	0.00E+00	-1.16E-01	-1.31E-01	0.00E+00
Total use of non-re. PER	MJ/FU	2.25E+01	4.97E-01	1.96E+00	2.50E+01	8.64E-01	-1.94E-01	MNR	MNR	MNR	MNR	MNR	1.93E+03	MNR	0.00E+00	9.02E-02	-2.10E+00	-1.63E+00	-7.99E+00
Secondary materials	kg/FU	2.04E-02	0.00E+00	0.00E+00	2.04E-02	0.00E+00	0.00E+00	MNR	MNR	MNR	MNR	MNR	0.00E+00	MNR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Renew. secondary fuels	MJ/FU	1.43E-03	2.69E-06	4.78E-03	6.22E-03	1.63E-06	4.64E-07	MNR	MNR	MNR	MNR	MNR	2.54E-03	MNR	0.00E+00	5.16E-07	2.92E-06	4.38E-07	-4.38E-05
Non-ren. secondary fuels	MJ/FU	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m^3/FU	1.61E-02	7.35E-05	2.20E-03	1.84E-02	7.21E-05	7.07E-05	MNR	MNR	MNR	MNR	MNR	1.66E+00	MNR	0.00E+00	1.20E-05	1.22E-04	-4.18E-05	-4.75E-03

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/FU	3.28E-01	8.42E-04	6.73E-03	3.35E-01	1.20E-03	1.14E-03	MNR	MNR	MNR	MNR	MNR	4.87E+00	MNR	0.00E+00	1.57E-04	1.97E-03	3.16E-03	-1.38E-01
Non-hazardous waste	kg/FU	4.65E+00	1.56E-02	3.71E-01	5.04E+00	1.77E-02	5.85E-02	MNR	MNR	MNR	MNR	MNR	3.77E+02	MNR	0.00E+00	2.95E-03	5.26E-02	1.84E-01	-1.46E+00
Radioactive waste	kg/FU	1.98E-05	1.06E-07	1.45E-06	2.13E-05	1.12E-07	1.10E-08	MNR	MNR	MNR	MNR	MNR	1.37E-02	MNR	0.00E+00	1.79E-08	6.47E-08	8.15E-09	-1.11E-05

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/FU	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg/FU	0.00E+00	0.00E+00	1.98E-04	1.98E-04	0.00E+00	0.00E+00	MNR	MNR	MNR	MNR	MNR	0.00E+00	MNR	0.00E+00	0.00E+00	2.10E-02	0.00E+00	0.00E+00
Materials for energy rec	kg/FU	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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	MJ/FU	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	0.00E+00	0.00E+00	4.86E-01	0.00E+00	0.00E+00

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

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2 éq./FU	2.43E+00	3.41E-02	1.77E-01	2.64E+00	6.81E-02	1.00E-02	MNR	MNR	MNR	MNR	MNR	8.28E+01	MNR	0.00E+00	6.40E-03	9.28E-02	5.16E-02	-7.28E-01
Ozone depletion Pot.	kg CFC-$_{11}$e/FU	1.47E-06	4.04E-10	2.58E-09	1.47E-06	7.84E-10	4.11E-11	MNR	MNR	MNR	MNR	MNR	1.27E-06	MNR	0.00E+00	7.19E-11	6.06E-11	2.82E-11	-2.98E-09
Acidification	kg SO_2e/FU	1.05E-02	8.92E-05	6.97E-04	1.12E-02	1.36E-03	1.55E-05	MNR	MNR	MNR	MNR	MNR	4.15E-01	MNR	0.00E+00	1.64E-05	4.28E-05	1.12E-05	-6.73E-03
Eutrophication	kg PO_4^3e/FU	2.08E-03	2.17E-05	3.77E-04	2.48E-03	1.54E-04	4.84E-06	MNR	MNR	MNR	MNR	MNR	5.36E-02	MNR	0.00E+00	3.99E-06	9.77E-06	4.92E-06	-8.99E-04
POCP (“smog”)	kg C_2H_4e/FU	8.93E-04	7.95E-06	6.44E-05	9.65E-04	6.88E-05	1.17E-06	MNR	MNR	MNR	MNR	MNR	2.26E-02	MNR	0.00E+00	1.47E-06	2.99E-06	1.19E-06	-3.87E-04
ADP-elements	kg Sbe/FU	6.55E-05	9.32E-08	4.34E-07	6.60E-05	8.61E-08	8.67E-09	MNR	MNR	MNR	MNR	MNR	1.11E-03	MNR	0.00E+00	2.06E-08	1.65E-07	4.20E-09	-3.36E-05
ADP-fossil	MJ/FU	2.43E+01	4.90E-01	2.11E+00	2.69E+01	8.56E-01	3.53E-02	MNR	MNR	MNR	MNR	MNR	9.88E+02	MNR	0.00E+00	8.91E-02	6.02E-02	2.32E-02	-7.69E+00

THIRD-PARTY VERIFICATION STATEMENT

EPD Hub declares that this EPD is verified in accordance with ISO 14025 by an independent, third-party verifier. The project report on the Life Cycle Assessment and the report(s) on features of environmental relevance are filed at EPD Hub.

EPD Hub is not able to identify any unjustified deviations from the PCR and EN 15802+A2 in the Environmental Product Declaration and its project report.

EPD Hub maintains its independence as a third-party body; it was not involved in the execution of the LCA or in the development of the declaration and has no conflicts of interest regarding this verification.

The company-specific data and upstream and downstream data have been examined as regards plausibility and consistency. The publisher is responsible for ensuring the factual integrity and legal compliance of this declaration.

Program assistant: Xinyuan Zhang

The software used in creation of this LCA and EPD is verified by EPD Hub to conform to the procedural and methodological requirements outlined in ISO 14025:2010, ISO 14040/14044, EN 15804+A2, and EPD Hub Core Product Category Rules and General Program Instructions.

Verified tools
Tool verifier: Hai Ha Nguyen
Tool verification validity: 28 March 2025 - 27 March 2028

APPENDIX 1

MATERIAL COMPOSITION

The product material composition is illustrated in the table below. The material weight is given in grams and in percentage on total product weight.

Table 1: Material composition

Material	Weight (g)	Weight-%
Aluminium	339.13	15.06
Copper	3.6	0.16
Other Plastics	82.78	3.68
Paint	18.67	0.83
PCB Copper	20.31	0.9
PCB Iron	13.77	0.61
PCB Non-ferrous metal	0.2	0.01
PCB Support	123.9	5.5
PCB Tin	2.02	0.09
PP / PS-High Impact PS / ABS	848.0	37.66
Silica Sand	0.12	0.01
Steel	798.8	35.48

APPENDIX 2

USE PHASE (B6) VALUES FOR DIFFERENT COUNTRY MIX

In this EPD the B6 impact has been calculated using the energy mix of EU. The table in this appendix 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:

If for example this 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 = 3.30E-01) and then multilplying for the Finland value from the same table (FINLAND = 1.54E-01).

Thus, the calculation of this example would be:

New B6 GWP tot for Finland = (4.06E-02 / 3.30E-01) x 1.54E-01 = 1.89E-02.

Country	GWP tot (kg CO2 eq. per kwh)	GERMANY	3.90E-01
AFRICA	7.30E-01	INDIA	1.50E+00
APAC	9.50E-01	ITALY	3.50E-01
AUSTRALIA	8.40E-01	LATAM	3.90E-01
AUSTRIA	2.30E-01	NAM	4.50E-01
BELGIUM	2.00E-01	NETHERLANDS	3.90E-01
CHINA	1.02E+00	NORWAY	4.50E-02
DENMARK	1.60E-01	ROW	7.30E-01
EU	3.30E-01	SPAIN	2.10E-01
FINLAND	1.54E-01	SWEDEN	3.70E-02
FRANCE	8.70E-02	UK	2.60E-01

Source Ecoinvent 3.10.1

APPENDIX 3 - EPD HUB ALIGNED

This section represents the scaling method for the **B6 module**, following the PEP EcoPassport PSR for luminaries (PSR-0014-ed2.0-EN-2023 07 13). The GWP results were scaled from a reference variant of a product family, based on various light management scenarios and power inputs of the luminaires within the same product 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 1: 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.

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

The following list of product configurations is not exhaustive. Please use the formula defined in point 1 above to calculate the exact power scaling factor (PSF) for any specific configuration.

Table 2: GWP per scaling factor (EPD Hub aligned)

	12NC or Product Family Code	Description	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
1	911401890685	RC133V G6 36S/840 PSU W62L62 OC	3600	26	138.5	1.0	1.0	0.75	0.75	0.55	856.0	642.0	642.0	470.8
2	911401890385	RC133V G6 36S/840 PSU W62L62 NOC	3600	26	138.5	1.0	1.0	0.75	0.75	0.55	856.0	642.0	642.0	470.8
3	911401890985	RC133V G6 36S/840 PSD W62L62 OC	3600	26	138.5	1.0	1.0	0.75	0.75	0.55	856.0	642.0	642.0	470.8
4	911401801387	RC133V G6 29_36_43S/830_40 PSU W62L62 OC	4300	31	138.7	1.192	1.192	0.894	0.894	0.656	1020.6	765.5	765.5	561.3
5	911401801487	RC133V G6 29_36_43S/830_40 PSD W62L62 OC	4300	31	138.7	1.192	1.192	0.894	0.894	0.656	1020.6	765.5	765.5	561.3
6	911401802687	RC133V G6 36S/840 WIA W62L62 OC	3600	26	138.5	1.0	1.0	0.75	0.75	0.55	856.0	642.0	642.0	470.8
7	910505102804	RC133V G6 36S/840 PSED W62L62 OC	3600	27	133.3	1.038	1.038	0.778	0.778	0.571	888.9	666.7	666.7	488.9

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 3: 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.

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

Table 4: Impact per scaling factor (PEP EcoPassport aligned)

	12NC or Product Family Code	Description	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
1	911401890685	RC133V G6 36S/840 PSU W62L62 OC	3600	26	138.5	1.0	0.097	0.073	0.073	0.053	83.2	62.4	62.4	45.8
2	911401890385	RC133V G6 36S/840 PSU W62L62 NOC	3600	26	138.5	1.0	0.097	0.073	0.073	0.053	83.2	62.4	62.4	45.8
3	911401890985	RC133V G6 36S/840 PSD W62L62 OC	3600	26	138.5	1.0	0.097	0.073	0.073	0.053	83.2	62.4	62.4	45.8
4	911401801387	RC133V G6 29_36_43S/830_40 PSU W62L62 OC	4300	31	138.7	1.192	0.097	0.073	0.073	0.053	83.1	62.3	62.3	45.7
5	911401801487	RC133V G6 29_36_43S/830_40 PSD W62L62 OC	4300	31	138.7	1.192	0.097	0.073	0.073	0.053	83.1	62.3	62.3	45.7
6	911401802687	RC133V G6 36S/840 WIA W62L62 OC	3600	26	138.5	1.0	0.097	0.073	0.073	0.053	83.2	62.4	62.4	45.8
7	910505102804	RC133V G6 36S/840 PSED W62L62 OC	3600	27	133.3	1.038	0.101	0.076	0.076	0.056	86.4	64.8	64.8	47.5