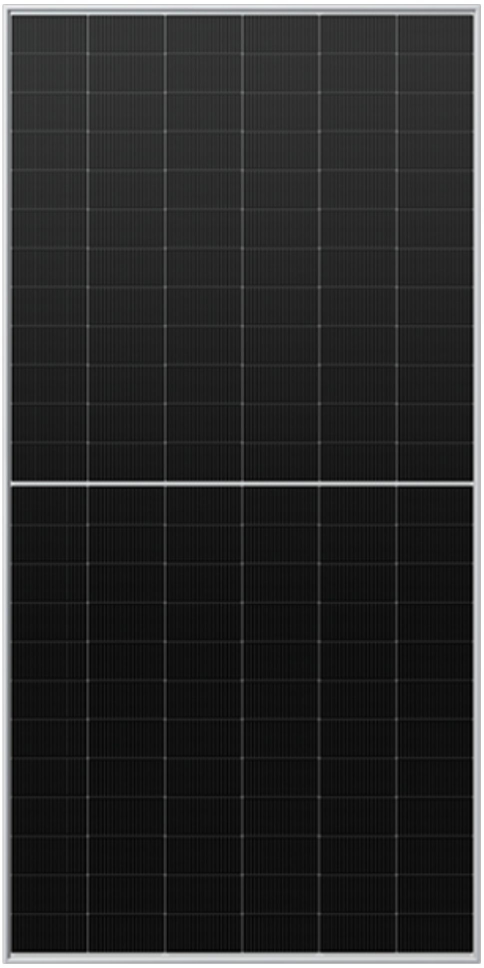
ENVIRONMENTAL PRODUCT DECLARATION

In accordance with 14025 and EN15804 +A2

LONGi MONOCRYSTALLINE TOPCon MODULE LR5-72HGD



Owner of the declaration:
LONGi Green Energy Technology Co., Ltd.

Product name:
LR5-72HGD

Functional unit:
1 Wp

Product category /PCR:
NPCR 029 version 1.2

Program holder and publisher:
The Norwegian EPD foundation

Declaration number:
NEPD-6162-5427-EN

Registration number:
NEPD-6162-5427-EN

Issue date:
06.03.2024

Valid to:
06.03.2029

General information

Product:

LR5-72HGD (Power range: 560~590W)

Program operator:

The Norwegian EPD Foundation
Post Box 5250 Majorstuen, 0303 Oslo, Norway
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Declaration number:

NEPD-6162-5427-EN

This declaration is based on Product Category Rules:

NPCR 029 version 1.2

Statements:

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer, life cycle assessment data and evidences.

Functional unit:

1Wp

System boundary:

Cradle to gate with options: A1-A3, A4, A5, B2, C1-C4 and D

Verification:

Independent verification of the declaration and data, according to ISO14025:2010	
Internal ☐	External ☒
Third Party Verifier: Martijn van Hövell (Independent verifier approved by EPD Norway)	

Owner of the declaration:

LONGi Green Energy Technology Co., Ltd.
e-mail: market@longi.com

Manufacturer:

LONGi Solar Technology (Chuzhou) Co., Ltd.

Place of production:

No. 18 Huizhou Road, Chuzhou City, Anhui Province, China

No. 19 Huaian Road, Chuzhou City, Anhui Province, China

Management system:

ISO 9001, ISO 14001, ISO 45001

Organisation no:

916101167101813521

Issue date:

06.03.2024

Valid to:

06.03.2029

Year of study:

2022.10-2023.9

Comparability:

EPD of construction products may not be comparable if they not comply with EN 15804 and seen in a building context.

The EPD has been worked out by:

TÜV SÜD Certification and Testing
(China) Co., Ltd. Shanghai Branch

Approved

Håkon Hauan

Manager of EPD Norway

PRODUCT

PRODUCT DESCRIPTION:

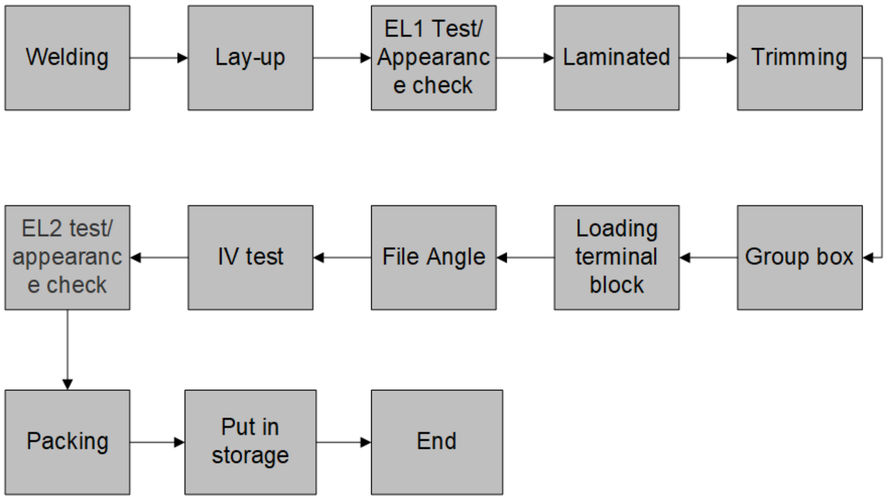
LR5-72HGD is LONGi's cutting-edge solution tailored for the utility market. This latest generation of high-efficiency modules integrates HPDC (High Performance and Hybrid Passivated Dual-Junction Cell) technology, ensuring exceptional power generation performance and reliability. The HPDC cell incorporates advanced hybrid passivation techniques on both the front and back, effectively minimizing carrier recombination. This results in an amplified power generation capacity, with higher Voc and efficiency, lower degradation, and an improved power temperature coefficient. These features collectively contribute to outstanding performance in diverse environments. With an impressive bifaciality of approximately 80%, the LR5-72HGD excels in challenging settings such as the desert Gobi. It delivers up to a 3% power generation gain compared to mainstream bifacial modules. The superior power temperature coefficient and lower operating temperatures further enhance its suitability for demanding environments. To ensure a stable and reliable life cycle, the LR5-72HGD comes with a power warranty featuring linear degradation of no more than 0.4%. This commitment underscores LONGi's confidence in the module's durability and consistent performance over time. It offers an optimal solution for maximizing energy output in challenging conditions.

PRODUCT SPECIFICATION:

LR5-72HGD has a power range from 560W to 590W and a weight of 31.8 kg. 590W is chosen as the representative product power output. Materials compositions and technical data are shown below. The models are manufactured in Chuzhou City, Anhui Province.

Materials	LR5-72HGD	
	KG/FU	%
Solar glass	4.34E-02	75.96
Frame	4.17E-03	7.30
Solder	4.11E-04	0.72
Solar cell	1.20E-03	2.10
Junction box	1.81E-04	0.32
Silicone gel	2.69E-03	4.72
Flux	5.30E-05	0.09
EVA	3.42E-03	5.99
Packaging: Pallet	8.31E-04	1.45
Packaging: Corrugated board	2.76E-04	0.48
Packaging: paper	3.67E-04	0.64
Packaging: bag	6.90E-05	0.12
Packaging: LDPE Film	6.10E-05	0.11

The manufacturing processes of the module are presented below.



Step 1: Welding

Solder the positive and negative electrodes of the single-welded batteries together to form a battery string and prepare for the lamination process. Repair the nonconforming battery string.

Step 2: Lay-up

Connect the soldered battery strings with busbar, and play glass, EVA film, and glass back plate to protect the battery.

Step 3: EL1 test/Appearance check

Conduct appearance and Electroluminescent imaging (El) inspection on the PV modules before lamination.

Step 4: Laminated

The lamination process is to melt EVA and solidify the laminate at a certain temperature. Laminating process is a key step of component production, which has a key influence on the quality of component products.

Step 5: Trimming

Trim the laminated components to prepare the frame.

Step 6: Group box

The profile and junction box are mounted with sealed silicone on laminates to increase component strength, further seal the battery assembly, and extend the service life of the components. Put the automatic glue uneven secondary tonic. Install aluminum frame and junction box on the laminate with sealed silica gel, increase the strength of the component, further seal the battery component, and extend the service life of the component.

Step 7: Loading terminal block

The junction box is glued with silicone to the back of the assembly and the lead-out wire is welded to make the assembly and the wire box work. Then in the AB glue potting.

Step 8: File Angle

Fix and polish the four corners of the component.

Step 9: IV test

Verify the output power of the battery component, test its output characteristics, and determine the power level of the component.

Step 10: Insulation withstand voltage and ground continuity test

Insulation test: test whether the current-carrying part of the component is well insulated with the frame or external; Voltage withstand test: the insulation material and insulation structure of the voltage withstand test; Grounding test: to determine whether the safety grounding wire can bear the current flow of the fault under the condition of the fault of the measured object.

Step 11: EL2 test/appearance check

Check whether there is any problem with battery cells in the component, such as hidden cracking, fragment, black plate, etc., and determine the level of component EL.

Step 12: Packing

Packing finished components in specified quantity for easy transportation and sale.

Step 13: Put in storage

Put the packed components into the warehouse procedure.

TECHNICAL DATA:

Series	LR5-72HGD
Power output range (W)	560~590
Dimensions (mm)	2278*1134*30
Area (m^2)	2.583
Converting factor (Wp/m^2)	206.80
Module efficiency (%)	21.7~22.8
Weight (kg)	31.8
Weight (incl. package)	33.7
First year degradation (%)	0.8
Annual degradation (%)	0.38

MARKET:

Italy

REFERENCE SERVICE LIFE, PRODUCT:

25 years (based on ≥80% of the labelled power output)

LCA: Calculation rules

Functional unit:

Functional unit is 1 Wp of manufactured photovoltaic module, with activities needed for a study period for a defined reference service life (≥80% of the labelled power output). The converting factor to convert the results related to the functional unit to 1 m^2 PV module is 206.80 Wp/m^2.

Data quality:

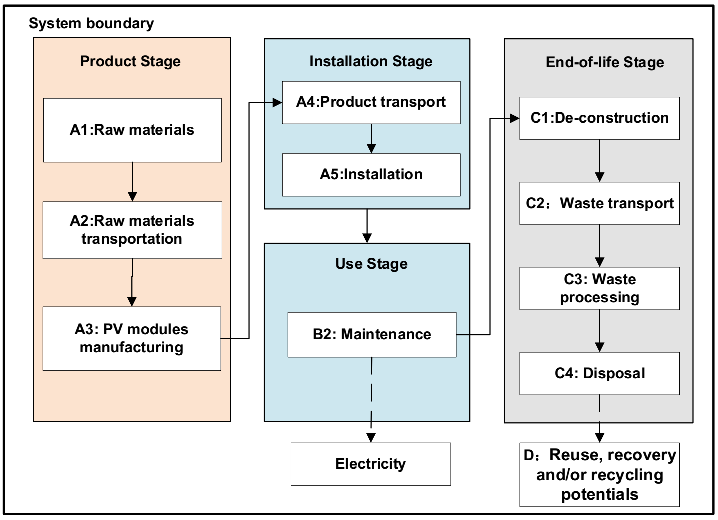
Primary data (such as materials or energy flows that enter and leave the production system) is from LONGi manufacturing facilities for the period spanning October 2022 to September 2023 (annual average). Secondary data such as silicon ingot, silicon wafer, and solar cell production is taken from IEA PVPS Task 12, 2020 report. Generic data related to the life cycle impacts of the material or energy flows that enter and leave the production system is sourced from Ecoinvent 3.9 "allocation, cut-off by classification - unit" database.

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among all products through power output allocation. For the end-of-life allocation of background data (energy and materials), the model “allocation cut-off by classification (ISO standard) is used. As for the end-of-life stage of the solar PV modules, the load and benefit of reuse, recycling, and recovery processes is reported separately following the PCR’s recommendation.

System boundary:

The system boundary for this LCA study of LONGi's PV modules encompasses product stage, installation stage, use stage, and end-of-life stage, from cradle to gate with options: A1-A3, A4, A5, B2, C1-C4 and D, as defined in the PCR.



Cut-off criteria:

For the processes within the system boundary, all available energy and material flow data have been included in the model. In cases where no matching life cycle inventories are available to represent a flow, proxy data has been applied based on conservative assumptions regarding environmental impacts.

LCA: Scenarios and additional technical information

The following information describes the scenarios in different modules of the EPD.

Transport from production place to assembly/user (A4)

For domestic transportation, 16-32 metric ton, dataset for EURO6 type truck is used for modelling, while for ocean transportation, dataset for container ship is used for modelling.

Type	Capacity utilization (incl. return) %	Type of vehicle	Fuel type	Fuel Consumption (kg/tkm)
Truck	36.7	EURO6 16-32 ton	Diesel	0.0366
Ship	70	Container ship	Heavy oil	0.0025

Assembly (A5)

According to PCR, mounting structures and electrical components will not be included in this stage, only energy consumption, waste generation and treatment of packaging materials will be considered. A proxy process of photovoltaic plant installation from Ecoinvent database is referred to, electricity and diesel consumption are downscaled to the power output of the product analyzed in this study. The waste from the products' packaging is considered in this stage, and waste treatment of wood pallet is modeled as 75% recycling and 25% incineration. Other packaging materials including paper and plastic film are modeled with 100% incineration.

A5 Assembly	Unit (per FU)	Value
Auxiliary	kg	-
Water consumption	m^3	-
Electricity consumption	kWh	6.32E-5
Other energy carriers	MJ	Diesel: 1.35E-2
Material loss	kg	-
Output materials from waste treatment	kg	-
Dust in the air	kg	-

Use (B1)

There are no material or energy inputs, nor emissions during the use phase (B1) of the PV module.

Maintenance (B2)/Repair (B3)

As for the maintenance stage (B2), water used for cleaning to maintain the performance is considered, 0.23L water used per module each time, and 2 times in a year are assumed as mentioned in the assumption section. During the operation of PV module, no repair (B3) is required under normal circumstances.

Replacement (B4)/Refurbishment (B5)

It is assumed that the PV module itself does not require replacement and refurbishment during its RSL.

Operational energy (B6) and water consumption (B7)

It is assumed that there is no operational electricity (B6) or water consumption (B7). To calculate the expected energy production over the lifetime of the panels, the following formula may be used:

$$E_1 = S_{\text{rad}} * A * y * PR * (1 - \deg)$$

Where:

E_1= Energy produced in the first year of operation, kWh/year

S_{rad} = Site specific annual average solar radiation on module (shadings not included), kWh/kWp/year. The annual radiation must take into consideration the specific inclination (slope, tilt) and orientation.

A = Area of module, m^2.

y = Module yield: electrical power, kWp for standard test conditions (STC) of the module divided by the area of the module.

STC: The ratio is given for standard test conditions: irradiance 1000 W/m^2, cell temperature 25 °C, wind speed 1 m/s, AM1.5.

PR = Performance ratio, coefficient for losses. Site specific performance ratio can be modelled with PV simulation software tools, such as PVSYST or similar.

Deg: yearly degradation rate.

Energy production second year of operation:

$$E_2 = E_1 * (1 - \text{deg})$$

Energy production n year of operation:

$$E_n = E_1 * (1 - \text{deg})^{n-1}$$

Energy production over reference service life of module, assuming linear annual degradation:

$$E_{RSL} = E_1 * (1 + \sum_{n=1}^{RSL-1} (1 - deg)^n)$$

End of Life (C1, C3, C4)

Assumptions are made for C1, C3 and C4 stage. Decommissioning stage (C1) of PV modules is assumed to be taken with same energy and fuel consumption as for installation stage. Waste processing (C3) stage is assumed to be mechanically treated to yield the bulk materials. Modelling of disposal stage (C4) refers to legal requirements issued by Waste Electrical and Electronic Equipment (WEEE) under the EU scenario.

End-of-Life	Unit (per FU)	LR5-72HGD
Hazardous waste disposed	kg	0
Collected as mixed construction waste	kg	5.39E-02
Reuse	kg	-
Recycling	kg	4.11E-02
Energy recovery	kg	1.81E-04
Landfill	kg	7.71E-03

TRANSPORT TO WASTE PROCESSING (C2)

50km transportation distance from the plant site to waste treatment site (C2) is assumed according to PCR.

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance KM	Fuel type	Fuel/Energy consumption
Truck	36.7	EURO6 16-32 ton	50	Diesel	0.0366kg/tkm

BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES (D)

100% of aluminium scrap, 95% of copper and silver, and 85% of glass scrap will be recycled. The plastic components are incinerated with energy recovery. Efforts required by secondary production, loss of materials and quality are considered.

	Unit (per FU)	LR5-72HGD
Substitution of converter aluminum with net scrap	kg	1.08E-03
Substitution of primary silver with net scrap	kg	6.34E-06
Substitution of primary copper with net scrap	kg	1.06E-05
Substitution of primary glass with glass gullets	kg	3.13E-02
Electrical energy recovery	kWh	1.71E-04
Thermal energy recovery	MJ	1.11E-03

LCA: RESULTS

The LCA results show the environmental impacts and resource input and output flows calculated according to EN 15804:2012+A2:2019. The results are shown per functional unit (1Wp). The LCA results have been calculated using the LCA software SimaPro 9.5.

SYSTEM BOUNDARIES (X=INCLUDED, MND= MODULE NOT DECLARED, MNR=MODULE NOT RELEVANT)

Product stage			Assembly stage		Use stage							End of life stage				Benefits & loads beyond system boundary
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	X	MND	MND	MND	MND	MND	X	X	X	X	X

CORE ENVIRONMENTAL IMPACT INDICATORS

LR5-72HGD (per Wp)

Indicator	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq.	3.68E-01	1.44E-02	2.93E-03	6.11E-06	1.36E-03	4.99E-04	6.45E-03	4.23E-04	-7.59E-02
GWP-biogenic	kg CO_2 eq.	8.21E-05	1.34E-06	1.32E-03	1.26E-07	2.59E-06	4.56E-07	5.39E-04	1.15E-06	1.00E-03
GWP-fossil	kg CO_2 eq.	3.67E-01	1.44E-02	1.62E-03	5.98E-06	1.36E-03	4.98E-04	5.91E-03	4.22E-04	-7.67E-02
GWP-LULUC	kg CO_2 eq.	3.93E-04	9.64E-06	1.97E-07	1.04E-08	1.54E-07	2.46E-07	9.31E-07	4.89E-08	-1.48E-04
ODP	kg CFC11 eq.	8.95E-09	2.33E-10	2.69E-11	1.69E-13	2.18E-11	1.08E-11	1.33E-10	9.45E-12	-9.45E-10
AP	mol H^+ eq.	2.20E-03	2.72E-04	1.29E-05	3.27E-08	1.25E-05	1.09E-06	2.14E-05	5.47E-07	-4.19E-04
EP-freshwater	kg P eq.	1.08E-04	7.37E-07	5.42E-08	3.96E-09	4.50E-08	3.54E-08	9.40E-07	1.83E-08	-2.47E-05
EP-marine	kg N eq.	4.87E-04	6.78E-05	5.95E-06	6.38E-09	5.75E-06	2.75E-07	3.65E-06	2.09E-07	-9.03E-05
EP-terrestrial	mol N eq.	4.79E-03	7.47E-04	6.45E-05	6.12E-08	6.26E-05	2.79E-06	4.15E-05	2.10E-06	-1.00E-03
POCP	kg NMVOC eq.	1.41E-03	2.12E-04	1.92E-05	2.24E-08	1.86E-05	1.69E-06	1.78E-05	7.90E-07	-2.94E-04
ADP-M&M	kg Sb eq.	1.66E-05	2.71E-08	7.74E-10	3.14E-11	5.11E-10	1.63E-09	1.05E-08	2.76E-10	-2.51E-06
ADP-fossil	MJ	4.33E+00	1.87E-01	1.89E-02	1.07E-04	1.79E-02	7.07E-03	9.30E-02	1.76E-03	-9.67E-01
WDP	m^3	4.27E-01	5.90E-04	6.50E-05	8.20E-04	5.35E-05	2.92E-05	3.73E-03	5.08E-05	-1.11E-02

***GWP-total:** Global Warming Potential; **GWP-fossil:** Global Warming Potential fossil fuels; **GWP-biogenic:** Global Warming Potential biogenic; **GWP-LULUC:** Global Warming Potential land use and land use change; **ODP:** Depletion potential of the stratospheric ozone layer; **AP:** Acidification potential, Accumulated Exceedance; **EP-freshwater:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; See "additional requirements" for indicator given as PO4 eq. **EP-marine:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **EP-terrestrial:** Eutrophication potential, Accumulated Exceedance; **POCP**: Formation potential of tropospheric ozone; **ADP-M&M**: Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil:** Abiotic depletion potential for fossil resources; **WDP:** Water deprivation potential, deprivation weighted water consumption*

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS

LR5-72HGD (per Wp)

Indicator	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
PM	Disease incidence	2.76E-08	6.82E-10	3.52E-10	3.39E-13	3.46E-10	3.71E-11	1.01E-10	9.78E-12	-4.61E-09
IRP	kBq U235 eq.	1.93E-02	1.35E-04	1.37E-05	2.27E-06	1.16E-05	9.57E-06	7.68E-04	4.85E-06	-6.60E-03
ETP-fw	CTUe	2.38E+00	9.53E-02	1.03E-02	2.74E-05	8.41E-03	3.50E-03	1.16E-02	2.29E-02	-2.63E-01
HTP-c	CTUh	2.14E-10	6.35E-12	6.71E-13	2.64E-14	4.16E-13	2.27E-13	1.58E-12	7.32E-14	-4.55E-11
HTP-nc	CTUh	4.22E-09	8.88E-11	5.11E-12	3.46E-13	2.97E-12	5.02E-12	2.90E-11	2.20E-12	-7.65E-10
SQP	Dimensionless	1.33E+00	5.69E-02	1.78E-03	2.34E-05	1.24E-03	4.28E-03	1.43E-02	2.85E-03	-4.05E-01

***M:** Particulate matter emissions; **IRP:** Ionising radiation, human health; **ETP-fw:** Ecotoxicity (freshwater); **ETP-c:** Human toxicity, cancer effects; **HTP-nc:** Human toxicity, non-cancer effects; **SQP:** Land use related impacts / soil quality*

RESOURCE USE

LR5-72HGD (per Wp)

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
RPEE	MJ	8.60E-01	1.88E-03	1.28E-02	1.59E-05	1.99E-04	1.11E-04	2.36E-02	8.98E-05	-1.25E-01
RPEM	MJ	1.26E-02	0.00E+00	-1.26E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TPE	MJ	8.60E-01	1.88E-03	2.26E-04	1.59E-05	1.99E-04	1.11E-04	2.36E-02	8.98E-05	-1.25E-01
NRPE	MJ	5.19E+00	1.82E-01	1.82E-02	7.36E-05	1.73E-02	6.83E-03	8.71E-02	0.00E+00	-1.05E+00
NRPM	MJ	2.13E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-2.13E-02	0.00E+00
TRPE	MJ	5.19E+00	1.82E-01	1.82E-02	7.36E-05	1.73E-02	6.83E-03	8.71E-02	1.68E-03	-1.05E+00
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
W	m^3	1.12E-02	2.02E-05	2.45E-06	1.92E-05	1.99E-04	1.11E-04	2.36E-02	1.28E-05	-4.27E-04

RPEE: *Renewable primary energy resources used as energy carrier;* ***RPEM***: *Renewable primary energy resources used as raw materials;* ***TPE***: *Total use of renewable primary energy resources;* ***NRPE***: *Non-renewable primary energy resources used as energy carrier;* ***NRPM***: *Non-renewable primary energy resources used as materials;* ***TRPE***: *Total use of non-renewable primary energy resources;* ***SM***: *Use of secondary materials;* ***RSF***: *Use of renewable secondary fuels;* ***NRSF***: *Use of non-renewable secondary fuels;* ***W***: *Use of net fresh water*

End of life – Waste

LR5-72HGD (per Wp)

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
HW	kg	6.19E-04	1.05E-06	1.25E-07	3.12E-10	1.19E-07	4.50E-08	3.13E-07	9.03E-09	-9.17E-07
NHW	kg	3.63E-02	4.28E-03	7.63E-05	1.24E-06	2.62E-05	3.51E-04	4.13E-02	1.02E-02	-9.65E-03
RW	kg	4.70E-06	3.17E-08	3.31E-09	5.83E-10	2.77E-09	2.33E-09	2.01E-07	1.18E-09	-1.58E-06

HW: *Hazardous waste disposed;* ***NHW***: *Non-hazardous waste disposed;* ***RW***: *Radioactive waste disposed*

End of life – output flow

LR5-72HGD (per Wp)

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
CR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MR	kg	8.87E-08	0.00E+00	6.23E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.11E-02	0.00E+00
MER	kg	6.15E-06	0.00E+00	9.10E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.16E-04	0.00E+00
ETE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.11E-03	0.00E+00

CR: *Components for reuse;* ***MR***: *Materials for recycling;* ***MER***: *Materials for energy recovery;* ***EEE***: *Exported electric energy;* ***ETE***: *Exported thermal energy*

Information describing the biogenic carbon content at the factory gate

Biogenic carbon content	Unit (per FU)	*LR5-72HGD*
Biogenic carbon content in product	kg C	0
Biogenic carbon content in the accompanying packaging	kg C	5.16E-4

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2

EPD RESULTS CONVERSION FACTORS OF VARIOUS POWER OUTPUT RANGES

Rated power output range (Wp)	560	565	570	575	580	585
Conversion factor*	1.054	1.044	1.035	1.026	1.017	1.008

*Note: Environmental impacts of other power outputs are determined by multiplying the results for 590 Wp by relevant conversion factors

ADDITIONAL REQUIREMENTS

GREENHOUS GAS EMISSION FROM THE USE OF ELECTRICITY IN THE MANUFACTURING PHASE

The determination of energy use and emission intensity follows location-based approach. Dataset for Eastern China grid electricity mix is applied for the manufacturing process (A3).

National electricity grid	Unit	Value
Electricity, medium voltage {CN-ECGC}| market for electricity, medium voltage | Cut-off, U, ecoinvent 3.9	kg CO_2 -eq/kWh	0.852

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS REQUIRED IN NPCR PART A FOR CONSTRUCTION PRODUCTS

In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context to Swedish public procurement legislation.

LR5-72HGD

Indicator	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
GWP-IOBC	kg CO2 eq.	3.68E-01	1.44E-02	1.61E-03	5.98E-06	1.36E-03	4.99E-04	5.91E-03	4.22E-04	-7.69E-02

GWP-IOBC: *Global warming potential calculated according to the principle of instantaneous oxidation.*

HAZARDOUS SUBSTANCES

The sample of LR5-72HGD has been tested according to REACH Regulation (EC) No. 1907/2006. The PV modules have passed the tests. The substances of Very High Concern concentration are less than 0.1%. Test reports are available upon request to EPD owner.

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