# Environmental Product Declaration

in accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for :

## [*X3-Hybrid Series*]

from

## [*SolaX Power Network Technology (Zhejiang) Co., Ltd*]

***EPD of multiple products, based on worst-case results, please refer to "Product information" section.***

| | |
|---|---|
| Programme: | The International EPD® System, www.environdec.com |
| Programme operator: | EPD International AB |
| EPD registration number: | S-P-12482 |
| Publication date: | 2024-02-07 |
| Valid until: | 2029-02-07 |

*An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com*

# Programme information

| | |
|---|---|
| **Programme:** | The International EPD® System |
| **Address:** | EPD International AB<br>Box 210 60<br>SE-100 31 Stockholm<br>Sweden |
| **Website:** | www.environdec.com |
| **E-mail:** | info@environdec.com |

| **Accountabilities for PCR, LCA and independent, third-party verification** |
|---|
| **Product Category Rules (PCR)** |
| PCR:<br>- *EPD International PCR - Construction products (2019:14, Version 1.3.1)*<br>- *C-PCR-024: PV components: inverters, battery energy storage systems, combiner boxes and tracker systems (2023-01-02)* |
| PCR review was conducted by:<br>- *For PCR :The Technical Committee of the International EPD® System. Chair: Massimo Marino.*<br>- *For C-PCR: Chair of the PCR review: Gorka Benito Alonso, The review panel may be contacted via info@environdec.com.* |
| **Life Cycle Assessment (LCA)** |
| LCA accountability: Young - *SolaX Power Network Technology (Zhejiang) Co., Ltd* |
| **Third-party verification** |
| Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:<br><br>☒ EPD verification by individual verifier<br><br>Third-party verifier: < *Mr. Béranger Hoppenot - Bureau Veritas,*  ><br><br>Approved by: The International EPD® System |
| Procedure for follow-up of data during EPD validity involves third-party verifier:<br><br>☐ Yes ☒ No<br>[Procedure for follow-up the validity of the EPD is at minimum required once a year with the aim of confirming whether the information in the EPD remains valid or if the EPD needs to be updated during its validity period. The follow-up can be organized entirely by the EPD owner or together with the original verifier via an agreement between the two parties. In both approaches, the EPD owner is responsible for the procedure being carried out. If a change that requires an update is identified, the EPD shall be re-verified by a verifier] |

EPDs within the same product category but registered in different EPD programmes may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see ISO 14025.

# Company information

Owner of the EPD:
SolaX Power Network Technology (Zhejiang) Co., Ltd
The EPD owner has the sole ownership, liability, and responsibility for the EPD.

Contact:
Mr. Jason.Shen, Mail: jason.shen@solaxpower.com; Web: www.solaxpower.com
No.288,Shizhu Road, Tonglu Economic Development Zone, Tonglu City, Zhejiang Province 310000
P.R. CHINA

Description of the organisation:
*SolaX Power Network Technology (Zhejiang) Co., Ltd. was founded in 2012 and is committed to the field of smart energy microgrid, owning core products including PV on grid inverters, energy storage inverters, energy storage batteries, PV energy storage systems and more. To date, SolaX o-ers the most diversified product line globally and has the widest application coverage. SolaX is the global leader in the field of smart PV energy storage systems.*
*SolaX in China is well-equipped with world-class production and testing facilities. With branches in five countries globally, SolaX Power has over 500 international employees, 130 of whom are senior engineers and industry experts. At present, SolaX sells its products to more than 118 countries. SolaX is a hi-tech enterprise that integrates R&D, production, sales and service as one, and is dedicated to providing grid-tied inverters, storage inverters, solar battery storage and smart PV energy storage systems.*
*SolaX was authorized more than 70 national patents since establishment, including more than 10 invention patents. SolaX inverters have been granted more than 150 international authorized certifications until now.*
*SolaX's products have passed the German VDE certification, Italian CEI certification, European Union EN certification, Australian SAA certification, American UL certification and other mainstream market certifications. SolaX is also the first Chinese manufacturer to obtain the Japanese S-Mark certificate for its residential energy storage system, which demonstrated the excellent performance and stable reliability of SolaX residential energy storage system.*
*In 2013, SolaX successfully launched Asian first X-Hybrid energy storage inverter, and now it's the 4th generation. SolaX is truly a leader in solar and energy storage industry.*

Name and location of production site:
SolaX Power Network Technology (Zhejiang) Co. ,Ltd.
No.288,Shizhu Road, Tonglu Economic Development Zone, Tonglu City, Zhejiang Province 310000
P.R. CHINA
Above location represents also the unique manufacturing plants of X3-Hybrid Series.

# Product information

Product name:
X3-Hybrid Series

Product identification:
The product series intended to be covered by this EPD is summarised as follows:

| Product reference | Rated power (kW) | Efficiency (%) | Lifespan (years) | Weight (kg) |
|---|---|---|---|---|
| **X3-Hybrid-5.0-D** | 5 | 97.7 | 25 | 31.30 |
| **X3-Hybrid-5.0-M** | 5 | 97.7 | 25 | 30.91 |
| **X3-Hybrid-6.0-D** | 6 | 97.7 | 25 | 31.30 |
| **X3-Hybrid-6.0-M** | 6 | 97.7 | 25 | 30.91 |
| **X3-Hybrid-8.0-D** | 8 | 97.7 | 25 | 31.30 |
| **X3-Hybrid-8.0-M** | 8 | 97.7 | 25 | 30.91 |
| **X3-Hybrid-10.0-D** | 10 | 97.7 | 25 | 31.30 |
| **X3-Hybrid-10.0-M** | 10 | 97.7 | 25 | 30.91 |
| **X3-Hybrid-12.0-D** | 12 | 97.7 | 25 | 31.30 |
| **X3-Hybrid-12.0-M** | 12 | 97.7 | 25 | 30.91 |
| **X3-Hybrid-15.0-D** | 15 | 97.7 | 25 | 31.30 |
| **X3-Hybrid-15.0-M** | 15 | 97.7 | 25 | 30.91 |

All above listed products (from 5kW to 15kW) are physically identical (D model has a AC switch (236.3g) and an associated plastic housing (332.4g in total) while the model M has a simpler but similar plastic cover of 117.8g), the difference on Rated power (kW) is achieved by software control. This software control is modifiable (means, 5kW version can be changed to 15kW and vice versa) and is developed to adapt the product to different user need.

The model **X3-Hybrid-5.0-D** is chosen as refence product by its higher weight compared to M model and by its lowest rated output power (5kW) converting lowest quantity of kWh during its lifespan and thus having highest impact allocated to each FU.

Below table provides mandatory product identification:

| Name | Rated output power, kW | Efficiency, %[1] | Lifespan, years |
|---|---|---|---|
| X3-Hybrid-5.0-D | 5 | 97.7 | 25 |

Product description:
Inverter is a power electronic device or circuitry that changes direct current (DC) to alternating current (AC). This high-quality inverter can convert solar energy into alternating current and store energy into batteries while connected to a PV system. The inverter can be used to optimize self-consumption, stored in batteries for future use or fed into the public grid. The way it works depends on user preferences. It can provide emergency power during power outages as well.

UN CPC code: [462 Electricity distribution and control apparatus, and parts thereof]

[1] Efficiency information is available in user manual of which calculation method is as following: η = (0.03 Xη5%) + (0.06 Xη10%) + (0.13 Xη20%) + (0.1 Xη30%) + (0,48 Xη50%) + (0.2Xη100%) = 97.7%. It is calculated in line with EN 50530:2010+A1: Overall efficiency of grid connected photovoltaic inverters.

According to Central Product Classification (CPC) Version 2.1

Geographical scope: Germany (product manufactured in China, ship and use for Germany scenario)

# LCA information

Functional unit:
The inverting functionality needed to be part of a reference PV system (with a service life of 25 years) that provides 1 kWh of AC energy output converted from DC energy generated from the panels.

Reference service life:
25 years

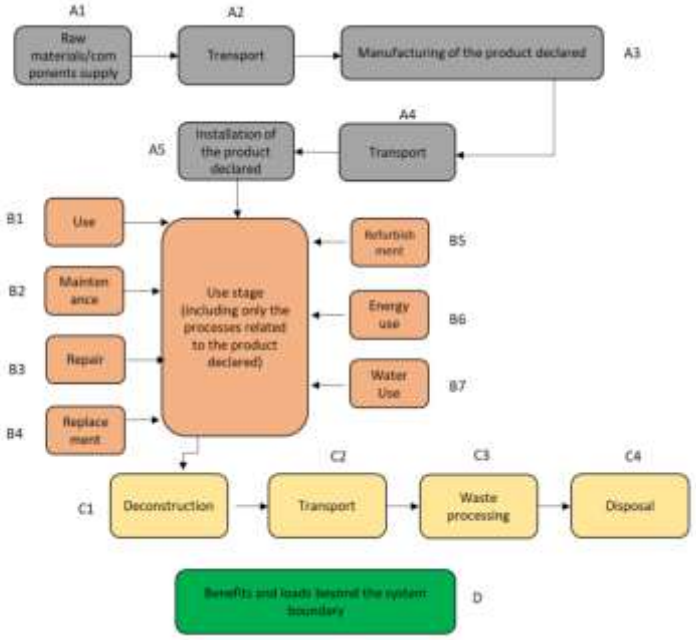
Time representativeness:

The data that has been the subject of data collection are representative of the period September 2022 – August 2023. Collection was conducted between August 2023 and December 2023. Data for the product X3-Hybrid-5.0-D was analysed and processed in December 2023.
The reference years of the LCI modules used are indicated in the EIME software. For the same geographical and technological representativeness, we selected the most recent data.

Database(s) and LCA software used:
Software: EIME (Environmental Improvement Made Easy) v6.1.1-39
Database: CODDE-2023-02

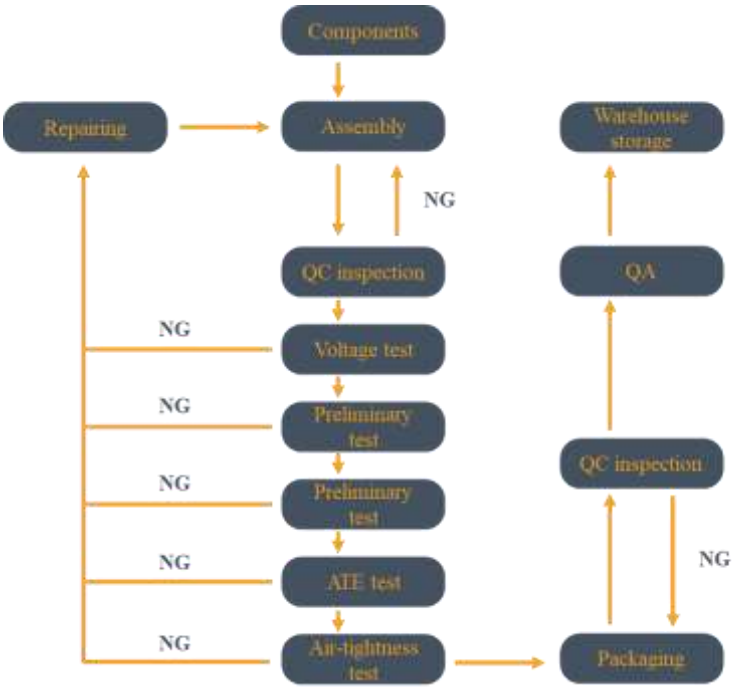
Results:
This study is intended to make an EPD covering all above-mentioned product of the X3-Hybrid Series, the worst-case approach is chosen to make EPD of multiple products according to EPD International PCR - Construction products (2019:14, Version 1.3.1).
Knowing that the environmental impacts will be allocated per FU. The model X3-Hybrid-5.0-D is thus selected as the reference product and the results in this EPD is related to X3-Hybrid-5.0-D only.

System diagram:




Zone on manufacturing process:

Since SolaX's core activities is the designing and assembly of PV invertors, please see below their manufacturing process diagram.




Description of system boundaries:

Cradle to grave and module D (A + B + C + D)

Modules B1-B5 and B7 contain only neglectable activities and thus not modelled. The result tables shown only aggregated result of B stage containing only B6 impact.

Excluded lifecycle stages:

Modules B1-B5 and B7 contain only neglectable activities (mainly, manual work and electricity consumption by tools such as screw drivers) and thus excluded from modelling.

More information:

**SUMMARY OF MAIN ASSUMPTIONS:**

| Phase | Parameter | Data used or hypothesis | Source |
|---|---|---|---|
| Whole model | Reference service life of the product | 25 years | C-PCR-024 (EPD INTERNATIONAL) |
| | Loading rate | 64% | (EU) 2021/2279 |
| | Empty return rate | 0% | (EU) 2021/2279 |
| | Packing of raw material and components | 5% of the total weight | PSR-0005-ed3 (PEP ecopassport® PROGRAM) |
| A2 | Transport to the manufacturer | 1000 km by lorry (default value) | PEP-PCR-ed4-EN-2021 09 06 |
| A3 | Default scrap rates of the manufacturing stage | 30% | PSR-0005-ed3 (PEP ecopassport® PROGRAM) |
| A4 | Transportation from production site to installation site | Marine transport: 10715.32 km Road transport: 720.15 km | C-PCR-024 (EPD INTERNATIONAL) Simulator: searates |
| A5 | Travel distance of the end-of-life of packaging | 50 km (default value) | C-PCR-024 (EPD INTERNATIONAL) |
| | Packaging end-of-life for European scope | default value | PSR-0005-ed3 (PEP ecopassport® PROGRAM) |
| B6 | Installation site of the product | Germany | Sales data (Appendix 4) of the product in the reference year |
| | Annual sunshine hours | 1600 hours | Annual sunshine hours of Germany |
| C2 | End-of-life transport distance | 50 km (default value) | C-PCR-024 (EPD INTERNATIONAL) |
| C3-C4 | End-of-life processing | Proportion of end-of-life process | PCR ed 4 p26 |
| D | End-of-life benefits | ESR dataset | ESR dataset |

**B6 ENERGY CONSUMPTION CALCULATION AND MODELLING:**

B6 energy consumption can be decomposed as follows:

1. Energy consumption:

According to the user manual, standby energy consumption of the product is 50w. Therefore, the total life cycle energy consumption is 10950 kWh, and the energy consumption per FU is 5.48E-02 kWh, being calculated as:

E2 = 50w * 24 hours * 365 days * 25 years / 1000 = 10950 kWh

E2u = E2 / 200000 kWh = 5.48E-02 kWh

2. Conversion loss:

For inverters, battery storage systems and combiner boxes, the energy consumption is considered as the energy loss percentage of the total produced energy by the PV system.

While ensuring the rated output power = 5kWh, the input power is 5.12 kWh, being calculated as:

Wi = W / e = 5 kWh / 97.7% = 5.12 kWh.

- Wi: input power
- W: rated output power
- e: energy efficiency

The amount of electricity loss is 4708.29 kWh, which is 2.35E-02 kWh per FU, being calculated as:
E3 = Wi * (1-e) * ALAS * RSL = 5.12 kWh * (1-97.7%) * 1600 hours * 25 years = 4708.29 kWh.

- E3: total amount of electricity loss
- Wi: Input power
- e: energy efficiency
- ASAL: average local annual sunshine
- RSL: Reference service life

E3u= E3 / E1 = 4708.29 kWh/200000 kWh = 2.35E-02 kWh

Therefore, the total energy consumed in the used stage is 15658.29 kWh; the energy consumed per FU is 7.83E-02 kWh, being calculated as:
EB6 = E2 + E3 = 10950 kWh + 4708.29 kWh = 15658.29 kWh
EB6U = EB6 / 200000 kWh = 7.83E-02 kWh

### TOTAL ENERGY OUTPUT CALCULATION AND CONNECTION BETWEEN FUNCTIONAL UNIT AND REFERENCE FLOW:

E1 = W * ALAS * RSL = 5 kWh*1600 hours*25 years = 200000 kWh

- E1: total amount of electricity converted
- W: rated output power
- ASAL: average local annual sunshine
- RSL: Reference service life

The calculation result of one unit of product (per FU) is divided by the amount of electricity converted (200000 kWh) through the product's lifespan.

Flows that are excluded from the study because of the difficulty of attributing them to a particular reference flow are conventionally the following:

- The lighting, heating, sanitation, and cleaning of facilities
- The transportation of employees
- The manufacture and maintenance of production tools
- The construction and maintenance of infrastructures
- The systems and infrastructures
- The flows from administrative, management, and R&D departments
- The product marketing
- The staff catering facilities.

Cut-off criteria:
In line with PCR, at least 95% of the environmental impact per module are included.
The following flows and operations are cut-off:

- Production, use and disposal of the packaging of components and semi-finished intermediates.
- Materials making up the power inverter itself whose total mass does not exceed 2% of the total weight of the device.
- Material and energy flows related to the installation stage (except packaging waste output flow).
- Material and energy flows related to dismantling phase, whenever it is reasonable to assume that dismantling is performed by adopting manual tools (e.g., screwdrivers, hammers, etc.).
- Devices external to the product itself required for installation.

- Transport of the scrap waste from the manufacture stage.

## SUMMARY OF MODULES AS IN THE INTERNATIONAL EPD® SYSTEM AND RELATED ADDITIONAL INFORMATION:

| | Raw material supply | Transport | Manufacturing | Transport | Construction - installation process | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | Deconstruction - demolition | Transport | Waste processing | Disposal | Reuse - Recovery - Recycling potential |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Module | A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| Modules declared | X | | | X | X | X | X | X | X | X | X | X | X | | | | X |
| Geography | CN | | | GER | GER | ND | ND | ND | ND | ND | GER | ND | ND | EU | EU | EU | EU |
| Specific data used | >90% | | | >90% | >90% | - | - | - | - | - | - | - | - | - | - | - | - |
| Variation - products | <10% | | | <10% | <10% | - | - | - | - | - | - | - | - | - | - | - | - |
| Variation - sites | 0% | | | <10% | 0% | - | - | - | - | - | - | - | - | - | - | - | - |

# Content declaration

## PRODUCT

Amount are presented per reference flow (product & accessories & packaging):

| Catalog | Constituent materials | Model weight (g) | Proportion |
|---|---|---|---|
| **Product** | Aluminum | 14430.31 | 46.10% |
| | Electronic components | 6166.07 | 19.70% |
| | Others | 2791.45 | 8.92% |
| | Steel | 1565.03 | 5.00% |
| | Cable | 682.54 | 2.18% |
| | Plastics | 616.76 | 1.97% |
| | Copper | 88.04 | 0.28% |
| | PCBA | 4959.80 | 15.85% |
| | **Total** | **31300.00** | **100.00%** |
| **Accessories** | Copper | 1.50 | 0.08% |
| | Electronic components | 540.30 | 28.13% |
| | Others | 5.30 | 0.28% |
| | Steel | 1373.30 | 71.51% |
| | **Total** | **1920.40** | **100.00%** |
| **Packaging** | PP | 21.60 | 0.61% |
| | PE-LD | 96.50 | 2.73% |
| | cardboard | 2092.30 | 59.30% |
| | wood | 299.00 | 8.47% |
| | EPS | 1019.00 | 28.88% |
| | **Total** | **3528.40** | **100.00%** |

## POST-CONSUMER MATERIAL & RENEWABLE MATERIAL

In the absence of evidence, none of above is considered in this study and thus no recycled content or renewable content is modelled in this study.

## DANGEROUS SUBSTANCES FROM THE CANDIDATE LIST OF SVHC FOR AUTHORISATION

No SVHC in product to be declared.

## BIOGENIC CARBON CONTENT IN PACKAGING

| Packaging | Cardboard | Wood | Paper | Sum |
|---|---|---|---|---|
| **Source** | ADEME | EN 16485 | APESA/RECORD | |
| **Biogenic carbon content (ratio)** | 28% | 39.52% | 37.80% | |
| **Mass (kg)** | 2.09E+00 | 2.99E-01 | 0.00E+00 | **2.39E+00** |
| **Biogenic carbon content (Per product)** | 5.86E-01 | 1.18E-01 | 0.00E+00 | **7.04E-01** |

# Additional environmental information

*n.a*

# Results of the environmental performance indicators

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Below tables shows the result per FU (Connection between functional unit and reference flow: divided by **200000 kWh**)

***Mandatory impact category indicators***

| Indicators | Unit | A1-A3 | A4 | A5 | B6 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| Climate change - total | kg CO2 eq. | 3.13E-03 | 4.02E-05 | 2.13E-05 | 3.79E-02 | 1.55E-06 | 3.82E-08 | 1.09E-04 | -4.78E-04 |
| Climate change - biogenic | kg CO2 eq. | 5.44E-05 | 0.00E+00 | 1.27E-06 | 1.94E-05 | 0.00E+00 | 2.85E-08 | 6.67E-06 | -7.97E-06 |
| Climate change - fossil | kg CO2 eq. | 3.07E-03 | 4.02E-05 | 2.00E-05 | 3.79E-02 | 1.55E-06 | 9.66E-09 | 1.03E-04 | -4.70E-04 |
| Climate change - land use and land transformation | kg CO2 eq. | 4.92E-12 | 0.00E+00 | 7.22E-14 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Ozone depletion | kg CFC-11 eq. | 4.99E-10 | 1.25E-11 | 8.69E-13 | 1.99E-10 | 1.37E-12 | 5.98E-15 | 9.15E-12 | -1.61E-11 |
| Acidification | mol H+ eq. | 2.58E-05 | 1.11E-06 | 4.93E-08 | 2.83E-04 | 6.98E-09 | 1.95E-10 | 2.54E-06 | -5.44E-06 |
| Eutrophication, freshwater | kg P eq. | 9.42E-09 | 1.04E-11 | 2.11E-10 | 4.12E-08 | 1.82E-13 | 7.77E-14 | 1.54E-09 | -6.55E-07 |
| Eutrophication aquatic, marine | kg N eq. | 2.37E-06 | 2.70E-07 | 1.86E-08 | 2.98E-05 | 3.23E-09 | 2.70E-11 | 1.79E-06 | -7.25E-07 |
| Eutrophication, terrestrial | mol N eq. | 2.57E-05 | 2.95E-06 | 1.27E-07 | 4.42E-04 | 3.49E-08 | 2.73E-10 | 1.00E-06 | -9.10E-06 |
| Photochemical ozone formation, human health | kg NMVOC eq. | 8.78E-06 | 7.81E-07 | 3.16E-08 | 9.60E-05 | 1.13E-08 | 8.45E-11 | 3.86E-07 | -2.24E-06 |
| Resource use, fossils (Abiotic resource depletion – Fossil fuels) | MJ | 4.92E-02 | 4.97E-04 | 1.50E-04 | 7.36E-01 | 1.93E-05 | 2.93E-07 | 1.42E-03 | -5.60E-03 |
| Resource use, minerals and metals (Abiotic resource depletion – Elements) | kg SB eq. | 3.00E-07 | 9.10E-13 | -2.03E-12 | 2.19E-09 | 1.34E-16 | 9.15E-15 | 5.40E-11 | -2.19E-07 |
| Water use | m3 eq. | 1.19E-03 | 7.97E-07 | 2.67E-06 | 1.56E-03 | 7.88E-08 | 4.32E-08 | 3.53E-02 | -2.01E-01 |

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

***Additional mandatory and voluntary impact category indicators***

| Indicators | Unit | A1-A3 | A4 | A5 | B6 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| GWP - GHG | kg CO2 eq. | 3.07E-03 | 4.02E-05 | 2.00E-05 | 3.79E-02 | 1.55E-06 | 9.66E-09 | 1.03E-04 | -4.70E-04 |

***Resource use indicators***

| Indicators | Unit | A1-A3 | A4 | A5 | B6 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| Total use of non-renewable primary energy resources | MJ | 4.92E-02 | 4.97E-04 | 1.50E-04 | 7.36E-01 | 1.93E-05 | 2.93E-07 | 1.42E-03 | -5.60E-03 |
| Total use of renewable primary energy resources | MJ | 1.71E-03 | 4.09E-07 | 2.31E-05 | 1.83E-01 | 1.26E-10 | 6.42E-07 | 1.78E-04 | -1.88E-03 |
| Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials | MJ | 4.81E-02 | 4.97E-04 | 1.50E-04 | 7.36E-01 | 1.93E-05 | 2.93E-07 | 1.42E-03 | -5.60E-03 |
| Use of non-renewable primary energy used as raw materials | MJ | 1.05E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of non-renewable secondary fuels | 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 |
| Use of renewable primary energy excluding renewable primary energy resources used as raw materials | MJ | 1.34E-03 | 4.09E-07 | 2.31E-05 | 1.83E-01 | 1.26E-10 | 6.42E-07 | 1.78E-04 | -1.88E-03 |
| Use of renewable primary energy used as raw materials | MJ | 3.71E-04 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Use of renewable secondary fuels | 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 |
| Use of secondary materials | 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 |
| Net use of fresh water | m3 | 2.77E-05 | 1.86E-08 | 6.22E-08 | 3.62E-05 | 1.83E-09 | 1.01E-09 | 9.27E-04 | -5.64E-03 |

***Waste indicators***

| Indicators | Unit | A1-A3 | A4 | A5 | B6 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| Hazardous waste disposed | kg | 3.44E-03 | 1.17E-08 | 2.72E-07 | 1.07E-03 | 1.29E-09 | 0.00E+00 | -4.19E-12 | 3.37E-07 |
| Nonhazardous waste disposed | kg | 2.76E-03 | 7.83E-07 | 1.44E-05 | 6.06E-03 | 1.58E-09 | 4.78E-09 | 7.53E-09 | 9.53E-06 |
| Radioactive waste disposed | kg | 2.22E-06 | 3.33E-09 | 4.69E-09 | 2.94E-07 | 3.09E-10 | 0.00E+00 | 1.14E-13 | 4.20E-09 |

***Output flow indicators***

| Indicators | Unit | A1-A3 | A4 | A5 | B6 | 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 | 0.00E+00 | 0.00E+00 |
| Exported Energy | MJ | 0.00E+00 | 0.00E+00 | 5.04E-07 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.37E-09 | 0.00E+00 |
| Materials for energy recovery | 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 |
| Materials for recycling | kg | 0.00E+00 | 0.00E+00 | 2.79E-06 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

To ease the reading of the result table, stages B1-B5, B7 and C1, with value equal to 0 for all indicators, are hidden.

*The result tables shall only contain values or the letters "INA" (Indicator Not Assessed). It is not possible to specify INA for mandatory indicators. INA shall only be used for voluntary parameters that are not quantified because no data is available.*

## Other environmental performance indicators

Results for other environmental performance indicators may also be declared. See the PCR for guidance.

***Additional indicators***

| Indicators | Unit | A1-A3 | A4 | A5 | B6 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|
| Ecotoxicity, freshwater | CTUe | 1.69E-01 | 7.32E-05 | 1.59E-04 | 6.22E-01 | 6.36E-06 | 3.74E-07 | 6.81E-02 | -5.39E-02 |
| Particulate matter | Disease occurrence | 1.68E-10 | 5.61E-12 | 3.27E-13 | 1.71E-09 | 1.88E-14 | 1.03E-15 | 6.36E-12 | -3.71E-11 |
| Human toxicity, cancer | CTUh | 2.41E-10 | 5.32E-16 | 4.14E-12 | 4.61E-12 | 1.77E-17 | 1.02E-18 | 2.04E-13 | 1.05E-12 |
| Human toxicity, non-cancer | CTUh | 9.82E-11 | 1.20E-13 | 6.45E-14 | 2.44E-10 | 3.93E-15 | 6.25E-17 | 1.91E-11 | -3.64E-11 |
| Ionising radiation, human health | kBq U235 eq. | 2.69E-02 | 8.30E-08 | 2.21E-06 | 2.24E-02 | 3.44E-09 | 2.65E-05 | 1.49E-05 | -2.71E-04 |
| Land use | No dimension | 2.87E-06 | 0.00E+00 | 2.66E-06 | 5.70E-04 | 0.00E+00 | 0.00E+00 | 6.72E-04 | -1.65E-03 |

The manufacturing electricity consumption is modelled with Electricity Mix; Low voltage; 2018; China, CN (CODDE-2572), of which the climate impact is: **8.73E-01 kg CO2 eq./kWh** (using the GWP-GHG indicator).

This EPD includes module C, it is not recommended to use the results of modules A1-A3 (A1-A5 for services) without considering the results of module C.

# References

- General Programme Instructions of the International EPD® System. Version 4.
- EPD International PCR - Construction products (2019:14, Version 1.3.1)
- C-PCR-024: PV components: inverters, battery energy storage systems, combiner boxes and tracker systems (2023-01-02)

*Other references:*

- ISO 14040: Environmental management -- Life cycle assessment -- Principles and framework (2006)
- ISO 14025: Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures (2006)
- ISO 14020: Environmental statements and programmes for products Principles and general requirements (2022)
- EPD International PCR - Construction products (2019:14, Version 1.3.1)
- EPDItaly: 032-SUB-PCR-EN-50693_Power-Inverter (22/12/2022)
- C-PCR-024: PV components: inverters, battery energy storage systems, combiner boxes and tracker systems (2023-01-02)
- EN 15804:2012+A2:2019 : Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.
- EIME v5 guides for the modelling of the different processes.
- PEP-PCR-ed4-EN-2021 09 06
- PSR-0005-ed3-EN-2023 06 06: Specific rules for electrical switchgear and control gear solutions
- Detailed handbook of EIME version 6
- Recommendations commission recommendation (EU) 2021/2279 of 15 December 2021 on the use of the Environmental Footprint methods to measure and communicate the life cycle environmental performance of products and organisations. Official Journal of the European Union, 30.12.2021.

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