THE INTERNATIONAL EPD® SYSTEM

# Environmental Product Declaration

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

| | |
|---|---|
| Programme: | The International EPD®System, www.environdec.com |
| Programme operator: | EPD International AB |
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*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.*

LONGi

Product name:

Solar photovoltaic module

LR5-54HIH

LR5-54HPB

LR5-54HPH

LR5-54HTB

LR5-54HTH

LR5-66HIH

LR5-66HPH

## General information

**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 |
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| **Accountabilities for PCR, LCA and independent, third-party verification** |
|---|
| **Product Category Rules (RCR)** |
| CEN standard EN 15804 serves as the Core Product Category Rules (PCR) |
| Product Category Rules (PCR):<br>NPCR Part A for Construction products and services, version2.0<br>PCR – Part B for photovoltaic modules used in the building and construction industry, including production of cell, wafer, ingot block, solar grade silicon, solar substrates, solar superstrates and other solar grade semiconductor materials" (NPCR 029 version 1.2) |
| PCR review was conducted by: The Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact. |
| **Life Cycle Assessment (LCA)** |
| LCA author: Harry LV, SGS-CSTC Standards Technical Services Co.,Ltd.<br>Contact:<br>Harry LV<br>Harry.lv@sgs.com |
| **Third-party verification**<br>Bill Kung, Independent third-party verifier approved by The International EPD®System<br>Contact email: bill.k@1mi1.cn |
| Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:<br>☒ EPD verification by individual verifier<br>Third-party verifier:<br>Approved by: The International EPD® System |
| Procedure for follow-up of data during EPD validity involves third party verifier:<br>☐ Yes ☒ No |

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## Contact information

| | |
|---|---|
| **EPD Owner** | Company: LONGi Green Energy Technology Co., Ltd.<br>Address: Block B, No.8989 Shangji Road, Economic & Technological Development Zone, Xi'an, Shaanxi, China<br>Contact: market@longi.com |
| **LCA Author** | LCA author: Harry LV,<br>SGS-CSTC Standards Technical Services Co.,Ltd.<br>Contact:<br>Harry.lv@sgs.com |
| **Programme Operator** | EPD International AB<br>info@environdec.com |

## Description of the organization

LONGi is a world leader in the clean energy transition. We provide a comprehensive suite of solar PV solutions that can optimize a wide range of project applications. LONGi's technological and manufacturing leadership in solar wafers, cells and modules underscores our commitment to helping accelerate the clean energy transition. By offering high-quality, reliable products and systems, we provide holistic solutions for the solar and renewables industry.

In 2021. LONGi produce a total of about 38.69 GW modules. In addition, LONGi hopes to work jointly with partners inside and outside the global energy industry to innovate and continuously improve the technology of PV power generation. LONGi also hopes to continuously expand the scale of the global PV industry to maximize the value of the eternal gift from our Sun.

Plants of LONGi Solar comply with the following standards:

- ISO 9001-Quality Management System
- ISO 14001- Environmental Management System
- ISO 50001- Energy Management System
- ISO14064 - Organization Level for Quantification and Reporting of Greenhouse Gas Emission and Removals
- ISO45001: Occupational Health and Safety Management System

**Name and location of production site(s).**

*Table1. location of production sites*

| Production sites name | location |
|---|---|
| LONGi Solar Technology (Chuzhou) Co., Ltd | No. 19 Huaian Road, Chuzhou City, Anhui Province, China |
| LONGi Solar Technology (Zhejiang) Co., Ltd | No.2 Bailing Middle Road, Donggang Industrial Functional Zone, Quzhou Economic Development Zone,Qujiang District,Quzhou City,Zhejiang Province, China |
| LONGi Solar Technology (Jiaxing) Co., Ltd | No.130 Ruifeng Street, Gaozhao Subdistrict, Xiuzhou District, Jiaxing City, Zhejiang Province, P. R. China |
| LONGi Solar Technology （Jiangsu）Co., Ltd. | No. 288 Yaojia Road, Jiulong Town, Hailing District, Taizhou City, Jiangsu Province, China |

| | |
|---|---|
| LONGi Solar Techology(Qinghai)Co.,Ltd | Hainan Green Industry Development Park (Building Materials Park) in Gonghe County, Hainan Tibetan Autonomous Prefecture, Qinghai Province, China |
| LONGi Photovoltaic Technology (Xianyang) Co., Ltd. | No.169,Wenxing Road, Qindu District, Shaanxi Province |
| LONGi Solar Techology(Datong)Co.,Ltd | Xinrong Economic and Technological Development Zone, Huayuantun Township, Xinrong District, Datong City, Shanxi Province, China |
| LONGi Solar Techology Co.,Ltd | No. 8369, Shangyuan Road, Economic and Technological Development Zone, Xi'an City, Shanxi Province, China |
| LONGi Solar Technology （Taizhou）Co., Ltd. | NO.8 Taikang Road, Hailing District, Taizhou City, Jiangsu Provice, China. |

**Product Identification**

The LONGi Solar's PV modules under analysis integrate various advanced technologies like half-cut cells and Gallium doped wafer. The unique circuit design of half-cut cells can reduce temperature coefficient. Moreover, the gallium-doped technology overcomes the light attenuation of the module and ensures the long-term power generation stability of the module. Application of this modules can reduce the number of modules employed in a power station, thus lowering the corresponding cost of supports, cables, construction and land, improving the return on investment.

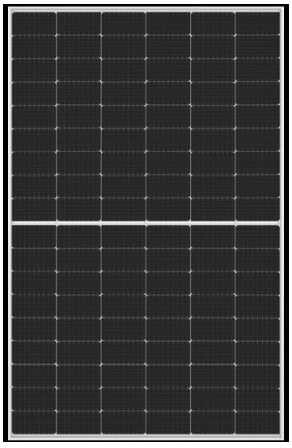

*Figure 1. LONGi Solar PV modules*

**Product Specification**

LONGi Solar produces more than a dozen series of mono-crystalline silicon PV modules. Within this project, LONGi Solar PV Bifacial double glass modules cover 7 PV modules that are analyzed, including LR5-54HIH, LR5-54HPB, LR5-54HPH, LR5-54HTB, LR5-54HTH, LR5-66HIH, LR5-66HPH. The full list of the modules under analysis is shown below.

*Table 2. Different PV module products models*

| Serious (brand name) | Power output range (W) | Dimensions (mm) | Weight(KG) | Weight (KG) including package | Cell number |
|---|---|---|---|---|---|
| LR5-54HIH | 400-420 | 1722 x1134 x 30 | 20.8 | 21.96 | 108 |
| LR5-54HPB | 400-420 | 1722 x1134 x 30 | 20.8 | 21.96 | 108 |
| LR5-54HPH | 405-425 | 1722 x1134 x 30 | 20.8 | 21.96 | 108 |
| LR5-54HTB | 410-440 | 1722 x1134 x 30 | 20.8 | 21.96 | 108 |
| LR5-54HTH | 415-450 | 1722 x1134 x 30 | 20.8 | 21.96 | 108 |
| LR5-66HIH | 490-510 | 2094x1134x35 | 26 | 27.26 | 132 |
| LR5-66HPH | 495-515 | 2094x1134x35 | 26 | 27.26 | 132 |

**Application**

LONGi Solar PV modules are widely used to generate electricity on ultra-large ground power station and Large-scale industrial and commercial projects.

## Life cycle assessment basic information

**Geographical scope**

Modules A1-A5: China

Modules B: European Union

Modules C: European Union

**Functional unit**

1 Wp of manufactured photovoltaic module, from cradle-to-grave, with activities needed for a study period for a RSL of 25 years.

**Reference service life (RSL)**

25 Years

**Factor for conversion to $m^2$**

*Table 3. Conversion factor list*

| Serious (brand name) | Maximum power output range（W） | Dimensions（m2） | Conversion factor （W/m2） |
|---|---|---|---|
| LR5-54HIH | 420 | 1.95 | 215.08 |
| LR5-54HPB | 420 | 1.95 | 215.08 |
| LR5-54HPH | 425 | 1.95 | 217.64 |
| LR5-54HTB | 440 | 1.95 | 225.32 |
| LR5-54HTH | 450 | 1.95 | 230.44 |
| LR5-66HIH | 510 | 2.37 | 214.77 |
| LR5-66HPH | 515 | 2.37 | 216.88 |

**Time representativeness**

Data collection is between January 2020-September 2022, all used background datasets are valid for collection period.

**Database(s) and LCA software used**

Software: SimaPro 9.3.0.2

Database: ecoinvent 3.8, cut-off model

**System boundaries**

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

Modules B1 and B3-B5 contains no activities and are therefore not declared in the result tables.

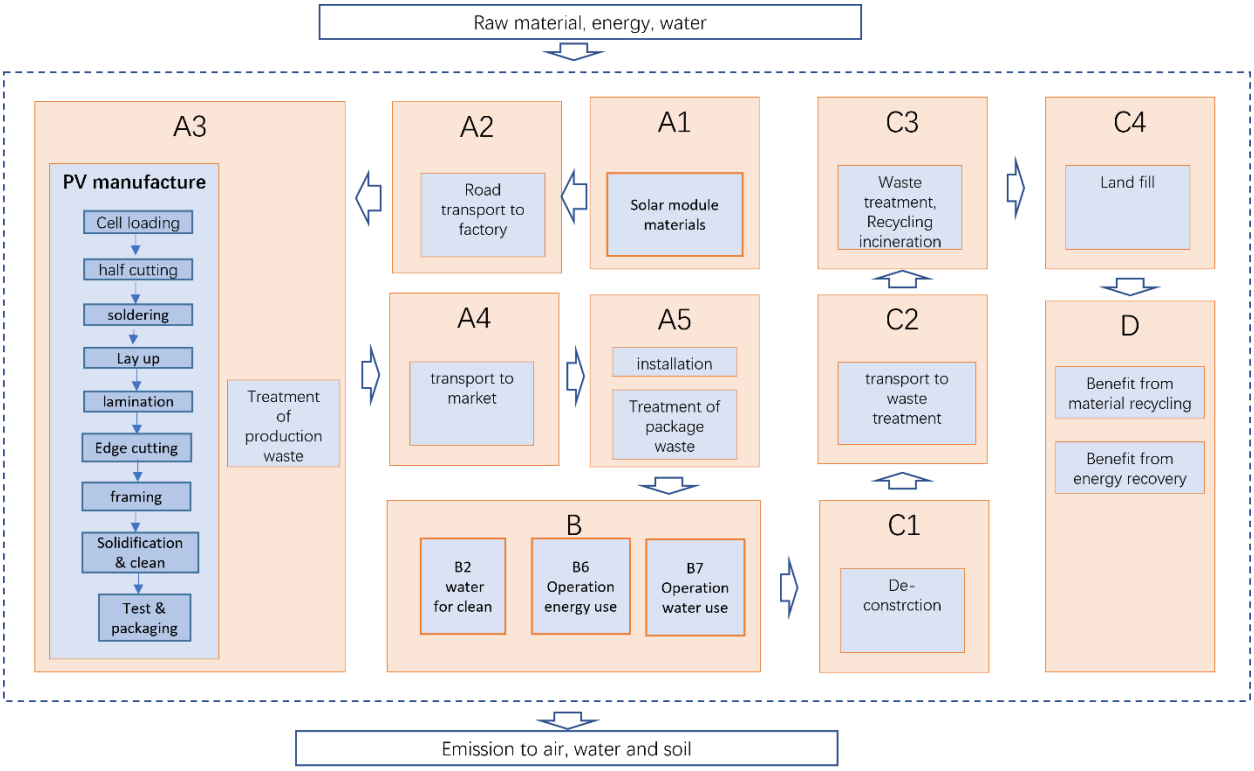


*Figure 2. System diagram*

As per PCR specifications, the following are not included in the system boundary:

- Materials for the mounting system of the module
- Microinverters
- Wiring
- Switches
- One or many solar inverters
- Battery bank
- Battery charger
- Other electrical components and systems necessary to connect the photovoltaic module to the
- electrical grid shall
- Personnel activities and transport of personnel
- Fasteners (screws) and other additional materials

**Assumptions, scenarios and additional technical information**

The most general assumptions of the LCA were:

- PV waste amount is assumed to be zero and waste package is recycled during construction stage A5.

- No energy is consumed for stage C1 dismantle of photovoltaic modules.
- The electricity mix is used for A3 production.
- During product transportation stage A4, due to no specific storage location is given, the real photovoltaic power station Albacete-Spain is chosen as representative for this study. And the maritime transport distance from Shanghai port to Cartagena port is 8883 n miles (source: www.SOL.com.cn) and convert to 16451 km, the lorry is used for domestic road transportation, and 2380 km is used from the farthest factory Qinghai to Shanghai port and 205km is used for road transportation distance from Cartagena port to Albacete. (Distance source: Gaode Map)
- The lorry is used for road transportation during stage C2 waste transferring to the waste treatment factory and 50km is assumed as the default transport distance as per PCR.
- PCR default plan is adopted as the waste treatment plan in C3 module in view of waste recovery rate of photovoltaic components shall be 85% which required in the WEEE2012/19/EU Article11& Annex V, and the recycling materials are treated according to the following solutions. For non-recycling components, the European Union (28 countries) ‘s waste disposal strategy is adopted that the 45% waste will be treated by incineration and 55% by landfill, as per Annex C, V2.1 in the cyclic footprint formula of EU product environment footprint (PEF).

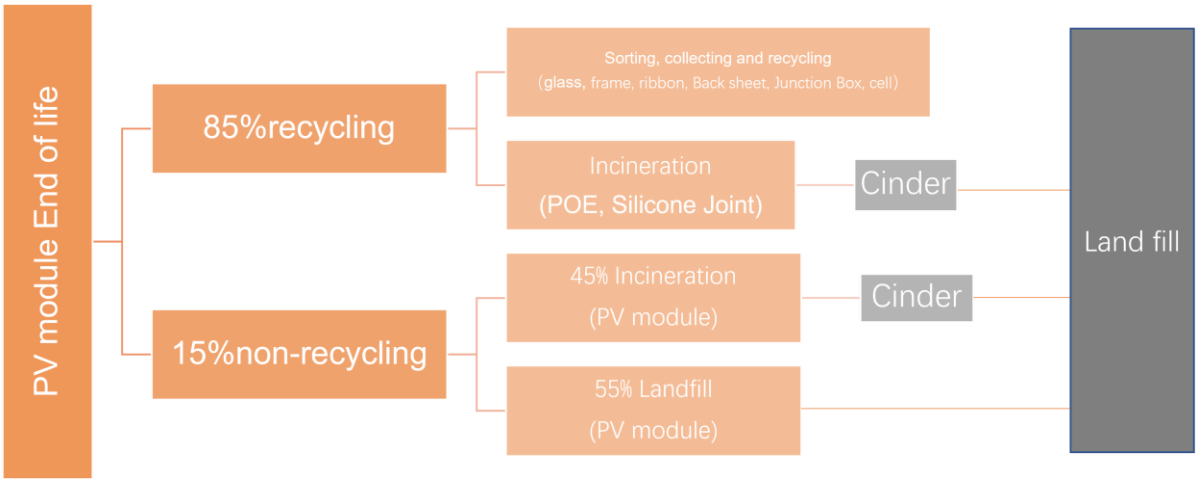


Figure 3. EoL waste disposal strategy

- Benefits and loads beyond the product system boundary in module D include benefits of secondary material from recycling material in C3 and package recycling in A5 and heat recovery from incineration power generation.

LR5-66HPH model is taken as an example in this study for sensitivity analysis.

For the assumption that the electricity mix is used for A3 production stage, this sensitivity analysis was carried out, and different power sources were used to compare, including Qinghai photovoltaic power generation, Qinghai wind power generation, Qinghai hydro power generation, and Zhejiang nuclear

power, and the different environmental impact results and change rate of the A3 electricity consumption process were obtained.

*Table 4. Change rate of different power sources compared with electricity, low voltage {CN} market group for | cut-off*

| | change rate | | | | |
|---|---|---|---|---|---|
| Indicator | Electricity, low voltage {CN-QH}\| electricity production, photovoltaic, 570kWp open ground installation, multi-Si \| Cut-off, S | Electricity, high voltage {CN-QH}\| electricity production, wind, 1-3MW turbine, onshore \| Cut-off, S | Electricity, high voltage {CN-QH}\| electricity production, hydro, run-of-river \| Cut-off, S | Electricity, high voltage {CN-ZJ}\| electricity production, nuclear, pressure water reactor \| Cut-off, S | Electricity, low voltage {CN}\| market group for \| Cut-off, S |
| GWP-fossil | 93% | 98% | 100% | 99% | 0% |
| GWP-biogenic | 106% | 101% | 100% | 100% | 0% |
| GWP-land use | -12% | 83% | 97% | 90% | 0% |
| GWP-total | 93% | 98% | 100% | 99% | 0% |
| AP | 91% | 98% | 100% | 99% | 0% |
| EP, aquatic freshwater | 81% | 95% | 99% | 98% | 0% |
| EP, aquatic marine | 93% | 98% | 99% | 95% | 0% |
| EP,terrestrial | 93% | 98% | 99% | 99% | 0% |
| POCP | 91% | 97% | 99% | 99% | 0% |
| ODP | -53% | 70% | 94% | 89% | 0% |
| (ADP) for fossil resources | 90% | 97% | 100% | -36% | 0% |
| (ADP) for minerals and metals (non-fossil resources) | -34% | 67% | 99% | 95% | 0% |
| WDP | 37% | 92% | 99% | -10% | 0% |
| Primary energy resources--Non--renewable | 90% | 97% | 100% | -29% | 0% |
| Primary energy resources-renewable | -303% | -290% | -280% | 99% | 0% |

It can be seen that the usage of clean energy can significantly reduce the environmental impact from above table.

For the assumption that product is transported by lorry from Qinghai factory to Shanghai port, by container ship from Shanghai port to Cartagena port and road transportation from Cartagena port to Albacete, different transportation scenarios are used for sensitivity analysis as below in A4.

Scenario A, product is transported by train from Qinghai factory to Shanghai port, by container ship from Shanghai port to Cartagena port and road transportation from Cartagena port to Albacete.

Scenario B, product is transported by lorry from Qinghai factory to Shanghai port, by aircraft from Shanghai port to Cartagena port (distance is 9849km source: Baidu Map) and road transportation from Cartagena port to Albacete.

*Table 5. Change rate of different scenarios compared with original transportation scenario*

| Indicator | scenarioA | scenarioB | Original scenario |
|---|---|---|---|
| GWP-fossil | 40% | -1474% | 0% |
| GWP-biogenic | 101% | -250% | 0% |
| GWP-land use | 83% | -13% | 0% |
| GWP-total | 41% | -1464% | 0% |
| AP | 10% | -493% | 0% |
| EP, aquatic freshwater | 14% | -241% | 0% |
| EP, aquatic marine | 14% | -691% | 0% |
| EP,terrestrial | 14% | -687% | 0% |
| POCP | 16% | -656% | 0% |
| ODP | 52% | -1623% | 0% |
| (ADP) for fossil resources | 48% | -1443% | 0% |
| (ADP) for minerals and metals (non-fossil resources) | 39% | -100% | 0% |
| WDP | 27% | -251% | 0% |
| Primary energy resources--Non--renewable | 48% | -1439% | 0% |
| Primary energy resources-renewable | 16% | -277% | 0% |

It can be seen that transport by train can significantly reduce the environmental impact and transport by aircraft can remarkably increase environmental impact.

For the assumption that the lorry is used for road transportation during stage C2 waste transferring to the waste treatment factory. Sensitivity analysis is carried out and different modes of transportation are used to compare different environmental impact results as follows, including lorry 16-32 metric ton, euro6, freight train:

*Table 6. Change rate of different vehicle compared with lorry unspecified {GLO} market group for | cut-off*

| Indicator | Transport, freight train {CN}| market for | Cut-off, S | Transport, freight train {GLO}| market group for | Cut-off, S | Transport, freight, lorry 16-32 metric ton, euro6 {RoW}| market for transport, freight, lorry 16-32 metric ton, EURO6 | Cut-off, S | Transport, freight, lorry, unspecified {GLO}| market group for transport, freight, lorry, unspecified | Cut-off, S |
|---|---|---|---|---|
| GWP-fossil | 65% | 63% | -27% | 0% |
| GWP-biogenic | 108% | 82% | 75% | 0% |
| GWP-land use | 95% | 94% | 92% | 0% |
| GWP-total | 65% | 64% | -26% | 0% |
| AP | 40% | 36% | 32% | 0% |
| EP, aquatic freshwater | 20% | 12% | -16% | 0% |
| EP, aquatic marine | 46% | 31% | 61% | 0% |
| EP,terrestrial | 46% | 31% | 61% | 0% |
| POCP | 48% | 35% | 49% | 0% |
| ODP | 81% | 80% | -29% | 0% |
| (ADP) for fossil resources | 73% | 69% | -25% | 0% |
| (ADP) for minerals and metals (non-fossil resources) | 51% | 54% | -29% | 0% |
| WDP | 36% | 39% | -11% | 0% |
| Primary energy resources--Non--renewable | 73% | 69% | -24% | 0% |
| Primary energy resources-renewable | 22% | 17% | 15% | 0% |

It can be seen that the usage of train as transportation can significantly reduce the environmental impact from above table.

For the assumption that the European Union (28 countries) ‘s waste disposal strategy is adopted that the 55% waste will be treated by incineration and 45% by landfill for non-recycling components in C4 module, another waste treatment plan scenario is used for sensitivity analysis as below.

Scenario A, Spain ‘s waste disposal strategy is adopted that the 14% waste will be treated by incineration and 86% by landfill for non-recycling components in C4 module.

*Table 7. Change rate of different waste disposal strategy in C4*

| Indicator | scenarioA | Original scenario |
|---|---|---|
| GWP-fossil | -17% | 0% |
| GWP-biogenic | -56% | 0% |
| GWP-land use | 30% | 0% |
| GWP-total | -53% | 0% |
| AP | 5% | 0% |
| EP, aquatic freshwater | 15% | 0% |
| EP, aquatic marine | -52% | 0% |
| EP,terrestrial | 8% | 0% |
| POCP | -33% | 0% |
| ODP | 13% | 0% |
| (ADP) for fossil resources | 19% | 0% |
| (ADP) for minerals and metals (non-fossil resources) | 30% | 0% |
| WDP | 30% | 0% |
| Primary energy resources--Non--renewable | 19% | 0% |
| Primary energy resources-renewable | 29% | 0% |

It can be seen that scenario A can significantly increase the environmental impact of GWP, EP, aquatic marine and POCP, and reduce the other environmental impact.

See detail in LCA report.

**Allocation rules**

For data sets in this study, the allocation of the material flow and energy flow is generally carried out via the amount.

**Cut-off rules**

The default cut-off criteria shall be set to 1% in accordance with the GENERAL PROGRAMME INSTRUCTIONS FOR THE INTERNATIONAL EPD® SYSTEM （version 4.0）A3.3. However, the big

environmental impact material shall not be allowed to be cut-off, such as a hazardous waste or precious metals. Capital goods and personnel activities shall be ignored

The total of neglected input flows per module, e.g. per module A1-A3, A4-A5, B2, B6-7, C1-C4 and module D is maximum 5% of energy usage and mass.

**Data quality**

The data quality assessment is divided by upstream (A1 & A2), core (A3) and downstream (A4-D).

The data quality assessment is based on the criteria of the UN Environment Global Guidance on LCA database development.

*Table8. Data quality assessment*

| Data Quality | Data Quality Assessment |
|---|---|
| Time related coverage | Upstream: Good as all used datasets are currently valid, and the collected quantities are from 2020-2022.<br>Core: Good as all used datasets are currently valid, and the collected quantities are from 2020-2022.<br>Downstream: Good as all used datasets are currently valid, and the collected quantities are from 2020-2022. |
| Geographical coverage | Upstream: Good, datasets are from global average or European region<br>Core: Good, quantities are from the area under study, datasets are from global average or European region, electricity mix data is taken where the process takes place based on grid mixes of China.<br>Downstream: Good, datasets are from global average or European region |
| Technology coverage | Upstream: Good, all datasets are taken from the latest ecoinvent version (3.8). Datasets have been chosen to closely relate to the actual conditions.<br>Core: Good, all datasets are taken from the latest ecoinvent version (3.8). Datasets have been chosen to closely relate to the actual conditions.<br>Downstream: Good, all datasets are taken from the latest ecoinvent version (3.8). Datasets have been chosen to closely relate to the actual conditions. |
| Other Data Quality | |
| Precision | The variance is shown in the uncertainty analysis. The variance is calculated using the SimaPro pedigree matrix and lognormal uncertainty distribution analysis function. |
| Completeness | All known flows are accounted for. |
| Representativeness | The data has been chosen to specifically reflect the true conditions; it is not within the scope of the project to verify the upstream value chain, but the chosen datasets should reflect this as accurately as possible within the scope of the project. |
| Consistency | The same methodology has been uniformly used |
| Reproducibility | The LCA is reproducible with all data reported in this report. No other data was used then what is reported in this document. |
| Data sources | Data collection method is described in the LCI chapter, and all datasets are referenced. |
| Data uncertainty | Uncertainty has been assessed through a sensitivity analysis for the most relevant assumptions and an uncertainty analysis for the variance of the datasets. |

*Table9.Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results)*

| | Product stage | | | Construction process stage | | Use stage | | | | | | | End of life stage | | | | Resource recovery stage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Raw material supply | Transport | Manufacturing | Transport | Construction installation | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction 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 | ND | X | ND | ND | ND | X | X | X | X | X | X | X |
| Geography | GLO | GLO | CN | GLO | GLO | ND | EU | ND | ND | ND | EU | EU | GLO | GLO | EU | EU | GLO |
| Specific data used | 0% | 0% | >99% | 0% | 0% | ND | 0% | ND | ND | ND | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Variation – products | 0% | | | | | | | | | | | | | | | | |
| Variation –sites | 0% | | | | | | | | | | | | | | | | |

Note：

X--- module included

ND--- Module not declared

Module B1 & B3-B5 are marked as ND as they do not contain any activities.

**Energy production during RSL in B6 module**

Formula in PCR Part B：

Energy production in the first year of operation:

$$E1 = Srad * A * y * PR * (1- deg) \text{----------} (1)$$

E1--- Energy produced in the first year of operation, kWh/year

Srad--- Site specific annual average solar radiation on module (shadings not included), kWh/kWp/year.

A--- Area of module, from functional unit (FU), m2

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

PR--- Performance ratio, coefficient for losses.

deg--- yearly degradation rate

Energy production second year of operation:

$$E2 = E1 * (1 - deg) \text{----------} (2)$$

Energy production n year of operation:

$$En = E1 * (1 - deg)^{n-1} \text{----------} (3)$$

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

$$E_{RSL} = E_1 * \left(1 + \sum_{n=1}^{RSL-1}(1 - deg)^n\right) \quad \text{----------} \quad (4)$$

Simulation calculation according to the below actual power station

*Table 10. Power station information*

| | | | |
|---|---|---|---|
| Location： | Albacete-Spain | angle： | 35° |
| Latitude： | 38.75839°N | Azimuth： | 0° south |
| Longitude： | -3.119985°W | system loss（PVGIS default） | 14% |
| Annual solar radiation（kwh/m2） | 2.1E+03 | data from PVGIS-5 geo-temporal irradiation database | |

*Table 11. Total energy production in RSL*

| Serious (brand name) | Maximum power output range（W） | E1/kwh | deg-first year | deg-after first year | $E_{RSL}$/kwh |
|---|---|---|---|---|---|
| LR5-54HIH | 420 | 1.8E+03 | 2.00% | 0.55% | 4.2E+04 |
| LR5-54HPB | 420 | 1.8E+03 | 2.00% | 0.55% | 4.2E+04 |
| LR5-54HPH | 425 | 1.8E+03 | 2.00% | 0.55% | 4.2E+04 |
| LR5-54HTB | 440 | 1.8E+03 | 1.50% | 0.40% | 4.3E+04 |
| LR5-54HTH | 450 | 1.8E+03 | 1.50% | 0.40% | 4.3E+04 |
| LR5-66HIH | 510 | 1.8E+03 | 2.00% | 0.55% | 4.2E+04 |
| LR5-66HPH | 515 | 1.8E+03 | 2.00% | 0.55% | 4.2E+04 |

## Content Declaration (including packaging)

Amounts are presented per Wp, for amounts per m2, multiply by transfer factor listed in table3.

*Table12. Content information--- LR5-66HPH*

| Product components | Weight, kg/Wp | Post-consumer material, weight-% | Biogenic material, kg/Wp |
|---|---|---|---|
| glass | 3.7E-02 | - | - |
| Frame | 5.1E-03 | - | - |
| Ribbon Interconnection | 5.2E-04 | - | - |
| Junction Box | 4.7E-04 | - | - |
| backsheet | 2.1E-03 | - | - |
| cells | 1.6E-03 | - | - |
| EVA | 4.2E-03 | - | - |
| POE. | 0.0E+00 | - | - |
| Junction Box - Silicone join | 8.8E-05 | - | - |
| Assembly - Silicone glue | 6.1E-04 | - | - |
| Insulating strip | 2.9E-06 | - | - |
| Soldering Flux | 1.0E-04 | - | - |
| Total | 5.5E-02 | - | - |
| Packaging materials | Weight, kg/Wp | Weight-% (versus the product) | Biogenic material, kg/Wp |
| pallet | 1.4E-03 | 2.82% | 5.7E-04 |
| Paperboard corner | 1.6E-05 | 0.03% | 7.1E-06 |
| Paperboard Carton | 6.3E-04 | 1.24% | 2.9E-04 |
| Box cover | 7.5E-05 | 0.15% | 3.5E-05 |
| paper floor | 1.3E-04 | 0.25% | 5.8E-05 |
| Strips | 1.0E-04 | 0.20% | - |
| PET film | 0.0E+00 | 0.00% | - |
| lable | 3.9E-06 | 0.01% | 1.8E-06 |
| A4 paper | 6.3E-08 | 0.00% | 2.9E-08 |
| Wrap film | 7.0E-05 | 0.14% | - |
| Total | 2.4E-03 | 4.84% | 9.6E-04 |
| Dangerous substances from the candidate list of SVHC for Authorization | EC No. | CAS No. | Weight-% per functional or declared unit |
| No SVHC in product | | | |

*Table13. Content information--- LR5-66HIH*

| Product components | Weight, kg/Wp | Post-consumer material, weight-% | Biogenic material, kg/Wp |
|---|---|---|---|
| glass | 3.8E-02 | - | - |
| Frame | 5.4E-03 | - | - |
| Ribbon Interconnection | 4.3E-04 | - | - |
| Junction Box | 5.9E-04 | - | - |
| backsheet | 2.0E-03 | - | - |
| cells | 1.4E-03 | - | - |
| EVA | 4.6E-03 | - | - |
| POE. | 0.0E+00 | - | - |
| Junction Box - Silicone join | 5.9E-05 | - | - |
| Assembly - Silicone glue | 5.9E-04 | - | - |
| Insulating strip | 7.8E-05 | - | - |
| Soldering Flux | 7.8E-05 | - | - |
| Total | 5.4E-02 | - | - |
| Packaging materials | Weight, kg/Wp | Weight-% (versus the product) | Biogenic material, kg/Wp |
| pallet | 1.4E-03 | 2.82% | 5.7E-04 |
| Paperboard corner | 1.6E-05 | 0.03% | 7.2E-06 |
| Paperboard Carton | 6.3E-04 | 1.24% | 2.9E-04 |
| Box cover | 7.6E-05 | 0.15% | 3.5E-05 |
| paper floor | 1.3E-04 | 0.25% | 5.8E-05 |
| Strips | 1.0E-04 | 0.20% | - |
| PET film | 0.0E+00 | 0.00% | - |
| lable | 3.9E-06 | 0.01% | 1.8E-06 |
| A4 paper | 6.3E-08 | 0.00% | 2.9E-08 |
| Wrap film | 7.1E-05 | 0.14% | - |
| Total | 2.5E-03 | 4.84% | 9.7E-04 |
| Dangerous substances from the candidate list of | EC No. | CAS No. | Weight-% per functional or declared unit |

| SVHC for Authorization | | | |
|---|---|---|---|
| No SVHC in product | | | |

*Table14. Content information--- LR5-54HTH*

| Product components | Weight, kg/Wp | Post-consumer material, weight-% | Biogenic material, kg/Wp |
|---|---|---|---|
| glass | 3.3E-02 | - | - |
| Frame | 4.6E-03 | - | - |
| Ribbon Interconnection | 5.0E-04 | - | - |
| Junction Box | 4.0E-04 | - | - |
| backsheet | 2.3E-03 | - | - |
| cells | 1.4E-03 | - | - |
| EVA | 5.1E-03 | - | - |
| POE. | 0.0E+00 | - | - |
| Junction Box - Silicone join | 8.2E-05 | - | - |
| Assembly - Silicone glue | 6.5E-04 | - | - |
| Insulating strip | 0.0E+00 | - | - |
| Soldering Flux | 6.6E-05 | - | - |
| Total | 5.4E-02 | - | - |
| **Packaging materials** | **Weight, kg/Wp** | **Weight-% (versus the product)** | **Biogenic material, kg/Wp** |
| pallet | 1.4E-03 | 3.03% | 5.6E-04 |
| Paperboard corner | 1.8E-05 | 0.04% | 8.2E-06 |
| Paperboard Carton | 7.2E-04 | 1.55% | 3.3E-04 |
| Box cover | 8.6E-05 | 0.19% | 4.0E-05 |
| paper floor | 1.4E-04 | 0.31% | 6.6E-05 |
| Strips | 1.2E-04 | 0.25% | |
| PET film | 0.0E+00 | 0.00% | |
| lable | 4.4E-06 | 0.01% | 2.0E-06 |
| A4 paper | 7.2E-08 | 0.00% | 3.3E-08 |
| Wrap film | 8.0E-05 | 0.17% | |
| Total | 2.6E-03 | 5.55% | 1.0E-03 |

| Dangerous substances from the candidate list of SVHC for Authorization | EC No. | CAS No. | Weight-% per functional or declared unit |
|---|---|---|---|
| No SVHC in product | | | |

*Table15. Content information--- LR5-54HTB*

| Product components | Weight, kg/Wp | Post-consumer material, weight-% | Biogenic material, kg/Wp |
|---|---|---|---|
| glass | 3.4E-02 | - | - |
| Frame | 4.7E-03 | - | - |
| Ribbon Interconnection | 5.1E-04 | - | - |
| Junction Box | 4.1E-04 | - | - |
| backsheet | 2.4E-03 | - | - |
| cells | 1.5E-03 | - | - |
| EVA | 5.2E-03 | - | - |
| POE. | 0.0E+00 | - | - |
| Junction Box - Silicone join | 8.3E-05 | - | - |
| Assembly - Silicone glue | 6.7E-04 | - | - |
| Insulating strip | 0.0E+00 | - | - |
| Soldering Flux | 6.8E-05 | - | - |
| Total | 4.9E-02 | - | - |
| Packaging materials | Weight, kg/Wp | Weight-% (versus the product) | Biogenic material, kg/Wp |
| pallet | 1.4E-03 | 3.03% | 5.7E-04 |
| Paperboard corner | 1.8E-05 | 0.04% | 8.4E-06 |
| Paperboard Carton | 7.3E-04 | 1.55% | 3.4E-04 |
| Box cover | 8.8E-05 | 0.19% | 4.0E-05 |
| paper floor | 1.5E-04 | 0.31% | 6.7E-05 |
| Strips | 1.2E-04 | 0.25% | - |
| PET film | 0.0E+00 | 0.00% | - |
| lable | 4.5E-06 | 0.01% | 2.1E-06 |
| A4 paper | 7.3E-08 | 0.00% | 3.4E-08 |

| | | | |
|---|---|---|---|
| Wrap film | 8.2E-05 | 0.17% | - |
| Total | 2.6E-03 | 5.55% | 1.0E-03 |
| Dangerous substances from the candidate list of SVHC for Authorization | EC No. | CAS No. | Weight-% per functional or declared unit |
| No SVHC in product | | | |

*Table16. Content information--- LR5-54HPH*

| Product components | Weight, kg/Wp | Post-consumer material, weight-% | Biogenic material, kg/Wp |
|---|---|---|---|
| glass | 3.5E-02 | - | - |
| Frame | 4.9E-03 | - | - |
| Ribbon Interconnection | 5.3E-04 | - | - |
| Junction Box | 4.2E-04 | - | - |
| backsheet | 2.4E-03 | - | - |
| cells | 1.5E-03 | - | - |
| EVA | 5.4E-03 | - | - |
| POE. | 0.0E+00 | - | - |
| Junction Box - Silicone join | 8.6E-05 | - | - |
| Assembly - Silicone glue | 6.9E-04 | - | - |
| Insulating strip | 0.0E+00 | - | - |
| Soldering Flux | 7.0E-05 | - | - |
| Total | 5.1E-02 | - | - |
| Packaging materials | Weight, kg/Wp | Weight-% (versus the product) | Biogenic material, kg/Wp |
| pallet | 1.5E-03 | 3.03% | 5.9E-04 |
| Paperboard corner | 1.9E-05 | 0.04% | 8.7E-06 |
| Paperboard Carton | 7.6E-04 | 1.55% | 3.5E-04 |
| Box cover | 9.1E-05 | 0.19% | 4.2E-05 |
| paper floor | 1.5E-04 | 0.31% | 7.0E-05 |
| Strips | 1.2E-04 | 0.25% | - |
| PET film | 0.0E+00 | 0.00% | - |

| | | | |
|---|---|---|---|
| lable | 4.7E-06 | 0.01% | 2.2E-06 |
| A4 paper | 7.6E-08 | 0.00% | 3.5E-08 |
| Wrap film | 8.5E-05 | 0.17% | - |
| Total | 2.7E-03 | 5.55% | 1.1E-03 |
| Dangerous substances from the candidate list of SVHC for Authorization | EC No. | CAS No. | Weight-% per functional or declared unit |
| No SVHC in product | | | |

*Table17. Content information--- LR5-54HPB*

| Product components | Weight, kg/Wp | Post-consumer material, weight-% | Biogenic material, kg/Wp |
|---|---|---|---|
| glass | 3.5E-02 | - | - |
| Frame | 4.9E-03 | - | - |
| Ribbon Interconnection | 5.4E-04 | - | - |
| Junction Box | 4.3E-04 | - | - |
| backsheet | 2.5E-03 | - | - |
| cells | 1.5E-03 | - | - |
| EVA | 5.5E-03 | - | - |
| POE. | 0.0E+00 | - | - |
| Junction Box - Silicone join | 8.7E-05 | - | - |
| Assembly - Silicone glue | 7.0E-04 | - | - |
| Insulating strip | 0.0E+00 | - | - |
| Soldering Flux | 7.1E-05 | - | - |
| Total | 5.2E-02 | - | - |
| Packaging materials | Weight, kg/Wp | Weight-% (versus the product) | Biogenic material, kg/Wp |
| pallet | 1.5E-03 | 3.03% | 6.0E-04 |
| Paperboard corner | 1.9E-05 | 0.04% | 8.8E-06 |
| Paperboard Carton | 7.6E-04 | 1.55% | 3.5E-04 |
| Box cover | 9.1E-05 | 0.19% | 4.2E-05 |
| paper floor | 1.5E-04 | 0.31% | 7.1E-05 |

| | | | |
|---|---|---|---|
| Strips | 1.2E-04 | 0.25% | - |
| PET film | 0.0E+00 | 0.00% | - |
| lable | 4.7E-06 | 0.01% | 2.2E-06 |
| A4 paper | 7.6E-08 | 0.00% | 3.5E-08 |
| Wrap film | 8.5E-05 | 0.17% | - |
| Total | 2.8E-03 | 5.55% | 1.1E-03 |
| Dangerous substances from the candidate list of SVHC for Authorization | EC No. | CAS No. | Weight-% per functional or declared unit |
| No SVHC in product | | | |

*Table18. Content information--- LR5-54HIH*

| Product components | Weight, kg/Wp | Post-consumer material, weight-% | Biogenic material, kg/Wp |
|---|---|---|---|
| glass | 3.5E-02 | - | - |
| Frame | 4.9E-03 | - | - |
| Ribbon Interconnection | 5.4E-04 | - | - |
| Junction Box | 4.3E-04 | - | - |
| backsheet | 2.5E-03 | - | - |
| cells | 1.5E-03 | - | - |
| EVA | 5.5E-03 | - | - |
| POE. | 0.0E+00 | - | - |
| Junction Box - Silicone join | 8.7E-05 | - | - |
| Assembly - Silicone glue | 7.0E-04 | - | - |
| Insulating strip | 0.0E+00 | - | - |
| Soldering Flux | 7.1E-05 | - | - |
| Total | 5.2E-02 | - | - |
| Packaging materials | Weight, kg/Wp | Weight-% (versus the product) | Biogenic material, kg/Wp |
| pallet | 1.5E-03 | 3.03% | 6.0E-04 |
| Paperboard corner | 1.9E-05 | 0.04% | 8.8E-06 |
| Paperboard Carton | 7.7E-04 | 1.55% | 3.5E-04 |

| | | | |
|---|---|---|---|
| Box cover | 9.2E-05 | 0.19% | 4.2E-05 |
| paper floor | 1.5E-04 | 0.31% | 7.1E-05 |
| Strips | 1.3E-04 | 0.25% | - |
| PET film | 0.0E+00 | 0.00% | - |
| lable | 4.8E-06 | 0.01% | 2.2E-06 |
| A4 paper | 7.7E-08 | 0.00% | 3.5E-08 |
| Wrap film | 8.6E-05 | 0.17% | - |
| Total | 2.8E-03 | 5.55% | 1.1E-03 |
| Dangerous substances from the candidate list of SVHC for Authorization | EC No. | CAS No. | Weight-% per functional or declared unit |
| No SVHC in product | | | |

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

***Impact category Indicator***

*Climate change*：*Global warming potential (GWP) including GWP-fossil, GWP-biogenic, GWP-land use and land use change (luluc), and GWP-total*

*Acidification*：*Acidification potential (AP)*

*Eutrophication*：*Eutrophication potential (EP), aquatic freshwater*

*Eutrophication*： *Eutrophication potential (EP), aquatic marine*

*Eutrophication*： *Eutrophication potential (EP), terrestrial*

*Photochemical pollution*： *Photochemical ozone creation potential (POCP)*

*Ozone depletion*： *Ozone depletion potential (ODP)*

*Resource depletion*： *Abiotic depletion potential for minerals and metals (non-fossil resources) (ADP-fossil)*

*Resource depletion*： *Abiotic depletion potential for fossil resources (ADP-mineral & metals)*
*Water deprivation Water deprivation potential (WDP)*

## Environmental Performance

The LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks. All results are presented per Wp.

**Potential environmental impact – mandatory indicators according to EN 15804**

Acronyms

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.

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment.

EP-terrestrial = Eutrophication potential, Accumulated Exceedance.

POCP = Formation potential of tropospheric ozone.

ADP-minerals&metals = Abiotic depletion potential for non-fossil resources.

ADP-fossil = Abiotic depletion for fossil resources potential.

WDP = Water (user) deprivation potential, deprivation-weighted water consumption.

*Table 19. Life Cycle Impact Assessment Results--LR5-66HPH*

| Results per functional unit | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B | C1 | C2 | C3 | C4 | D |
| GWP-fossil | kg CO2 eq | 4.4E-01 | 1.7E-03 | 3.6E-02 | 4.8E-01 | 2.5E-02 | 1.7E-02 | 2.2E-01 | 0.0E+00 | 4.0E-04 | 5.8E-03 | 5.7E-04 | -1.1E-01 |
| GWP-biogenic | kg CO2 eq | 4.2E-03 | 4.7E-06 | 2.6E-03 | 6.8E-03 | 4.6E-05 | 1.1E-03 | 1.0E-03 | 0.0E+00 | 1.1E-06 | 5.4E-03 | 5.9E-03 | -1.6E-03 |
| GWP-land use | kg CO2 eq | 9.8E-04 | 1.2E-05 | 4.6E-06 | 1.0E-03 | 1.3E-04 | 2.2E-05 | 4.4E-04 | 0.0E+00 | 2.8E-06 | 8.7E-07 | 1.6E-07 | -1.8E-04 |
| GWP-total | kg CO2 eq | 4.5E-01 | 1.8E-03 | 3.8E-02 | 4.9E-01 | 2.6E-02 | 1.9E-02 | 2.3E-01 | 0.0E+00 | 4.1E-04 | 1.1E-02 | 6.5E-03 | -1.1E-01 |
| ODP | kg CFC 11 eq. | 1.1E-07 | 3.7E-10 | 2.4E-10 | 1.1E-07 | 5.3E-09 | 8.1E-10 | 2.5E-08 | 0.0E+00 | 8.5E-11 | 3.8E-11 | 2.0E-11 | -6.8E-09 |
| POCP | kg NMVOC eq. | 2.2E-03 | 1.1E-05 | 1.1E-04 | 2.3E-03 | 2.9E-04 | 1.6E-04 | 8.9E-04 | 0.0E+00 | 2.5E-06 | 1.4E-05 | 2.7E-06 | -2.9E-04 |
| AP | mol H+ eq. | 2.8E-03 | 9.6E-06 | 1.9E-04 | 3.0E-03 | 3.6E-04 | 8.0E-04 | 1.5E-03 | 0.0E+00 | 2.2E-06 | 5.4E-06 | 1.2E-06 | -5.2E-04 |
| EP, aquatic freshwater | kg P eq. | 2.2E-04 | 1.4E-07 | 6.7E-06 | 2.3E-04 | 1.7E-06 | 6.2E-05 | 1.1E-04 | 0.0E+00 | 3.3E-08 | 2.6E-07 | 1.7E-06 | -5.0E-05 |
| EP, aquatic marine | kg N eq. | 5.7E-04 | 3.4E-06 | 4.1E-05 | 6.1E-04 | 9.8E-05 | 4.2E-05 | 2.6E-04 | 0.0E+00 | 7.9E-07 | 7.2E-06 | 4.6E-06 | -1.0E-04 |
| EP,terrestrial | mol N eq. | 5.1E-03 | 3.7E-05 | 4.3E-04 | 5.6E-03 | 1.1E-03 | 5.7E-04 | 2.7E-03 | 0.0E+00 | 8.5E-06 | 3.0E-05 | 3.7E-06 | -1.0E-03 |
| WDP | m3 world eq. | 8.9E-01 | 1.0E-04 | 5.1E-03 | 8.9E-01 | 1.2E-03 | 1.7E-02 | 2.1E-01 | 0.0E+00 | 2.4E-05 | 2.7E-04 | 3.3E-05 | -2.5E-01 |
| Abiotic depletion potential (ADP) for fossil resources | MJ | 6.0E+00 | 2.6E-02 | 3.1E-01 | 6.4E+00 | 3.6E-01 | 2.3E-01 | 2.7E+00 | 0.0E+00 | 6.0E-03 | 2.9E-03 | 1.9E-03 | -1.4E+00 |
| Abiotic depletion potential (ADP) for minerals and metals (non-fossil resources) | kg Sb eq. | 3.7E-05 | 5.9E-09 | 1.1E-07 | 3.7E-05 | 7.0E-08 | 1.9E-05 | 1.3E-05 | 0.0E+00 | 1.4E-09 | -1.5E-09 | 7.7E-10 | -2.2E-07 |

*Table 20. Life Cycle Impact Assessment Results--LR5-66HIH*

| Results per functional unit | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B | C1 | C2 | C3 | C4 | D |
| GWP-fossil | kg CO2 eq | 4.6E-01 | 2.0E-03 | 3.3E-02 | 4.9E-01 | 2.6E-02 | 1.7E-02 | 9.6E-02 | 0.0E+00 | 4.0E-04 | 6.2E-03 | 5.8E-04 | -9.6E-02 |
| GWP-biogenic | kg CO2 eq | 4.4E-03 | 5.4E-06 | 2.6E-03 | 7.0E-03 | 4.6E-05 | 1.1E-03 | 4.4E-04 | 0.0E+00 | 1.1E-06 | 6.2E-03 | 5.9E-03 | -1.4E-03 |
| GWP-land use | kg CO2 eq | 1.0E-03 | 1.4E-05 | 4.2E-06 | 1.0E-03 | 1.3E-04 | 2.2E-05 | 1.9E-04 | 0.0E+00 | 2.8E-06 | 9.3E-07 | 1.7E-07 | -1.5E-04 |
| GWP-total | kg CO2 eq | 4.6E-01 | 2.0E-03 | 3.5E-02 | 5.0E-01 | 2.6E-02 | 1.9E-02 | 9.7E-02 | 0.0E+00 | 4.1E-04 | 1.2E-02 | 6.5E-03 | -9.8E-02 |
| ODP | kg CFC 11 eq. | 1.1E-07 | 4.3E-10 | 2.2E-10 | 1.1E-07 | 5.3E-09 | 8.1E-10 | 1.1E-08 | 0.0E+00 | 8.5E-11 | 4.3E-11 | 2.0E-11 | -5.9E-09 |
| POCP | kg NMVOC eq. | 2.2E-03 | 1.2E-05 | 1.0E-04 | 2.3E-03 | 2.9E-04 | 1.6E-04 | 3.8E-04 | 0.0E+00 | 2.5E-06 | 1.4E-05 | 2.7E-06 | -2.5E-04 |
| AP | mol H+ eq. | 2.8E-03 | 1.1E-05 | 1.7E-04 | 3.0E-03 | 3.6E-04 | 8.0E-04 | 6.4E-04 | 0.0E+00 | 2.2E-06 | 5.7E-06 | 1.2E-06 | -4.5E-04 |
| EP, aquatic freshwater | kg P eq. | 2.3E-04 | 1.7E-07 | 6.1E-06 | 2.3E-04 | 1.7E-06 | 6.2E-05 | 4.8E-05 | 0.0E+00 | 3.3E-08 | 2.9E-07 | 1.8E-06 | -4.3E-05 |
| EP, aquatic marine | kg N eq. | 5.8E-04 | 4.0E-06 | 3.7E-05 | 6.2E-04 | 9.9E-05 | 4.2E-05 | 1.1E-04 | 0.0E+00 | 7.9E-07 | 7.2E-06 | 4.6E-06 | -8.9E-05 |
| EP,terrestrial | mol N eq. | 5.2E-03 | 4.3E-05 | 3.9E-04 | 5.7E-03 | 1.1E-03 | 5.7E-04 | 1.1E-03 | 0.0E+00 | 8.5E-06 | 3.1E-05 | 3.8E-06 | -8.8E-04 |
| WDP | m3 world eq. | 9.1E-01 | 1.2E-04 | 4.7E-03 | 9.2E-01 | 1.2E-03 | 1.7E-02 | 8.9E-02 | 0.0E+00 | 2.4E-05 | 3.1E-04 | 3.4E-05 | -2.1E-01 |
| Abiotic depletion potential (ADP) for fossil resources | MJ | 6.2E+00 | 3.0E-02 | 2.8E-01 | 6.5E+00 | 3.7E-01 | 2.3E-01 | 1.2E+00 | 0.0E+00 | 6.0E-03 | 3.3E-03 | 1.9E-03 | -1.2E+00 |
| Abiotic depletion potential (ADP) for minerals and metals (non-fossil resources) | kg Sb eq. | 3.6E-05 | 6.9E-09 | 9.7E-08 | 3.6E-05 | 7.0E-08 | 1.9E-05 | 5.4E-06 | 0.0E+00 | 1.4E-09 | -1.6E-09 | 8.0E-10 | -1.9E-07 |

*Table 21. Life Cycle Impact Assessment Results -LR5-54HTH*

| Results per functional unit | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B | C1 | C2 | C3 | C4 | D |
| GWP-fossil | kg CO2 eq | 4.7E-01 | 4.2E-03 | 2.9E-02 | 5.1E-01 | 2.3E-02 | 1.7E-02 | 1.1E-01 | 0.0E+00 | 2.7E-04 | 6.2E-03 | 5.5E-04 | -9.6E-02 |
| GWP-biogenic | kg CO2 eq | 5.1E-03 | 1.1E-05 | 2.9E-03 | 8.0E-03 | 4.3E-05 | 1.2E-03 | 5.0E-04 | 0.0E+00 | 7.3E-07 | 6.1E-03 | 5.4E-03 | -1.2E-03 |
| GWP-land use | kg CO2 eq | 1.0E-03 | 2.9E-05 | 3.8E-06 | 1.1E-03 | 1.2E-04 | 2.2E-05 | 2.2E-04 | 0.0E+00 | 1.9E-06 | 7.8E-07 | 1.7E-07 | -1.5E-04 |
| GWP-total | kg CO2 eq | 4.8E-01 | 4.2E-03 | 3.2E-02 | 5.2E-01 | 2.4E-02 | 1.9E-02 | 1.1E-01 | 0.0E+00 | 2.7E-04 | 1.2E-02 | 5.9E-03 | -9.7E-02 |
| ODP | kg CFC 11 eq. | 1.2E-07 | 8.8E-10 | 2.1E-10 | 1.2E-07 | 4.9E-09 | 8.1E-10 | 1.2E-08 | 0.0E+00 | 5.7E-11 | 4.0E-11 | 2.0E-11 | -5.9E-09 |
| POCP | kg NMVOC eq. | 2.3E-03 | 2.5E-05 | 9.4E-05 | 2.5E-03 | 2.7E-04 | 1.6E-04 | 4.3E-04 | 0.0E+00 | 1.6E-06 | 1.3E-05 | 2.6E-06 | -2.5E-04 |
| AP | mol H+ eq. | 2.9E-03 | 2.3E-05 | 1.5E-04 | 3.1E-03 | 3.3E-04 | 8.0E-04 | 7.2E-04 | 0.0E+00 | 1.5E-06 | 5.5E-06 | 1.2E-06 | -4.5E-04 |
| EP, aquatic freshwater | kg P eq. | 2.4E-04 | 3.4E-07 | 5.5E-06 | 2.5E-04 | 1.6E-06 | 6.2E-05 | 5.5E-05 | 0.0E+00 | 2.2E-08 | 3.0E-07 | 1.8E-06 | -4.3E-05 |
| EP, aquatic marine | kg N eq. | 6.1E-04 | 8.2E-06 | 3.4E-05 | 6.5E-04 | 9.0E-05 | 4.2E-05 | 1.3E-04 | 0.0E+00 | 5.3E-07 | 7.1E-06 | 4.2E-06 | -8.9E-05 |
| EP,terrestrial | mol N eq. | 5.3E-03 | 8.8E-05 | 3.5E-04 | 5.8E-03 | 9.9E-04 | 5.7E-04 | 1.3E-03 | 0.0E+00 | 5.7E-06 | 3.0E-05 | 3.7E-06 | -8.8E-04 |
| WDP | m3 world eq. | 1.0E+00 | 2.5E-04 | 4.6E-03 | 1.0E+00 | 1.1E-03 | 1.7E-02 | 1.0E-01 | 0.0E+00 | 1.6E-05 | 3.1E-04 | 3.4E-05 | -2.1E-01 |
| Abiotic depletion potential (ADP) for fossil resources | MJ | 6.6E+00 | 6.2E-02 | 2.6E-01 | 6.9E+00 | 3.4E-01 | 2.3E-01 | 1.3E+00 | 0.0E+00 | 4.0E-03 | 3.1E-03 | 1.9E-03 | -1.2E+00 |
| Abiotic depletion potential (ADP) for minerals and metals (non-fossil resources) | kg Sb eq. | 4.0E-05 | 1.4E-08 | 8.7E-08 | 4.0E-05 | 6.5E-08 | 1.9E-05 | 6.1E-06 | 0.0E+00 | 9.1E-10 | -1.2E-09 | 8.1E-10 | -1.9E-07 |

*Table 22. Life Cycle Impact Assessment Results -LR5-54HTB*

| Results per functional unit | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B | C1 | C2 | C3 | C4 | D |
| GWP-fossil | kg CO2 eq | 4.8E-01 | 4.3E-03 | 3.0E-02 | 5.2E-01 | 2.5E-02 | 1.7E-02 | 1.1E-01 | 0.0E+00 | 2.7E-04 | 5.8E-03 | 5.6E-04 | -1.0E-01 |
| GWP-biogenic | kg CO2 eq | 5.3E-03 | 1.2E-05 | 3.1E-03 | 8.4E-03 | 4.6E-05 | 1.2E-03 | 5.0E-04 | 0.0E+00 | 7.3E-07 | 6.2E-03 | 5.5E-03 | -1.4E-03 |
| GWP-land use | kg CO2 eq | 1.1E-03 | 3.0E-05 | 4.0E-06 | 1.1E-03 | 1.3E-04 | 2.2E-05 | 2.2E-04 | 0.0E+00 | 1.9E-06 | -7.3E-07 | 1.8E-07 | -1.7E-04 |
| GWP-total | kg CO2 eq | 4.9E-01 | 4.3E-03 | 3.3E-02 | 5.3E-01 | 2.5E-02 | 1.9E-02 | 1.1E-01 | 0.0E+00 | 2.7E-04 | 1.2E-02 | 6.1E-03 | -1.1E-01 |
| ODP | kg CFC 11 eq. | 1.3E-07 | 9.1E-10 | 2.1E-10 | 1.3E-07 | 5.2E-09 | 8.1E-10 | 1.2E-08 | 0.0E+00 | 5.7E-11 | 1.1E-10 | 2.0E-11 | -6.4E-09 |
| POCP | kg NMVOC eq. | 2.4E-03 | 2.6E-05 | 9.8E-05 | 2.5E-03 | 2.8E-04 | 1.6E-04 | 4.3E-04 | 0.0E+00 | 1.6E-06 | 8.6E-06 | 2.6E-06 | -2.7E-04 |
| AP | mol H+ eq. | 3.0E-03 | 2.4E-05 | 1.6E-04 | 3.1E-03 | 3.4E-04 | 8.0E-04 | 7.2E-04 | 0.0E+00 | 1.5E-06 | 5.9E-06 | 1.2E-06 | -4.8E-04 |
| EP, aquatic freshwater | kg P eq. | 2.5E-04 | 3.5E-07 | 5.7E-06 | 2.5E-04 | 1.7E-06 | 6.2E-05 | 5.5E-05 | 0.0E+00 | 2.2E-08 | 3.3E-07 | 1.8E-06 | -4.6E-05 |
| EP, aquatic marine | kg N eq. | 6.2E-04 | 8.4E-06 | 3.5E-05 | 6.6E-04 | 9.5E-05 | 4.2E-05 | 1.3E-04 | 0.0E+00 | 5.3E-07 | 7.9E-06 | 4.3E-06 | -9.6E-05 |
| EP,terrestrial | mol N eq. | 5.5E-03 | 9.1E-05 | 3.7E-04 | 5.9E-03 | 1.0E-03 | 5.7E-04 | 1.3E-03 | 0.0E+00 | 5.7E-06 | 2.8E-05 | 3.8E-06 | -9.5E-04 |
| WDP | m3 world eq. | 1.0E+00 | 2.5E-04 | 4.7E-03 | 1.0E+00 | 1.2E-03 | 1.7E-02 | 1.0E-01 | 0.0E+00 | 1.6E-05 | 4.2E-04 | 3.5E-05 | -2.3E-01 |
| Abiotic depletion potential (ADP) for fossil resources | MJ | 6.7E+00 | 6.4E-02 | 2.7E-01 | 7.1E+00 | 3.6E-01 | 2.3E-01 | 1.3E+00 | 0.0E+00 | 4.0E-03 | 8.4E-03 | 2.0E-03 | -1.3E+00 |
| Abiotic depletion potential (ADP) for minerals and metals (non-fossil resources) | kg Sb eq. | 4.1E-05 | 1.5E-08 | 9.1E-08 | 4.1E-05 | 7.0E-08 | 1.9E-05 | 6.1E-06 | 0.0E+00 | 9.1E-10 | -4.4E-10 | 8.3E-10 | -2.0E-07 |

*Table 23. Life Cycle Impact Assessment Results -LR5-54HPH*

| Results per functional unit | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B | C1 | C2 | C3 | C4 | D |
| GWP-fossil | kg CO2 eq | 5.1E-01 | 3.9E-03 | 3.1E-02 | 5.4E-01 | 2.5E-02 | 1.7E-02 | 1.2E-01 | 0.0E+00 | 2.7E-04 | 6.6E-03 | 5.8E-04 | -1.0E-01 |
| GWP-biogenic | kg CO2 eq | 5.6E-03 | 1.1E-05 | 3.1E-03 | 8.7E-03 | 4.6E-05 | 1.2E-03 | 5.3E-04 | 0.0E+00 | 7.3E-07 | 6.6E-03 | 5.6E-03 | -1.4E-03 |
| GWP-land use | kg CO2 eq | 1.1E-03 | 2.7E-05 | 4.1E-06 | 1.2E-03 | 1.3E-04 | 2.2E-05 | 2.3E-04 | 0.0E+00 | 1.9E-06 | 8.7E-07 | 1.8E-07 | -1.7E-04 |
| GWP-total | kg CO2 eq | 5.1E-01 | 3.9E-03 | 3.5E-02 | 5.5E-01 | 2.5E-02 | 1.9E-02 | 1.2E-01 | 0.0E+00 | 2.7E-04 | 1.3E-02 | 6.2E-03 | -1.1E-01 |
| ODP | kg CFC 11 eq. | 1.3E-07 | 8.2E-10 | 2.2E-10 | 1.3E-07 | 5.2E-09 | 8.1E-10 | 1.3E-08 | 0.0E+00 | 5.7E-11 | 4.4E-11 | 2.1E-11 | -6.4E-09 |
| POCP | kg NMVOC eq. | 2.5E-03 | 2.4E-05 | 1.0E-04 | 2.6E-03 | 2.9E-04 | 1.6E-04 | 4.6E-04 | 0.0E+00 | 1.6E-06 | 1.4E-05 | 2.7E-06 | -2.7E-04 |
| AP | mol H+ eq. | 3.1E-03 | 2.1E-05 | 1.7E-04 | 3.3E-03 | 3.5E-04 | 8.0E-04 | 7.6E-04 | 0.0E+00 | 1.5E-06 | 6.0E-06 | 1.3E-06 | -4.8E-04 |
| EP, aquatic freshwater | kg P eq. | 2.6E-04 | 3.2E-07 | 5.9E-06 | 2.7E-04 | 1.7E-06 | 6.2E-05 | 5.8E-05 | 0.0E+00 | 2.2E-08 | 3.2E-07 | 1.9E-06 | -4.6E-05 |
| EP, aquatic marine | kg N eq. | 6.5E-04 | 7.7E-06 | 3.6E-05 | 6.9E-04 | 9.7E-05 | 4.2E-05 | 1.3E-04 | 0.0E+00 | 5.3E-07 | 7.6E-06 | 4.4E-06 | -9.6E-05 |
| EP,terrestrial | mol N eq. | 5.7E-03 | 8.2E-05 | 3.8E-04 | 6.2E-03 | 1.1E-03 | 5.7E-04 | 1.4E-03 | 0.0E+00 | 5.7E-06 | 3.2E-05 | 4.0E-06 | -9.5E-04 |
| WDP | m3 world eq. | 1.1E+00 | 2.3E-04 | 4.9E-03 | 1.1E+00 | 1.2E-03 | 1.7E-02 | 1.1E-01 | 0.0E+00 | 1.6E-05 | 3.4E-04 | 3.7E-05 | -2.3E-01 |
| Abiotic depletion potential (ADP) for fossil resources | MJ | 7.0E+00 | 5.8E-02 | 2.8E-01 | 7.4E+00 | 3.6E-01 | 2.3E-01 | 1.4E+00 | 0.0E+00 | 4.0E-03 | 3.4E-03 | 2.0E-03 | -1.3E+00 |
| Abiotic depletion potential (ADP) for minerals and metals (non-fossil resources) | kg Sb eq. | 4.3E-05 | 1.3E-08 | 9.4E-08 | 4.3E-05 | 7.0E-08 | 1.9E-05 | 6.5E-06 | 0.0E+00 | 9.1E-10 | -1.3E-09 | 8.6E-10 | -2.0E-07 |

*Table 24. Life Cycle Impact Assessment Results -LR5-54HPB*

| Results per functional unit | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B | C1 | C2 | C3 | C4 | D |
| GWP-fossil | kg CO2 eq | 5.1E-01 | 4.4E-03 | 3.6E-02 | 5.5E-01 | 2.5E-02 | 1.7E-02 | 1.2E-01 | 0.0E+00 | 2.7E-04 | 6.7E-03 | 5.9E-04 | -1.0E-01 |
| GWP-biogenic | kg CO2 eq | 5.5E-03 | 1.2E-05 | 3.1E-03 | 8.7E-03 | 4.6E-05 | 1.3E-03 | 5.3E-04 | 0.0E+00 | 7.3E-07 | 6.7E-03 | 5.8E-03 | -1.4E-03 |
| GWP-land use | kg CO2 eq | 1.1E-03 | 3.1E-05 | 4.7E-06 | 1.2E-03 | 1.3E-04 | 2.2E-05 | 2.3E-04 | 0.0E+00 | 1.9E-06 | 8.7E-07 | 1.8E-07 | -1.7E-04 |
| GWP-total | kg CO2 eq | 5.1E-01 | 4.5E-03 | 3.9E-02 | 5.6E-01 | 2.5E-02 | 1.9E-02 | 1.2E-01 | 0.0E+00 | 2.7E-04 | 1.3E-02 | 6.4E-03 | -1.1E-01 |
| ODP | kg CFC 11 eq. | 1.3E-07 | 9.4E-10 | 2.5E-10 | 1.3E-07 | 5.3E-09 | 8.1E-10 | 1.3E-08 | 0.0E+00 | 5.7E-11 | 4.4E-11 | 2.1E-11 | -6.4E-09 |
| POCP | kg NMVOC eq. | 2.5E-03 | 2.7E-05 | 1.2E-04 | 2.7E-03 | 2.9E-04 | 1.6E-04 | 4.6E-04 | 0.0E+00 | 1.6E-06 | 1.4E-05 | 2.8E-06 | -2.7E-04 |
| AP | mol H+ eq. | 3.1E-03 | 2.4E-05 | 1.9E-04 | 3.3E-03 | 3.5E-04 | 8.0E-04 | 7.6E-04 | 0.0E+00 | 1.5E-06 | 6.0E-06 | 1.3E-06 | -4.8E-04 |
| EP, aquatic freshwater | kg P eq. | 2.6E-04 | 3.7E-07 | 6.7E-06 | 2.7E-04 | 1.7E-06 | 6.2E-05 | 5.8E-05 | 0.0E+00 | 2.2E-08 | 3.2E-07 | 1.9E-06 | -4.7E-05 |
| EP, aquatic marine | kg N eq. | 6.5E-04 | 8.7E-06 | 4.1E-05 | 7.0E-04 | 9.8E-05 | 4.2E-05 | 1.3E-04 | 0.0E+00 | 5.3E-07 | 7.6E-06 | 4.5E-06 | -9.6E-05 |
| EP,terrestrial | mol N eq. | 5.7E-03 | 9.4E-05 | 4.3E-04 | 6.3E-03 | 1.1E-03 | 5.7E-04 | 1.4E-03 | 0.0E+00 | 5.7E-06 | 3.2E-05 | 4.0E-06 | -9.6E-04 |
| WDP | m3 world eq. | 1.1E+00 | 2.6E-04 | 5.4E-03 | 1.1E+00 | 1.2E-03 | 1.7E-02 | 1.1E-01 | 0.0E+00 | 1.6E-05 | 3.4E-04 | 3.7E-05 | -2.3E-01 |
| Abiotic depletion potential (ADP) for fossil resources | MJ | 7.1E+00 | 6.6E-02 | 3.1E-01 | 7.4E+00 | 3.6E-01 | 2.3E-01 | 1.4E+00 | 0.0E+00 | 4.0E-03 | 3.4E-03 | 2.1E-03 | -1.3E+00 |
| Abiotic depletion potential (ADP) for minerals and metals (non-fossil resources) | kg Sb eq. | 4.3E-05 | 1.5E-08 | 1.1E-07 | 4.4E-05 | 7.0E-08 | 1.9E-05 | 6.5E-06 | 0.0E+00 | 9.1E-10 | -1.3E-09 | 8.7E-10 | -2.0E-07 |

*Table 25. Life Cycle Impact Assessment Results -LR5-54HIH*

| Results per functional unit | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B | C1 | C2 | C3 | C4 | D |
| GWP-fossil | kg CO2 eq | 5.1E-01 | 4.4E-03 | 3.6E-02 | 5.5E-01 | 2.5E-02 | 1.7E-02 | 1.2E-01 | 0.0E+00 | 2.7E-04 | 6.7E-03 | 5.9E-04 | -1.0E-01 |
| GWP-biogenic | kg CO2 eq | 5.5E-03 | 1.2E-05 | 3.1E-03 | 8.7E-03 | 4.6E-05 | 1.3E-03 | 5.3E-04 | 0.0E+00 | 7.3E-07 | 6.7E-03 | 5.8E-03 | -1.4E-03 |
| GWP-land use | kg CO2 eq | 1.1E-03 | 3.1E-05 | 4.7E-06 | 1.2E-03 | 1.3E-04 | 2.2E-05 | 2.3E-04 | 0.0E+00 | 1.9E-06 | 8.7E-07 | 1.8E-07 | -1.7E-04 |
| GWP-total | kg CO2 eq | 5.1E-01 | 4.5E-03 | 3.9E-02 | 5.6E-01 | 2.5E-02 | 1.9E-02 | 1.2E-01 | 0.0E+00 | 2.7E-04 | 1.3E-02 | 6.4E-03 | -1.1E-01 |
| ODP | kg CFC 11 eq. | 1.3E-07 | 9.4E-10 | 2.5E-10 | 1.3E-07 | 5.3E-09 | 8.1E-10 | 1.3E-08 | 0.0E+00 | 5.7E-11 | 4.4E-11 | 2.1E-11 | -6.4E-09 |
| POCP | kg NMVOC eq. | 2.5E-03 | 2.7E-05 | 1.2E-04 | 2.7E-03 | 2.9E-04 | 1.6E-04 | 4.6E-04 | 0.0E+00 | 1.6E-06 | 1.4E-05 | 2.8E-06 | -2.7E-04 |
| AP | mol H+ eq. | 3.1E-03 | 2.4E-05 | 1.9E-04 | 3.3E-03 | 3.5E-04 | 8.0E-04 | 7.6E-04 | 0.0E+00 | 1.5E-06 | 6.0E-06 | 1.3E-06 | -4.8E-04 |
| EP, aquatic freshwater | kg P eq. | 2.6E-04 | 3.7E-07 | 6.7E-06 | 2.7E-04 | 1.7E-06 | 6.2E-05 | 5.8E-05 | 0.0E+00 | 2.2E-08 | 3.2E-07 | 1.9E-06 | -4.7E-05 |
| EP, aquatic marine | kg N eq. | 6.5E-04 | 8.7E-06 | 4.1E-05 | 7.0E-04 | 9.8E-05 | 4.2E-05 | 1.3E-04 | 0.0E+00 | 5.3E-07 | 7.6E-06 | 4.5E-06 | -9.6E-05 |
| EP,terrestrial | mol N eq. | 5.7E-03 | 9.4E-05 | 4.3E-04 | 6.3E-03 | 1.1E-03 | 5.7E-04 | 1.4E-03 | 0.0E+00 | 5.7E-06 | 3.2E-05 | 4.0E-06 | -9.6E-04 |
| WDP | m3 world eq. | 1.1E+00 | 2.6E-04 | 5.4E-03 | 1.1E+00 | 1.2E-03 | 1.7E-02 | 1.1E-01 | 0.0E+00 | 1.6E-05 | 3.4E-04 | 3.7E-05 | -2.3E-01 |
| Abiotic depletion potential (ADP) for fossil resources | MJ | 7.1E+00 | 6.6E-02 | 3.1E-01 | 7.4E+00 | 3.6E-01 | 2.3E-01 | 1.4E+00 | 0.0E+00 | 4.0E-03 | 3.4E-03 | 2.1E-03 | -1.3E+00 |
| Abiotic depletion potential (ADP) for minerals and metals (non-fossil resources) | kg Sb eq. | 4.3E-05 | 1.5E-08 | 1.1E-07 | 4.4E-05 | 7.0E-08 | 1.9E-05 | 6.5E-06 | 0.0E+00 | 9.1E-10 | -1.3E-09 | 8.7E-10 | -2.0E-07 |

## Potential environmental impact – additional indicators-Resource Use

The resource consumption is demonstrated in tables below

*Table 26. Resource Use-LR5-66HPH*

| Results per functional unit | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | | Unit | A1 | A2 | A3 | **A1-A3** | A4 | A5 | B | C1 | C2 | C3 | C4 | D |
| Primary energy resources--Non--renewable | use as energy carrier | MJ | 6.5E+00 | 2.8E-02 | 3.3E-01 | 6.8E+00 | 3.8E-01 | 2.3E-01 | 2.6E+00 | 0.0E+00 | 6.3E-03 | 3.1E-03 | 1.9E-03 | -1.3E+00 |
| | use as raw material | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Total | MJ | 6.5E+00 | 2.8E-02 | 3.3E-01 | 6.8E+00 | 3.8E-01 | 2.3E-01 | 2.6E+00 | 0.0E+00 | 6.3E-03 | 3.1E-03 | 1.9E-03 | -1.3E+00 |
| Primary energy resources-renewable | use as energy carrier | MJ | 3.2E+00 | 4.5E-04 | 3.2E-02 | 3.3E+00 | 5.2E-03 | 3.5E-02 | 1.4E+01 | 0.0E+00 | 1.0E-04 | 1.9E-05 | 7.2E-05 | -5.0E-01 |
| | use as raw material | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Total | MJ | 3.2E+00 | 4.5E-04 | 3.2E-02 | 3.3E+00 | 5.2E-03 | 3.5E-02 | 1.4E+01 | 0.0E+00 | 1.0E-04 | 1.9E-05 | 7.2E-05 | -5.0E-01 |
| Secondary material | | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Renewable secondary fuels | | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Non-renewable secondary fuels | | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Net use of fresh water | | m3 | 0.0E+00 | 0.0E+00 | 3.3E-05 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 2.2E-08 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |

*Table 27. Resource Use - LR5-66HIH*

| Results per functional unit | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | | Unit | A1 | A2 | A3 | **A1-A3** | A4 | A5 | B | C1 | C2 | C3 | C4 | D |
| Primary energy resources--Non--renewable | use as energy carrier | MJ | 6.7E+00 | 3.2E-02 | 3.0E-01 | 7.0E+00 | 3.9E-01 | 2.4E-01 | 1.3E+00 | 0.0E+00 | 6.4E-03 | 3.5E-03 | 2.0E-03 | -1.3E+00 |
| | use as raw material | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Total | MJ | 6.7E+00 | 3.2E-02 | 3.0E-01 | 7.0E+00 | 3.9E-01 | 2.4E-01 | 1.3E+00 | 0.0E+00 | 6.4E-03 | 3.5E-03 | 2.0E-03 | -1.3E+00 |
| Primary energy resources-renewable | use as energy carrier | MJ | 3.3E+00 | 5.2E-04 | 2.9E-02 | 3.3E+00 | 5.2E-03 | 3.5E-02 | 6.0E+00 | 0.0E+00 | 1.0E-04 | 2.5E-05 | 7.5E-05 | -4.3E-01 |
| | use as raw material | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Total | MJ | 3.3E+00 | 5.2E-04 | 2.9E-02 | 3.3E+00 | 5.2E-03 | 3.5E-02 | 6.0E+00 | 0.0E+00 | 1.0E-04 | 2.5E-05 | 7.5E-05 | -4.3E-01 |
| Secondary material | | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Renewable secondary fuels | | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Non-renewable secondary fuels | | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Net use of fresh water | | m3 | 0.0E+00 | 0.0E+00 | 3.3E-05 | 3.3E-05 | 0.0E+00 | 0.0E+00 | 2.3E-08 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |

*Table 28. Resource Use - LR5-54HTH*

| Results per functional unit | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | | Unit | A1 | A2 | A3 | **A1-A3** | A4 | A5 | B | C1 | C2 | C3 | C4 | D |
| Primary energy resources--Non--renewable | use as energy carrier | MJ | 7.0E+00 | 6.7E-02 | 2.7E-01 | 7.4E+00 | 3.6E-01 | 2.4E-01 | 1.4E+00 | 0.0E+00 | 4.3E-03 | 3.3E-03 | 2.0E-03 | -1.3E+00 |
| | use as raw material | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Total | MJ | 7.0E+00 | 6.7E-02 | 2.7E-01 | 7.4E+00 | 3.6E-01 | 2.4E-01 | 1.4E+00 | 0.0E+00 | 4.3E-03 | 3.3E-03 | 2.0E-03 | -1.3E+00 |
| Primary energy resources-renewable | use as energy carrier | MJ | 3.6E+00 | 1.1E-03 | 2.6E-02 | 3.6E+00 | 4.8E-03 | 3.5E-02 | 6.8E+00 | 0.0E+00 | 6.9E-05 | 3.3E-05 | 7.5E-05 | -4.3E-01 |
| | use as raw material | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Total | MJ | 3.6E+00 | 1.1E-03 | 2.6E-02 | 3.6E+00 | 4.8E-03 | 3.5E-02 | 6.8E+00 | 0.0E+00 | 6.9E-05 | 3.3E-05 | 7.5E-05 | -4.3E-01 |
| Secondary material | | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Renewable secondary fuels | | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Non-renewable secondary fuels | | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Net use of fresh water | | m3 | 0.0E+00 | 0.0E+00 | 3.8E-05 | 3.8E-05 | 0.0E+00 | 0.0E+00 | 2.6E-08 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |

*Table 29. Resource Use - LR5-54HTB*

| Results per functional unit | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | | Unit | A1 | A2 | A3 | **A1-A3** | A4 | A5 | B | C1 | C2 | C3 | C4 | D |
| Primary energy resources--Non--renewable | use as energy carrier | MJ | 7.2E+00 | 6.9E-02 | 2.8E-01 | 7.6E+00 | 3.8E-01 | 2.4E-01 | 1.4E+00 | 0.0E+00 | 4.3E-03 | 9.0E-03 | 2.1E-03 | -1.4E+00 |
| | use as raw material | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Total | MJ | 7.2E+00 | 6.9E-02 | 2.8E-01 | 7.6E+00 | 3.8E-01 | 2.4E-01 | 1.4E+00 | 0.0E+00 | 4.3E-03 | 9.0E-03 | 2.1E-03 | -1.4E+00 |
| Primary energy resources-renewable | use as energy carrier | MJ | 3.7E+00 | 1.1E-03 | 2.7E-02 | 3.7E+00 | 5.2E-03 | 3.5E-02 | 6.8E+00 | 0.0E+00 | 6.9E-05 | 3.3E-04 | 7.7E-05 | -4.7E-01 |
| | use as raw material | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Total | MJ | 3.7E+00 | 1.1E-03 | 2.7E-02 | 3.7E+00 | 5.2E-03 | 3.5E-02 | 6.8E+00 | 0.0E+00 | 6.9E-05 | 3.3E-04 | 7.7E-05 | -4.7E-01 |
| Secondary material | | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Renewable secondary fuels | | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Non-renewable secondary fuels | | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Net use of fresh water | | m3 | 0.0E+00 | 0.0E+00 | 3.8E-05 | 3.8E-05 | 0.0E+00 | 0.0E+00 | 2.6E-08 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |

*Table 30. Resource Use - LR5-54HPH*

| Results per functional unit | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | | Unit | A1 | A2 | A3 | **A1-A3** | A4 | A5 | B | C1 | C2 | C3 | C4 | D |
| Primary energy resources--Non--renewable | use as energy carrier | MJ | 7.5E+00 | 6.2E-02 | 2.9E-01 | 7.9E+00 | 3.9E-01 | 2.4E-01 | 1.5E+00 | 0.0E+00 | 4.3E-03 | 3.7E-03 | 2.2E-03 | -1.4E+00 |
| | use as raw material | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Total | MJ | 7.5E+00 | 6.2E-02 | 2.9E-01 | 7.9E+00 | 3.9E-01 | 2.4E-01 | 1.5E+00 | 0.0E+00 | 4.3E-03 | 3.7E-03 | 2.2E-03 | -1.4E+00 |
| Primary energy resources-renewable | use as energy carrier | MJ | 3.9E+00 | 1.0E-03 | 2.8E-02 | 3.9E+00 | 5.2E-03 | 3.5E-02 | 7.2E+00 | 0.0E+00 | 6.9E-05 | 3.7E-05 | 8.0E-05 | -4.7E-01 |
| | use as raw material | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Total | MJ | 3.9E+00 | 1.0E-03 | 2.8E-02 | 3.9E+00 | 5.2E-03 | 3.5E-02 | 7.2E+00 | 0.0E+00 | 6.9E-05 | 3.7E-05 | 8.0E-05 | -4.7E-01 |
| Secondary material | | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Renewable secondary fuels | | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Non-renewable secondary fuels | | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Net use of fresh water | | m3 | 0.0E+00 | 0.0E+00 | 4.0E-05 | 4.0E-05 | 0.0E+00 | 0.0E+00 | 2.7E-08 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |

*Table 31. Resource Use - LR5-54HPB*

| Results per functional unit | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | | Unit | A1 | A2 | A3 | **A1-A3** | A4 | A5 | B | C1 | C2 | C3 | C4 | D |
| Primary energy resources--Non--renewable | use as energy carrier | MJ | 7.6E+00 | 7.1E-02 | 3.3E-01 | 8.0E+00 | 3.9E-01 | 2.4E-01 | 1.5E+00 | 0.0E+00 | 4.3E-03 | 3.7E-03 | 2.2E-03 | -1.4E+00 |
| | use as raw material | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Total | MJ | 7.6E+00 | 7.1E-02 | 3.3E-01 | 8.0E+00 | 3.9E-01 | 2.4E-01 | 1.5E+00 | 0.0E+00 | 4.3E-03 | 3.7E-03 | 2.2E-03 | -1.4E+00 |
| Primary energy resources-renewable | use as energy carrier | MJ | 3.9E+00 | 1.1E-03 | 3.2E-02 | 3.9E+00 | 5.2E-03 | 3.5E-02 | 7.2E+00 | 0.0E+00 | 6.9E-05 | 3.8E-05 | 8.1E-05 | -4.7E-01 |
| | use as raw material | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Total | MJ | 3.9E+00 | 1.1E-03 | 3.2E-02 | 3.9E+00 | 5.2E-03 | 3.5E-02 | 7.2E+00 | 0.0E+00 | 6.9E-05 | 3.8E-05 | 8.1E-05 | -4.7E-01 |
| Secondary material | | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Renewable secondary fuels | | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Non-renewable secondary fuels | | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Net use of fresh water | | m3 | 0.0E+00 | 0.0E+00 | 4.0E-05 | 4.0E-05 | 0.0E+00 | 0.0E+00 | 2.7E-08 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |

*Table 32. Resource Use - LR5-54HIH*

| Results per functional unit | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | | Unit | A1 | A2 | A3 | **A1-A3** | A4 | A5 | B | C1 | C2 | C3 | C4 | D |
| Primary energy resources--Non--renewable | use as energy carrier | MJ | 7.6E+00 | 7.1E-02 | 3.3E-01 | 8.0E+00 | 3.9E-01 | 2.4E-01 | 1.5E+00 | 0.0E+00 | 4.3E-03 | 3.7E-03 | 2.2E-03 | -1.4E+00 |
| | use as raw material | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Total | MJ | 7.6E+00 | 7.1E-02 | 3.3E-01 | 8.0E+00 | 3.9E-01 | 2.4E-01 | 1.5E+00 | 0.0E+00 | 4.3E-03 | 3.7E-03 | 2.2E-03 | -1.4E+00 |
| Primary energy resources-renewable | use as energy carrier | MJ | 3.9E+00 | 1.1E-03 | 3.2E-02 | 3.9E+00 | 5.2E-03 | 3.5E-02 | 7.2E+00 | 0.0E+00 | 6.9E-05 | 3.8E-05 | 8.1E-05 | -4.7E-01 |
| | use as raw material | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Total | MJ | 3.9E+00 | 1.1E-03 | 3.2E-02 | 3.9E+00 | 5.2E-03 | 3.5E-02 | 7.2E+00 | 0.0E+00 | 6.9E-05 | 3.8E-05 | 8.1E-05 | -4.7E-01 |
| Secondary material | | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Renewable secondary fuels | | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Non-renewable secondary fuels | | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| Net use of fresh water | | m3 | 0.0E+00 | 0.0E+00 | 4.0E-05 | 4.0E-05 | 0.0E+00 | 0.0E+00 | 2.7E-08 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |

## Potential environmental impact – additional indicators-Waste to disposal

Environment impact indicates for waste to disposal are studied and declared.

*Table 33. Waste to disposal -LR5-66HPH*

| Results per functional unit | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | | Unit | A1 | A2 | A3 | **A1-A3** | A4 | A5 | B2 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| Waste to disposal | Hazardous waste | kg | 0.0E+00 | 0.0E+00 | 1.6E-04 | 1.6E-04 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Non-hazardous waste | kg | 0.0E+00 | 0.0E+00 | 1.6E-03 | 1.6E-03 | 0.0E+00 | 6.0E-04 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Radioactive waste disposed (total low, intermediate and high level waste) | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Radioactive waste disposed (high level waste) | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |

*Table 34. Waste to disposal -LR5-66HIH*

| Results per functional unit | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | | Unit | A1 | A2 | A3 | **A1-A3** | A4 | A5 | B2 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| Waste to disposal | Hazardous waste | kg | 0.0E+00 | 0.0E+00 | 1.6E-04 | 1.6E-04 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Non-hazardous waste | kg | 0.0E+00 | 0.0E+00 | 1.6E-03 | 1.6E-03 | 0.0E+00 | 6.1E-04 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Radioactive waste disposed (total low, intermediate and high level waste) | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Radioactive waste disposed (high level waste) | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |

*Table 35. Waste to disposal -LR5-54HTH*

| Results per functional unit | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | | Unit | A1 | A2 | A3 | **A1-A3** | A4 | A5 | B2 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| Waste to disposal | Hazardous waste | kg | 0.0E+00 | 0.0E+00 | 1.8E-04 | 1.8E-04 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Non-hazardous waste | kg | 0.0E+00 | 0.0E+00 | 8.2E-01 | 8.2E-01 | 0.0E+00 | 6.8E-04 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Radioactive waste disposed (total low, intermediate and high level waste) | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Radioactive waste disposed (high level waste) | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |

*Table 36. Waste to disposal -LR5-54HTB*

| Results per functional unit | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | | Unit | A1 | A2 | A3 | **A1-A3** | A4 | A5 | B2 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| Waste to disposal | Hazardous waste | kg | 0.0E+00 | 0.0E+00 | 1.8E-04 | 1.8E-04 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Non-hazardous waste | kg | 0.0E+00 | 0.0E+00 | 1.9E-03 | 1.9E-03 | 0.0E+00 | 6.9E-04 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Radioactive waste disposed (total low, intermediate and high level waste) | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Radioactive waste disposed (high level waste) | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |

*Table 37. Waste to disposal -LR5-54HPH*

| Results per functional unit | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | | Unit | A1 | A2 | A3 | **A1-A3** | A4 | A5 | B2 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| Waste to disposal | Hazardous waste | kg | 0.0E+00 | 0.0E+00 | 1.9E-04 | 1.9E-04 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Non-hazardous waste | kg | 0.0E+00 | 0.0E+00 | 1.9E-03 | 1.9E-03 | 0.0E+00 | 7.2E-04 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Radioactive waste disposed (total low, intermediate and high level waste) | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Radioactive waste disposed (high level waste) | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |

*Table 38. Waste to disposal -LR5-54HPB*

| Results per functional unit | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | | Unit | A1 | A2 | A3 | **A1-A3** | A4 | A5 | B2 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| Waste to disposal | Hazardous waste | kg | 0.0E+00 | 0.0E+00 | 1.9E-04 | 1.9E-04 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Non-hazardous waste | kg | 0.0E+00 | 0.0E+00 | 2.0E-03 | 2.0E-03 | 0.0E+00 | 7.2E-04 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Radioactive waste disposed (total low, intermediate and high level waste) | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Radioactive waste disposed (high level waste) | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |

*Table 39. Waste to disposal -LR5-54HIH*

| Results per functional unit | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | | Unit | A1 | A2 | A3 | **A1-A3** | A4 | A5 | B2 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| Waste to disposal | Hazardous waste | kg | 0.0E+00 | 0.0E+00 | 1.9E-04 | 1.9E-04 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Non-hazardous waste | kg | 0.0E+00 | 0.0E+00 | 2.0E-03 | 2.0E-03 | 0.0E+00 | 7.2E-04 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Radioactive waste disposed (total low, intermediate and high level waste) | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Radioactive waste disposed (high level waste) | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |

## Potential environmental impact – additional indicators-Other output flow

Environment impact indicates e.g. components for reuse, materials for recycling, materials for energy recovery and export energy are studied and declared.

*Table 40. Other output flow-LR5-66HPH*

| Results per functional unit | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | | Unit | A1 | A2 | A3 | **A1-A3** | A4 | A5 | B2 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| Other output flows | Components for reuse | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 1.4E-03 | 0.0E+00 |
| | Materials for recycling | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 1.6E-03 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 3.0E-02 | 0.0E+00 |
| | Materials for energy recovery | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Export energy | MJ per energy carrier | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 9.3E-03 | 0.0E+00 |

*Table 41. Other output flow-LR5-66HIH*

| Results per functional unit | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | | Unit | A1 | A2 | A3 | **A1-A3** | A4 | A5 | B2 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| Other output flows | Components for reuse | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 1.2E-03 | 0.0E+00 |
| | Materials for recycling | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 1.7E-03 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 3.1E-02 | 0.0E+00 |
| | Materials for energy recovery | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Export energy | MJ per energy carrier | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 9.7E-03 | 0.0E+00 |

*Table 42. Other output flow- LR5-54HTH*

| Results per functional unit | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | | Unit | A1 | A2 | A3 | **A1-A3** | A4 | A5 | B2 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| Other output flows | Components for reuse | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 1.2E-03 | 0.0E+00 |
| | Materials for recycling | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 1.7E-03 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 2.7E-02 | 0.0E+00 |
| | Materials for energy recovery | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Export energy | MJ per energy carrier | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 9.9E-03 | 0.0E+00 |

*Table 43. Other output flow- LR5-54HTB*

| Results per functional unit | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | | Unit | A1 | A2 | A3 | **A1-A3** | A4 | A5 | B2 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| Other output flows | Components for reuse | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 1.3E-03 | 0.0E+00 |
| | Materials for recycling | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 1.7E-03 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 2.7E-02 | 0.0E+00 |
| | Materials for energy recovery | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Export energy | MJ per energy carrier | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 1.0E-02 | 0.0E+00 |

*Table 44. Other output flow- LR5-54HPH*

| Results per functional unit | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | | Unit | A1 | A2 | A3 | **A1-A3** | A4 | A5 | B2 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| Other output flows | Components for reuse | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 1.3E-03 | 0.0E+00 |
| | Materials for recycling | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 1.8E-03 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 2.8E-02 | 0.0E+00 |
| | Materials for energy recovery | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Export energy | MJ per energy carrier | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 1.0E-02 | 0.0E+00 |

*Table 45. Other output flow- LR5-54HPB*

| Results per functional unit | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | | Unit | A1 | A2 | A3 | **A1-A3** | A4 | A5 | B2 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| Other output flows | Components for reuse | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 1.3E-03 | 0.0E+00 |
| | Materials for recycling | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 1.8E-03 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 2.9E-02 | 0.0E+00 |
| | Materials for energy recovery | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Export energy | MJ per energy carrier | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 1.1E-02 | 0.0E+00 |

*Table 46. Other output flow- LR5-54HIH*

| Results per functional unit | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicator | | Unit | A1 | A2 | A3 | **A1-A3** | A4 | A5 | B2 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| Other output flows | Components for reuse | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 1.3E-03 | 0.0E+00 |
| | Materials for recycling | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 1.8E-03 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 2.9E-02 | 0.0E+00 |
| | Materials for energy recovery | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| | Export energy | MJ per energy carrier | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 1.1E-02 | 0.0E+00 |

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