# Life Cycle Assessment

LCA generated 8th July 2026

**In accordance with EN 15804+A2 and ISO 14040 / ISO 14044**



**SHL01 Sholes Chair**

**GWP-Fossil**
**75.8 kgCO2e**
**cradle to gate**

The Senator Group

# GENERAL INFORMATION

## MANUFACTURER

| | |
|---|---|
| Manufacturer | The Senator Group |
| Address | Altham Business Park |
| Contact details | marketingteam@thesenatorgroup.com |
| Website | www.thesenatorgroup.com |

## LCA STANDARDS, SCOPE AND VERIFICATION

| | |
|---|---|
| Program operator | EPD Hub, hub@epdhub.com |
| LCA software provider | One Click LCA |
| Reference standard | EN 15804+A2:2019 and ISO 14025/14040/14044 |
| PCR | EPD Hub Core PCR Version 1.2, 24 Mar 2025 |
| Sector | Manufactured product |
| Scope of the LCA | Cradle to gate with options, A4-A5, and modules C1-C4, D |
| LCA verification | Self-verified by The Senator Group |

The manufacturer has the sole ownership, liability, and responsibility for the LCA. LCAs within the same product category but from different programs may not be comparable. LCAs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

## PRODUCT

| | |
|---|---|
| Product name | Sholes Chair on Castors |
| Additional labels | - |
| Product reference | SHL01 |
| Place of production | United Kingdom |
| Period for data | 01/01/2025 - 31/12/2025 |
| Averaging in LCA | No averaging |
| Variation in GWP-fossil for A1-A3 | -% |

## ENVIRONMENTAL DATA SUMMARY

| | |
|---|---|
| **Declared unit** | 1 |
| **Declared unit mass** | 20.617 kg |
| **GWP-fossil, A1-A3 (kgCO2e)** | 75.8 |
| **GWP-total, A1-A3 (kgCO2e)** | 71.4 |
| **Secondary material, inputs (%)** | 33 |
| **Secondary material, outputs (%)** | 99.8 |
| **Total energy use, A1-A3 (kWh)** | 1910 |
| **Net freshwater use, A1-A3 (m3)** | 0.92 |

# PRODUCT AND MANUFACTURER

## ABOUT THE MANUFACTURER

The tale begins in 1976, when our Chairman Colin Mustoe began designing and manufacturing office furniture. In the early days he would even build and deliver the products to customers himself. All these years on and although we've grown into one of the largest office furniture manufacturers in the world, we remain an independent, family-owned business. All the things that were important to us in the beginning; our attention to detail, integrity, investment in people and passion for design, are still very much running through the veins of our business today.

## PRODUCT DESCRIPTION

The Sholes multi-purpose chair has been designed to support collaborative working. Its generous proportions and wrap around back provide excellent comfort whichever position you take. The Educational chair option utilises a moulded PU seat and back for enhanced durability in learning environments.

Further information can be found at www.thesenatorgroup.com.

### PRODUCT RAW MATERIAL MAIN COMPOSITION

| Raw material category | Amount, mass- % | Material origin |
|---|---|---|
| Metals | 36.40 | UK & Europe |
| Minerals | - | - |
| Fossil materials | 53.23 | UK & Europe |
| Bio-based materials | 10.37 | UK |

### MATERIAL CONTENT

| Raw material category | Amount, mass- KG |
|---|---|
| Aluminium | 4.762 |
| Polypropylene | 2.225 |
| PA6 | 1.03 |
| PA66 | 0.006 |
| POM | 0.087 |
| Polyurethane Foam | 7.170 |
| Steel | 3.107 |
| Rubber | 0.008 |
| Fabric | 0.980 |
| Plywood | 2.242 |

## FUNCTIONAL UNIT AND SERVICE LIFE

| | |
|---|---|
| Declared unit | 1 |
| Mass per declared unit | 20.617 kg |

## SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

# PRODUCT LIFE-CYCLE

## SYSTEM BOUNDARY

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

| Product stage | | | Assembly stage | | Use stage | | | | | | | End of life stage | | | | Beyond the system boundaries | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D | | |
| X | X | X | X | X | MND | MND | MND | MND | MND | MND | MND | X | X | X | X | X | | |
| Raw materials | Transport | Manufacturing | Transport | Assembly | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | Deconstruction | Transport | Waste processing | Disposal | Reuse | Recovery | Recycling |

*Modules not declared = MND. Modules not relevant = MNR.*

## MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

## TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

An average transportation distance of 400 kms has been used within the model based on the distance from our manufacturing site to a delivery address in central London. The product is manually carried and installed on-site by The Senator Group operatives and assembled by hand using hand-tools. Installation waste is returned to The Senator Group for reuse/recycling.

## PRODUCT USE AND MAINTENANCE (B1-B7)

If the products are properly assembled no repair, replacement or refurbishment processes are expected within its service life.
Air, soil, and water impacts during the use phase have not been studied.

## PRODUCT END OF LIFE (C1-C4, D)

We can strip products down to their component parts and recycle, ensuring that no waste goes to landfill. Every product from The Senator Group is 99-100% recyclable, so we can guarantee recycling or repurposing on all Senator products. We will additionally recycle as much of our competitor products as possible. You will receive a certificate outlining volumes of products recycled and carbon emissions. All waste packaging is sent back to our Sustain division for recycling. Our packaging programme covers both Senator waste packaging and that of our competitors. In fact, we actively encourage our dealers, suppliers, and other contractors to utilise our packaging recycling scheme. Other companies can purchase The Senator Group white bags for a nominal price, fill with packaging waste, and return to Sustain for us to recycle on their behalf.

# MANUFACTURING PROCESS

**We support our clients Sustainability through:**

1. Life cycle understanding

To understand product lifecycle in more detail, our Life Cycle Assessments (LCAs) are more detailed and incorporate elements of the product lifecycle. LCAs will provide our clients with more insight to support decision making, with publicly comparable data to compare our products against our competitors and support our design teams in better designing out carbon.

2. Servicing

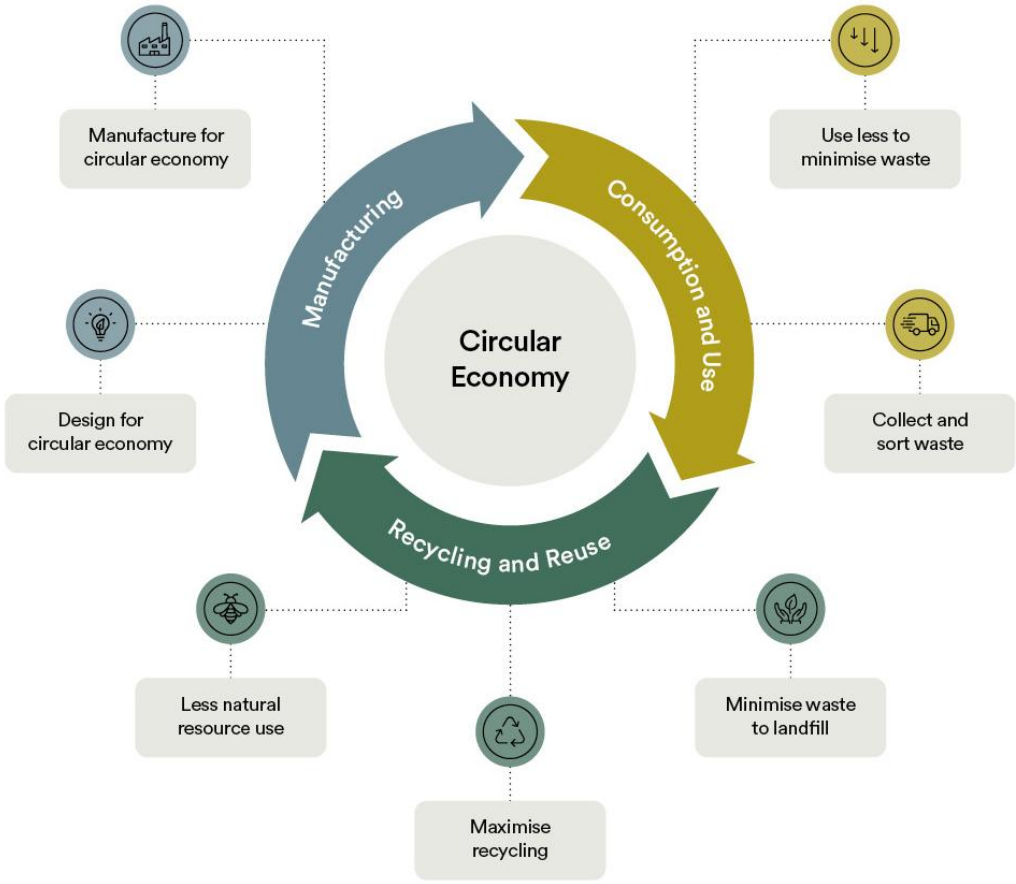
We offer servicing agreements where products are serviced periodically to extend the product lifecycle.

3. Subscription

We can agree a subscription service – this will be assessed alongside the client to consider both commerciality and sustainability benefits alongside the other services we offer.

4. End of Life

Sustainability services via Sustain.



# LIFE-CYCLE ASSESSMENT

## CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

## ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

| Data type | Allocation |
|---|---|
| Raw materials | No allocation |
| Packaging materials | No allocation |
| Ancillary materials | No allocation |
| Manufacturing energy and waste | Allocated by mass or volume |

## AVERAGES AND VARIABILITY

| | |
|---|---|
| Type of average | No averaging |
| Averaging method | Not applicable |
| Variation in GWP-fossil for A1-A3 | % |

This LCA is factory specific.

## LCA SOFTWARE AND BIBLIOGRAPHY

This LCA has been created using One Click LCA EPD Generator. The LCA has been prepared according to the reference standards and ISO 14040/14044. Ecoinvent v3.8 and One Click LCA databases were used as sources of environmental data.

# ENVIRONMENTAL IMPACT DATA

## CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GWP – total[1)] | kg $CO_2$e | 5.17E+01 | 2.64E+00 | 1.70E+01 | 7.14E+01 | 9.18E-01 | 7.54E-03 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 1.00E+00 | 1.63E+01 | 4.63E+00 | -1.73E-15 |
| GWP – fossil | kg $CO_2$e | 5.61E+01 | 2.64E+00 | 1.70E+01 | 7.58E+01 | 9.17E-01 | 7.54E-03 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 1.00E+00 | 1.54E+01 | 0.00E+00 | -1.72E-15 |
| GWP – biogenic | kg $CO_2$e | -4.57E+00 | 5.50E-04 | -3.15E-02 | -4.60E+00 | 2.11E-04 | -2.03E-06 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 2.04E-04 | 8.89E-01 | 4.63E+00 | 0.00E+00 |
| GWP – LULUC | kg $CO_2$e | 1.74E-01 | 1.18E-03 | 2.15E-02 | 1.96E-01 | 4.09E-04 | 3.94E-06 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 4.45E-04 | 2.23E-03 | 0.00E+00 | -1.39E-17 |
| Ozone depletion pot. | kg $CFC_{-11}$e | 1.46E-06 | 3.85E-08 | 4.54E-07 | 1.95E-06 | 1.33E-08 | 4.03E-11 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 1.45E-08 | 2.90E-08 | 0.00E+00 | 1.06E-22 |
| Acidification potential | mol $H^+$e | 2.19E-01 | 9.25E-03 | 1.02E-01 | 3.30E-01 | 3.19E-03 | 1.51E-05 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 3.48E-03 | 2.10E-02 | 0.00E+00 | -4.77E-18 |
| EP-freshwater[2)] | kg Pe | 2.78E-03 | 2.80E-04 | 6.48E-03 | 9.54E-03 | 9.94E-05 | 7.78E-07 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 1.08E-04 | 4.91E-04 | 0.00E+00 | 1.26E-19 |
| EP-marine | kg Ne | 4.35E-02 | 3.05E-03 | 1.83E-02 | 6.49E-02 | 1.05E-03 | 7.78E-06 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 1.15E-03 | 6.42E-02 | 0.00E+00 | -8.67E-19 |
| EP-terrestrial | mol Ne | 4.30E-01 | 3.30E-02 | 1.88E-01 | 6.51E-01 | 1.14E-02 | 4.99E-05 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 1.24E-02 | 9.27E-02 | 0.00E+00 | 1.39E-17 |
| POCP ("smog")[3)] | kg NMVOCe | 1.46E-01 | 1.35E-02 | 6.22E-02 | 2.22E-01 | 4.68E-03 | 1.73E-05 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 5.10E-03 | 2.40E-02 | 0.00E+00 | 2.30E-19 |
| ADP-minerals & metals[4)] | kg Sbe | 3.03E-04 | 7.54E-06 | 5.49E-04 | 8.59E-04 | 2.62E-06 | 2.58E-08 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 2.86E-06 | 3.46E-05 | 0.00E+00 | 6.78E-21 |
| ADP-fossil resources | MJ | 7.68E+02 | 3.77E+01 | 4.35E+02 | 1.24E+03 | 1.31E+01 | 4.20E-02 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 1.43E+01 | 2.03E+01 | 0.00E+00 | -6.66E-15 |
| Water use[5)] | $m^3$e depr. | 1.81E+01 | 2.17E-01 | 1.22E+01 | 3.05E+01 | 7.64E-02 | 9.73E-04 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 8.33E-02 | 1.27E+00 | 0.00E+00 | 0.00E+00 |

*1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.*

## ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Particulate matter | Incidence | 3.09E-06 | 2.59E-07 | 9.00E-07 | 4.25E-06 | 8.99E-08 | 3.15E-10 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 9.79E-08 | 1.48E-07 | 0.00E+00 | 1.11E-22 |
| Ionizing radiation[6)] | kBq U235e | 1.46E+00 | 3.17E-02 | 8.97E-01 | 2.39E+00 | 1.10E-02 | 1.72E-04 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 1.20E-02 | 1.10E-01 | 0.00E+00 | 0.00E+00 |
| Ecotoxicity (freshwater) | CTUe | 3.44E+02 | 7.62E+00 | 9.68E+01 | 4.48E+02 | 2.72E+00 | 2.44E-02 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 2.96E+00 | 4.98E+01 | 0.00E+00 | 0.00E+00 |
| Human toxicity, cancer | CTUh | 6.54E-08 | 4.17E-10 | 9.99E-09 | 7.58E-08 | 1.44E-10 | 2.97E-12 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 1.57E-10 | 2.77E-09 | 0.00E+00 | 2.64E-24 |
| Human tox. non-cancer | CTUh | 5.05E-07 | 2.35E-08 | 4.33E-07 | 9.62E-07 | 8.14E-09 | 6.21E-11 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 8.87E-09 | 7.90E-08 | 0.00E+00 | -6.70E-25 |
| SQP[7)] | - | 4.78E+02 | 3.76E+01 | 1.55E+02 | 6.70E+02 | 1.31E+01 | 5.77E-02 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 1.42E+01 | 3.69E+01 | 0.00E+00 | -6.93E-14 |

*6) EN 15804+A2 disclaimer for Ionizing radiation, human health. This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator; 7) SQP = Land use related impacts/soil quality.*

## USE OF NATURAL RESOURCES

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Renew. PER as energy[8)] | MJ | 1.90E+02 | 5.24E-01 | 5.33E+03 | 5.52E+03 | 1.82E-01 | 2.68E-03 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 1.98E-01 | -2.54E+01 | 0.00E+00 | 2.55E-15 |
| Renew. PER as material | MJ | 3.39E+01 | 0.00E+00 | 0.00E+00 | 3.39E+01 | 0.00E+00 | 0.00E+00 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 0.00E+00 | 0.00E+00 | -3.39E+01 | 0.00E+00 |
| Total use of renew. PER | MJ | 2.24E+02 | 5.24E-01 | 5.33E+03 | 5.55E+03 | 1.82E-01 | 2.68E-03 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 1.98E-01 | -2.54E+01 | -3.39E+01 | 2.55E-15 |
| Non-re. PER as energy | MJ | 7.56E+02 | 3.77E+01 | 5.73E+02 | 1.37E+03 | 1.31E+01 | -1.44E+00 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 1.43E+01 | -3.48E+02 | 0.00E+00 | 2.40E-14 |
| Non-re. PER as material | MJ | 8.44E-01 | 0.00E+00 | 0.00E+00 | 8.44E-01 | 0.00E+00 | 0.00E+00 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 0.00E+00 | 0.00E+00 | -8.44E-01 | 0.00E+00 |
| Total use of non-re. PER | MJ | 7.57E+02 | 3.77E+01 | 5.73E+02 | 1.37E+03 | 1.31E+01 | -1.44E+00 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 1.43E+01 | -3.48E+02 | -8.44E-01 | 2.40E-14 |
| Secondary materials | kg | 6.80E+00 | 1.58E-02 | 5.37E-01 | 7.35E+00 | 5.48E-03 | 1.27E-04 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 5.97E-03 | 2.15E-02 | 0.00E+00 | 1.78E-17 |
| Renew. secondary fuels | MJ | 1.38E-02 | 2.06E-04 | 7.59E-03 | 2.16E-02 | 7.15E-05 | 1.08E-06 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 7.79E-05 | 4.13E-04 | 0.00E+00 | -1.19E-20 |
| Non-ren. secondary fuels | MJ | 3.79E-02 | 0.00E+00 | 0.00E+00 | 3.79E-02 | 0.00E+00 | 0.00E+00 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of net fresh water | $m^3$ | 5.83E-01 | 5.42E-03 | 3.31E-01 | 9.20E-01 | 1.88E-03 | 1.62E-05 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 2.05E-03 | 1.72E-02 | 0.00E+00 | -8.24E-18 |

*8) PER = Primary energy resources.*

## END OF LIFE – WASTE

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hazardous waste | kg | 1.12E+01 | 2.26E-01 | 2.47E+00 | 1.39E+01 | 8.37E-02 | 5.25E-04 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 9.13E-02 | 4.14E-01 | 0.00E+00 | 2.86E-16 |
| Non-hazardous waste | kg | 1.15E+01 | 4.47E+00 | 3.94E+01 | 5.54E+01 | 1.65E+00 | 1.45E-02 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 1.80E+00 | 2.32E+01 | 0.00E+00 | -5.07E-15 |
| Radioactive waste | kg | 2.78E-02 | 7.61E-06 | 2.91E-03 | 3.07E-02 | 2.62E-06 | 4.37E-08 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 2.86E-06 | 2.81E-05 | 0.00E+00 | -2.37E-20 |

## END OF LIFE – OUTPUT FLOWS

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Components for re-use | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Materials for recycling | kg | 6.86E-02 | 0.00E+00 | 6.17E-09 | 6.86E-02 | 0.00E+00 | 3.50E-02 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 0.00E+00 | 1.84E+01 | 0.00E+00 | 0.00E+00 |
| Materials for energy rec | kg | 1.36E-01 | 0.00E+00 | 0.00E+00 | 1.36E-01 | 0.00E+00 | 0.00E+00 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 0.00E+00 | 3.23E+00 | 0.00E+00 | 0.00E+00 |
| Exported energy | MJ | 8.20E-01 | 0.00E+00 | 0.00E+00 | 8.20E-01 | 0.00E+00 | 0.00E+00 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Exported energy – Electricity | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Exported energy – Heat | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |

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

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Global Warming Pot. | kg $CO_2$e | 1.59E+01 | 2.63E+00 | 1.84E+01 | 3.69E+01 | 9.12E-01 | 7.52E-03 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 9.94E-01 | 1.53E+01 | 0.00E+00 | 1.33E-15 |
| Ozone depletion Pot. | kg CFC-$_{11}$e | 6.50E-07 | 3.07E-08 | 2.66E-06 | 3.34E-06 | 1.06E-08 | 3.30E-11 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 1.16E-08 | 2.42E-08 | 0.00E+00 | 0.00E+00 |
| Acidification | kg $SO_2$e | 6.74E-02 | 7.06E-03 | 1.61E-01 | 2.36E-01 | 2.43E-03 | 1.16E-05 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 2.65E-03 | 1.52E-02 | 0.00E+00 | -1.04E-17 |
| Eutrophication | kg $PO_4^3$e | 1.33E-02 | 1.88E-03 | 3.28E-02 | 4.79E-02 | 6.59E-04 | 2.98E-06 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 7.18E-04 | 7.14E-03 | 0.00E+00 | 1.03E-18 |
| POCP (“smog”) | kg $C_2H_4$e | 6.01E-03 | 6.13E-04 | 9.48E-03 | 1.61E-02 | 2.12E-04 | 1.13E-06 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 2.31E-04 | 1.10E-03 | 0.00E+00 | -6.78E-20 |
| ADP-elements | kg Sbe | 1.91E-04 | 7.34E-06 | 5.16E-04 | 7.14E-04 | 2.55E-06 | 2.54E-08 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 2.78E-06 | 3.40E-05 | 0.00E+00 | 6.78E-21 |
| ADP-fossil | MJ | 5.10E+02 | 3.73E+01 | 3.69E+02 | 9.16E+02 | 1.29E+01 | 3.90E-02 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 1.41E+01 | 1.84E+01 | 0.00E+00 | 1.07E-14 |

## ENVIRONMENTAL IMPACTS – GWP-GHG - THE INTERNATIONAL EPD SYSTEM

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GWP-GHG[9)] | kg $CO_2$e | 5.63E+01 | 2.64E+00 | 1.71E+01 | 7.60E+01 | 9.18E-01 | 7.54E-03 | ND | ND | ND | ND | ND | ND | ND | 0.00E+00 | 1.00E+00 | 1.54E+01 | 0.00E+00 | -1.73E-15 |

## SCENARIO DOCUMENTATION

## DATA SOURCES

### Manufacturing energy scenario documentation

1. Electricity production, deep geothermal, United Kingdom, Ecoinvent, 0.0718 kgCO2e/kWh
2. Electricity production, hydro, run-of-river, United Kingdom, Ecoinvent, 0.0044 kgCO2e/kWh
3. Electricity production, photovoltaic, 3kWp slanted-roof installation, multi-Si, panel, mounted, United Kingdom, Ecoinvent, 0.0806 kgCO2e/kWh
4. Electricity production, wind, <1MW turbine, onshore, United Kingdom, Ecoinvent, 0.0136 kgCO2e/kWh
5. Electricity, United Kingdom, United Kingdom, One Click LCA
6. Electricity from photovoltaik (1 kWh), Germany, GaBi, 0.0340 kgCO2e/kWh

### Transport scenario documentation - A4 (Transport resources)

1. Market for transport, freight, lorry >32 metric ton, EURO5, 400 km

### End of life (C1-C4) - Scenario documentation

| Scenario information | Value |
|---|---|
| Collection process: collected separately (kg) | |
| Collection process: Mixed waste (kg) | |
| Recovery: re-use (kg) | 0 |
| Recovery: recycling (kg) | 18..4 |
| Recovery: energy recovery (kg) | 3.23 |
| Disposal (kg) | 0 |
| Scenario assumptions e.g. transportation (mode, km) & other | |