Life Cycle Assessment

LCA generated 30 October 2025

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



GWP-Fossil
53.3 kg CO2e
cradle to gate

AD12 Ad Lib Chair with Upholstered Seat without Arms

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	Ad Lib Chair with Upholstered Seat and no Arms
Additional labels	-
Product reference	AD12
Place of production	United Kingdom
Period for data	01/01/2024 - 31/12/2024
Averaging in LCA	No averaging
Variation in GWP-fossil for A1-A3	-%

ENVIRONMENTAL DATA SUMMARY

Declared unit	1
Declared unit mass	11.326 kg
GWP-fossil, A1-A3 (kgCO2e)	53.3kg
GWP-total, A1-A3 (kgCO2e)	34.3kg
GWP-total for A1-A5, C1-C4 & D (kgCO2e)	56.8kg
Secondary material, inputs (%)	34.3
Secondary material, outputs (%)	99.6
Total energy use, A1-A3 (kWh)	424
Net freshwater use, A1-A3 (m3)	0.55

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

With Ad-Lib we set out to redefine the genre of multi-purpose seating, developed with fewer components so that it still achieves the versatility needed to build an amazingly wide range of chairs. Ad-Lib has been designed to be specified for all multi-purpose seating uses throughout the corporate environment; meeting, conference, training, light work or retail environments. It would also be applicable in educational and leisure areas.

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

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	30.72	Uk, Europe & Asia
Minerals	-	-
Fossil materials	69.28	UK
Bio-based materials		

MATERIAL CONTENT

Raw material category	Amount, mass- KG
Polypropylene	1.957
Polyurethane Foam	0.539
Steel	3.479
PA6	5.001
Synthetic Fabric	0.300
Powder Coat	0.050

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1
Mass per declared unit	11.326 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 the 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

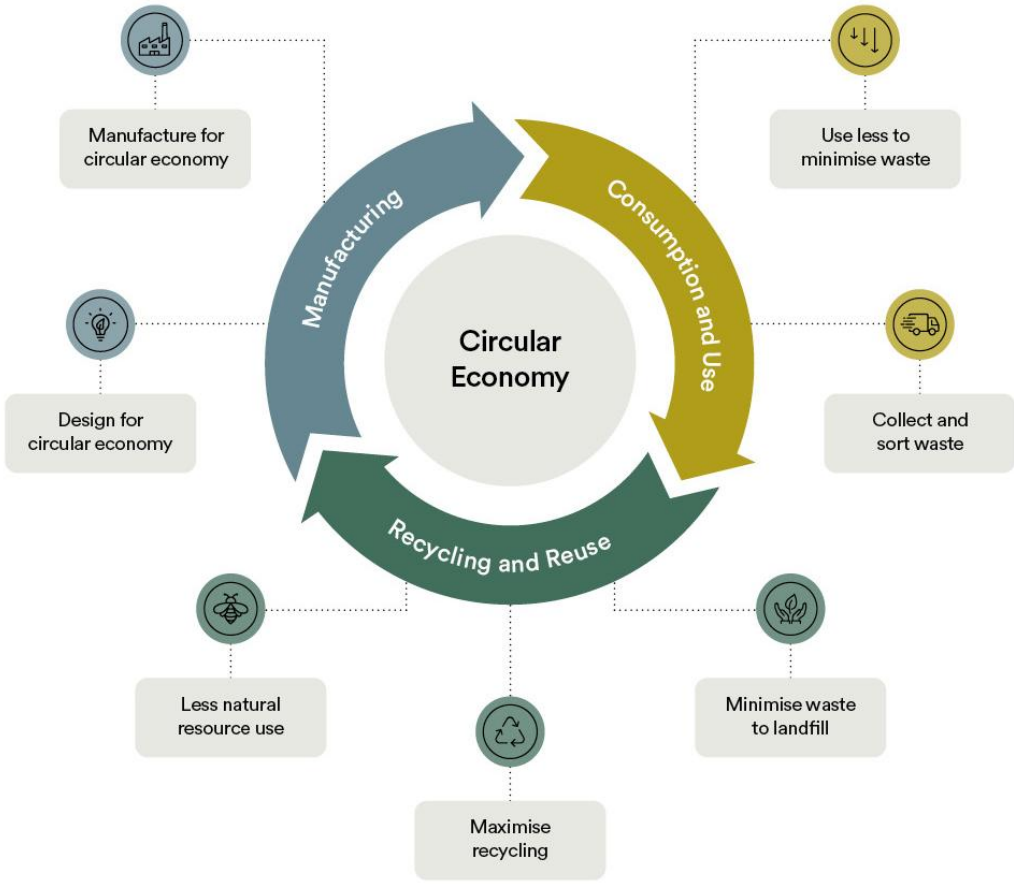
We offer servicing agreements where products are serviced periodically to extend the product lifecycle.

3. Leasing

We can agree a leasing 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_2e	4.97E+01	7.08E-01	2.87E+00	5.33E+01	4.89E-01	3.49E-03	MND	MND	MND	MND	MND	MND	MND	0.00E+00	5.19E-01	2.44E+00	5.01E-04	1.36E-20
GWP – fossil	kg CO_2e	4.97E+01	7.08E-01	2.87E+00	5.33E+01	4.89E-01	3.49E-03	MND	MND	MND	MND	MND	MND	MND	0.00E+00	5.19E-01	2.44E+00	5.00E-04	0.00E+00
GWP – biogenic	kg CO_2e	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GWP – LULUC	kg CO_2e	3.74E-02	4.14E-04	3.72E-03	4.16E-02	2.19E-04	1.33E-06	MND	MND	MND	MND	MND	MND	MND	0.00E+00	2.32E-04	7.55E-04	1.38E-07	1.36E-20
Ozone depletion pot.	kg CFC_{-11}e	1.55E-06	1.02E-08	8.28E-08	1.64E-06	7.22E-09	4.67E-11	MND	MND	MND	MND	MND	MND	MND	0.00E+00	7.66E-09	6.05E-09	1.57E-11	-7.44E-24
Acidification potential	mol H^+e	2.07E-01	1.26E-02	1.73E-02	2.37E-01	1.67E-03	1.86E-05	MND	MND	MND	MND	MND	MND	MND	0.00E+00	1.77E-03	4.55E-03	5.52E-06	0.00E+00
EP-freshwater[2)]	kg Pe	3.02E-03	3.68E-05	1.18E-03	4.24E-03	3.81E-05	5.15E-07	MND	MND	MND	MND	MND	MND	MND	0.00E+00	4.04E-05	1.79E-04	8.40E-07	-2.17E-19
EP-marine	kg Ne	4.64E-02	2.97E-03	3.08E-03	5.24E-02	5.48E-04	8.98E-06	MND	MND	MND	MND	MND	MND	MND	0.00E+00	5.81E-04	6.55E-03	1.38E-06	0.00E+00
EP-terrestrial	mol Ne	4.58E-01	3.30E-02	3.15E-02	5.23E-01	5.96E-03	8.10E-05	MND	MND	MND	MND	MND	MND	MND	0.00E+00	6.32E-03	1.73E-02	1.48E-05	0.00E+00
POCP ("smog")[3)]	kg NMVOCe	1.65E-01	9.59E-03	1.08E-02	1.85E-01	2.46E-03	2.45E-05	MND	MND	MND	MND	MND	MND	MND	0.00E+00	2.61E-03	4.70E-03	5.41E-06	0.00E+00
ADP-minerals & metals[4)]	kg Sbe	3.35E-04	1.25E-06	9.70E-05	4.33E-04	1.36E-06	8.81E-09	MND	MND	MND	MND	MND	MND	MND	0.00E+00	1.45E-06	9.96E-06	9.82E-10	0.00E+00
ADP-fossil resources	MJ	6.85E+02	9.24E+00	7.73E+01	7.71E+02	7.10E+00	3.92E-02	MND	MND	MND	MND	MND	MND	MND	0.00E+00	7.53E+00	5.73E+00	1.16E-02	0.00E+00
Water use[5)]	m^3e depr.	1.95E+01	3.63E-02	2.17E+00	2.17E+01	3.51E-02	1.68E-03	MND	MND	MND	MND	MND	MND	MND	0.00E+00	3.72E-02	2.80E-01	7.04E-05	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	2.26E-06	3.92E-08	1.65E-07	2.47E-06	4.90E-08	2.94E-10	MND	MND	MND	MND	MND	MND	MND	0.00E+00	5.19E-08	4.90E-08	8.40E-11	0.00E+00
Ionizing radiation[6)]	kBq U235e	1.58E+00	6.20E-03	1.69E-01	1.75E+00	6.18E-03	4.10E-05	MND	MND	MND	MND	MND	MND	MND	0.00E+00	6.55E-03	4.04E-02	1.55E-05	6.94E-18
Ecotoxicity (freshwater)	CTUe	2.73E+02	9.71E-01	1.79E+01	2.92E+02	1.00E+00	2.25E-02	MND	MND	MND	MND	MND	MND	MND	0.00E+00	1.06E+00	7.91E+00	7.78E-03	0.00E+00
Human toxicity, cancer	CTUh	3.76E-08	1.44E-10	1.81E-09	3.96E-08	8.07E-11	4.40E-12	MND	MND	MND	MND	MND	MND	MND	0.00E+00	8.56E-11	7.78E-10	2.16E-13	-4.14E-25
Human tox. non-cancer	CTUh	3.70E-07	3.86E-09	7.81E-08	4.52E-07	4.60E-09	1.85E-10	MND	MND	MND	MND	MND	MND	MND	0.00E+00	4.87E-09	1.79E-08	1.39E-11	3.31E-24
SQP[7)]	-	6.24E+01	4.24E+00	2.81E+01	9.47E+01	7.15E+00	3.25E-02	MND	MND	MND	MND	MND	MND	MND	0.00E+00	7.58E+00	9.00E+00	2.86E-02	5.55E-16

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	3.62E+01	1.02E-01	7.85E+02	8.21E+02	9.73E-02	-5.55E-01	MND	MND	MND	MND	MND	MND	MND	0.00E+00	1.03E-01	-3.37E+00	2.45E-04	4.44E-16
Renew. PER as material	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renew. PER	MJ	3.62E+01	1.02E-01	7.85E+02	8.21E+02	9.73E-02	-5.55E-01	MND	MND	MND	MND	MND	MND	MND	0.00E+00	1.03E-01	-3.37E+00	2.45E-04	4.44E-16
Non-re. PER as energy	MJ	5.94E+02	9.24E+00	1.01E+02	7.04E+02	7.10E+00	3.92E-02	MND	MND	MND	MND	MND	MND	MND	0.00E+00	7.53E+00	-3.08E+02	1.16E-02	0.00E+00
Non-re. PER as material	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-re. PER	MJ	5.94E+02	9.24E+00	1.01E+02	7.04E+02	7.10E+00	3.92E-02	MND	MND	MND	MND	MND	MND	MND	0.00E+00	7.53E+00	-3.08E+02	1.16E-02	0.00E+00
Secondary materials	kg	3.88E+00	4.72E-03	9.66E-02	3.98E+00	3.02E-03	2.54E-05	MND	MND	MND	MND	MND	MND	MND	0.00E+00	3.20E-03	2.49E-02	3.87E-06	-4.72E-17
Renew. secondary fuels	MJ	5.89E-02	2.69E-05	2.38E-03	6.14E-02	3.84E-05	2.65E-07	MND	MND	MND	MND	MND	MND	MND	0.00E+00	4.07E-05	2.57E-04	7.00E-08	-1.52E-20
Non-ren. secondary fuels	MJ	1.31E-02	0.00E+00	0.00E+00	1.31E-02	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m^3	4.88E-01	9.81E-04	5.88E-02	5.47E-01	1.05E-03	2.29E-05	MND	MND	MND	MND	MND	MND	MND	0.00E+00	1.11E-03	4.21E-03	-1.41E-04	0.00E+00

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	3.92E+00	1.49E-02	4.47E-01	4.39E+00	1.20E-02	1.45E-03	MND	MND	MND	MND	MND	MND	MND	0.00E+00	1.27E-02	1.10E-01	1.96E-05	0.00E+00
Non-hazardous waste	kg	1.15E+01	2.34E-01	7.63E+00	1.93E+01	2.23E-01	4.11E-02	MND	MND	MND	MND	MND	MND	MND	0.00E+00	2.36E-01	4.22E+00	1.79E-01	1.11E-16
Radioactive waste	kg	2.53E-03	1.52E-06	4.66E-04	2.99E-03	1.51E-06	1.02E-08	MND	MND	MND	MND	MND	MND	MND	0.00E+00	1.60E-06	1.03E-05	3.80E-09	4.66E-21

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	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	4.43E-03	0.00E+00	1.10E-09	4.43E-03	0.00E+00	3.50E-02	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	1.13E+01	0.00E+00	0.00E+00
Materials for energy rec	kg	1.18E-01	0.00E+00	0.00E+00	1.18E-01	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	MJ	1.19E-02	0.00E+00	0.00E+00	1.19E-02	0.00E+00	0.00E+00	MND	MND	MND	MND	MND	MND	MND	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	MND	MND	MND	MND	MND	MND	MND	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	MND	MND	MND	MND	MND	MND	MND	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_2e	4.32E+01	7.04E-01	3.39E+00	4.73E+01	4.86E-01	3.45E-03	MND	MND	MND	MND	MND	MND	MND	0.00E+00	5.16E-01	2.43E+00	4.96E-04	0.00E+00
Ozone depletion Pot.	kg CFC-$_{11}$e	6.93E-07	8.13E-09	4.78E-07	1.18E-06	5.76E-09	3.81E-11	MND	MND	MND	MND	MND	MND	MND	0.00E+00	6.11E-09	5.11E-09	1.25E-11	-8.27E-25
Acidification	kg SO_2e	1.49E-01	1.02E-02	2.91E-02	1.88E-01	1.27E-03	1.36E-05	MND	MND	MND	MND	MND	MND	MND	0.00E+00	1.35E-03	3.41E-03	4.43E-06	0.00E+00
Eutrophication	kg PO_4^3e	3.67E-02	1.12E-03	7.06E-03	4.49E-02	3.10E-04	4.34E-06	MND	MND	MND	MND	MND	MND	MND	0.00E+00	3.29E-04	1.13E-03	1.18E-06	0.00E+00
POCP (“smog”)	kg C_2H_4e	1.18E-02	5.28E-04	1.75E-03	1.41E-02	1.14E-04	1.05E-06	MND	MND	MND	MND	MND	MND	MND	0.00E+00	1.20E-04	2.73E-04	2.87E-07	0.00E+00
ADP-elements	kg Sbe	2.96E-04	1.23E-06	9.28E-05	3.90E-04	1.33E-06	7.84E-09	MND	MND	MND	MND	MND	MND	MND	0.00E+00	1.41E-06	9.84E-06	9.53E-10	0.00E+00
ADP-fossil	MJ	5.46E+02	9.14E+00	6.83E+01	6.23E+02	7.00E+00	3.86E-02	MND	MND	MND	MND	MND	MND	MND	0.00E+00	7.42E+00	5.03E+00	1.14E-02	0.00E+00

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_2e	4.97E+01	7.08E-01	2.87E+00	5.33E+01	4.89E-01	3.49E-03	MND	MND	MND	MND	MND	MND	MND	0.00E+00	5.19E-01	2.44E+00	5.01E-04	1.36E-20