Statement of Verification

BREG EN EPD No.: 000731 Issue 01

This is to verify that the

Environmental Product Declaration

provided by:

Orangebox

BRE Global Verified EPD

is in accordance with the requirements of:

EN 15804:2012+A2:2019

and

BRE Global Scheme Document SD207

This declaration is for:

1 Recur HBA task chair with a weight of 12.5kg (with height adjustable arms) maintained for a 10-year period

Company Address

Orangebox
Heol y Gamlas
Parc Nantgarw
Cardiff
CF15 7QU

orangebox

Signed for BRE Global Ltd	Hayley Thomson Operator	22 September 2025 Date of this Issue
22 September 2025 Date of First Issue		21 September 2030 Expiry Date

BRE Global Verified EPD

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ECO PLATFORM EPD VERIFIED

Environmental Product Declaration

EPD Number: **000731**

General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom	BRE Environmental Profiles 2023 Product Category Rules for Type III environmental product declaration of construction products to EN 15804+A2 PN 514 Rev 3.1
Commissioner of LCA study	**LCA consultant/Tool**
Orangebox Heol y Gamlas Parc Nantgarw Cardiff CF15 7QU	Gareth Banks using BRE LINA A2
Declared/Functional Unit	**Applicability/Coverage**
1 Recur HBA task chair with a weight of 12.5kg (with height adjustable arms) maintained for a 10-year period	Other (please specify). Product specific
EPD Type	**Background database**
Cradle to Gate with Module C and D	Ecoinvent 3.8

Demonstration of Verification
CEN standard EN 15804 serves as the core PCR [a]
Independent verification of the declaration and data according to EN ISO 14025:2010 ☐Internal ☒ External
(Where appropriate [b])Third party verifier: Regina Poveda
a: Product category rules b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)

Comparability
Environmental product declarations from different programmes may not be comparable if not compliant with EN 15804:2012+A2:2019. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See Clause 5.3 of EN 15804:2012+A2:2019 for further guidance

Information modules covered

Product			Construction		Use stage							End-of-life				Benefits and loads beyond the system boundary
					Related to the building fabric					Related to the building						
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Raw materials supply	Transport	Manufacturing	Transport to site	Construction – Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse, Recovery and/or Recycling potential
☑	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☑	☑	☑	☑

Note: Ticks indicate the Information Modules declared.

Manufacturing site(s)

Orangebox manufacturing HQ

Heol y Gamlas
Parc Nantgarw
Cardiff
CF15 7QU
Wales
United Kingdom

Construction Product:

Product Description

Recur is a range of task chairs from Orangebox who's design is focused on delivering class leading affordability and sustainability. This EPD is specific to one model within the range: Recur-HBA, an ergonomic task chair with height adjustable arms that's suitable for a multitude of work environments. The physical design and materials used with the chair have been carefully considered to help maximize the chair's lifecycle whilst also facilitating ease of disassembly when material recycling is eventually required. The chair is assembled in Orangebox's factory HQ in South Wales which is accredited to ISO14001 and ISO9001.

Technical Information

Property/ Standard	Value, Unit
Chair weight (with height adjustable arms)	12.5kg
Overall dims	110mm x 740mm x 740mm
Chair mechanism	Synchronous & weight balancing, with a max recline angle of 16 degrees
User weight range	50 to 150 kg
Seat Height adjustment	130 mm
Seat Depth adjustment	60 mm
Arm Height adjustment	80 mm
Structural testing to	EN 1335-2: 2018 BS 5459-2: 2000+A2: 2008
Dimensional / Ergonomic testing	EN 1335-1: 2020 and BS EN ISO 9241: 2019

Property/ Standard	Value, Unit
Intertek Clean Air VOC certification program (Gold rating)	Intertek's Clean Air certification demonstrates that Recur has been independently tested and found to conform to ANSI/BIFMA e3-2019, Sections 7.6.1, 7.6.2: Open Plan Office and Private Office
BS EN 1335-1: 2020	Office furniture. Office work chair - Dimensions. Determination of dimensions
BS EN 1335-2: 2018	Office furniture. Office work chair. Safety requirements.
BS 5459-2:2000+A2:2008	Specification for performance requirements and tests for office furniture - Office pedestal seating for use by persons weighing up to 150kg and for use up to 24 hours a day, including type-approval tests for individual components
Note: For more information, please contact Orangebox technical team and please check out https://orangebox.com/products/recur	

Main Product Contents

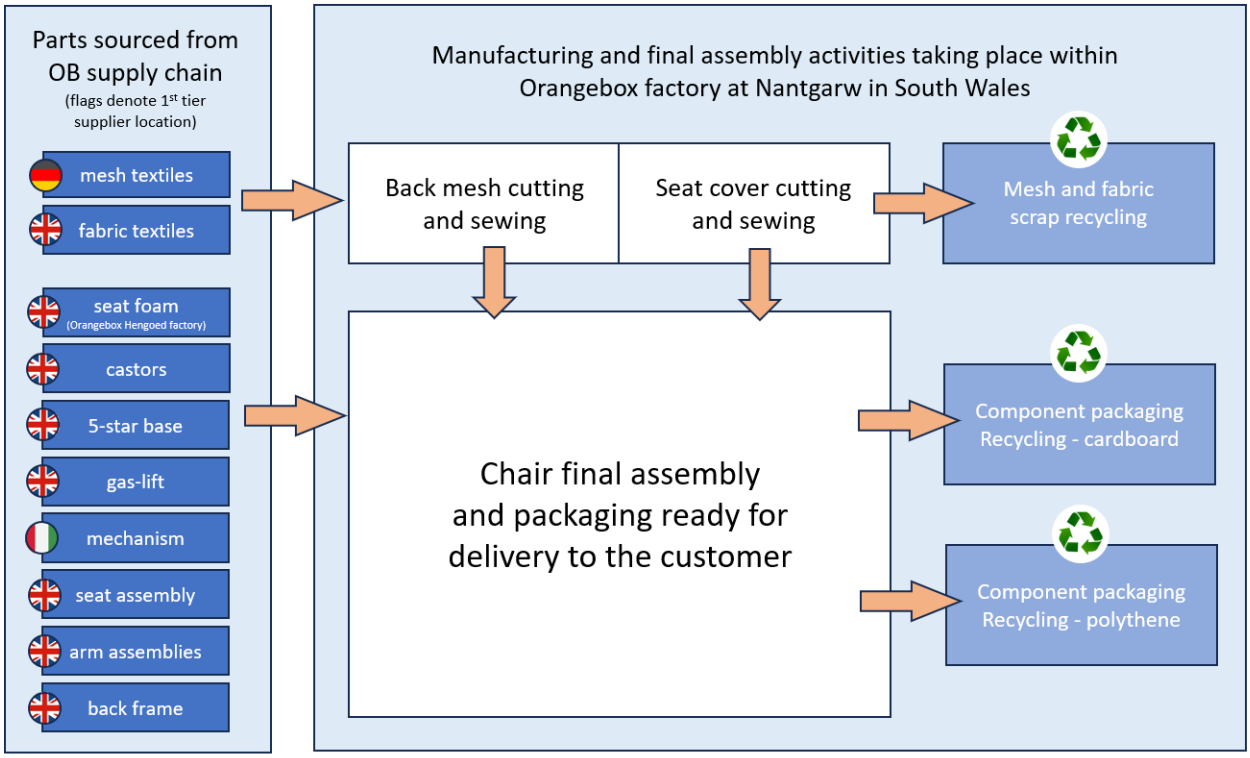
For Orangebox model code Recur-HBA (high-back task chair with height adjustable arms)

Material/Chemical Input	%
Plastic	45-50
Steel	20-25
Polypropylene	20-25
Aluminium	5-10
Others	<1

Manufacturing Process

The manufacturing process for building a Recur chair at Orangebox's factory consists predominantly of the final assembly of parts designed by Orangebox and procured through the supply chain. Fabric seat covers and mesh back covers are cut & sewn on the same premises, prior to final assembly of the chair, which is undertaken using compressed air powered hand tools as required. Production scrap (fabric) and packaging materials from the supply of parts into Orangebox (predominantly polythene and cardboard) are recycled locally.

Process flow diagram



End of Life

At the end of its life, the chair will be manually removed from the building and sent to a waste processing facility for treatment.

For more information - Please see the scenario table on Page 14 of this document.

Life Cycle Assessment Calculation Rules

Declared / Functional unit description

1 Recur HBA task chair with a weight of 12.5kg (with height adjustable arms) maintained for a 10-year period

System boundary

This is a Cradle-to-Gate with Module C and D EPD, reporting the upstream processing stages A1 to A3, end-of-life stages C1-C4 and D in accordance with EN 15804:2012+A2:2019 and BRE 2023 Product Category Rules (PN 514 Rev 3.1).

Data sources, quality and allocation

The datasets are derived from Ecoinvent v3.8, and the LCA tool used was BRE LINA A2. The LCA analysis is conducted for the **1 Recur HBA task chair with the weight of 12.5 kg (with height adjustable arms)** manufactured in Nantgarw factory over the period from 01/04/2024 to 30/09/2024 which is produced at 5.67% of the overall site production. Only six months of production data was used for the LCA modelling due to limited data availability and the manufacturer has confirmed that the manufacturing process and the electricity used for the manufacturing remains the same.

In addition to the Recur Chair, other products are manufactured in the Nantgarw factory. Therefore, the allocation of electricity, fuel, water consumption, and discharge are required. This allocation has been done according to the provisions of BRE PCR PN514 and EN 15804, using the **Unit** production quantity. In the Recur Chair production line there is no other co-products are manufacturing therefore Site-wide gas and electricity data taken from monthly meter readings and site-wide waste data collated from monthly reports submitted by waste carrier suppliers. Figures for the raw materials, ancillary materials and packaging were from actual usages. Manufacturer has confirmed that the production waste is metered, and the quantity reported in the LCA report are based on the actual figures.

Upon data review, it is noted that the output is slightly higher than the input however the mass balance is within the acceptable range. In addition, no proxy dataset used for the LCA modelling, secondary data has been obtained for all other upstream and downstream processes that are beyond the control of the manufacturer (i.e. raw material production) from the ecoinvent 3.8 database. All ecoinvent datasets are complete within the context used and conform to the system boundary and the criteria for the exclusion of inputs and outputs, according to the requirements specified in EN 15804:2012+A2:2019.

ISO14044 guidance. Quality Level	**Geographical representativeness**	**Technical representativeness**	**Time representativeness**
Very Good	Data from area under study.	Data from processes and products under study. Same state of technology applied as defined in goal and scope (i.e., identical technology).	There is approximately 1-2 years between the Ecoinvent LCI reference year, and the time period for which the LCA was undertaken.

Specific European datasets have been selected from the ecoinvent LCI for this LCA. Manufacturer uses the Uk national grid electricity for production, so therefore the UK national grid electricity dataset has been used for the LCA modelling (Ecoinvent 3.8). The GWP carbon footprint for using 1 kWh of the UK grid electricity is 0.239 kgCO2e/kWh and for using 1kWh of Natural gas is 0.232 kgCO2eq/kWh. The quality level of time representativeness is also Very Good as the background LCI datasets are based on ecoinvent v3.8 which was compiled in 2021. Therefore, there is less than 5 years between the ecoinvent LCI reference year and the time period for which the LCA was undertaken

Cut-off criteria

All raw materials and energy input to the manufacturing process have been included, except for direct emissions to air, water, and soil, which are not measured because Orangebox's Nantgarw factory is an assembly plant and as such, there are no requirements for monitored emissions to air, water or soil. The inventory process in this LCA includes all data related to raw material, packaging material and consumable items.

LCA Results

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts									
			GWP-total	GWP-fossil	GWP-biogenic	GWP-luluc	ODP	AP	EP-freshwater
			kg CO_2 eq	kg CO_2 eq	kg CO_2 eq	kg CO_2 eq	kg CFC11 eq	mol H^+ eq	kg $(PO_4)^{3-}$ eq
Product stage	Raw material supply	A1	2.46E+01	2.44E+01	1.51E-01	2.08E-02	1.12E-06	1.16E-01	6.59E-03
	Transport	A2	2.35E+00	2.34E+00	1.81E-03	1.09E-03	5.27E-07	2.15E-02	1.49E-04
	Manufacturing	A3	4.41E+00	2.55E+00	1.86E+00	1.71E-03	1.43E-07	5.29E-03	3.26E-04
	Total (Consumption grid)	A1-3	3.13E+01	2.93E+01	2.01E+00	2.36E-02	1.79E-06	1.43E-01	7.07E-03
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.04E-01	1.04E-01	8.85E-05	4.08E-05	2.40E-08	4.22E-04	6.69E-06
	Waste processing	C3	5.77E+00	5.77E+00	-5.24E-03	2.25E-03	2.74E-07	1.28E-02	4.83E-04
	Disposal	C4	2.11E-03	2.09E-03	1.37E-05	2.23E-06	4.20E-10	1.57E-05	4.85E-07
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-3.19E+01	-3.18E+01	-5.11E-02	-2.15E-02	-7.27E-07	-1.44E-01	-6.64E-03

GWP-total = Global warming potential, total;
GWP-fossil = Global warming potential, fossil;
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; and
EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts									
			EP-marine	EP-terrestrial	POCP	ADP-mineral &metals	ADP-fossil	WDP	PM
			kg N eq	mol N eq	kg NMVOC eq	kg Sb eq	MJ, net calorific value	m^3 world eq deprived	disease incidence
Product stage	Raw material supply	A1	2.37E-02	2.32E-01	8.29E-02	2.16E-04	4.39E+02	1.31E+01	2.28E-06
	Transport	A2	5.73E-03	6.32E-02	1.77E-02	8.59E-06	3.45E+01	1.51E-01	1.89E-07
	Manufacturing	A3	1.61E-03	1.69E-02	4.92E-03	1.02E-05	4.94E+01	4.30E-01	4.48E-08
	Total (Consumption grid)	A1-3	3.10E-02	3.12E-01	1.06E-01	2.34E-04	5.23E+02	1.37E+01	2.52E-06
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.27E-04	1.39E-03	4.25E-04	3.61E-07	1.57E+00	7.07E-03	8.96E-09
	Waste processing	C3	5.49E-03	4.44E-02	1.33E-02	2.46E-05	3.54E+01	9.23E-01	2.40E-07
	Disposal	C4	4.49E-06	4.87E-05	1.43E-05	4.67E-09	3.86E-02	1.48E-03	2.66E-10
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.53E-02	-2.66E-01	-1.03E-01	-1.25E-04	-7.62E+02	-9.19E+00	-1.75E-06

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;
EP-terrestrial = Eutrophication potential, accumulated exceedance;
POCP = Formation potential of tropospheric ozone;
ADP-mineral&metals = Abiotic depletion potential for non-fossil resources;
ADP-fossil = Depletion potential of the stratospheric ozone layer;
WDP = Water (user) deprivation potential, deprivation-weighted water consumption; and
PM = Particulate matter.

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts							
			IRP	ETP-fw	HTP-c	HTP-nc	SQP
			kBq U^{235} eq	CTUe	CTUh	CTUh	dimensionless
Product stage	Raw material supply	A1	1.38E+00	7.14E+02	8.33E-08	7.32E-07	4.58E+01
	Transport	A2	1.76E-01	2.65E+01	1.15E-09	2.71E-08	2.20E+01
	Manufacturing	A3	1.17E+00	2.29E+01	9.81E-10	2.00E-08	1.45E+01
	Total (Consumption grid)	A1-3	2.72E+00	7.63E+02	8.55E-08	7.79E-07	8.23E+01
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	8.07E-03	1.23E+00	3.97E-11	1.29E-09	1.08E+00
	Waste processing	C3	1.91E-01	4.18E+01	4.19E-09	4.75E-08	2.60E+01
	Disposal	C4	2.00E-04	2.29E+01	1.63E-12	4.29E-11	6.43E-02
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.86E+00	-4.57E+02	-2.95E-08	-4.12E-07	-4.87E+01

IRP = Potential human exposure efficiency relative to U235;
ETP-fw = Potential comparative toxic unit for ecosystems;
HTP-c = Potential comparative toxic unit for humans;
HTP-nc = Potential comparative toxic unit for humans; and
SQP = Potential soil quality index.

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing resource use, primary energy								
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	1.98E+01	0.00E+00	1.98E+01	3.19E+02	1.16E+02	4.35E+02
	Transport	A2	4.67E-01	0.00E+00	4.67E-01	3.37E+01	0.00E+00	3.37E+01
	Manufacturing	A3	-1.68E+01	2.54E+01	8.63E+00	4.69E+01	1.35E+01	6.04E+01
	Total (Consumption grid)	A1-3	3.46E+00	2.54E+01	2.89E+01	3.99E+02	1.29E+02	5.29E+02
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	2.21E-02	0.00E+00	2.21E-02	1.54E+00	0.00E+00	1.54E+00
	Waste processing	C3	6.45E-01	0.00E+00	6.45E-01	-3.57E+02	3.64E+02	6.96E+00
	Disposal	C4	1.48E-03	0.00E+00	1.48E-03	3.81E-02	0.00E+00	3.81E-02
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.96E+01	0.00E+00	-1.96E+01	-4.76E+02	-2.78E+02	-7.54E+02

PERE = Use of renewable primary energy excluding renewable primary energy used as raw materials;
PERM = Use of renewable primary energy resources used as raw materials;
PERT = Total use of renewable primary energy resources;

PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials;
PENRM = Use of non-renewable primary energy resources used as raw materials;
PENRT = Total use of non-renewable primary energy resource

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing resource use, secondary materials and fuels, use of water						
			SM	RSF	NRSF	FW
			kg	MJ net calorific value	MJ net calorific value	m^3
Product stage	Raw material supply	A1	1.11E+00	0.00E+00	0.00E+00	3.15E-01
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	3.74E-03
	Manufacturing	A3	5.96E-03	2.98E-05	0.00E+00	1.58E-02
	Total (Consumption grid)	A1-3	1.12E+00	2.98E-05	0.00E+00	3.35E-01
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	1.75E-04
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	2.22E-02
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	3.51E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	-2.22E-01

SM = Use of secondary material;
RSF = Use of renewable secondary fuels;
NRSF = Use of non-renewable secondary fuels;
FW = Net use of fresh water

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	3.39E+00	2.59E+01	5.41E-04
	Transport	A2	4.10E-02	6.70E-01	3.67E+01
	Manufacturing	A3	1.24E-01	3.34E+00	3.19E-04
	Total (Consumption grid)	A1-3	3.55E+00	2.99E+01	3.67E+01
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	1.73E-03	3.08E-02	1.06E-05
	Waste processing	C3	1.10E-01	1.77E+00	3.57E-05
	Disposal	C4	5.81E-04	4.06E-02	2.00E-07
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-2.98E+00	-2.88E+01	-6.08E-04

HWD = Hazardous waste disposed;
NHWD = Non-hazardous waste disposed;
RWD = Radioactive waste disposed

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Other environmental information describing output flows – at end of life								
			CRU	MFR	MER	EE	Biogenic carbon (product)	Biogenic carbon (packaging)
			kg	kg	kg	MJ per energy carrier	kg C	kg C
Product stage	Raw material supply	A1	0.00E+00	1.24E-03	2.31E-06	0.00E+00	0.00E+00	1.42E-03
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Manufacturing	A3	0.00E+00	1.27E+00	2.76E-07	2.41E-02	6.00E-01	2.76E-01
	Total (Consumption grid)	A1-3	0.00E+00	1.27E+00	2.58E-06	2.41E-02	6.00E-01	2.78E-01
End of life	Deconstruction, demolition	C1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Waste processing	C3	0.00E+00	7.68E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

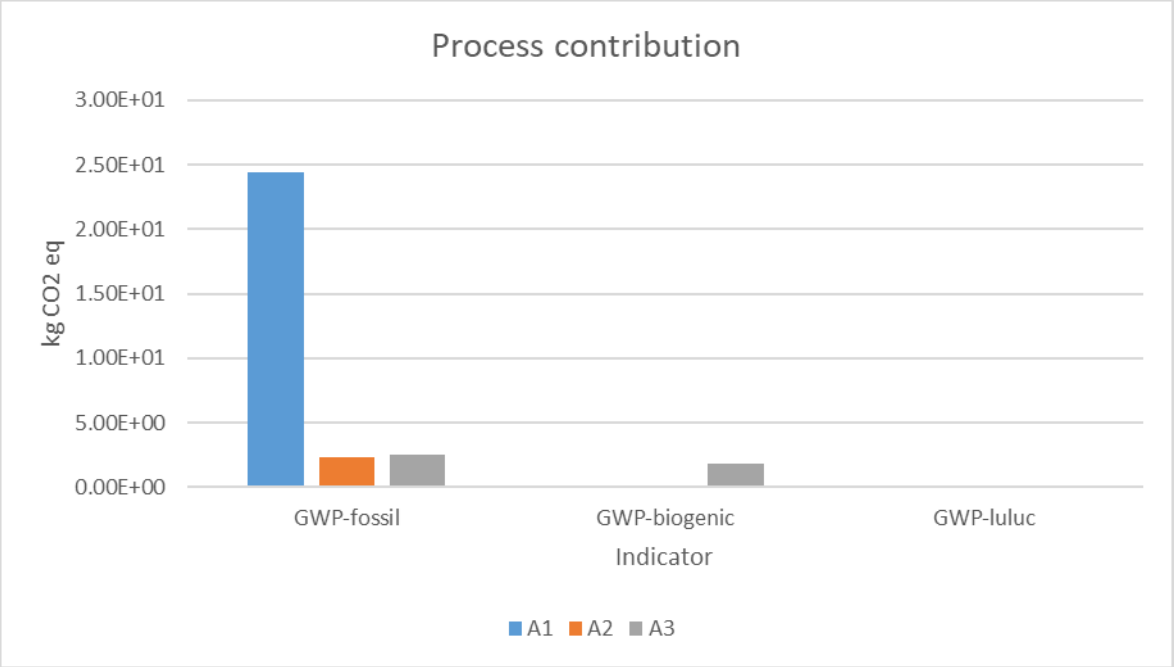
Scenarios and additional technical information

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
C1 – Deconstruction	There is no specific deconstruction process required to remove the chair once it reaches the end of its life. Since the chair can be used in various applications, such as households or offices, the deconstruction process may vary depending on the final application. For the purposes of this analysis, it is assumed that the chair is used in an office setting. At the end of its life, the chair will be manually removed from the building and sent to a waste processing facility for treatment. It is assumed that 100% of the final product is removed from the deconstruction unit at its end of life.		
C2 – Transportation	50km by road has been modelled for module C2 as a typical distance from the demolition site to the pre-processing unit. However, end-users of the EPD can use this information to calculate the impacts of a bespoke transport distance for module C2 if required		
	Road transport	Lorry, 16-32 tonne	50 km
C3 - Deconstruction	Once the waste chair reaches the waste processing facility, it will be manually dismantled using hand tools. The dismantling process involves categorising the chair components into parts such as the seat adjusting mechanism, castor body and wheels, 5-star base, gas lift, seat foam, and seat cover. These components are treated as steel and plastic waste, with each undergoing an appropriate end-of-life treatment based on its material composition. The energy used for the dismantling process is not included in this analysis, as it is considered outside the scope of this LCA. The corresponding end-of-life scenarios for steel materials have been referenced from BRE PCR EN 15804 3.1, while the end-of-life treatment for Nylon-based plastics has been referenced from the British Plastics Federation. Typically, the Recur chair components consist of 43% Nylon (glass-filled), 25% Polypropylene (glass-filled), with the remaining percentage comprising steel, aluminium, polyester resin, and polyurethane foam. According to BRE PCR EN 15804 V3.1, 95% of the steel and aluminium waste will be recycled, while 5% is considered a natural loss during the waste processing stage. Additionally, 100% of the polyurethane and polyester waste will be incinerated for energy recovery. For plastics, the manufacturer has confirmed that the materials used in the production process have significant recycling potential. In alignment with guidance from the British Plastics Federation, it is assumed that 100% of the plastic waste can be recycled.		
	Steel waste 95% to recycling	kg	2.339
	Aluminium waste to recycling	kg	0.701
	Nylon glass filled plastic to recycling	kg	5.466
	Polypropylene plastic waste to recycling	kg	3.018
	Polyurethane waste to incineration	kg	0.710
	Polyester resin waste to incineration	kg	0.104

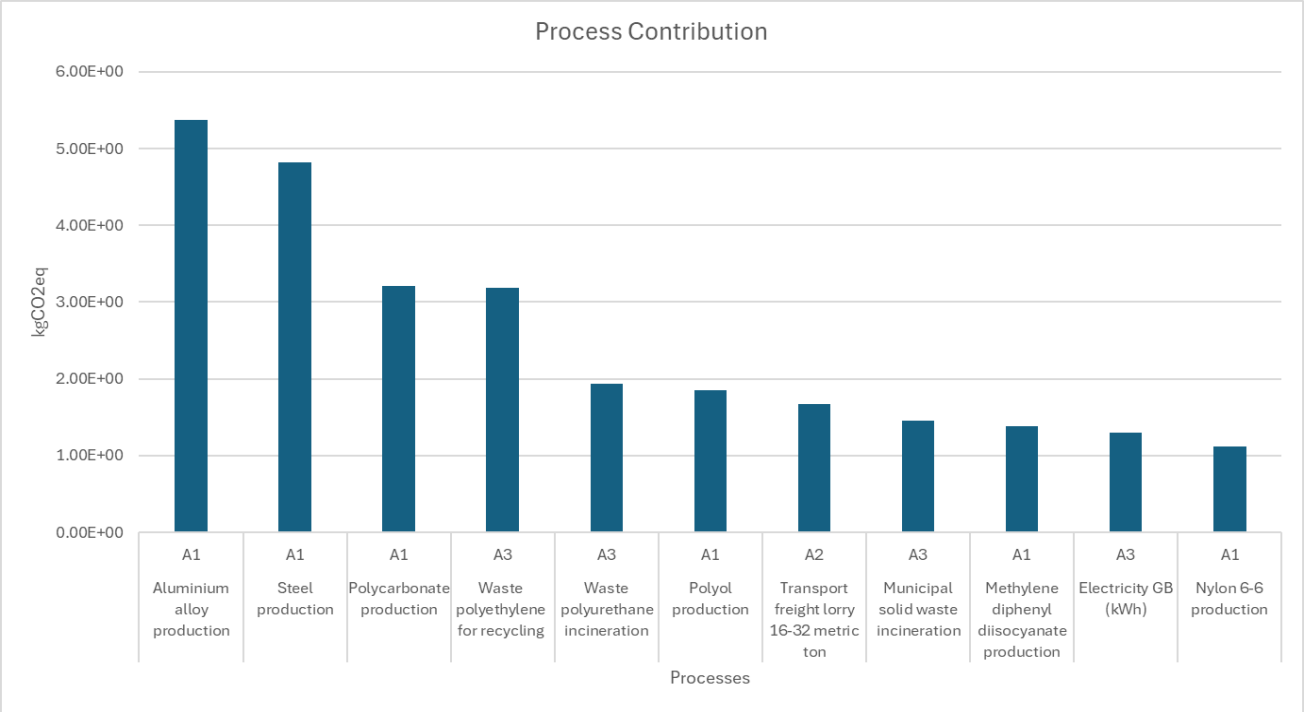
Scenarios and additional technical information			
Scenario	Parameter	Units	Results
C4 – Disposal	Some of the materials can't be recovered during the waste processing process and they will be end up in landfill		
	5% Steel waste to landfill	kg	0.123
	5% aluminium waste to landfill	kg	0.037
Module D	The Recur chair is made up of post-consumer and virgin materials. In calculating the benefits of recycling the steel the pre-existing recycled content has been removed, and the benefits have been calculated only for virgin steel, aluminium and for only virgin plastics. The waste plastic is the mix of nylon, polycarbonate, polypropylene therefore the polypropylene dataset has been used for the analysis. A recycling plastic involves shredding or grinding plastic into smaller flakes. The washed and sorted plastic is sent through shredding machines where it is ground into smaller pieces of plastic and melting down the plastic and forcing this through an extruder. The plastic is cut as it comes out of the extruder to form pellets. Pellets are sold onto manufacturers. Steel and aluminium recycling is highly efficient and helps reduce the need for new raw materials, saving energy and resources. Incinerating the PU foam and polyester resin will generate energy, which can be used to generate electricity or heat. The dataset used to calculate the avoided impacts of electricity consumption in a future system was 'Electricity, medium voltage {GB}| market for | Alloc Def, U'. Secondary material in steel = 37.6%, therefore, to calculate the amount of virgin steel = 2.34-(2.34*37.6%) = 1.46 kg Benefits due to recycling of steel = 1.46 kg Secondary material in Aluminium = 25.9%, therefore, to calculate the amount of virgin aluminium = 0.70- (0.70*25.9%) = 0.52 kg Benefits due to recycling of Aluminium = 0.52 kg Note: Secondary material content has been taken from Ecoinvent 3.8 database Secondary material content is negligible in the Polypropylene dataset therefore the benefits due to recycling of Polypropylene = 8.48 kg (sum of Nylon, polypropylene) Benefits due to incineration of PU foam and polyester resin = 0.814 kg		

Interpretation of results

The bulk of the environmental impacts and primary energy demand are attributed to the manufacturing phase, covered by information modules A1-A3 of EN15804:2012+A2:2019. The chart provides a breakdown of the Global Warming Potential (GWP) from various categories and emission sources, This helps identify where the most significant contributions to GWP are occurring, which could inform decisions about reducing environmental impacts in production and supply chain processes.



The chart illustrates the Global Warming Potential (GWP) contributions of various materials and processes, measured in kg CO_2-equivalent per unit. Aluminium alloy production has the highest environmental impact, followed closely by low-alloyed hot-rolled steel and polycarbonate production, all within the raw material extraction phase (A1). Waste polyethylene recycling (A3) and transportation via freight lorry (A2) also contribute significantly, highlighting emissions from both waste management and logistics. Mid-level contributors include waste incineration and polyol production, while materials like municipal waste incineration, electricity use, methylene diphenyl diisocyanate, and Nylon 6-6 production show comparatively lower GWP values.



References

BSI. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. BS EN 15804:2012+A2:2019. London, BSI, 2019.

BSI. Environmental labels and declarations – Type III Environmental declarations – Principles and procedures. BS EN ISO 14025:2010 (exactly identical to ISO 14025:2006). London, BSI, 2010.

BSI. Environmental management – Life cycle assessment – Principles and framework. BS EN ISO 14040:2006. London, BSI, 2006.

BSI. Environmental management – Life cycle assessment – requirements and guidelines. BS EN ISO 14044:2006. London, BSI, 2006.

BS EN 1335-1: 2020 - Office furniture. Office work chair - Dimensions. Determination of dimensions

BS EN 1335-2: 2018 - Office furniture. Office work chair. Safety requirements.

BS 5459-2:2000+A2:2008 - Specification for performance requirements and tests for office furniture - Office pedestal seating for use by persons weighing up to 150kg and for use up to 24 hours a day, including type-approval tests for individual components

ISO 9241-220:2019 - Ergonomics of human-system interaction

ISO 14001:2015 - Environmental management systems

ISO 9001:2015 - Quality management systems

https://www.bpf.co.uk/plastipedia/sustainability/how-is-plastic-recycled-a-step-by-step-guide-to-recycling.aspx