Life Cycle Assessment

FlexStep

by Energy Solution
Vers. 11.2024

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LCA (LIFE CYCLE ASSESSMENT) FLEXSTEP

3 TYPES OF ENVIRONMENTAL DECLARATIONS

Type 1:

A declaration stating that the product is better than the benchmark. This requires an assessment by an independent third party. Threshold values must be met to receive the certification. Examples include the Nordic Swan Ecolabel and Ecolabel, among others.

Type 2:

Declarations that are self-declared and not necessarily third-party verified. This can be done to draw attention to the environmental aspects of a product. Reliability, credibility, and recognition of this type of declaration can vary greatly.

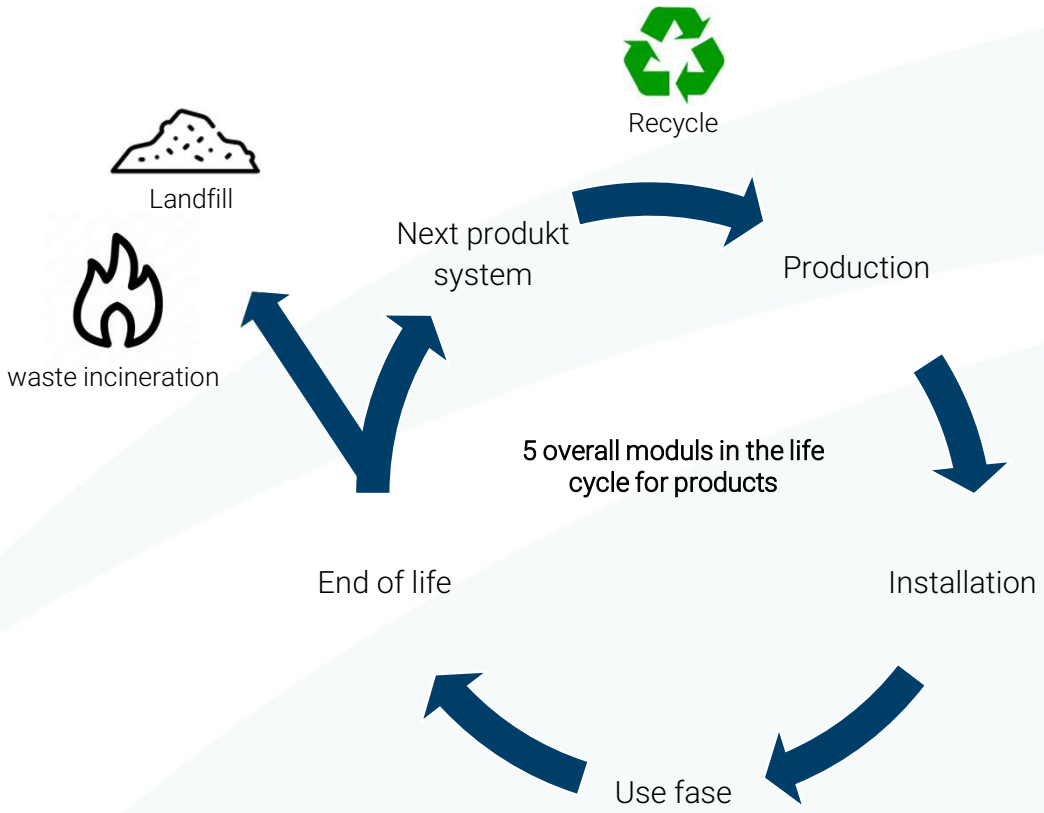
Type 3: ISO 14025

A declaration that neutrally communicates the environmental effects of a product quantitatively. The assessment must be third-party verified by an independent third party. The declaration is based on an LCA according to ISO 14040. EPDs fall under this type of declaration and additionally follow ISO 15804 +A2. Products with the same function can be compared.

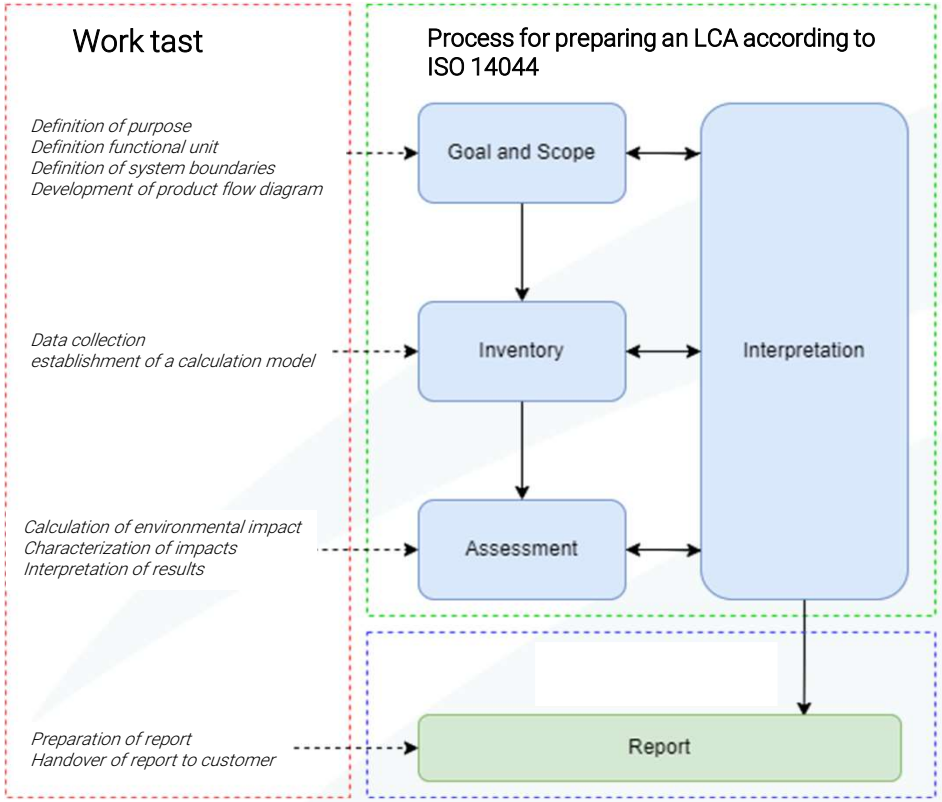
LIFE CYCLE ASSESSMENT

Life cycle assessment, abbreviated LCA, is widely used to document the environmental impacts of products and services.

An LCA assesses environmental impacts for the entire life cycle of a product, from raw material extraction to waste treatment or recycling.



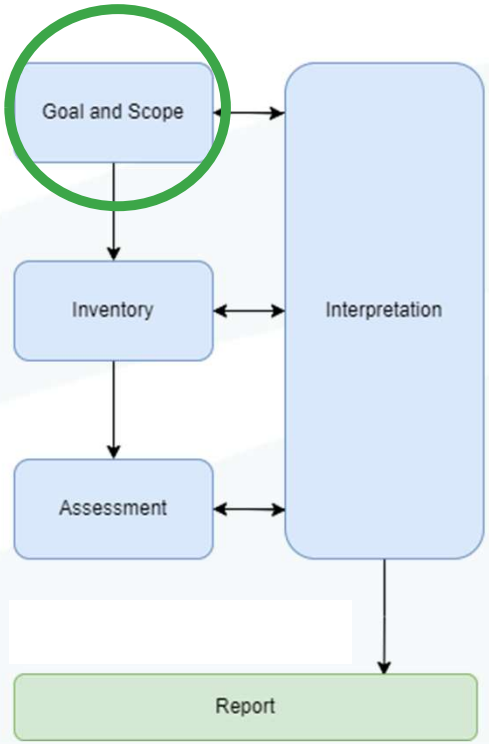
THE PROCESS FOR PREPARING AN LCA



DESCRIPTION OF THE PROCESS TOWARDS THE GOAL

GOAL AND SCOPE

Process for preparing an LCA according to ISO 14044



Purpose

1. To gain insight into the environmental impact of FlexStep

GOAL AND SCOPE

Functional unit – according to c-PCR-008

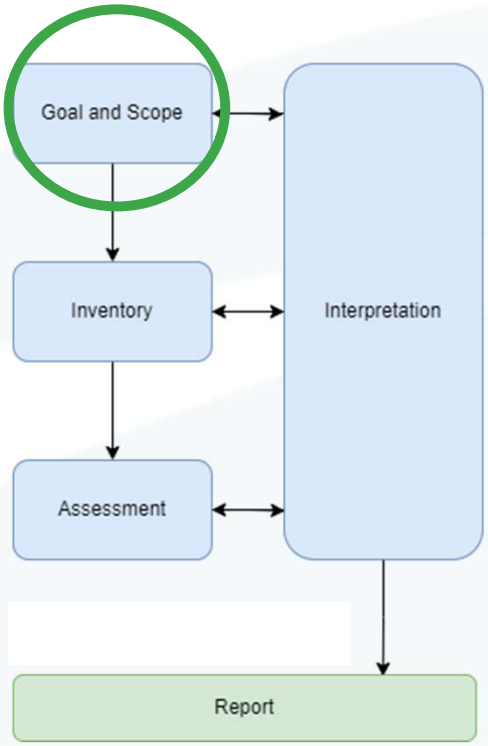
Index	Values	In case of range
Type of installation	FlexStep, indoor with 4 steps and a width of 900 mm	
Commercial name	FlexStep V2	
Mail purpose	Transport of passengers	
Type of lift	Electric	
Type of driven system	Screw and nut drive	
Rated load [fixed or range]	400 kg / 200 kg (temp.<-20)	400 kg
Rated speed [fixed or range]	Lifting speed at temperature +40˚C - +5˚C <60 mm/sek. +5˚C - -10˚C 20 mm/sek. -10˚C - -20˚C 10 mm/sek. -20˚C - -25˚C 10 mm/sek.	55mm/sek.
Number of stops [fixed or range]	1	
Travelled height [fixed or range]	240-1250mm.	600mm.
Number of operating days/year [fixed or range]	12-365	365
Applied usage category (UC) according to ISO 25745-2	UC1	
Designed Reference Service Life (RSL)	25 years according to toc-PCR-008	
Geographic region of intended installation	Europe	
Additional information		
Recommended application (main marked) - Building rise - Building type	Low-rise residential/commercial	
Optional equipment	N/A	
Additional requirements	N/A	

GOAL AND SCOPE

Functional unit

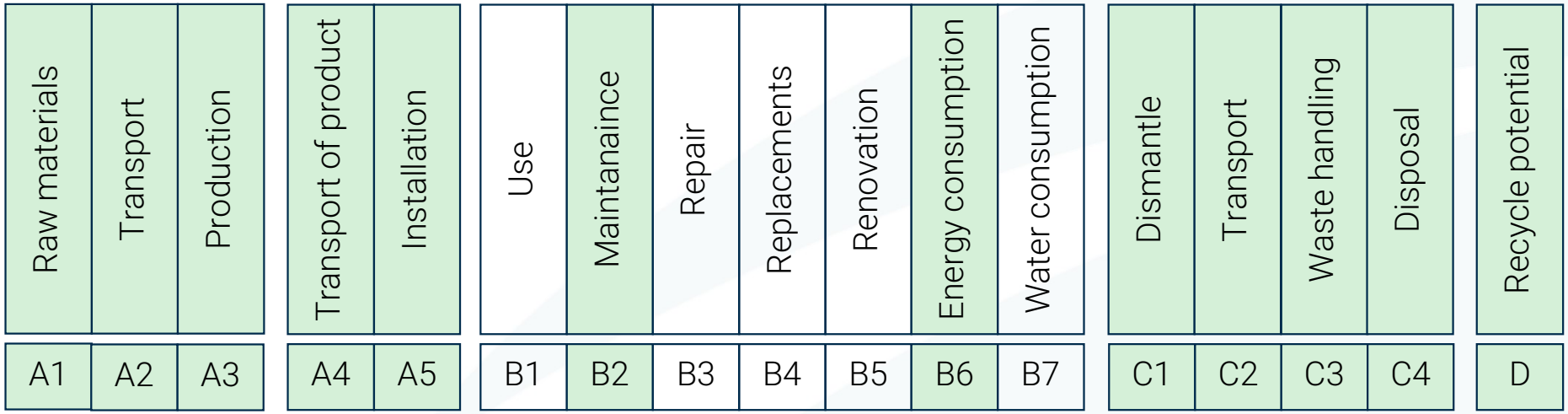
Parameter	How to calculate	Calculation
Average car load	Rated load [t] multiplied by the corresponding percentage from Table 3 of ISO 25745-2.	0.4 tonnes * 0.075 = 0.03 tonnes
Distance travelled by the lift during the service life	One-way average travel distance * number of trips per day * number of operating days per year * Reference Service Life	0.0006 km * 20 trips * 365 days * 25 years = 109.5 km
Transportation performance (TP)	Average car load multiplied by the distance travelled by the lift during the service life	0.03 tonnes * 109.5 km = 3.3 tkm

Process for preparing an LCA according to ISO 14044



GOAL AND SCOPE

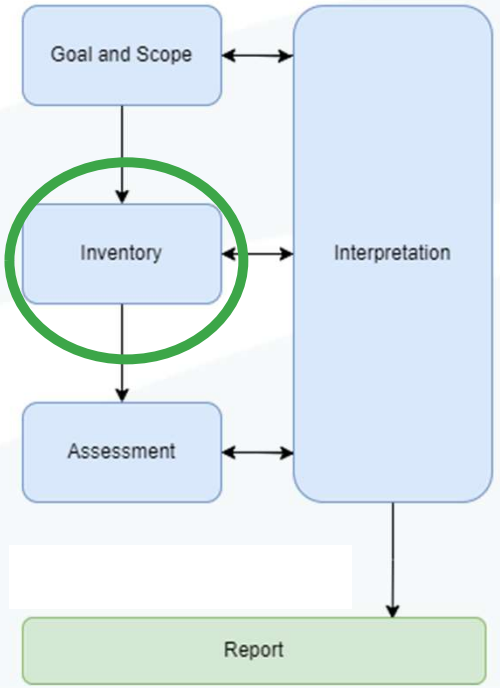
System boundaries, c-PCR-008

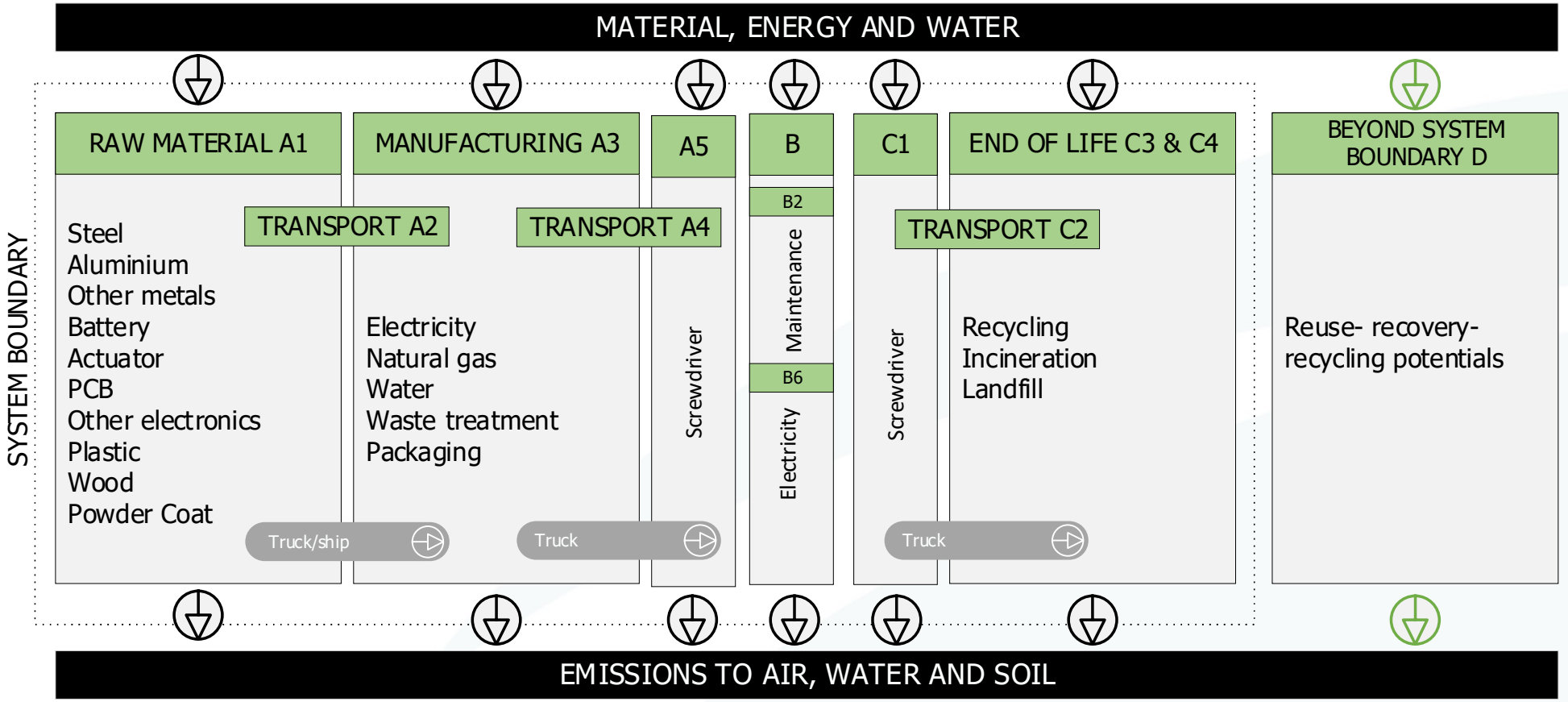


LIFE CYCLE INVENTORY (LCI)

1. Data collection
2. establishment of a calculation model

Process for preparing an LCA according to ISO 14044




MATERIAL, ENERGY AND WATER
SYSTEM BOUNDARY
RAW MATERIAL A1
MANUFACTURING A3
A5
B
C1
END OF LIFE C3 & C4
BEYOND SYSTEM BOUNDARY D
Steel
Aluminium
Other metals
Battery
Actuator
PCB
Other electronics
Plastic
Wood
Powder Coat
TRANSPORT A2
Truck/ship
TRANSPORT A4
Truck
Electricity
Natural gas
Water
Waste treatment
Packaging
Screwdriver
B2
Maintenance
B6
Electricity
Screwdriver
TRANSPORT C2
Truck
Recycling
Incineration
Landfill
Reuse- recovery-
recycling potentials
EMISSIONS TO AIR, WATER AND SOIL

RESULTATS OF THE LCA

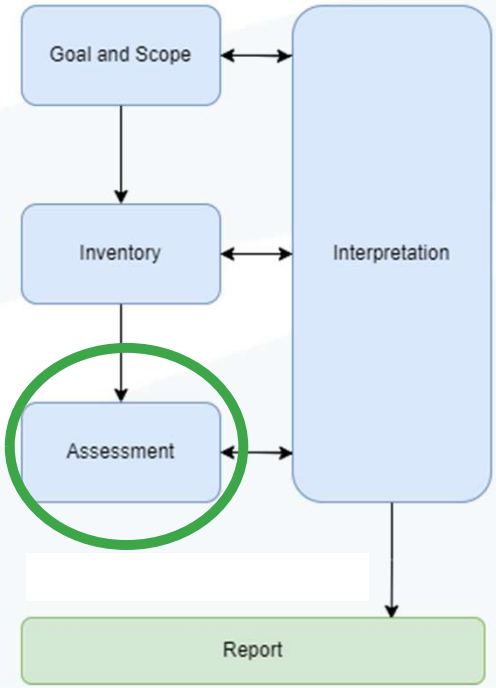
LIFE CYCLE INVETORY ASSESSMENT (LCIA)

1. Valg af metode
   - Fastsat på baggrund af EN 15804+A2

2. Characterization of impacts
   - Calculation of environmental impact

3. Interpretation of results

Process for preparing an LCA according to ISO 14044



ALL IMPACT CATEGORIES

ENVIRONMENTAL IMPACTS PER tkm														
Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	B2	B6	C1	C2	C3	C4	D
GWP-total	**kg CO_2 eq.**	**7.92E+02**	**4.22E+00**	**-1.11E+01**	**7.85E+02**	**2.88E+01**	**3.94E+01**	**1.50E+02**	**4.53E+02**	**0.00E+00**	**5.74E-01**	**1.45E+01**	**0.00E+00**	**-2.33E+01**
GWP-fossil	kg CO_2 eq.	7.96E+02	4.21E+00	2.64E+01	8.26E+02	2.88E+01	1.80E+00	1.50E+02	4.36E+02	0.00E+00	5.74E-01	8.56E+00	0.00E+00	-6.32E+01
GWP-biogenic	kg CO_2 eq.	-5.90E+00	3.72E-03	-3.76E+01	-4.35E+01	2.64E-02	3.76E+01	4.16E-02	1.52E+01	0.00E+00	5.26E-04	4.35E+01	0.00E+00	4.00E+01
GWP-luluc	kg CO_2 eq.	1.69E+00	2.11E-03	5.29E-02	1.75E+00	1.42E-02	4.10E-04	7.23E-02	1.09E+00	0.00E+00	2.83E-04	4.49E-03	0.00E+00	-5.75E-02
ODP	kg CFC 11 eq.	2.35E-05	9.09E-08	1.32E-06	2.49E-05	6.27E-07	3.00E-08	3.79E-06	8.32E-06	0.00E+00	1.25E-08	2.10E-07	0.00E+00	-2.55E-06
AP	mol H^+ eq.	5.62E+00	1.27E-02	7.10E-02	5.71E+00	6.29E-02	1.03E-02	6.37E-01	2.50E+00	0.00E+00	1.25E-03	2.29E-02	0.00E+00	-4.94E-01
EP-freshwater	kg P eq.	5.79E-01	2.95E-04	6.96E-03	5.86E-01	2.05E-03	8.39E-05	2.11E-02	4.13E-01	0.00E+00	4.08E-05	1.02E-03	0.00E+00	-3.57E-02
EP-marine	kg N eq.	1.22E+00	3.24E-03	2.63E-02	1.25E+00	1.59E-02	1.33E-02	1.96E-01	4.05E-01	0.00E+00	3.16E-04	1.45E-02	0.00E+00	-7.40E-02
EP-terrestrial	mol N eq.	1.01E+01	3.38E-02	1.89E-01	1.03E+01	1.61E-01	4.67E-02	2.09E+00	3.66E+00	0.00E+00	3.21E-03	5.96E-02	0.00E+00	-1.16E+00
POCP	kg NMVOC eq.	3.25E+00	1.68E-02	7.10E-02	3.34E+00	9.77E-02	1.88E-02	7.86E-01	1.18E+00	0.00E+00	1.95E-03	1.99E-02	0.00E+00	-3.30E-01
ADPm[1]	kg Sb eq.	9.74E-02	1.35E-05	4.78E-05	9.74E-02	9.41E-05	1.57E-06	1.63E-03	5.29E-03	0.00E+00	1.88E-06	2.08E-05	0.00E+00	-2.91E-03
ADPf[1]	MJ	9.29E+03	5.96E+01	3.88E+02	9.74E+03	4.09E+02	2.55E+01	2.04E+03	9.93E+03	0.00E+00	8.15E+00	4.24E+01	0.00E+00	-7.11E+02
WDP[1]	m^3 world eq. deprived	1.04E+02	2.43E-01	9.24E+00	1.14E+02	1.69E+00	2.77E-01	1.33E+01	1.12E+02	0.00E+00	3.36E-02	2.51E+00	0.00E+00	-8.63E+00
Caption	GWP-total = Global Warming Potential - total; 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 = Ozone Depletion; AP = Acidifcation; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use													
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.													

Additional environmental impacts, resource use and waste categories are available as well

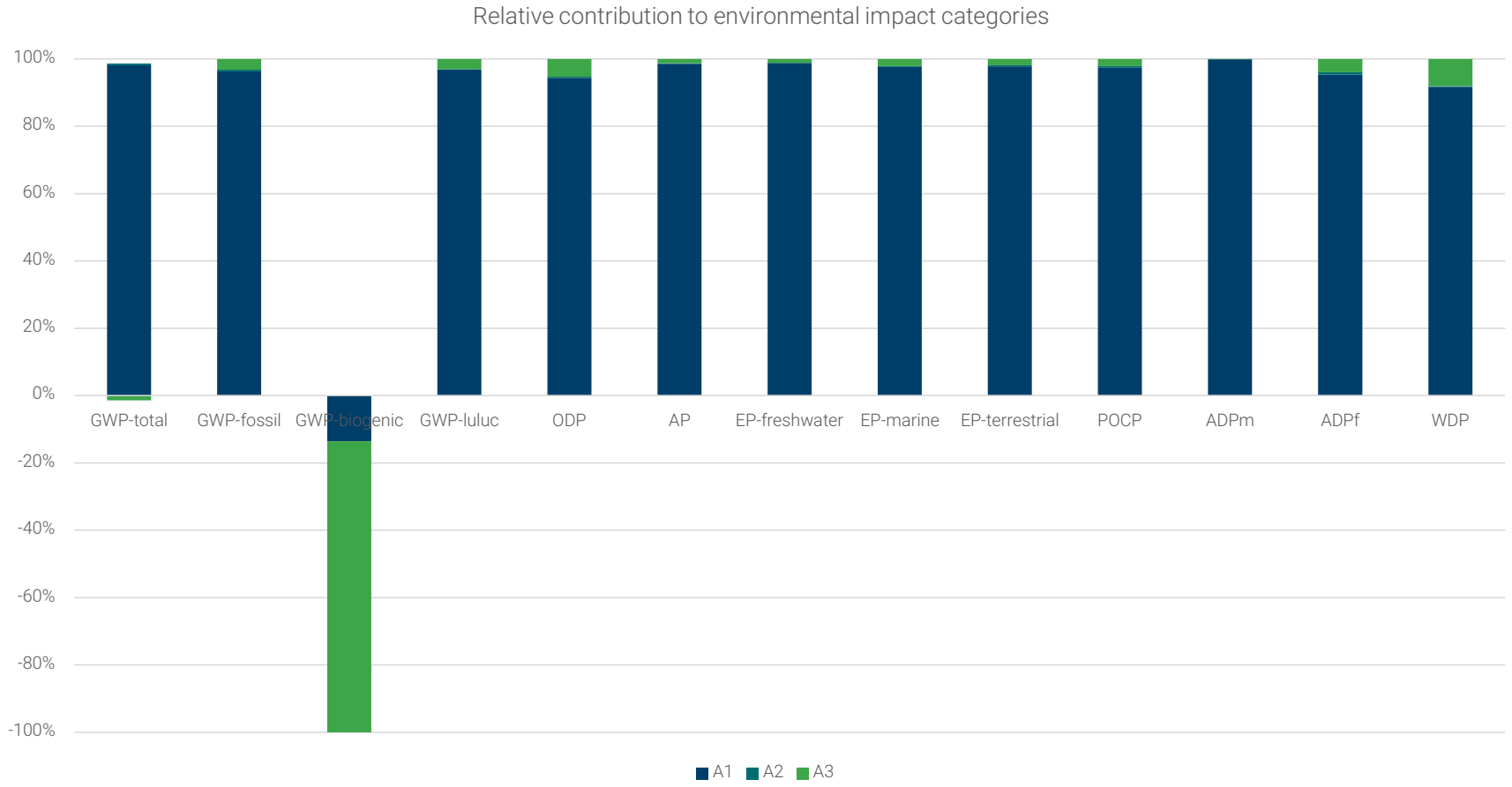
HEATMAP A1-A3

Environmental Impact				
Impact Category	Unit	Contribution	Process	% of category
GWP-total	kg CO_2 eq.	1.95E+02	Aluminium	13.2%
GWP-fossil	kg CO_2 eq.	1.95E+02	Aluminium	13.4%
GWP-biogenic	kg CO_2 eq.	3.76E+01	Waste wood, sanitary landfill	71.1%
GWP-luluc	kg CO_2 eq.	5.62E-01	Aluminium	19.2%
ODP	kg CFC 11 eq.	1.13E-05	Printed wiring board	29.9%
AP	mol H^+ eq.	1.36E+00	Printed wiring board	15.2%
EP-freshwater	kg P eq.	2.83E-01	Printed wiring board	27.6%
EP-marine	kg N eq.	2.86E-01	Electric motor	15.1%
EP-terrestrial	mol N eq.	2.93E+00	Printed wiring board	18.0%
POCP	kg NMVOC eq.	8.08E-01	Printed wiring board	14.9%
ADPm	kg Sb eq.	8.03E-02	Printed wiring board	76.9%
ADPf	MJ	2.36E+03	Printed wiring board	10.6%
WDP	m^3 world eq. deprived	3.30E+01	Printed wiring board	13.5%

HEATMAP

Environmental Impact				
Impact Category	Unit	Contribution	Process	% of category
GWP-total	kg CO_2 eq.	4.53E+02	Electricity, B6	31%
GWP-fossil	kg CO_2 eq.	4.36E+02	Electricity, B6	19%
GWP-biogenic	kg CO_2 eq.	4.35E+01	Waste wood, sanitary landfill	462%
GWP-luluc	kg CO_2 eq.	1.09E+00	Electricity, B6	23%
ODP	kg CFC 11 eq.	1.13E-05	Printed wiring board	18%
AP	mol H^+ eq.	2.50E+00	Electricity, B6	17%
EP-freshwater	kg P eq.	4.13E-01	Electricity, B6	26%
EP-marine	kg N eq.	4.05E-01	Electricity, B6	13%
EP-terrestrial	mol N eq.	3.66E+00	Electricity, B6	14%
POCP	kg NMVOC eq.	1.18E+00	Electricity, B6	13%
ADPm	kg Sb eq.	8.03E-02	Printed wiring board	40%
ADPf	MJ	9.93E+03	Electricity, B6	31%
WDP	m^3 world eq. deprived	1.12E+02	Electricity, B6	31%

INTERPRETATION



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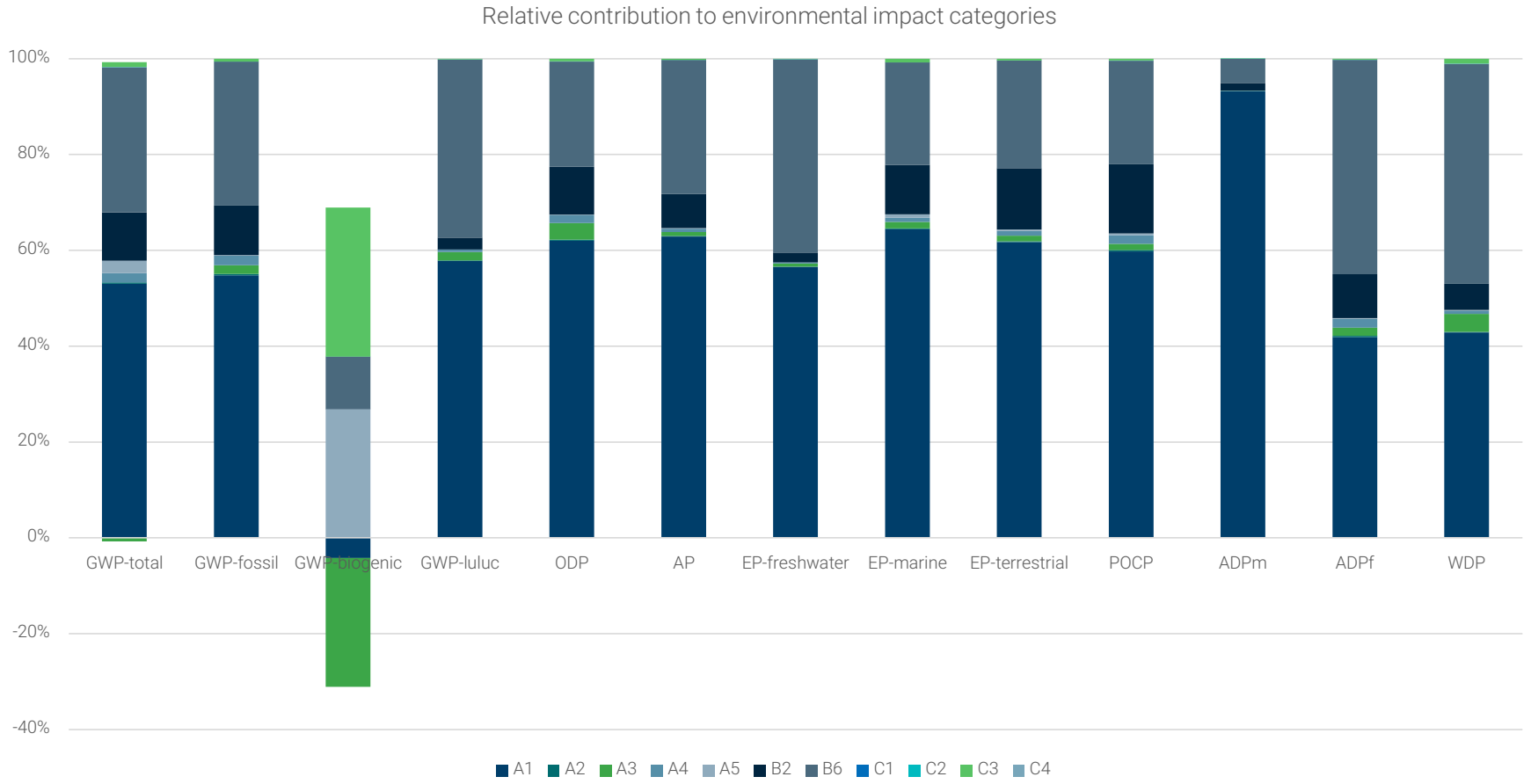
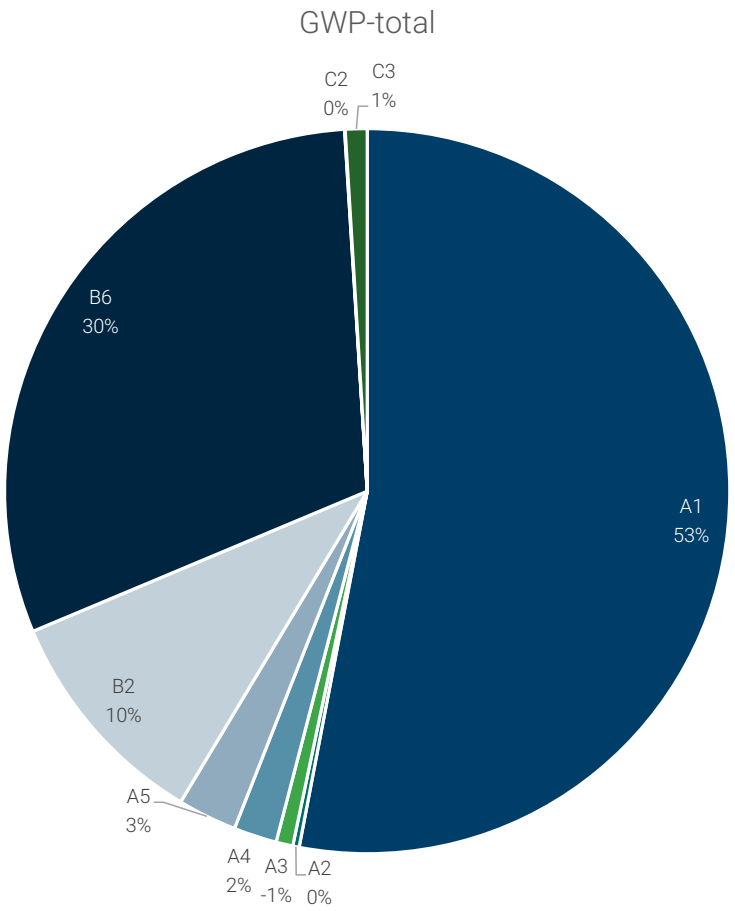


INTERPRETATION, GWP-TOTAL



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DIFFERENCE BETWEEN TYPE II AND TYPE III ENVIRONMENTAL PRODUCT DECLARATIONS

	Type II (LCA)	Type III (EPD)
Background report prepared	YES	YES
EPD report prepared	NO	YES
III party verifikation	NO	YES
Published by program operator	NO	YES
Can be used in communication	YES	YES

COMMUNICATION

Type II (LCA)
Our LCA shows that FlexStep has a CO2 impact of 4,832 kg CO2-eq. over its life cycle of 25 years Our LCA has been prepared based on ISO 14040 and 14044

How much is 4,832 kg CO2-EQ?

FlexStep = 4,832 kg CO2-eq (over 25 years)

Here are a few examples of activities or items that have a comparable carbon footprint of around 4,832 kg CO2-eq:

- **Car Travel**: Driving a gasoline-powered car for approximately 12,000 miles (about 19,300 kilometers) can produce a similar amount of CO2 emissions, depending on the vehicle's fuel efficiency.
- **Air Travel**: A round-trip flight from New York to Los Angeles generates about 2,000 kg CO2-eq per passenger, so two round trips would be roughly equivalent.
- **Home Energy Use**: The annual energy consumption of an average U.S. household, which can range from 6,000 to 12,000 kWh, can produce around 4,000 to 6,000 kg CO2-eq, depending on the energy source.
- **Meat Consumption**: Producing about 200 kg of beef can result in approximately 4,000 to 5,000 kg CO2-eq, depending on farming practices.

These examples illustrate activities or products that emit a similar amount of CO2 over a year or during their life cycle.

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