EcoProduct i-report

2013 PRODUCT FOOTPRINT REPORT

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i-report tool prepared by:

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1 Scope of the study

1.1 System boundaries

The study accounts for all the phases of the life cycle, including the manufacturing of the raw materials, transportation of the raw materials to the converting facility, manufacturing of the final product, all internal transportation during the manufacturing phase, packaging of the products, transportation of the product to the consumer, and end of life. The use phase is accounted for (number of times the product is reused), but the cleaning of the reusable product is not taken into account.

The life cycle steps are broken down as follows in the model:

1. Materials	The materials life cycle step includes the "cradle-to-gate" production of the materials. This includes all the impacts from the extraction of resources to the material manufacturing facility gates.
2. Transport of raw materials	The transport of raw materials life cycle step includes the direct emissions due to the transport of the raw materials, as well as the fuel production.
3. Manufacturing	The manufacturing life cycle step includes the electricity used at the converters, as well as the water usage and the scrap rate.
4. Transport inside manufacturing	The transport inside manufacturing life cycle step includes the direct emissions due to the transport of the intermediate product (if any), as well as the fuel production.
5. Packaging	The packaging life cycle step includes the production of the packaging materials as well as their transport.
6. Transport to warehouse	The transport to warehouse life cycle step includes the direct emissions due to the transport of the final product to the warehouse, as well as the fuel production.
7. Transport to customer	The transport to customer life cycle step includes the direct emissions due to the transport of the final product to the retailer, as well as the fuel production.
8. Transport to end-of-life	The transport to end-of-life life cycle step includes the direct emissions due to the transport of the used product to its disposal, as well as the fuel production.
9. End-of-life	The end-of-life life cycle step includes the disposal of the product in a landfill or incineration plant, according to US averages by material.

1.2 Data

Data are taken from GaBi '11 database, developed by PE International. Additionally, the end-of-life share of disposal in landfill vs. incineration of the used products is taken from the EPA's 2010 "Municipal Solid Waste Generation, Recycling, and Disposal in the United States" report.

1.3 Impact Assessment Methodology

The environmental impact assessment is based on the Tool for Reduction and Assessment of Chemical and Environmental Impacts 2.0 (TRACI 2.0) methodology from the US Environmental Protection Agency. Biogenic carbon dioxide, however, is not considered as contributing to overall GWP because most of Eco-Products' products are fast-moving consumer goods. Thus, any biogenic carbon dioxide sequestered during tree growth will quickly be re-released at end-of-life.

To measure toxicity, the USETox indicator has been selected.

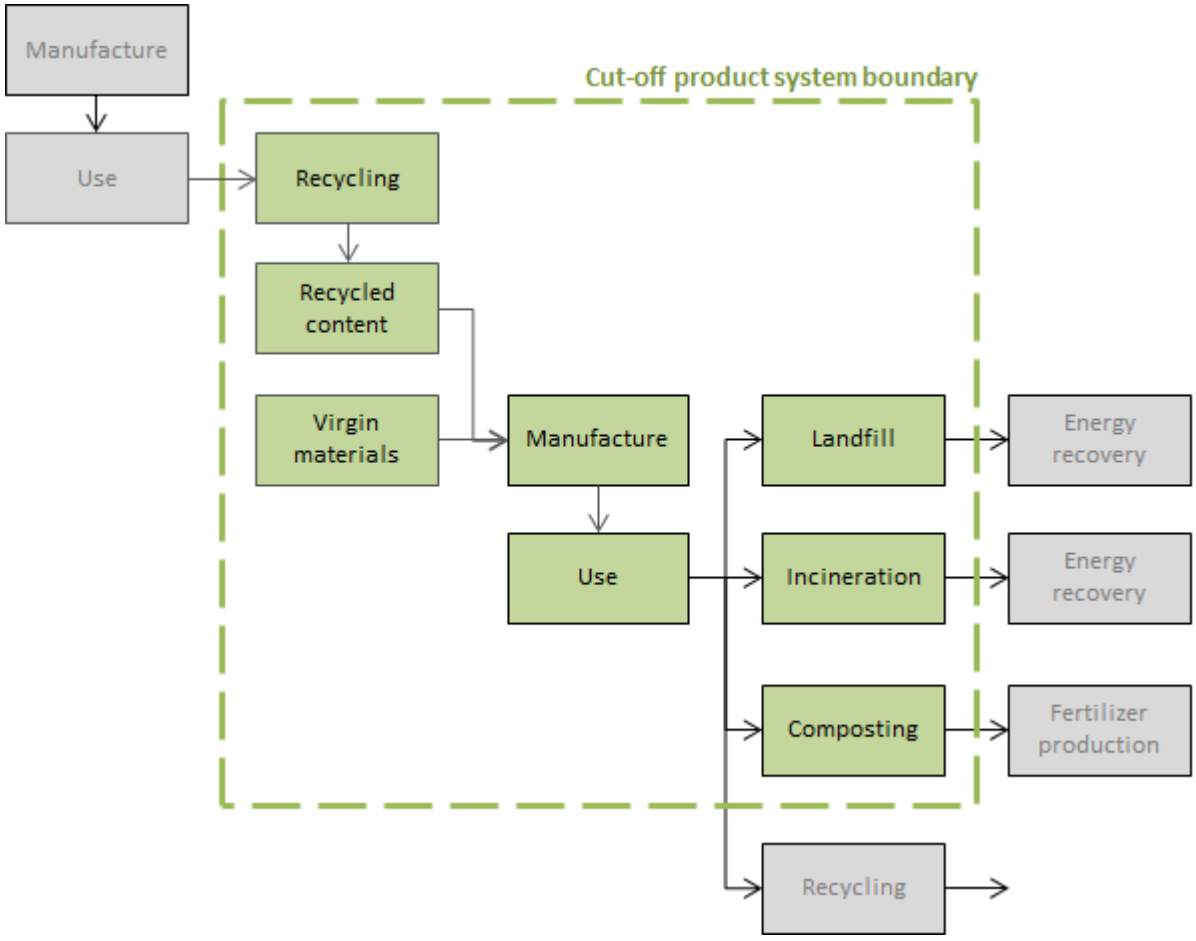
1.4 End of Life Allocation

One of the challenges in life cycle assessment is allocating the burden associated with recyclable materials, especially if the recycled materials are not expected to return to the same product system (i.e. open-loop recycling). Often, in open-loop recycling, it is not possible to know how a material was used in previous product life cycles, how it will be used in future life cycles, nor the total number of life cycles a material will "experience" before it is ultimately disposed in a landfill or incinerated. Numerous methodological approaches of allocating the burden of virgin material production, recycling that material, and the final disposition of that material at end-of-life, to the multiple product life cycles have been developed for LCA.

This report adopts the *cut-off* allocation approach for plastics, glass, and corrugate. This approach accounts for impacts as they take place rather than shifting the burden to future products. Thus, products that use recycled content are assigned the burden of recycling waste material into secondary product; the waste material, however, enters the system burden-free. In the LCA model, this means that products that use recycled content are allocated the burden of secondary material production in the “1. Materials” life cycle stage. If the product is recycled at the “9. End of life” stage, the product system receives neither burden nor credit for recycling, and the impacts associated with the recycling process are assigned to the following product life cycle.

By contrast, the *avoided burden* allocation approach is used for aluminum and steel. In this approach, the burden associated with virgin materials production is shifted to future products; consequently, waste material does not enter a product system burden-free. The avoided burden approach is implemented by allocating the burden of virgin material production minus any burden associated with producing recycled content to a product life cycle that uses recycled content. This represents the upfront burden of the material and is added to the actual impacts of producing the recycled content in the “1. Materials” life cycle stage. At the “9. End of life” stage, recycled product receives credit for the avoided production of virgin material that would have been produced had the product not been recycled, but is allocated the burden of recycling. Thus, if product recycling rate is 100%, the credit at the End of life stage exactly cancels out the upfront burden in the Materials stage.

In both cases, products that are landfilled, incinerated, or composted are assigned the full burden of each process; no credit is given for the avoided production of electricity, thermal energy, or fertilizer (compost).



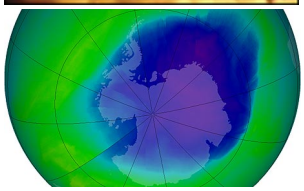
2 Executive Summary

2.1 Environmental indicators - Per scenario

Acidification [kg mol H+ equiv.]: A measure of emissions that cause acidifying effects to the environment. The acidification potential is a measure of a molecule's capacity to increase the hydrogen ion (H+) concentration in the presence of water, thus decreasing the pH value. Potential effects include fish mortality, forest decline and the deterioration of building materials.

Eutrophication ("water pollution") [kg N-equiv] : Eutrophication covers all potential impacts of excessively high levels of macronutrients, the most important of which nitrogen (N) and phosphorus (P). Nutrient enrichment may cause an undesirable shift in species composition and elevated biomass production in both aquatic and terrestrial ecosystems. In aquatic ecosystems increased biomass production may lead to depressed oxygen levels, because of the additional consumption of oxygen in biomass decomposition.

Global Warming ("carbon footprint") [kg CO2-equiv.] : A measure of greenhouse gas emissions, such as CO2 and methane. These emissions are causing an increase in the absorption of radiation emitted by the earth, increasing the natural greenhouse effect. This may in turn have adverse impacts on ecosystem health, human health and material welfare.



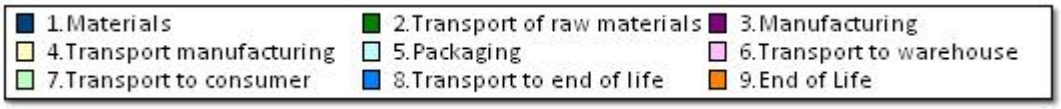
Ozone Depletion [kg CFC 11-equiv.]: A measure of air emissions that contribute to the depletion of the stratospheric ozone layer. Depletion of the ozone to leads to higher levels of UVB ultraviolet rays.

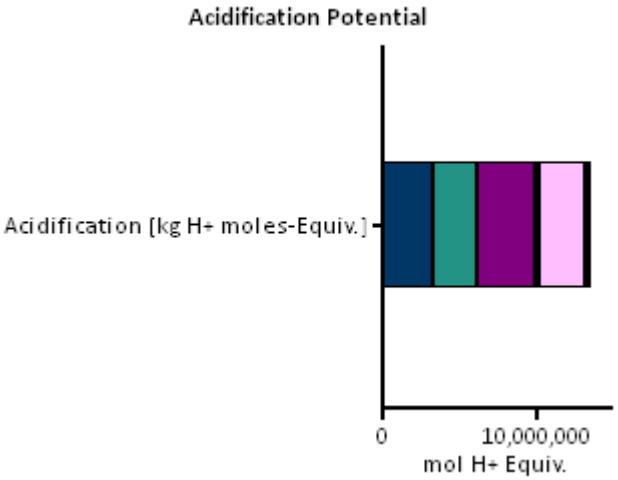
Smog [kg O3-equiv.]: A measure of emissions of precursors that contribute to ground level smog formation (mainly ozone O3), produced by the reaction of VOC and carbon monoxide in the presence of nitrogen oxides under the influence of UV light. Ground level ozone may be injurious to human health and ecosystems and may also damage crops.

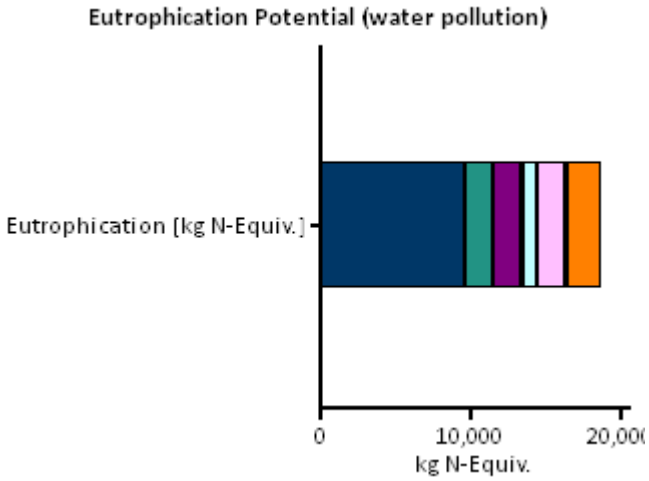
Primary Energy Demand [MJ]: A measure of the total amount of primary energy extracted from the earth. PED is expressed in energy demand from non-renewable resources (e.g. petroleum, natural gas, etc.) and energy demand from renewable resources (e.g. hydropower, wind energy, solar, etc.). Efficiencies in energy conversion (e.g. power, heat, steam, etc.) are taken into account.

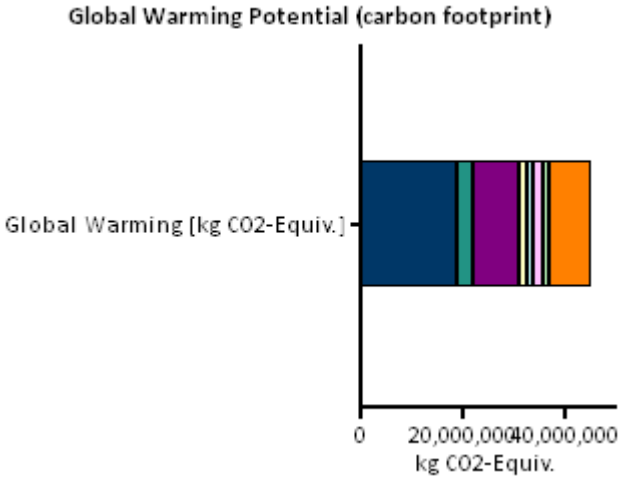
	EcoProduct i-report
Acidification [kg H+ moles-Equiv.]	1.35E07
Eutrophication [kg N-Equiv.]	1.87E04
Global Warming [kg CO2-Equiv.]	4.53E07
Ozone [kg CFC 11-Equiv.]	2.40E-01
Smog [kg O3-Equiv.]	4.04E06
PED from fossil resources [MJ]	4.91E08
PED from renewables [MJ]	2.08E08

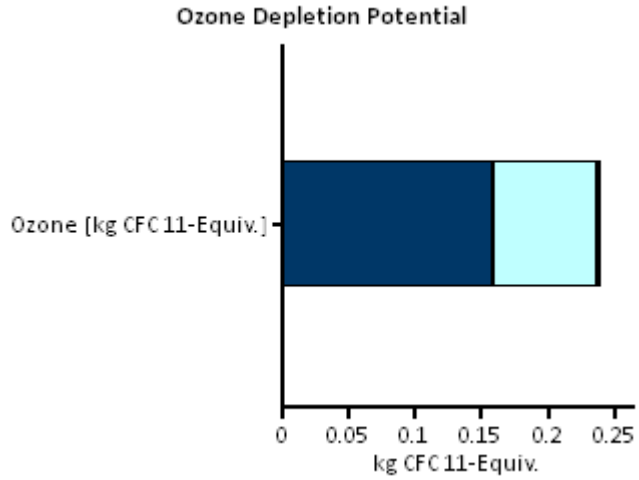
The field are colored in GREEN when an alternative has a value that is 20% lower than the Product 1 (first column). The field are colored in RED when an alternative has a value that is 20% higher than the base scenario.

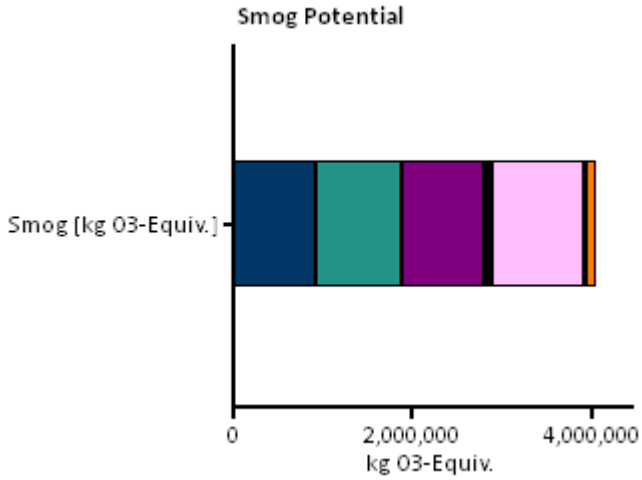


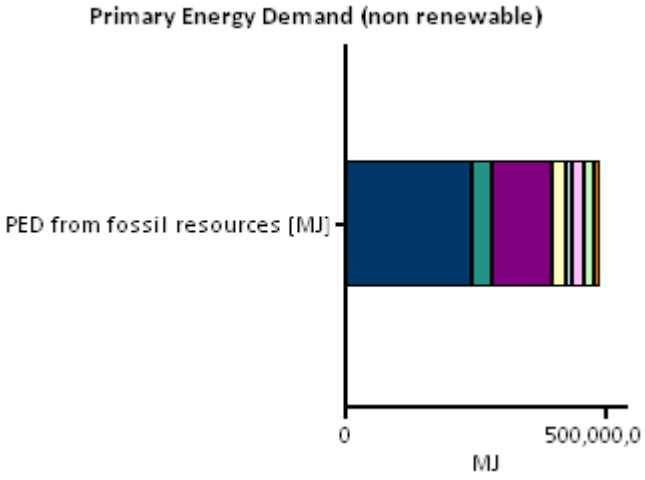


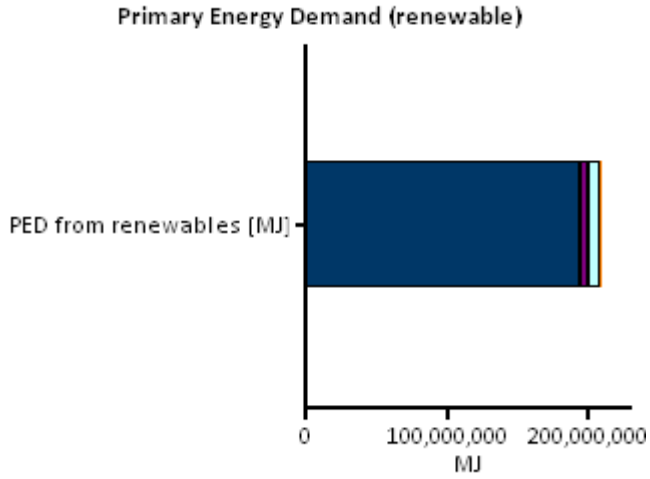












2.2 Total Carbon Footprint (Global Warming Potential)

Global Warming Potential (GWP) total = GWP 1 + GWP 2 + ...

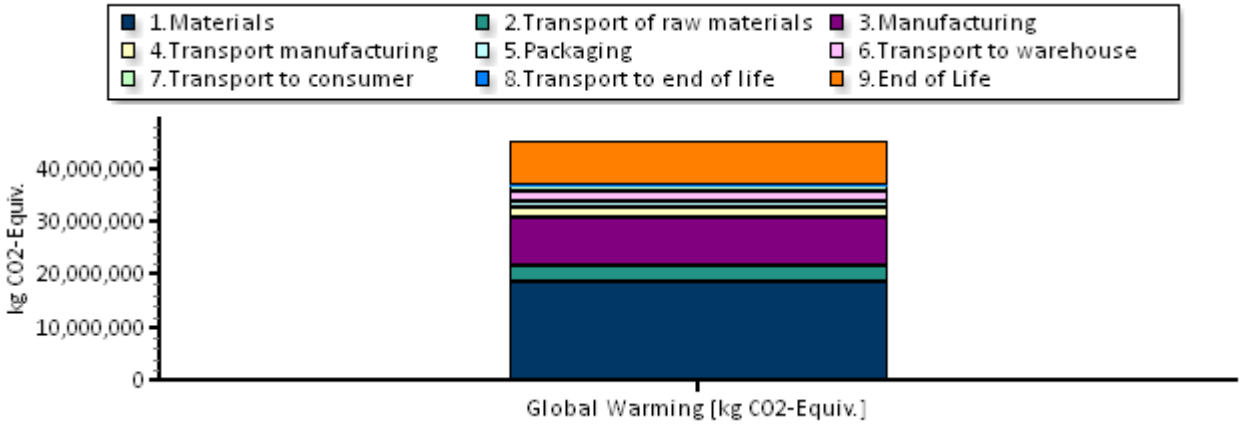
Global Warming [kg CO2-Equiv.]	4.53E007

3 Detailed Environmental Impacts

3.1 Global Warming Potential

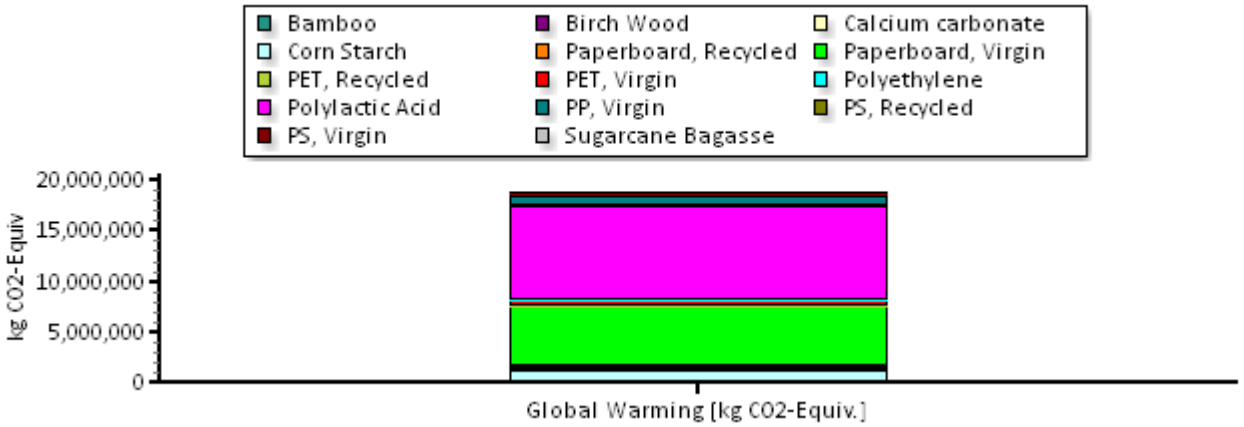
Global Warming ("carbon footprint") [kg CO2-equiv.] : A measure of greenhouse gas emissions, such as CO2 and methane. These emissions are causing an increase in the absorption of radiation emitted by the earth, increasing the natural greenhouse effect. This may in turn have adverse impacts on ecosystem health, human health and material welfare.

3.1.1 Life Cycle



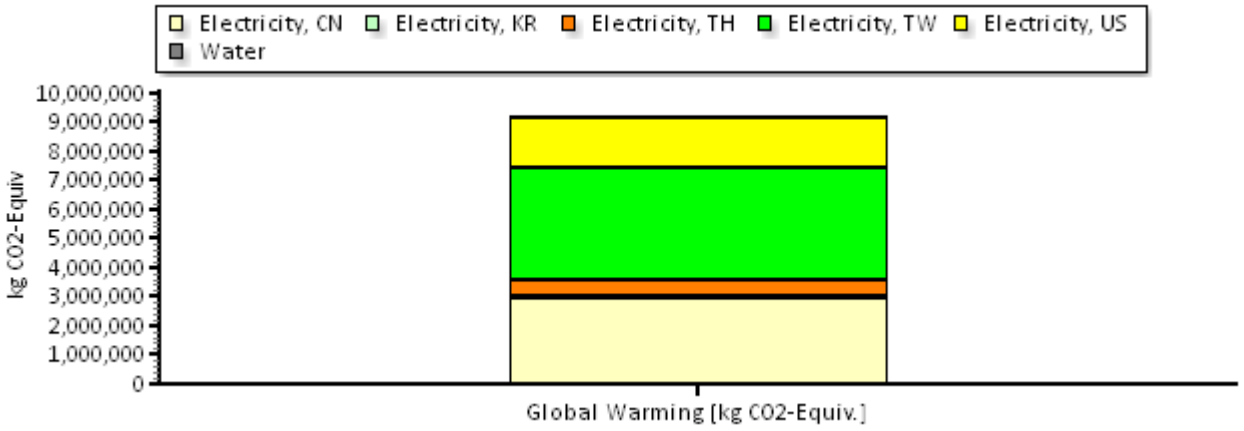
	Global Warming [kg CO2-Equiv.]
1.Materials	1.88E07
2.Transport of raw materials	3.01E06
3.Manufacturing	9.20E06
4.Transport manufacturing	1.63E06
5.Packaging	1.12E06
6.Transport to warehouse	1.94E06
7.Transport to consumer	1.23E06
8.Transport to end of life	3.09E04
9.End of Life	8.35E06

3.1.2 Materials



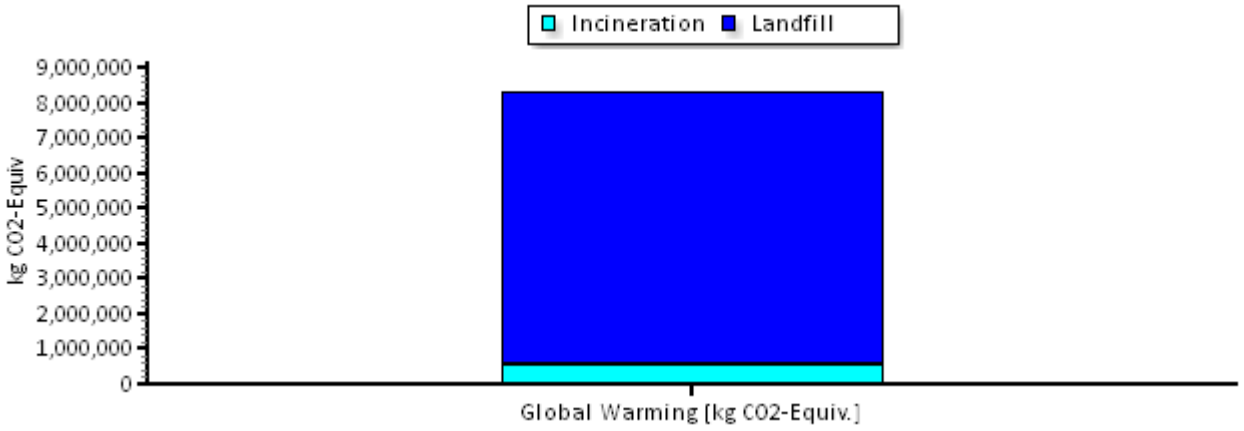
	Global Warming [kg CO2-Equiv.]
Bamboo	4.25E01
Birch Wood	2.43E04
Calcium carbonate	1.20E02
Corn Starch	1.24E06
Paperboard, Recycled	4.21E05
Paperboard, Virgin	5.88E06
PET, Recycled	7.24E04
PET, Virgin	4.69E05
Polyethylene	1.10E05
Polylactic Acid	9.26E06
PP, Virgin	1.02E06
PS, Recycled	7.84E04
PS, Virgin	1.54E05
Sugarcane Bagasse	4.29E04

3.1.3 Manufacturing



	Global Warming [kg CO2-Equiv.]
Total	9.20E06
Electricity, CN	2.98E06
Electricity, KR	6.00E04
Electricity, TH	5.21E05
Electricity, TW	3.85E06
Electricity, US	1.78E06
Water	1.12E04

3.1.4 End-of-Life

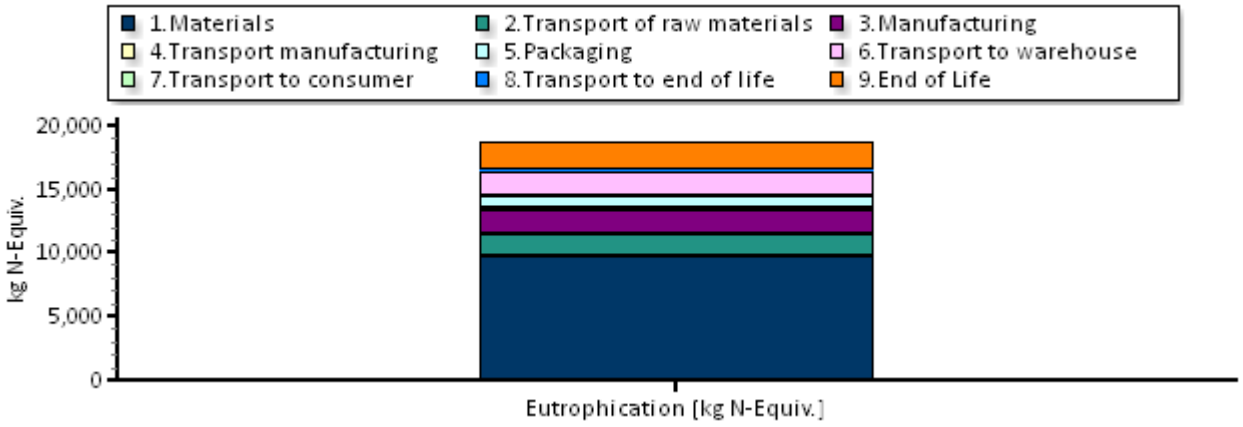


	Global Warming [kg CO2-Equiv.]
Total	8.35E06
Incineration	5.84E05
Landfill	7.76E06

3.2 Eutrophication Potential

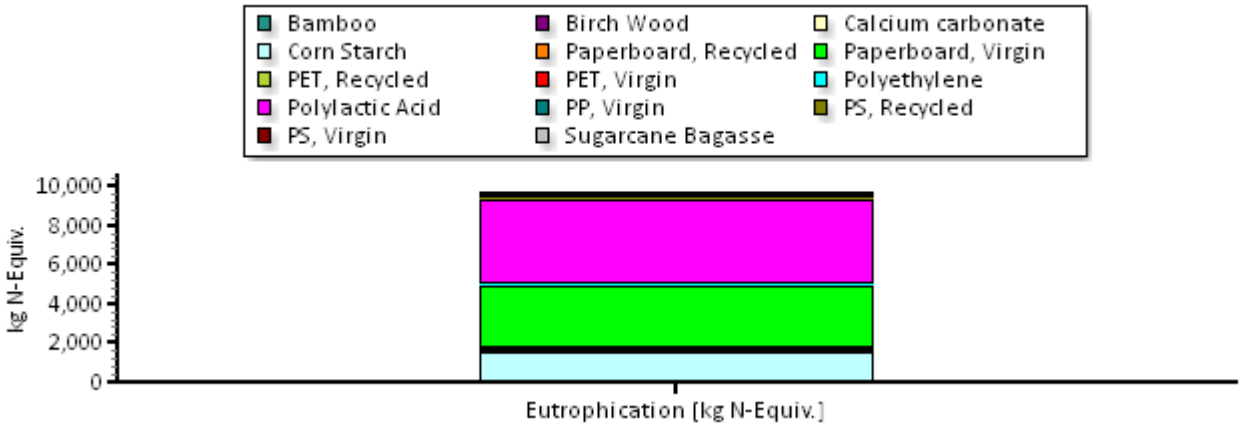
Eutrophication ("water pollution") [kg N-equiv] : Eutrophication covers all potential impacts of excessively high levels of macronutrients, the most important of which nitrogen (N) and phosphorus (P). Nutrient enrichment may cause an undesirable shift in species composition and elevated biomass production in both aquatic and terrestrial ecosystems. In aquatic ecosystems increased biomass production may lead to depressed oxygen levels, because of the additional consumption of oxygen in biomass decomposition.

3.2.1 Life Cycle



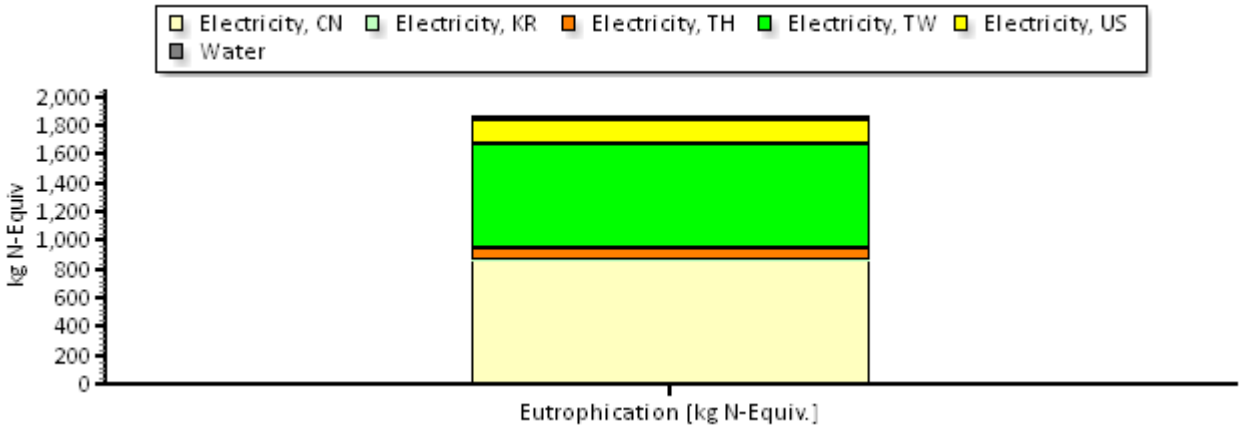
	Eutrophication [kg N-Equiv.]
1.Materials	9.68E03
2.Transport of raw materials	1.83E03
3.Manufacturing	1.86E03
4.Transport manufacturing	1.81E02
5.Packaging	9.12E02
6.Transport to warehouse	1.85E03
7.Transport to consumer	1.37E02
8.Transport to end of life	3.44E00
9.End of Life	2.27E03

3.2.2 Materials



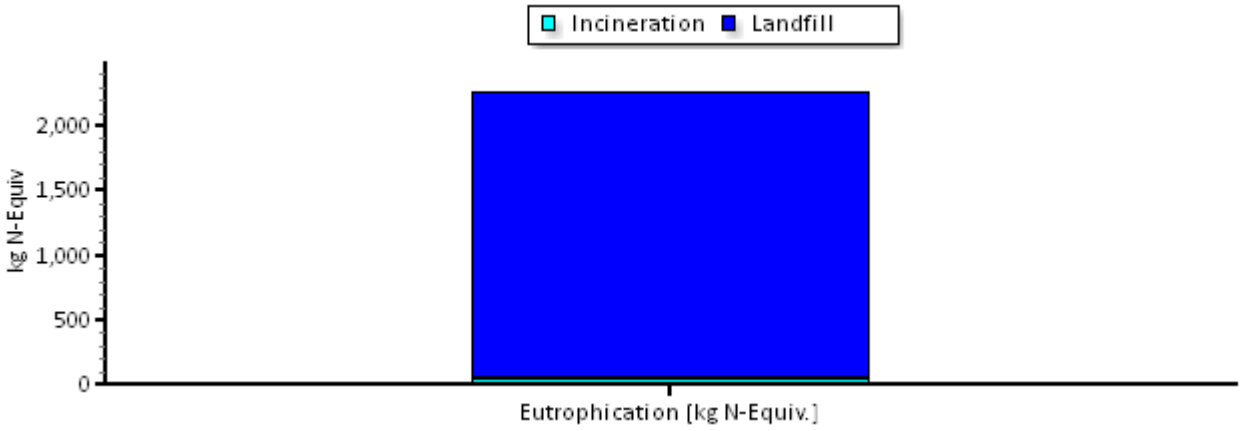
	Eutrophication [kg N-Equiv.]
Bamboo	2.37E-02
Birch Wood	7.24E00
Calcium carbonate	2.64E-02
Corn Starch	1.48E03
Paperboard, Recycled	2.20E02
Paperboard, Virgin	3.26E03
PET, Recycled	1.38E01
PET, Virgin	3.88E01
Polyethylene	1.26E01
Polylactic Acid	4.31E03
PP, Virgin	1.12E02
PS, Recycled	1.54E01
PS, Virgin	1.45E01
Sugarcane Bagasse	1.96E02

3.2.3 Manufacturing



	Eutrophication [kg N-Equiv.]
Total	1.86E03
Electricity, CN	8.64E02
Electricity, KR	4.51E00
Electricity, TH	7.42E01
Electricity, TW	7.30E02
Electricity, US	1.73E02
Water	1.65E01

3.2.4 End-of-Life

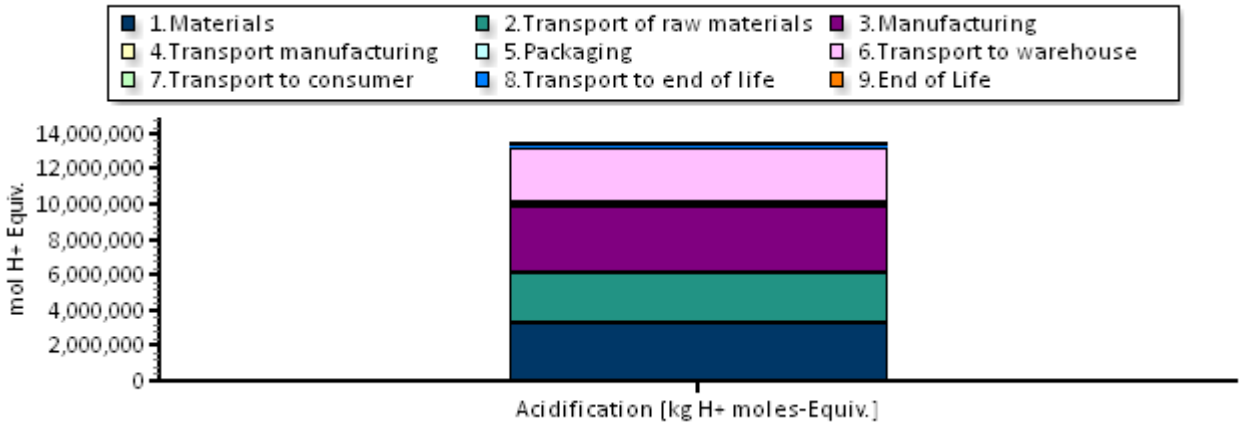


	Eutrophication [kg N-Equiv.]
Total	2.27E03
Incineration	5.35E01
Landfill	2.22E03

3.3 Acidification Potential

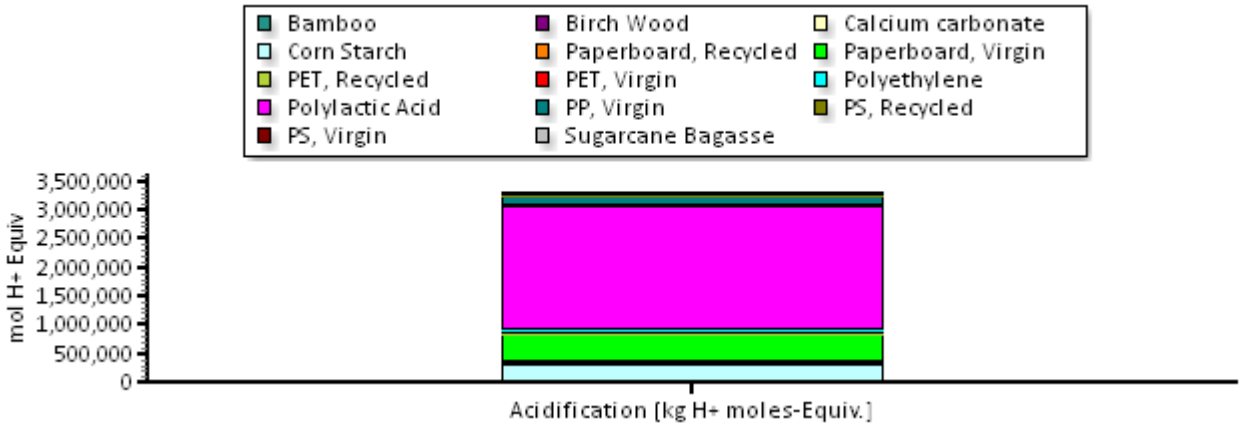
Acidification [kg H+ equiv.]: A measure of emissions that cause acidifying effects to the environment. The acidification potential is a measure of a molecule's capacity to increase the hydrogen ion (H+) concentration in the presence of water, thus decreasing the pH value. Potential effects include fish mortality, forest decline and the deterioration of building materials.

3.3.1 Life Cycle



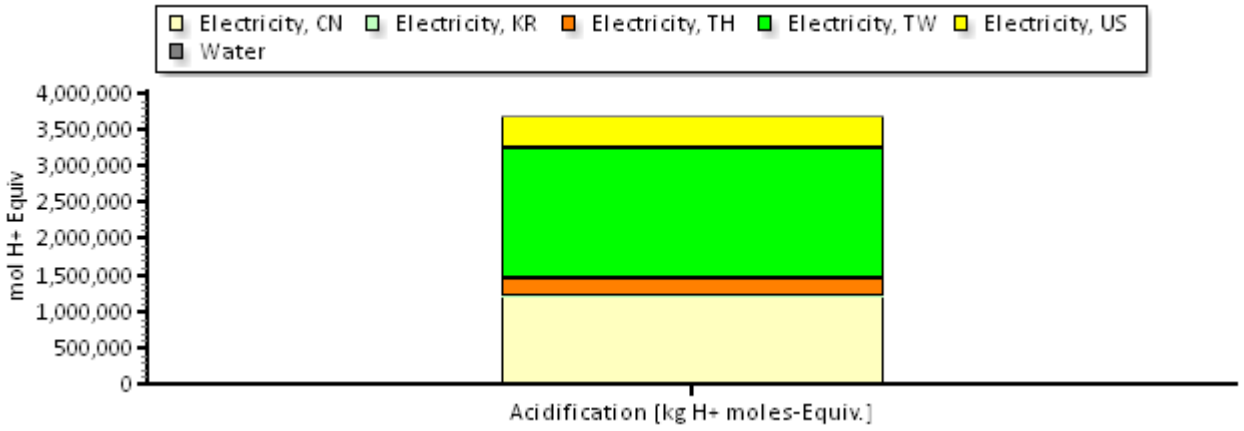
	Acidification [kg H+ moles-Equiv.]
1.Materials	3.30E06
2.Transport of raw materials	2.88E06
3.Manufacturing	3.69E06
4.Transport manufacturing	1.18E05
5.Packaging	1.75E05
6.Transport to warehouse	3.04E06
7.Transport to consumer	8.93E04
8.Transport to end of life	2.23E03
9.End of Life	2.33E05

3.3.2 Materials



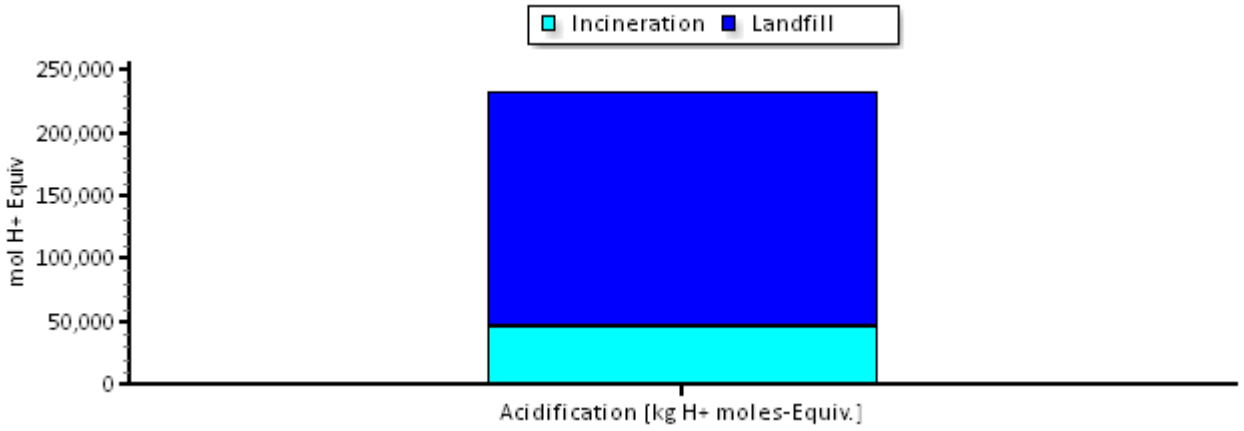
	Acidification [kg H+ moles-Equiv.]
Bamboo	2.67E01
Birch Wood	1.11E04
Calcium carbonate	2.93E01
Corn Starch	2.99E05
Paperboard, Recycled	5.08E04
Paperboard, Virgin	4.67E05
PET, Recycled	1.38E04
PET, Virgin	5.09E04
Polyethylene	1.67E04
Polylactic Acid	2.17E06
PP, Virgin	1.54E05
PS, Recycled	1.47E04
PS, Virgin	1.75E04
Sugarcane Bagasse	3.28E04

3.3.3 Manufacturing



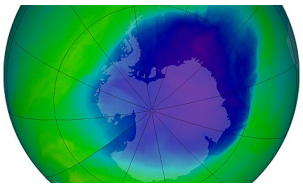
	Acidification [kg H+ moles-Equiv.]
Total	3.69E06
Electricity, CN	1.21E06
Electricity, KR	5.32E03
Electricity, TH	2.47E05
Electricity, TW	1.80E06
Electricity, US	4.24E05
Water	1.51E03

3.3.4 End-of-Life



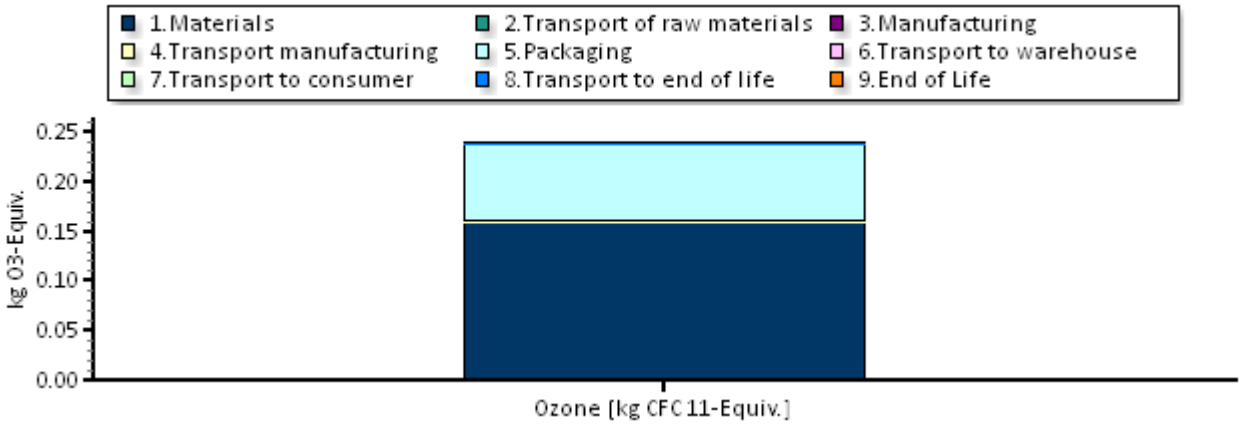
	Acidification [kg H+ moles-Equiv.]
Total	2.33E05
Incineration	4.56E04
Landfill	1.88E05

3.4 Ozone Depletion Potential



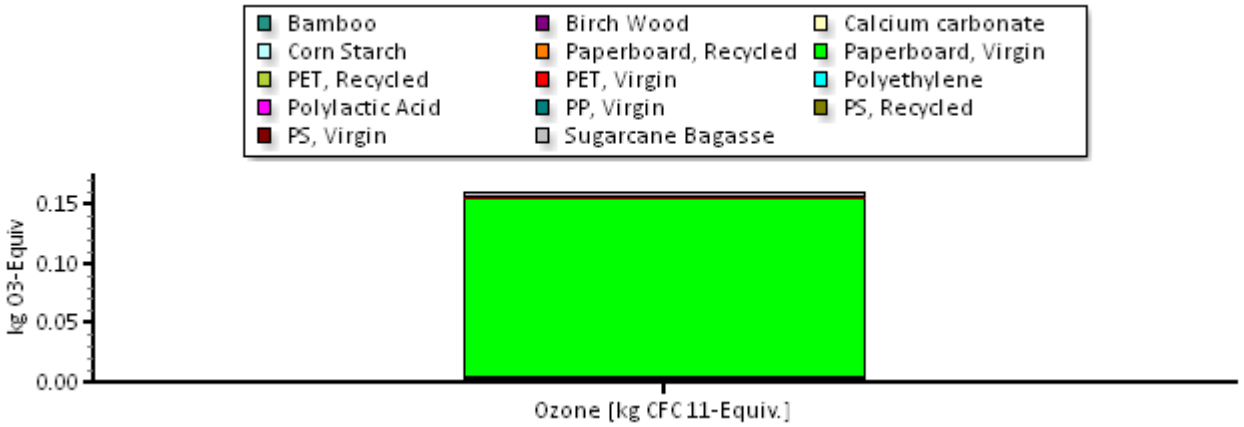
Ozone Depletion [kg CFC 11-equiv.]: A measure of air emissions that contribute to the depletion of the stratospheric ozone layer. Depletion of the ozone to leads to higher levels of UVB ultraviolet rays.

3.4.1 Life Cycle



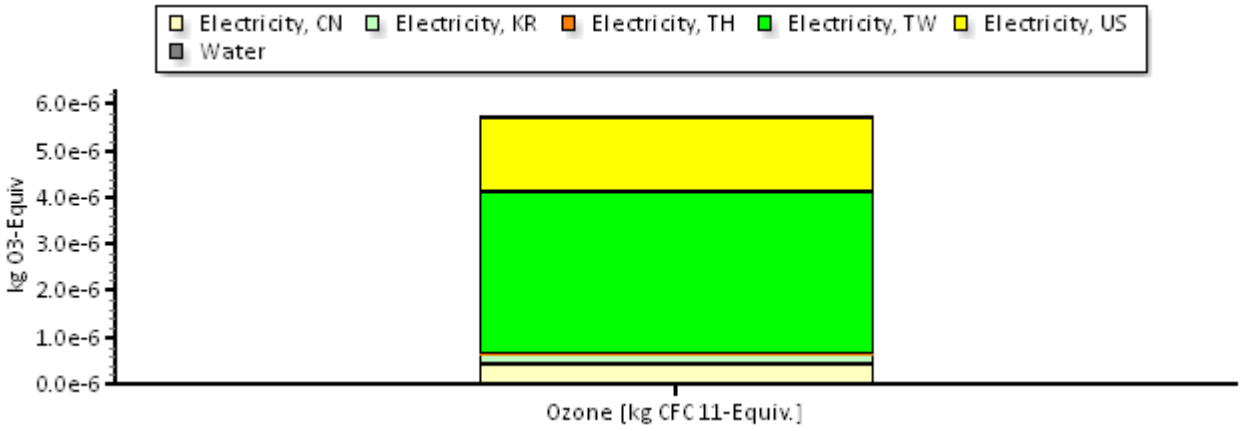
	Ozone [kg CFC 11-Equiv.]
1.Materials	1.59E-01
2.Transport of raw materials	2.64E-07
3.Manufacturing	5.74E-06
4.Transport manufacturing	3.78E-08
5.Packaging	7.82E-02
6.Transport to warehouse	4.28E-08
7.Transport to consumer	2.86E-08
8.Transport to end of life	7.16E-10
9.End of Life	2.74E-03

3.4.2 Materials



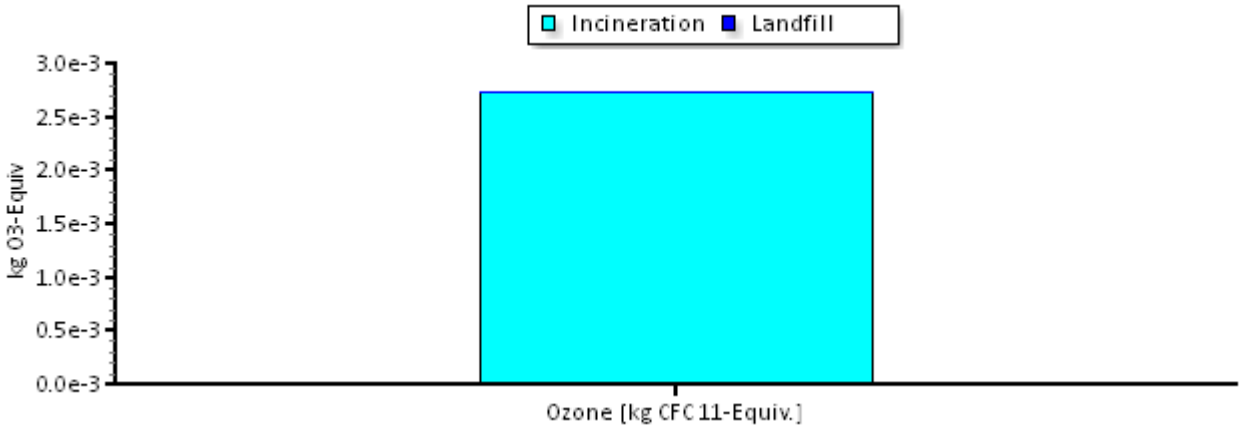
	Ozone [kg CFC 11-Equiv.]
Bamboo	5.64E-08
Birch Wood	6.82E-08
Calcium carbonate	8.29E-11
Corn Starch	4.17E-07
Paperboard, Recycled	3.82E-03
Paperboard, Virgin	1.51E-01
PET, Recycled	5.50E-08
PET, Virgin	1.61E-07
Polyethylene	2.92E-08
Polylactic Acid	3.42E-06
PP, Virgin	2.92E-07
PS, Recycled	5.89E-08
PS, Virgin	8.26E-08
Sugarcane Bagasse	4.17E-03

3.4.3 Manufacturing



	Ozone [kg CFC 11-Equiv.]
Total	5.74E-06
Electricity, CN	4.49E-07
Electricity, KR	1.87E-07
Electricity, TH	1.01E-09
Electricity, TW	3.48E-06
Electricity, US	1.61E-06
Water	1.16E-08

3.4.4 End-of-Life

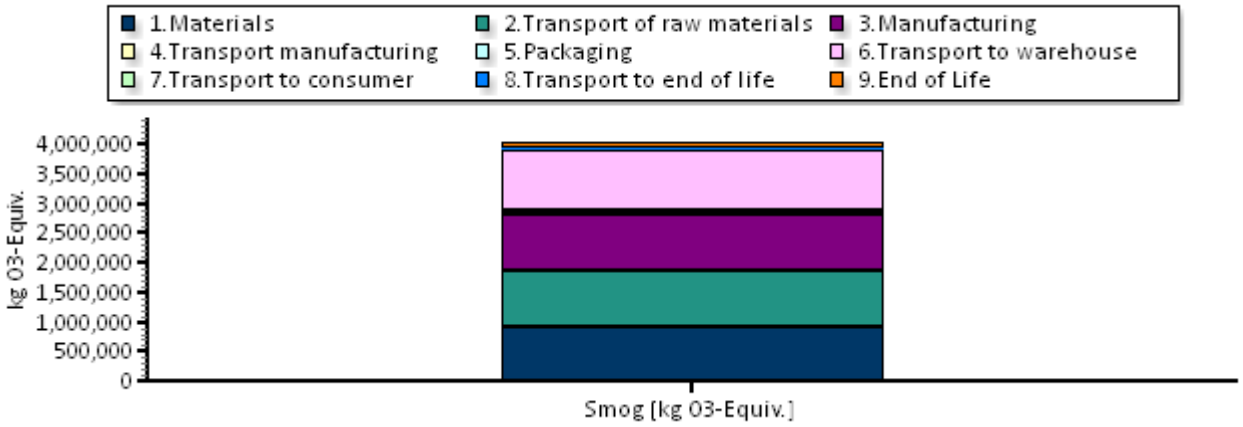


	Ozone [kg CFC 11-Equiv.]
Total	2.74E-03
Incineration	2.74E-03
Landfill	5.11E-07

3.5 Smog Potential

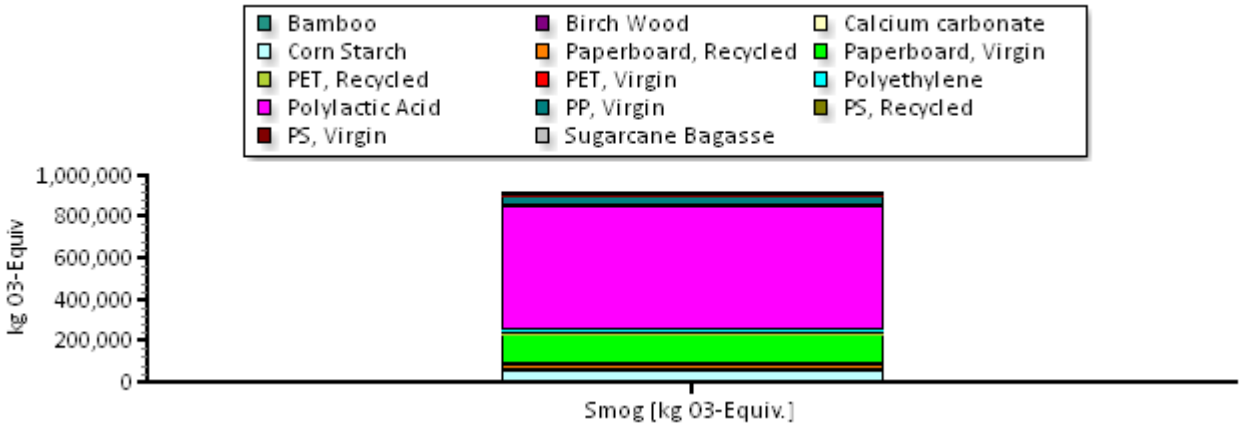
Smog [kg O3-equiv.]: A measure of emissions of precursors that contribute to ground level smog formation (mainly ozone O3), produced by the reaction of VOC and carbon monoxide in the presence of nitrogen oxides under the influence of UV light. Ground level ozone may be injurious to human health and ecosystems and may also damage crops.

3.5.1 Life Cycle



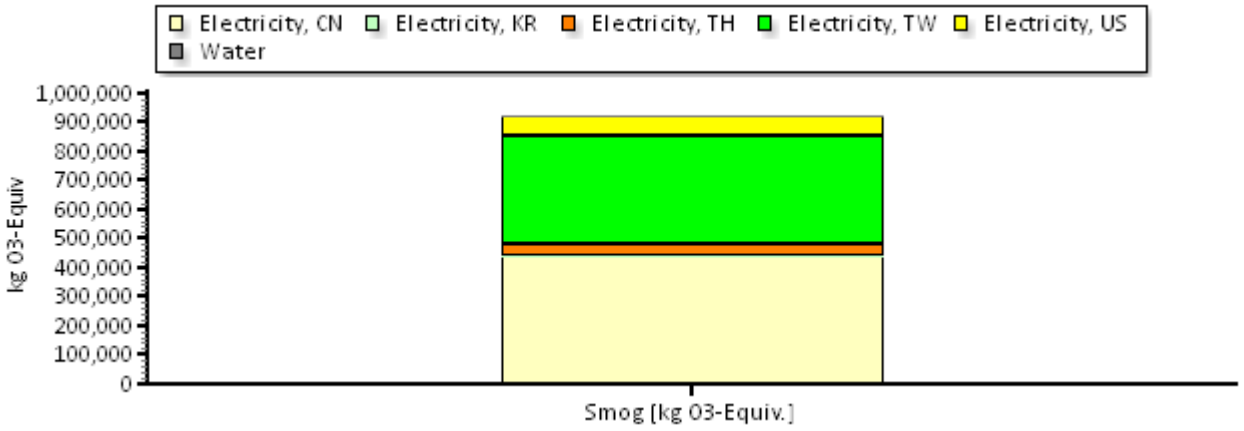
	Smog [kg O3-Equiv.]
1.Materials	9.14E05
2.Transport of raw materials	9.65E05
3.Manufacturing	9.22E05
4.Transport manufacturing	3.52E04
5.Packaging	5.02E04
6.Transport to warehouse	1.02E06
7.Transport to consumer	2.67E04
8.Transport to end of life	6.67E02
9.End of Life	1.05E05

3.5.2 Materials



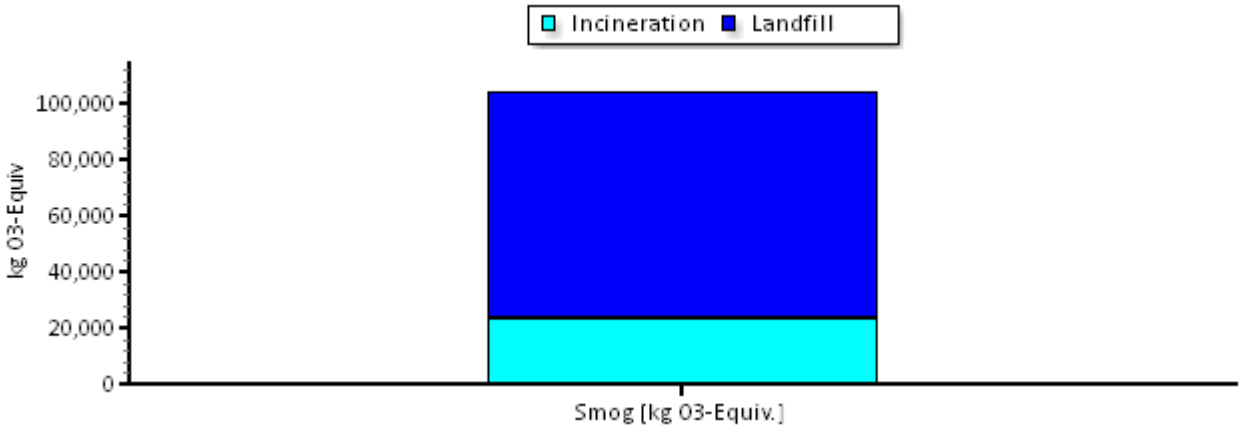
	Smog [kg O3-Equiv.]
Bamboo	1.31E01
Birch Wood	3.51E03
Calcium carbonate	6.40E00
Corn Starch	5.92E04
Paperboard, Recycled	1.95E04
Paperboard, Virgin	1.52E05
PET, Recycled	2.49E03
PET, Virgin	1.42E04
Polyethylene	5.20E03
Polylactic Acid	5.93E05
PP, Virgin	4.64E04
PS, Recycled	2.68E03
PS, Virgin	4.99E03
Sugarcane Bagasse	1.11E04

3.5.3 Manufacturing



	Smog [kg O3-Equiv.]
Total	9.22E05
Electricity, CN	4.39E05
Electricity, KR	1.68E03
Electricity, TH	3.93E04
Electricity, TW	3.73E05
Electricity, US	6.77E04
Water	5.48E02

3.5.4 End-of-Life



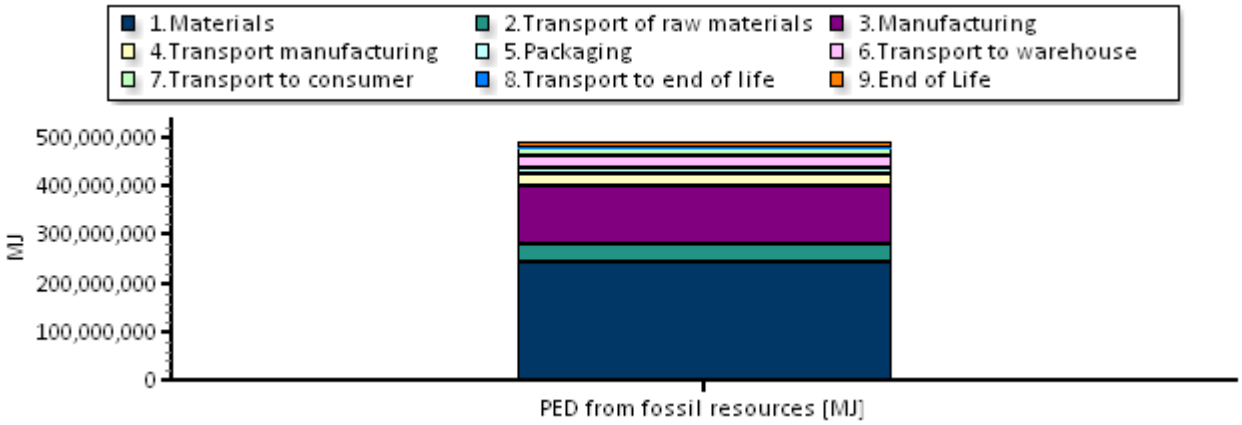
	Smog [kg O3-Equiv.]
Total	1.05E05
Incineration	2.35E04
Landfill	8.10E04

3.6 Primary Energy Demand

Primary Energy Demand [MJ]: A measure of the total amount of primary energy extracted from the earth. PED is expressed in energy demand from non-renewable resources (e.g. petroleum, natural gas, etc.) and energy demand from renewable resources (e.g. hydropower, wind energy, solar, etc.). Efficiencies in energy conversion (e.g. power, heat, steam, etc.) are taken into account.

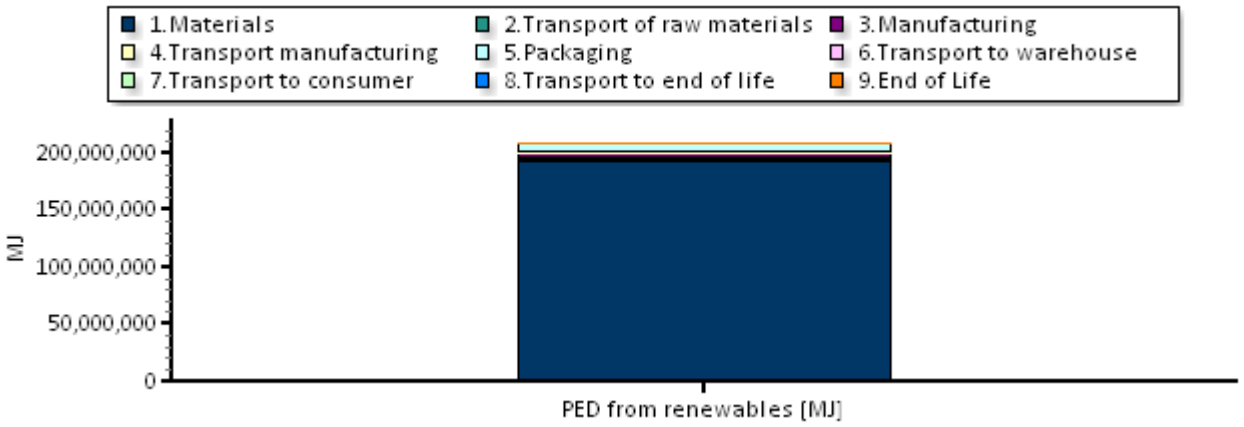
3.6.1 Life Cycle

3.6.1.1 Primary Energy Demand from fossil resources



	PED from fossil resources [MJ]
1.Materials	2.42E08
2.Transport of raw materials	4.02E07
3.Manufacturing	1.17E08
4.Transport manufacturing	2.39E07
5.Packaging	1.32E07
6.Transport to warehouse	2.42E07
7.Transport to consumer	1.81E07
8.Transport to end of life	4.52E05
9.End of Life	1.24E07

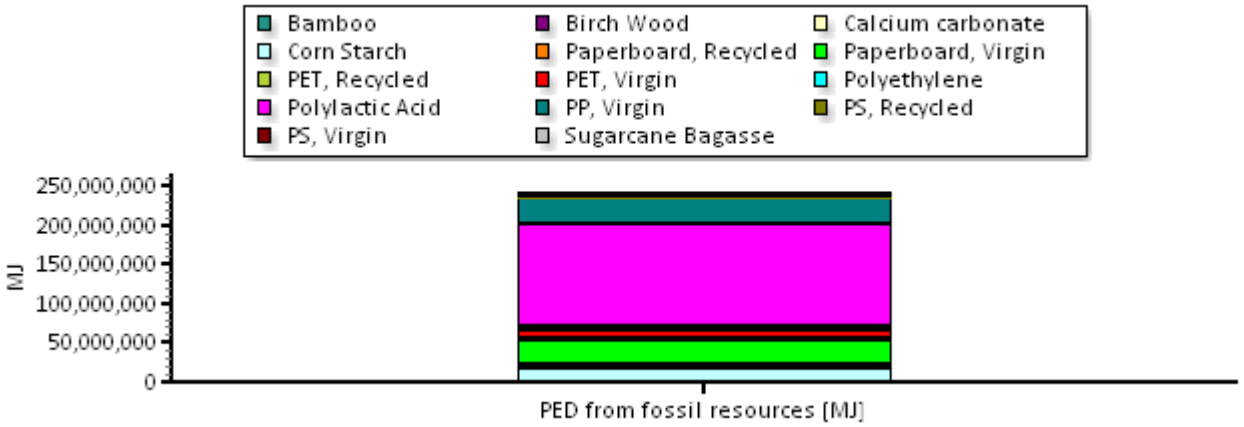
3.6.1.2 Primary Energy Demand from renewable resources



	PED from renewables [MJ]
1.Materials	1.93E08
2.Transport of raw materials	4.49E05
3.Manufacturing	5.87E06
4.Transport manufacturing	2.31E05
5.Packaging	7.96E06
6.Transport to warehouse	7.95E04
7.Transport to consumer	1.75E05
8.Transport to end of life	4.38E03
9.End of Life	4.14E05

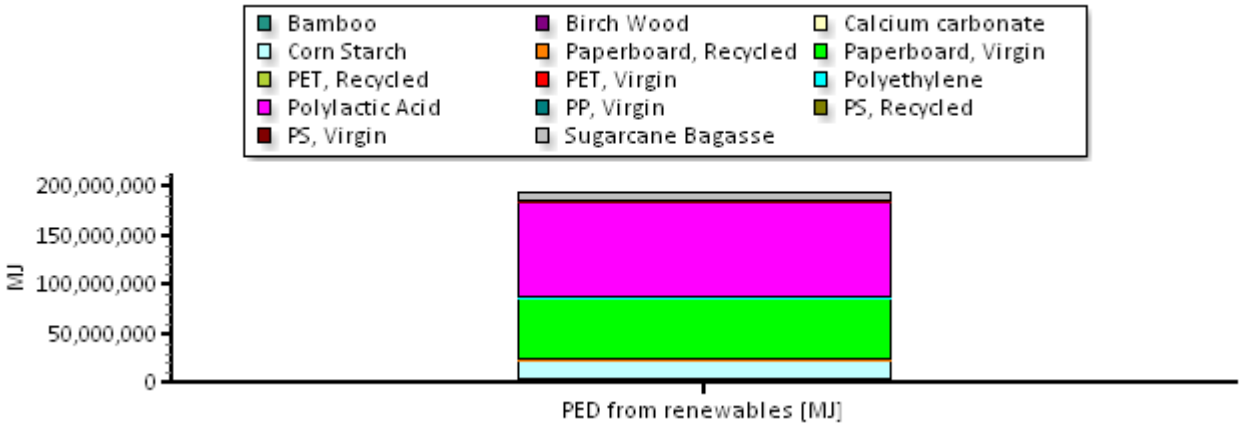
3.6.2 Materials

3.6.2.1 Primary Energy Demand from fossil resources



	PED from fossil resources [MJ]
Bamboo	6.25E02
Birch Wood	5.18E05
Calcium carbonate	2.81E03
Corn Starch	1.65E07
Paperboard, Recycled	6.76E06
Paperboard, Virgin	3.08E07
PET, Recycled	1.08E06
PET, Virgin	1.15E07
Polyethylene	3.70E06
Polylactic Acid	1.32E08
PP, Virgin	3.24E07
PS, Recycled	1.17E06
PS, Virgin	4.84E06
Sugarcane Bagasse	4.13E05

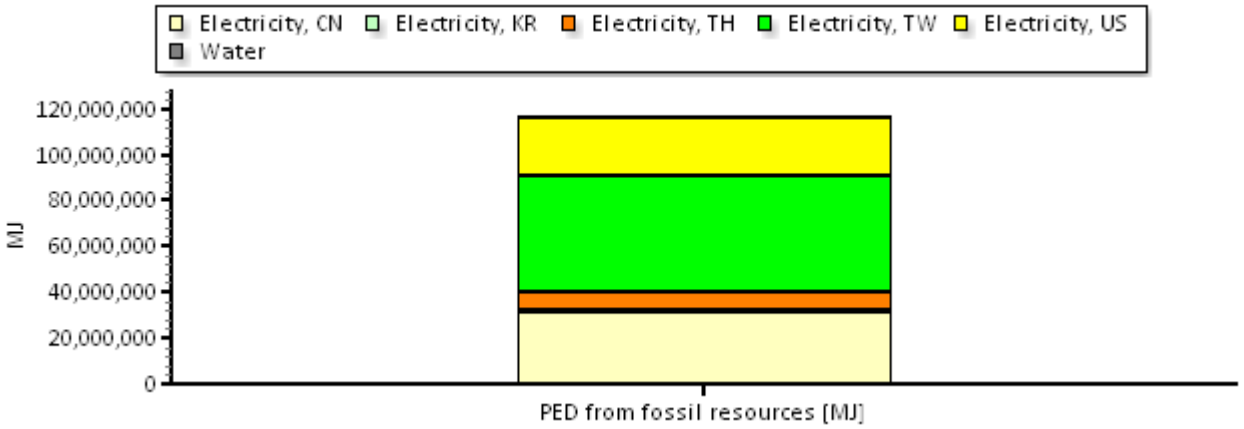
3.6.2.2 Primary Energy Demand from renewable resources



	PED from renewables [MJ]
Bamboo	4.37E05
Birch Wood	2.09E06
Calcium carbonate	1.04E02
Corn Starch	1.91E07
Paperboard, Recycled	9.36E05
Paperboard, Virgin	6.23E07
PET, Recycled	5.85E04
PET, Virgin	1.28E05
Polyethylene	3.15E04
Polylactic Acid	9.93E07
PP, Virgin	3.18E05
PS, Recycled	6.24E04
PS, Virgin	3.90E04
Sugarcane Bagasse	8.28E06

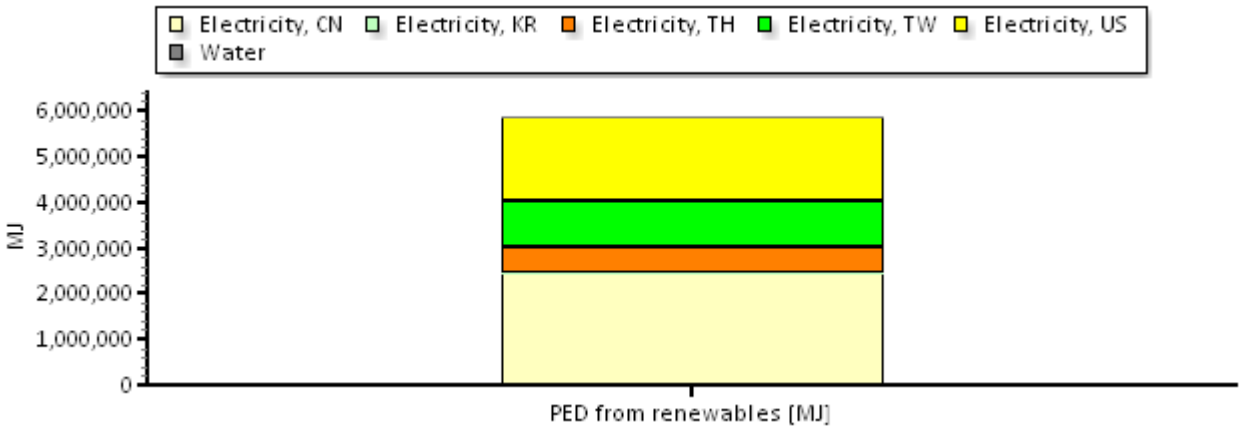
3.6.3 Manufacturing

3.6.3.1 Primary Energy Demand from fossil resources



	PED from fossil resources [MJ]
Total	1.17E08
Electricity, CN	3.16E07
Electricity, KR	1.04E06
Electricity, TH	7.41E06
Electricity, TW	5.09E07
Electricity, US	2.57E07
Water	1.64E05

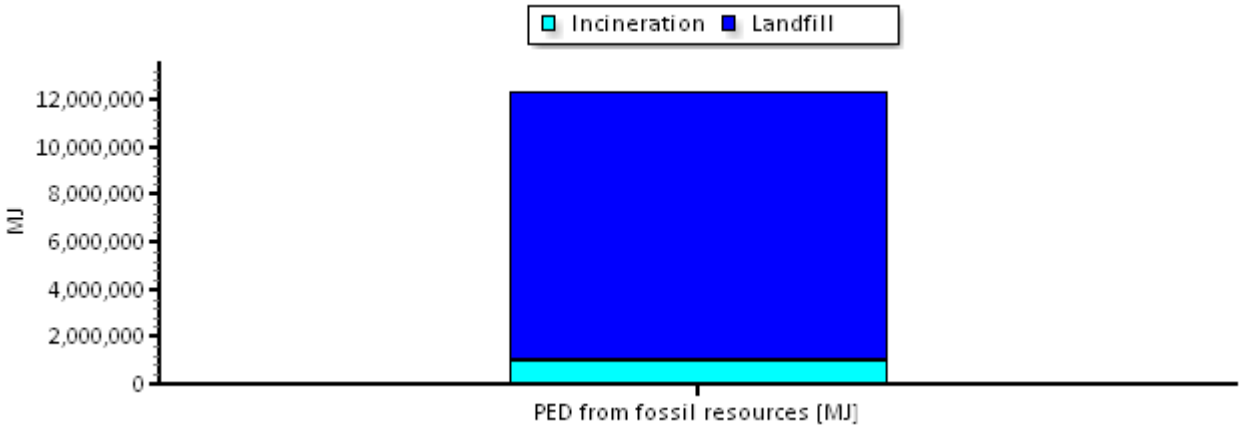
3.6.3.2 Primary Energy Demand from renewable resources



	PED from renewables [MJ]
Total	5.87E06
Electricity, CN	2.46E06
Electricity, KR	1.17E04
Electricity, TH	5.41E05
Electricity, TW	1.02E06
Electricity, US	1.83E06
Water	5.43E03

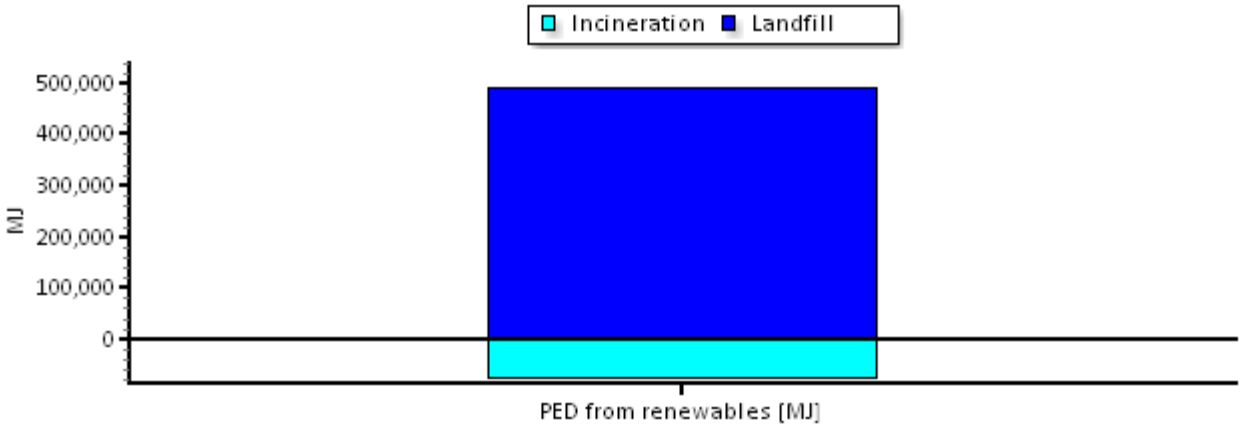
3.6.4 End-of-Life

3.6.4.1 Primary Energy Demand from fossil resources



	PED from fossil resources [MJ]
Total	1.24E07
Incineration	1.02E06
Landfill	1.14E07

3.6.4.2 Primary Energy Demand from renewable resources



	PED from renewables [MJ]
Total	4.14E05
Incineration	-7.84E04
Landfill	4.93E05

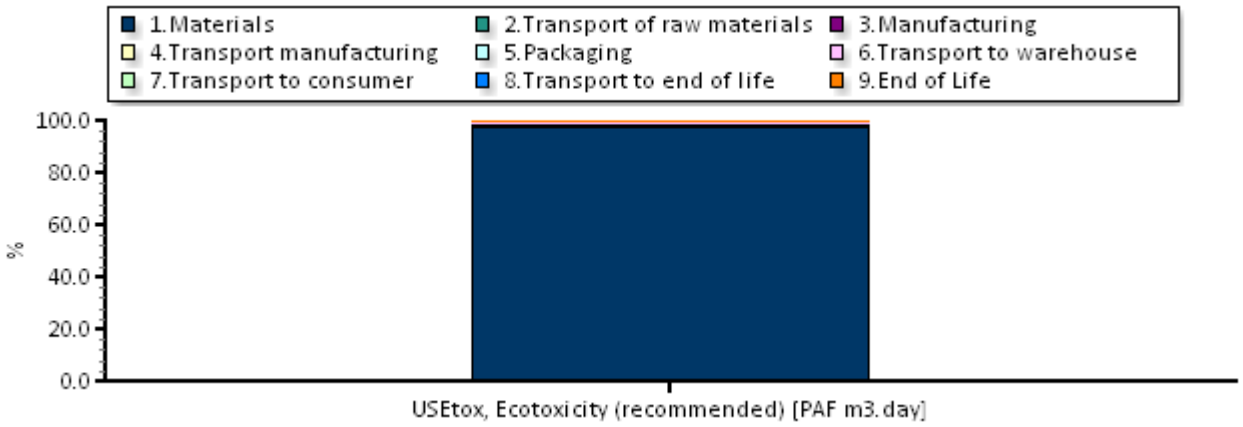
4 Toxicity Hotspots

In addition to the environmental impact categories detailed in previous sections, the study includes an evaluation of Human and Ecotoxicity using the USEtox™ characterization model. The precision of the current USEtox characterization factors is within a factor of 100–1,000 for human health and 10–100 for freshwater ecotoxicity. This is a substantial improvement over previously available toxicity characterization models. However, at present, the international LCA community has not formally adopted the USEtox characterization factors into recommended LCA best practice. Therefore, the USEtox characterization factors are used within this report to identify key components within product lifecycles which influence that product's toxicity potential. The life cycle results would indicate which materials show up as 'flags' but would not include the same level of detail for the USEtox metrics as the TRACI indicators because of the higher uncertainty of the USEtox model.

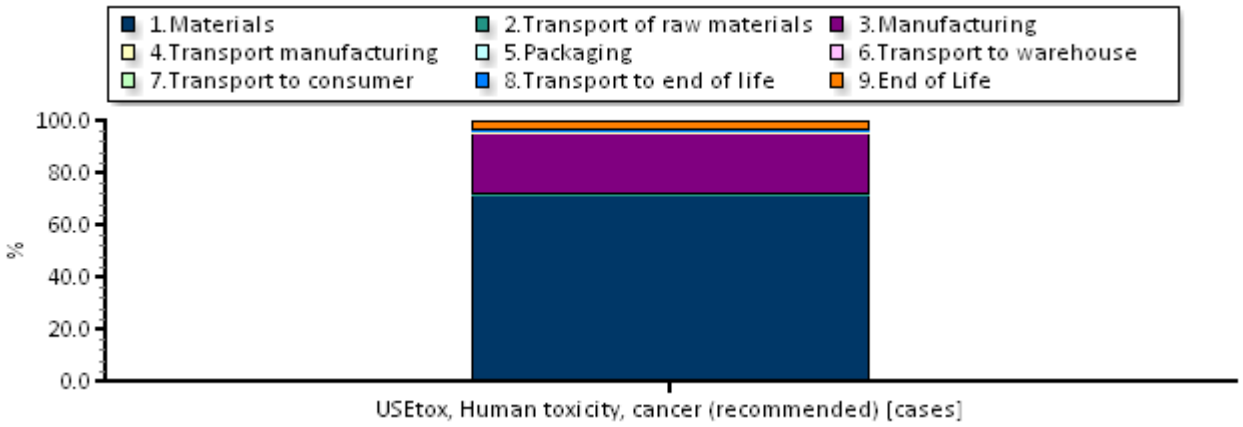
Consequently, no absolute numbers are shown in this section. The goal of this section is to show where the hotspots are for toxicity in the life cycle, but not to compare each scenario.

4.1 Toxicity hotspots in the life cycle

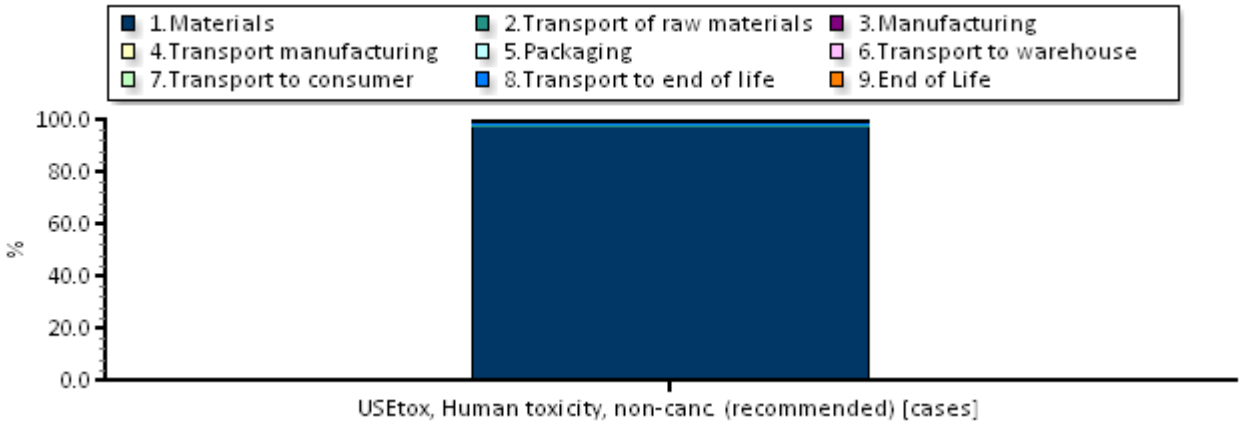
Ecotoxicity



Human toxicity, cancer

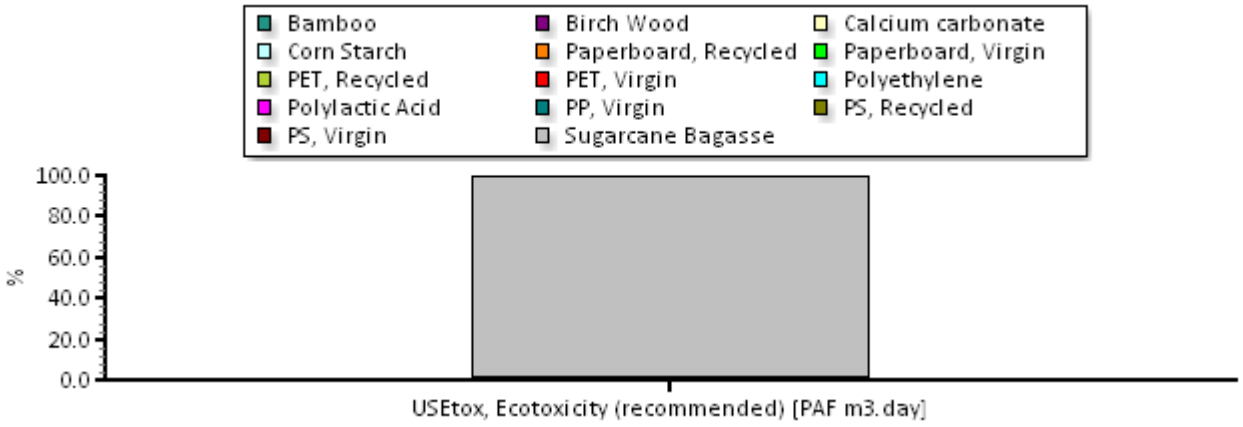


Human toxicity, non-cancer

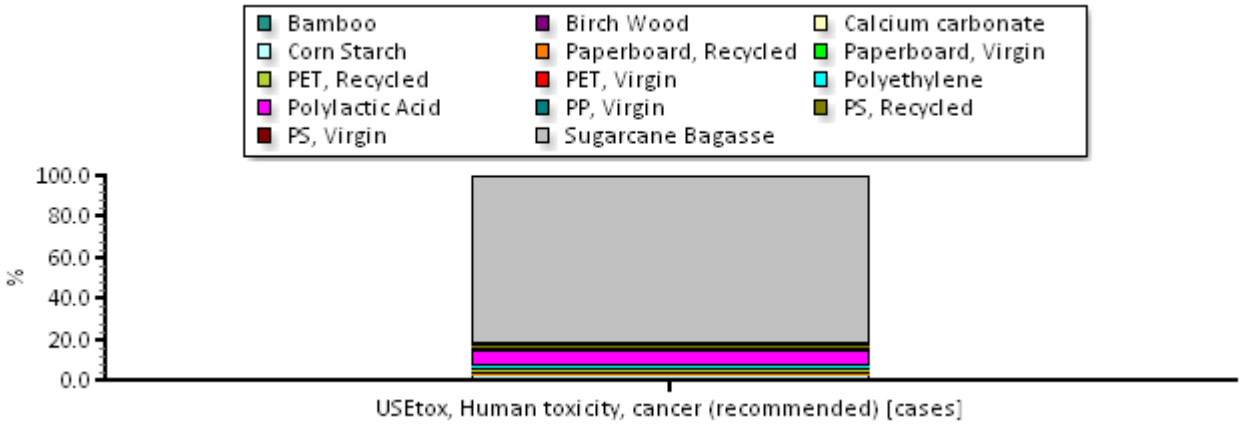


4.2 Toxicity hotspots in raw materials used

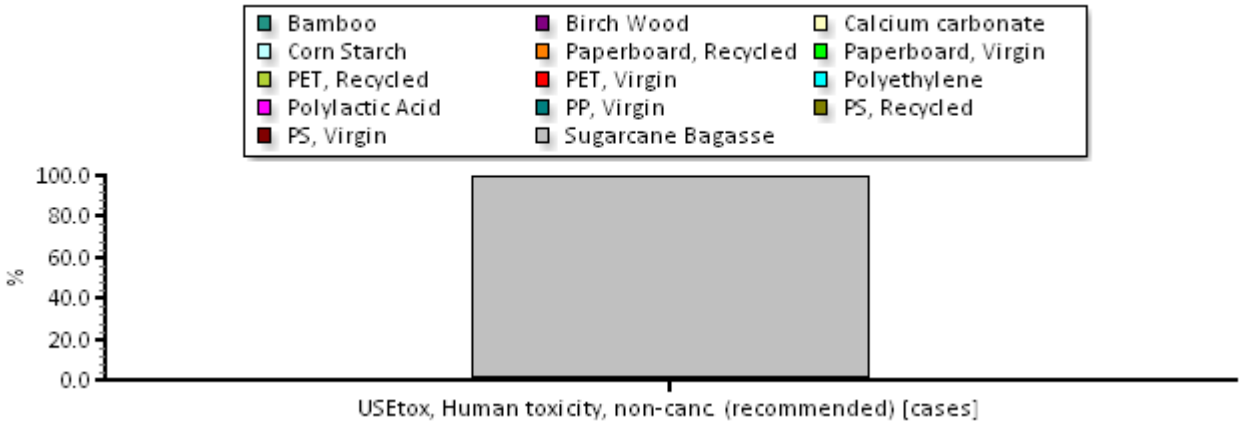
Ecotoxicity



Human toxicity, cancer



Human toxicity, non-cancer



5 Summary of Parameters for the study

5.1 Materials input (including scrap rate) in kg

	Materials use
Intermediate products	3.65E004
Materials from renewable raw materials	2.89E006
Plastics	6.62E005
Birch wood	8.33E004
Corn starch	6.36E005
Polylactic acid (PLA)	3.66E006
Recycled Polystyrene (PS)	1.39E005
Sugarcane bagasse	3.89E006
RNA: Recycled postconsumer PET pellet	1.21E005

5.2 Summary of Scenario Parameters

Scenario parameters		
	Product 1	
GENERAL		
Number of products (volume)	1246155450	[#] total number of products
Unit choice	[grams]	Select a unit system
USE PHASE		
# times the product is used	1	[#] number of times the product is used
PRODUCT		
Select a product from the list	Not pre-defined	
If not pre-defined:		
Product weight	8.92382087	[g] or [oz] or [kg] weight of material
Raw materials (%)		
Ink	0	[0-100%]
Polylactic acid (PLA)	30.20259714	[0-100%]
Virgin PET	1.06030625	[0-100%]
Recycled PET	0.99679825	[0-100%]
Sugarcane bagasse	32.09456539	[0-100%]
Virgin polypropylene	3.4863239	[0-100%]
Recycled polypropylene	0	[0-100%]
Paperboard	18.39913556	[0-100%]
Recycled paperboard	5.24490239	[0-100%]

Virgin polystyrene	0.50927164	[0-100%]
Recycled polystyrene	1.14247566	[0-100%]
Expanded polystyrene (EPS)	0	[0-100%]
Birch wood	0.68697843	[0-100%]
Corn starch	5.24440254	[0-100%]
Calcium carbonate	0.30116421	[0-100%]
Glass	0	[0-100%]
Steel	0	[0-100%]
Bamboo	0.22534337	[0-100%]
Aluminum	0	[0-100%]
Vinyl Acetate	0	[0-100%]
Polyethylene	0.40573526	[0-100%]
MANUFACTURING		
Process information: Converter A		
Converter A	Not pre-defined	Select a converter
If "not pre-defined", please enter numbers for:		
Electricity use	1.00591403	[kWh/kg] Electricity used at facility
Scrap rate	0.09052173	[kg/kg] Scrap rate
Water usage	0.00425462	[m3/kg] Water used at facility
Manufacturing country (%)		
Brazil	0	[0-100%] percentage of grid mix in manufacturing
Canada	0	[0-100%] percentage of grid mix in manufacturing
China	26.06595751	[0-100%] percentage of grid mix in manufacturing
Egypt	0	[0-100%] percentage of grid mix in manufacturing
India	0	[0-100%] percentage of grid mix in manufacturing
Korea	0.94390863	[0-100%] percentage of grid mix in manufacturing
Mexico	0	[0-100%] percentage of grid mix in manufacturing
Thailand	7.21419425	[0-100%] percentage of grid mix in manufacturing
Taiwan	41.95593941	[0-100%] percentage of grid mix in manufacturing
USA	23.8200002	[0-100%] percentage of grid mix in manufacturing
Process information: Converter B		
Converter B	No 2nd converter	
If "not pre-defined", please enter for:		

Electricity use	0	[kWh/kg] Electricity used at facility
Scrap rate	0	[kg/kg] Scrap rate
Water usage	0	[m3/kg] Water used at facility
Manufacturing country (%)		
Brazil	0	[0-100%] percentage of grid mix in manufacturing
Canada	0	[0-100%] percentage of grid mix in manufacturing
China	0	[0-100%] percentage of grid mix in manufacturing
Egypt	0	[0-100%] percentage of grid mix in manufacturing
India	0	[0-100%] percentage of grid mix in manufacturing
Korea	0	[0-100%] percentage of grid mix in manufacturing
Mexico	0	[0-100%] percentage of grid mix in manufacturing
Thailand	0	[0-100%] percentage of grid mix in manufacturing
Taiwan	0	[0-100%] percentage of grid mix in manufacturing
USA	0	[0-100%] percentage of grid mix in manufacturing
PACKAGING		
Corrugated		
Number of units per case	870.70836183	[-] number of products per corrugated box
Box dimensions (height)	18.04861353	[in] height of corrugated box
Box dimensions (length)	13.13538414	[in] length of corrugated box
Box dimensions (width)	16.9281543	[in] width of corrugated box
Plastic sleeves		
Choice of packaging sleeve	HDPE	
TRANSPORT		
1. Raw materials to manufacturing site		
Product materials transport		
Aluminum		
Distance (airplane)	0	[miles]
Distance (rail)	0	[miles]
Distance (truck)	0	[miles]
Distance (ocean/sea freight)	0	[miles]
Bamboo		
Distance (airplane)	0	[miles]
Distance (rail)	0	[miles]

Distance (truck)	0	[miles]
Distance (ocean/sea freight)	0	[miles]
Birch wood		
Distance (airplane)	0	[miles]
Distance (rail)	0	[miles]
Distance (truck)	0	[miles]
Distance (ocean/sea freight)	0	[miles]
Calcium carbonate		
Distance (airplane)	0	[miles]
Distance (rail)	1500	[miles]
Distance (truck)	0	[miles]
Distance (ocean/sea freight)	6500	[miles]
Corn starch		
Distance (airplane)	0	[miles]
Distance (rail)	0	[miles]
Distance (truck)	0	[miles]
Distance (ocean/sea freight)	0	[miles]
Expanded polystyrene (EPS)		
Distance (airplane)	0	[miles]
Distance (rail)	0	[miles]
Distance (truck)	0	[miles]
Distance (ocean/sea freight)	0	[miles]
Glass		
Distance (airplane)	0	[miles]
Distance (rail)	0	[miles]
Distance (truck)	0	[miles]
Distance (ocean/sea freight)	0	[miles]
Ink		
Distance (airplane)	0	[miles]
Distance (rail)	0	[miles]
Distance (truck)	0	[miles]
Distance (ocean/sea freight)	0	[miles]
Paperboard		
Distance (airplane)	0	[miles]
Distance (rail)	350.38463408	[miles]
Distance (truck)	2363.4384615	[miles]
Distance (ocean/sea freight)	14219.84043581	[miles]
Polylactic acid (PLA)		
Distance (airplane)	0	[miles]
Distance (rail)	1372.58927095	[miles]

Distance (truck)	240.27323509	[miles]
Distance (ocean/sea freight)	7228.3149022	[miles]
Virgin polypropylene (PP)		
Distance (airplane)	0	[miles]
Distance (rail)	800	[miles]
Distance (truck)	0	[miles]
Distance (ocean/sea freight)	6500	[miles]
Virgin polystyrene (PS)		
Distance (airplane)	0	[miles]
Distance (rail)	0	[miles]
Distance (truck)	1500	[miles]
Distance (ocean/sea freight)	0	[miles]
Recycled paperboard		
Distance (airplane)	0	[miles]
Distance (rail)	1701.87642858	[miles]
Distance (truck)	43.27078571	[miles]
Distance (ocean/sea freight)	7942.09000006	[miles]
Recycled PET		
Distance (airplane)	0	[miles]
Distance (rail)	999.40333564	[miles]
Distance (truck)	76.50279999	[miles]
Distance (ocean/sea freight)	6168.48786672	[miles]
Recycled polypropylene		
Distance (airplane)	0	[miles]
Distance (rail)	0	[miles]
Distance (truck)	0	[miles]
Distance (ocean/sea freight)	0	[miles]
Recycled polystyrene		
Distance (airplane)	0	[miles]
Distance (rail)	0	[miles]
Distance (truck)	0	[miles]
Distance (ocean/sea freight)	0	[miles]
Steel		
Distance (airplane)	0	[miles]
Distance (rail)	0	[miles]
Distance (truck)	0	[miles]
Distance (ocean/sea freight)	0	[miles]
Sugarcane bagasse		
Distance (airplane)	0	[miles]
Distance (rail)	0	[miles]

Distance (truck)	500	[miles]
Distance (ocean/sea freight)	0	[miles]
Vinyl acetate		
Distance (airplane)	0	[miles]
Distance (rail)	0	[miles]
Distance (truck)	0	[miles]
Distance (ocean/sea freight)	0	[miles]
Virgin PET		
Distance (airplane)	0	[miles]
Distance (rail)	737.88311159	[miles]
Distance (truck)	116.46916576	[miles]
Distance (ocean/sea freight)	5995.3002817	[miles]
Packaging materials transport		
Corrugated		
Distance (airplane)	0	[miles]
Distance (rail)	0	[miles]
Distance (truck)	0	[miles]
Distance (ocean/sea freight)	0	[miles]
HDPE		
Distance (airplane)	0	[miles]
Distance (rail)	0	[miles]
Distance (truck)	0	[miles]
Distance (ocean/sea freight)	0	[miles]
Ink		
Distance (airplane)	0	[miles]
Distance (rail)	0	[miles]
Distance (truck)	0	[miles]
Distance (ocean/sea freight)	0	[miles]
LDPE		
Distance (airplane)	0	[miles]
Distance (rail)	0	[miles]
Distance (truck)	0	[miles]
Distance (ocean/sea freight)	0	[miles]
PP		
Distance (airplane)	0	[miles]
Distance (rail)	0	[miles]
Distance (truck)	0	[miles]
Distance (ocean/sea freight)	0	[miles]
Polyethylene		
Distance (airplane)	0	[miles]

Distance (rail)	0	[miles]
Distance (truck)	0	[miles]
Distance (ocean/sea freight)	0	[miles]
2. Inside manufacturing		
Distance (airplane)	0	[miles]
Distance (rail)	0	[miles]
Distance (truck)	1147.59794038	[miles]
Distance (ocean/sea freight)	0	[miles]
3. Manufacturing to warehouse		
Distance (airplane)	0	[miles]
Distance (rail)	0	[miles]
Distance (truck)	39.50980172	[miles]
Distance (ocean/sea freight)	6239.39812754	[miles]
4. Distribution to customer		
Distance (airplane)	0	[miles]
Distance (rail)	0	[miles]
Distance (truck)	800	[miles]
Distance (ocean/sea freight)	0	[miles]
5. Transport to End of Life		
Distance (rail)	0	[miles]
Distance (truck)	20	[miles]
END-OF-LIFE		
Disposal scenario	Baseline US	Select default US scenario or define below
If not "pre-defined", please enter for:		
Recovery (% of generated waste)	0	[% 0-100] Percent of generated waste sent for recovery
Composting (% of generated waste)	0	[% 0-100] Percent of generated waste sent for composting
Landfill (% of discarded waste)	81	[% 0-100] Percent of discarded waste sent to a landfill (remainder incinerated)