



Carbon Footprint Report 2020

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 To: Kingdom of Wow management
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Table of Contents

Summary.....	3
Methodology	4
Two companies one report.....	5
Consideration for the future.....	6
KOW Lifestyle Manufacturing.....	8
Scope 3 Indirect Upstream	8
Scope 1 Direct	9
Scope 2 Indirect Energy	9
Scope 3 Indirect Downstream.....	10
KOW Lifestyle Europe	10
Scope 3 Indirect Upstream	10
Scope 1 Direct	11
Scope 2 Indirect Energy	11
Scope 3 Indirect Downstream.....	11

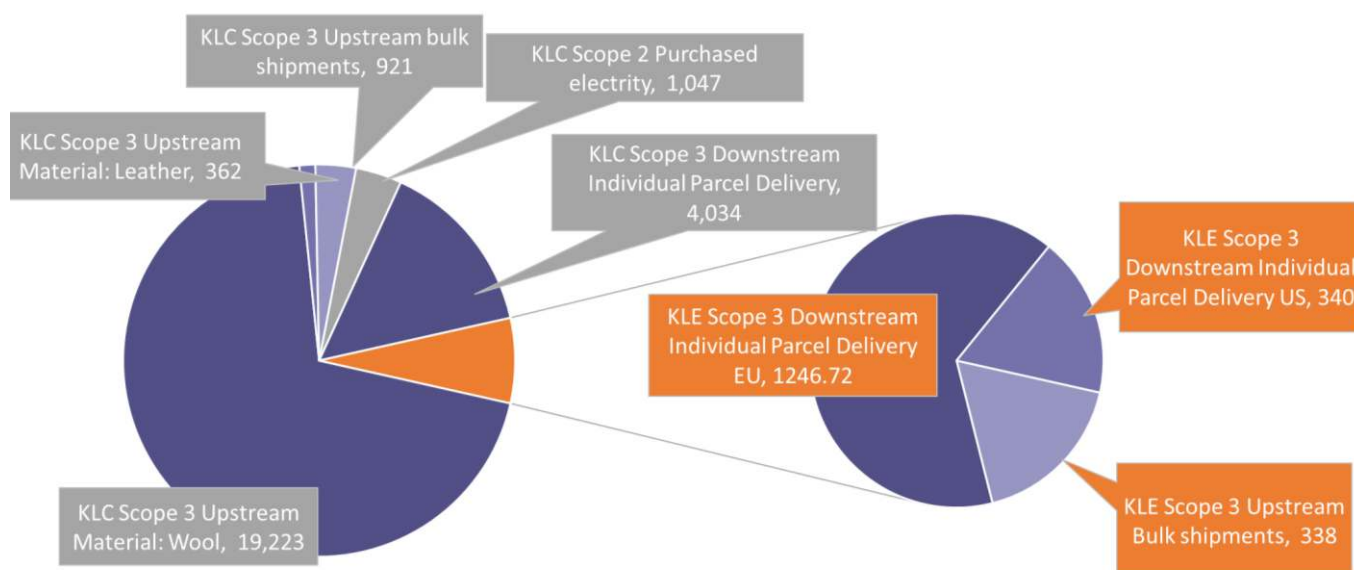
Summary

KOW Lifestyle Manufacturing		what and how	Carbon Footprint	U/M
Scope 3 Upstream	Material: Wool	footprint per kg of wool, multiplied by kg bought	19,223	kg CO ₂ e
Scope 3 Upstream	Material: Leather	footprint per m ² of leather, multiplied by kg bought	362	kg CO ₂ e
Scope 3 Upstream	Bulk shipments	list out all incoming shipments modality, origin, weight run through calculator	921	kg CO ₂ e
Scope 1 Direct	Company facilities	negligible emissions from company processes		
Scope 2	Purchased electricity	total all electricity bills for 2020 Multiply the kWh with the estimated emissions per kWh, as given by the IEA	1,047	kg CO ₂ e
Scope 3 Downstream	Individual parcel delivery	calculate parcel delivery emissions from Siem Reap to different standard locations with DHL take these calculations to come to fulfilment footprint in Cambodia	4,034	kg CO ₂ e

KOW Lifestyle Europe		What and how	Carbon Footprint	U/M
Scope 3 Upstream	Bulk shipments	list out incoming shipments, modality, origin, weight run through calculator	338	kg CO ₂ e
Scope 1	Company facilities	negligible emissions from company processes		
Scope 2	Purchased electricity	negligible purchase of electricity		
Scope 3 Downstream	Individual Parcel Delivery EU	Calculate parcel delivery emissions from EU and US warehouse to set number of locations use this to estimate average delivery emissions run through calculator	1246.72	kg CO ₂ e
Scope 3 Downstream	Individual Parcel Delivery US	Take the US parcel average multiplied by number of sales and returns	340	kg CO ₂ e

**Grand total Footprint
2020**

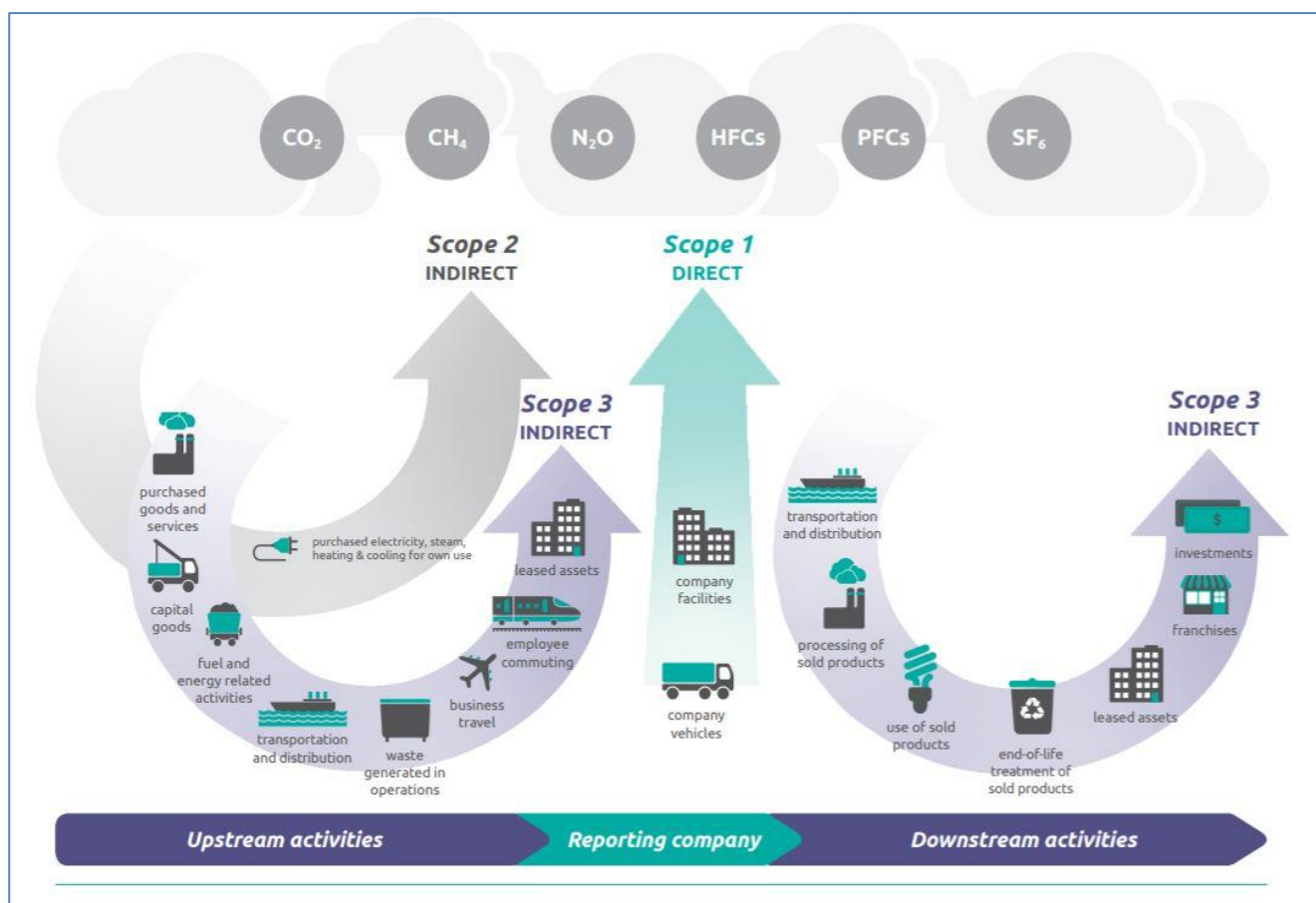
27,512



Methodology

For 2020, we use the carbon footprint standards of the GHG protocol Corporate Standard. This means that we try to scope the direct and indirect emissions of one year of operation of the company.

We use the below graph to determine the scope of this report:



Two companies one report

Kingdom of Wow as a brand runs two companies.

- KOW Lifestyle Europe – established in the Netherlands. Scope of activity: procure and sell our own branded footwear through retail and webshops fulfilled from third party stock locations, marketing and sales activities
- KOW Lifestyle Manufacturing – established in Cambodia. Scope of activity: procurement of raw materials, production of branded footwear, local sales, some fulfilment direct from factory, but most product is sold to KOW Lifestyle Europe.

In this report we try to capture the full supply chain from the procurement of raw material by KOW Lifestyle Manufacturing to the parcel delivery to the end customer by KOW Lifestyle Europe

Scope

KOW Lifestyle Manufacturing (Cambodia)

Category	Element	KOW description	In/out scope
Scope 1 direct	Company facilities	Small workshop buildings, no carbon emissions	Out
	Company vehicles	No company vehicles	Out
Scope 2 indirect	Purchased electricity, steam, heating and cooling for own use	Electricity used for aircon, lighting, light equipment	In
Scope 3 indirect upstream	Leased assets	No leased assets	Out
	Employee commuting	Short distances by motorbikes, negligible	Out
	Business travel	No business travel in 2020	Out
	Waste generated in production	Organic materials used, plastic packing materials reduced, negligible	Out
	Transportation and distribution	Incoming raw materials	In
	Fuel and energy related activities	No activities of this kind purchased	Out
	Capital goods	Hardly considerable and also outside our capacity to calculate	Out
	Purchased goods and services	Services negligible in size and outside capacity to calculate Raw materials we include the most used materials: wool and leather, for accessories we have no capacity yet to calculate	In
Scope 3 indirect downstream	Transportation and distribution	All KOW intercompany transports are covered by KOW Europe Direct wholesales are in scope	In
	Processing of sold products	Consumer product, no more processing	Out
	Use of sold products	At best we can say that warm feet reduce requirement of heating in homes, but other than that, not relevant	Out
	End-of-life treatment of sold products	Products almost completely biodegradable and containing short cycle carbon (wool fibres, leather) so neutral at full-life cycle of materials	Out
	Leased assets	None	Out
	Franchises	None	Out
	Investments	None	Out

KOW Lifestyle Europe (Netherlands)

Category	Element	KOW description	In/out scope
Scope 1 direct	Company facilities	No physical office, any work done and covered by the Cambodia office	Out
	Company vehicles	No company vehicles	Out
Scope 2 indirect	Purchased electricity, steam, heating and cooling for own use	No physical office	Out
Scope 3 upstream	Leased assets	No leased assets	Out
	Employee commuting	No commute	Out
	Business travel	No business travel in 2020	Out
	Waste generated in production	No activities	Out
	Transportation and distribution	Incoming finished goods	In
	Fuel and Energy related activities	No activities of this kind purchased	Out
	Capital Goods	No capital goods	Out
	Purchased Goods and Services	Webhosting, accountancy and warehousing. Outside our capacity to calculate the emissions	Out
Scope 3 indirect downstream	Transportation and Distribution	Outgoing parcel deliveries to customers	In
	Processing of sold products	Consumer product, no more processing	Out
	Use of sold products	At best we can say that warm feet reduce requirement of heating in homes, but other than that, not relevant	Out
	End-of-life treatment of sold products	Products almost completely biodegradable and containing short cycle carbon (wool fibres, leather) so neutral at full-life cycle of materials	Out
	Leased assets	None	Out
	Franchises	None	Out
	Investments	None	Out

Considerations for the future

Intensity vs absolute targets

For the future we are looking to include carbon intensity calculations to be able to benchmark ourselves against other footwear brands.

Materials and scope

Due to our limited capacity being a small company, we had to choose to scope the two main materials of the slippers, we have the ambition to include more and more materials in future reports. We are also contacting our key suppliers for their actions to reduce footprint and/or offset their footprint, allowing us to procure already a reduced or neutral material.

Sources of emission numbers

We have done research in emissions for the materials that we use and the (mainly logistic) services that we use. Where there was doubt, we have chosen the highest emission numbers for our calculations. But it must be acknowledged that many products and services, standards are not yet generally available online.

In order to be accountable and to possibly receive feedback on better sources, for each emission we have included the source we used. Feedback is very welcome.

Offset, reduce, offset, reduce

We have done this calculation and report for the first time over the year 2020. For the resulting carbon footprint, we will look for certified projects that we can use to offset our carbon emissions.

Creating the report has given us valuable insights into where our emissions are generated and gives us some actionability to start reducing this footprint during our activities in 2021. We hope to improve in a way that we minimise the footprint of our operations and products. Whatever footprint remains, we will look to offset to ensure in a way a carbon neutral footprint going forwards.

Note to the Board

This report will be discussed in the next board meeting to establish a high-level confirmation and support for footprint reducing decisions that we can take during the year.

- Anchor our principle and objective for a carbon neutral operation through emission reduction first and offsetting the footprint that is left.
- Purchase climate neutral services as much as possible, or include an offset option when available (like with flights and transportation services)
- Make energy saving investments in the Kingdom of Wow Cambodia office
- Source more sustainable materials with a smaller footprint where possible

KOW Lifestyle Manufacturing

Scope 3 Indirect Upstream

Material: Wool

What to measure

Carbon footprint per kg of wool

Sources

Publication	Conclusion	
"Greenhouse gas emissions profile for 1 kg of wool produced in the Yass Region, New South Wales: A Life Cycle Assessment approach"	24.9	kg CO ₂ e greasy wool at farm gate
"Carbon Footprint of Lamb and Wool Production at Farm Gate and the Regional Scale in Southern Patagonia"	18.7	kg CO ₂ e Fine grade wool (incl processing)

Standard we use

24.9 kg CO₂e

Wool purchases

Shipment 1	487	kg	Bamboo Wool
Shipment 2	224	kg	Lopi wool
Shipment 3	61	kg	Lopi wool
total	772	kg	

Total Carbon Footprint

kg of wool	Carbon footprint per kg	Total footprint
772	24.9	19,222.80

Material: Leather

Sources

Publication	Conclusion	
Water, energy and carbon footprints of a pair of leather shoes	0.12	kg CO ₂ e cow leather production
Analyzing the carbon footprint of the finished bovine leather: a case study of aniline leather	64.8	kg CO ₂ e per square meter of finished aniline leather

Standard we use

64.8 kg CO₂e

Leather purchases

Shipment 1	362	kg	suede cow leather skins
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The leather shipment took place in December 2019. But as we only start this carbon report per 2020, and these leather skins supplied our 2020 production of slippers, we decided to include the purchase in this report

Convert kg to m²

thickness of hide		1.4	mm
		3.5	oz/ft ²
		37.67	oz/m ²
		1.068	kg/m ²
Shipment 1	338	m ²	suede cow leather skins

Total Carbon Footprint

m ² of leather	Carbon footprint per kg	Total footprint
338.94	1.068	362.00

Material Shipments

We use the multi-modality CO² Emissions Calculator from Carbon Care to calculate the emissions of all incoming bulk shipments, including the trucking at the country of origin and the trucking in Cambodia

Shipment Reference	Type of goods	Origin	Destination	Weight of shipment	Freight Modality	Route	Carbon	U/M	remark
Bamboo Wool 2020	Wool	Changshu City	Siem Reap	487	Sea	Changshu - Shanghai - SHV - Siem Reap	80.68	kg	CO ₂ e WTW
Espadrille soles 2020	Soles	Foshan City	Siem Reap	645	Sea	Foshan - Hongkong - SHV - Siem Reap	112.59	kg	CO ₂ e WTW
20-De Bondt Bulk - DB Schenker	Wool	Ter Apel	Siem Reap	224	Sea	Ter Apel - Rotterdam - PP - Siem Reap	144.38	kg	CO ₂ e WTW
Label shipment 2020	Accessories	HK	Siem Reap	10	air	Hong Kong - PP - Siem Reap	13.65	kg	CO ₂ e WTW
Dyneema black thread 2020	Accessories	HK	Siem Reap	10	air	Hong Kong - PP - Siem Reap	13.65	kg	CO ₂ e WTW
Metal silver button 2020	Accessories	HK	Siem Reap	10	air	Hong Kong - PP - Siem Reap	13.65	kg	CO ₂ e WTW
Black elastic band thread 2020	Accessories	HK	Siem Reap	10	air	Hong Kong - PP - Siem Reap	13.65	kg	CO ₂ e WTW
De Bondt 2020	Wool	Ter Apel	Siem Reap	61	Air	Ter Apel - Amsterdam - PP - Siem Reap	480.35	kg	CO ₂ e WTW
Suede Dec 2020	Leather	Foshan City	Siem Reap	362	Sea	Foshan - Guangzhou - SHV - Siem Reap	48	kg	CO ₂ e WTW

Source: <https://www.carboncare.org/en/co2-emissions-calculator.html>

Date: 2021-05-04

Total Emission from incoming material shipments

921 kg CO₂e WTW

Scope 1 Direct

Negligible emission

The production process in our workshop itself has no greenhouse gas emission.

Scope 2 Indirect Energy

Purchased electricity

Below the energy bill for 2020

Date	Amount Energy	unit	Name	Memo/Description	Amount
2020-01-31	162	kWh		Electricity in January 2020	40.50
2020-02-28	169	kWh		Electricity in February 2020	42.25
2020-03-31	194	kWh		Electricity in March 2020	48.50
2020-04-30	148	kWh		Electricity in April 2020	37.00

2020-05-30	260	kWh		Electricity in May 2020	65.00
2020-06-30	215	kWh		Electricity in June 2020	53.75
2020-07-31	206	kWh		Electricity in July 2020	51.50
2020-08-31	109	kWh		Electricity in August 2020 for half month	27.25
2020-08-31	219	kWh		Electricity in August 2020 for new workshop	54.75
2020-09-30	193	kWh		Electricity in September 2020 for new workshop	48.25
2020-10-31	163	kWh		Electricity in October 2020 for new workshop	40.75
2020-11-30	199	kWh		Electricity in November 2020 for new workshop	49.75
2020-12-31	123	kWh		Electricity in December 2020 for new workshop	30.75
	2360	kWh			\$590.00

Carbon emission per kWh

We take the Thai average as much of the electricity we use is imported from Thailand.
They also publish official numbers

Source: <http://www.eppo.go.th/index.php/en/en-energystatistics/indicators>

Year	CO ₂ Emission (1,000 tons-CO ₂)	Generation (GWh)	CO ₂ /kWh (kg-CO ₂ / kWh)
2020 (2M)	15,118	34,082	0.444

Carbon Emission Calculation

kWh used	Emission per kWh	Electricity Carbon Footprint	U/M
2360	0.444	1,046.83	kg CO ₂

Scope 3 Indirect Downstream

Individual Parcel Delivery

We have executed a few direct DHL shipments from KOW Lifestyle Manufacturing to customers in countries closer to Cambodia than our standard fulfilment locations or for rush replenishment.

Below is the table of deliveries.

size of shipment	Dimensions	Route	modality	Carbon	U/M
Customer AMS	13 pair - 13 kg 0.6m ³	Phnom Penh - Amsterdam	air	747.3	kg CO ₂ e WTW
India from CAM	13 pair - 13 kg 0.6m ³	Phnom Penh - New Delhi	air	596.75	kg CO ₂ e WTW
AUS from CAM	13 pair - 13 kg 0.6m ³	Phnom Penh - Melbourne	air	318.7	kg CO ₂ e WTW
Japan Indochine	74 pair - 44kg 3.5m ³	Phnom Penh - Tokyo	air	2371	kg CO ₂ e WTW

Total Emission from individual parcel delivery

4033.75 kg CO₂e WTW

KOW Lifestyle Europe

Scope 3 Indirect Upstream

KOW Lifestyle purchases products from KOW Lifestyle Manufacturing in Cambodia. They buy Exw, so the full shipment footprint is allocated to KOW Lifestyle Europe

Shipment Reference	Type of goods	Origin	Destination	Weight of shipment	Freight Modality	Route	Carbon	U/M	remark
20-US Shipment Export Tigers	Slippers and Espadrilles	Siem Reap	Los Angeles	806	Sea	Siem Reap - PP - LA - LA warehouse	125.34	kg	CO ₂ e WTW
New Zealand July	Slippers	Siem Reap	Christchurch	20	Air	Siem Reap - PP - Christchurch	149.24	kg	CO ₂ e WTW
Van Bommel shipment	Slippers	Siem Reap	Nuenen	311	Sea	Siem Reap - Sihanoukville - Rotterdam - Nuenen	63.45	kg	CO ₂ e WTW

Total Emission from individual parcel delivery

338.03 kg CO₂e WTW

Scope 1 Direct

Negligible emission

We run sales and marketing activities from Cambodia. They would not have process emissions anyways, apart from a little bit of steam coming from ears when Amazon changed their product listing requirements again.

Scope 2 Indirect Energy

Negligible emission

We do not run any physical office in the Netherlands or US.

Scope 3 Indirect Downstream

Individual Parcel Delivery EU

For parcel delivery we have calculated the emissions for an average distance, multiplied with the number of sales.

Average parcel delivery distance

size of shipment	Dimensions	Route	modality	Carbon	U/M
Single Package	1kg - 0.05m ³	Nuenen - Amsterdam	Trucking	0.14	kg CO ₂ e WTW

Source: DHL carbon calculator

Packaging footprint

assuming similar footprint as in US on packaging (see below)

one standard packaging box	1	kg CO ₂ e
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Total Emission from Parcel Delivery EU

Number of sales and returns	Carbon footprint (kg)	Total footprint
974	1.28	1246.72

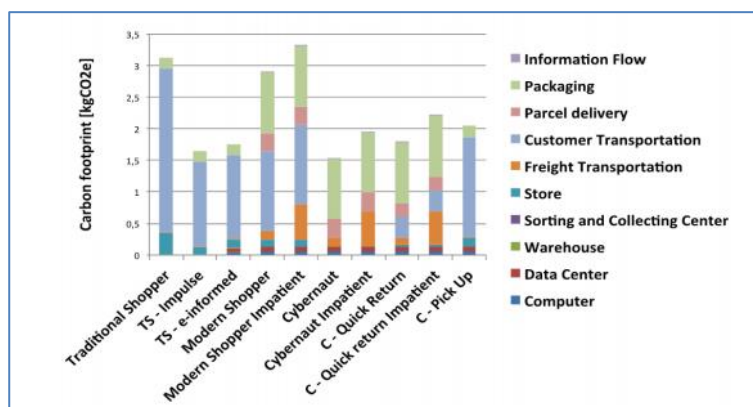
Individual Parcel Delivery US

We started selling in the US late 2020, so we are looking at a limited number of transactions compared to the EU

We have used a research on average carbon footprint in the US of one product (toy) bought online.

source: https://ctl.mit.edu/sites/default/files/library/public/Dimitri-Weideli-Environmental-Analysis-of-US-Online-Shopping_0.pdf

Below a graph that shows carbon footprints of different types of consumers.



We noticed that the packaging is a considerable part of the footprint at about 1kg. So we decided to use that also for our EU footprint calculation.

To use in KOW calculations

the footprint of the Cybernaut impatient	2kg	CO ₂ e
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Number of US parcels

taken from sales table	170
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Total Emission from Parcel Delivery US

Number of sales and returns	Carbon footprint (kg)	Total Footprint
170	2	340