



Carbon Footprint Report 2022

Created by: Martijn van Rijnsoever
 To: Kingdom of Wow Management
 Date: 6/26/2023

Table of Contents

Summary.....3

Methodology4

 Two companies one report.....5

 Scope5

 Considerations for the future6

 History.....7

KOW Lifestyle Manufacturing.....9

 Scope 3 Indirect Upstream9

 Scope 1 Direct.....10

 Scope 2 Indirect Energy10

 Scope 3 Indirect Downstream.....11

KOW Lifestyle Europe12

 Scope 3 Indirect Upstream12

 Scope 1 Direct.....12

 Scope 2 Indirect Energy12

 Scope 3 Indirect Downstream.....12

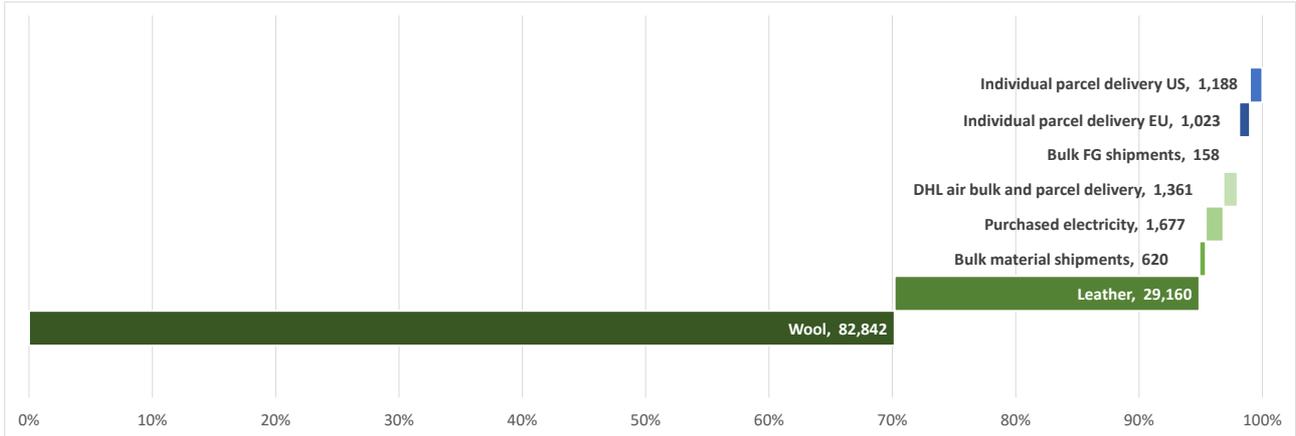
Summary

Carbon Footprint KOW Lifestyle Manufacturing			what and how	Carbon Footprint	U/M
KLC	Scope 3 Upstream	Wool	footprint per KG of wool, multiplied by KG bought	82,842	KG CO2e
KLC	Scope 3 Upstream	Leather	footprint per M2 of leather, multiplied by KG bought	29,160	KG CO2e
KLC	Scope 3 Upstream	Bulk material shipments	list out all incoming shipments modality, origin, weight run through calculator	620	KG CO2e
KLC	Scope 1 Direct	Company Facilities	Negligible emissions from company processes		
KLC	Scope 2	Purchased electricity	Add up all electricity bills for 2020 Multiply the kWh with the estimated Thai emissions per kWh, as this is where most power comes from	1,677	KG CO2
KLC	Scope 3 Downstream	DHL air bulk and parcel delivery	Calculate parcel delivery emissions from SR to different standard locations (DHL) take these calculations to come to a CAM fulfillment footprint	1,361	KG CO2

Carbon Footprint KOW Lifestyle Europe				Carbon Footprint	U/M
KLE	Scope 3 Upstream	Bulk FG shipments	list out incoming shipments, modality, origin, weight run through calculator Green Webhosting	158	KG CO2e
KLE	Scope 1	Company facilities	Negligible emissions from company processes		
KLE	Scope 2	Purchased electricity	Negligible purchase of electricity		
KLE	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	1,023	KG CO2e
KLE	Scope 3 Downstream	Individual parcel delivery US	Take the US parcel average multiplied by number of sales and returns	1,188	KG CO2e

Grand total Footprint 2021

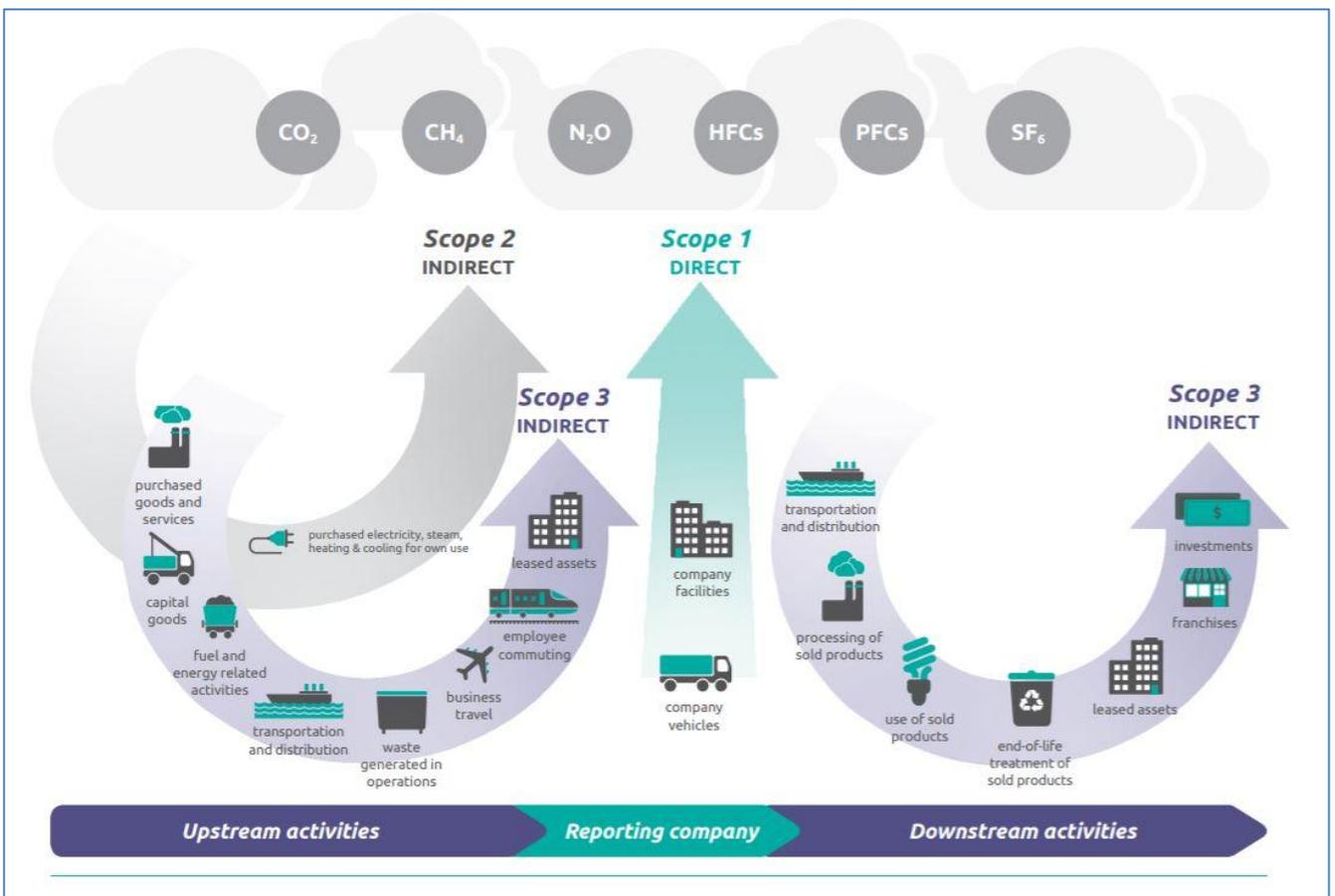
118,030



Methodology

For 2022, 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 web shops 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 2022	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	Not considered material. Also, outside our capacity to calculate	Out
	Purchased goods and services	Services negligible in size and outside our capacity to calculate Raw materials we include the materials most used: 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 99% 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 2022	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	We purchase accountancy and warehousing services. Outside our capacity to calculate the emissions. We do purchase green webhosting services.	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 focus the two main materials of the slippers. We have ambitions to include more materials in future reports. We are also contacting our key suppliers for their actions to reduce and/or offset their footprint, allowing us to procure already reduced or neutral materials.

Sources of emission numbers

We have done research in emissions for the materials and the (main logistic) services that we use. Where there was any 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 receive feedback on better sources, we have included our source for each emission. Feedback is very welcome.

First Reduce, Offset what is left

We completed this calculation and report for the first time over 2020. This gave us great insight as to where our footprint is created, and also how this is distributed. 2022 is our third report using the same methodology.

You will see in this report that the footprint for wool and leather used far exceeds any of the other impacts. Currently we do not have alternatives to using wool and leather for our products.

For the resulting carbon footprint, we look for certified projects that we can use to offset our carbon emissions.

History

3 years of history

Year	Footprint	Remark
2020	50,474 kg CO2-e	There was a sizeable mistake in the leather footprint calculation of 21,963 kg CO2-e. It is added in this overview we added this to our 2021 offset purchase.
2021	100,110kg CO2-e	We bought 400% more wool in 2021.
2022	118.030kg CO2-e	In 2022 we experienced a relatively low growth curve. Resulting in only a slightly higher carbon footprint

Offset of 2022

Carbon offset can be arranged in many ways and across the globe. We have chosen to look for a project that has a relevant connection for us. We have donated to this project since the completion of our first Footprint Report.

We are aware of discussions on the carbon offsetting claims. For this year we have chosen to remain with the plan. See where things are heading. We may switch in the future.

Stand For Trees – Southern Cardamom.

This project works in one of the most beautiful tropical forests in Cambodia. It offers the purchase of carbon offset credits, working in accordance with REDD+, which is a UN approved model specially created to fight climate change by saving forests.

REDD+ also means that in addition to the carbon offset, there is positive impact on biodiversity, livelihoods, wildlife habitat and much more.

Kingdom of Wow likes this comprehensive approach.



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 (i.e. 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

PO2021-022 Bamboo Wool	1198	kg
PO2022-012 Bamboo Wool	2094	kg
PO2022-XXX Lopi wool	35	kg
total	3327	kg

Total Carbon Footprint

kg of wool	Carbon footprint per kg	Total footprint	Unit
32327	24.9	82,842.30	Kg CO ₂ -e

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		kg	suede cow leather skins
------------	--	----	-------------------------

Convert kg to m²

Shipment 1	5000	ft ²	suede cow leather skins
convert	450	m ²	

Total Carbon Footprint

m ² of leather	Carbon footprint per kg	Total footprint
450	64.8	29,160 kg CO ₂ -e

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	Import/Export	Origin	Destination	Weight of shipment	Freight Modality	Route	Carbon	U/M
PO2022-002 Suede Leather	Suede Leather	Import	Guangzhou	Siem Reap	350	Truck	Guazhou-SR	12.3	CO ₂ e
PO2022-008 Espa Soles	Espa Soles	Import	Foshan city	Siem Reap	711	Truck-Ocean-Truck	Foshan - Shanghai - SHV-SR	79.93	CO ₂ e
PO2022-xxx Lopi Yarn	Wool Yarn	Import	Tynaarlo	Siem Reap	56	Express Air- Truck	Amsterdam PP - Truck	438.29	CO ₂ e
PO2022-012 Bamboo Wool	Bamboo Wool	Import	Shanghai	Siem Reap	2094	Ocean-Truck	Shanghai - SHV- SR	89.92	CO ₂ e
								620.44	

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

Date: 2023-06-26

Total Emission from incoming material shipments

620 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

Total energy bill for 2022

Date	Amount Energy	unit	Memo/Description	Amount
2021 full year	4116	kWh	Electricity in Jan - Dec 2022	\$1,033.99

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 /kWh (kg-CO ₂ / kWh)
2022	0.407

Carbon Emission Calculation

kWh used	Emission per kWh	Electricity Carbon Footprint	U/M
4,116	0.407	1,676	kg CO ₂

Scope 3 Indirect Downstream

Individual Parcel Delivery

We have seen an increase in direct DHL shipments from KOW Lifestyle Manufacturing to customers in countries closer to Cambodia than our standard fulfilment locations or for rush replenishment. We have also used DHL Air for some bulk shipments that were too small for ocean freight.

Below, in the table of individual deliveries, we use one destination per country and the carbon footprint for all shipments into that country. We use the weight as given in the DHL CSV file that we receive after each shipment and use the footprint that the calculator gives us. It seems more precise to work this way. The result is a lower footprint per individual shipment than our calculation in 2020.

size of shipment	Dimensions	Route	modality	Carbon	U/M	number of shipments	Total Carbon
Single Package	0.5kg	Australia	air	10	KG CO ₂ e WTW	2	20
Single Package	0.5kg	Brazil	air	20.56	KG CO ₂ e WTW	8	164.48
Single Package	0.5kg	Canada	air	14.55	KG CO ₂ e WTW	2	29.1
Single Package	0.5kg	Germany	air	12.33	KG CO ₂ e WTW	1	12.33
Single Package	0.5kg	India	air	5.37	KG CO ₂ e WTW	74	397.38
Single Package	0.5kg	Israel	air	10.87	KG CO ₂ e WTW	1	10.87
Single Package	0.5kg	Mexico	air	19.3	KG CO ₂ e WTW	4	77.2
Single Package	0.5kg	United States	air	17.18	KG CO ₂ e WTW	6	103.08
Total							814.44

size of shipment	Dimensions	Route	modality	Carbon	U/M
Batch shipment	26.9 kg	Siem Reap - Los Angeles	air	263.21	KG CO ₂ e WTW
Batch shipment	29 KG	Siem Reap - Los Angeles	air	283.76	KG CO ₂ e WTW
Total				546.97	

Total Emission from air freight parcel and bulk delivery

1361 kg CO₂e WTW

KOW Lifestyle Europe

Scope 3 Indirect Upstream

KOW Lifestyle purchases products (slippers and shoes) from KOW Lifestyle Manufacturing in Cambodia. They buy EXW, so the full shipment footprint is allocated to KOW Lifestyle Europe

Shipment Reference	KOW unit	Origin	Destination	Weight of shipment	Freight Modality	Route	Carbon	U/M
FG Slippers	Export	Siem Rea	Nuenen	1893	Truck-Ocean-Truck	SR-SHV-AMS-Nuenen	158.4	CO2e

Total Emission from individual parcel delivery

158 kg CO₂e WTW

Webhosting

Our web builder and digital marketing agency Olive & Lake provides us with 100% green hosting services.



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 the 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	Truck	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
----------------------------	---	----------------------

Total Emission from Parcel Delivery EU

	Number of transactions	Carbon footprint (kg)	Total footprint
Sales	1002	1.14	1002

Returns	152	0.14	21.28
			1023.28

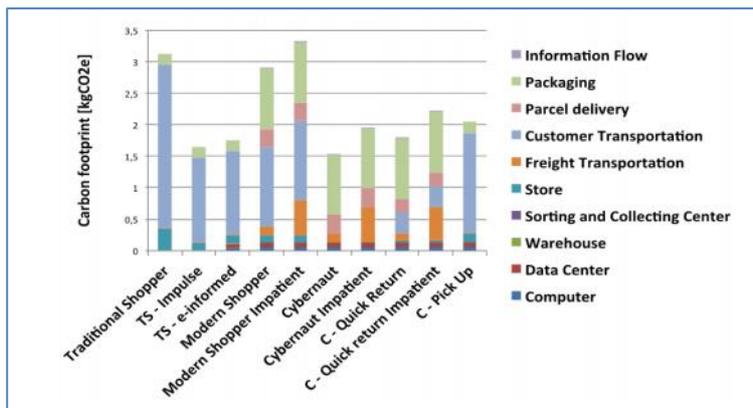
Individual Parcel Delivery US

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 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
--	-----	-------------------

Number of US parcels

Taken from sales table	608
------------------------	-----

Total Emission from Parcel Delivery US

	Number of transactions	Carbon footprint (kg)	Total Footprint
Sales	579	2	1158 CO ₂ -e
Returns	30	1	30 CO ₂ -e