



# Carbon Footprint Report 2021

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 To: Kingdom of Wow Management  
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## Table of Contents

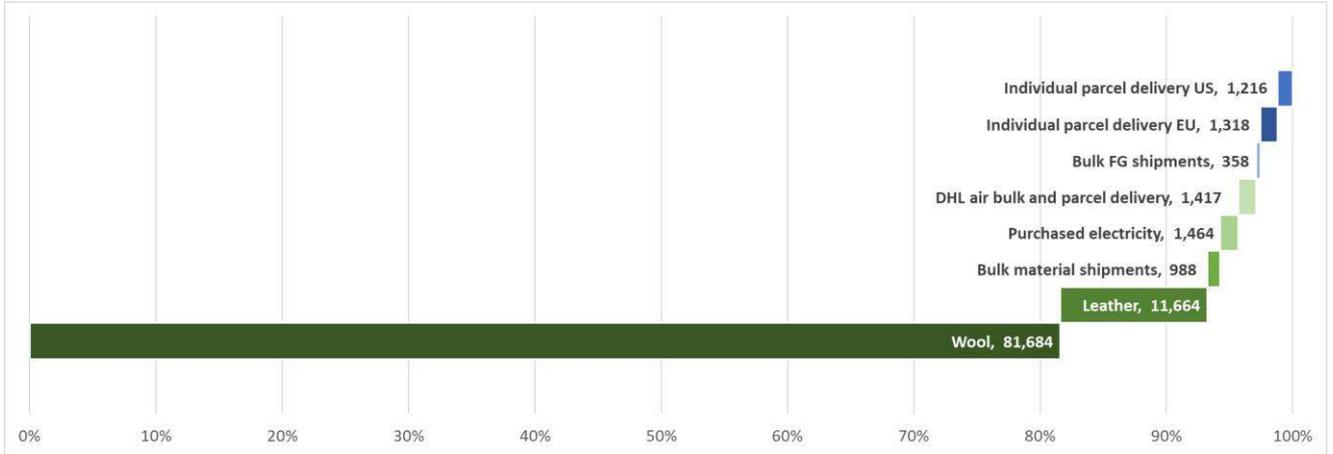
Summary.....	3
Methodology .....	4
Two companies one report.....	5
Scope .....	5
Considerations for the future .....	6
Historical figures .....	7
KOW Lifestyle Manufacturing.....	9
Scope 3 Indirect Upstream .....	9
Scope 1 Direct.....	10
Scope 2 Indirect Energy .....	10
Scope 3 Indirect Downstream.....	11
KOW Lifestyle Europe .....	12
Scope 3 Indirect Upstream .....	12
Scope 1 Direct.....	12
Scope 2 Indirect Energy .....	12
Scope 3 Indirect Downstream.....	12

## 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	81,684	kg CO <sub>2</sub> e
Scope 3 Upstream	Material: Leather	footprint per m <sup>2</sup> of leather, multiplied by kg bought	11,664	kg CO <sub>2</sub> e
Scope 3 Upstream	Bulk shipments	list out all incoming shipments modality, origin, weight run through calculator	988	kg CO <sub>2</sub> e
Scope 1 Direct	Company facilities	negligible emissions from company processes		
Scope 2	Purchased electricity	total all electricity bills for 2021 Multiply the kWh with the estimated emissions per kWh, as given by the IEA	1,464	kg CO <sub>2</sub> e
Scope 3 Downstream	Individual parcel delivery	calculate parcel and bulk delivery emissions from Siem Reap to different locations around the world with DHL calculator. take these calculations to come to fulfilment footprint in Cambodia	1,417	kg CO <sub>2</sub> 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	358	kg CO <sub>2</sub> 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	1,318	kg CO <sub>2</sub> e
Scope 3 Downstream	Individual Parcel Delivery US	take the US parcel average multiplied by number of sales and returns	1,216	kg CO <sub>2</sub> e

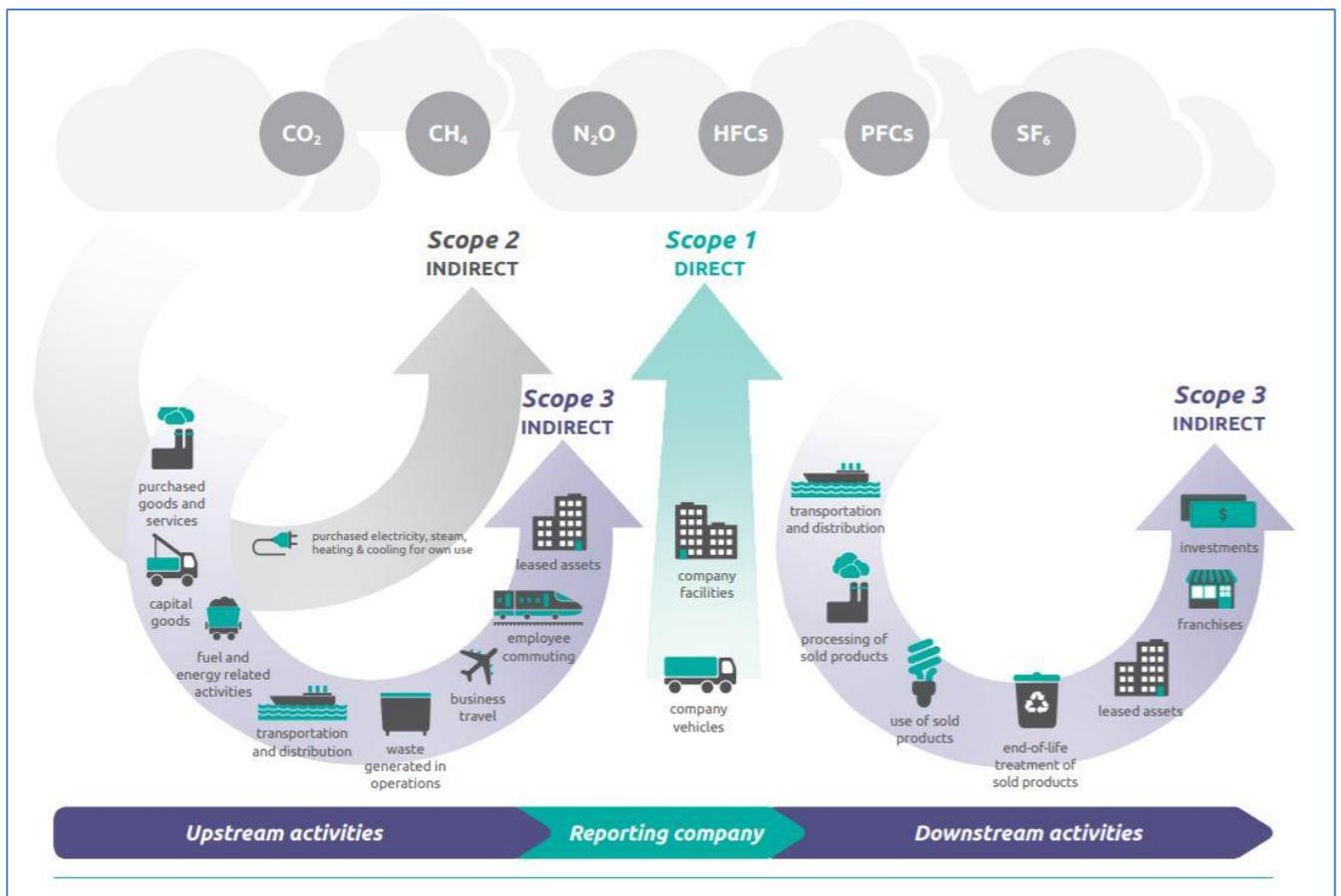
<b>Footprint 2021</b>	<b>100,110</b>
<b>2020 Shortfall</b> See explanation below @History)	<b>21,963</b>
<b>Grand total for offset</b>	<b>122,073</b>



## Methodology

For 2021, 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 2021	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 2021	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
Scope 3 indirect downstream	Purchased Goods and Services	Webhosting, accountancy and warehousing. Outside our capacity to calculate the emissions	Out
	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 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 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.

### **First Reduce, Offset what is left**

We completed this calculation and report for the first time over the year 2020. This gave us great insight as to where our footprint is made, and also how this is distributed. 2021 is our second 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

### ***Only 2 years of history***

Year	Footprint	Remark
2020	27,511 kg CO2-e	There was a sizeable mistake in the leather footprint calculation of 21,963 kg CO2-e we will add this to our 2021 offset purchase
2021	100,110kg CO2-e	We bought 400% more wool in 2021.

### ***Offset of 2020***

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.

#### ***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.



## CERTIFICATE OF FOREST PROTECTION

PRESENTED TO

**KINGDOM OF WOW**



PURCHASE OF 30 TONNES OF CO<sub>2</sub> MAY 24TH, 2021

CERTIFICATE ID YSQ4XA5DFCC2410



**STAND FOR TREES**

### **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 <sub>2</sub> 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 <sub>2</sub> e Fine grade wool (incl processing)

#### Standard we use

24.9 kg CO<sub>2</sub>e

#### Wool purchases

Shipment 1	185.5	kg	17 Jan 2021 Lopi Wool
Shipment 2	544	kg	18 Feb 2021 Bamboo Wool
Shipment 3	295	kg	1 Jun 2021 Lopi Wool
Shipment 4	1839	kg	7 Jun 2021 Bamboo wool
Shipment 5	417	kg	4 Sep 2021 Lopi wool
<b>total</b>	<b>3280</b>	<b>kg</b>	

#### Total Carbon Footprint

kg of wool	Carbon footprint per kg	Total footprint	Unit
3280	24.9	81,684.45	Kg CO <sub>2</sub> -e

### **Material: Leather**

#### Sources

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

#### Standard we use

64.8 kg CO<sub>2</sub>e

#### Leather purchases

Shipment 1	198.45	kg	suede cow leather skins
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### Convert kg to m<sup>2</sup>

Thickness of hide		1.4	mm
		3.5	oz/ft <sup>2</sup>
		37.67	oz/m <sup>2</sup>
		35.3	oz/kg
Shipment 1	198.45	Kg	suede cow leather skins

### Total Carbon Footprint

m <sup>2</sup> of leather	Carbon footprint per kg	Total footprint
180	64.8	11,664 kg CO <sub>2</sub> -e

### Material Shipments

We use the multi-modality CO<sub>2</sub> 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
Shoe boxes_2021	Shoe boxes	Import	Phnom Penh	Siem Reap	430	Truck	PP – Siem Reap	35.89	KG CO <sub>2</sub> e WTW
Lopi Wool 2021	Lopi Wool	Import	Tynaarlo	Siem Reap	250	Truck-Sea-Truck	Tynaarlo - RTD - SIH - Siem Reap	60.26	KG CO <sub>2</sub> e WTW
Bamboo Yarn_2021	Bamboo	Import	Shanghai	Siem Reap	544	Truck-Sea-Truck	Dayi Town Changshu - Shanghai - SIH - Siem Reap	123.88	KG CO <sub>2</sub> e WTW
Lopi Wool 2021_1	Lopi Wool	Import	Tynaarlo	Siem Reap	295	Truck-Sea-Truck	Tynaarlo - RTD - SIH - Siem Reap	71.1	KG CO <sub>2</sub> e WTW
Bamboo Yarn_2021_1	Bamboo	Import	Shanghai	Siem Reap	1839	Truck-Sea-Truck	Shanghai - SIH - Siem Reap	192.87	KG CO <sub>2</sub> e WTW
Shoe boxes_2021_1	Shoe boxes	Import	Changzhou City	Siem Reap	3602	Truck-Sea-Truck	Changzhou - SH- SIH - Siem Reap	238.77	KG CO <sub>2</sub> e WTW
Espadrille soles_2021	Soles	Import	Guangzhou	Siem Reap	953.5	Truck-Sea-Truck	Guangzhou - HK- SIH - Siem Reap	165.14	KG CO <sub>2</sub> e WTW
Lopi Wool 2021_2	Lopi Wool	Import	Tynaarlo	Siem Reap	417	Truck-Sea-Truck	Tynaarlo - RTD - SIH - Siem Reap	100.5	KG CO <sub>2</sub> e WTW

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

Date: 2022-03-18

### Total Emission from incoming material shipments

988 kg CO<sub>2</sub>e 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 2021

Date	Amount Energy	unit	Name	Memo/Description	Amount
2021 full year	3734	kWh		Electricity in Jan - Dec 2021	933.50

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

#### Carbon Emission Calculation

kWh used	Emission per kWh	Electricity Carbon Footprint	U/M
3734	0.392	1,464	kg CO <sub>2</sub>

## 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	Siem Reap - Netherlands (Amsterdam)	air	3.74	KG CO <sub>2</sub> e WTW	16	59.84
Single Package	0.5kg	Siem Reap - Australia (Melbourne)	air	3.01	KG CO <sub>2</sub> e WTW	13	39.13
Single Package	0.5kg	Siem Reap - India (New Delhi)	air	1.6	KG CO <sub>2</sub> e WTW	1	1.6
Single Package	0.5kg	Siem Reap - Canada (Ottawa)	air	5.07	KG CO <sub>2</sub> e WTW	2	10.14
Single Package	0.5kg	Siem Reap - Brazil (Sao Paulo)	air	6.18	KG CO <sub>2</sub> e WTW	3	18.54
Single Package	0.5kg	Siem Reap - China (Shanghai)	air	1.3	KG CO <sub>2</sub> e WTW	2	2.6
Single Package	0.5kg	Siem Reap - Thailand (Bangkok)	air	0.29	KG CO <sub>2</sub> e WTW	3	0.87
Single Package	0.5kg	Siem Reap - UK (London)	air	3.18	KG CO <sub>2</sub> e WTW	18	57.24
Single Package	0.5kg	Siem Reap - German (Berlin)	air	2.89	KG CO <sub>2</sub> e WTW	2	5.78
Single Package	0.5kg	Siem Reap - Denmark (Aalborg)	air	2.94	KG CO <sub>2</sub> e WTW	1	2.94
Single Package	0.5kg	Siem Reap - US (Los Angeles)	air	4.89	KG CO <sub>2</sub> e WTW	17	83.13
<b>Total</b>							<b>281.81</b>

size of shipment	Dimensions	Route	modality	Carbon	U/M
Batch shipment	5.5 KG	Siem Reap - Berlin	air	38.88	KG CO <sub>2</sub> e WTW
KOW Japan	19kg	Siem Reap - Hamamatsu	air	78.19	KG CO <sub>2</sub> e WTW
KOW Japan	96.5kg	Siem Reap - Hamamatsu	air	397.25	KG CO <sub>2</sub> e WTW
US Inventory	27.5kg	Siem Reap - Los Angeles	air	276.7	KG CO <sub>2</sub> e WTW
US Inventory	32.5kg	Siem Reap - Los Angeles	air	318.5	KG CO <sub>2</sub> e WTW
Sample box to Boxmeer	3.5kg	Siem Reap - Boxmeer	air	26.14	KG CO <sub>2</sub> e WTW
<b>Total</b>				<b>1135.66</b>	

### Total Emission from air freight parcel and bulk delivery

1417 kg CO<sub>2</sub>e 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
INV2021009 Export to USA combined Keptop	KOW EUR	Siem Reap	LA	381	Truck-Sea-Truck	Siem Reap - SIH - LA	61.68	KG CO2e WTW
NL shipment Export slippers 2021 FTS	KOW EUR	Siem Reap	Nuenen	210.6	Truck-Sea-Truck	Siem Reap - SIH - RTD - Nuenen	42.84	KG CO2e WTW
INV2021084 Export Slippers KOW & FVB	KOW EUR	Siem Reap	Nuenen	1051.34	Truck-Sea-Truck	Siem Reap - SIH - RTD - Nuenen	123.46	KG CO2e WTW
INV2021104 Export Slippers KOW & FVB	KOW EUR	Siem Reap	Nuenen	635.04	Truck-Sea-Truck	Siem Reap - SIH - RTD - Nuenen	129.55	KG CO2e WTW

### Total Emission from individual parcel delivery

357 kg CO<sub>2</sub>e 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 <sup>3</sup>	Nuenen - Amsterdam	Trucking	0.14	kg CO <sub>2</sub> 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 <sub>2</sub> e
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#### Total Emission from Parcel Delivery EU

Number of sales and returns	Carbon footprint (kg)	Total footprint
1156	1.14	1,317

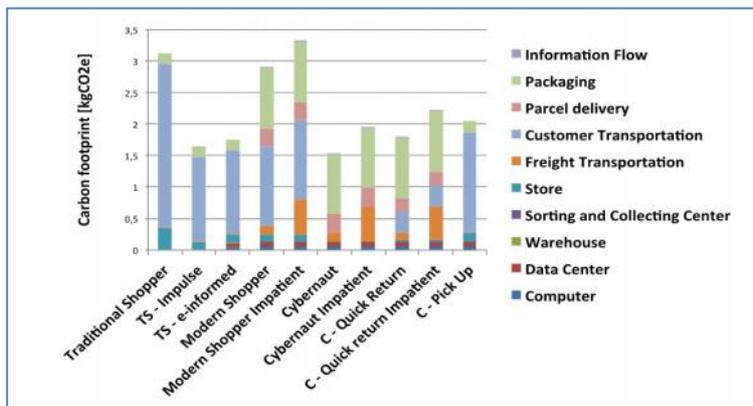
### Individual Parcel Delivery US

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](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 <sub>2</sub> e
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#### Number of US parcels

Taken from sales table	608
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#### Total Emission from Parcel Delivery US

Number of sales and returns	Carbon footprint (kg)	Total Footprint
608	2	1,216 CO <sub>2</sub> -e