

CO2 Footprint; my personal case

by *Gerrit Muller* TNO-ESI, University of South-Eastern Norway

e-mail: gaudisite@gmail.com

www.gaudisite.nl

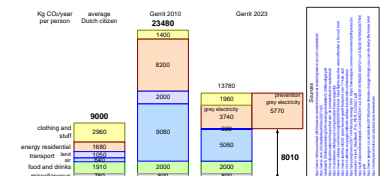
Abstract

The transition to a sustainable society requires solutions for all Sustainability Development Goals. One of the challenges is to lower our CO2 footprint. This presentation estimates my personal CO2 footprint to understand the main contributors of our personal footprint.

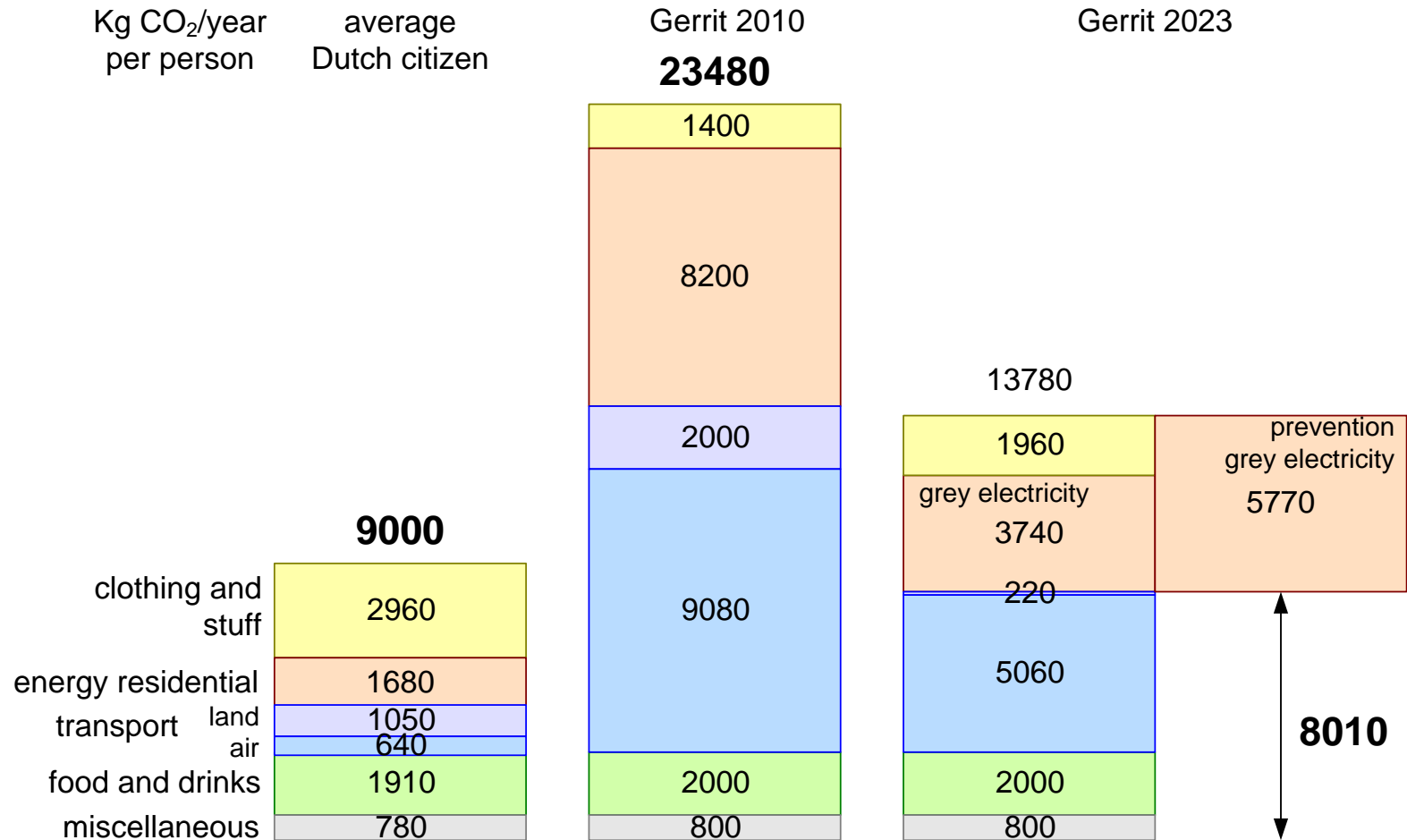
Distribution

This article or presentation is written as part of the Gaudí project. The Gaudí project philosophy is to improve by obtaining frequent feedback. Frequent feedback is pursued by an open creation process. This document is published as intermediate or nearly mature version to get feedback. Further distribution is allowed as long as the document remains complete and unchanged.

August 16, 2025
status: preliminary
draft
version: 0



Total CO2 Footprint



Sources

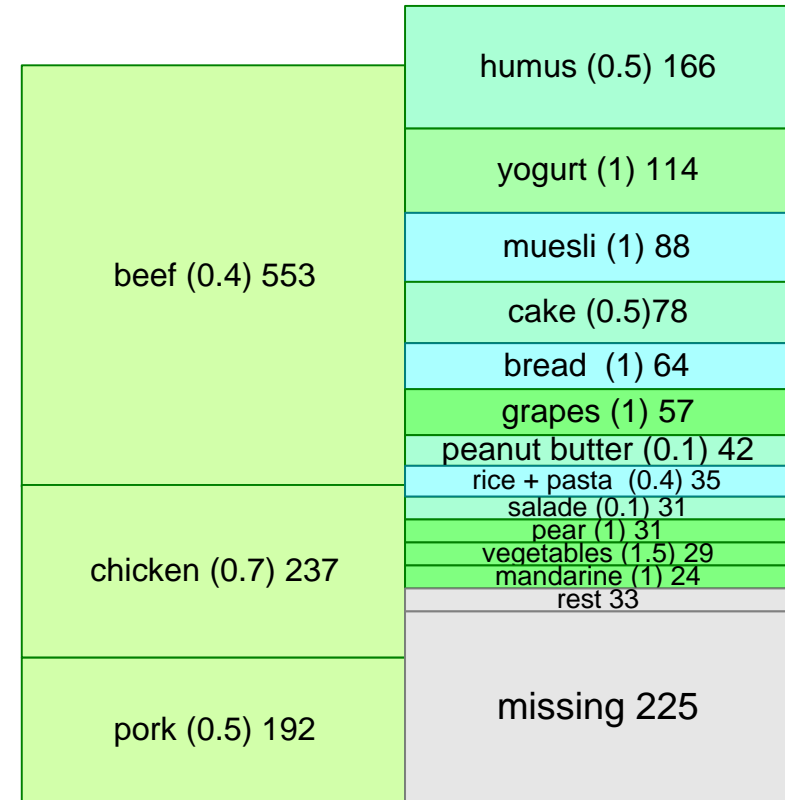
- <https://www.milieucentraal.nl/klimaat-en-aarde/klimaatverandering/wat-is-je-co2-voetafdruk/>
- <https://www.rivm.nl/sites/default/files/2021-02/Database%20milieubelasting%20voedingsmiddelen%20Beveiligd.pdf>
- <https://ce.nl/publicaties/milieuprofiel-van-stroomaanbod-in-nederland/>
- <https://vandebron.nl/blog/co2-compensatie-hoezo-eigenlijk>
- <https://www.robeco.com/en/insights/2020/02/short-haul-flights-are-the-worst-offenders-for-co2.html>
- <https://www.textilia.nl/220-gram-textiel-geeft-footprint-van-1-1-kilo-co2/>
- <https://nl.nl.allbirds.eu/pages/allbirds-adidas-futurecraft-collaboration>
- <https://phys.org/news/2011-04-factory-energy.html>
- https://www.apple.com/environment/pdf/products_notebooks/14-inch_MacBook_Pro_PER_Oct2021.pdf
- <https://pdf.sciencedirectassets.com/306234/1-s2.0-S2351978920X00072/1-s2.0-S2351978920307794/main.pdf>
- <https://www.penguin.co.uk/articles/2019/jul/ios-climate-change-things-you-can-do-daily-life-home.html>
- <https://mobly.be/nl/wiki/co2-uitstoot-auto-berekenen>

Food CO2 Footprint

food and drinks		Kg CO ₂ /Kg			
butter	sandwich filling	9.25	potatoes	carbohydrates	0.18
cheese	sandwich filling	12	bread	carbohydrates	1.2
Humus	sandwich filling	6.4	rice	carbohydrates	1.8
peanut butter	sandwich filling	8	wheat flour	carbohydrates	0.9
salad	sandwich filling	6	pasta	carbohydrates	1.5
wine	drinks	2	musli	carbohydrates	1.7
tea	drinks	0.16	cake	luxury	3
coffee	drinks	0.3	kidney beans	legumes	1.5
Vegetarian sausage	protein	4.3	chickpeas	legumes	6.2
tofu	protein	3.2	mayonnaise	sauce	5
vegetarian slice	protein	3.3	beef	meat	26.6
vegetables	fruit, vegetables	0.37	pork	meat	7.4
grapes	fruit, vegetables	1.1	chicken	meat	6.5
mandarine	fruit, vegetables	0.47	fish	meat	6
pear	fruit, vegetables	0.6	yogurt	dairy	2.2

preparation counted twice

Gerrit (food/week in Kg) 2000



Clothing and Stuff CO2 Footprint

Gerrit 2023
1000 + 960 Kg CO₂

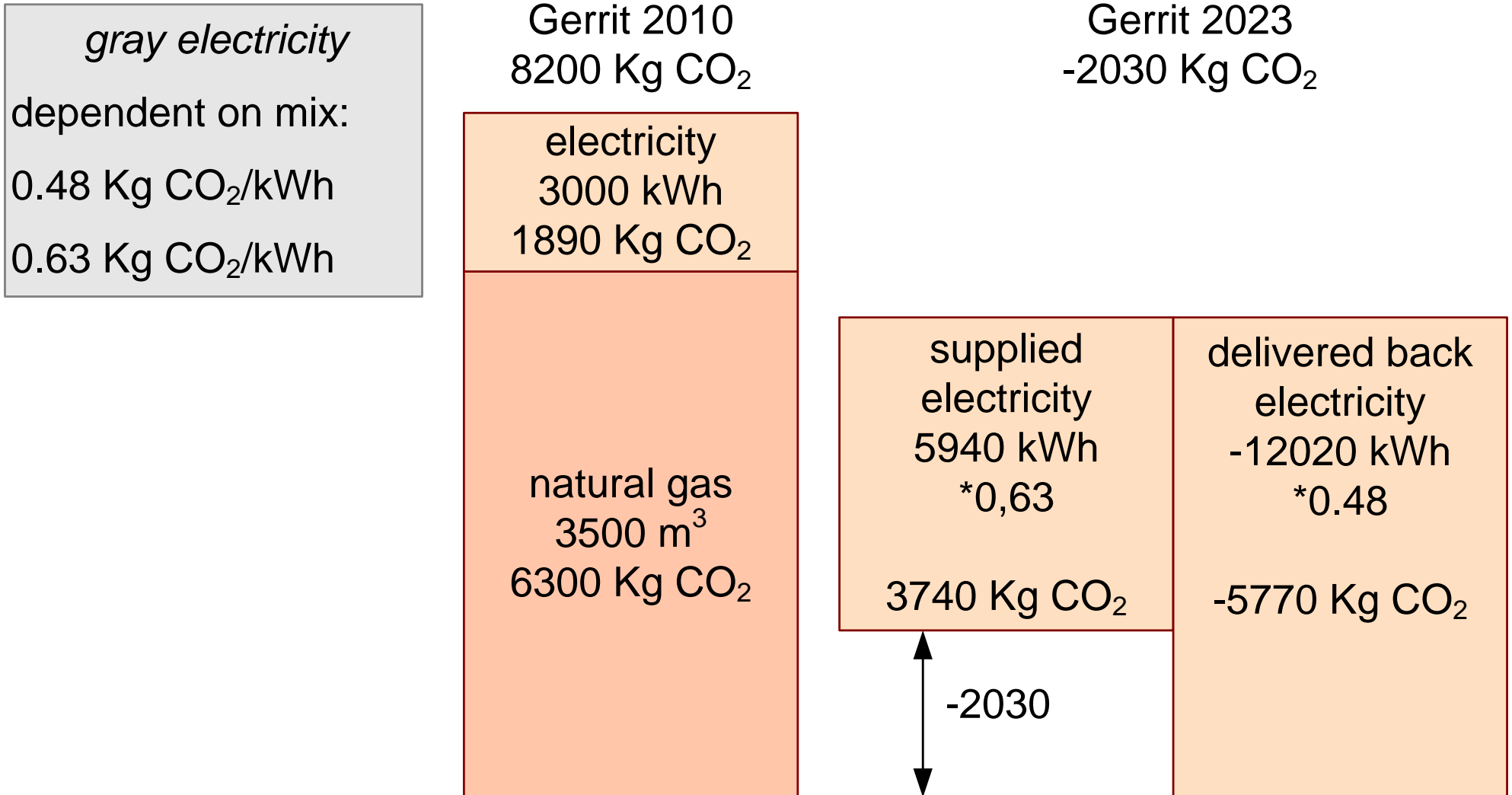
CO ₂ emission data	
	Kg CO ₂ /Kg
production textile	13.6
transport textile	1.4
paperback	2
	Kg CO ₂
shoes/pair	4
laptop/piece	250
AA battery	0.1
household equipment	300
small car (Citroën C1)	6000
medium car (Mondeo)	17000
large car (Landrover)	35000
PV panel (1.7*1m ²)	31
	Kg CO ₂ /kWh
Li-ion battery	73

Clothing (maat XL)		
garment	weight	Kg CO ₂ /piece
shirts	280	4.2
vest	850	12.8
jeans	780	11.7
T-shirt	200	3.0
underpants	80	1.2
towels	230	3.5
tea towels	70	1.1
pair of socks	80	1.2
jacket	1000	15.0
pajamas	760	11.4

electronic devices 281
household equipment 300
books 132
clothing 128
shoes 4
rest 155

PV 94
electric car "depreciation" over 10 years 863 (battery 263)

Energy CO2 Footprint

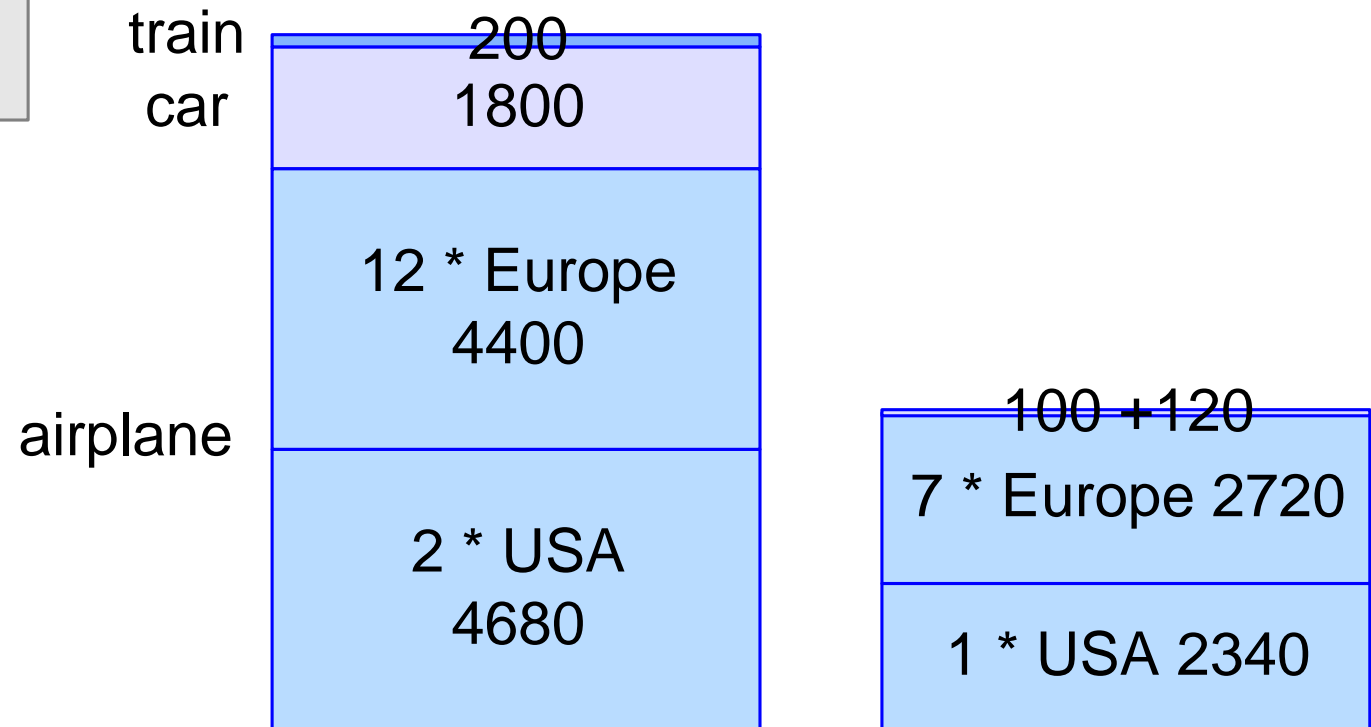


Transport CO2 Footprint

transport	
flying	g/km
short distance	251
long distance	195
train	41
car, 5l/100km	120

Gerrit 2010
land 2000 Kg CO₂
air 9080 Kg CO₂

Gerrit 2023
land 220 Kg CO₂
air 5060 Kg CO₂



CO₂ footprint for typical Dutch family (2021)

family of 2.2 persons	Kg CO ₂ /yr	%
clothing and "stuff"	6500	33
residential energy	3700	19
transportation land	2300	12
transportation air	1400	7
food and drinks	4200	21
miscellaneous	1700	8
total	19800	

<https://www.milieucentraal.nl/klimaat-en-aarde/klimaatverandering/wat-is-je-co2-voetafdruk/>

gray electricity
dependent on mix:
0.48 Kg CO₂/kWh
0.63 Kg CO₂/kWh

Transort cost containers Shanghai-Rotterdam

modus	Cost[\$]	time[days]	distance[km]	Kg CO ₂
ship	4000	35..55	20.000	757
train	8000	15..28	11.000	125
plane	32000	5.. 8	9.000	49.500

NRC Handelsblad ZATERDAG 16 APRIL 2022, CarbonCare.org

person transport

flyng	g/km
short distance	251
long distance	195
train	41
car, 5l/100km	120

food and drinks

		Kg CO ₂ /Kg			
butter	sandwich filling	9.25	potatoes	carbohydrates	0.18
cheese	sandwich filling	12	bread	carbohydrates	1.2
Humus	sandwich filling	6.4	rice	carbohydrates	1.8
peanut butter	sandwich filling	8	wheat flour	carbohydrates	0.9
salad	sandwich filling	6	pasta	carbohydrates	1.5
wine	drinks	2	musli	carbohydrates	1.7
tea	drinks	0.16	cake	luxury	3
coffee	drinks	0.3	kidney beans	legumes	1.5
Vegetarian sausage	protein	4.3	chickpeas	legumes	6.2
tofu	protein	3.2	mayonnaise	sauce	5
vegetarian slice	protein	3.3	beef	meat	26.6
vegetables	fruit, vegetables	0.37	pork	meat	7.4
grapes	fruit, vegetables	1.1	chicken	meat	6.5
mandarine	fruit, vegetables	0.47	fish	meat	6
pear	fruit, vegetables	0.6	yogurt	dairy	2.2

CO₂ emission data

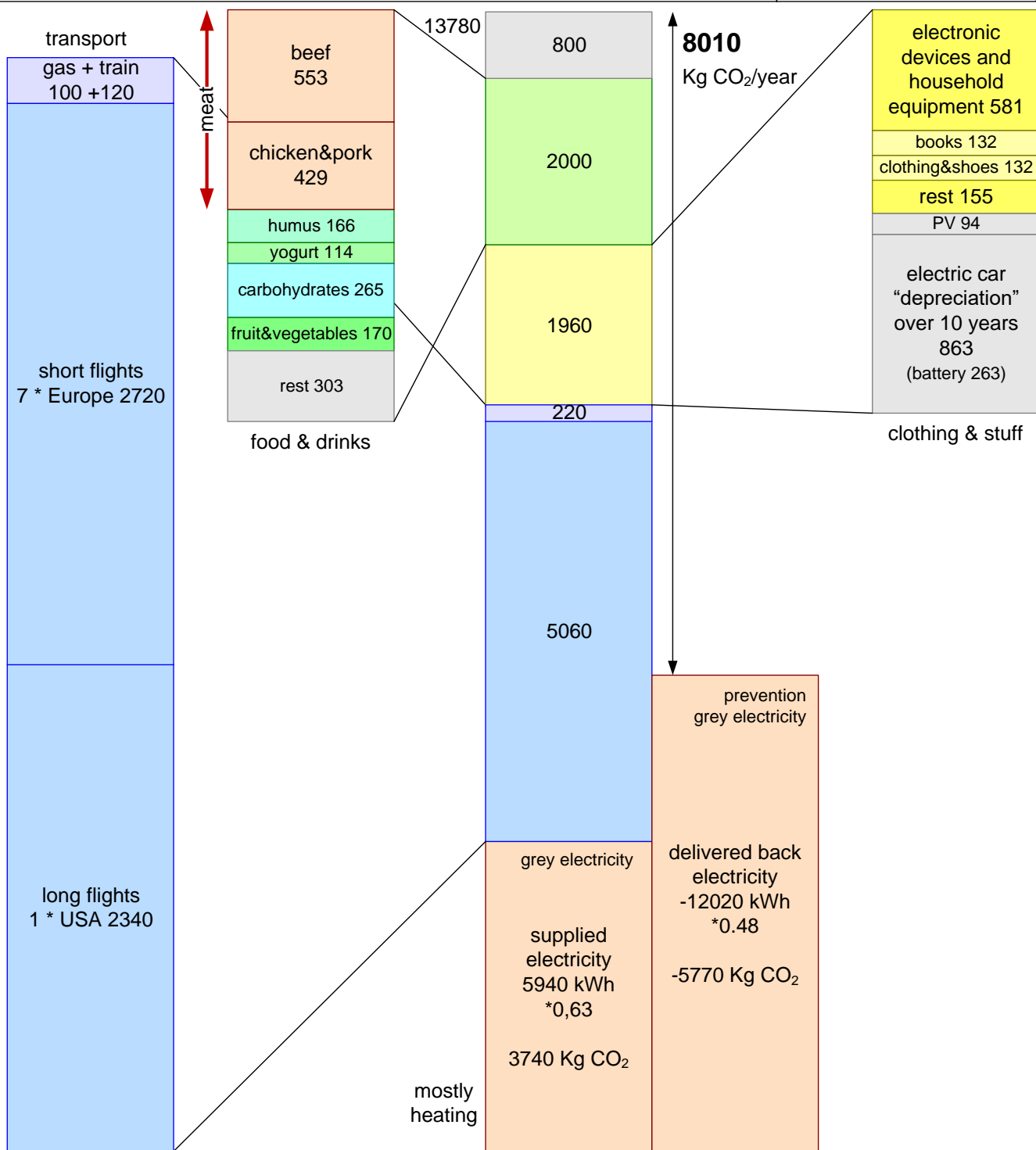
	Kg CO ₂ /Kg
production textile	13.6
transport textile	1.4
paperback	2
shoes/pair	4
laptop/piece	250
AA battery	0.1
household equipment	300

Kg CO₂

small car (Citröen C1)	6000
medium car (Mondeo)	17000
large car (Landrover)	35000
PV panel (1.7*1m ²)	31
Li-ion battery	73

Sources

<https://www.milieucentraal.nl/klimaat-en-aarde/klimaatverandering/wat-is-je-co2-voetafdruk/>
<https://www.rivm.nl/sites/default/files/2021-02/Database%20milieubelasting%20voedingsmiddelen%20Beveiligd.pdf>
<https://ce.nl/publicaties/milieu-profiel-van-stroomaanbod-in-nederland/>
<https://vandebroen.nl/blog/co2-compensatie-hoezo-eigenlijk>
<https://www.robeco.com/en/insights/2020/02/short-haul-flights-are-the-worst-offenders-for-co2.html>
<https://www.textilia.nl/220-gram-textiel-geeft-footprint-van-11-kilo-co2/>
<https://nl-nl.allbirds.eu/pages/allbirds-adidas-futurecraft-collaboration>
<https://phys.org/news/2011-04-factory-energy.html> https://www.apple.com/environment/pdf/products/notebooks/14-inch_MacBook_Pro_PER_Oct2021.pdf
<https://pdf.scienceirectassets.com/306234/1-s2.0-S2351978920X00072/1-s2.0-S2351978920307794/main.pdf>
<https://www.penguin.co.uk/articles/2019/jul/sos-climate-change-things-you-can-do-daily-life-home.html>
<https://mobly.be/nl/wiki/co2-uitstoot-auto-berekenen>



transport
gas + train
100 +120

short flights
7 * Europe 2720

long flights
1 * USA 2340

meat

beef 553

chicken&pork 429

humus 166

yogurt 114

carbohydrates 265

fruit&vegetables 170

rest 303

food & drinks

13780

800

2000

1960

220

5060

grey electricity

supplied electricity
5940 kWh
*0,63

3740 Kg CO₂

mostly heating

8010
Kg CO₂/year

prevention
grey electricity

delivered back
electricity
-12020 kWh
*0.48

-5770 Kg CO₂

electronic
devices and
household
equipment 581

books 132

clothing&shoes 132

rest 155

PV 94

electric car
"depreciation"
over 10 years
863
(battery 263)

clothing & stuff