

Data is based on the 2024 EUROPEAN LCA FOR A 110ML (LUNGO) COFFEE WITH A NESPRESSO ORIGINAL ALUMINUM CAPSULE COMPARED WITH OTHER BREWING METHODS

Table 1

	Nespresso Original aluminum capsule	Full automate coffee machine	Drip filter coffee
Coffee cultivation	Average global green coffee supply (v3.5 WFLDB, 2019)		
Delivery to factory	Average transport for green coffee supply (NN primary data): 846 km by truck, 9159 km by container ship, 900km by train		
R&G coffee in g/cup of lungo (110 ml)	5.7 g /110 ml Data source: Nespresso primary data shows 5.7g of roast and ground coffee as weighted average over different lungo (110ml) capsules in the European market	9 g/110 ml Data source: 9 g roasted beans for a 40 ml cup according to draft PEFCR coffee, assumed to be brewed with the same amount of coffee but up to 110 ml.*	6.4 g/110ml Data source: draft PEFCR coffee – 7 g roasted beans for a 120 ml coffee. Linear proportion assumed. 7 g R&G coffee for 120 ml and 6.4 g R&G coffee for 110 ml

* This is a conservative assumption to consider not more coffee for the lungo compared to espresso. Higher and lower amount of coffee per cups are tested in sensitivity analyses.

Table 2

	Nespresso Original aluminum capsule	Full automate coffee machine	Drip filter coffee
Primary packaging	0.96 g/cup 87.5% alu (of which 18% is primary alu and 82% is recycled alu), 12.5% lacquerings and polymers (plastics) Nespresso primary data (mass and composition)	0.24 g/cup (mass of pouch for 500 g of coffee is 13.2 g)	0.17 g/cup (mass of pouch for 500 g of coffee is 13.2 g) 59% PE, 18% PET, 23% alu PEFCR coffee (composition), own measurement (mass)
Secondary packaging	1.17 g/cup 100% primary solid bleached board Nespresso primary data (mass and composition)	1.51 g/cup	1.08 g/cup 97% carton, 3% wrapping (plastics) PEFCR coffee (mass and composition)
Tertiary packaging	0.73 g/cup 96% primary corrugated board, 4% wrapping (plastic) and pallet Nespresso primary data (mass and composition)	0.002 g/cup	0.002 g/cup >99% LDPE film, <1% pallet PEFCR coffee (mass and composition)

Table 3

	Nespresso Original aluminum capsule	Full auto. / Drip filter
Distribution (EUROPE)	<p>Distribution: via post, boutiques and pick-up points (specific share based on Nespresso 2022/23 data).</p> <p>Manufacturing site to distribution centers: 1318 km by truck and train (Nespresso 2022 data)</p> <p>Distribution centers activities (per 1000 cup): 0.4 cm2 building, 1 kWh electricity, 4 MJ heat¹¹</p> <p>Distribution centers to boutiques: 5 km by ship, 137 km by truck, 53 km by van¹¹</p> <p>Boutiques activities (per 1000 cup): 4 cm2 building, 4 kWh electricity, 17 MJ heat, 0.4 pkm (pers-km) business travels, 10 pkm commuting¹¹</p> <p>Shipping trip: PEF method 2019.</p> <p>Distribution centers to arrival post: 100 km by truck, 27 km by van, 3 km by motorbike, < 1 km by plane¹¹</p> <p>Postal delivery: 30 km by van for 150 parcels delivered (200 capsules per order, i.e., per parcel)¹², consistent with previous Nespresso studies</p> <p>Internet order: 2 minutes of a computer and network use (100 W) for an order of 200 capsules - consistent with previous Nespresso studies</p> <p>Distribution centers to pick-up points: 161 km by truck, 67 km by van, 2 km by plane¹¹</p> <p>Shopping trip: same as for boutiques.</p> <p>¹¹Weighted average on the 35 most important Nespresso markets, 2020 data ¹²based on Postlogistic Europe data from 2012</p>	<p>Distribution: 100% via supermarkets.</p> <p>From manufacturing site to retail place (via distribution centre): 1200 km by truck (PEF method 2019)</p> <p>Distribution center activities: PEF method 2019</p> <p>Retail place activities: PEF method 2019</p> <p>Volume for the products: FAuto 19 cm3 (lungo), Drip filter 13 cm3 (lungo).</p> <p>Shopping trip: same as for Nespresso boutiques shopping trip.</p>

Table 4

	Nespresso Original aluminum capsule	Full automate coffee machine	Drip filter coffee
Consumables or replacement pieces	n.a.	Filter: 190 g (modelled as 100% PE), changed every 50 L coffee brewed. Data source: own measurement for the mass, assumption for the composition, https://ch.jura.com/fr/support/c-onseils-d-entretien/faq#H for the lifetime (note that a Jura filter data was not considered because the machine is a Jura but as it was an available reference)	Filters sold in 40 units boxes (20x13x2 cm), 2 paper/filter. 1 filter used for 2 cups of coffee. Data source: draft PEFCR coffee
Coffee brewing electricity consumption	17 Wh/110 ml cup (40.6 kWh/y) Data source: Nespresso average mix on 3 Original machines. Topten website, applying EN 60661 protocol.	24.3 Wh/110 ml cup (58 kWh/y) Data source: www.melectronics.ch website, applying EN 60661 protocol	30.5 Wh/110 ml cup (PEF: 0.277 kWh/L) Data source: draft PEFCR coffee
Coffee wastes	Baseline scenario: no prepared coffee waste is considered. Some coffee wastes for the non-portioned systems are tested in sensitivity analyses, see sections 4.5 and 5.3.		
Cup production and washing	Cup production: 260 g ceramic for lungo cup, 365 uses over its lifetime. Cup distribution: see section 4.2.7		
Machine cleaning	2 l of water at the temperature of 35°C every 300 brews Data source: draft PEFCR coffee		2 l of water at 35°C every 300 brews are needed for machine cleaning, 250 ml cold water after every use for decanter rinsing. Additionally, the decanter is washed in dishwasher once per week (occupation of 10% of the dishwasher). Data source: draft PEFCR coffee

Table 5

	Nespresso Original aluminum capsule	Full automate coffee machine	Drip filter coffee
"Trashed"	In Europe, wastes that are not recycled or recovered but are "trashed" are 53% incinerated and 47% landfilled (https://ec.europa.eu/eurostat/databrowser/view/env_wasmun/default/table?lang=en) When incinerated, the energy recovery from incinerator is 31% as heat and 10% as electricity (based on PEF EOL default data – "PEF-OEF_EOL DefaultData_V1.2_uploaded.xlsx") 2015 document provided by the EU commission		
Primary packaging	The capsules are 30% recycled (Nespresso 2022 data for recycling rate) and remaining portion of 70% is trashed. Recycling Capsule separation: per ton input material, 0.1 m2 building, 33 kWh electricity and 56 MJ heat (mix of natural gas, light fuel oil and biogas) (Nespresso 2020 data) Aluminium recycling: 1000 km truck from capsule separation place to remelter (assumption), the paint, LSR and PU layers burn during the remelting process while the aluminium is remelted into secondary aluminium. This avoids the used of primary aluminium (wrought alloy).	The laminated pouch is 100% trashed	
Coffee grounds	Coffee grounds: in Europe, the coffee grounds from recycled aluminium capsule are 47% sent to industrial composting, 37% sent to biogas facility and 16% sent to a pyrolysis facility (Nespresso 2022 data). The coffee grounds from capsules sent to trash is 53% incinerated and 47% landfilled (see ref above).	The coffee grounds is considered to be 50% sent to the organic waste bin (assumed 50% industrial composting, 50% methanisation), and 50% sent to trash according to PEF.	
Secondary packaging	Sleeve treatment: 82% recycling, remaining portion is trashed (Eurostat 2022 data)		
Tertiary packaging	Tertiary cardboard box: same as for NN alu sleeve. Wooden pallet and LDPE film are assumed 100% trashed.		
Machine	Machine end-of-life treatment: for all types of machines, it is considered they are dismantled and then the metallic parts are assumed to be 100% recycled while the plastic parts are 100% incinerated. The dismantling energy consumption itself is neglected.		
Cup	The cup is sent to an inert material landfill according to draft PEFCR coffee		

¹¹Lifetime of full automat machine was longer in the past but recent surveys showed the average lifetime today is about 6 years for this type of machine too (according to Nadja Gross communication)

¹²https://www.topten.ch/private/products/coffee_machines

¹³Hochschule Pforzheim, Germany study, project from Master students in LCA and sustainability, supervised by Prof. Dr. Tobias Viero and Prof. Dr. Mario Schmidt