BLEND
FOR BETTER
LAVAZZA GROUP COMMITMENT

ZERO CO_2 IMPACT

ALUMINIUM
CAPSULES

Estimated carbon footprint of Lavazza aluminium Capsules Compatible with Nespresso* Original machines sold in 2022

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Introduction

Looking for a continuous improvement of the offer to the market, Lavazza launches the new Lavazza capsules "ZERO CO2 IMPACT Aluminum Capsules", compatible with Nespresso Original machines. This claim is highlighted on the packaging, as the product line is Lavazza's first commitment to the global fight to reduce carbon dioxide emissions.
In 2021 Lavazza compensated the whole amount of greenhouse gases emissions deriving from the life cycle of the Lavazza Nespresso Compatible Capsules in aluminium sold [1].
The evaluation of the carbon footprint (CFP) was carried out by using the Life Cycle Assessment (LCA) methodology, applied with a cradle-to-grave approach through all the steps of the life cycle of the capsules. The 2021 calculation was validated ISO 14067 compliant by a certification body.
Lavazza is undertaking the effort to compensate the whole amount of greenhouse gases emissions of Compatible capsules sold in 2022 as well. To assure to its customers that all the capsules, once bought, have already been compensated, an estimated CFP was carried out. The calculation was based on the estimated sales for 2022 and on the CFP of 1 average Compatible capsules piece sold in 2021.
To ensure the accuracy of the estimated calculation, the 2022 carbon footprint will be recalculated when all 2022 final data is available. In case the estimated and the final calculation are not aligned, the difference will be compensated.
The purpose of this report is to explain the carbon footprint quantification.

Carbon footprint assessment

The structure of this report follows the main steps of an LCA:

A. *Goal and scope definition*: defines the aim of the study, the reference unit, the processes included in the study and other important characteristics of the assessment;
B. *Inventory analysis:* describes which data are used;
C. *Impact assessment*: presents impact results obtained through the use of scientific models;
D. *Interpretation*: discussion of the results in order to formulate conclusions.

A. Goal and scope

Type of Carbon Footprint

This Carbon Footprint study is cradle to grave, since all the relevant life cycle stages are included in the LCA (i.e., raw material acquisition, production, distribution, use and end-of-life).
The LCA follows an attributional approach.

Functional unit

The studied functional unit is the expected 2022 sales of Nespresso compatible Lavazza aluminium capsules.

System boundaries

The Carbon footprint of 2022 Compatible capsules considers the following life cycle processes:

- The upstream processes include green coffee production, its transport to suppliers, semifinished products and film production, packaging reel production (including printing, coupling and cutting) and its transport to the production plant[1]. In particular, the following processes were considered: green coffee cultivation; green coffee processing and packaging at farm, green coffee transport to the third-party production plant.
- At the production plant[1] the following core processes are performed: transport of green coffee blend, green coffee transformation into ground coffee, packet preforming, coffee dosing and filling, wrapping and palletization.
- Downstream processes include outbound distribution of the final product, coffee preparation and end-of-life stage of the packaging and of coffee dregs. In the use phase only water and electrical consumptions were evaluated.

1 The whole 2021 production is provided by an external supplier. Starting from 2022 Lavazza is progressively producing the capsules.

Figure 1: LCA model

Norms of reference

The reported carbon footprint is based on the CFP study of Compatible capsules sold in 2021[1] which is validated ISO14067 compliant[2] and therefore in line with the existing PCR on espresso coffee [3].

Disclaimer CFP limitations

The most important limitations of this Carbon Footprint study are:

- Focus on a single environmental indicator: where information regarding CFPs is used to inform consumer decisions, consideration shall be given to the potential importance of other relevant environmental aspects.
- Limitations related to the methodology: because of limitations related to the underlying LCA report [1], the results of the CFP are often not a sound basis for comparison.
- The 2022 CFP of Compatible capsules is based on the 2021 CFP study and on 2022 expected sales. For this reason this estimated CFP will be revised when 2022 final data is available.

Exclusions

- Capital goods (e.g., equipment and buildings) already available in LCA databases (i.e., ecoinvent v3.7.1 [4]) were included in the LCA. Other capital goods have been excluded from the LCA, since it was assumed that they do not contribute significantly to the overall LCA results.
- The coffee machine life cycle was not assessed.
- Transport of coffee from the selling point to the consumer and coffee distribution transport not directly controlled by Lavazza were excluded.

Biogenic CO_2 emissions and trapping

- For CO_2 emissions originating from biogenic materials, the carbon neutrality approach was adopted. With this approach, we assumed that all the CO_2 emissions absorbed by plants and derivative materials will be released back into the atmosphere during the end-of life stage. Essentially, neither emissions nor trapping of CO_2 related to biological materials were evaluated, assuming a carbon net exchange equal to zero. It is important to highlight that biogenic methane release is evaluated under the global warming indicator.
- In accordance with the ISO norm, atmospheric CO_2 stored in bio-based materials was reported separately in the LCA report. The Global Warming Potential (GWP) results do not consider biogenic carbon emissions.

Land Use Change

Land use change impacts were considered as reported in WFLDB datasets for green coffee. Datasets are aligned with the ISO norm request on land use change (LUC). LUC emissions are reported separately in the LCA report.

Time and geographical boundaries

Temporal data regarding average piece of Compatible capsules caps are reported in Table 1, according to the relative categories. Secondary data were found in the ecoinvent v3.7.1 database [4], and from WFLDB[5], both published in 2020.
The plant responsible for producing Compatible capsules products is in Europe[2]. Raw materials are extracted from all over the world, as well as the destination of the final product.

2 The whole 2021 production is provided by an external supplier. Starting from 2022 Lavazza is progressively producing the capsules.

B. Inventory

This report uses data and results from the 2021 CFP study [1]. The only additional data used in this study is the estimation of the whole amount of capsules sold in 2022. The full Life Cycle Inventory (LCI) is available in the 2021 CFP study.

Data for categories	
Quantity sold	2022 data
Green coffee	Specific blend for system, data 2021 purchases
Transport green coffee	Data 2021+ Sustainability Report 2020 [6]assumption
Packaging	Main supplier data, 2021
Pack supply	
Final product production	Supplier data, 2021
Distribution and end of life coffee	Data 2020, Sustainability Report 2020 [6]assumption
Use of energy and H2O	Sustainability Report 2020 [6] distribution mix for energy used and consumption of competitor machine

Table 1: Inventory table

C. Impact Assessment: Carbon footprint for 2022 estimated sales

The method used to assess the environmental impact of the Compatible capsules is the global warming potential of atmospheric emissions, evaluated through Intergovernmental Panel on Climate Change (IPCC) [7].
The 2022 Carbon footprint was evaluated by multiplying the impact of 1 average piece of Compatible capsules sold in 2021 by the expected sales for 2022, in order to obtain the 2022 CFP prevision for Compatible capsules (Table 2).

LCIA results related to 1 average piece sold in 2021

Global Warming Potential (GWP)	Unit	Total	LC coffee		LC Packaging		Distribution		Use	
GWP- IPCC 100a neutral approach	g CO_2 eq	78,1	49,3	63%	22,6	29%	4,18	5 %	2,04	3%
GWP- GHG emissions and removals caused by Land Use Change	g CO_2 eq	18,9	18,8	100%	0,08	0%	0,00	0%	0,00	0%
GWP- Biogenic methane emissions	g CO_2 eq	4,06	3,88	96%	0,16	4%	0,00	0,03%	0,02	0%
GWP- IPCC 100a neutral approach without Land Use Change and biogenic methane	g CO_2 eq	55,1	26,6	48%	22,3	40%	4,18	7,58%	2,02	4%
Impact category	**Unit**	**Total**	**LC coffee**		**LC Packaging**		**Distribution**		**Use**	
GWP- Biogenic GHG emissions and removals	g CO_2 eq	-3,43	-0,94	27 %	-2,66	78%	0,01	0%	0,16	-5%

Table 2: Carbon footprint of Compatible capsules 2022

D. Interpretation and conclusion

According to the results obtained with the IPCC method, calculated with the described assumptions and limitations, the expected 2022 sales of Compatible capsules is potentially responsible for approximately 55258 tons of CO_2 eq.

Reduction plan

Lavazza aluminium capsules compatible with Nespresso machines represent a new product among the ones already provided by Lavazza. In 2021 the capsules were produced by a third-party supplier. From 2022 onwards, Lavazza will implement a gradual production internalization process, and integrating the production of Compatible capsules as well. Therefore, the activities for emissions reduction will be applied to this system according to the plans adopted at Corporate level, which aim to have a better energetic efficiency, use renewable energy sources, and optimize packaging and logistics.

Offsetting activity

In 2020 we achieved carbon neutrality for all the emissions related to Scope 1 and 2 of the Lavazza Group as the first step of our commitment. On the other hand, at product level, the new Lavazza compatible Nespresso aluminium capsules will be the first Lavazza product to be-CO_2-neutral; this means we offset all our annual carbon emissions related to the sold volumes. The neutrality of these capsules includes the offsetting of emissions throughout the life cycle of the product, from the cultivation of coffee to its end of life, passing through all stages of production, transport and disposal.
The Madre De Dios project was selected by Lavazza to offset the new Lavazza Compatible espresso capsules, starting in 2021. The project is certified by internationally recognized standards (VCS and CCB) to ensure the high quality and robustness of the project. In addition, our climate partner EcoAct, in charge of all carbon offsetting transactions, ensures compliance with offsetting best practices from project selection to credit withdrawal on behalf of Lavazza.

References

[1] Lavazza, Carbon footprint of Lavazza Compatible Capsules with Nespresso Original machines in aluminium" - December,10th 2021 – Lavazza, 2B srl Capsule 2021, Confidential report, October 2021.

[2] ISO/ TS 14067, 2018: Greenhouse gases- Carbon footprint of product- Requirements and guidelines for quantification and communication.ISO, ISO/ TS 14067, 2018 (www.iso.org).

[3] PCR 2018:03, v 1.01: Espresso coffee Product Category Rules UN CPC 23912 v 1.01, The International EPD® System, 2018 (www.environdec.com)

[4] ecoinvent, 2021: Database ecoinvent version 3.7.1 Swiss Centre for Life Cycle Inventories (www.ecoinvent.ch)

[5] Quantis, 2020, WORLD FOOD LCA DATABASE version 3.5 (quantis-intl.com).

[6] Luigi Lavazza (2021), Lavazza Sustainability Report 2020, Available on: https://www.lavazzagroup.com/it/come-lavoriamo/il-bilancio-di-sostenibilita.html

[7] IPCC 100a 2013: Climate Change 2013, IPCC Fifth Assessment Report (www.ipcc.ch)

[8] Environment section of Company website (The Environment | Lavazza Group)