



Supplement - Life Cycle Assessment (LCA) Results of Fairphone 5 with additional scenarios - 128GB configuration and renewable energy integration

This document is produced by Fairphone B.V as a supplement to the [Fairphone 5 LCA Report](#) published in August 2024. This supplement contains LCA results of product carbon footprint analyzed by our knowledge partner Fraunhofer, based on the following scenarios:

- Fairphone 5 with configuration of 6GBRAM/128GB storage
- Fairphone 5 (6GBRAM/128GB storage) with renewable energy integration in the display and battery packaging
- Fairphone 5 (8GBRAM/256GB storage) with renewable energy integration in the display and battery packaging

Our knowledge partner:



Summary of life cycle assessment (LCA) results of carbon footprint analysis of Fairphone 5 with the following additional scenarios:

Total Product Carbon Footprint of Fairphone 5 with 6GBRAM/128GB storage.

Product life cycle emissions	in kgCO2e
Production	27.6
Transportation	2.81
Use phase	6.59
End of Life	0.04
Total Product Footprint	37.01

LCA results analysis with the renewable energy integration:

Scenario 1: Total Product Carbon Footprint of Fairphone 5 with 6GBRAM/128GB storage with renewable energy integration in the display and battery packaging.

Product life cycle emissions	in kgCO2e
Production	21.21
Transportation	2.81
Use phase	6.59
End of Life	0.04
Total Product Footprint	30.60

Scenario 2: Total Product Carbon Footprint of Fairphone 5 with 8GBRAM/256GB storage with renewable energy integration in the display and battery packaging.

Product life cycle emissions	in kgCO2e
Production	26.36
Transportation	2.81
Use phase	6.59
End of Life	0.04
Total Product Footprint	35.80

In 2023, we integrated renewable energy in the final assembly of Fairphone 5. This year Fairphone is engaging with the supply chain to integrate renewable energy (via renewable energy certificates purchase) in the display manufacturing and battery packaging. This will lead to further lower product carbon footprint of Fairphone 5 as shown in LCA modeling results for scenario 2 & 3. LCA modeling results of the additional scenarios by Fraunhofer are provided in the document below.

Berlin, 14/08/2024

Addition to 'Life Cycle Assessment of the Fairphone 5': Product and production changes

Life Cycle Assessment is a data sensitive and highly iterative process. During the reporting period of the Life Cycle Assessment of the Fairphone 5, new data points were retrieved by Fairphone B.V. from their suppliers and due to time constraints they could not be included in the modelling and final report of said LCA. In this document we aim to briefly present the latest changes and the new related LCA results.

Display modelled with primary data

In the original LCA the energy required for the manufacturing of the OLED display was retrieved from literature, since no fitting dataset was found for this technology and the manufacturer data used in previous models referred to an LCD. Fairphone B.V. has now provided primary data on electricity use during display manufacturing from their supplier, calculated top down to estimate the allocatable effort per display.

Battery produced with renewable energy

In the original LCA the manufacturing of the battery was modelled using primary data and the national Chinese electricity grid, since the planned use of renewable energy by the supplier was still not fully in place. During the project however this transition has finally taken place and thus, the effect of renewable energy in battery production is now accounted for in this new modelling.

Fairphone 5 variant 6GB RAM/128GB storage

As part of the results of the original LCA it was seen that the manufacturing of integrated circuits leads most environmental indicators of the device's manufacturing. With the release of a new version of the Fairphone 5 with 6GB RAM/128GB storage instead of 8GB RAM/256 GB storage, a new modelling has been done to quantify the estimated effect on the environmental impacts of manufacturing.

Results

The updated GHG manufacturing totals for the previously assessed Fairphone 5 8GB RAM/256 GB storage and the new FP5 6GB RAM/128GB storage version are as follows:

- Footprint of Fairphone 5 8GB RAM/256 GB storage (as in full report): 32,7 kg CO₂ eq.
- Fairphone 5 8GB RAM/256 GB storage w/ primary display data and renewable energy in battery production: 26,5 kg CO₂ eq.
- Fairphone 5 6GB RAM/128GB storage w/ primary display data and renewable energy in battery production: 21,2 kg CO₂ eq.

In the following table, the newly calculated scenarios are shown.

	Display modelled w/ primary data	Memory 6GB RAM/128GB storage	Battery produced w/ RE
ADP elements [kg Sb eq.]	4,64E-05	2,31E-04	1,03E-05
ADP fossil [MJ]	1,46E+01	2,10E+01	5,25E+00
Eutrophication P [kg Phosphate eq.]	3,57E-03	5,11E-04	4,52E-04
GWP100 [kg CO ₂ eq.]	1,18E+00	1,76E+00	4,03E-01
Land Use [Pt]	3,95E+00	4,36E+00	2,01E+00
Ecotoxicity [CTUe]	4,37E-02	1,52E-03	6,55E-03
Blue water consumption [kg]	9,26E+00	1,46E+01	3,10E+00
Blue water use [kg]	4,14E+03	2,12E+03	9,34E+02

About Fraunhofer IZM

Fraunhofer IZM specializes in industry-oriented applied research on electronic packaging and environmental optimization of electronics. The institute has conducted LCAs for many renowned OEMs and is a firm authority on critical reviews of LCA studies for electronics. Fraunhofer IZM is regularly involved in EU Ecodesign studies and LCA related research projects in the ICT field.

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