HYDRAO Aloé shower's Life Cycle Assessment (LCA) Report

Drafted by Ad Fine the engineering consultancy - July 2020

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Main conclusions of the LCA

“The usage phase represents over **95% of the impact”**

When looking at an ALOE shower head used for 5 years, and according to the assumptions used, **the usage phase is the one that impacts the environmental footprint most (> 95%)***. This is due to the energy that is used to heat the water, and to a lesser extent, to the water used. In the end, the production phase has a negligible impact.

“After 2-months use in a 3-person household, the environmental impact of the Aloé becomes better than that of a standard shower head for *all* of the 7 impact and flow indicators studied.”

After 162 showers (about 54 days of usage in a 3-person household), **the negative impact generated by the production of the ALOE shower head** (due to the presence of a PCB and a micro-turbine, and manufacturing location) **are offset by the environmental gain** brought about by the savings made during the usage phase.

** In other words, whatever the shower head considered, and whether looking at HYDRAO Aloé or a shower head seen as “standard” (market data), the water and energy consumption linked with the “shower” feature of the shower head weighs more in terms of environmental impact, than the production and transport phases.*

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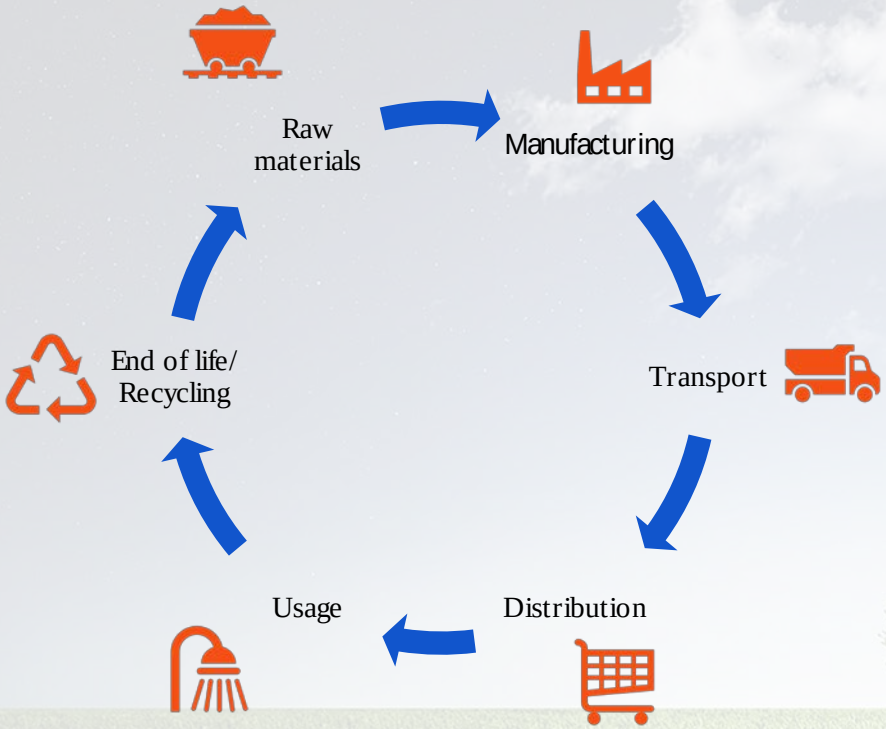
What is an LCA?



According to the ADEME, an LCA (**Life Cycle Assessment)** is the most complete tool when it comes to global and multi-criteria evaluation of the environmental impact of a good or service.

The LCA analyses **the impact of a product for the entirety of its life cycle, from its design to its usage phase and to its end-of-life**. For the Aloé shower head, Ad Fine conducted the LCA using 7 criteria, including global warming, depletion of abiotic resources (non-renewable mineral resources), exhaustion of the ozone layer, as well as water and energy consumption.

Ad Fine's LCA is meant to be **comparative.** Multiple scenarios were studied: comparison with a stainless steel-bodied shower head, with a European-made shower head, with a standard economical shower head (without the nudge feature), and finally with an Aloé shower head with a shorter lifespan (2 years).

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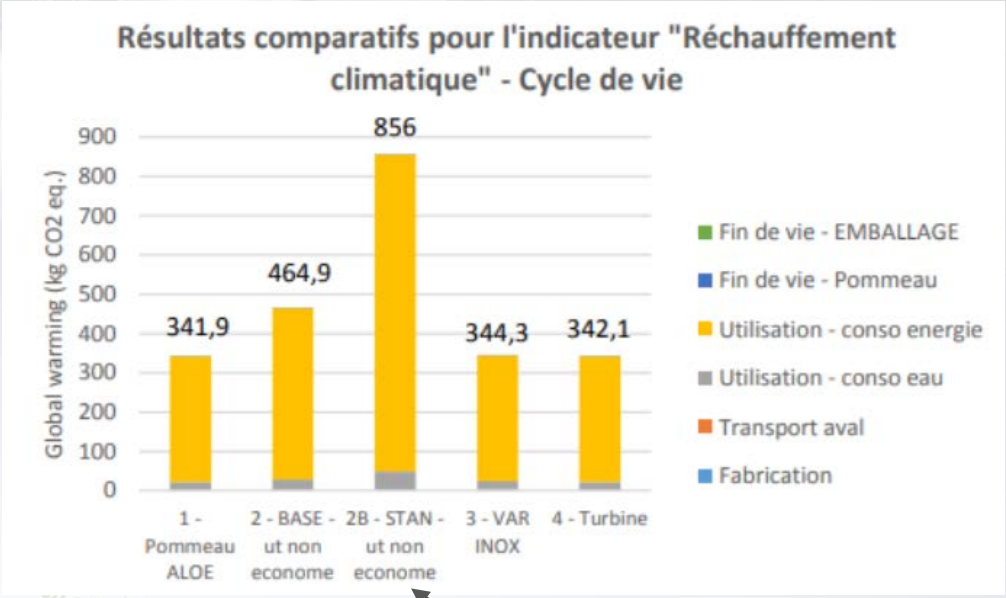
Spotlight on the “Impact on Global Warming” indicator

During **manufacturing**, the Aloé shower head generates **1.6kg CO2 eq.*** **more than a standard shower head****, but when looking at its overall life cycle, **it prevents the emission of 514kg CO2 eq. compared to the standard shower head,** according to the assumptions used.

Over the course of its lifespan, this means **HYDRAO Aloé prevents the emission of 300 times the amount of CO2 that was necessary for its production.** By comparison, the same figure for a photocell (solar panel) is only 6.



Scenario for a standard shower head

* CO2 eq = carbon dioxide equivalent

** Reminder: the shower head considered as standard is a shower head without electronics and with a 10L/min flow.

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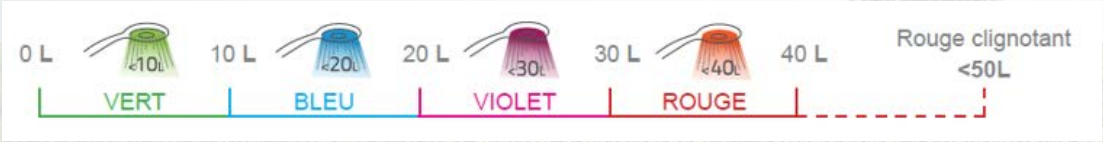
Features of the HYDRAO Aloé shower head used in the LCA

★Reduced flow compared to a standard shower head, thanks to a flow limiter: **6.6 liters per minute** (vs. 10 L/min. for a standard shower head).

★**Self-powered** due thanks to a turbine system driven by the water flow: no need for batteries

★Volume of water used is indicated by 5 LEDs that change colors depending on the usage threshold. This is its ***Nudge* feature**.



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Our LCA process: Eying continuous improvement

January 2020
Launch of the design and LCA processes within HYDRAO, with the support of the ADEME and the Auvergne-Rhône-Alpes region

ADEME
Agence de l'Environnement et de la Maîtrise de l'Energie

Answering the **new expectations** of customers looking for environmental coherence

September 2020
Results of the LCA conducted by the Ad Fine consultancy for the HYDRAO Aloé shower head

BUREAU D'ÉTUDES & DE CONSEIL AD FINE

Obtaining **reliable data** in order to evaluate the environmental performance of our products

Current and future actions
Ownership of a simplified internal tool to conduct environmental evaluation of new products; implementation of an action plan to improve the impact of our existing products

HYDRAO

Acting on our **mission to reduce negative environmental impacts**

This study is a Life Cycle Assessment (LCA) conducted in accordance with the 14040 and 14044 ISO standards, using SimaPro software (version 9.0.0.35), developed by Pré Consultants (www.pre.nl)

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The main assumptions used

5 years is the assumed lifespan of the Aloé shower head and its Nudge feature. A "sensitivity study" still shows that even **if the ALOE lifespan is divided by 2, it's environmental impact is still better than that of a standard shower head**. This is due to the low impact of the production and end-of-life phases compared with the usage phase.

3 minutes is the average duration of a shower with Aloé according to our user statistics, obtained via the HYDRAO app (standard duration is about 5 minutes according to our customers). We work under the assumption that the user installs the flow reducer which comes with the shower head (6.6L/min flow). We compare Aloé to a standard shower head (10L/min flow) used for the "standard duration of a shower" (5 minutes).

37°C is the average temperature of a shower in France (ADEME statistic). We have considered the use of a **water-heater with a 90% output**. If the water-heater used has a better output or if the temperature of the water used during the shower is under 37°C, the energy consumption will be lower during the usage phase, which means the environmental gain of the Aloé shower head will decrease. In that case, a mere 200 showers are necessary for the 7 indicators to turn "green"!

It is important to note that all the conclusions presented here rely on assumptions, all justified and verified, and then adjusted by Ad Fine, even though independent counsel was not involved.

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Some of our environmental initiatives implemented in 2019-2020

- ★ Work on the repairability of the shower heads (video on how to change the turbine yourself)
- ★ Information on recyclability thanks to a recycler of electrical and electronic appliances in the Lyon region
- ★ New design of the micro-turbine to extend its lifespan and efficicency
- ★ Implementation and tracking of new environmental performance indicators, with clear, precise and realistic objectives

Any questions? Contact us (contact@hydrao.com)!

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In light of the LCA results, what do we want to focus on in the future?

★ **Continue our efforts to improve product design**: lighten the materials, increase the ratio of recycled material in the product, reduce electronic components to a minimum, limit the surface treatments (chrome plating) while maintaining product durability, stenghten the good environmental conditions in which the product is made

★ **Support the valorization of the product at the end of its life**: inform the user that the product should be disposed of through a channel dedicated to electrical and electronic appliances, allow them to keep this information in mind even after 5 years of us; rethink the design of the product to allow for an easy removal of the electrical and electronic components (in anticipation of the development of product and plastic recycling methods).

Any questions? Contact us (contact@hydrao.com)! HYDRAO SMART SOLUTIONS FOR WATER CONSERVATION