



## The Life Cycle of water consumption on a film set

## Short Summary of the practice

Something as simple as drink water on a film set makes an important difference. A detailed Life Cycle analysis of the water consumption during the production of feature film 'Binti' offers surprising results. The impact of 2102 litres of drink water results in 1,2 tons of CO<sub>2</sub> eq or 2 % of the total estimated footprint.

Replacing the water supply (a mix of bottled water and tap water) by single use plastic bottles or water dispensers would increase the negative impact drastically and should be avoided. The best and most idiot proof option is to use tap water (in combination with a tap system offering filtered and cooled water).

Also the choice of cups plays a role: reusable cups are the best option, compostable cups cannot be composted in practice and should be avoided at all times. Their impact is even worse than single use plastic cups. The results of the study not only help to improve the awareness of location managers and sustainability experts, but also filters into the Eureka calculator.

## Detailed information on the practice

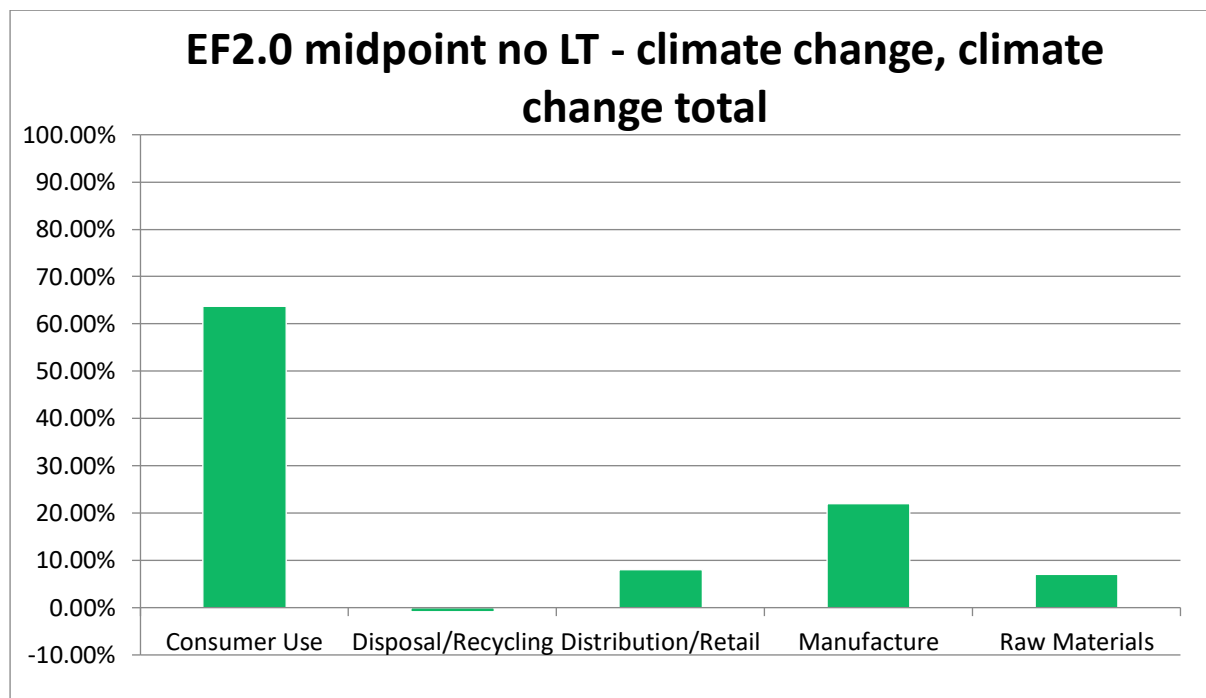
Sustainable practices on a filmset have gained more and more momentum during the past years. The increasing environmental awareness results in funds embedding sustainability in their regional funding policy, service providers offering more innovative 'green' alternatives and clever creative sustainable solutions finding their way within the different departments.

Flanders Audiovisual Fund (VAF) has been linking sustainability to its production support for film and media projects. After a basic 'sustainable production introduction', projects are asked to consider green alternatives on set. They are guided by VAF and report about their activities using a carbon calculator. Quantifying the environmental productional impact is not only a way to report initiatives in a formal way, but also helps understanding the positive and negative impacts of our daily filmmaking activities.

The quantification of logistic choices within film production plays an important role in the understanding of sustainable film production. Within Green Screen efforts have been made to develop Eureka, an environmental impact calculator for audiovisual (international co)productions. Eureka can be seen as an online interface, the underlying database containing conversion factors forms the heart of the calculator. The accuracy and user friendliness of Eureka depends strongly on the detail within the database. Whereas the environmental impact of many logistic choices are already well known, some domains remain unexplored. This is the case for drinking water consumption on set. Strangely enough not all processes within our industry are well quantified. Catering usually accounts for 10 to 15 % of the total CO<sub>2</sub> emissions, but specific data on different catering components is largely missing. In close collaboration with the Catholic University of Leuven – Department of Material Engineering (Belgium) a Life Cycle Assessment (LCA) of drinking water consumption on the 'Binti' filmset was conducted.

The 2102 liters of water consumed by the Binti cast and crew was supplied by means of 15 l mineral water dispensers (690 liters) and water from the tap (1412) in combination with both reusable polypropylene and single use cardboard cups. Relevant data was delivered by the film producer and the equipment suppliers. The total environmental impact of the water consumption (scenario 1) was estimated at 1.2 tons of CO<sub>2</sub>-eq (or 2 % of the overall environmental impact of the entire production).

As can be seen in graph 1, the biggest impact is linked to consumer use (63 % of the impact, this includes the transport of water between the shop and the set), 8 % is linked to the distribution and retail of the water, 22 % to the manufacturing (production of water and recipients) and 7 % is embedded within the raw materials. There is a negative impact in disposal / recycling – the residual plastics can be recycled into new products.

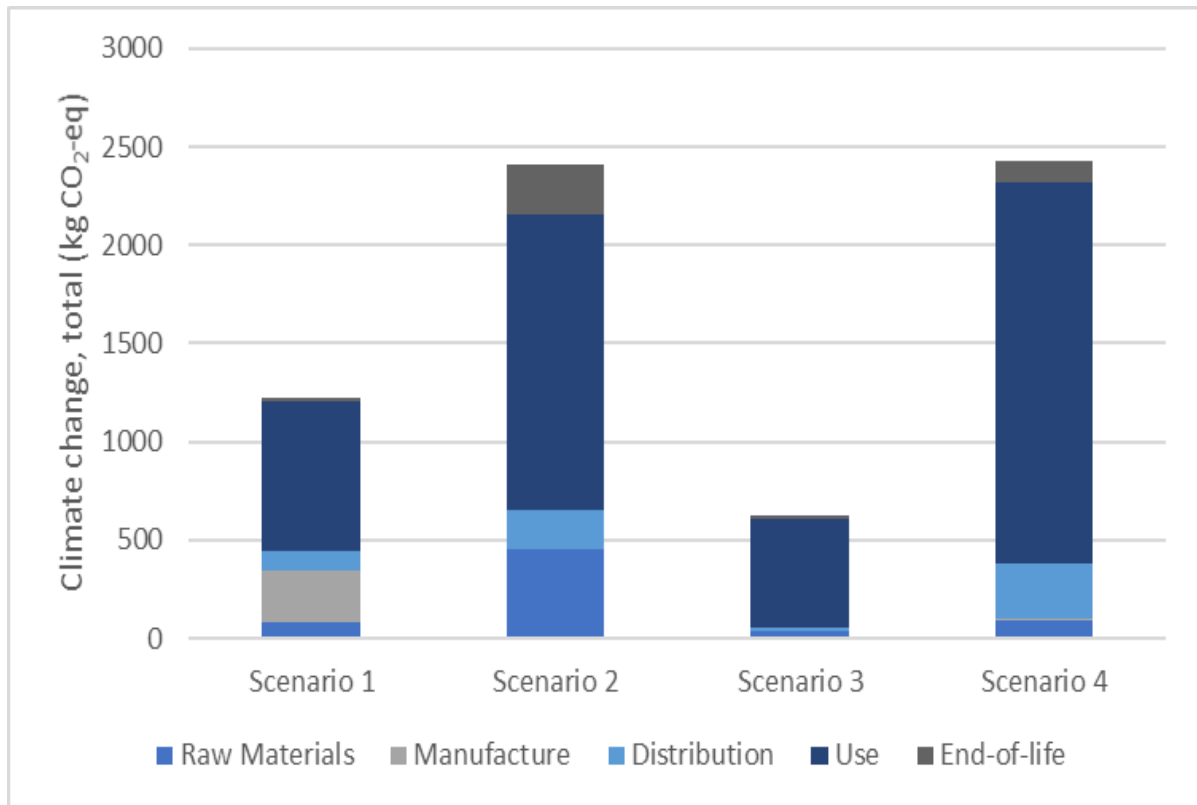


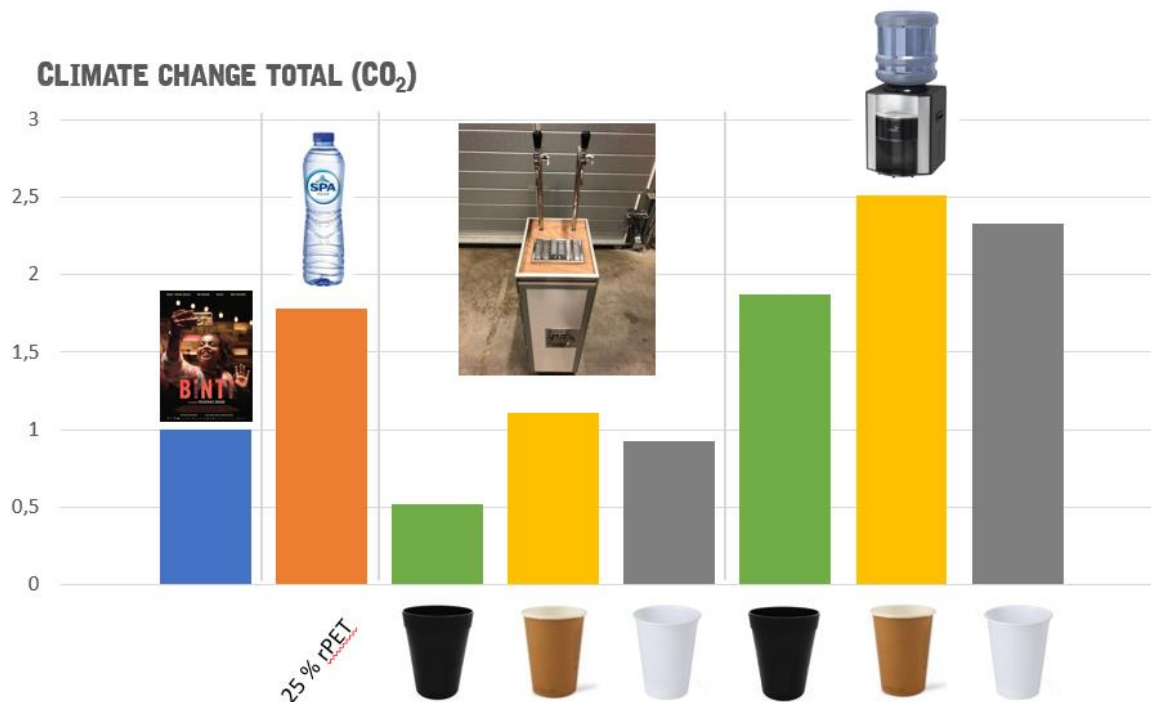
Three additional alternatives were compared with the real situation (scenario 1 - mix of water dispensers and tap water):

- Scenario 2: The use of 0.5 liter plastic bottles to supply 2102 liters of drinking water
- Scenario 3: The use of a water tap providing cooled still or sparkling water to supply 2102 liters of drinking water (in combination with reusable, compostable or single use plastic cups)
- Scenario 4: The use of a water dispenser to supply 2102 liters of drinking water (in combination with reusable, compostable or single use plastic cups)

The results in graph 2 and 3 show that transportation during the filming period had the largest share of just about all environmental impact factors. The water tap in combination with the reusable cup was the option with the lowest impact. As for the environmental impact of the disposable cups, the result depended on the assumed electricity use in the production process, but its use is discouraged as much as possible. The recommendation is to use

lightweight reusable cups as much as possible, avoid bottled water, and minimize transportation of water and (heavy) transportation in general. An important note is that it makes little sense to directly compare the values obtained within this study with values from other studies because all LCA studies rely on assumptions and system boundaries chosen by the researcher.





Results show that transportation of bottled water, the single use cups and the water dispensers had the largest impact. Using the water tap in combination with reusable cups (scenario 3) would have reduced the CO<sub>2</sub> impact by 50 %. The scenarios of the plastic water bottles (2) and water dispensers (4) would result in an impact that is 2.5 times higher than scenario 1.

This increase is largely explained by the (pointless) transportation of water.

Another important conclusion: the use of reusable cups (black in graph 3) is the most environmentally friendly; compostable cups (brown in graph 3) cannot be composted correctly (they degrade too slow for industrial composting processes) and are discarded as residual waste. Their use should be avoided; their impact is even higher than the impact of single use plastic cups (white in graph 3).

Having access to this detailed LCA results is a real eye opener. They not only help us to improve and fine tune our knowledge on sustainable alternatives and specific logistic choices (how many of us have been promoting water dispensers and are lured into purchasing compostable cups). They also aid the development of the new 'Eureca calculator'. This way we measure what we preach and we preach what we measure.

The official study is available online via: [https://limo.libis.be/primo-explore/fulldisplay?docid=32LIBIS\\_ALMA\\_DS71255411880001471&context=L&vid=KULeuven&search\\_scope=ALL\\_CONTENT&tab=all\\_content\\_tab&lang=en\\_US](https://limo.libis.be/primo-explore/fulldisplay?docid=32LIBIS_ALMA_DS71255411880001471&context=L&vid=KULeuven&search_scope=ALL_CONTENT&tab=all_content_tab&lang=en_US)

## Resources needed

The study was delivered by a student and is part of a Master Thesis. Besides the invested research time of this student, guidance by a scientific promotor (professor KULeuven) and copromotor (VAF) and direct contact with the production of the audiovisual project are needed. In order to fulfill the study, the student used Umberto software in combination with the Ecolnvent database.

In practice: the results help to increase awareness and helps location managers to make the right logistic choices. There are no resources needed to adapt the findings in real time productions.



### Evidence of success

Something as simple as ‘how to provide drinking water’ seems to have an important impact on the environmental burden of a film production. The results of the LCA study are impactful:

- VAF changed the water supply in the office (replacing glass bottles and water fountains with a drink water tap and reusable bottles)
- A prototype watertap for film productions has been developed by Robinetto (a supplier of water taps) and BOXrentals (a rental company offering sustainable alternatives for film productions – see picture)
- The results of the study have been translated into a scientific article <https://www.sciencedirect.com/science/article/pii/S2212827122001263> and have been presented at [Ice2022.eu](http://Ice2022.eu)
- The scientific findings are embedded in the VAF practical coaching of audiovisual projects

### Potential for learning or transfer

This scientific information will help other sustainability experts and producers to make more and well balanced logistic choices in the field of water supplies. The study also inspired KULeuven and VAF to launch similar research projects on textiles and costumes, set decoration and the financial costs and benefits of sustainable productions.

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