

TRANSLATION:

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Report on the**Peer review of the study****Ecological comparison: shopping bags made of paper or synthetic material for reuse****Content**

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1 Preliminary note

The peer review on hand of the life cycle assessment (LCA) study “Ecological comparison: shopping bags made of paper or synthetic material for reuse” of the Carbotech AG was developed in the 32nd and 33rd calendar weeks. It was based on a draft of the study; therefore from the two methods of a peer review – concomitant or after the conclusion of the study – the first method was chosen. The remarks, recommendations and objections of the reviewer were discussed in detail on the 6th of August 2008 with Dr. Fredy Dinkel at the office of the Carbotech AG in Zurich. Mr. Wettstein, the orderer of the LCA study was present as well. A

second dialogue took place on the 12th of August 2008 at the office of Carbotech in Basel. Without exception, all issued suggestions were adopted and considered in the final version of the study.

2 Steps reviewed in detail

As in (almost) all life cycle assessments (LCA) – or in general in many studies in natural or engineering sciences – numeric results (output) are the functional result of the numbers and numeric assumptions of the input variables. The transformation is not influenced by opinions, it is determined by facts. The system boundaries define what has to be considered and what not. The computer calculates with those input variables, and therefore no calculation errors are being made.

This means that, when reviewing a LCA, one has check carefully all the input variables, as they define the result. Therefore in the actual case all input variables (including the determination of the system boundaries and the consulted criteria), their numeric values including possible suggestions were reviewed in detail.

This detailed review resulted in the following:

- the LCA study is transparent;
- the structure is described comprehensively;
- the logic is coherent and plausible;
- no mistakes nor other abnormalities were found.

- Various remarks and proposals (e.g. specifications) concerning the written text were made;
- This concerned mainly the correct linguistic handling of the results including their visualisation:
the lower environmental impact of one of the two shopping bags had to be formulated a bit circuitous, i.e. as “preferable is the synthetic shopping bag, if it is used at least three times more often than the paper shopping bag”;
(this, because it is the ratio between the respective usage of the two bags, that defines the ecologic preference and not the one or other bag per se).

The study made a very good impression. The profound experience of the Carbotech AG was remarkably.

3 Steps reviewed summarily

The individual calculations were not analysed line by line, but reviewed summarily. The numeric values of the intermediary and end results were throughout plausible, no abnormalities were found. The software used for the ecological inventory and the LCA are well known and approved, and are therefore widely spread. The same is also valid for the base data, which were taken from the leading eco-database, ecoinvent®.

4 Recommendations

Both, the orderer of the peer review and the orderer of the LCA, made two recommendations concerning communications:

- The formerly noted fact that the ratio between the respective usages of the two bags defines the ecological preference (and not the one or other shopping bag per

se) is highly demanding for the visual and linguistic communication of the results. The behaviour of the consumers defines which of the two shopping bags is the ecologically better choice: if the shopping bag made of synthetic material is used at least three times as often as one made of paper, it is preferable. Up to this break-even, the bag made of paper has the smaller ecological impact.

- As in many other LCA, the ecological impact is expressed in Environmental Impact Points (Swiss method of ecological scarcity - UBP 06). This unit is not very comprehensive for lay people, and even LCA experts are often not able to scale and compare the results intuitively with environmental impacts of our everyday life.

Therefore it was proposed to transform the Environmental Impact Points into kilometres covered by a compact car (e.g. a Volkswagen Golf). This measure is much easier to classify. This, or another likely comprehensive transformation, is of special importance, because MIGROS, the orderer of the LCA wants to use the results for their company policy and for customers' communication.

5 Conclusion

The result of the study answers the questions posed by the orderer of the LCA, concerning the ecological preference of shopping bags made of paper compared to those made of synthetic material. The orderer of the peer review can consider the LCA as a reliable and resilient element for their further formation of her climate protecting activities. The reported numeric values are reliable; the demonstration of the results is comprehensible and applicable.