

Critical Review Statement

Background

The life cycle assessment (LCA) study “Evaluation of pyrolysis with LCA” was commissioned by BASF and carried out by Sphera. The study was critically reviewed by an international panel of experts comprising:

- Professor Adisa Azapagic (Panel Chair), Ethos Research, UK;
- Dr Florian Antony, Institute for Applied Ecology, Germany; and
- Simon Hann, Eunomia Research & Consulting Ltd., UK.

All members of the review panel were independent of any party with a commercial interest in the study.

The aim of the review was to ensure that:

- the methods used to carry out the LCA study are consistent with the ISO 14040:2006 and 14044:2006 standards;
- the methods used are scientifically and technically valid given the goal of the study;
- the data used are appropriate and reasonable in relation to the goal of the study;
- the interpretation of the results and the conclusions of the study reflect the goal and the findings of the study; and
- the study report is transparent and consistent.

The critical-review process involved the following:

- a review of the goal and scope definition at the outset of the project;
- a review of three versions of draft reports according to the above criteria and recommendations for improvements to the study and the report; and
- a review of the fourth and final version of the report, in which the authors of the study fully addressed the points as suggested in the draft critical review.

The critical review panel did not review the LCA models developed by Sphera for the purposes of this project and hence all the findings of the critical review are based solely on the LCA report that was made available to the panel during the course of the critical review.

Conclusion of the critical review

The panel confirms that this LCA study followed the guidance of and is consistent with the international standards for Life Cycle Assessment (ISO 14040:2006 and 14044:2006).

Communication of the study results

The following aspects should be mentioned when communicating the results of the study to external stakeholders:

- Some of the assumptions affect the results, interpretation and conclusions of the study. Therefore, it is of utmost importance that these and their influence on the results and conclusions are described transparently, whenever the study or its parts are disclosed to any stakeholders to avoid any potential misinterpretation of the study.
- The study is based on an assumed future development of pyrolysis and the waste sector in Germany in 2030 and thus the results should be interpreted with this in mind.

To reduce the uncertainty and increase the robustness of the study, the assumptions and the results should be reviewed again as soon as more detailed information becomes available.

- It should always be mentioned that Cases #2 and #3 are based on the mass balance approach. Although this has been applied rigorously, it is important to state this clearly in any future communication to maintain the transparency of the study.
- The comparison of pyrolysis with the alternative methods is based on the assumption that a difference of 10% is considered 'significant' when comparing the results of the life cycle impact assessment. This is a subjective assumption and should be interpreted accordingly. This is particularly important for impact categories with higher uncertainty, such as toxicity-related impacts where the margin for error is likely to be greater than 10%.
- Whenever a reference is made to the review of the study and its outcome, it should also be mentioned that the critical review statement is available upon request.



Professor Adisa Azapagic
Panel Chair



Dr Florian Antony
Panel Member



Simon Hann
Panel Member

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