

# Critical review statement

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## Comparative Life Cycle Assessment (LCA): Single Use and Multiple Use Tableware Systems for Take-Away Services in Quick Serve Restaurants

### Review background

This document forms the critical review statement for the study “Comparative Life Cycle Assessment (LCA) Single Use and Multiple Use Tableware Systems for Take-away Services in Quick Service Restaurants” as reported by Ramboll in their Technical LCA report for Project Number 330001928, dated November 2022. The report was prepared by Ramboll Italy, and was commissioned and funded by European Paper Packaging Alliance (EPPA).

The critical review has been performed by an independent panel consisting of:

- Michael Sturges (lead panellist) - RISE Research Institutes of Sweden / RISE Innventia AB, Sweden – a life cycle assessment practitioner with specific experience of environmental studies relating to the packaging and food service sectors
- Prof. Umberto Arena – University of Campania “Luigi Vanvitelli”, Italy. – a chemical engineer with experience of packaging systems, including LCA studies on valorisation of paper and plastic waste streams
- Frank Wellenreuther, ifeu - Institut für Energie- und Umweltforschung Heidelberg gGmbH, Germany – a life cycle assessment practitioner with specific experience of environmental studies relating to packaging systems

### Critical review process

The review was performed based on the requirements of ISO14044:2006 Section 6.3, i.e., critical review by panel of relevant experts.

The critical review was iterative in nature, being performed concurrently with the LCA study. The review panel was in regular contact with the LCA study team and provided comments at the following stages of the study:

- Goal and scope document (word document and presentation to the critical review panel)

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- Primary and secondary life cycle inventory data selected for the modelling (word document and presentation to the critical review panel – this included access under non-disclosure agreement to the confidential primary data used in the models)
- Draft baseline results (presentation to the critical review panel)
- Finalised baseline results and sensitivity scenarios (presentation to the critical review panel)
- Draft final report (word document)

At each stage, comments were provided using a MS Excel feedback template and were discussed in a meeting with the LCA practitioners and representatives of EPPA. The LCA team then responded to the comments and provided its feedback, also describing subsequent changes to the data, models and report, by using the appropriate section of the feedback template. The reviewers considered these responses and changes and were satisfied that appropriate clarifications and actions had been provided.

### **Result of the critical review**

Subsequently, the study was found to be in conformance with ISO 14040 and ISO 14044.

### **Opinion of the reviewers**

The reviewers find the study's level of quality, detail and transparency to be appropriate considering the goal and scope. In particular, they appreciate the specific data gathering implemented by the authors of the study. Subsequently, the reviewers consider the results and conclusions to be a sound and fair reflection of the potential comparative environmental impacts of the studied systems representing the use of single use and multiple use tableware for take-away services in Quick Service Restaurants. The detailed sensitivity analysis provides transparency of the uncertainties and confidence in the overall robustness of the results achieved and conclusions drawn.

As with all LCA studies, there are opportunities to improve the analysis and evaluation. In particular, for this study it would be interesting to see the results for all the Environmental Footprint impact categories, including toxicity-related impact categories and land-use. However, it is appreciated by the review panel that there are limitations to achieving this: the available primary LCI data did not support the fair comparison of toxicity related impact categories and the applicability and robustness of the land use impact category for paper products is subject to ongoing development. If further data becomes available to support fair comparison of toxicity impact categories and if the land use impact category is fully developed, then updating the analysis to include these would give further insights into the nature of any wider trade-offs between the systems not addressed by the selected impact categories, and would increase the transparency of the analysis.

However, the critical review panel appreciates that this would also add further complexity to and require additional resource for an already comprehensive study.

In conclusion, it is the opinion of the review panel that the report provides useful and realistic information for stakeholders interested in this topic.

### Critical review sign-off

The reviewers certify that the statement provided is a fair reflection of their assessment and views of the study “Comparative Life Cycle Assessment (LCA) Single Use and Multiple Use Tableware Systems for Take-away Services in Quick Service Restaurants”:

Signed:  Dated: 12<sup>th</sup> November 2022

Michael Sturges, RISE Research Institutes of Sweden / RISE Innventia AB, Sweden (lead panellist)

Signed:  Dated: 12<sup>th</sup> November 2022

Prof. Umberto Arena – University of Campania “Luigi Vanvitelli”, Italy

Signed:  Dated: 12<sup>th</sup> November 2022

Frank Wellenreuther, ifeu - Institut für Energie- und Umweltforschung Heidelberg gGmbH, Germany