

# LIFE CYCLE ASSESSMENT OF INFLIGHT SERVICES AND CIRCULAR INFLIGHT SERVICE PRACTICES

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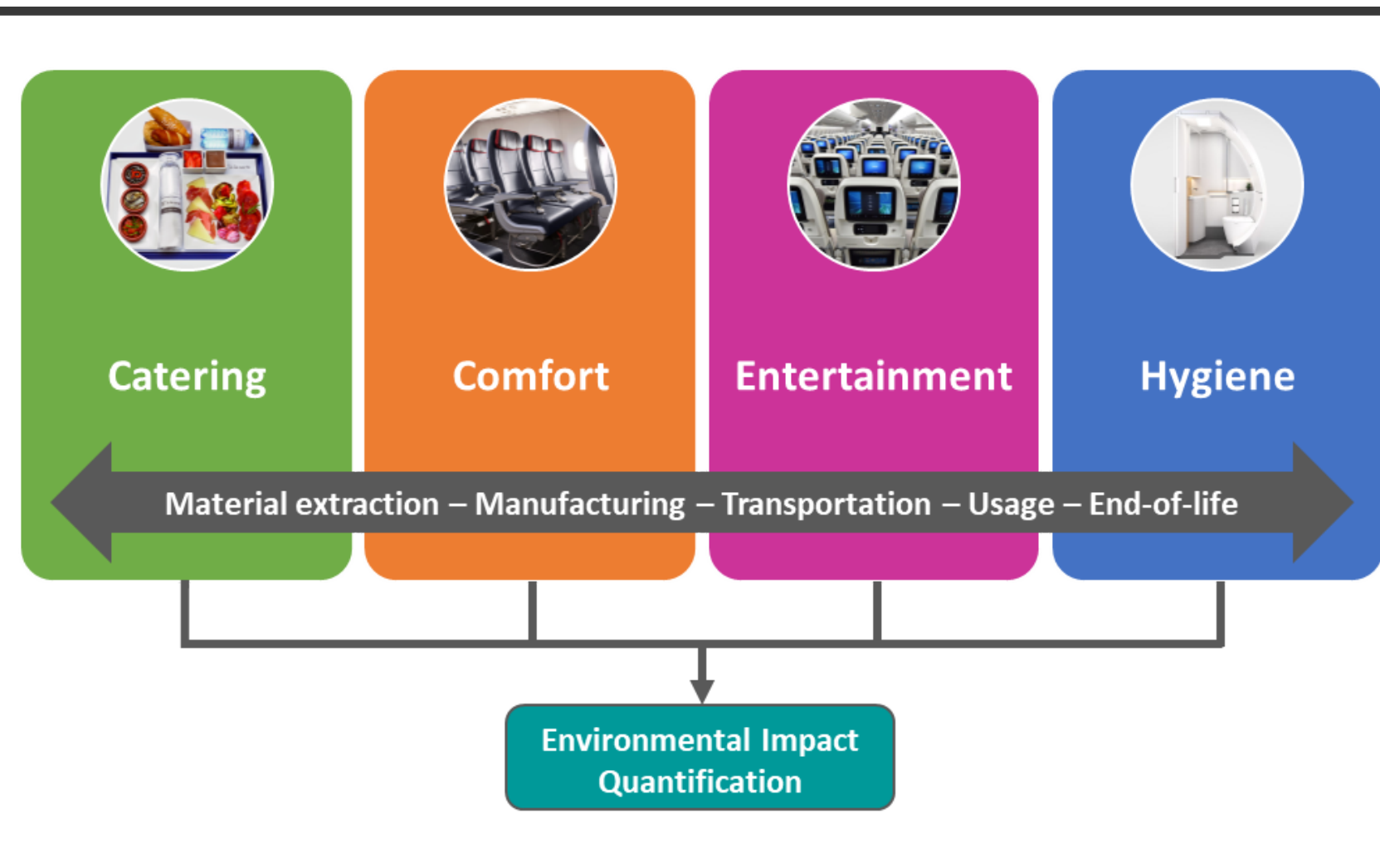
## INTRODUCTION

The circular economy is an emerging economic model that offers solutions to global challenges such as climate change [1]. In the aviation sector, the current economic model relies on linear activities following the pathway of 'creation, consumption, and disposal'. **Transitioning to a circular model** would benefit aviation with the **reduction of the impacts** associated with the resource's consumption, emissions, and waste generation.

Currently, airlines in Europe are **adopting more sustainable practices**, seeking ways to leave the linear economy behind and embrace circularity [2][3]. However, the title 'sustainable' for some of these practices, such as reforestation, is questionable. Moreover, although recycling waste can be considered part of a circular economy strategy, its practice does not render an airline circular. Therefore, **the assessment of the environmental impact of such practices needs to be investigated.**

### Main research question

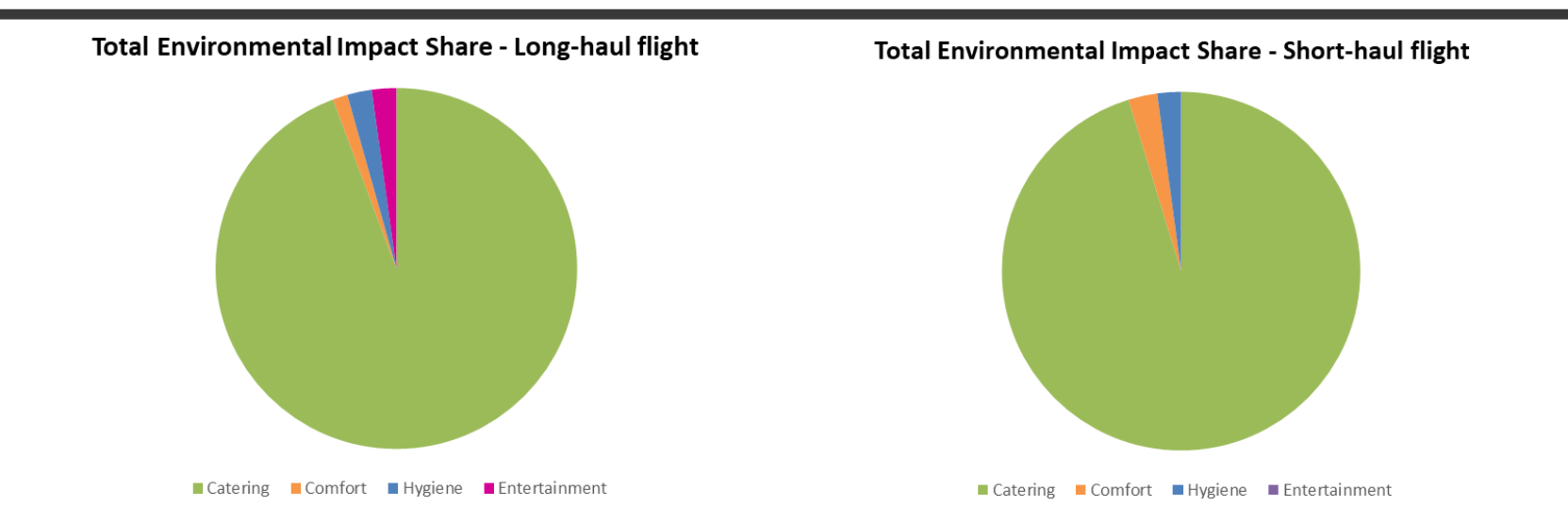
*How current inflight sustainable service practices, that an airline can adopt, perform in terms of environmental impact and do they enable circularity?*



## LIFE CYCLE ASSESSMENT METHOD

To assess the environmental impact of business-as-usual and sustainable inflight service practices, the **Life Cycle Assessment (LCA)** method is used. The LCA method is an analytical tool that quantifies the environmental impact of a product associated with its life stages, such as materials extraction, use phase and end-of-life phase. LCA expresses the impact in terms of carbon footprint, material depletion, land use, human health and the ecosystem.

The LCA consists of two business-as-usual (BAU) scenarios: a short-haul flight (within Europe) and a long-haul flight (transatlantic) flight. Inflight services provided on each flight are categorised in four main groups: **catering, comfort, entertainment** and **hygiene**. The total impact of each BAU scenario is assessed. A comparison of the BAU scenarios and the more sustainable alternatives will also be performed.



## PRELIMINARY RESULTS AND DISCUSSION

- Dietary choices have a great effect on the environment.
- Long-haul flight scenario: 94.3% of the total environmental impact is generated by catering services provision.
- Comfort services contribute an average of 1.3%, entertainment services an average of 2.2% and hygiene services and average of 2.2%.
- Short-haul flight scenario displays the same pattern, confirming the importance of dietary choices.
- The final results will reveal to what extent can inflight services become circular and reduce their environmental impact.