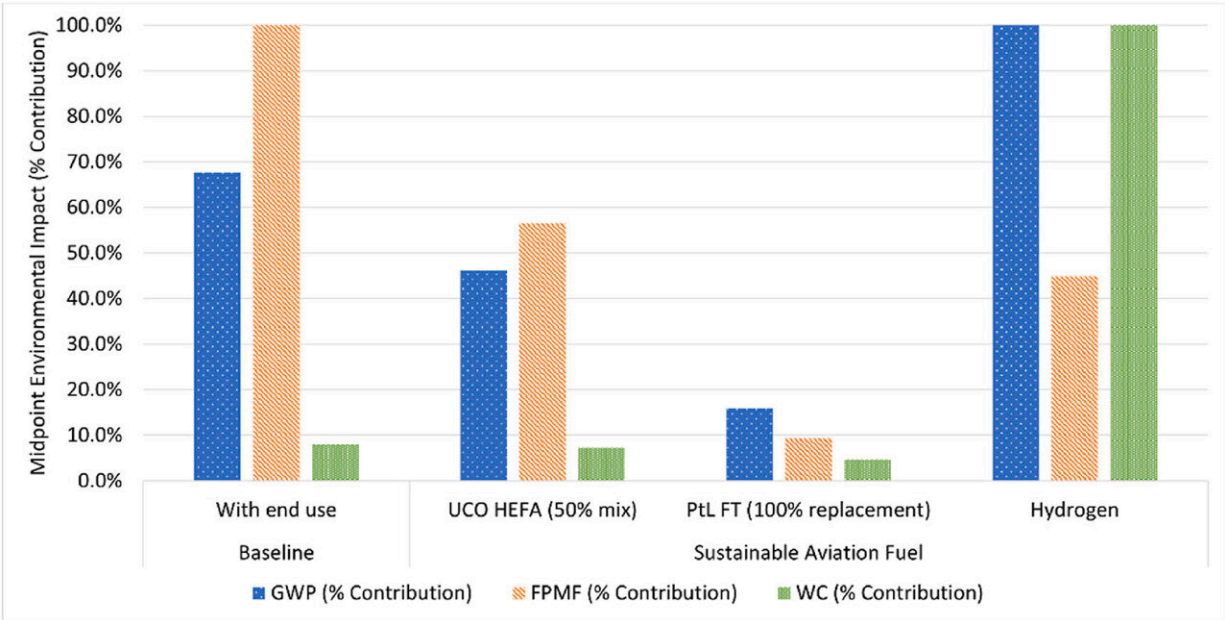


New framework developed to allow rapid evaluation of decarbonization technologies towards net zero

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Environmental impact assessment results (percentage contribution) for the SAF scenarios (GWP, ReCiPe Midpoint H – characterisation phase). Credit: *Journal of Cleaner Production* (2024). DOI: 10.1016/j.jclepro.2024.143440

A new novel high-level framework is set to improve efficiency in life cycle assessment. In a [paper](#), appearing in *Journal of Cleaner Production*, the stakeholder-driven framework is applied to an aviation case study.

Conventional Life Cycle Assessment (LCA) methods are able to assess [environmental impact](#) using significant resources (including time and data). However, due to the challenges associated with [data collection](#), these can still suffer from issues including representation accuracy, comparability, data availability, [data quality](#), and uncertainty.

The new paper, "A new high-level Life Cycle Assessment framework for evaluating [environmental performance](#): An aviation case study," describes a new streamlined, high-level framework which seeks to solve these issues through rigorous and iterative application of existing standardized LCA methodologies while continually engaging with stakeholders.

This research has developed a novel high-level framework which improves efficiency in LCA in this regard. The proposed framework allows for efficient joint interpretation of results by different stakeholders, enabling effective [strategic decision](#) making without requiring the granular level of data detail demanded by conventional LCA frameworks.

The paper is written by University of Sheffield researchers Jacob Whittle (EngD Researcher in Advanced Metallic Systems and Research Associate), Professor Lenny Koh (Director of the Advanced Resource Efficiency Center and Chair in Operations Management), Katie Callander (Analyst at the AMRC and Research Associate) and Faizal Kachwala (Project Delivery Manager at AMRC North West), as well as BAE's Net Zero Technology Lead, Michelle Akure.

In this paper, the new framework is applied to an aviation case study which seeks to investigate the potential environmental impact of implementing sustainable aviation fuel, including fuels based on used cooking oil, power to liquid technology and hydrogen. It also seeks to investigate digitalization of training regimes within a UK aircraft

manufacturer.

This research has shown that applying the new framework allows for rapid evaluation of decarbonization technologies through rigorous environmental assessment to a degree of accuracy of which still enables strategic decision making, but without the use of unnecessary resources.

While the framework has been developed to work across a range of products, platforms and systems, going forward we will look to apply it in different contexts as an LCA enabler within technological developments.

This could include exploration of other aviation decarbonization pathways to achieve net zero, says Professor Lenny Koh, principal investigator of the project.

More information: J.W. Whittle et al, A new high-level life cycle assessment framework for evaluating environmental performance: An aviation case study, *Journal of Cleaner Production* (2024). [DOI: 10.1016/j.jclepro.2024.143440](https://doi.org/10.1016/j.jclepro.2024.143440)

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