

SSAPTI: SYNERGISTIC SUSTAINABILITY ASSESSMENT OF PASSENGER TRANSPORT INTERIORS

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Value Statement:

The present framework facilitates qualitative sustainability assessment of passenger transport cabin interiors based on synergistic application of MCDA and LCA approaches described in the publication titled "A SYNERGISTIC MCDA-LCA METHOD FOR SIMPLIFIED SUSTAINABILITY ASSESSMENT OF PASSENGER TRANSPORT CABIN INTERIORS" [44]. This framework uses a sequenced process flow to translate cabin product data into a set of impacts based on a combination of objective information about product materials, and subjective expert judgements about product life cycle and their strategic importance. The following set of sheets constitutes the presented framework:

- "1. Cabin Inventory": offers the space for detailed product data records to store the materials and masses for each product component.
- "2. Sustainability Assessment": used as the central space for integrating quantitative assessment elements: sustainability impact of cabin materials, impact category weights, circularity effects.
- "3. Circular Economy": provides the space to model the circular scenarios of cabin product life cycle.
- "4. Qualitative LCA": facilitates qualitative assessment of cabin product impacts due to the activities performed across its life cycle based on expert judgement where robust data is unavailable.
- "5. Strategic Criteria": facilitates qualitative assessment of cabin product importance for the business against non-technical criteria to adjust product priorities, also based on expert judgement.
- "6. Results Aggregation": the central space where the interim results from each assessment block are pulled into a single final score for each product reflecting its sustainability priority level.

A set of supporting sheets that enable the 6 core sheets:

- "a. LCIA Method Selection": a summary of relevant LCIA method features informing the decision about its inclusion in this framework.
- "b. IC Generalisation": provides the reference to IC organisation where several IC used by the individual methods are merged into one general IC to enable method comparability.
- "c. Importance Weighting": contains the analytical instruments for deriving the importance weights for both the individual IC and qualitative LCA stages.
- "d. Method Comparisons": offers the comparison between all included LCIA methods per each IC to inform the user's prioritisation strategy.
- "e. Qualitative Evaluation": contains the functional block performing the analysis for Qualitative LCA and Strategic Criteria sheets; is not intended for user's review or amendment.
- "mx" sheets provide the space for importing the normalised outputs from selected LCIA methods for the materials assessed; each sheet houses a single method and the associated functional tools to transform the raw impacts from LCA databases into cabin product impacts based on material weights.

- "References" outline the list of sources used throughout this framework.

The presented sheets may be used as information source, or be amended by the user to reflect the needs of their specific project. Amendments may be performed in the cells containing blue text on yellow background only, which applies to all sheets in this framework. Any sheets that do not contain blue text on yellow background shall not be amended.

Abbreviations:

CE	Circular Economy
CFRP	Carbon Fibre Reinforced Plastics
DB	Database
DL	Design Life
EF	Environmental Footprint
EI	EcoInvent
EP	Environmental Prices
EPS	Environmental Priority Strategies
FF	Flexible Foam
GFRP	Glass Fibre Reinforced Plastics
HC	Honeycomb
IC	Impact Category
ILCD	International Life Cycle Data system
IMPACT	IMPact Assessment of Chemical Toxics
IPCC	Intergovernmental Panel on Climate Change
LCA	Life Cycle Assessment
LCIA	Life Cycle Impact Assessment
OEM	Original Equipment Manufacturer
PC	Polycarbonate
PEI	Polyetherimide
PET	Polyethylene Terephthalate
PMMA	Polymethyl Methacrylate
PU	Polyurethane
PVC	Polyvinyl Chloride
RF	Rigid Foam
TRACI	Tool for Reduction and Assessment of Chemicals & other Impacts