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# Life Cycle Assessment (LCA) of Tourism Activities

An evaluation of existing methodologies and data

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***Abstract***— Tourism, like other developed industries is a commerce that requires energy inputs and yields outputs with significant effects on the environment. However a comprehensive study examining the life cycle impact associated with each tourism component including transportation, accommodation, food services, and recreation is still lacking. Therefore a search of previous tourism life cycle studies was carried out and ten studies were further investigated. Indicators, assessment approaches, and system boundaries of these previous studies were assessed. Then the outcomes were normalized and compared in order to obtain ranges for the four components of tourism. It was found that energy intensity (MJ) and carbon dioxide (kg CO<sub>2</sub>-eq) are the most investigated life cycle indicators. System boundaries vary significantly among studies, with airplane transportation to the destination, hotel accommodations during the trip and local recreation attractions being the most studied tourism components. Of the ten studies, transportation is consistently reported as the most energy intensive component, requiring 2.6 – 2.8 MJ/pkm and sightseeing recreation is the least, requiring 4 – 8.5 MJ/visitor. Finally, this study identifies gaps in the existing literature and provides a direction for future research concerning the impacts of tourism.

*Keywords*—Life Cycle Assessment; sustainable tourism; hotel buildings; food management; GHG Emissions; environmental loads