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INCORPORATING LIFE CYCLE ASSESSMENT IN THE GREEN METRIC RANKING: A CONCEPTUAL APPROACH

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Abstract – Integrating sustainability principles into their daily operations is an overarching goal of universities and higher education institutions (HEIs), as knowledge multipliers, have to perform (Filimonau *et al.*, 2021). Various studies have demonstrated that the operational activities of universities cause GWP emissions and, in general, negative environmental impacts, due mainly to student and staff mobility, on-campus energy and water consumption, and waste production (Jürgens *et al.*, 2023). Findler *et al.* (2019) outlined numerous analytical methods, ranging from input-output analysis to full Life Cycle Assessment (LCA), for evaluating the carbon footprints of universities and colleges. Concurrently, a variety of tools have been devised to measure sustainability based on environmental metrics, such as the Green Metric (GM) ranking developed by Universitas Indonesia (UI). The GM, which is first in which tops university sustainability rankings (Marrone *et al.*, 2018), rates HEIs by utilizing 51 criteria across 6 rating areas. Researchers analyzed the UI Green Metric World Ranking system to examine the requirements for a fair sustainability ranking of worldwide HEIs, although the latter were only examined in general without inspecting each item separately (Boiocchi *et al.*, 2023). In order to lessen the environmental impacts of HEIs, recognized and robust methods must be used to identify appropriate and effective measures. LCA is a standardized (ISO 14040 and 14044) tool for quantifying and reducing environmental impacts throughout the entire life cycle of a product, service, or organization. This study is focused on understanding how LCA can be integrated into GM, and more specifically, how it can assist in achieving a consistent and structured review of specific indexes such as EC4, EC7, EC8, WR2, and TR1. The analysis was conducted by comparing the items one by one. Such a method was implemented as a result of the authors' specialized background, the scientific literature of interest, and the adoption of a critical thinking approach. The study results emphasize the necessity of incorporating LCA into the environmental sustainability strategies of HEIs. This integration is crucial for developing a robust approach adaptable to various local contexts, enhancing the precision in assessing and improving HEIs' sustainability practices. Such a strategy will align HEIs' operational activities more effectively with sustainable development goals. The application of the conceptual approach to a case study is recommended.

Keywords – GreenMetric; Life Cycle Assessment; sustainability; university campus