

## Strengths and Weaknesses of Tally, an LCA Tool for Comparative Analysis

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**Abstract :** The main purpose of this first tier of the study is to quantify and compare the embodied environmental impacts associated with alternative materials applied to Adohi Hall, a residence building at the University of Arkansas campus, Fayetteville, AR. This 200,000square foot building has5 stories builtwith mass timber and is compared to another scenario where the same edifice is built with a steel frame. Based on the defined goal and scope of the project, the materials respectivetothetwo building options are compared in terms of Global Warming Potential (GWP), starting from cradle to the construction site, which includes the material manufacturing stage (raw material extract, process, supply, transport, and manufacture) plus transportation to the site (module A1-A4, based on standard EN 15804 definition). The consumedfossil fuels and emitted CO2 associated with the buildings are the major reason for the environmental impacts of climate change. In this study, GWP is primarily assessed to the exclusion of other environmental factors. The second tier of this work is to evaluate Tally's performance in the decision-making process through the design phases, as well as determine its strengths and weaknesses. Tally is a Life Cycle Assessment (LCA) tool capable of conducting a cradle-to-grave analysis. As opposed to other software applications, Tally is specifically targeted at buildings LCA. As a peripheral application, this software tool is directly run within the core modeling application platform called Revit. This unique functionality causes Tally to stand out from other similar tools in the building sector LCA analysis. The results of this study also provide insights for making more environmentally efficient decisions in the building environment and help in the move forward to reduce Green House Gases (GHGs) emissions and GWP mitigation.

**Keywords :** comparison, GWP, LCA, materials, tally

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