

## A Participatory Life Carbon Assessment: Case Study of a London Estate Community Plan

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**Abstract** – The operational energy performance is one of the main metrics in decision-making over regeneration scenarios of housing estates. The assessments in many cases do not include the overall carbon footprint and other environmental impacts of different regeneration scenarios. Life Cycle Assessment (LCA) is the methodology used to calculate the environmental impacts over the lifecycle of buildings. The current practice of building LCA is regularly conducted less effectively, and the uncertainties such as the limited scope of the framework and the variable system boundaries can produce considerably contrasting outcomes which can also be interpreted subjectively. This paper aims to explore a participatory approach to conducting LCA for options appraisal of estate regeneration schemes. The study employs a mixed methods design consisting of primary and secondary data collection and rapid ethnographic observations. The research includes a case study of a Housing Estate in London under threat of demolition. The community's refurbishment and extension proposal has been developed through knowledge mobility and co-design workshops with the members of the community and University College London (UCL) design team, who are the stakeholders involved in conducting the participatory LCA. LCA of different regeneration and redevelopment scenarios have been explored. The results of the research provide convincing evidence in favour of the refurbishment scenarios over the redevelopment scenario. The findings can make a case for a participatory assessment framework for the evaluation of estate regeneration schemes and highlight the necessity of including other aspects beyond CO<sub>2</sub> emissions in the assessment criteria. This study can assist researchers in preparing a framework for participatory integration of broader environmental and socio-economic impacts and including different stakeholders in decision-making over regeneration projects in different contexts.

**Keywords**—Life Cycle Assessment; LCA; Estate Regeneration; Participatory Research; Community-based Participatory Research

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