

## **The Potential in the Use of Building Information Modelling and Life-Cycle Assessment for Retrofitting Buildings: A Study Based on Interviews with Experts in Both Fields**

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**Abstract :** Life cycle of residential buildings are expected to be several decades, 40% of European residential buildings have inefficient energy conservation measure. The existing building represents 20-40% of the energy use and the CO<sub>2</sub> emission. Since net zero energy buildings are a short-term goal, (should be achieved by EU countries after 2020), is necessary to plan the next logical step, which is to prepare the existing outdated stack of building to retrofit them into an energy efficiency buildings. In order to accomplish this, two specialize and widespread tool can be used Building Information Modelling (BIM) and life-cycle assessment (LCA). BIM and LCA are tools used by a variety of disciplines; both are able to represent and analyze the constructions in different stages. The combination of these technologies could improve greatly the retrofitting techniques. The incorporation of the carbon footprint, introducing a single database source for different material analysis. To this is added the possibility of considering different analysis approaches such as costs and energy saving. Is expected with these measures, enrich the decision-making. The methodology is based on two main activities; the first task involved the collection of data this is accomplished by literature review and interview with experts in the retrofitting field and BIM technologies. The results of this task are presented as an evaluation checklist of BIM ability to manage data and improve decision-making in retrofitting projects. The last activity involves an evaluation using the results of the previous tasks, to check how far the IFC format can support the requirements by each specialist, and its uses by third party software. The result indicates that BIM/LCA have a great potential to improve the retrofitting process in existing buildings, but some modification must be done in order to meet the requirements of the specialists for both, retrofitting and LCA evaluators.

**Keywords :** retrofitting, BIM, LCA, energy efficiency

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