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## TOWARDS A LIFE CYCLE ASSESSMENT BASED SYSTEM FOR SAHARIAN BUILDING IN ALGERIA

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### ABSTRACT

Facing the effects of the climate change and in the alignment of the commitments of Paris Agreement, many countries have laid down neutrality carbon and reheating to 2 C<sup>0</sup> maximum as an objective up to 2050. In Algeria, the national energy balance shows that building environment consumes more than 51 % of total energy consumption. However, if measurements of attenuation of the emission of greenhouse gas GHG were not undertaken the reheating could reach 7 °C by the end of the century causing irrevocable environmental consequences. The adoption of the concept of neutrality carbon in the building sector can be included under a Zero Energy Building strategy. In order to reach this goal, architects often face problems that require suitable solutions. To carry out this task a multitude of software programs were developed. Nevertheless, it has been noticed that an important number of architects do not use any bioclimatic device tools during the design process, at least in the present case study. The inadequacy of these tools, to the professionals implied in the designing process, especially architects, is very probable. In this regard, the aim of this contribution is to develop an assistant tool for designers so that to produce high-performance buildings in terms of energy. It seeks to develop a bioclimatic sketching dashboard based on the Algerian guideline combined by case based reasoning and data visualization method. The research methodology embraces three steps: (1) analyzing the current designing practices; (2) integrating case based reasoning system by using artificial intelligence techniques; and (3) evaluating the performance of the proposed method. The validation section aims to check that the association Concept-Cases allows a correct interpretation and a performant appropriation of the neutrality Carbone concepts during the building life cycle (BLC), and to validate the practical, economic, environmental and creative benefit of the suggested method. The experimentation is carried out by two different means. The first set of experiments take the form of practical exercises; whereas, the second one is done by analyzing the energetic performance using Building Energy Performance Simulation (BEPS). This tool not only assists architects but also offers concrete illustrations to the various actors and feeds the design process from the early stages.

**Keywords:** Life Cycle Assessment, the Building Sector, Climate Change, Design Support, Data Visualization, Carbone Neutrality.