Research information

Key words
design support, renewable resources, sustainable building, regenerative design, energy, materials

Introduction
➢ Regenerative design promises a new era of sustainable engineering that has long been of great interest to architects, construction professionals and their clients, but is still relatively primitive in practice.
➢ The research will focus on the study of energy and materials because the positive impact can only be achieved through the deliberate use of resources (energy and materials).
➢ Develop a methodology to guide architects during early design within the regenerative design paradigm and empower Belgian architects to embrace and integrate the principles of regenerative design in an innovative way in their design practice and facilitate their leadership towards the European sustainability targets and set the foundation for future development in education, research and practice within a new paradigm and for knowledge know-how in relation to circular economy.

Problem statement
The main principles of regenerative design are not new [5,8,9,10,25,26]. However, up to now, only vague definitions or general and broad principles exist. No clear criteria, indicators and no hands-on guide to support architects when designing buildings within a regenerative paradigm are developed so far [7]. A framework for net positive development is needed, complemented with practical design strategies and measures that are validated for the Belgian context. The accurate and specific determination of regenerative characteristics of buildings can help designers to make fundamental choices in the design and construction of sustainable architecture.

Objectives
Accelerating the embracement or uptake of sustainability principles, set by the EU, in the architectural design practice in Belgium is essential. Sustainability should be brought to the ideation or concept development phase and the inherent integration of sustainability principles in the architect’s design practice should be supported. this research aims to inform and guide architectural students and architects in practice during the design process for regenerative design outcomes, starting from early design.

The operational objectives of the research project are formulated as follows:
➢ Development of a carrying framework (design principles and strategies, indicators, metrics, measures, …) for regenerative design
➢ Providing an overview of and recommendations for regenerative building design in Belgium
➢ Translation of this framework into a methodology that will guide architects during early design within a regenerative design paradigm
➢ Validation and dissemination of the guiding methodology in education

Methodology
In this PhD, literature review, case study analysis, quantitative research (energy performance simulation, LCC and LCA), qualitative research (interviews, workshops) and research by design are the main research methods. For the research by design part of the research. The framework and methodology that will be developed within this PhD will be used as input for both the Design Studio and the Research Seminar. It will allow and guide students to explore regenerative designs and serves, therefore, on the other hand, as input for the PhD. In addition, the usability and effectiveness of the developed methodology will be tested in the Design Studio and the Research Seminar and will be iteratively improved.

Contact
Muheeb Al-Obaidy
E-mail: muheeb.al-obaidy@doct.ulg.be

References