

# Simplification of building LCA through structured sub-characterization and probabilistic sampling

Record number : OPR-924

## Overview

### RESEARCH DIRECTION

Mourad Ben Amor, Professeur -  
Department of Civil and Building  
Engineering

### INFORMATION

[ben.amor@usherbrooke.ca](mailto:ben.amor@usherbrooke.ca)

### ADMINISTRATIVE UNIT(S)

Faculté de génie  
Département de génie civil et de génie du  
bâtiment  
Département de génie mécanique

### LEVEL(S)

3e cycle

### LOCATION(S)

Campus de Sherbrooke  
LIRIDE

---

## Project Description

### Description:

This PhD project is part of a research partnership with the non-profit organization Écohabitation, which is driven by environmental issues in the construction field in Quebec and Canada. In order to disseminate the use of LCA in the field of construction for multiple stakeholders, this project combines the expertise of LIRIDE and Écohabitation partners.

This project is based on the development and generalization of the structured sub-characterization approach of inventory data followed by probabilistic sampling applied to buildings. The first step is to define hierarchical levels describing at different degrees of precision materials over their entire life cycle and energies used. The following step is the characterization of the uncertainties associated with each element (materials, energy), knowing that there are several types of uncertainties on the parameters. Subsequently, the probabilistic sampling method will be used for each level, in order to identify the set of inventory elements that are particularly relevant for a more precise characterization. This sampling will be carried out using a Monte-Carlo simulation and GSA techniques. This will result in a set of inventory items representing with given confidence the impact threshold by building archetypes.

### Day to day work:

The work will be carried out within an interdisciplinary team of LIRIDE, in close collaboration with the partner. The team will consist of one master's student, two PhD students, one postdoctoral fellow and researchers. In addition, an integral part of your work is to publish your results in peer-reviewed journals and present them at international conferences.

### Qualifications:

Your qualifications should include a master's level university degree in civil, building, mechanical, environmental engineering or similar studies with excellent grades. A strong interest in modelling would be an important advantage. Your admission will be subject to the standard rules of the University of Sherbrooke (funding assured for the entire PhD). The project will start as soon as possible or upon mutual agreement. You are expected to contribute to teaching and research activities of the laboratory up to a maximum of 20% of your working time.

### Application:

[USherbrooke.ca/recherche](http://USherbrooke.ca/recherche)

We look forward to receiving your online application including 1) cover letter, 2) resume, 3) credentials and 4) contact information for two references. We will begin interviewing candidates as soon as a sufficient number of applications are received. Applications will be accepted until the position is filled.

Further information:

Questions (no applications) regarding the position should be directed to Prof. Dr. Ben Amor, [ben.amor@usherbrooke.ca](mailto:ben.amor@usherbrooke.ca). Please also visit our website [www.liride.info](http://www.liride.info). For applications: [info@liride.info](mailto:info@liride.info)

**Discipline(s) by sector**

**Funding offered**

**Partner(s)**

Yes

ÉcoHabitation

**Sciences naturelles et génie**

Génie civil, Génie mécanique

The last update was on 13 March 2024. The University reserves the right to modify its projects without notice.