

Multi-Scale Assessment of Life Cycle Energy and GHG Emissions of Australian Buildings

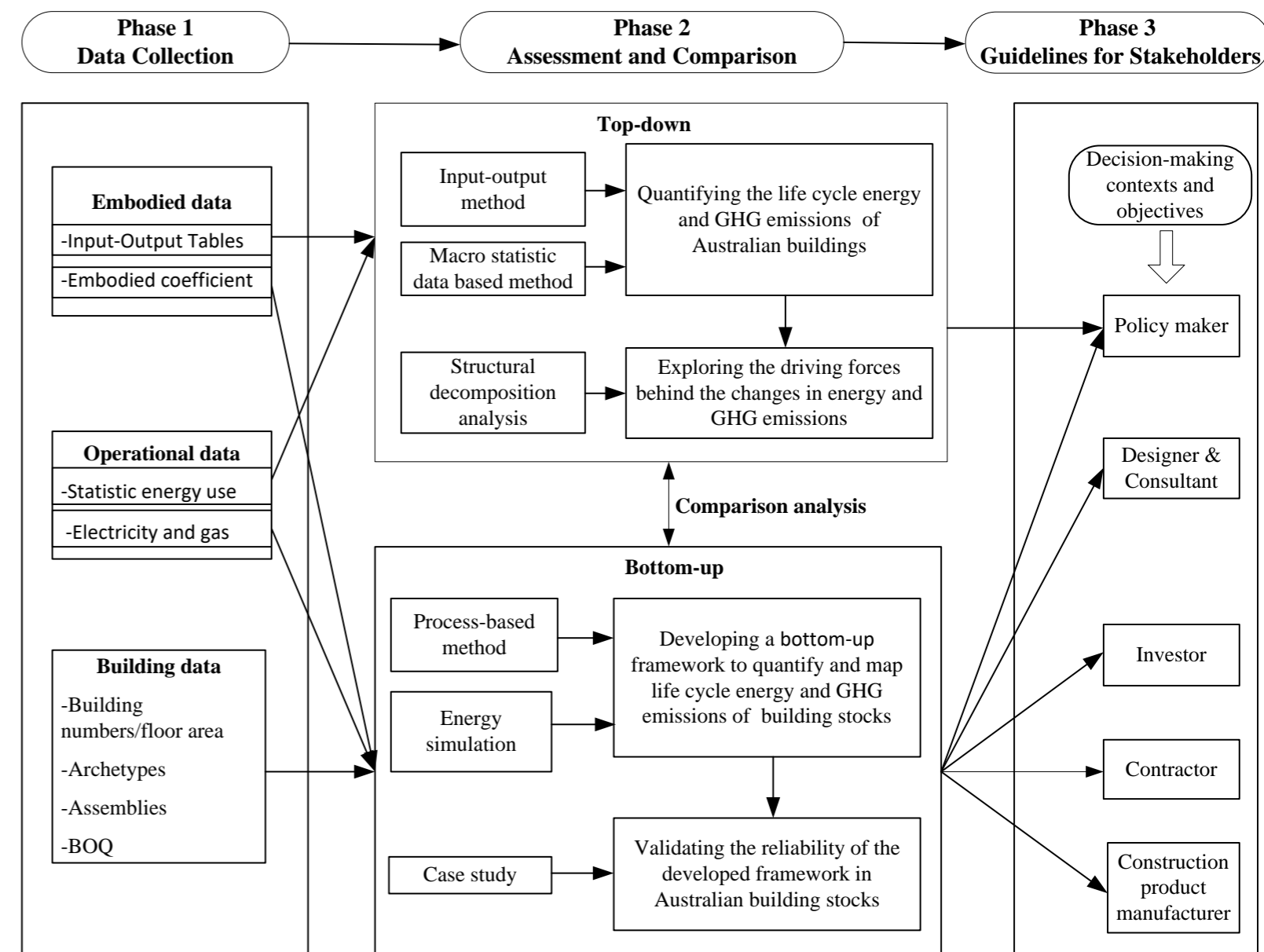
Introduction

Building sector plays a dominant role in the energy use and GHG emissions, which contributes nearly 39% of global energy-related carbon dioxide (CO₂) emissions and 36% of global final energy use (IEA, 2018). Currently, reduction strategies are primarily focused on the operational stage of buildings. With the decrease of operational energy and GHG emissions of low-energy buildings, embodied energy and GHG emissions account for a growing share. It is necessary to take account of embodied energy/GHG emissions as part of life cycle energy/GHG emissions. Besides, various stakeholders have different roles and decision-making contexts that require explicit consideration of regional and building specific characteristics, but most previous studies focus on one dimension or a single method. There isn't a comprehensive multi-scale life cycle assessment framework to provide guidelines for different stakeholders.

Research Objectives

- Quantify the life cycle energy and GHG emissions of Australian buildings across multi scales, and explore the driving forces behind the changes in energy use and GHG emissions.
- Analyse the discrepancies of results between the top-down and bottom-up approaches in calculating life cycle energy and GHG emissions.
- Develop effective guidelines for energy and GHG emission reduction for different stakeholders.

Research Design



More Information

Shengping Li

PhD Candidate

shengpingli@student.unimelb.edu.au

Supervisors:

Prof. Greg Foliente, Prof. Lu Aye, Dr. Seongwon Seo



Discipline : Civil Engineering