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Comparing greenhouse gas emissions of precast in-situ and conventional construction methods

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Abstract

Precast in-situ construction is gaining popularity among construction practitioners in China for its efficient system and its ability to reduce construction waste. However, there has been little to no empirical evidence that elucidates the greenhouse gas (GHG) emissions from this method. In an effort to address this knowledge gap, this paper establishes a systems boundary for the measurement of GHG emissions for precast in-situ construction. Employing a quantitative model, the GHG emissions of precast in-situ is determined and compared with conventional construction method. Results show that the precast in-situ construction produces less GHG emissions than the conventional method. Embodied GHG of building materials is found to be the main GHG emitter in both precast in-situ and conventional construction methods. Furthermore, four factors are identified that positively contributes towards reduced emissions: (i) embodied GHG emissions of building materials, (ii) transportation of building materials, (iii) resource consumption of equipment and techniques and (iv) transportation of waste and

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