Integrating Embodied Carbon Feedback into Footbridge Design

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Summary

The aim of this paper is to demonstrate a new workflow that integrates an embodied carbon assessment into a standard footbridge design procedure.

Engineers are becoming increasingly conscious of the need to minimise the carbon content of their designs. However, evaluating this is often treated as a separate task requiring designers to calculate the embodied carbon of each individual footbridge component. This process is time consuming and does not offer great flexibility to make changes to the design. As a result, it is often carried out at a later stage when adapting to a lower embodied carbon design can be more difficult.

The Buildings and Habitats Object Model (BHoM) was implemented into a new workflow to integrate embodied carbon feedback in the design process. It involves the use of parametric scripts and the ability to obtain information from finite element analysis models prepared using proprietary software such as Lusas and MidasCivil (Fig. 1).

The use of this workflow reduces time spent carrying out embodied carbon calculations; allowing it to be implemented throughout the design lifecycle and gives designers greater flexibility to make meaningful changes to reduce the embodied carbon. Another key benefit of this approach is the ability to identify carbon heavy components with clear visual output that can be easily understood by all collaborators. This information allows stakeholders to make informed decisions around embodied carbon throughout the design development.

This paper will discuss this powerful methodology and will provide project examples demonstrating the benefits of implementing this workflow.

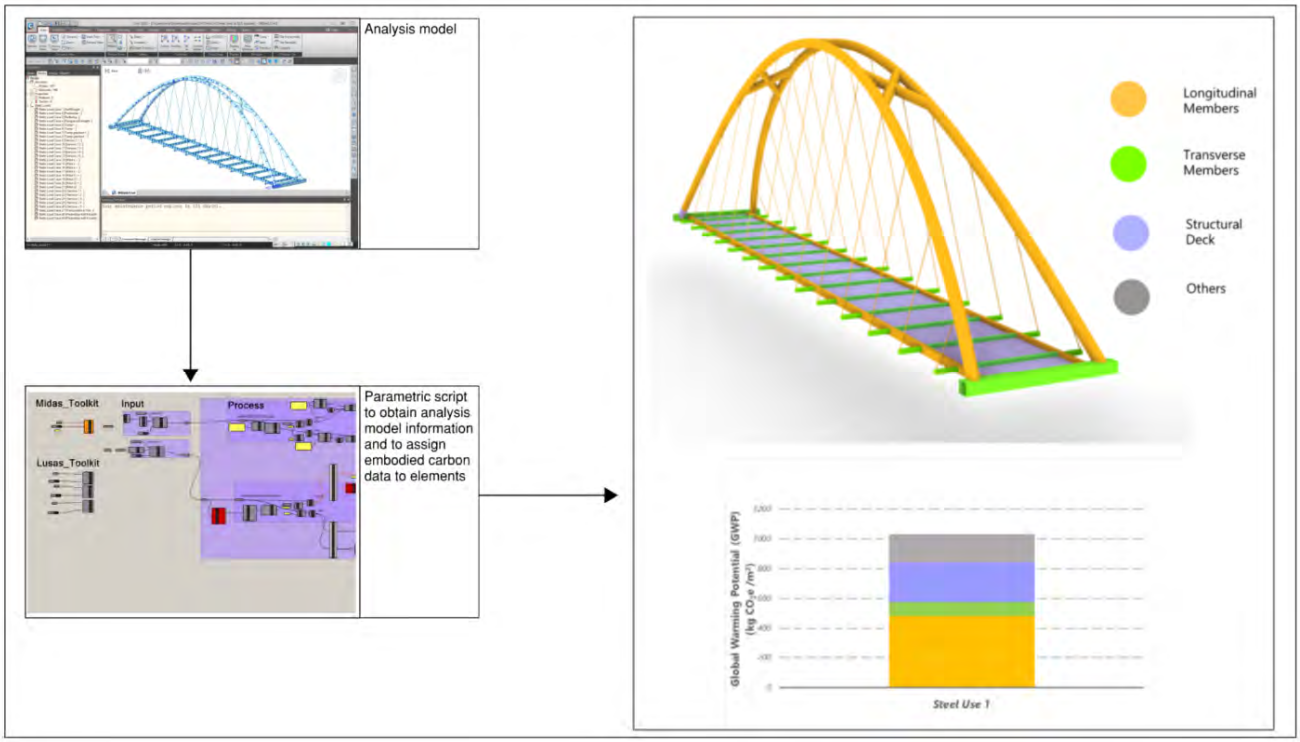

Fig. 1. Flow Chart showing the new workflow of carrying out embodied carbon

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