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Authors: Martin Andersson, Jonas Barkander, Jun Kono, York Ostermeyer



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# Abatement cost of embodied emissions of a residential building in Sweden

Martin Andersson\*, Jonas Barkander\*, Jun Kono, York Ostermeyer

Chalmers University of Technology. Department of Architecture and Civil Engineering

Keywords: embodied emissions; LCA; optimization; building sector; Sweden; carbon abatement

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## **Highlights**

- Abatement of embodied emissions was found cost effective in relation to carbon dioxide abatement in other sectors.
- Embodied emissions could be reduced by 15 % using cost neutral or nearly cost neutral measures.
- Acoustic requirements were found to be a limiting factor in abatement of embodied emissions.

## **Abstract**

In 2010, the world's buildings accounted for approximately 19 % of all greenhouse gas emissions. These emissions stem from both the construction and operation of buildings. In recent years the carbon efficiency of energy sources and energy efficiency of new buildings has been improved in Sweden. Therefore, embodied emissions accounts for an increasing share of the life cycle emissions of new buildings. This study aims to assess the cost effectiveness in abatement of embodied emissions. This was done by assessing the embodied emissions of a case building and several conventional design measures along with the implication on production cost. It was found that many of the measures enabled cost effective carbon abatement. Embodied emissions could be reduced by 15 % using cost neutral or nearly cost neutral measures. Abatements up to 18% were found cost effective in relation to abatement of carbon dioxide emissions in other sectors. Abatements up to 24 % were

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