A European reference house for Life Cycle Assessment of wooden
residential buildings

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The construction industry accounts for 15 % of all greenhouse gas emissions. During their use phase, buildings use 40 % of the total energy consumption, which contributes significantly to air pollution and other environmental impacts. While the energy consumption during the use phase is predicted to decrease as efficient buildings, like zero and near zero energy buildings, become more common, climate change and other environmental problems from the production or raw materials, construction and end of life remain serious concerns that need to be solved urgently.

Life cycle assessment (LCA) and the EU-recommended Environmental Footprint (EF) are well known and accepted tools to measure a comprehensive set of environmental impacts throughout a products life cycle. However, to assess how good (or bad) a wooden building performs environmentally is still a challenge. In the EU Environmental Footprint pilot phase from 2013 – 2018, an average benchmark for the different product groups was found to be very useful.

Based upon the recommendations for a benchmark of all kinds of European dwellings, we developed a scenario of a single-family house nearly zero energy building. This scenario results cover 16 recommended LCA impact indicators and can be normalised and weighted into 1 single point for easy and quick comparisons. The results are presented as the average impact per one square metre (m2) of floor area over one year.

The developed benchmark for wooden buildings is a suitable comparison point for new wooden building designs. The benchmark can be used by architects and designers early in the planning stages when changes still can be made to improve the environmental performance of wooden buildings, or to improve the communication and interpretation of the LCA results for customers and other stakeholders. This presentation will discuss the methodology, results and compare the results of the wooden building with the benchmark of average European dwellings made of different materials.

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