



LCA of ECO-SANDWICH® wall panel for the University of Zagreb



ECO-SANDWICH
ENERGY EFFICIENT, RECYCLED CONCRETE
SANDWICH FACADE PANEL

The Challenge

The ECO-SANDWICH® wall panel is an energy-efficient sandwich facade panel made of recycled and innovative materials. It was developed in collaboration by a group of Croatian scientific institutions and industry, led by the University of Zagreb, Faculty of Civil Engineering. The panel provides a possible technological solution for fast construction of energy-efficient buildings on a large scale, and is intended to be used in residential as well as commercial buildings. The developers wanted to understand the environmental performance of the ECO-SANDWICH® wall panel, so they could communicate this when introducing the panel into the European market.

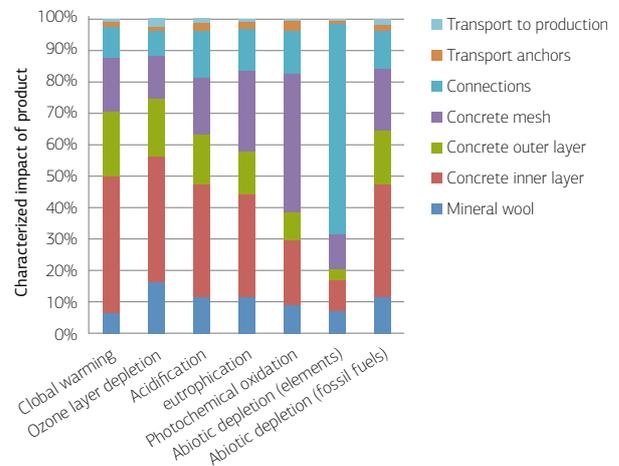
The Solution

PRé conducted a life cycle assessment (LCA) to assess the environmental impacts of the ECO-SANDWICH® wall panels. Since the LCA followed the specific product category rules (PCR) described by the EN 158041 standard for building materials, the results of the LCA could be used to make an environmental product information sheet. The advantage of using the same PCR standards is that it makes comparing the LCA results of similar products easier and more reliable.

The study included the wall panels' full life cycle, from cradle to grave. The results include the production stage, installation into a building, use and maintenance, replacements, demolition, waste processing for re-use, recovery, recycling, and disposal. A questionnaire was developed to collect inventory data from the ECO-SANDWICH® consortium. Information provided included amounts of materials, transport distances for the raw materials and (components of) the wall panel, energy or fuel required for specific processes. The following impact categories were included in the impact assessment: global warming, ozone layer depletion, acidification, eutrophication, photochemical oxidation, depletion of elements, and depletion of fossil fuels. The resulting environmental product information sheet was reviewed by a third-party verifier.

The results showed that the environmental impact of an ECO-SANDWICH® wall panel is predominantly determined by the product itself – that is, raw materials, transport to production, and assembly – rather than e.g. installation on the building or the end-of-life stage. The total contribution of life cycle stages relating to product itself ranges from 48% for the impact category abiotic depletion (elements) to 84% for

global warming. The figure shows that the contribution of the different raw materials to the impact of the product differs per impact category.



Contribution of the various raw materials to the environmental impact of an ECO-SANDWICH® wall panel, product stage only.

These results represent the current situation in Croatia. However, the panels can also be sold in countries where the recycling rates for mineral wool and concrete are higher. A scenario analysis showed that higher recycling percentages for mineral wool and concrete can reduce the environmental impact by up to 3%.

Business value

- The developers of the ECO-SANDWICH® wall panel gained valuable insight into the environmental performance and the hotspots of the wall panel.
- The environmental information sheet of ECO-SANDWICH® panels provides full product transparency and allows comparison to information sheets of similar products. This way, it can be used in business to business (B2B) communication to communicate the environmental performance of the wall panel.
- Opportunities for improvement by means of higher recycling rates at the end of life were illustrated, and can be used to stimulate actual improvements.



SimaPro

“Thanks to the compatibility of SimaPro to the EN15804 standard for building materials, it was easy to get insights in the environmental impact of the ECO-SANDWICH® wall panels and to identify possibilities for improvement. The results are reliable and standard-conform, therefore of great use for our business to business communication.”

dr.sc. Bojan Milovanović - dipl.ing.grad. (mag.ing.aedif.) Faculty of Civil Engineering, University of Zagreb, Department of Materials



SimaPro – empowering LCA experts to deliver sustainable value

SimaPro was developed to help you effectively apply your LCA expertise to empower solid decision-making, change your products' life cycles for the better, and improve your company's positive impact. SimaPro is the world's leading LCA software, with a 25-year reputation in industry and academia in more than 80 countries.

Find out more about how SimaPro can help you deliver sustainability value at: simapro.com



Meet the developer – about PRé

SimaPro was developed by PRé with the goal of making sustainability a fact-based endeavour. All of our efforts are focused on helping you create value from sustainability. PRé has been a leading voice in sustainability metrics and life cycle thinking development for the past 25 years, pioneering the field of environmental and social impact assessment. That is how we help LCA and sustainability practitioners deliver sustainable value.

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Discover more about how we help LCA experts deliver sustainable value:

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