

# Putting the metrics behind sustainability at the University of Zagreb.



## University of Zagreb, Faculty of Civil Engineering



**ECO-SANDWICH**  
ENERGY EFFICIENT, RECYCLED CONCRETE  
SANDWICH FACADE PANEL

### LCA of ECO-SANDWICH® wall panels

#### 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.

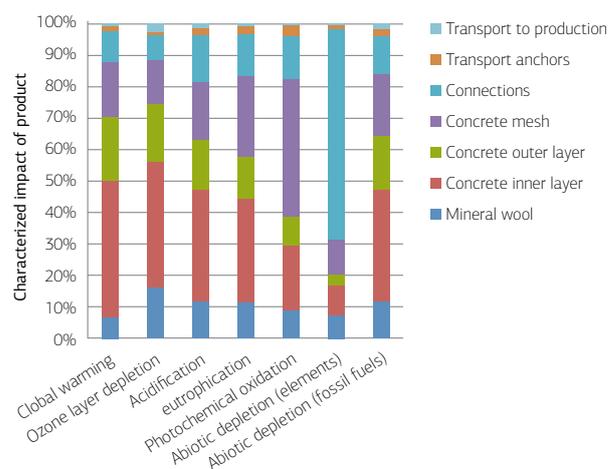
#### PRé Solution

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, demolitions, 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.



## Creating Business Value Through Sustainability Metrics

### Sustainability Metrics Consulting

Sustainability in business has become a core business concern and a driving factor in creating business value. PRé offers a range of consulting services, provided by a team of experts who will work with you to choose, create and deliver the right metrics for your sustainability goals.

### **PIONEERING** Developing Innovative New Metrics For New Challenges

Societal and stakeholder expectations for implementing sustainability in business are becoming more demanding. Sometimes, off-the-shelf metrics cannot help you answer their questions. PRé has extensive experience in life-cycle-based metrics pioneering: implementing cutting-edge new product metrics and developing completely new, scientifically sound and robust metrics. PRé has been the driving force behind many ground-breaking initiatives like ReCiPe or the Handbook for Product Social Impact Assessment.

### **INTEGRATION** Integrating Sustainability Metrics In Your Business

To create business value from sustainability, your business needs to integrate sustainability metrics across its business functions. You can't improve what you can't measure. PRé has the expertise required to help you choose the right metrics and to integrate sustainability into your day-to-day operations. PRé also supports you in increasing the efficiency of your LCA work and in empowering your LCA practitioners.

### **DELIVERY** Expert LCA Knowledge To Measure Sustainability Performance

LCA has proven to be a robust and science-based way to measure and communicate your sustainability performance. PRé can review your LCA studies, deliver EPDs, footprints and other metrics, and provide you with completely new LCA studies to measure your impact. Our consultants are renowned for their expertise in specific topics, such as impact assessment, uncertainty, normalisation, toxicity, social sustainability and databases. PRé offers training courses and in-house training that build a solid knowledge base to help you conduct LCA studies yourself.

### Those Who Have Gone Before – Market-leading Businesses That Are Creating Value From Sustainability Metrics

PRé has built a worldwide reputation as a leader on environmental and social impact assessment. We work with organisations and institutes such as the European Commission, European Space Agency, Heineken, BASF, Philips, L'Oréal and DSM.



### About PRé

PRé has been a leading voice in sustainability metrics and life cycle thinking, since 1990, pioneering the field of product and supply chain sustainability metrics. We've developed some of the world's most widely recognised and applied environmental impact assessment methods, as well as the world's leading LCA software, SimaPro. From the very first, we have not only focused on developing the science of LCA, but also its application – helping companies create value by using state-of-the-art measuring, monitoring and analysis methodologies to improve their sustainability performance.

Find out more about what we can do for your organisation at [www.pre-sustainability.com](http://www.pre-sustainability.com)

**Get In Touch With PRé**  
We're always happy to discuss your sustainability challenges with you. If you have any questions, feel free to contact our offices in the Netherlands and the US.

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*We look forward to being your partner in putting the metrics behind sustainability.*

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