

Life Cycle Assessment of Re-Board® Premium



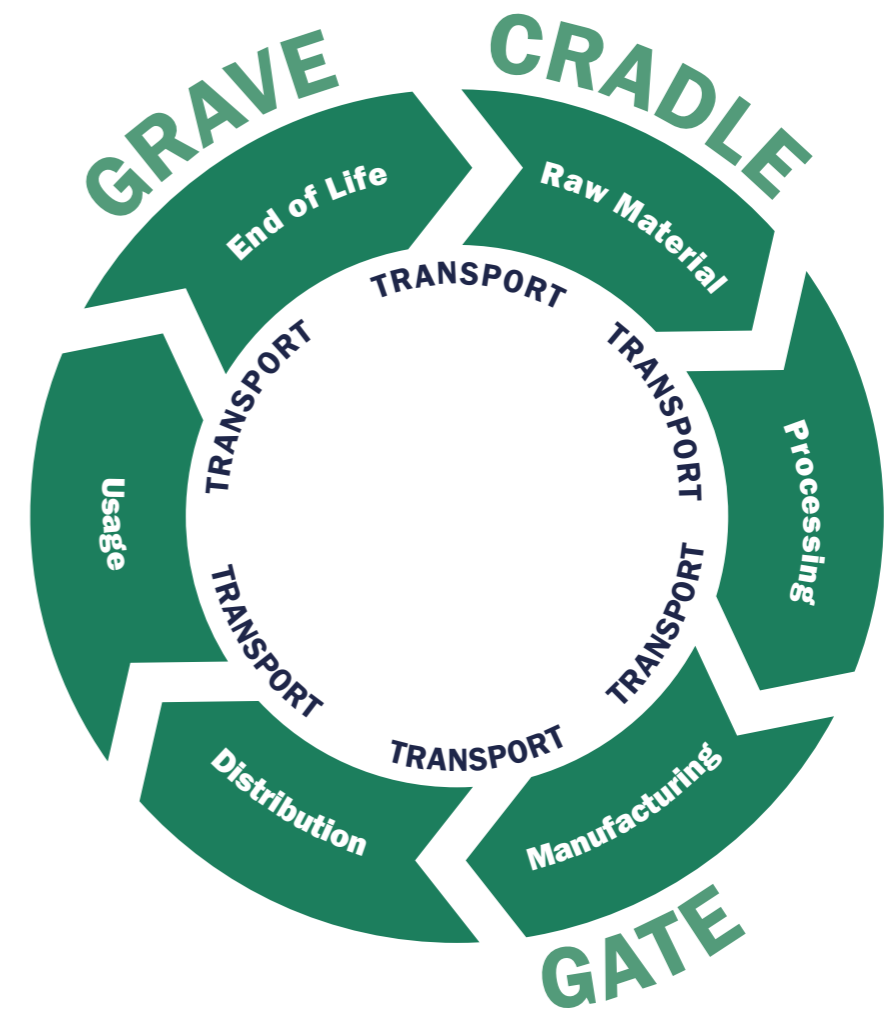
What is a Life Cycle Assessment?

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At Re-Board Technology, our vision is to lead the sustainability revolution with premium, light-weight creative paper-boards. This report is created to, in a transparent way, evaluate the environmental impact of Re-board® Premium through a life cycle assessment.



A life cycle assessment (LCA) is a method for assessing a product's environmental impact at all stages of its existence. It can go from raw material extraction through to the recycling or final disposal of the product. When the whole process is measured to its end point, it is called *cradle to grave*.

Our life cycle assessment is *cradle to gate*: it runs from the extraction of the raw materials to the moment the finished product leaves the Re-board® production facility.

Types of Emissions

Our life cycle assessment focuses on the emissions of CO₂, SO₂ and NO_x. Based on these emissions, we chose the following impact categories: global warming potential, terrestrial acidification, ozone formation, fine particulate matter formation, and water consumption.

Each environmental impact category group quantifies substance emissions into the effect on the environment. The most frequently used category is global warming potential, but the full range of categories gives a more comprehensive picture of a product's effect on the environment.

■ Global Warming (CO₂)

The global warming potential relates to the emissions of greenhouse gases, including carbon dioxide, methane, nitrogen oxides and ozone. The emission of these gases leads to an increase in global temperature. The consequences of climate change include rising sea levels, extreme weather, ecological collapse, habitat destruction and pest propagation.

■ Terrestrial Acidification (SO₂, NO_x)

Terrestrial acidification sums up emissions of nutrients, mainly sulphur and nitrogen, that change the chemical properties of the soil. This causes the pH-level and the base saturation of the soil to decline, while the amount of dissolved aluminium in the soil increases. The increase of aluminium affects the viability of plants and animals and may affect plant diversity.

■ Ozone Formation Human Health and Ozone Formation Terrestrial Ecosystems (NO_x)

Photochemical ozone creation occurs because of a reaction between a volatile organic compound and nitrogen oxides in the presence of heat and sunlight. When inhaled by humans, ozone leads to an increased mortality rate. Ozone also causes the disappearance of plant species and damage to natural ecosystems.

■ Fine Particulate Matter (SO₂, NO_x)

Fine particulate matter (PM_{2.5}) is mainly caused by direct emissions of small particles. These particles originate from sources like combustion and tyre wear. When inhaled by humans, fine particulate matter leads to an increased mortality rate. It also affects ecosystems by contributing to terrestrial acidification, eutrophication, and climate change.

■ Water consumption

Water is the most important resource for human beings and wider natural ecosystems. Reduced water supplies caused by water consumption lead to changed surface water volumes, and changed ground water tables. This leads to the disappearance of both terrestrial species and freshwater species. Irrigation is the main limiting factor in agricultural production, which forms a direct threat to human health.

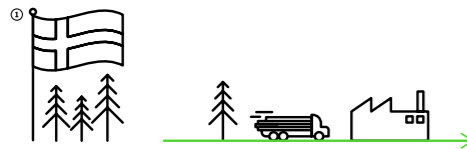
Emissions Data

Impact Category	Production Suppliers	Transport to Re-board	Production of Re-board® Premium	Total (Cradle to Gate)
Global Warming (kg CO ₂ eq)	53%	34%	13%	0,7035
Terrestrial acidification (kg SO ₂ eq)	43%	30%	26%	0,0023
Ozone formation, Human health (kg NO _x eq)	72%	17%	10%	0,0029
Ozone formation, Terrestrial ecosystems (kg NO _x eq)	72%	17%	10%	0,0029
Fine particulate matter formation (kg PM _{2.5} eq)	38%	38%	25%	0,0008
Water consumption (m³)	86%	1%	13%	0,0611

Table: The environmental impact from cradle to gate at different stages and impact categories

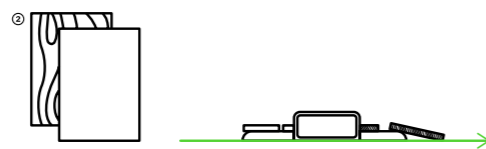
This life cycle assessment is based on ISO 14040, which is an environmental management standard. The function describes what the product is used for, and the functional unit (FU) is a quantification of the function. The functional unit that has been used in this report is one square meter of a 16 mm thick sheet of Re-board® Premium.

Product Journey



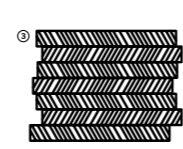
Trees grow in the Nordic forests.

Using wood from Nordic forest guarantees sustainable forestry, thanks to the strong forestry acts in these countries. The forests are primarily harvested for timber, i.e. wood for building and construction. Whatever that can't be used as timber is sent to paper mills, like our suppliers.



Our supplier's paper mill turns wood first into pulp, then into paper.

Some of the paper mills are conveniently on the other side of the road from Re-board® Technology. Depending on the product requirements, the paper is made from new fibres, recycled fibres or a mix of both.



At Re-board® Technology, the paper is turned into our patented paper core board.

We uphold the highest standards for our working environment, using as little chemicals and additives as possible. We laminate Re-board® using a water-based glue.



On site, the sheets are folded and set up into the final product.

A campaign can range from days to several months, with some installations lasting for years.



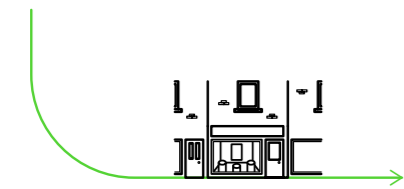
The sheets are printed and cut into the desired colour and shape at print houses.

The printed sheets are flat packed again and delivered to the end user.



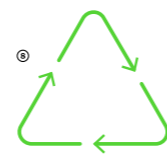
Re-board® sheets are distributed to stockists using the most efficient means.

This is by truck in Europe, or by vessel for longer distances. Sheets are flat packed on pallets. Since Re-board® is very light (>2 kg per m²) less fuel is needed compared to chipboard or PVC.



At the end of the campaign, Re-board® can be disassembled, flat packed, and transported to be re-used.

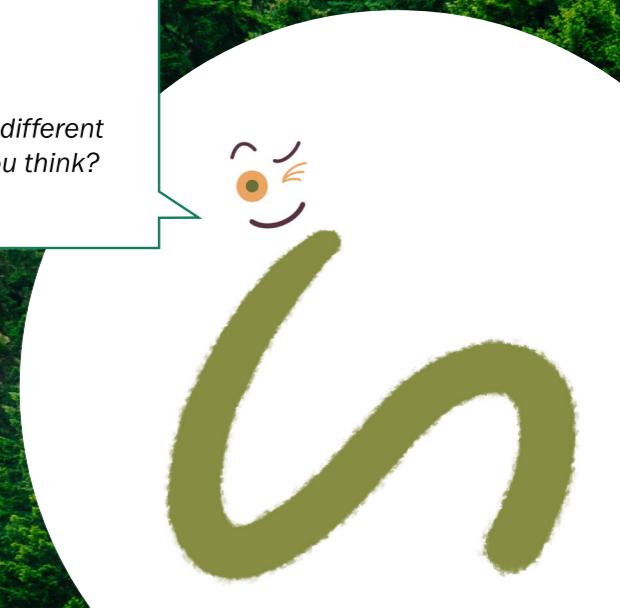
This is ideal for temporary events like pop-up shops and trade fairs, with some installations lasting years.







At its end of life, the material is recycled as cardboard.

The high-quality fibres mean it can be reused up to 7 times before the fibre is worn out.

"Hi, I am the Re-board fibre. I am a long and strong fibre, born in the Nordic forests. My recycling value is 5-7 times. That means you will meet me as 5-7 different products before I am worn out. That's quite an achievement, don't you think? Please get in touch with Re-board about eco design!"



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