

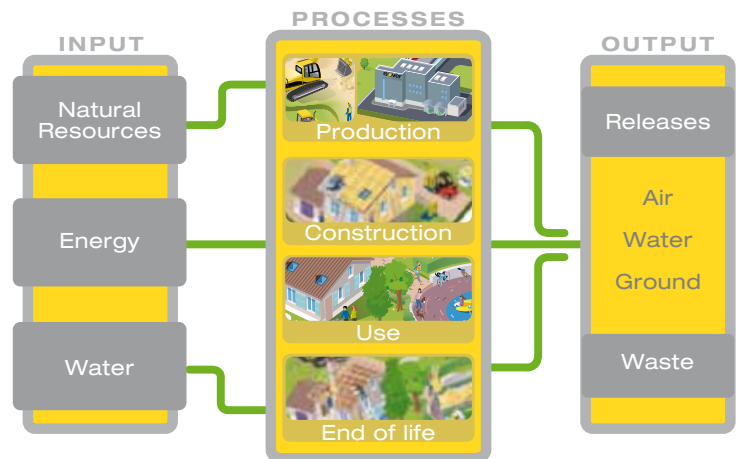


Sustainable Insulation Solutions

A lifecycle perspective

What is a LCA?

A LCA means a **Life Cycle Assessment**. It is considered the state-of-the-art methodology for assessing all relevant environmental impacts of a construction product, of a system or of a building over its entire life cycle. Following international standards (EN 15804 and ISO 21930), a LCA calculates in a rigorous and scientific manner the use of energy, water and natural resources, the emissions and releases into the air, ground and water, and the waste generation. These **inputs and outputs** are calculated at each stage of the building life cycle.



“
LCAs are the best science-based tools
to assess the environmental impacts
of construction products
and buildings.”



What are the different stages of the building Life Cycle?

The building Life Cycle starts at the **product stage**: raw materials are extracted and processed, secondary raw materials are selected; everything is transported to a plant where the products will be manufactured.

During **the construction stage**, building products are transported from the manufacturing plant to the distributors and to the building site, and installed into the building.

Once construction is complete, the **use stage** begins, including the maintenance, repair or replacement of the installed products.

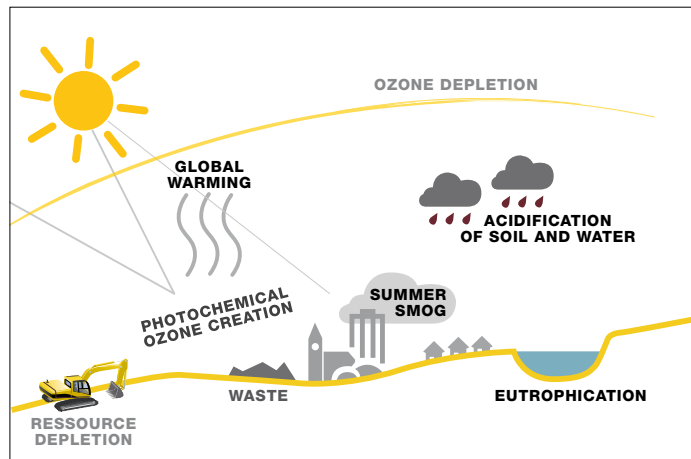
At the end-of-life stage, the building is either deconstructed or demolished; its components are processed for reuse, recovery, recycling or disposal as waste.



What are the environmental impacts?

All construction products, systems or buildings, have environmental impacts which are aggregated values of outputs or inputs:

- **Global Warming Potential** refers to long-term changes in global weather patterns – including temperature and precipitation – that are caused by increased concentrations of greenhouse gases in the atmosphere.
- **Ozone Depletion Potential** is the destruction by human-made air pollution of the stratospheric ozone layer, which shields the earth from ultraviolet radiation that's harmful to life.
- **Acidification Potential** is the result of human made emissions and refers to the increase in acidity of oceans, lakes, rivers, and streams – a phenomenon that pollutes groundwater and harms aquatic life.
- **Eutrophication Potential** occurs when excessive nutrients cause increased algae growth in water,



blocking the underwater penetration of sunlight needed to produce oxygen and resulting in the loss of aquatic life.

- **Photochemical Ozone Creation Potential** happens when sunlight reacts with hydrocarbons, nitrogen oxides, and volatile organic compounds, to produce a type of air pollution known as smog.
- **Depletion of Abiotic Resources** refers to decreasing availability of nonrenewable natural resources due to human activity.

What are the benefits of using LCAs?

- LCAs enable to avoid green washing and to communicate credible, fact-based information about products' environmental performances.
- More and more building assessment schemes (LEED, BREEAM, HQE, DGNB...) require provision of LCAs. Results of LCAs for different construction products can be consolidated to assess the

environmental impacts of a whole building.

- LCAs are a powerful tool to help improving the environmental features of products through eco-innovation. Considering multiple indicators over the entire life cycle allows avoiding impact shifting (reducing one impact but increasing another) and a biased assessment.

What is an EPD?

The results of a Life Cycle Assessment are presented in the form of an Environmental Product Declaration (EPD) that can be verified by an independent third party. This process ensures the quality and reliability of the results.

“
An environmental
Product Declaration
(EPD) is a document
presenting
the LCA results.”

What are our commitments?

1. LCAs for all ISOVER products.

The principles of LCA are embedded in our DNA. We have carried out our first LCAs in the early 90's. We have decided to promote the use of LCAs in the building industry, to carry out LCAs and EPDs according to ISO 21930 or EN 15804 standards for all our products, to use them in our eco-innovation policy and to communicate actively on the results.

2. Third party verified Environmental Product Declarations

To give confidence in our communicated LCA results, we commit to have our EPDs verified by an independent third party.

3. Transparent communication

You can recognise our commitments for Life Cycle Assessments and verified Environmental Product Declarations with the “EPD verified” pictogram:



✓ Environmental impacts assessed (Life Cycle)
✓ Environmental Product Declaration verified



The environmental impacts of this product have been assessed over its whole life cycle. Its Environmental Product Declaration has been verified by an independent third party.

This pictogram lets you identify products with LCA results available through 3rd party verified EPDs.

“

The environmental impacts of all our products will be assessed over their whole life cycle. Third party verified Environmental Product Declarations will communicate the results. ”

RAW MATERIALS

WHAT IS AT STAKE?

- ISOVER glass wool is traditionally manufactured with sand, abundant in nature.
- Reducing extraction from quarries helps to protect the biodiversity.

INCREASED USE OF RECYCLED GLASS

- To significantly lower the consumption of sand, the ISOVER glass wool batch contains up to 80% of recycled glass (58% in average).



MANUFACTURING

WHAT IS AT STAKE?

- Producing glass wool consumes energy, emits greenhouse gases and uses high volumes of water.
- Continuously improving the environmental performances of our plants helps to reduce their environmental impacts.

OPTIMIZED MANUFACTURING PROCESSES

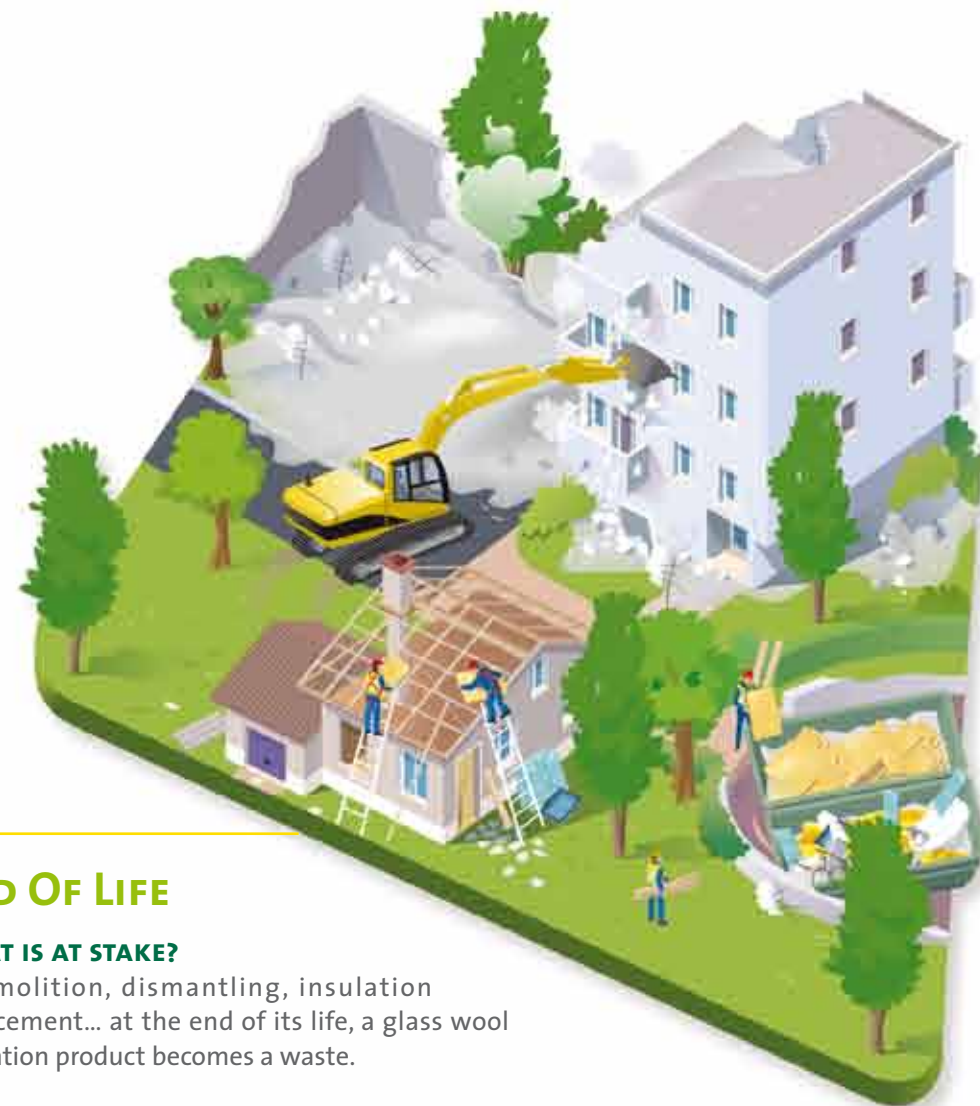
- More than 75% of ISOVER glass wool factories in the world are ISO 14001 certified.

- Recycled glass melts at a lower temperature than primary raw materials; its increased use reduces the energy consumption of the melting furnace and related CO₂ emissions. **Energy consumption and CO₂ emissions per ton of produced glass wool have been reduced by 19% between 1993 and 2010.**
- Closed circuit systems reduce water withdrawal: between 1999 and 2011, fresh water consumption per ton of produced glass wool has been reduced by 30%.
- **75% of our glass wool production waste is recycled (100% in some plants), thus diverted from going to landfill.**

ISOVER, sustainable insulation solutions

A life cycle perspective

THE EXAMPLE OF GLASS WOOL



END OF LIFE

WHAT IS AT STAKE?

- Demolition, dismantling, insulation replacement... at the end of its life, a glass wool insulation product becomes a waste.

FOSTERING RECYCLING

- Glass wool insulation products are recyclable: ISOVER develops waste management schemes to properly collect, sort out and process the end-of-life waste to become new glass wool insulation or to manufacture other useful products such as bricks.



USE

WHAT IS AT STAKE?

- Buildings consume more energy and emit more CO₂ than industries or transports.
- Reducing their energy consumption and CO₂ emissions while improving indoor environment and comfort should be a priority.

ENERGY AND CLIMATE SAVERS

- Up to 90% of the energy used for heating or cooling can be saved, with no need for maintenance, no CO₂ emissions and no energy consumption.
- Over its installed life (usually 50 years), a typical ISOVER glass wool insulation product can save up to 300 times the energy consumed and the CO₂ emitted in its production, transport and disposal. The energy and CO₂ balance switches to positive only a few months after installation.



TRANSPORTATION

WHAT IS AT STAKE?

- Transportation includes the distances covered between the manufacturing plant, the distribution outlets and the sites where the glass wool products are installed.
- Transportation inevitably incurs energy consumption and CO₂ emissions.

REDUCED TRANSPORTATION AND STORAGE IMPACTS

- We use the resilient properties of glass wool products to compress them by a factor of up to 10 at the time of packaging and palletizing.
- This patented process improves handling, reduces the need for packaging materials and lowers the environmental impact of transportation.
- Moreover, to reduce transportation impacts, ISOVER plants are located close to our markets.

CONSTRUCTION

WHAT IS AT STAKE?

- Contractors need products and solutions easy to handle and to install, with reduced environmental impacts on the jobsite.

CONTRACTOR FRIENDLY PRODUCTS

- The installation of ISOVER glass wool insulation products does not require heavy tools nor generate a high consumption of additional materials.
- Off-cuts during installation are limited and can be shipped back for recycling.