



# SIKA AT WORK

## SUSTAINABLE ROOFING SOLUTION FOR A SUPERMARKET, GIRONA ES

# SIKA ROOFING SOLUTIONS

Sustainable solutions measured by Life Cycle Assessment (LCA)



## PROJECT DESCRIPTION

This project is about the construction of a roofing system for a new supermarket in Girona, Spain. The owner, an international German food discounter chain, was looking for a long lasting and high quality roofing system, which can be applied across Europe on their standardized supermarkets with a total area of 1800 m<sup>2</sup>.

## PROJECT REQUIREMENT

The roofing system had to be persistent and must guarantee highest performance for at least 20 years. Furthermore it's a prerequisite to facilitate the installation of a photovoltaic system for self-consumption.

The designers needed a reliable complete system and a trusted roofing partner which can provide a durable proven solution.

The Sika solution convinced the customer with its high high-performance thermoplastic roofing system, which fulfills the requirements both from a technical, an economic and environmental point of view.

In order to show the benefits of the specified Sika roofing system for the store in Girona, Sika implemented a full-system approach by taking into account both the environmental impacts of the system and the heating/cooling savings for this specific project and location for an estimated service lifespan of 20 years.

## SIKA'S SUSTAINABLE SOLUTION APPROACH

The specified Sika roofing system with a beige coloured waterproofing membrane has been approved by the central headquarters of the food discounter in Germany. In warm climates like Spain it is confirmed, that white, highly reflective roofing membranes are able to reduce heat absorption and reduce both the cooling energy consumption of buildings and the energy costs.

## TECHNICAL SOLUTION:

- **Substrate:** Trapezoidal steel deck
- **Waterproofing:** Sarnafil TS 77-18 beige
- **Insulation:** PIR 60 mm (Rd = 2.2 (m<sup>2</sup>\*K/W))
- **Vapour control:** Sarnavap 1000 E
- **Fasteners:** Sarnafast SF 4.8 x 80 and Washer Sarnafast KT 82 x 40

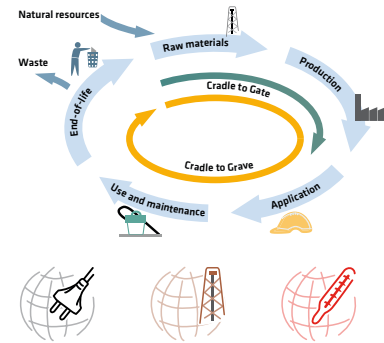
To differentiate from black coloured bituminous solutions which are typically applied in Spain and to promote the additional benefits of highly reflective thermoplastic cool roofs, Sika's Product Sustainability Group performed a Life Cycle Assessment (LCA) of three roofing solutions with similar performance:

- Specified Sika system build-up with beige membrane (SRI: 75%) = applied solution (see above)
- Same system build-up with black membrane (e.g. bituminous solution) = benchmark
- Same system build-up with highly reflective membrane (SRI: 108%) = potential solution

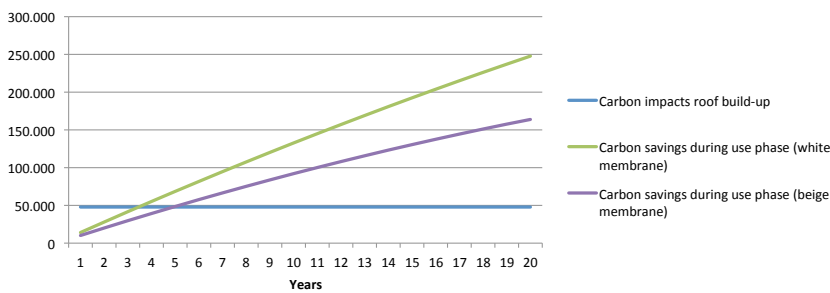
The comparative study helps customers choosing the best solution, especially in warm climates and to provide an ideal differential tool which reflects the life cycle perspective by quantifying energy savings and avoided CO<sub>2</sub> emissions.

**RESULTS OF THE LCA FOR THE PROJECT**

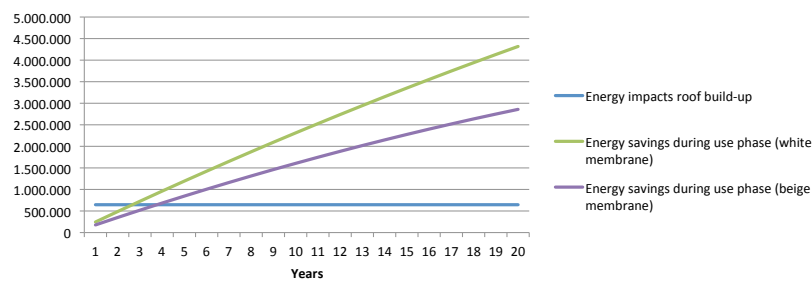
For the total surface area of the project, 1800 m<sup>2</sup>, the results for a beige Sarnafil TS 77-18 and a white Sarnafil TS 77-18 SR based roofing system demonstrate that both thermoplastic membranes bring significant savings from avoided cooling compared to a system with a black roofing membrane. The savings surpass the cradle to grave Energy and Carbon impacts ("Footprint") of the whole roofing system in less than 5 years.<sup>1</sup>



**Break even carbon impacts Roofing System: Global Warming Potential (GWP) [kg CO<sub>2</sub>-eq./1800 m<sup>2</sup>]**



**Break even energy impacts Roofing System: Cumulative Energy Demand (CED) [MJ/1800 m<sup>2</sup>]**



The project allowed Sika to demonstrate its competence and expertise in sustainability, including all relevant quantitative contributions to a high performance tailor-made roofing solution. All requirements were fulfilled from a technical, economic and environmental point of view.



<sup>1</sup>Cradle to Grave: potential environmental impacts from raw material extraction, manufacturing, application and use to final disposal at the end-of-life (incineration of all components). Roof build-up impacts are the same for all three systems.

# THE SIKA LIFE CYCLE ASSESSMENT (LCA) APPROACH



LCA is a standardized method to assess and compare the inputs, outputs and potential environmental impacts of products and services over their life cycle. LCA's are increasingly recognized as the best way to evaluate the sustainability performance of products and systems.

The LCA can greatly assist our customers in evaluating Sika's products and systems namely by providing quantitative data on their environmental profile. This enables the differentiation of products that may have similar performance, but greater differences concerning their environmental impact - where obviously the lower, the better.

Sika carries out LCA's according to the ISO 14040 series and the Standard EN 15804. The impact assessment methodology used is CML 2001.

The LCA results are shown for the following two relevant impact categories deemed as most relevant for roofing systems:

- Global Warming Potential (GWP) [kg CO<sub>2</sub>-eq.] ("Carbon Footprint") - is the potential contribution to climate change due to greenhouse gases emissions.
- Primary Energy (CED) [MJ] ("Energy Footprint") - is the total amount of primary energy from renewable and nonrenewable resources



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