

Climate solutions in the built environment: *An avoided emissions case study*

Specialty chemicals company Sika® has developed reflective roofing solutions that improve buildings' energy performance.

→ **Up to 200,000 tCO₂eq. avoided**

during the product's lifetime, based on 2023 sales in Europe and the Americas.



Cool roofs reflect more than 65% of sunlight. They can **lower indoor temperatures¹ by 1.2–3.3°C and city temperatures by up to 2–3°C** during heat waves.

Capturing avoided emissions

— assessment details

→ **Functional unit (FU):** kg CO₂ eq/1000 m² roof on the average house in Spain or the US.

→ **Impact – emissions avoided:**

- Spain: 119 ton CO₂eq/1000 m²
- US: 135 ton CO₂eq/1000 m²

→ **Time period:** 50 years forward-looking (lifetime of the solution).

→ **Scope:** Spain and the US.

→ **System boundaries:** The use phase of the roof on the building.

Use this document to support your understanding of avoided emissions calculations and disclosure as outlined in the WBCSD Guidance on Avoided Emissions:



The reference scenario

→ A sample of a 1000 m² dark roofing membrane (e.g., bituminous) with a heat-transfer rating ('U-value') representative of typical roofs in Spain or the US. The U-value indicates how quickly heat passes through the roof: the higher the value, the more heat the building gains in summer.

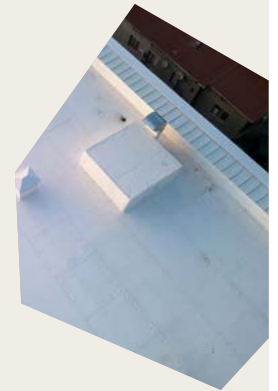
→ The commonly used dark membrane absorbs solar radiation in buildings. This increases roof and indoor temperatures and the need for mechanical cooling, which represents a major share of a building's total CO₂ emissions.

The low-carbon scenario

→ Cool roofs improve indoor thermal comfort and decrease cooling expenses by reflecting more sunlight and thus absorbing less heat. White roofing membranes are manufactured, coated or treated with materials that make them highly reflective.

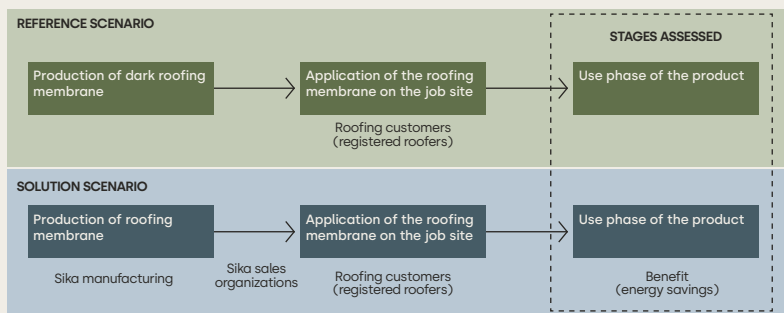
→ Membranes in two locations were assessed:

- The US region, which uses the Sarnafil S327-18 Energy Smart membrane.
- Spain, which uses the Sarnafil TS 77-18SR membrane.



How it works

System boundaries²



The solution helps reduce the building owner/operator's Scope 2 emissions.

WBCSD Avoided Emissions Eligibility Gates

- Gate 1: Climate Action Credibility Gate 2: Climate Science Alignment Gate 3: Contribution Legitimacy

What share of the company's revenue does this solution represent?

Revenue from cool roofs represented around 10% of Sika's total roofing business in 2023.

Environmental and social side effects

The solution improves building occupants' comfort and reduces the heat island effect in urban areas. However, the solution uses plastic-based membranes, as no scalable non-fossil alternatives match their performance and durability. Its use is limited to energy-efficient roofing, with clear traceability of avoided emissions. Transitioning to bio-based feedstocks remains constrained by cost, availability and sustainability trade-off.

Third-party verification

The avoided emissions assessment has not been verified by a third party. Sika calculated energy savings using their ESCR (Energy Savings Calculator Roofing), developed by the Zurich University of Applied Sciences and Arts (ZHAW) for Sika.

1. <https://www.epa.gov/heatislands/using-cool-roofs-reduce-heat-islands#1>

2. Embodied carbon represents less than 1% of the total emissions and has been excluded, with the building's heating and cooling energy dominating the carbon impact over the roof's lifetime. The end of life scenarios are similar for the solution and the reference and were also excluded.

PLEASE NOTE: THE CURRENT VERSION OF THE WBCSD GUIDANCE ON AVOIDED EMISSIONS IS NOT A STANDARD AGAINST WHICH COMPANIES CAN VERIFY SOLUTIONS. WE HAVE INCLUDED THIS USE CASE AS AN INDICATIVE ILLUSTRATION ONLY IT DOES NOT QUALIFY AS A THIRD PARTY REVIEW OR VERIFICATION FOR THE UNDERLYING AVOIDED EMISSIONS CLAIMS.