

Avoiding Greenhouse Gas Emissions

The Essential Role of Chemicals



External thermal insulation composite system for the refurbishment of a house in Germany

A BASF case study



Chemical insulation products such as expanded polystyrene (EPS) have excellent thermal insulation properties. They are used as part of an External Thermal Insulation Composite System to improve the thermal insulation of outer walls, thereby reducing energy consumption and GHG emissions.

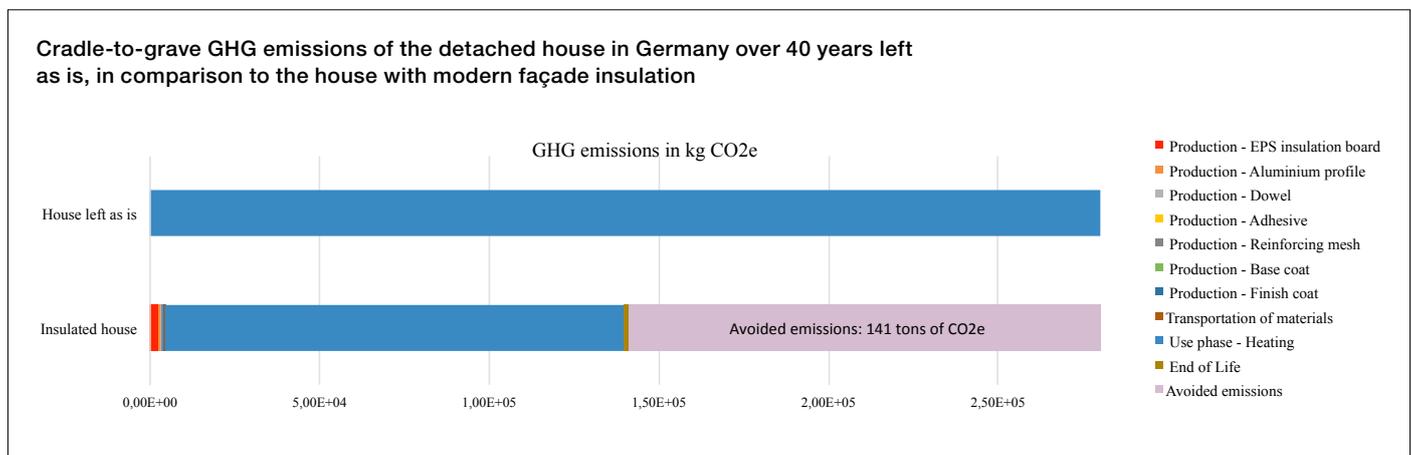
Insulation materials play a vital role in combatting climate change by saving heating and cooling energy in buildings. The study compares two alternatives for an existing detached house in Germany: one in which the house is left as is (representing the weighted average of non-refurbished and already refurbished houses in Germany), and one in which the façades are refurbished to current German standards using an External Thermal Insulation Composite System based on expanded polystyrene (EPS).

EPS is a lightweight, rigid, plastic foam insulation material produced from solid beads of polystyrene. The difference between the cradle-to-grave GHG emissions of the house left as is, and the newly-insulated house with the ETIC System amount to 141 tons of avoided emissions over a service life of 40 years. The result is largely dominated by the use phase, that is the combustion of heating fuel with associated GHG emissions. The impact of the manufacture and disposal of the ETIC System is very small and hence not visible in the result figure below.

Full study available at: www.icca-chem.org/energy-climate

External Thermal Insulation Composite System based on expanded polystyrene

1. Adhesive
2. Polystyrene insulation board
3. Reinforcement plaster
4. Reinforcement mesh
5. Exterior plaster



This case study illustrates how the reduction of greenhouse gas (GHG) emissions can be enabled by chemical products, as part of a series of case studies brought to you by ICCA. Chemical industry members offered Life Cycle Assessment [LCA] case studies for the purpose of showing illustrative examples on how to calculate avoided greenhouse gas emissions. The avoided emission calculations were based on the guidelines developed by ICCA and WBSCD (World Business Council for Sustainable Development) - Chemical Sector, with the support of Arthur D. Little and Ecofys. Other life cycle environmental impacts such as water and land use change were outside the scope and usually not considered.

