Avoiding Greenhouse Gas Emissions

The Essential Role of Chemicals

Engineering plastics for vehicle light-weighting

A Solvay case study

Lightweight car parts play a key role in designing more fuel-efficient cars. Even small and specific car parts like the engine mount housing made of 280 grams of Technyl®, an engineering plastic, demonstrates that it brings significant greenhouse gas savings as compared to the traditional version made of 400 grams aluminum alloy equivalent.

In the studied case, the avoided emissions for this very small part represent 2.0 kg CO_2 eq. per car during its complete life cycle. Considering the total production of the specific car model under study (280,000 cars/year, with a 10 years lifetime), the emissions avoided due to this technology change amount to 5,600 t CO_2 eq.

The "engine mount housing" is a small car part that ensures one attachment point between the engine/gearbox and the vehicle structure in a small-medium size car. The comparison takes place at the end-use level and focuses on the specific car part (e.g. the remainder of the car is outside the system boundaries).

The comparison shows that car part made of Technyl® enables to avoid emissions both because of lower emissions at the production phase, and because it reduces fuel consumption during the use phase (i.e. when driving the car) as a result of the reduced weight.

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

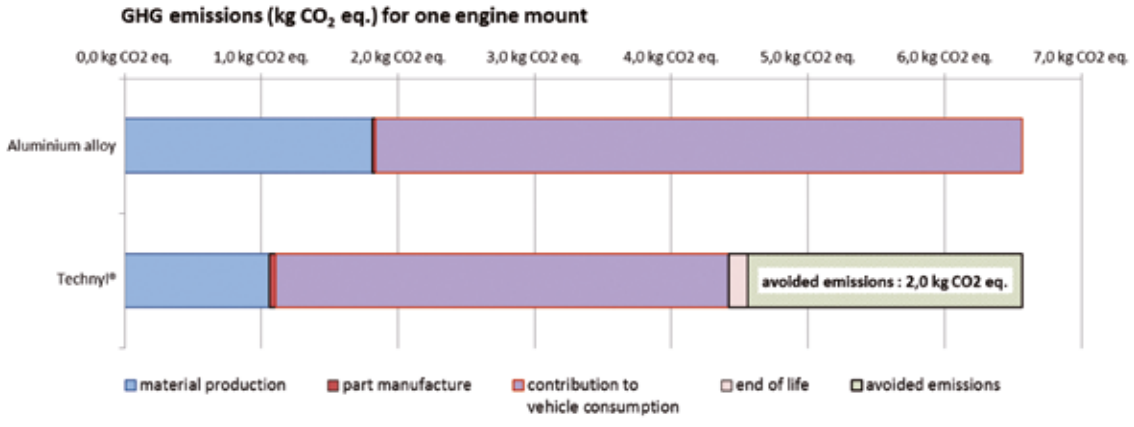
An engine mount housing

Technyl® versus aluminium alloy

Engine Mount
Al Si9 Cu3 alloy

Engine Mount
Technyl® A218V50 Bk 21N
Polyamide 6.6 compound (50% glass fiber)

Avoided emissions over the life cycle of an engine mount housing: comparing Technyl® with the reference (metal alloy).



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.