european aluminium association

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Carbon footprint: a reliable environmental indicator?

Increasingly, the "Carbon Footprint" is used for evaluating the environmental performance of goods, services or industrial activities. Progressively, this environmental indicator becomes a marketing tool used by companies not only for showing their commitment to reduce their environmental footprint but also for demonstrating that their products are more sustainable than those from their competitors. However, in practice, calculating and comparing the carbon footprint can be challenging. A few critical points have to be considered.

Broaden the scope to avoid trade-offs

A carbon footprint measures the amount (expressed in units of CO2 equivalents) of greenhouse gases that enter the atmosphere as the result of a given activity or product. Compared to a complete life cycle assessment (LCA) study, carbon footprint does not take into account environmental impact categories other than climate change. To get a true picture, many other factors like acidification, ozone depletion, energy consumption, soil and water pollution, should be considered. The carbon footprint can therefore give a distorted picture of the environmental performance of a product or a service. Statements and claims based solely on carbon footprint studies can lead to choices without any environmental benefit.

Apply an already standardized approach

The Carbon Footprint of a product should be understood as the indicator result of the impact category "climate change", determined in accordance with the requirements of ISO 14044 and based on the characterization factors published by the IPCC (Intergovernmental Panel on Climate Change). The ISO 14044 standard requires modelling the full product life cycle in order to determine the Carbon Footprint. The carbon footprint should never be used as the sole basis for making purchasing decisions or improving goods or services, it is only one of many factors that need to be considered. Decisions about a given application mean finding a balance between the functional benefits of different materials, cost, end-of-life treatment, and a whole set of other factors.

Avenue de Broqueville, 12
BE - 1150 Brussels - Belgium
Phone: +32 2 775 63 63
Fax: +32 2 779 05 31
Email: eaa@eaa.be
Website: www.aluminium.org

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Compare products which serve the same purpose

For materials, carbon footprint is frequently calculated on a weight basis, ignoring the true function of the product. For example, calculating the carbon footprint for a one-way glass bottle or for an aluminium can requires to consider that the aluminium can is about 25 times lighter than the glass bottle. As a result, the carbon footprint calculation should refer to the appropriate function of the final product.

Don't forget the use phase and the recycling benefits

Any reliable measurement of a product's environmental impact needs to consider the entire product lifecycle. However, very frequently, carbon footprint calculation is limited to the production phase, and ignores the use phase. There is scientific evidence for instance that contrary to common belief, reducing packaging can induce negative effects on a product's carbon footprint. For instance, there is no benefit to be gained by slightly reducing packaging of foods if it is detrimental to preservation, leading to a significant increase in food spoilage. In transport applications, the use phase is usually the most critical in terms of environmental impact. It is then particularly important to consider properly the energy savings from lightweighting. Durability, solar gain harnessing and low maintenance requirements are also use phase considerations which are crucial for aluminium applications in buildings.

In most cases, the benefits of recycling are not considered while it is a cornerstone of metals sustainability. In many applications, metals are not consumed but are recovered at the end of the product life cycle and are recycled into new metal products. Due to its high value, aluminium recycling is a well established procedure and recycling rates of more than 90% are achieved in many market sectors. Since the recycling process only requires 5% of the energy used for primary production, the inclusion of the end-of-life step is essential for all aluminium products. It is important that proper calculation methodologies are used for considering the benefits of such end-of-life treatments.

Establish robust life-cycle based methodology

The European Aluminium Industry supports complete Life Cycle Assessment methods, to develop fair and robust environmental indicators.
For this reason, the European Aluminium Industry contributes to the European Platform on Life Cycle Assessment which is developed by the European Commission's Joint Research Centre. This LCA platform aims at integrating life cycle thinking into product development and into policy making using sound LCA methodologies based on ISO standards.