SUSTAINABILITY: WL GORE

As consumers become increasingly keen on knowing the environmental profile of all the products they buy, WL Gore has calculated the extent to which higher-quality hiking boots can help people keep their carbon footprint as low as possible.

Better boots have a lower carbon footprint

Developer of Gore-Tex membrane solutions for outdoor clothing and shoes, WL Gore, has announced the findings of a new lifecycle assessment (LCA) exercise it has carried out for footwear (following a similar announcement in 2013 on a jacket). On presenting the findings at the end of 2014, Gore's fabrics division described LCA as "the global standard for assessing the total environmental impact of a finished product", taking account of all aspects of a product's ecological footprint, including resource and energy consumption, emissions to air, water and land, health and more.

The company says it has been using LCA to monitor its own environmental impact since 1992; it says it likes the way this method analyses the various aspects of a product's impact on the environment and translates these into specific indicators, providing a "holistic, cradle-to-grave view" that helps it identify ways in which to minimise impact.



Gore wants consumers to choose hiking boots with a low environmental footprint, which means high-quality boots that will last a long time.

WL Gore

Three-and-a-half years of use

Its aim in this latest analysis was to evaluate the environmental impact of a hiking boot containing Gore-Tex for waterproof and breathable functionality over three-and-a-half years of use. The study was carried out with input from third-party experts, including the Öko-Institut Freiburg and the Institute for Environmental Research in the US state of Washington.

Results show that the use of the boots for 3.5 years emits carbon emissions of 27.1 kilos of CO_2-equivalent, comparable to the environmental impact of driving 100 kilometres in a mid-sized car consuming 7.5 litres of fuel. "To put that into perspective," WL Gore said, "buying two less durable pairs of hiking boots over this time would result in carbon emissions of 52.4 kilos. This would cause an environmental impact equivalent to driving 190 kilometres instead of 100."

Critical stages

Raw materials have the greatest impact, WL Gore says, putting at 77.2% the share of overall global warming potential of the processes that occur at the beginning of the boots' lifecycle; production and distribution are, therefore "the most critical stages". This requires more careful scrutiny.

Gore chose to model a pair of waterproof, breathable hiking boots that it felt would be typical of the western European market. It hasn't named the footwear brand whose boots it used, so we won't either, but we can say that the footwear was handcrafted in Slovakia on behalf of a major German outdoor brand. It has a nubuck upper, a polyurethane midsole and a Vibram Evo outsole. It has a Gore-Tex lining, of course, and a weight in size 41 of 1.1 kilos per pair. Its recommended retail price is more than $200 per pair.



High-end hiking boots, made from quality materials, should last around three-and-a-half years.

Ecco

The calculation that produces the figure of 27.1 kilos of CO_2-equivalent over the lifetime of the boots is just one part of a complex calculation that examines a long list of contributing factors and comes up with indicator scores (using a method called ReCiPe).

Gore is adamant that the assessment shows that materials and distribution are responsible for the vast majority of the boots' global warming potential. But not all of the 77.2% contribution of the upstream processes relate directly to the raw materials. Distribution accounts for more than 25% of the total, 7.2 kilos of CO_2-equivalent, including transport from the production site of the finished product to a warehouse and from there to a retail store, plus a share of heating, air-conditioning and lighting costs in the retail store.

Material opportunities

On the material side it breaks down as 50.6%, which works out at 13.7 kilos of CO_2-equivalent. But this figure is for all the materials that go into the shoe, not just the leather. The production of the polymers in the Vibram sole make a big contribution to this and, in the upper, the Gore-Tex laminate and seam tape play a part as well. Focusing on these materials will provide the best opportunities to reduce the boots' impact, Gore says. "A careful and informed choice of materials has the potential to reduce impact," it explains. "Considerations should include using hides from grass-fed cows and leather from Leather Working Group gold-rated tanneries."

These two specific references to leather are easy to explain. A grass-fed cow will usually have a lower carbon footprint than one raised in a feedlot. Cows that eat grass need less cattle-feed, which can include products grown using intensive methods of agriculture and can, conceivably, even include crops grown on illegally deforested land, such as soya beans. For its part, the Leather Working Group (LWG) is a multi-stakeholder group that assesses the environmental performance of tanneries and drives improvement through its auditing process. Several big names in sports and outdoor, including Timberland and adidas, have said the leather in their shoes must come from tanneries with a silver or gold rating from the LWG, and Gore is calling for other brands to follow suit, even though (as a component brand itself) it has no leather-buying responsibility.

The longer the better

The good news for material suppliers in this story is the conclusion that the longer the boots last, the lower their environmental impact will be. Gore hit on the 3.5 years as a reasonable length of time an active hiker, sticking mainly to proper paths, could expect boots at this price level to last, with correct care. "This means that the less often a pair of boots needs to be produced, the smaller the impact on the environment," Gore points out. It believes there is a good chance a consumer opting for cheaper boots will not get three-and-a-half years' wear out of them, meaning a second pair will have to be produced, with all the up-front global warming potential this entails, to replace the ones that didn't endure. If a million extra consumers chose to buy a high-quality, durable pair of hiking boots with leather uppers, opting for longevity and quality over price, the company concludes, the same car as in the illustration above could drive all the way around the world 2.3 times.

Quality not quantity

WL Gore says these results show parallels with the earlier LCA analyses it has carried out. The leader of its fabrics division, Bernhard Kiehl, says this has led him to conclude that the best way to minimise the environmental footprint of outerwear products is to enhance their durability. "Quality, durability and performance are the three cornerstones," he says. Gore's appeal to consumers is that they switch to buying products that last a long time, and buy fewer of them.

This is in keeping with a new mood among some consumers, typically slightly older people with relatively high levels of income. In contrast to very young buyers, for whom price and look are the most important factors, a large group is now making no secret of its desire to have products that last a long time instead. Paying a bit more presents no problem at all.

Global warming indicators

The production of the materials used to make a pair of hiking boots equipped with Gore-Tex (polymer fabrics, finished leather, Gore processes including PTFE, metal etc.) has the most important impact: 50.6% of global warming indicators (GWP).

