Life Cycle Assessment: Understanding Wool’s Environmental Performance

Fact Sheet

Key Points

- Life cycle assessment (LCA) is a tool used to understand a product’s environmental impact.
- Wool’s life cycle starts with the farm and continues through production, use, reuse and recycling.
- There is no single LCA for “all things wool” – every wool product has its own footprint.
- LCA for wool is still evolving. A recently published scientific study, for example, provides a new methodology for sharing impacts when wool is produced alongside meat or milk from sheep, which should lead to more accurate and consistent wool LCAs.
- Wool is one of the most recycled fibres: LCAs for wool must also reflect wool’s full lifespan.
- Wool’s true environmental story across the diverse production systems and products will be clearer with improved data and methodology for wool LCA.

LCA is a Tool for Understanding Wool

Wool affects the environment, like everything else human beings produce and use.

Consumers of wool, retailers and designers of apparel and interior textiles, spinners, weavers and indeed all those who contribute to the creation of a wool product right down to the farmer who grows it, have an interest in understanding wool’s environmental credentials.

Today, that understanding is most commonly based on life cycle thinking. LCA helps us understand the environmental impacts of a product over the entire course of its lifetime. Through LCA these impacts are identified and quantified.

Although we talk about “an LCA for wool” it is important to understand that no single LCA can accurately cover every wool product.

With products ranging from carpets to suits to acoustic insulation, using wool from different breeds of sheep, from different countries and climates, a single LCA assessment for “all things wool” is neither feasible nor useful.

The Life Cycle of Wool is Cradle-to-Grave

When LCA considers the entire lifetime of a product, it is known as a “cradle-to-grave” assessment.

In the case of wool, the life cycle begins with the farm inputs and production of wool on-farm (the “cradle”), continues out the farm gate to the production of a garment, carpet, or other wool product, moves then to the use, reuse and recycling phases, and finishes with a disposal phase (the “grave”) where it readily biodegrades.

The environmental performance of a wool textile product is accordingly measured over the course of its full life cycle. Each stage of the process makes an identifiable contribution to the overall environmental impact.

As a natural agricultural product key metrics for wool include land use, energy use and water use, along with emissions of greenhouse gases (GHGs) and chemical discharges to air, land and water. The main GHGs emitted in the production of wool textile products are CO2, methane and nitrous oxide.

Using LCAs for Wool

Properly used, LCA can help to identify ‘hot spots’ for action to increase efficiency in the wool supply chain, and to monitor decreases in negative impacts and accelerated environmental benefits, and to provide information sought by brands, retailers and consumers.
Wool growers, processors, dyers, spinners and weavers can all use LCA to better understand their particular contribution to environmental impacts and the effect they can have in moving to more sustainable improvements in efficiency or carbon offsets. LCA for wool provides assurance for brands and retailers that the wool fibre they choose is an environmentally ethical and sustainable choice.

Equally, wool consumers will be able to look behind a label and find assurance that the product they are buying is good for the planet and its future.

**LCA is only as Good as Its Data**
LCA for wool is still evolving. While a number of LCAs have been performed on wool products, these have focused on different items (socks, carpets) and often only part of the life cycle (some stop at the farm gate, few go on to disposal). Differences in data and methodology result in varying conclusions that are confusing and inconsistent. Moreover, good data has not been available for all life cycle stages and some existing wool LCAs make assumptions that do not represent wool accurately.

The Wool LCA Technical Advisory Group (TAG) was formed by the International Wool Textile Organisation (IWTO) to improve the quality of information available on the environmental performance of wool products globally.

The first issue the TAG addressed was the methodology used in sharing the environmental impacts between the different products that come from sheep. As many sheep farms around the world produce both meat and wool, it is vital that the impacts are distributed fairly and consistently.

As a result of the TAG’s work, a recently published technical study recommends a scientifically-sound methodology for impact sharing which should lead to greater consistency in wool LCAs.

IWTO’s researchers are also filling a knowledge gap concerning the lifespan of wool. Wool products have long lives and are frequently reused and recycled, significantly increasing their overall lifespan. This data needs to be quantified and fed into wool LCAs.

A key role of the TAG will be to address other data gaps along today’s entire wool supply chain.

**What the Future Holds**
As a result of the work of IWTO’s LCA TAG, a growing number of wool case studies should appear that apply consistent methodology and utilise up-to-date data.

This will result in a better understanding of the impacts of different wool production systems and how environmental performance is changing and improving over time.

Consumer benchmarking tools will begin to incorporate the improvements in data and methodology, allowing wool’s true environmental credentials to be recognized.

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**Learn more**
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**About IWTO**
The International Wool Textile Organisation (IWTO) has been the recognized global authority for standards in the wool textile industry since 1930. With a membership comprised of 60% of total wool production world-wide, encompassing the wool pipeline “from sheep to shop”, IWTO represents the interests of the wool textile trade at the global level. By facilitating industry strategy and ensuring standards in manufacturing and sustainability, IWTO fosters connection between members and all stakeholders through mutual support of opportunities for wool.

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**About IWTO’s LCA Technical Advisory Group (TAG)**
The Wool LCA Technical Advisory Group was formed by IWTO to improve the quality of information available on the environmental performance of wool fibre and wool products globally. The LCA TAG represents IWTO in many technical forums, including the FAO Livestock Environmental Assessment and Performance Partnership (LEAP), the European Product Environmental Footprint Reference Group, and the Sustainable Apparel Coalition. The LCA TAG is kindly funded by the Australian Government and the wool growers of Australia through Australian Wool Innovation.