

Wool Life Cycle Assessment

Author:
**International Wool
Textile Organisation**

LCA life cycle assessment
noun A method of
determining the
environmental impacts of
a product.

*Read more about
conducting LCA for
wool textiles in IWTO's
Guidelines for Wool LCA
on iwto.org*

Life Cycle Assessment (LCA) is a technique used to assess the environmental impacts of products, processes or services.

On Farm

A complete LCA for wool includes on-farm data about

- Greenhouse gas emissions (GHG)
- Fossil energy use
- Water stress levels on farm
- Freshwater consumption
- Land occupation and potentially a wide range of other impacts.

Sheep provide not only wool but also meat and sometimes milk. The on-farm data needs to be divided between these different products. Researchers have found that the most exact method for sharing the data between products is by biophysical allocation.

This method is based on the proportion of protein required to produce each product. However, LCA research is a fast-moving area of academia and new methods are being developed to ensure accurate and fair calculations for all product life cycles.

Processing & Manufacturing

The important impact categories here are water, GHG, energy and impacts from chemical use during the following stages:

- Scouring and combing (aka top making)
- Spinning
- Dyeing
- Weaving
- Finishing
- Cutting and sewing

Obtaining accurate data for the processing and manufacturing stage including transportation is difficult as often many different companies are involved. In the past, many published wool LCAs either used outdated data to calculate the environmental impacts or used so called proxy data from other industries. This has led to inaccurate calculations and false claims about wool's environmental ratings.



Use Phase

The use phase is where the environmental impacts of the consumer using, wearing and maintaining the wool product are measured. Impacts taken into account are:

- Amount of water used for washing
- Washing temperatures
- Drying methods
- Number of wears before washing
- Lifetime of garment, including when that garment is used by a second or subsequent owner (reused).

The use phase is where wool is expected to have a low environmental impact compared to other fibres. Research has shown that wool garments are washed less often, washed at cooler temperatures, are mostly air-dried rather than tumble-dried and last longer than other garments made of other fibres. Measuring the use phase impacts is very complex as user habits vary across countries, but generally impacts are lower for wool at this stage.

End of Life

The end of life phase looks at impacts related to what happens to a product after it is no longer needed. This includes:

- Number of times a product is recycled
- End of life such as land fill, incineration or biodegradation

As wool garments are quite durable, they are often donated or re-sold for a second and third use phase. Wool garments also lend themselves well for recycling. Recyclability is an important factor for sustainable products, because the environmental impacts created throughout the supply chain become relative the longer a product is used. Being a natural fibre, wool readily biodegrades in land and in water. Renewability is difficult to account for in LCA, and currently microfibre and microplastic pollution is not included at all, which is a shortcoming of the current approaches to textile environmental assessment.

