



EXECUTIVE SUMMARY

The Carbon Footprint Of A Cotton T-shirt

Calculation, Analysis and Communication of Greenhouse Gas Emissions
in the Lifecycle of Cotton Clothing



INTRODUCTION

This carbon footprinting study was carried out in three stages over a period of 18 months starting in October 2007. Phase one included the raw materials, manufacturing and wholesale (B2B) distribution, and was completed in January 2008. The silk screen-printing of garments was added in September 2008, followed by the study of online retailing, mail order distribution, consumer use and disposal, completing the full lifecycle analysis in March 2009.

The study was carried out by Continental Clothing Co. Ltd, a pilot partner in the Carbon Trust's product footprinting and labeling initiative, on its organic cotton T-shirts, sweatshirts and tote bags from the EarthPositive® range of products. The Carbon Trust has certified the final calculations.

The adopted methodology was BSI PAS 2050:2008 - Specification for the assessment of the life cycle greenhouse gas emissions of goods and services.

CALCULATIONS

A number of flexible calculation models have been developed to allow the footprinting of a family of products, based on primary data collected at all stages in the lifecycle.

The initial B2B study looked at a men's T-shirt, two women's T-shirts, two polo shirts, two pullovers and two zip-up hoodies, as well as two woven tote bags. They were studied in a full range of colours and sizes, making the final SKU count of 196 items.

The final B2C study focused on three T-shirts and two hoodies with fourteen different prints – a total of 77 SKUs.

A product profile was developed for the category of casual cotton clothing to provide the definition of the consumer use phase.

The geographical boundaries were set as the UK with built-in options for the EU, USA and Japan.

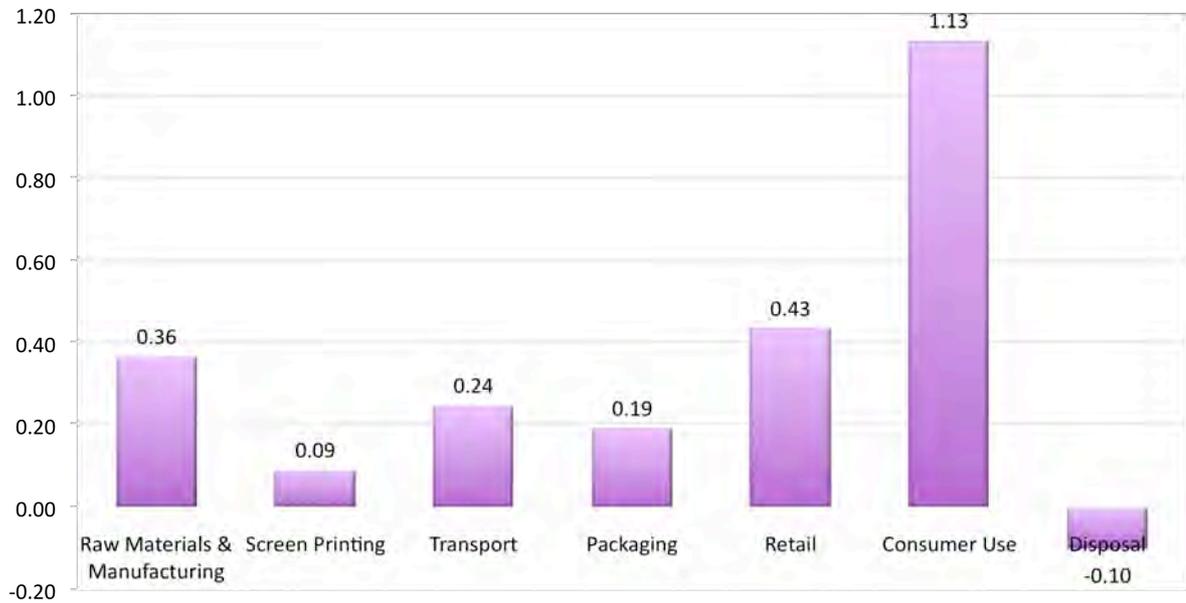
ANALYSIS

The footprinting study provides an in-depth analysis of the impacts (hotspots) of greenhouse gas emissions throughout the lifecycle of a garment.

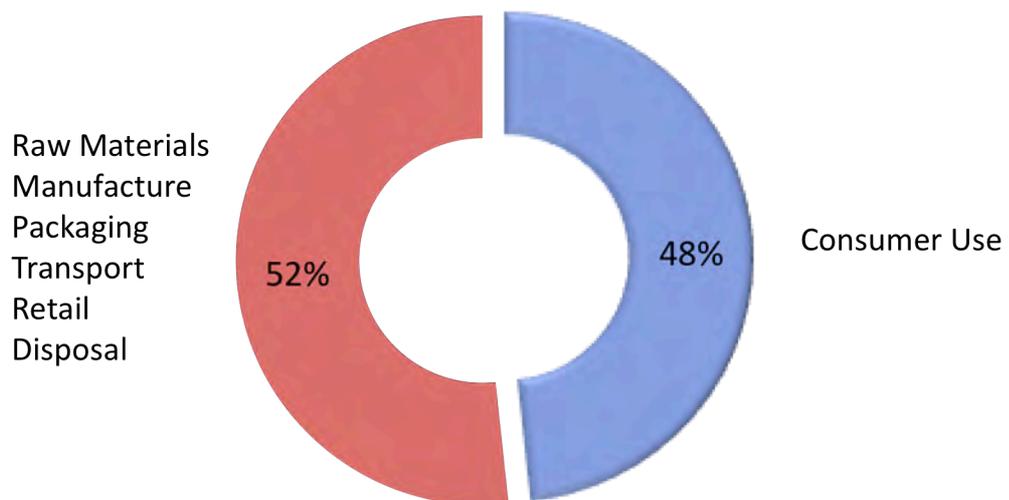
For the purposes of this report one garment was chosen to provide an illustration. It is a typical women's short sleeve T-shirt in size small, colour charcoal, with one colour print. It is certified organic and has been manufactured in a low-carbon process.



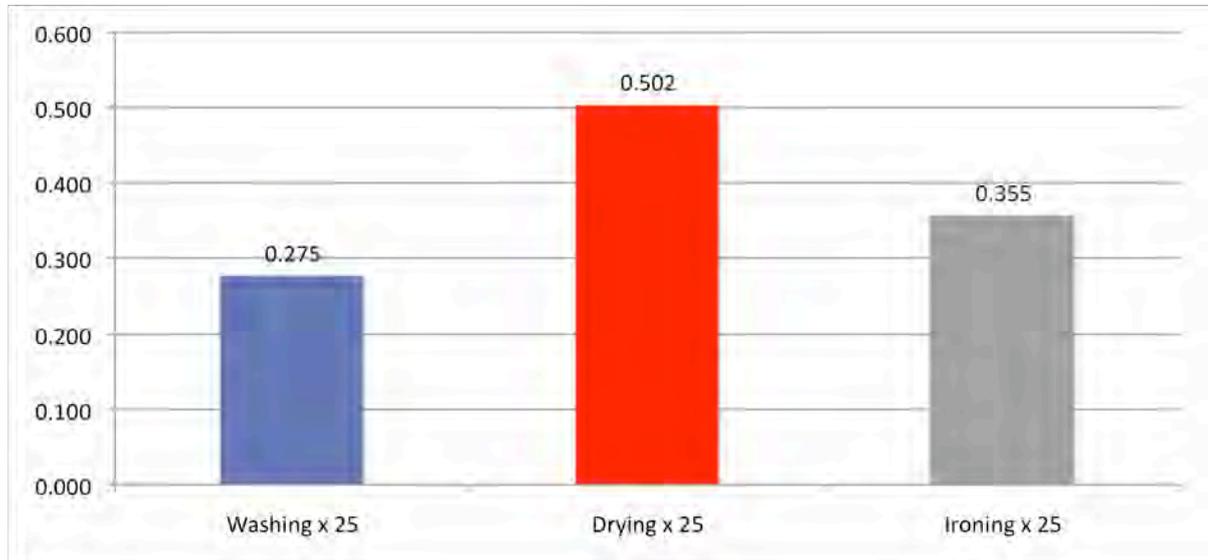
The **total lifecycle footprint** of this product is 2.34 kg CO₂e, which is the total carbon dioxide and other greenhouse gases emitted from raw materials, production, distribution, consumer use and disposal.



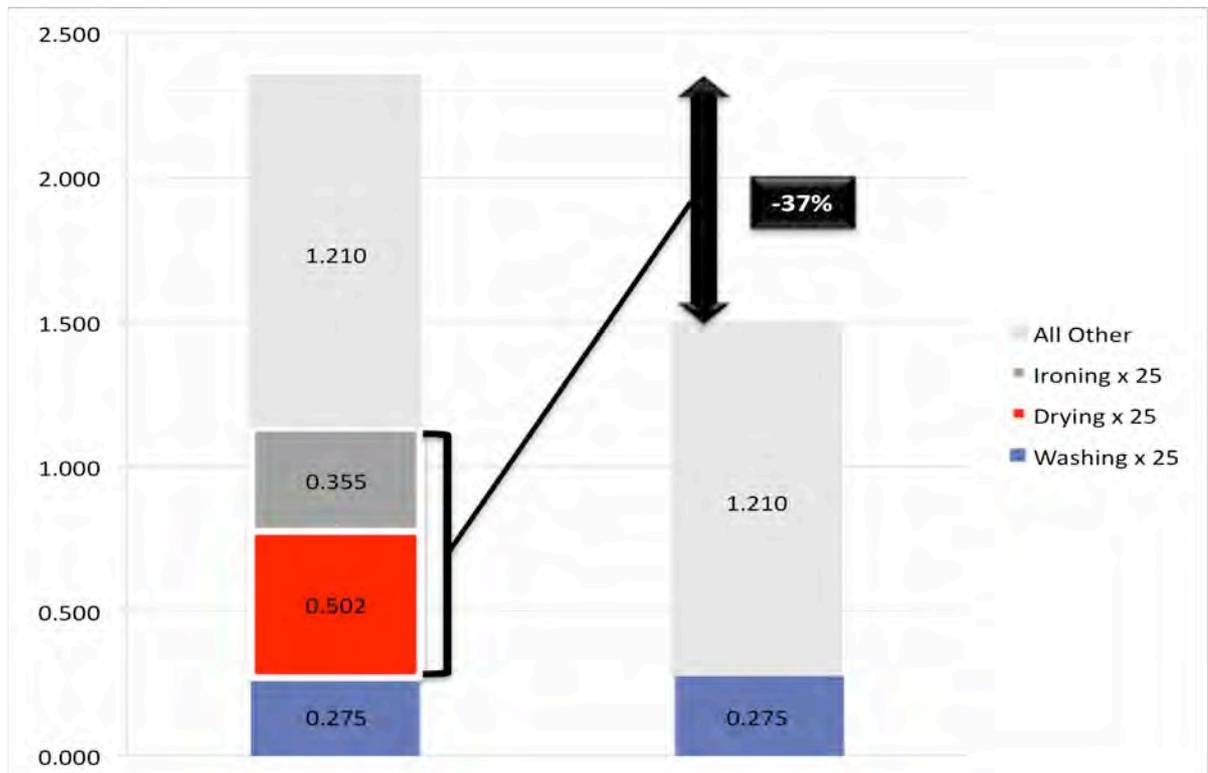
The breakdown of the key elements over the lifecycle of this particular product identifies the **consumer use** as the single largest impact, constituting 48% of the value. The consumer use is made up of automatic washing, tumble drying and ironing twenty five times during the product's useful life.



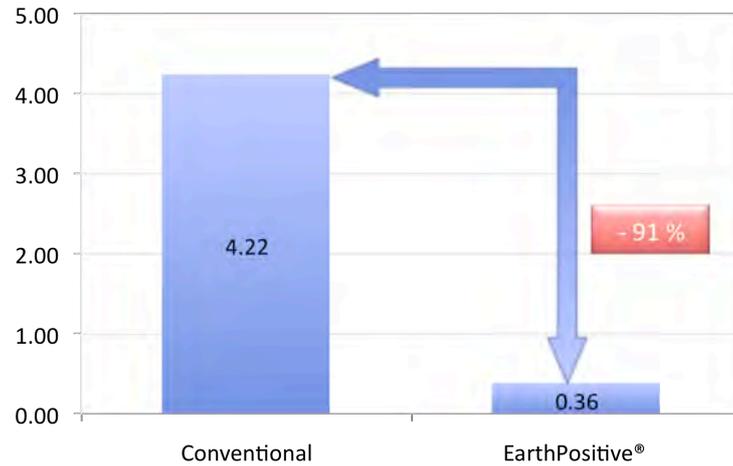
Within the **consumer use phase**, the breakdown is as follows: automatic washing 24%, tumble drying 45% and ironing 31%.



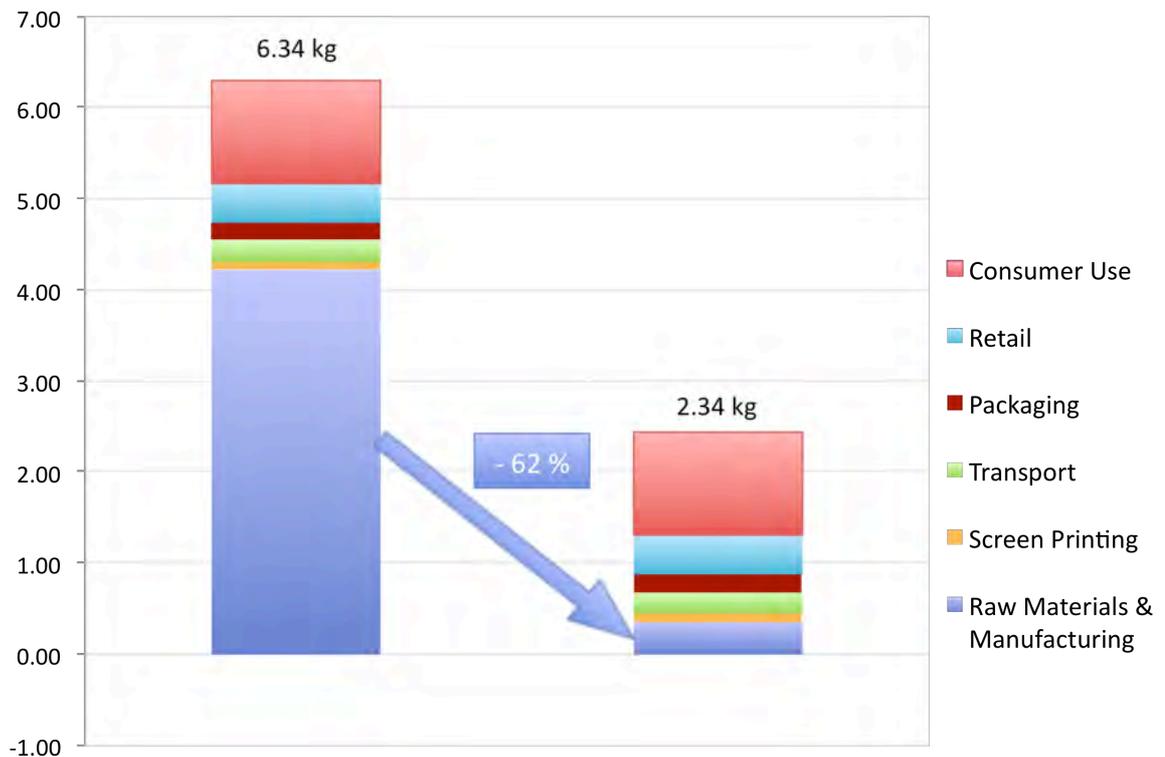
Thus, avoiding tumble drying and ironing would result in an overall reduction in the product footprint of some 37% or 0.857 kg.



Analysis of the **manufacturing** processes within the EarthPositive® supply chain shows a significant reduction in the GHG emissions achieved through the use of renewable energy. Compared to an identical product manufactured with the standard grid electricity the reduction stands at 91%.



This translates into a net reduction over the lifecycle of the product of 62% or 4 kg of CO₂e.



Other important findings can be summarised as follows:

transportation (10.4% of total) - the footprint of ocean freight from India to UK is only 0.8% compared to road freight in India of 6.2% and road freight and postage in the UK of 3.5%

packaging (8% of total) - despite minimum use and maximum re-use of packaging throughout the supply chain, the contribution is notable, with 3/4 of the packaging footprint attributed to the packing for the final delivery to consumers

screen-printing (3.7% of total) - shows drying/curing as the single largest impact, but also identifies the number of screens used in the process as a significant factor, where each additional screen (colour on the print) could increase the footprint of the decoration by 5%

The T-shirts were manufactured and dyed in India, the graphic designs were printed in Bristol, and the T-shirts were worn, cleaned and disposed of in the UK.

COMMUNICATION

The carbon footprint of the garment is communicated to the consumers by way of a **Carbon Reduction Label** from the Carbon Trust. This is the first textile product family that carries the label.

The label is designed to provide clear, factual and accurate information about the impact of the product on climate change, and to encourage positive change at all stages of the lifecycle.

The main module of the label shows the total amount of greenhouse gases emitted in the lifecycle of the garment. It also states the

brand’s commitment to further reduction over a two-year period. The second module explains the meaning of the number shown, and, in its lower part, shows the reduction in emissions already achieved. The third module informs of the impact of the consumer use phase, and provides examples of reductions that could be achieved by altering the use pattern.

Rounding rules as prescribed in the Carbon Trust’s Code of Good Practice are applied to all values.

<p>working with the Carbon Trust</p>  <p>per garment</p>	<p>The carbon footprint of the lifecycle of this T-shirt is 2.4kg. This is the total carbon dioxide (CO2) and other greenhouse gases emitted from the raw materials, production, distribution, use (which is washing, tumble drying and ironing 25 times) and disposal.</p>	<p>You can reduce this carbon footprint by washing at 30°C or lower, avoiding tumble drying, ironing only when necessary, and recycling at the end of its life.</p> <p>For example, avoiding tumble drying and ironing will save approx. 0.9kg of CO2 or one third of this garment’s carbon footprint in its lifecycle.</p>
<p>We have committed to reduce this carbon footprint</p>	<p>By using green renewable electricity we have reduced the footprint by 4.0kg per garment.</p>	

CONCLUSIONS

The study has shown that:

- significant reduction (~90%) in emissions from the manufacturing stages can be achieved by the use of renewable energy and low-impact techniques
- consumers should be encouraged to wash in cold water, avoid tumble drying and iron only when necessary
- graphic designers should understand that adding colours to the print design can result in a significant increase in the footprint of the process
- ocean transport has a negligible contribution to the lifecycle footprint of the garment but inland road freight should be considered at every stage, and kept in check
- packaging should be kept to a minimum and re-used whenever possible; bulk and multiple unit packaging is favourable
- storage and retail operators should drive towards improvements in energy efficiency

A full report is available upon request.

Published by

Continental Clothing Co. Ltd

8 Falcon Park, Neasden, London NW10 1RZ, UK

www.continentalclothing.com

24th March 2009

Enquiries to

Mariusz Stochaj

email: mariuszcontinental@mac.com

tel: +44 (0)7710 278585