

Life cycle assessment: shopping bags

Learning objectives

- 1 Understand how the overall environmental impact of a product is assessed using a life cycle assessment.
- 2 Evaluate the use of three different types of shopping bag using a life cycle assessment of each one.

Introduction

A life cycle assessment looks at every stage of a product's life and assesses the impact it has on the environment.

In 2008, supermarkets in the UK gave away approximately 10 billion lightweight single-use carrier bags. This is around 10 bags a week per household.

In 2011, the Environment Agency conducted a life cycle assessment of carrier bags used in supermarkets in England. This provided the evidence for the government to act on single-use plastic waste.

Your task

1. Complete a life cycle assessment (LCA) using the table for three different types of supermarket carrier bag:
 - Single-use plastic bag
 - Reusable plastic bag
 - Cotton bag
2. Make a recommendation to the Department for Food and Rural Affairs (DEFRA) based on your assessment.
 - Which of the bags do you think has the least overall environmental impact?
 - Use evidence from your completed LCA to support your suggested action.



| Stage of life cycle | Key questions | Single-use plastic bag | Reusable plastic bag | Cotton bag |
|------------------------------|---|------------------------|----------------------|------------|
| Raw materials | What is the bag made from? What is the source of the raw material? How much is needed to make one bag? | | | |
| | What pollution and energy use are linked with the raw materials? | | | |
| | Are the raw materials sustainable? | | | |
| Manufacturing and processing | What is the process of turning the raw material into a bag? | | | |
| | How much pollution and energy use are linked with the bag's manufacture and processing? | | | |
| Transport | Where is the geographic location of the raw materials? | | | |
| | What is the method of transport? | | | |
| Consumer use | How many bags are needed for a month's shopping? | | | |
| | How many times is the consumer likely to reuse the bag? | | | |
| Disposal | How is the bag disposed of at the end of its useful life? Can it be recycled? | | | |



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| Manufacturing and processing | | | |
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| Disposal | | | |