

According to their life-cycle assessment, after one use, which of the following has the lowest environmental impact?

- A. Cotton bags B. Paper bags C. PP reusable bags **D. Conventional HDPE bags**

A 2006 study, commissioned by the Environment Agency in the UK*, assessed the life cycle environmental impacts of the production, use and disposal of different carrier bags.

The conventional HDPE bag had the lowest environmental impacts of the lightweight bags in eight of the nine impact categories. The bag performed well because it was the lightest bag considered. The lifecycle impact of the bag was dictated by raw material extraction and bag production, with the use of Chinese grid electricity significantly affecting the acidification and ecotoxicity of the bag.

The cotton bag has a greater impact than the conventional HDPE bag in seven of the nine impact categories even when used 173 times (i.e. the number of uses required to reduce the global warming potential of the cotton bag to that of the conventional HDPE bag with average secondary reuse). The impact was considerably larger in categories such as acidification and aquatic & terrestrial ecotoxicity due to the energy used to produce cotton yarn and the fertilisers used during the growth of the cotton.

The study also found that:

- The environmental impact of all types of carrier bag is dominated by resource use and production stages. Transport, secondary packaging and end-of-life management generally have a minimal influence on their performance.
- Whatever type of bag is used, the key to reducing the impacts is to reuse it as many times as possible and where reuse for shopping is not practicable, other reuse, e.g. to replace bin liners, is beneficial.
- The reuse of conventional HDPE and other lightweight carrier bags for shopping and/or as bin-liners is pivotal to their environmental performance and reuse as bin liners produces greater benefits than recycling bags
- The paper, LDPE, non-woven PP and cotton bags should be reused at least 3, 4, 11 and 131 times respectively to ensure that they have lower global warming potential than conventional HDPE carrier bags that are not reused. The number of times each would have to be reused when different proportions of conventional (HDPE) carrier bags are reused are shown in the table below.
- Recycling or composting generally produce only a small reduction in global warming potential and abiotic depletion.

Type of carrier	HDPE bag (No secondary reuse)	HDPE bag (40.3% reused as bin liners)	HDPE bag (100% reused as bin liners)	HDPE bag (Used 3 times)
Paper bag	3	4	7	9
LDPE bag	4	5	9	12
Non-woven PP bag	11	14	26	33
Cotton bag	131	173	327	393

The amount of primary use required to take reusable bags below the global warming potential of HDPE bags with and without secondary reuse

* Life cycle assessments will differ from country to country, and even province to province, as regions generate energy and dispose of waste differently.

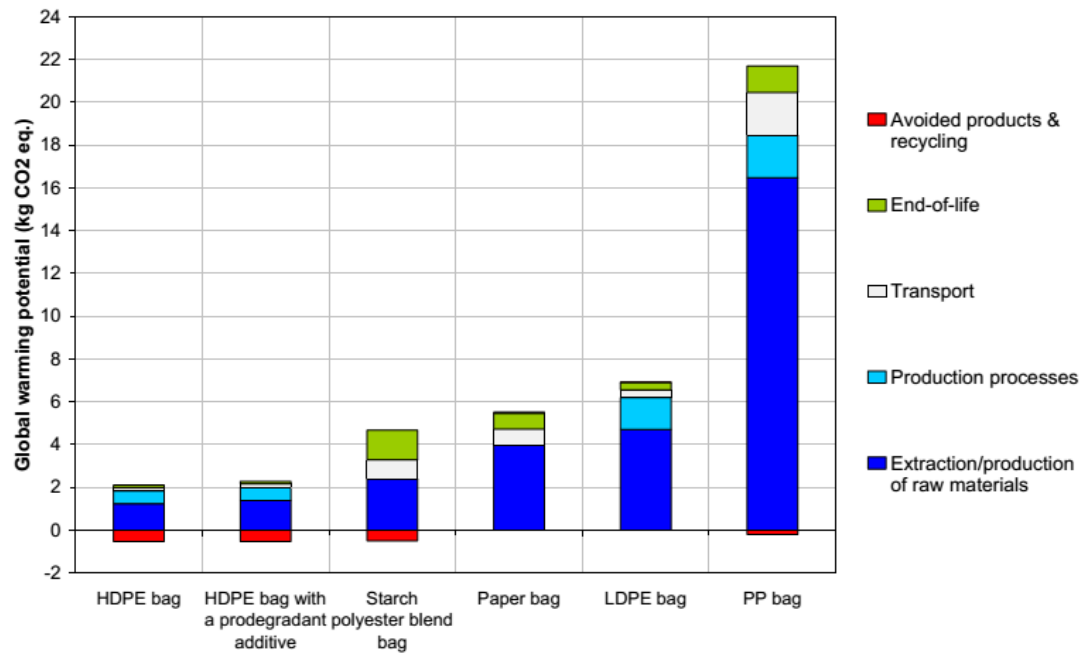


Figure 5.1 The lifecycle impacts of each carrier bag on global warming potential (excluding primary reuse).

The full Life cycle assessment can be found at <https://www.gov.uk/government/publications/life-cycle-assessment-of-supermarket-carrierbags-a-review-of-the-bags-available-in-2006>

Or on the GCU website