

Position Statement on best alternatives to single-use plastic bags

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Single-use plastic bags (HDPE/LDPE) are the most obvious 'low hanging fruit' plastic packaging for policy action. This is because they are used in huge quantities, are particularly harmful to wildlife, block drains and waterways and represent a very visual environmental litter. These bags are also manufactured using fossil fuels and therefore contribute to greenhouse gas emissions. They also have readily available alternatives - with a simple behaviour change their use could be eliminated or drastically reduced.

Waste, lifecycle and litter perspectives

1. Based upon lifecycle assessments, and reducing the impact of litter on the environment, the polypropylene (green bag) and recycled fabric bags are the best options (above all single-use bags). Durability and recycled content make a big difference when choosing the right reusable bag.
2. Thicker plastic bags, whilst offering reduced plastic bag use (if reused), are high impact products. Their use as a lightweight bag replacement is offset by their other environmental and resource impacts.
3. Paper bags, whilst reducing single plastic use and litter, have a high resource impact, particularly as they are unlikely to be multiple use product. However, they are better than plastic bags and should contain recycled content.

Waste disposal perspectives

With 95% of all plastic packaging used once and then wasted, often as litter¹, we have a waste problem. Plastic bags are included in this 'used once and thrown away' packaging waste assessment and, whilst they grab attention as a litter problem, they are also a major waste and resource use issue.

Our single-use, plastic throwaway mentality is a problem for the environment and for resource efficiency. The notion that using scarce resources to make products that are designed to be used once and then discarded has no currency in the 21st century. It is the absolute polar opposite to the notion of environmental and resource sustainability.

Actions to reduce greenhouse gas emissions also means that fossil fuel use in the making of plastics needs to be significantly reduced. The production of single-use plastics for something with a very limited useful life that is then discarded as waste, impacts on material, energy, transport and water use.

Avoid/Reduce

The solution is to change behaviour and practices away from single-use, particularly fossil fuel derived plastics. This will mean eliminating unnecessary plastic use and utilising reusable, more durable products instead. Achieving sustainability is dependent upon removing single-use products, particularly where better alternatives exist.

Recycle

¹ -New Plastics Economy Report-World Economic Forum/Ellen MacArthur Foundation 2016/17

Separation is the key for resource recovery, but mixed waste landfills are full of plastic bags which overwhelmingly contain other mixed and putrescible wastes. Their removal would be a significant step in managing mixed landfill as resource recovery facilities. It would allow mixed products to be more easily managed, separated and processed, extracting their value. As long as the plastic bag is used to contain discarded mixed wastes, the harder it will be to recover resources.

Recycling facilities register plastic bags in kerbside collection services as the single biggest contamination problem. Plastic bags can clog recycling equipment when left undetected. The same is true for any source separation considered at mixed landfill.

Plastic bags are not recycled through the kerbside collection service.

Due to their wind-blown nature, plastic bags easily escape their storage, and landfill is no exception. Landfill is regarded as a major source of plastic bag litter. It has been estimated that 47% of wind-blown litter escaping from landfill is plastic bags².

Lifecycle perspectives

Streamlined Life Cycle Assessments (LCA) include resource use, material consumption, transport, greenhouse gas emissions, water and chemical use and litter/waste impacts of a product or practice.

An LCA undertaken by Centre of Design at RMIT³ that compared single-use plastic bags with a range of alternatives is our key reference. This study is often referenced in other Australian reports and is reflective and consistent with most studies on the lifecycle of these products.

The study compared single-use HDPE plastic bags, single-use LDPE bags (thicker bags), paper bags, reusable woven (cotton) bags and reusable polypropylene (green bags).

The LCA found that:

- reusable bags have a lower environmental impact than all single-use bags
- a shift to more durable bags would deliver most environmental gains (the benefit of reusable bags are amplified by their number of uses as replacements for single-use bags)
- the shift from one single-use bag to another single-use bag may improve one environmental outcome but be offset by other impacts. As a result, no single-use bag produced an overall environmental benefit
- recycled content in bags reduced overall environmental impact (green bags have post-consumer materials included)
- end of life destination of bags is crucial, with environmental benefits greatest where bags are recycled.

Plastic bag litter perspectives

Plastic bags as a percentage of the litter stream tends to be relatively small, usually estimated at around 1-2% (this is consistent with NLI reports). However, due to the wind-blown nature of plastic bags, where they tend to move through the environment and out to sea, means that many are less likely to be seen or counted. It is likely that this 1-2% is an underestimate. These estimates are used in most jurisdictions to

² Implementing a lightweight plastic shopping bag ban Discussion paper-QLD EHP 2017

³ Life Cycle Assessment on Shopping Bags-RMIT University 2002-3

calculate plastic bag litter. In Queensland, for instance, the State Government estimates that 16 million plastic bags are littered every year, that being 1.5% of total estimated use.

The principal problem with plastic bag litter, and the major reason action is taken, is their threat to wildlife and the environment. Sea turtles, in particular, are known to eat plastic bags as they resemble jellyfish. The nature of bags also means that they can cause birds and other creatures to become entangled. It has been estimated that 1 million birds and 200,000 sea creatures die each year as a result of plastic litter. In Moreton Bay (QLD) researchers have found that 30% of turtles found dead have died directly as a result of eating plastic⁴.

Plastic bag litter is a major problem for drains and waterways due to its ability to easily block passageways. A blocked passageway or drain exacerbates flooding and can cause significant other threats to life and property. The first country in the world to ban plastic bags was Bangladesh, who did so precisely because bags were blocking drains and waterways.

Plastic bag litter is consistently a major concern in the community with 69% expressing that concern in a national news poll⁵. The QLD Discussion Paper on plastic bags (2017) received over 26,000 public submissions, 98% supporting a ban.

Alternatives options

Thicker plastic bags

Thicker plastic bags (LDPE), whilst reducing the number of lightweight bags used (if they are used multiple times) are, based upon the LCA, not as beneficial as other 'reusable' bags. It is noted that any benefits accrued from using thicker bags are offset by other lifecycle impacts⁶ such as greater fossil fuel use, and the threat they pose as litter. In fact, under the LCA, LDPE plastic bags are ranked as the product with the greatest impact.

Jurisdictions that have introduced plastic bags have allowed thicker bags to be used as a 'reusable' alternative. However, there is little evidence to show that they are, in fact, being reused in any great numbers. Many jurisdictions only assume that 70% are reused and rely upon anecdotal commentary. The ACT Government noted a significant increase in the use of thicker bags when their ban was introduced and assumed most would be reused, but concluded that they would 'all end up in landfill after their useful life ...or litter'⁷. A missing data gap is how many thicker 'reusable' bags are provided by supermarkets.

Most litter datasets do not specifically identify thicker bag litter. However, the National Litter Index is an exception. Based on collected numbers in recent NLI reports (2013-16), thicker bags represent about 25-30 % of plastic bag litter⁸.

We have discounted degradable and biodegradable bags. These bags have similar lifecycle impacts as HDPE/LDPE bags and do not solve the issues of litter and wildlife threat. Indeed, these products are often littered more as they are assumed to be 'environmentally safe'.

Degradable plastic bags are designed to break into smaller pieces and resemble food for wildlife even more than standard plastic bags as a result. Biodegradable/compostable bags contain agents to slow down their

⁴ Studies on turtle mortalities Moreton Bay-UQ Research Station/Kathy Townsend

⁵ News poll Boomerang Alliance July 2015

⁶ Life Cycle Assessment on Shopping Bags-RMIT University 2002-3

⁷ Review of Shopping Bag Ban 2014-ACT Government

⁸ Nation Litter Index Litter composition tables 2013/14 and 2014/15

decomposition when in contact with liquid-so that they can be useful as a carrier bag. This means that they decompose slowly in the marine environment. The US Department Fisheries estimate it takes up to two years to decompose, whilst the UN point to the fact that biodegradable bags need high temperatures to degrade⁹. By that time, they have already done the damage.

All jurisdictions with recent bans such as Qld, WA and Vic have included degradable/biodegradable plastic bags in their bans.

Woven, Fabric and Polypropylene (green bags)

Taking the LCA into account, the alternative options of woven, fabric, and polypropylene reusable bags are the best option. The polypropylene 'green' bag scores the highest under the LCA, primarily due to its durability and recycled content.

The more durable the bag, and therefore more likely to be used multiple times, the better. Woven or fabric bags made with recycled fabric are also highly regarded (e.g. Boomerang Bags which use locally sourced, post-consumer fabrics).

Paper and Cardboard

From the LCA point of view, the single-use paper bag has a high environmental impact. This is somewhat offset when recycled content is used. However, paper bags are more expensive and unlikely to be used more than once. They are considered better than plastic, however.

Reused cardboard boxes (used as a replacement for shopping bags) are a recommended alternative, and more fit-for-purpose and readily recycled.

Conclusion: Alternatives to Single-Use Plastic Shopping Bags (by preference order)

If the outcome sought is simply to reduce single-use plastics, reduce litter and environmental/wildlife threat (i.e. not take account of resource use, climate impacts, water and chemical use) - then the best alternatives remain as:

1. Durable, woven, fabric or polypropylene 'green' bags (using recycled/post-consumer materials)
2. Durable, woven, fabric bags (using virgin materials)
3. Recycled cardboard boxes/other reusable containers or durable, reusable bags such as freezer/cold bags, currently available in the market
4. Paper bags (preferably with recycled content)
5. Thicker LDPE plastic bags (assuming reuse)

⁹ UN Environment Program Marine Debris Report 2016









Bag type	Example	Material consumption (kg)	Global warming (kg CO ₂ eq)	Energy consumption (MJ)	Water use (kL H ₂ O)	Litter marine biodiversity (kg y)	Litter aesthetics (m ² .y)	Disposal options
Reusable non-woven plastic (polypropylene) "Green Bag"		♠	♠	♠	♠	♠	♠	Recycle at major supermarkets
Reusable calico bag		♠	♠	♠	♠♠♠♠♠	♠	♠	No recycling, dispose to landfill
Reusable kraft paper bag with 100% recycled content (2 trips)	Photo unavailable	♠♠♠♠♠	♠♠♠	♠♠	♠	♠	♠	Recycle in household recycling bin
Single use oxo-biodegradable bag (e.g. TDPA-EPI)		♠♠♠	♠♠	♠♠♠	♠	♠♠♠	♠♠	Reuse as a garbage bin liner (disintegrates over several years)
Single use plastic (HDPE) bag with 100% recycled content		♠♠♠	♠	♠	♠♠	♠♠♠♠♠	♠♠♠♠♠	Recycle at major supermarkets Reuse as a garbage bin liner
Reusable kraft paper bag (2 trips)		♠♠♠♠♠	♠♠♠♠	♠♠♠	♠	♠	♠	Recycle in household recycling bin
Single use compostable starch-polyester blend bag (e.g. Mater-Bi)	Photo unavailable	♠♠♠♠	♠	♠	♠♠♠♠♠	♠	♠♠	Compost (degrades within six months) Reuse as a garbage bin liner
Single use plastic (HDPE) bag		♠♠♠	♠♠	♠♠♠♠	♠	♠♠♠♠♠	♠♠♠♠♠	Recycle at major supermarkets Reuse as a garbage bin liner
Single use kraft paper bag with 100% recycled content	Photo unavailable	♠♠♠♠♠	♠♠♠♠♠	♠♠♠♠♠	♠	♠	♠♠	Recycle in household recycling bin
Single use kraft paper bag		♠♠♠♠♠	♠♠♠♠♠	♠♠♠♠♠	♠♠	♠	♠♠	Recycle in household recycling bin
Single use 'boutique' plastic (LDPE) bag		♠♠♠♠♠	♠♠♠♠♠	♠♠♠♠♠	♠	♠♠♠♠♠	♠♠♠♠♠	No recycling, reuse as a garbage bin liner

Table Extracted from LCA Shopping Bag RMIT Study 2002/3