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Australia Post

Packaging Life Cycle Assessment

To inform Australia Post's packaging strategy, part of its 2020-2022 Group Corporate Responsibility Plan.

Australia Post provides postal and delivery services to all Australians, playing a critical role in connecting communities across the nation. The quality of packaging utilised is integral to ensuring that items sent reach their destination safely and intact.

12.3 million
delivery points across Australia

4,330
post offices

75,000
people in the extended workforce

2.8 billion
letters and parcels processed through the Australia Post network

SITUATION:

Australia Post wanted to determine the most favourable packaging products when considering the entire life cycle across a range of environmental indicators

Committed to integrating sustainability across every aspect of the Group, Australia Post continually seeks solutions to minimise its environmental impact. With plenty of ideas out there about what is 'good' for the environment and what packaging 'should' be like, the true challenge in designing sustainable packaging is considering a myriad of environmental indicators such as greenhouse gas (GHG) emissions, freshwater use, and land use, for example. When updating their packaging range, Australia Post sought out packaging alternatives that would not mitigate one environmental impact at the expense of aggravating another.

Packaging options needed to be validated with a Life Cycle Assessment (LCA), ensuring a scientific approach to measure holistic impacts on the environment.

LCA methodology evaluates environmental impacts over the entire life cycle of a product, from mineral extraction through to materials processing, manufacture, distribution, product use to end of life. It considers impacts such as freshwater use, land use, energy, and GHG emissions generated or used at each stage of producing a product or delivering a service. The methodology for conducting LCAs are governed by ISO standards 14040 and 14044.

SCOPE:

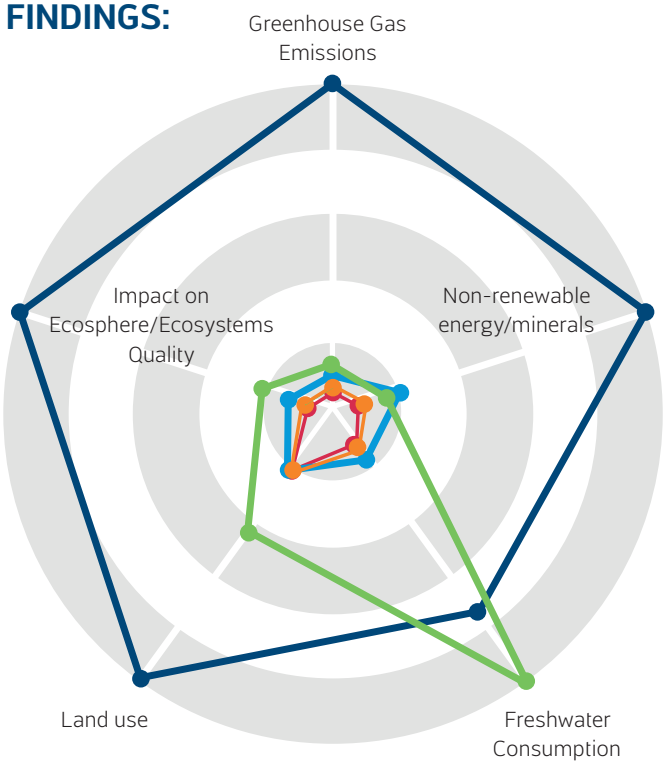
In 2019, Australia Post chose Selerant to conduct a streamlined LCA of four options compared with a plastic satchel, made from virgin low-density polyethylene (LDPE) to inform their packaging strategy. The study was conducted using Ecodex, Selerant's LCA tool, certified to ISO 14040 and 14044. Ecodex focuses on five indicators: GHG emissions, non-renewable resource use, freshwater consumption, land use, and ecosystem quality, which provides a holistic view of the environmental impacts.

The baseline for the study was a virgin LDPE satchel (made from fossil fuel), and the four alternatives considered were a:

- **satchel made from compostable plastic;**
- **plastic satchel made from 80% recycled LDPE;**
- **plastic satchel made from 100% recycled LDPE; and**
- **cardboard box.**

All the satchels reviewed were the same weight, while the cardboard box was substantially heavier due to the nature and structure of the material. Secondary packaging and transport required to deliver the packs from the manufacturer to Australia Post facilities were also included, but the use of the packs by consumers and the items they may send were outside the scope. Various recycling, composting and landfill scenarios were considered for the packs' end of life.

FINDINGS:



The spider graph (above) shows a relative comparison of results across the five environmental indicators, where smaller is better in terms of environmental impact. The highest value in each category is shown at the outside of the circle; it does not imply that all categories are of equal significance.

The LCA confirmed satchels made from recycled content LDPE to be the most environmentally friendly packaging option.

The results showed that the primary material used had the greatest contribution to GHG emissions, non-renewable resource use, freshwater consumption, and ecosystem quality. The secondary packaging for the satchels was cardboard boxes (each contained 250 satchels), and these had a significant contribution towards land use, which is typical of fibre-based products. Transport and end of life scenarios had only a minor impact. Selerant's LCA study confirmed that Australia Post's packaging strategy should focus on the material used and incorporating as much recycled content as possible while also ensuring it enables reuse, and then recycling at end of life.

Compostable satchels

In understanding the impacts of different options in more detail, the results showed the compostable satchel had a lower use of non-renewable resources than the satchel made from new LDPE; however, it had higher GHG emissions, freshwater consumption, land use and impacts on ecosystem quality. This is the case even when it is composted after use rather than landfilled. This is because the process of growing corn to manufacture the resin requires significant land, water for irrigation, and use of fertiliser that results in air and water emissions impacting GHG emissions and ecosystem quality.

LDPE satchels

When the impacts of the satchel made from virgin LDPE were compared with the one made from recycled content LDPE, the results showed a significant decrease in GHG emissions, non-renewable resource use, and freshwater consumption. Changes to land use and ecosystem quality were insignificant. Selerant's LCA evaluated satchels with both 80 per cent and 100 per cent recycled content LDPE. While 100 per cent recycled content LDPE does have the lowest environmental impact, testing showed these did not meet Australia Post's product strength specifications to withstand distribution and sorting machine requirements and as such, are not a realistic option. Satchels containing 80 per cent recycled content LDPE met Australia Post's specifications and still showed a significant reduction in environmental impacts compared with the satchels made from virgin LDPE.

Cardboard boxes

The cardboard box showed significantly higher impacts in all categories, despite being made from a renewable resource and being highly recyclable. This is due to the weight difference, with the cardboard box being around 30 times heavier, resulting in higher impacts at all stages of the life cycle – raw materials, manufacturing, transport, and end of life. There is still a place for the cardboard box in the packaging options available to Australia Post's customers. If the item for delivery is fragile and needs the extra protection of the box and inner cushioning, then it is the best product for that application.

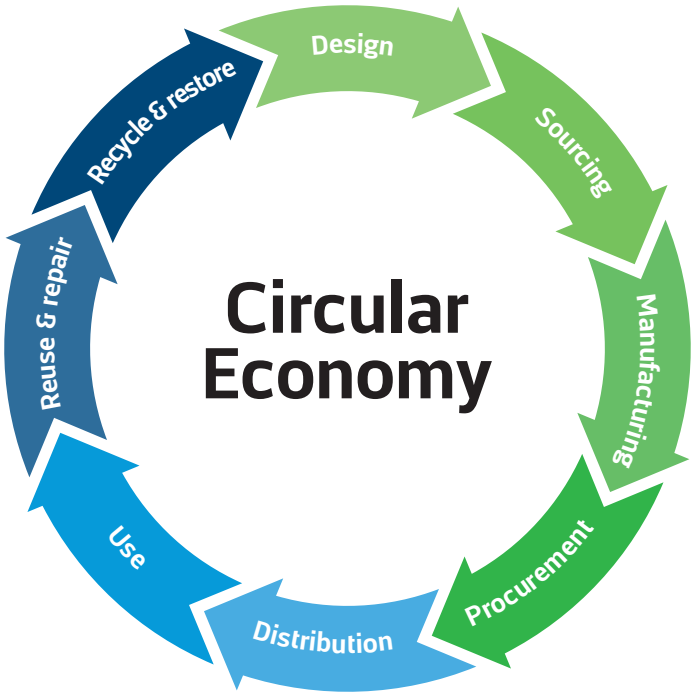
End of life scenarios for each packaging type had a relatively small impact, but it is still important that this is managed correctly, so that Australia Post takes stewardship of its products within the circular economy and minimises resource use and single use.

RESULTS:

With the environmental benefits of the satchel made from 80 per cent recycled content LDPE substantiated by Selerant's LCA, in 2019 Australia Post made the strategic decision to overhaul its satchel range.

Together with fellow Australian brand, Country Road Group, Australian Post trialled its first 80 per cent recycled content LDPE satchel in December 2019. The success of this trial led to the roll out of 80 per cent recycled content LDPE across Australia Post's core range. Today, less than 5 per cent of Australia Post's satchel range is made with virgin LPDE and the organisation is committed to having all of its plastic satchels made from recycled content by the end of 2021.

Selerant's LCA findings helped Australia Post make informed decisions leading to reduced environmental impact. This supports the organisation's circular economy approach, ensuring design with as little material as possible without compromising product integrity, and removing unrecyclable products. Australia Post's holistic circular economy approach is summarised below.



1. Design

- Designed to ensure minimal resource inputs
- Designed for current recycling systems
- Discontinued unrecyclable packaging e.g. polystyrene and 'composite' products

2. Sourcing

- Plastic satchels: 80 per cent recycled content LDPE
- Cardboard packaging: 55 – 99 per cent recycled content
- Australian made, Forest Stewardship Council (FSC) certified cardboard packaging

3. Manufacturing

- Working with suppliers who demonstrate robust environmental credentials

4. Procurement

- Purchasing only what is needed
- Purchasing in bulk to reduce transport footprint

5. Distribution

- Carbon neutral deliveries for retail and MyPost business customers
- Electric vehicles program

6. Use

- Providing advice to avoid overpackaging
- Packaging is fit for purpose so products arrive safely and intact

7. Reuse and repair

- Investigating a reusable satchel

8. Recycle and restore

- Partnering with REDcycle to ensure satchels can be recycled
- Expanding accessibility of soft plastic recycling using the Post Office Network
- Donating furniture made from recycled content to local communities
- Exploring use of recycled content furniture for Australia Post's assets

Interested in learning more?

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