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CIRCULARITY IN PLASTICS IN SOUTH AFRICA

Opportunities in a circular economy for plastic packaging in South Africa

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A circular economy for plastics has projected net economic and job creation benefits in both developed and developing country settings. South Africa has good potential to realise the benefits in a circular economy for plastics, building on expertise in both the plastics production and recycling sectors. This series of 10 briefs provides the context of the plastics industry in South Africa and highlights opportunities in a circular economy: Part 3 of 10

Plastic packaging in the South African plastics market

Packaging constitutes the largest market sector for plastics in South Africa at 49% (**Figure 1**).

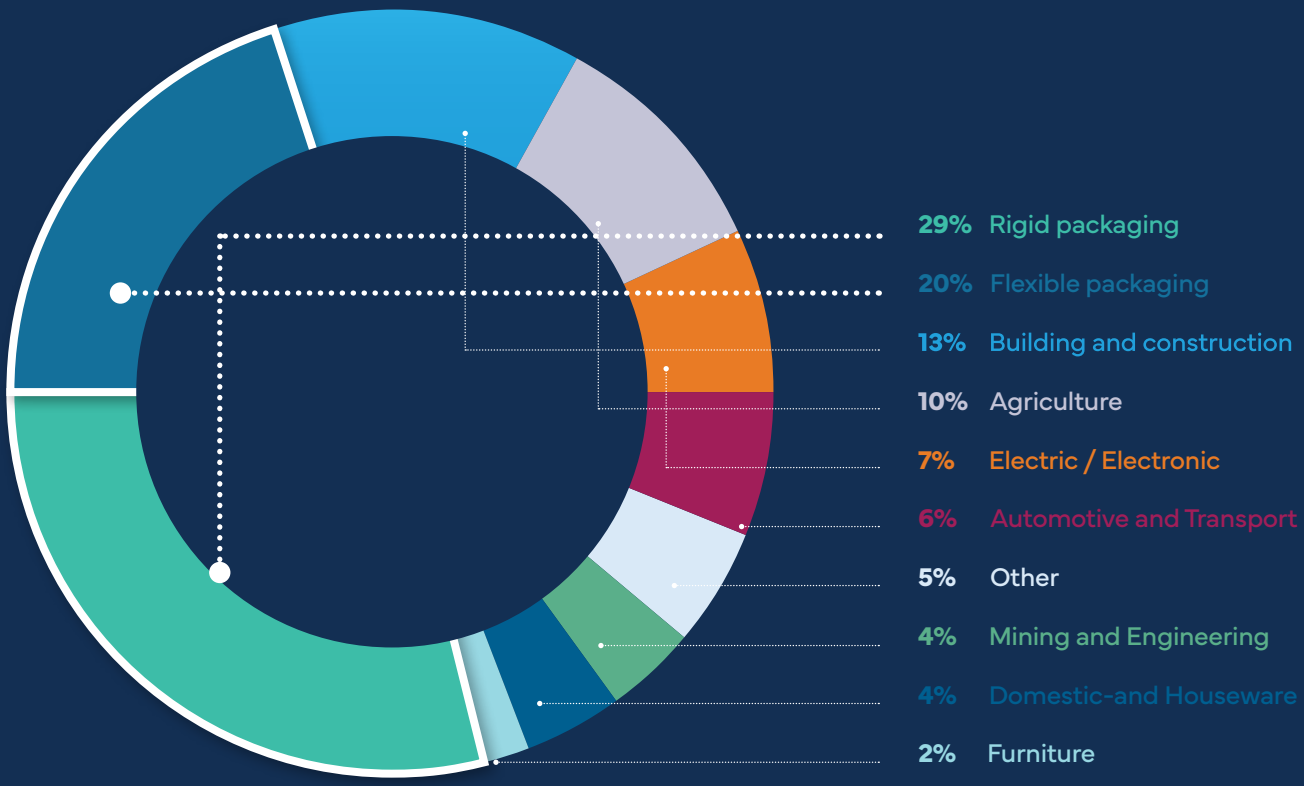

Figure 1: Market sectors in South Africa consuming polymers (virgin and recycled) based on volumes converted in 2019[1]

[1] Plastics SA (2020) South African Plastics Recycling Survey 2019.

This brief sets out the opportunities for circularity for plastic packaging in the South African context in the short term, which are:

1. Replacement of packaging that has limited or no opportunity for circularity (i.e. those ranging from 0-15% output recycling rates) with alternative materials or business models.
2. Reuse/ refill models, which are also suited to the low-income market – as the consumer could pay less for a product, as they are not paying for the packaging.
3. Driving recycling rates through increasing demand, with closed-loop applications (packaging to packaging) having the greater potential for growth compared to open-loop markets (which are in general closer to saturation).

Replacement of packaging with limited or no opportunity for circularity with alternative materials

The largest tonnage of non-recyclable plastic packaging on the market in South Africa is in multi-layer formats that include polymer mixes incompatible with recycling systems. A shift to innovative mono-polymer, mono-layer packaging, or packaging with recycling-compatible polymers and a thin barrier layer are entering the South African market, as are paper packaging options able to achieve the functionality of certain multi-layer plastic packaging. There has been limited uptake of bioplastics (i.e. plastics produced from organic renewable resources) in the plastic packaging market due to concerns that compostable bioplastic packaging will disrupt mechanical recycling of well-recycled plastics in South Africa. Certain niche applications, such as biodegradable bioplastic bags in which to store food waste for composting, are currently on the market, and are likely to not end up in the recycling stream. The application of compostable bioplastics is potentially less disruptive in packaging applications that do not currently have recyclable formats, or in substituting fossil fuel based plastics that are not recycled in other sectors (e.g. in the agriculture sector). Local production of bioplastics has not yet commenced - bioplastic polymer or finished products are currently imported.

The is also limited uptake of bio-based polymer (durable bioplastics that are identical to polymers from fossil fuel sources). This is related to the cost of the material relative to traditional polymer.

Reuse/ refill models

Reuse models for plastic packaging represent opportunities to retain packaging material at its maximum value, and, depending on the business model, can achieve a much higher recovery of packaging than single-use business models. Reuse models also have the potential to deliver product to customers cheaper than products in single-use packaging, as the consumer only pays for the packaging once.

However, a rapid shift to reuse for a large proportion of the market, particularly in the highly recyclable formats, will reduce income to informal collectors and other collectors, as well as reducing sales volumes at converters, and reducing feedstock to recyclers. Although, circular business models often generate more income opportunities in service roles, and a circular economy for plastics is likely to achieve a net gain in income opportunities, this shift needs to be managed to reduce the negative economic and social effects of the change.

Reuse models hold potential as circular solutions in South Africa, with recommended focus areas being on application in areas where recyclables are not recovered due to distance to market, and non- or poorly recyclable on-the-go packaging, which is very likely to be littered or landfilled.

A rough assessment of the replacement of 10% of HDPE, PET, and PP[2] rigid packaging with reusable packaging was performed. Assuming that production of packaging for 10% of the market is reduced by a factor of 12 (this average reuse factor will differ depending on the packaging and business model), at current market size, 23 000 tonnes of plastic packaging will be avoided per year, and an additional 1 300 tonnes of material is likely to be recovered and recycled (through take back by the brand owner, assuming a 60% recovery rate) that would have otherwise been landfilled or littered.[3]

[2] HDPE and PP crates were not included in this analysis as such packaging is often already reused.

[3] The tonnage of packaging in the reuse model should be higher than the estimated tonnages, as packaging designed to be reused many times will need to be sturdier and therefore heavier than single-use packaging.

Increasing recycling and inclusion of recycled content

Other market opportunities include growing the tonnages of material recycled, and increasing recycled content of packaging. Both opportunities rely on growing end markets, and especially matching of recyclate quality with end market application. There is currently a mismatch with high-quality recyclate being included in low-value products (such as high value white bottles being recycled into refuse bags). This is limiting the growth in recycled content into packaging, as well as generally 'losing' the material from the economy, as the lower value packaging products are less likely to be recycled at end-of-life.

Driven by extended producer responsibility (EPR) targets, the recycling opportunities constitutes between 78 000 and 103 000 tonnes per annum by the end of 2025, of which 51 000 tonnes is PET (polymer code no. 1).

In terms of recycled content assessed as needed to drive recycling rates, the additional tonnage is 66 000 tonnes per annum of high-value recyclate, of which 33 700 tonnes is PET, 12 000 tonnes is LDPE (polymer code no. 4), 12 500 tonnes is PP (polymer code no. 5) and 7 600 tonnes is HDPE (polymer code No. 2). In order to achieve such tonnages recycled, a 70% increase in PP recycling capacity (currently at ~38 000 tonnes per annum), and an 30% increase in HDPE recycling capacity (currently at ~58 000 tonnes per annum) is needed in South Africa.

Conclusion

With new mandatory EPR legislation for packaging, which includes both recycling rate and recycled content targets, as well as possible reuse targets, additional funding from industry will be available to improve both the supply of material for recycling and the demand for recycled content. The EPR fees must also be designed to reflect ease of recyclability, and therefore once this is reflected in the fees it is likely that packaging on the market will shift towards the better recycled formats. This will improve the business case for circular plastics in South Africa. However, with a new and developing EPR system additional financing and support for reuse models, recycling and increasing recycled content will be needed to realise these opportunities in a circular economy for plastic packaging.

This summary is an extract from the report "*Market assessment of circular plastics opportunities in packaging, construction, agriculture and the automotive industry*", which forms part of a series "*Circularity in the plastics value chain in South Africa – opportunities and barriers*". The reports in the series are:

- **Part 1:** The Plastics Landscape in South Africa – Mapping value chains and key players.
- **Part 2:** South African enabling environment for a circular economy for plastics – a scan of best practice and current local and international policies and legislation.
- **Part 3:** Market assessment of circular plastics opportunities in packaging, construction, agriculture and the automotive industry.
- **Part 4:** A focus on increasing recycled content in packaging through multi-layer conversion.
- **Part 5:** Advanced recycling technologies in South Africa – status quo and potential.
- **Part 6:** Alternatives to problematic plastic packaging in South Africa.
- **Part 7:** The current state of waste plastics management in South Africa.
- **Part 8:** Realising opportunities for a circular economy for plastics in South Africa: actions for the short, medium- and long-term.

The individual reports and a summary of the entire series can be accessed by contacting the GreenCape Circular Economy team via **circulareconomy@greencape.co.za.**

The series is a product of the staff of the World Bank in collaboration with a research and analysis team comprising of GreenCape, the African Circular Economy Network (ACEN) Foundation, the South African Plastics Recyclers' Organisation (SAPRO), WRAP, and WWF South Africa. Financing for this work comes from the **PROBLUE Trust Fund**.

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