

CIRCULARITY IN PLASTICS IN SOUTH AFRICA

Opportunities for a circular economy for agricultural plastics in South Africa



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 6 of 10

Agricultural plastics in the South African plastics market

The agricultural sector consumed approximately 10% or 150 400 tonnes of the total domestic virgin plastics output in 2019 and is the third largest sector regarding plastics consumption after packaging (49%) and construction (13%) (Figure 1). Import and export volumes are small in comparison to products manufactured locally.

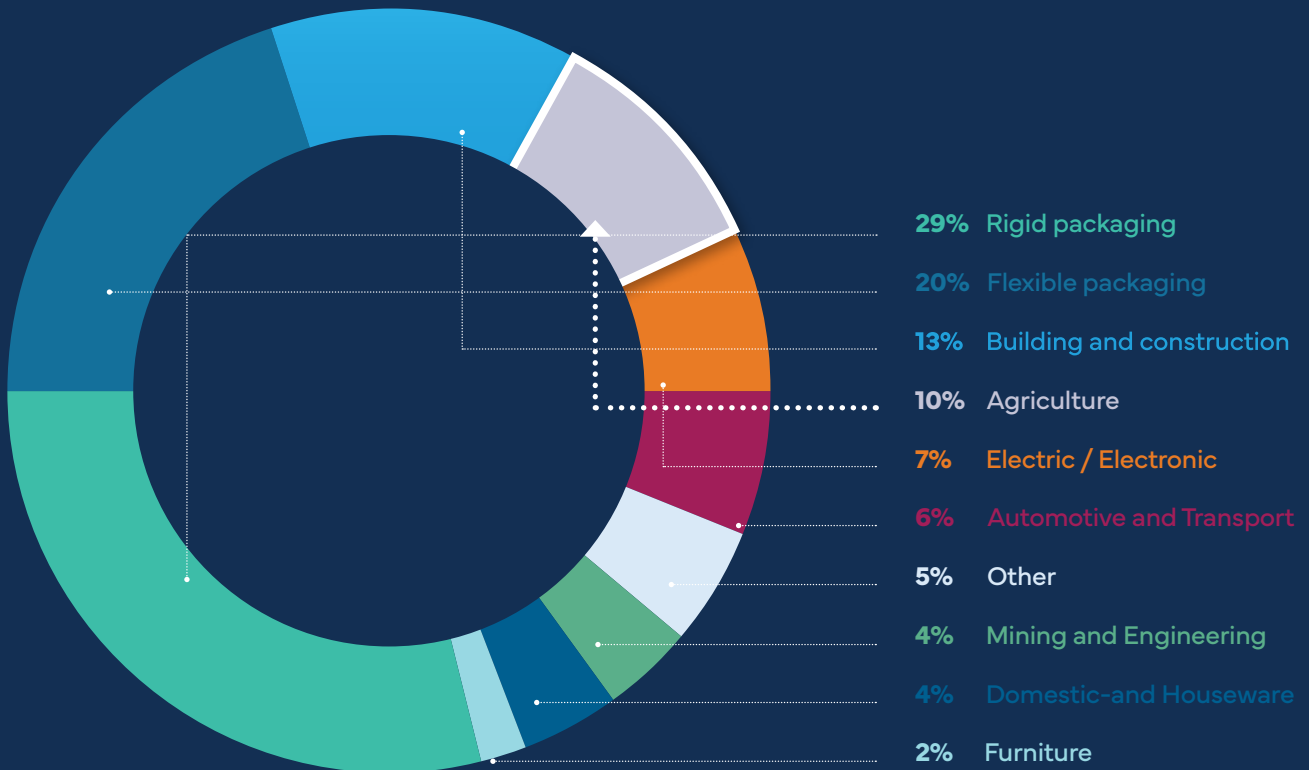


Figure 1: The proportion of polymer converted locally by market sectors

Source: Pretorius (2021)¹

¹Pretorius, A. (2021) Plastics Industry in South Africa in 2019

The agricultural sector consumes more durable products which have a lifetime of more than a year. Annual waste generation and leakage of plastics in tonnes from this sector is relatively small compared to, for example, packaging. Approximately 80 000 tonnes of plastic waste is generated annually and 56% of that volume is improperly disposed of in non-compliant or unregulated landfills.

Rigid plastic packaging (HDPE) used for agricultural chemicals (<25 L containers, drums, totes, and intermediate bulk containers (IBCs)) by members of the industry body CropLife South Africa was estimated to be recycled at a 76% output recycling rate in 2020. Although, packaging is not the focus of this brief, recovery and recycling of plastic packaging from the agricultural sector is driving the recovery of other (non-packaging) plastics, such as irrigation piping, cattle troughs and water tanks, and plastic droppers. Closed loop recycling is achieved for irrigation pipes provided UV-protection is included in the manufacturing process.

The percentage of recycled content in plastic products used in the sector is 25% of total domestic consumption in tonnes. This sector is the third largest sink for recycled plastic after the construction and textile sectors. However, there is scope for much larger usage of recycled plastics specifically in polymers PE-HD, PP, and PE-LD/LLD not only sourced from agricultural products, but also packaging (rigid and flexible), in cases where closed loop recycling is not possible.

This brief:

- o Sets out the further opportunities for circularity for agricultural plastics in the South African context in the short term, namely bioplastics, biodegradable and bio-based materials for non-recovered and non-recycled agricultural plastics; regional reprocessing of agricultural plastics, and avoidance of dumping of products made of polymers that are being phased out elsewhere, and
- o Discusses potential levers to drive greater circularity in the agricultural plastics sector in South Africa.

Bioplastics, biodegradable and bio-based materials

Bioplastics, biodegradable and bio-based materials are new material entrants in the South African agriculture industry. Truly biodegradable plastics are good substitutes for agricultural plastics that are not recovered and recycled, and often degrade in situ, thereby becoming a pollutant. These include agricultural mulch films, shade netting and plastic ties and stays used to support vines and saplings. Opportunities are being explored for compostable mulch films to replace PE-LD/LLD film; and compostable ties and tags to fasten vines and fruit trees. However, there are no local standards and certifications to govern the composting and biodegradation rates of these imported products and it is unclear whether these products will biodegrade in soils or via windrow composting which is the current method of composting in South Africa.

A newly developed South African industry body, the Compostable Packaging Council (COPCO) has developed a nascent local certification system, which currently requires their members to demonstrate adherence to international standards of compostability.

For bioplastics that will not biodegrade in soil, there are also no collection systems or treatment facilities available to process these materials at end of life. Farms are in most cases far from cities or towns where these facilities could be built which could drive up transport costs and hinder effective collections and treatment.

² IUCN-EA-QUANTIS, 2020, National Guidance for plastic pollution hotspotting and shaping action, Country report South Africa (updated)

Regional reprocessing of agricultural plastics

A regional circular economy for plastic products holds potential, particularly for rigid plastics such as chemical drums, irrigation piping, plastic droppers, cattle troughs and water tanks. With South Africa exporting plastic products (either from imports or locally manufactured) and having an established mechanical recycling sector, it may be viable (under new policy and legislative regimes) that these products be sent back to South Africa for end-of-life processing.

As with packaging and finished goods packaged in plastic that is exported to several African countries, circularity could be enabled by initiating assessments of potential for circularity and appropriate requirements to circulate agricultural plastics, which may include bringing these products back to South Africa. These may then be included in the nascent Africa Circular Economy Action Plan that is being developed by the African Union (AU).

Avoidance of dumping of products made of polymers that are being phased out elsewhere

With emerging plastic regulation in the EU and UK that phases out certain polymer types (such as PS and PVC) and applications, there could potentially be dumping of various plastic products in South Africa due to a lack of import criteria or standards.

Therefore, there is a need for such import criteria and standards to avoid efforts for circularity of agricultural plastics being undermined or making the process more challenging in the South African context.

Levers to drive circular plastics in agriculture



Certification schemes: The sector is very diverse and distributed geographically. The key leverage points for circularity for agricultural plastics are active industry bodies and green agricultural certification schemes.

The most effective driver for circularity in agricultural plastics is currently CropLife South Africa's container management programme promoting the recovery and recycling of agricultural chemical packaging. CropLife SA has established a network of more than 117 recyclers countrywide, which are certified by the organisation against strict quality standards. Through these established relationships, CropLife has facilitated the recovery of irrigation piping, water tanks, cattle troughs and plastic droppers (all HDPE) for recycling. The Global G.A.P. System is a private sector food safety certification for the agricultural sector, which has waste management aspects included. The system is used in South Africa, and has facilitated better waste management, and to some degree, recovery of agricultural plastics, especially for those farmers exporting products.



- Other levers** for further development of a circular economy for agricultural plastics include:
- o Focusing on material substitution for agricultural plastics that often leak into the environment, such as:
 - agricultural mulch films;
 - plastics ties to tie vines and other plants;
 - stickers used in orchards and vineyards with relevant information; and
 - bags around flowers and fruit to promote maturation (these are often sprayed and therefore cannot be recycled).
 - o Leveraging CropLife South Africa's relationships with farmers and existing network of recyclers to recover more recyclable agricultural plastics. This includes further training of CropLife South Africa's auditors and team to identify plastics for recovery on farms, and supplying the tools to educate farmers.



- o Investigating other agricultural rating and accreditation systems used locally that may be used to drive plastic circularity, such as systems currently used in viticulture, as well as supplier requirements (health and safety, responsible sourcing, and environmental performance).
- o Developing product standards to promote the use of more post-consumer recycled plastic in agricultural products.
- o Expanding local manufacturing capability of products using locally and regionally sourced post-consumer recycled plastic to reduce the reliance on imports – in the agricultural sector the biggest tonnage imported is in PP twine, netting and bags.
- o Advocating for Extended Producer Responsibility (EPR) regulation for these products (including fishing gear) to assist with financing end of life activities in South Africa and regionally.
- o Including criteria in the nascent African Circular Economy Action Plan under development by the AU to allow cross border material flows from African countries where these products are purchased and used to be sent back to South Africa for processing at end of life. These activities could be financed through mandatory EPR schemes.

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:

- o **Part 1:** The Plastics Landscape in South Africa – Mapping value chains and key players.
- o **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.
- o **Part 3:** Market assessment of circular plastics opportunities in packaging, construction, agriculture and the automotive industry.
- o **Part 4:** A focus on increasing recycled content in packaging through multi-layer conversion.
- o **Part 5:** Advanced recycling technologies in South Africa – status quo and potential.
- o **Part 6:** Alternatives to problematic plastic packaging in South Africa.
- o **Part 7:** The current state of waste plastics management in South Africa.
- o **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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