

South Africa

Shrinking the Problem?

Addressing Problematic PET, PETG and PVC Shrink Sleeves on Food and Beverage Bottles



Plastic Reboot
South Africa

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About Plastic Reboot

Plastic Reboot is a \$108 million programme supported by the Global Environment Facility (GEF), co-led by the United Nations Environment Programme and WWF, and implemented in partnership with the United Nations Development Programme (UNDP) and the United Nations Industrial Development Organization (UNIDO). Plastic Reboot is focused on upstream and midstream solutions to plastic pollution in the food and beverage sector, and is delivered through a Global Project and a suite of 15 National Projects. Together, we are working to transform material systems and engage governments, civil society organisations and the private sector to reduce plastic pollution.

plastic-reboot.org

About GreenCape

GreenCape is a non-profit organisation that drives the widespread adoption of economically viable green economy solutions from South Africa. The team works with businesses, investors, academia and government to unlock the investment and employment potential of green technologies and services, and to support a transition to a resilient green economy. GreenCape is the Secretariat of the South African Plastics Pact, a collaborative platform that convenes key role players across the plastic-packaging value chain to drive innovation, dialogue and collective action towards a circular economy for plastic packaging in South Africa.

GreenCape leads Component 3 of Plastic Reboot – South Africa which aims to promote the uptake of circular solutions in the food and beverage plastic packaging sector. This component focuses on private sector engagement in order to support the adoption of and scaling up of circular economy practices for plastic packaging placed on the market in South Africa. This would be achieved through the development of implementation plans to eliminate problematic plastics, scale reuse models and inclusion of recycled content; reporting on usage of bioplastics; and the facilitation of co-design workshops and pitch events to improve design for circularity with South African Plastics Pact members and the wider plastic-packaging ecosystem.

greencape.co.za









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Contents

ACRONYMS AND ABBREVIATIONS	2
KEY INSIGHTS	3
ABOUT THIS CASE STUDY	4
 TAKING ACTION ON PROBLEMATIC AND UNNECESSARY PLASTICS UNDER THE SA PLASTICS PACT	5
 THE CHALLENGE: PET, PETG AND PVC SHRINK SLEEVES ON PET BOTTLES	6
 THE SOLUTION: REDESIGN	8
 SA PLASTICS PACT MEMBER SUCCESS STORIES	9
Woolworths	9
SPUR Corporation	10
 BARRIERS AND ENABLERS TO ADOPTION AT SCALE	11
 FUTURE OUTLOOK: A PATHWAY FORWARD	13
GLOSSARY	14

Acronyms and Abbreviations

EPR	Extended Producer Responsibility
LLDPE	Linear low-density polyethylene
PE	Polyethelene
PET	Polyethylene terephthalate
PETG	Polyethylene terephthalate glycol-modified
PLA	Polylactic acid
PP	Polypropylene
PVC	Polyvinyl chloride
SA	South Africa



Key Insights

- PET (polyethylene terephthalate), PETG (polyethylene terephthalate glycol-modified) and PVC (polyvinyl chloride) shrink sleeves on PET food and beverage bottles:
 - Have been identified as priority problematic and unnecessary plastic items¹ by the South African (SA) Plastics Pact members
 - Currently represent the largest share by weight of priority problematic and unnecessary plastics being put on the market by the SA Plastics Pact members
 - Disrupt the PET bottle recycling process, resulting in bottles that are technically recyclable being rejected, sent to landfill or polluting the environment.
- Brand owners have begun the shift away from PET, PETG and PVC to a floatable polyolefin material that is compatible with the existing PET bottle recycling process.
- Wider adoption of polyolefin shrink sleeves by importers, brand owners and retailers could substantially increase the number of PET bottles that are successfully recycled.
- Key barriers to the transition to polyolefin shrink sleeves include:
 - Financial and technical implications for packaging designers, label manufacturers, and food and beverage manufacturers
 - Short-term cost premiums for brand owners and retailers.
- Early adopters of polyolefin shrink sleeves succeeded in this transition through close communication and collaboration between the value-chain role players, including packaging and label manufacturers, brand owners, retailers and recyclers.
- Market-wide adoption is needed to unlock the full circularity and financial benefits of transitioning to polyolefin sleeves for PET bottles.
- The SA Plastics Pact provides a platform for knowledge sharing and collaboration. This has accelerated and continues to accelerate the uptake of polyolefin shrink sleeves on PET food and beverage bottles by importers, brand owners and retailers, both individually and at scale.
- Individual and collective action across the value chain can enable a market-wide transition to polyolefin shrink sleeves. This would support all role players in the food and beverage sector. It would also deliver broader circularity benefits, including the decreased use of virgin fossil-based plastic; less waste to landfill; and reduced plastic leakage into the environment.

¹ A plastic item or material is defined as problematic or unnecessary if:

- It is not reusable, recyclable (technically and/or economically not recyclable) or compostable.
- It comprises, or its manufacturing requires, hazardous chemicals that pose a significant risk to human health or the environment.
- It hinders or disrupts the recyclability or compostability of other items.
- It has a high likelihood of being littered or ending up in the natural environment.



Koni © iStock

About this Case Study

Location

South Africa

Lead organisation

GreenCape

Description

How collaboration across the plastic-packaging value chain supports the redesign of shrink sleeves to improve the recyclability of PET food and beverage bottles.

This case study is written for key stakeholders who make or influence decisions about the design, manufacture, retail and recycling of polyethylene terephthalate (PET) food and beverage bottles, including:



Packaging designers and label manufacturers

who are responsible for material and format choices that determine what kind of packaging enters the market.



Brand owners and retailers who make or approve packaging decisions, including:

- o Technical and packaging teams responsible for packaging specifications
- o Marketing teams that influence packaging formats and branding requirements
- o Sustainability teams that drive corporate sustainability commitments.



Collectors and recyclers responsible for the collection, sorting and recycling of PET bottles and associated materials.



Government departments and regulators

responsible for packaging-related policy and legislation, including Extended Producer Responsibility (EPR) regulations.

The case study is focused on the technical aspects of addressing problematic shrink sleeves on PET food and beverage bottles. It does not delve into the social aspects around usage or recycling; this could be a topic for further research.

Taking Action on Problematic and Unnecessary Plastics under the SA Plastics Pact

The SA Plastics Pact is a voluntary initiative that brings together businesses across the plastic-packaging value chain, government and civil society to accelerate the transition to a circular plastics economy in South Africa. During its first phase (2020–2025), members committed to four ambitious 2025 targets that address the entire life cycle of plastic packaging. The aim was to ensure that plastic was valued, reused, recycled and kept out of the environment.



Target 1

Taking action on problematic or unnecessary plastic packaging through elimination, redesign, innovation or alternative (reuse) delivery models.



Target 2

100% of plastic packaging to be reusable, recyclable or compostable.



Target 3

70% of plastic packaging effectively recycled.



Target 4

30% average recycled content across all plastic packaging.

To operationalise Target 1, 12 problematic and unnecessary items were prioritised. PET, PETG and PVC shrink sleeves on PET food and beverage bottles were identified as one of the priority problematic items for action.



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The Challenge: PET, PETG and PVC Shrink Sleeves on PET Bottles

PET beverage bottles are one of the most successfully recycled packaging formats in South Africa, with 67% reportedly collected for recycling in 2024. However, shrink sleeves, a 360-degree, form-fitting label that fully wraps around the bottle, present a significant challenge to this otherwise effective recycling stream. Currently, most shrink sleeves are made from PET or PETG,

with some PVC still in use. Of the 12 problematic and unnecessary items, PET, PETG and PVC shrink sleeves account for the largest share by weight still being placed on the market by the SA Plastics Pact membership (see Figure 1 for 2024, the latest data available). As a result, these shrink sleeves represent a high-impact opportunity for intervention.

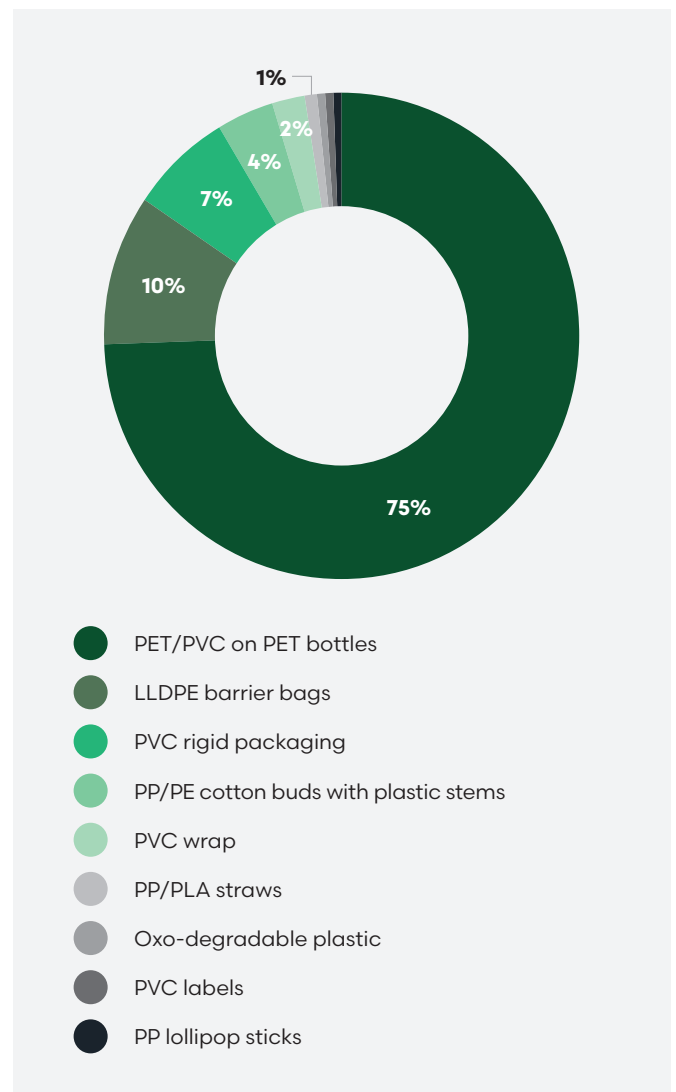


Figure 1: Proportion by weight of problematic and unnecessary items identified under Target 1 placed on the market in 2024 by SA Plastics Pact members

Source: SA Plastics Pact

Current recycling processes cannot effectively separate PET, PETG and PVC shrink sleeve materials from PET bottles that are brought in for recycling. This is due to the densities: the materials are all of similar densities and all sink in the sink-float separation process.



As PET progresses in the recycling processes, the inks and additives in the PET shrink sleeve contaminate the product stream.



Although a PETG shrink sleeve is theoretically the same material as the bottle, it has a different melting temperature and stretch profile, which can create problems in the recycling process.



PVC is particularly problematic because of its different melting point and chlorine content, which can lead to the formation of hazardous byproducts during recycling.

PET, PETG and PVC sleeves can contaminate PET recycling streams, reducing their value and quality. To manage this, recyclers need to manually remove sleeves, necessitating additional labour, logistics, time and costs. It is important to note that even upon removal, the sleeves are not recyclable and must be disposed of in landfills, adding extra costs. In many cases, bottles with these shrink sleeves are rejected entirely. As a result, bottles that are technically recyclable can become practically unrecyclable because of their sleeves.

These design choices (i.e. having a shrink sleeve and material choice) both have implications for compliance with the EPR regulations, which aim to increase the collection and recycling of PET bottles.



Anna Tarazewich © Pexels

The Solution: Redesign

The SA Plastics Pact provides an enabling platform and opportunity to address the challenge of PET, PETG and PVC shrink sleeves on recyclable PET bottles. Through the Pact's Action Groups, which are specialised working groups representing relevant value-chain role players, members have worked together to identify practical solutions for problematic and unnecessary plastic packaging. In the case of shrink sleeves, this process highlighted several potential pathways:

- Replacement of shrink sleeves with labels
- Complete elimination of shrink sleeves
- Material substitution.

Of the pathways considered, replacement of shrink sleeves with labels was not favoured by brand owners and retailers as the bottle would need to be redesigned to enable the application of a label.

Complete elimination of shrink sleeves was also not widely supported by brand owners and retailers. While elimination may be feasible for some products, shrink sleeves often have important functions. These include providing space for regulatory and product information, branding and, in some cases, protecting products from light exposure that could affect quality.

As a result, material substitution emerged as a more practical and scalable pathway for many applications.

Material substitution using floatable polyolefin sleeves (see Figure 2), which include polyethylene (PE) and the more popular polypropylene (PP) (see Figure 2), has emerged as the most viable near-term solution. Polyolefin shrink sleeves can maintain the functional and marketing benefits of shrink sleeves, while improving compatibility with existing PET recycling processes, particularly where the sleeves can be separated from the bottles through float-sink mechanisms.



Figure 2: CCL Label won the 2023 Petco Design for Circularity Award in South Africa for the EcoFloat® polyolefin shrink sleeve

SA Plastics Pact Member Success Stories

Woolworths

Woolworths, a leading multinational brand owner, retail company and founding member of the SA Plastics Pact, has made a long-term commitment to reducing problematic and unnecessary plastic packaging as part of its Good Business Journey sustainability programme.

The company's journey to phase out PVC shrink sleeves began about 20 years ago, driven by concerns about the environmental and health impacts associated with PVC production. These impacts include the release of toxic substances and the risk posed by the improper management of wastewater, which can release harmful contaminants into local ecosystems.

Woolworths chose to substitute PVC shrink sleeves with PETG, which – at the time – was widely considered a suitable alternative. However, exposure to international developments, such as efforts in California to reclassify PETG separately from PET, and engagements with local recyclers, including SA Plastics Pact member Extrupet, revealed that PETG behaves differently during recycling. Woolworths realised that PETG was not the ideal solution.

This prompted a search for a material that could deliver the same shrink performance without disrupting recycling. After exploring international options that did not meet performance requirements, Woolworths worked with label manufacturer MCC, a locally operating multinational supplier and SA Plastics Pact member, to find an alternative. The alternative was polypropylene (PP), a floatable polyolefin material compatible with PET recycling processes. However, as the shrink sleeves had to be imported, supply was initially an issue, with the shrink sleeves not being readily available as they were still considered in development. However, those issues were soon resolved as global supply became available and local demand increased.

In 2023, Woolworths transitioned its first product line to PP shrink sleeves (see Figure 3). This innovation was recognised with the 2024 Petco Award for “Best Design for Circularity”. Woolworths has since continued to transition more product lines to polyolefin sleeves.



Figure 3: Woolworths' PP shrink sleeves fitted to the in-house iced tea brand. These shrink sleeves won “Best Design for Circularity” at the 2024 Petco Awards.

SPUR Corporation

SPUR Corporation, a leading multinational franchised casual-dining restaurant group, is a founding member of the SA Plastics Pact and has committed to eliminating problematic and unnecessary plastics from its portfolio. SPUR has pledged to phase out PET, PETG and PVC shrink sleeves as part of its Greater Good Journey.

The SPUR journey to eliminate PETG shrink sleeves began with the identification of this material as problematic plastic packaging by the SA Plastics Pact. After some investigation, SPUR began tests with the printing supplier and PET bottle manufacturer, Polyoak, in 2023 to identify the most suitable material for

substitution. Polyoak is also an SA Plastics Pact member. Based on the tests, they ultimately selected a floatable polyolefin material, supplied by SA Plastics Pact member MCC, as a suitable alternative. However, the adoption of the chosen polyolefin shrink sleeve was initially hampered by global supply problems, which caused a delay in transitioning to the new format.

In 2024, SPUR began to transition the shrink sleeves on sauce bottles supplied to restaurants to the polyolefin material (see Figure 4). By 2025, SPUR was on track for the complete adoption of polyolefin sleeves across its restaurant range.



Figure 4: SPUR's range of restaurant sauce bottles fitted with polyolefin shrink sleeves

Barriers and Enablers to Adoption at Scale

For substantial and significant impact to be realised, a market-wide change needs to take place. Several barriers currently limit the large-scale replacement of PET, PETG and PVC shrink sleeves with polyolefin alternatives. The most significant of these is cost.

As with many packaging innovations, early adoption carries a price premium. When Woolworths first transitioned to PP shrink sleeves (see Figure 5), the price from their global supplier was reportedly 50% higher than for PETG sleeves. As the adoption of polyolefin shrink sleeves has grown and scaled, the premium has reduced to approximately 20%. This trend illustrates how increased demand can drive affordability. Wider uptake across brand owners and retailers could further reduce costs over time, helping to make polyolefin shrink sleeves financially accessible to the broader market.

It is important to note that pricing strategies can vary among label manufacturers. Where pricing is primarily informed by the cost of raw materials, for example, it has been reported that initial price differentials in the sector were of the order of 20%. This suggests a potential for smaller differentials depending on growth in demand and specific pricing strategies.

Beyond the costs attributable to the material choice, technical adjustments may be required depending on the properties of the sleeve material. Some polyolefin sleeves may have different shrinkage behaviour, which can necessitate equipment recalibration or changes to printing plates. The shrinkage behaviour can also require a change in the bottle design. In the case of SPUR, the new shrink sleeve material called for an increase in the mass of one of the bottles.



Figure 5: PP shrink sleeve fitted to Woolworth's in-house iced-tea PET bottle



Figure 6: CCL Label’s EcoFloat, a low-density polyolefin material that separates automatically from the PET flakes in the sorting and recycling process

The transition may initially appear technically complex and costly to implement, or can be challenging to justify internally. Early adopters have shown that these adjustments are manageable through testing, phased implementation and collaboration with suppliers and recyclers. However, not all polyolefin sleeves exhibit the same behaviour and thus will not present the same challenges or require the same, if any, adjustments.

Local manufacturing of polyolefin shrink labels is a long-term opportunity. Currently, international suppliers operate at scale, and may supply several national or regional markets. At this stage, local demand has not reached the required tonnages to justify investment in a local manufacturing facility, thus all current supply is imported.

In terms of enablers, knowledge sharing across the value chain plays a key role in reducing uncertainty and accelerating learning and adoption. This would include sharing knowledge between packaging and label manufacturers, brand owners and recyclers. Collaborative platforms, such as the SA Plastics Pact, enable this exchange, so that companies do not have to navigate the transition alone.

As demonstrated in the member success stories, alignment across the supply chain, as well as within internal departments, creates an enabling environment for innovation and lowers barriers to change.

Collaboration between members of the value chain is also a key lever for innovation. Comments by a recycler brought focus on PET, PETG and PVC shrink sleeves as a problematic item. Brand owners, label manufacturers and PET bottle manufacturers worked together to find a solution that met the technical requirements of their products. A recycler played a further vital role by making its facilities available to the label manufacturer for testing.

Even as local adoption of polyolefin shrink sleeves increases, recycling imported PET beverage bottles may continue to pose a challenge if the sleeves on those bottles contain incompatible materials. Such products can contaminate recycling streams and undermine local progress. Importers may have some leverage, and could exercise this, to specify packaging that is compatible with South African recycling systems. In addition, policy mechanisms such as eco-modulation under EPR regulations could create incentives that support the transition to recycling-compatible shrink sleeve materials.

Future Outlook: A Pathway Forward

Despite encouraging progress, PET, PETG and PVC shrink sleeves remain widely used. In many cases, recyclers are still unable to distinguish between compatible and incompatible shrink sleeves. As a result, any PET bottle with a shrink sleeve may be rejected and end up in landfill. Scaling the transition to recyclable alternatives is therefore essential to improve circularity for PET food and beverage bottles. Plastic Reboot – South Africa aims to support the SA Plastics Pact in eliminating problematic shrink sleeves.

The widespread adoption of polyolefin shrink sleeves by brand owners and retailers could deliver several benefits, such as:



Drive down the costs of polyolefin materials through economies of scale.



Increase the likelihood that PET bottles with shrink sleeves will be collected by both the formal and informal sectors.



Reduce the risk of contamination of an already reliable recycling stream (PET bottles).



Eliminate problematic plastics – PET, PETG and PVC shrink sleeves – from the food and beverage bottle value chain.



Provide circularity benefits for South Africa, including reduced use of virgin fossil-based plastic, less waste to landfill, and reduced plastic leakage into the environment.



© Woolworths

Figure 7: PP shrink sleeve fitted to Woolworth's mayonnaise PET bottle

Glossary

EPR (Extended Producer Responsibility):

An environmental policy strategy that extends a producer's accountability for a product beyond its initial manufacturing stages to include the post-consumer phase of the product's life cycle. Key characteristics of an EPR policy include the transfer of responsibility, either in physical or economic terms, from municipalities to producers, either entirely or partially. EPR policies incentivise producers to integrate environmental considerations into the design of their products.

LLDPE (linear low-density polyethylene): A plastic polymer produced from co-polymerisation of ethylene with short-chain alpha-olefins such as butene or hexene.

PE (polyethylene): A versatile polyolefin derived from ethylene.

PET (polyethylene terephthalate): A highly versatile plastic belonging to the polyester family.

PETG (polyethylene terephthalate glycol-modified): A copolymer version of PET where a second type of alcohol (glycol) is added to the chemical process.

PLA (polylactic acid): A bioplastic derived entirely from renewable, plant-based resources.

Polyolefin: A family of thermoplastics that includes polyethylene and polypropylene. They are produced by polymerising respectively ethylene and propylene, mainly obtained from oil and natural gas. Polyolefins can also be derived from renewable resources (e.g., sugar cane).

PP (polypropylene): A plastic produced by polymerising propylene.

Problematic and unnecessary plastic items: A plastic item or material is defined as problematic or unnecessary if:

- It is not reusable, recyclable (technically and/or economically not recyclable) or compostable.
- It comprises, or its manufacturing requires, hazardous chemicals that pose a significant risk to human health or the environment.
- It hinders or disrupts the recyclability or compostability of other items.
- It has a high likelihood of being littered or ending up in the natural environment.

PVC (polyvinyl chloride): A polymer whose manufacturing process involves combining chlorine with ethylene.



Transitioning the food and beverage sector from linear waste to circular systems.