



Industrial containers: A poster child for the circular plastics economy?

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The need to re-imagine our relationship with plastic is one of the most pressing societal challenges



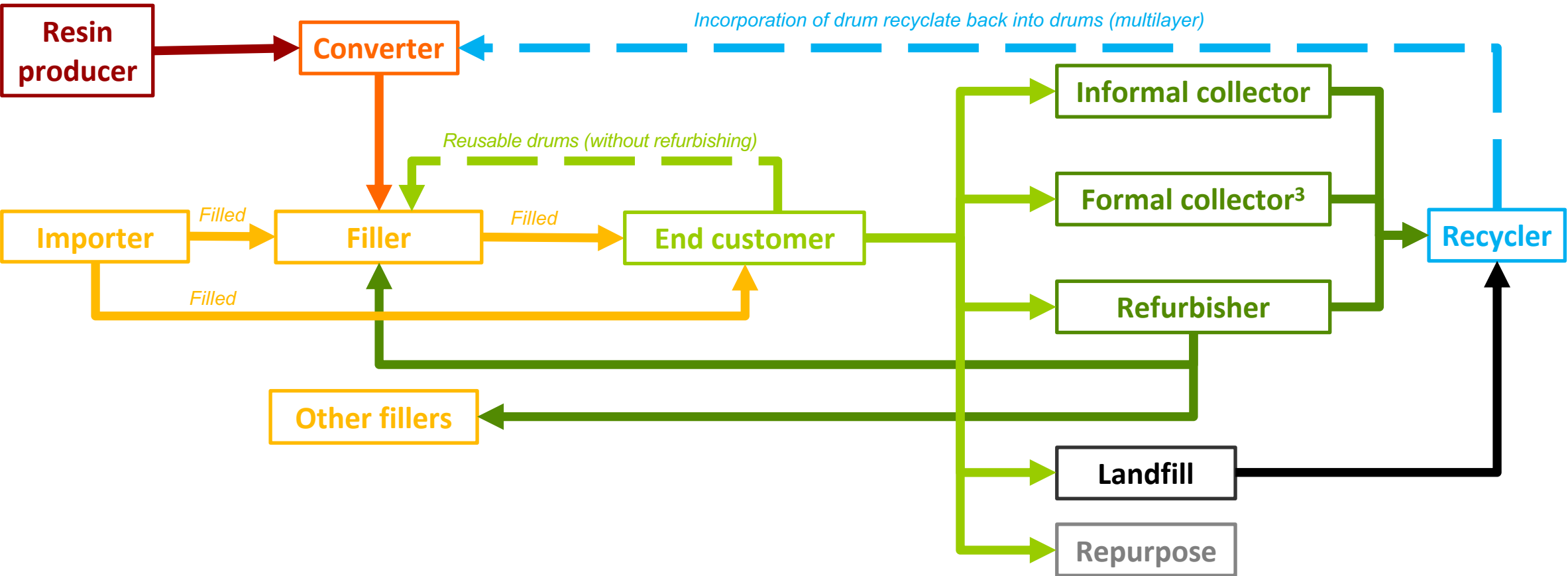
VS



How does the industrial packaging sector stack up?



The value chain for drums is significantly more complex than many other forms of packaging

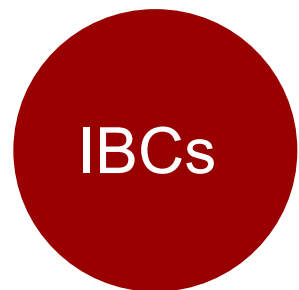
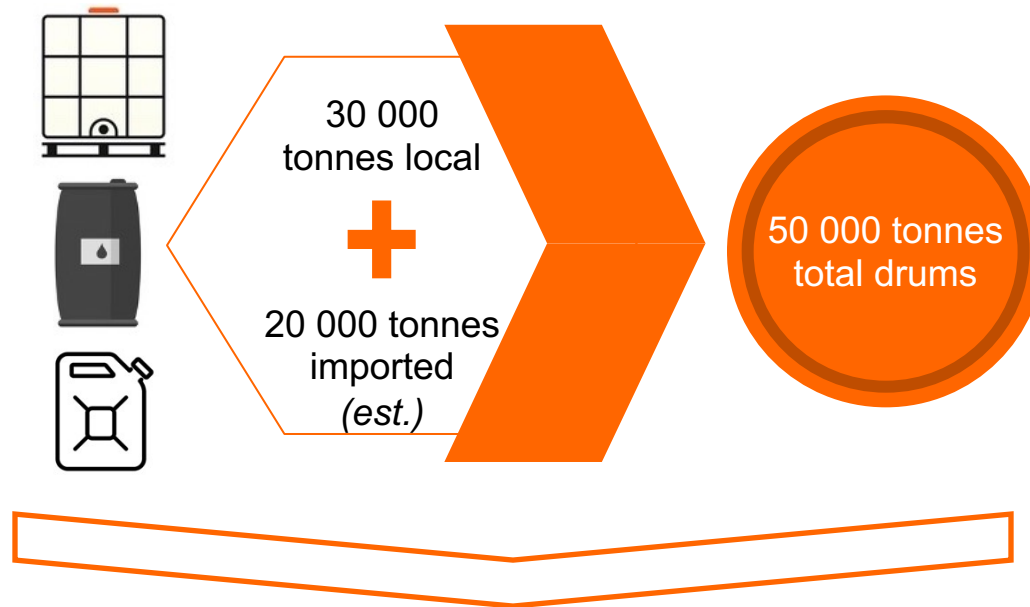


This is because drums are predominantly used for storage and transport of bulk product and are a type of asset, rather than a consumable packaging item.

1. Filler buys packaging and fills with commodity product; 2. End customer buys drum filled with product. 3. This may be the filler, if they have an arrangement to collect empty drums to be refurbished.



The drums market in South Africa is estimated at $\pm 50\,000$ tonnes (local + imported)



Leader:



Leader:



Leader:



Quantification of imports is challenging as most drums enter the country filled.

Drums used to transport product across borders need to be UN certified

Why

Provides critical packaging data:

- Packaging type, material, head or wall type, level of testing, mass / specific gravity, hydrostatic test pressure, year and location of manufacture and manufacturer

How

- Manufacturer applies for certification in line with UN standards
- Testing of physical integrity of products by an external accredited facility
- Internal processes and procedures also externally assessed
- Regular internal testing of products to ensure integrity



When

- Annual external assessments
- Internal product integrity tests done daily and weekly, depending on what is being tested and internal processes and procedures

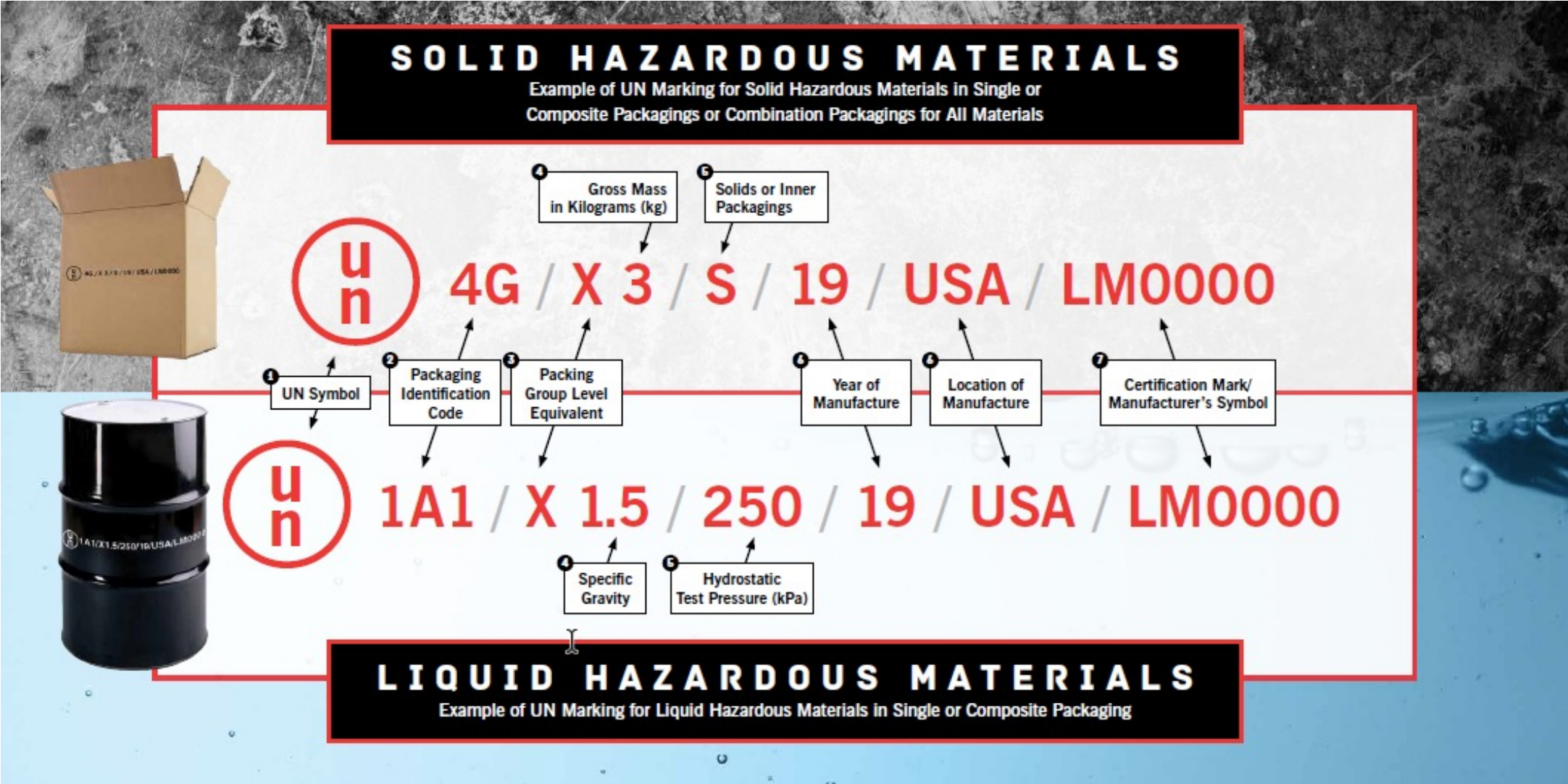
By who

- Two key accreditation agencies, namely TEN-E and SABS
- Majority of manufacturers use TEN-E
- Internal Quality Assurance functions

Much like with ISO accreditation, converters need to maintain very specific processes, procedures and product integrity to be able to UN certify their drums.



The UN number could be used to account for imports in a closed-loop system

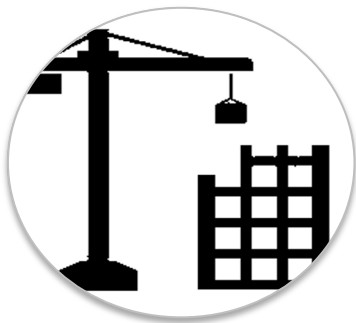




Plastic drums have widespread applications that span many industrial & commercial sectors



Food & Beverages



Building & Construction



Pharmaceuticals



Chemicals

*Tend to be large drums
(210-250 l)
Almost always tight-head
drums*



Agriculture

*Tend to be
smaller drums
(20 / 25 l)*



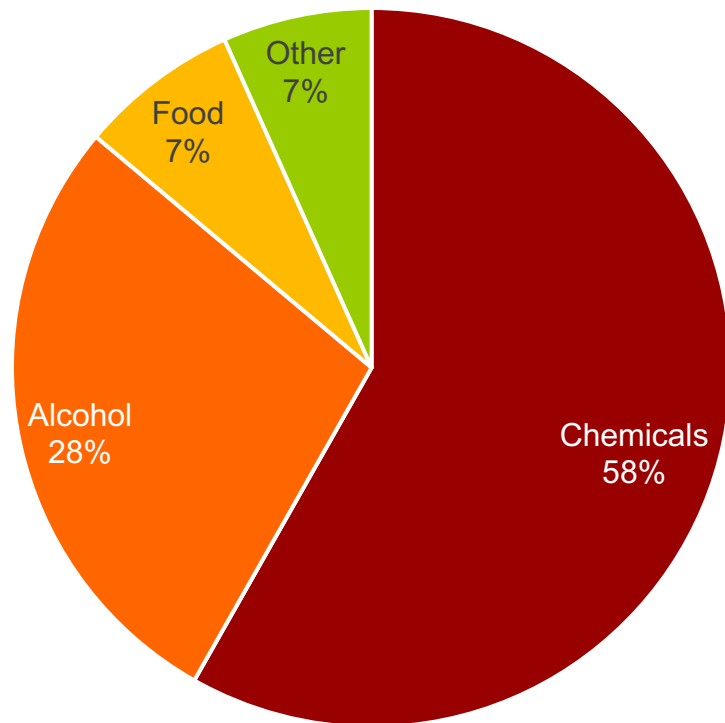
Oil, lubricants & paints

*Tend to be
smaller drums
(20 / 25 l)*

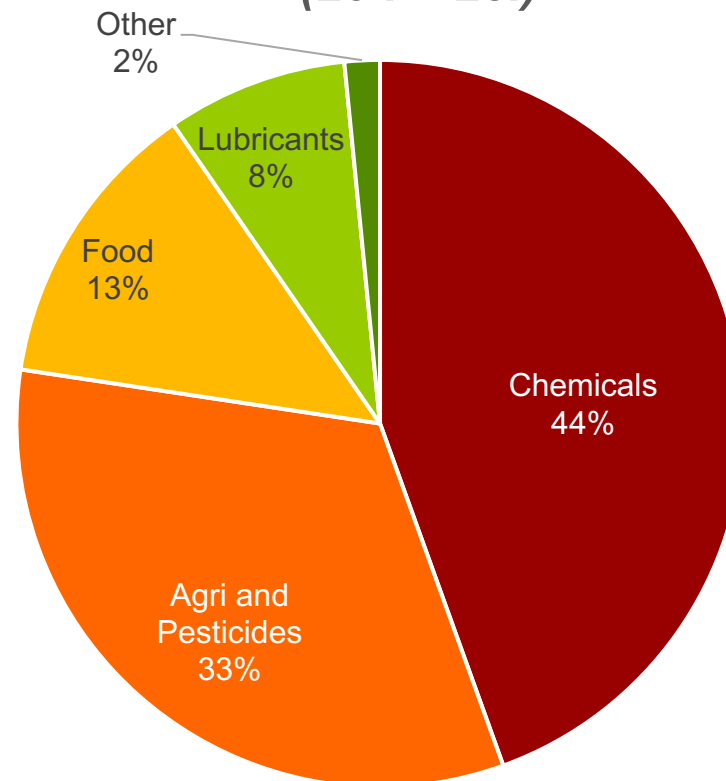


The agricultural and chemicals sectors seem to drive the majority of locally manufactured drum market

*Large drums tonnages by sector
(100 l – 250 l)*



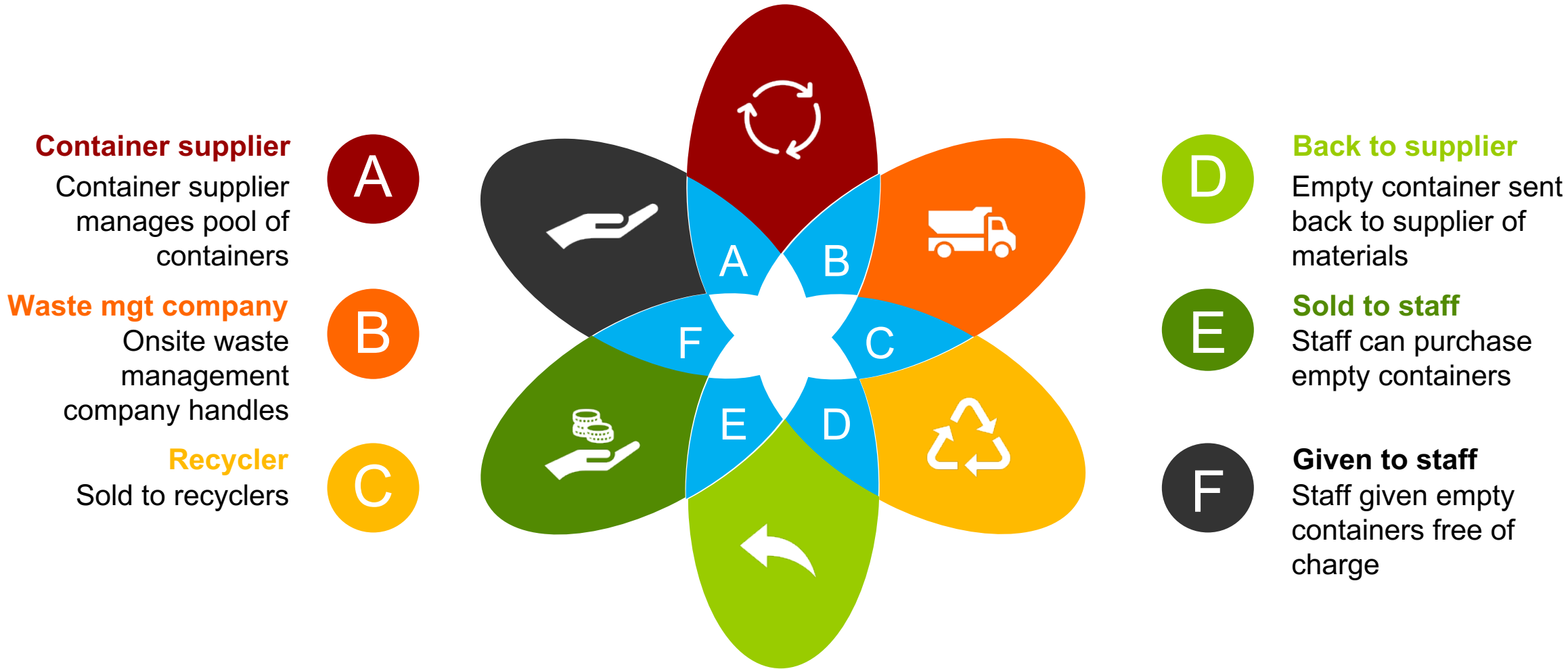
*Small drum tonnages by sector
(20 l – 25l)*



Almost 70% of drum tonnages are attributable to the chemicals and agri sectors.

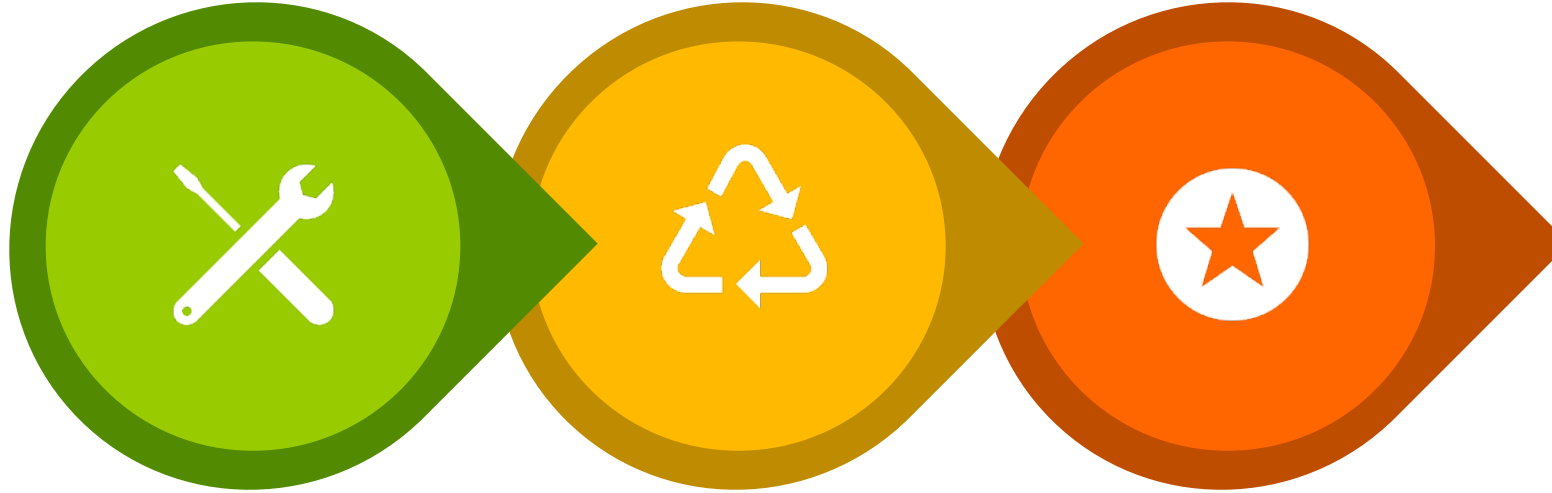


Our analysis highlighted that end customers deal with their drums in multiple ways



Tracking and tracing drums' next life is extremely complex, particularly given the number of end customers.

All drums tend to have a “next life” after their first application and as a result, are largely circular in nature



Recondition

- Large drums and IBCs
- Both certified & non-certified reconditioners
- Managed by SAICRA
- When cannot be reconditioned again then recycled

Recycle

- Viewed as valuable by recyclers
- Good management of herbicide and pesticide small drums pre-recycling by CropLife

Repurpose

- Often to carry and store water for construction
- Used as dustbins

It is important to note that very few drums appear to end up permanently on landfill or in the environment as they are too valuable from a recycling perspective.



Reconditioning of large drums involves the process to allow the drum to be re-used

What reconditioning involves:

Plastic drums:

- Decanting of contents
- Washing (interior & exterior) with hot caustic wash
- Drying

Steel drums:

- De-denting
- Drum curling, expanding
- Cutting, grinding
- Washing, wiping, vacuuming
- Welding
- Spray painting



Washing



Drying



Images from site visit to
Peninsula Drums, Philippi

A UN certified drum can have a useful lifespan of up to five years



There is progress towards a more circular, closed-loop system



IBC management model:

- Collected > washed > shredded
- Regrind sent to Germany plant for reprocessing (from B grade to A grade)
- Buys back pelletized PCR from Germany
- Minimum 30% used PCR in IBCs



Large drum management model:

- Currently manage drum “pool” on behalf of clients
- Collected > washed > reconditioned / sent to recycling
- Purchase PCR from recyclers
- Integrate into drums:
 - For drums used for waste going to incineration (e.g. medical) = 100% PCR
 - Apply in middle layer of co-extruded drums
- Minimum 30% used PCR in drums



Can this be a model for broader sector?

The inclusion of PCR is not without challenges

Challenges with PCR inclusion:

- UN-specifications don't allow recycled content to any great extent due to weakening polymer chains
- Only certain applications allow PCR (not food grade)
- Recycled content is more expensive than virgin due to proximity to recyclers
- The smell of PCR can be off-putting



- **Co-extrusion is currently the best solution:**
 - Product contact layer and external layer are virgin polymer while the middle layer is PCR
- **Requires co-extrusion equipment:**
 - Mauser has this capability and is utilising it
 - A further 3 converters are currently running co-extrusion trials

All manufacturers use industrial regrind in their processes but this is simply a production efficiency mechanism, not a circular economy solution.



There are risks associated with the repurposing of drums



*"There **appears to be less of an issue with contamination** by previous contents. This is probably due to the nature of the resins which have low porosity - unlike the grade used for milk bottles"*

*"Remaining residues from our drums (water treatment) is **not going to kill you** – but precautions must still be taken"*



"Ingress definitely occurs – even if container is fluorinated"



"Drums are dangerous – people need to be aware that cannot repurpose all drums"

*"The interiors and exteriors of these containers must be cleaned & reconditioned to **prevent contamination of materials** from one consignment to the next and to ensure the integrity of the containers"*



Qualitative evidence indicates that drums are reused to carry and store water, especially for construction, and as refuse bins, although it appears that the volumes of these are limited.





From an EPR perspective, contents are as important as packaging



- Pesticide and herbicide drum management post-use
- Registered as a PRO and have submitted an EPR plan
- Already achieving >70% recycling rates on drums



- **Levy collection at filler level** as the focus of the EPR scheme is on dealing with hazardous waste disposal



- Management of all other drums (20 l – 1050 l)
- Registered as a PRO and have submitted an EPR plan
- Already have Nampak as a member (Polyoak is not)



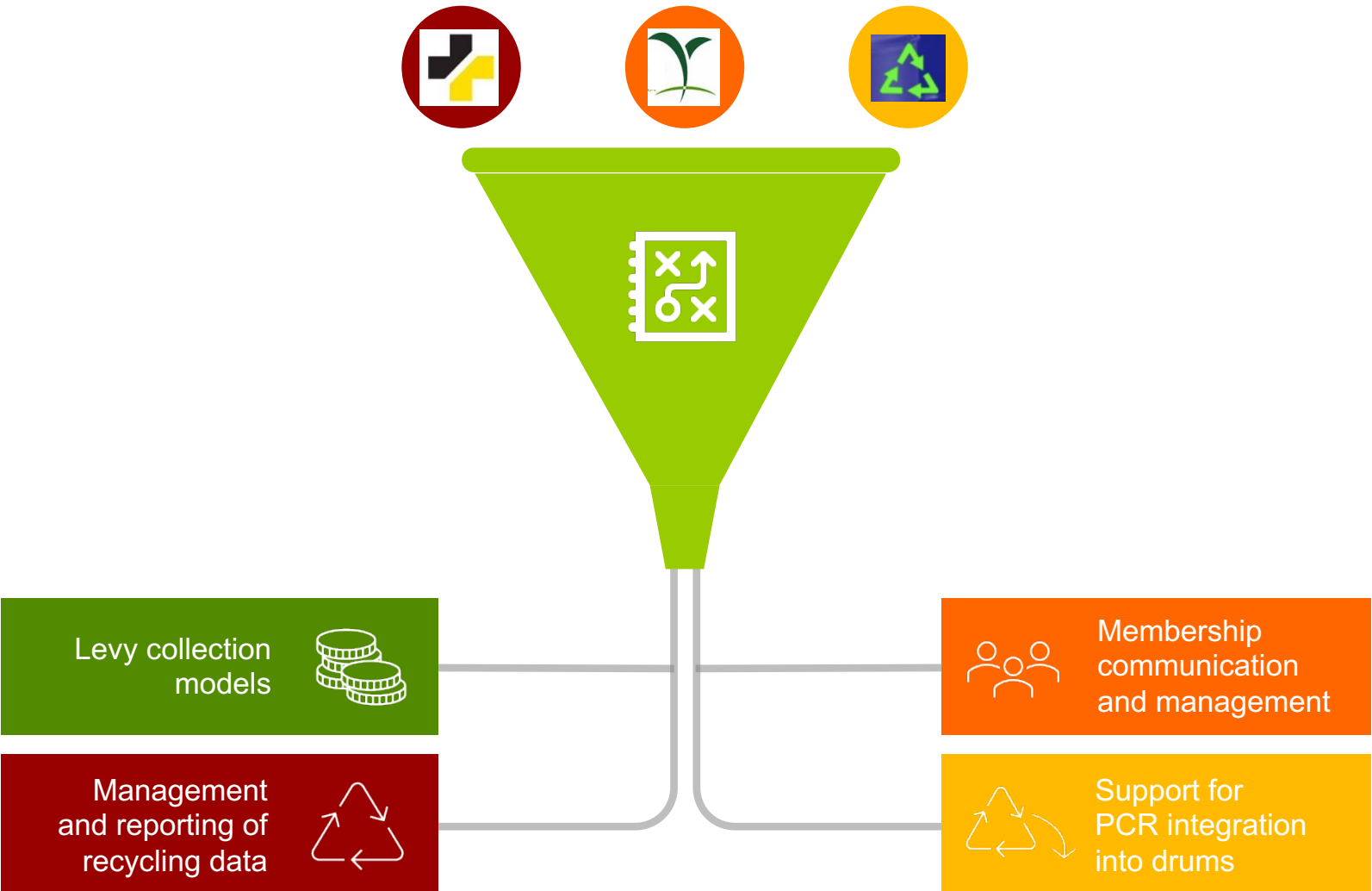
- Planned **levy collection** from **converters**
- Aiming to ensure levies are as low as possible¹ - exploring exclusion of drums from packaging EPR
- Focus is on driving circularity and responsible post-use management – close loop approach to become norm

These organisations are well equipped to manage EPR .

1. All research indicates informal collector contribution to this sector is relatively small, as most drums are handled by formal waste management companies. Levies are therefore unlikely going to be needed to stimulate collection, unlike with many other packaging types.

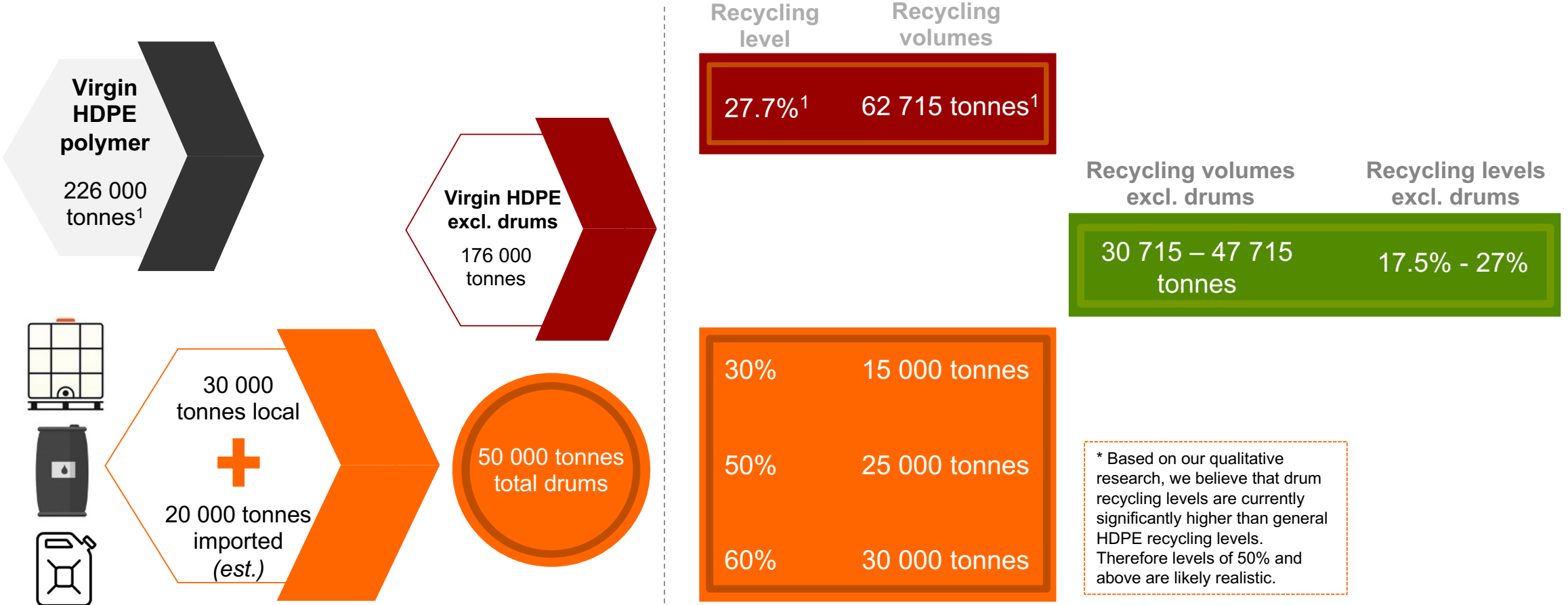


Multiple PROs need to collaborate to ensure effective EPR





The impact of excluding drums from packaging recycling targets needs to be very carefully considered

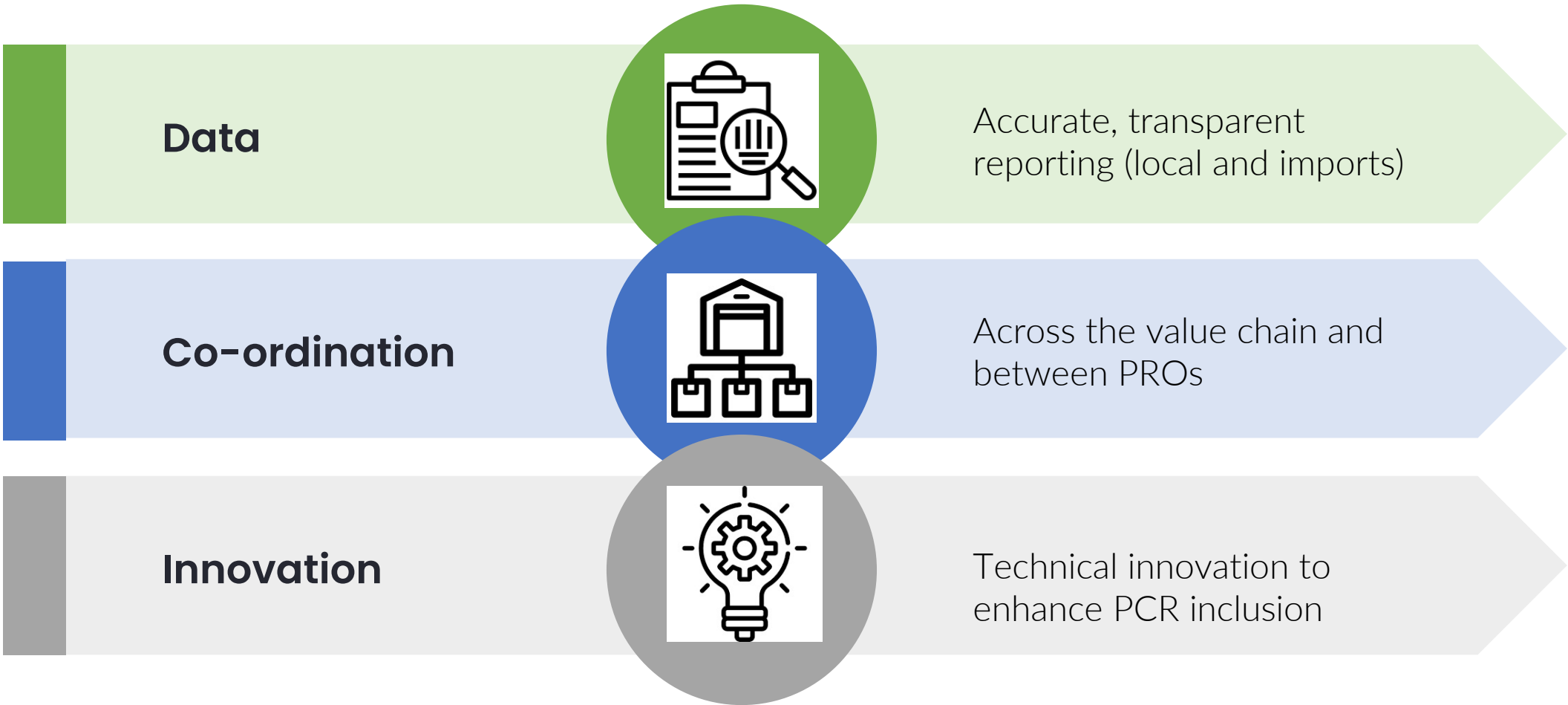


Their exclusion may have a material impact on the ability to meet legislated targets for packaging.

Source: 1. Plastics Recycling Report Executive Summary 2020 (PlasticsSA).



What is needed to drive greater circularity?



REDUCE · RE-USE · RECYCLE · RE-THINK · RE-PURPOSE



Thank You