Design for Recycling

-Fundamentals-

Annabe Pretorius

March 2019

SAPRO

South African Plastics Recycling Organisation


Lite Medium Fat Spread
1 kg
Margarine
1 kg
Extra Lite Low Fat Spread
500 g


SPAR
Choice Grade
MIXED VEGETABLES
DICED CARROTS, CUT GREEN BEANS, SWEETCORN KERNELS, WHOLE GREEN PEAS
KEEP FROZEN
1 kg


SPAR
FULL CREAM FRESH MILK
ULTRA-PASTEURISED
EXTENDED SHELF LIFE
2 Litres
STAYS FRESH FOR 35 DAYS UNOPENED
KEEP REFRIGERATED
CONSUME WITHIN 4 DAYS OF OPENING


SPAR
BURST
orange
500 ml


Blueberry muffins 6's


SPAR
INSTANT NOODLES
Chicken Flavour
Ready in 3 minutes
75 g


SPAR
SUNFLOWER OIL
500 ml


PEEL HERE
SPAR
CHEDDAR
CHEESE
700 g
KEEP REFRIGERATED
ONCE OPENED USE WITHIN 5 DAYS.


SPAR
Coconut Oil
50 ml


SPAR
REFINED
WHITE
SUGAR
Best Quality


SPAR
Squillos
CHOCOLATE FLAVOURED
FULL CREAM MILK
STERILISED


SPAR
HONEY
CHOICE GRADE
Gathered from the nectar hidden in the heart of flowers
375 g
IRRADIATED


PnP
Summer crisp lettuce
Frilly, crispy leaves with a gentle sweet flavour
150 g
WASHED AND READY TO EAT
KEEP REFRIGERATED


Chicken
Fresh Chicken
Without giblets
All excess skin & fat removed


PnP
Feta Cheese with Black Pepper
200 g
KEEP REFRIGERATED
SERVING SUGGESTION

Today's content

- Environmental messages
- The need for packaging
- Plastics Recycling in South Africa
- Why are we not recycling more?
- Circular economy
- Design for Recycling fundamentals

SAPRO
South African Plastics Recycling Organisation

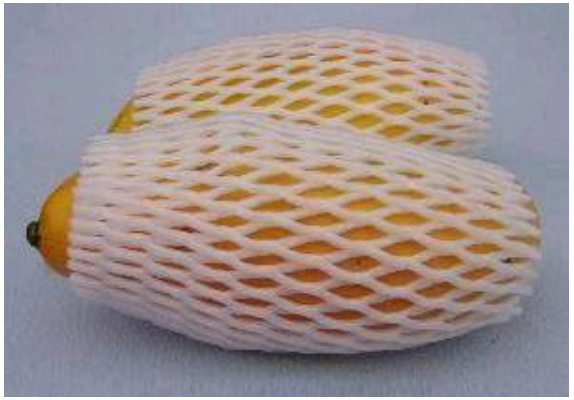
Masiphumelele township


MILK
CASSAVA
MUHOGO
KORIE


Mac Marshall's
GOURMET
CHICKEN SAUSAGES
Gourmet Sausages with the authentic taste of India

We need packaging!

Maybe not so much!



5 Disturbing Facts about Plastic

Why Plastic is Bad!

Adverse Health Effects

Can cause cancer, birth defects, genetic changes, chronic bronchitis, ulcers, skin diseases, deafness, vision failure, indigestion, and liver dysfunction

PLASTIC
not currently
recycled

SLEEVE	TRAY	FILM
CARD widely recycled	METAL check local recycling	PLASTIC not currently recycled

SOURCE SLEEVE	SLEEVE	LIDDING FILM	TRAY
MADE FROM A MINIMUM 70% PAPER THAT YOU RECYCLED	PAPER WIDELY RECYCLED	PLASTIC NOT RECYCLED CURRENTLY	PLASTIC WIDELY RECYCLED

WWW.WOOLWORTHS.CO.ZA/RECYCLE

??

Visible litter

Visible Recycling

Mechanical
Recycling

Visible
litter

Visible
Recycling

Recycling ?

What is happening in the Plastics Recycling Industry?

Plastics Recycling - 2017

- 313 780 tons recycled into new materials
- Only 6,3 % of collected waste was exported to be recycled elsewhere
- 43,7 % of all recyclable plastics waste collected for recycling
- More than 1 million tons not yet recycled

PlasticsISA

How much is 313 780 tons?

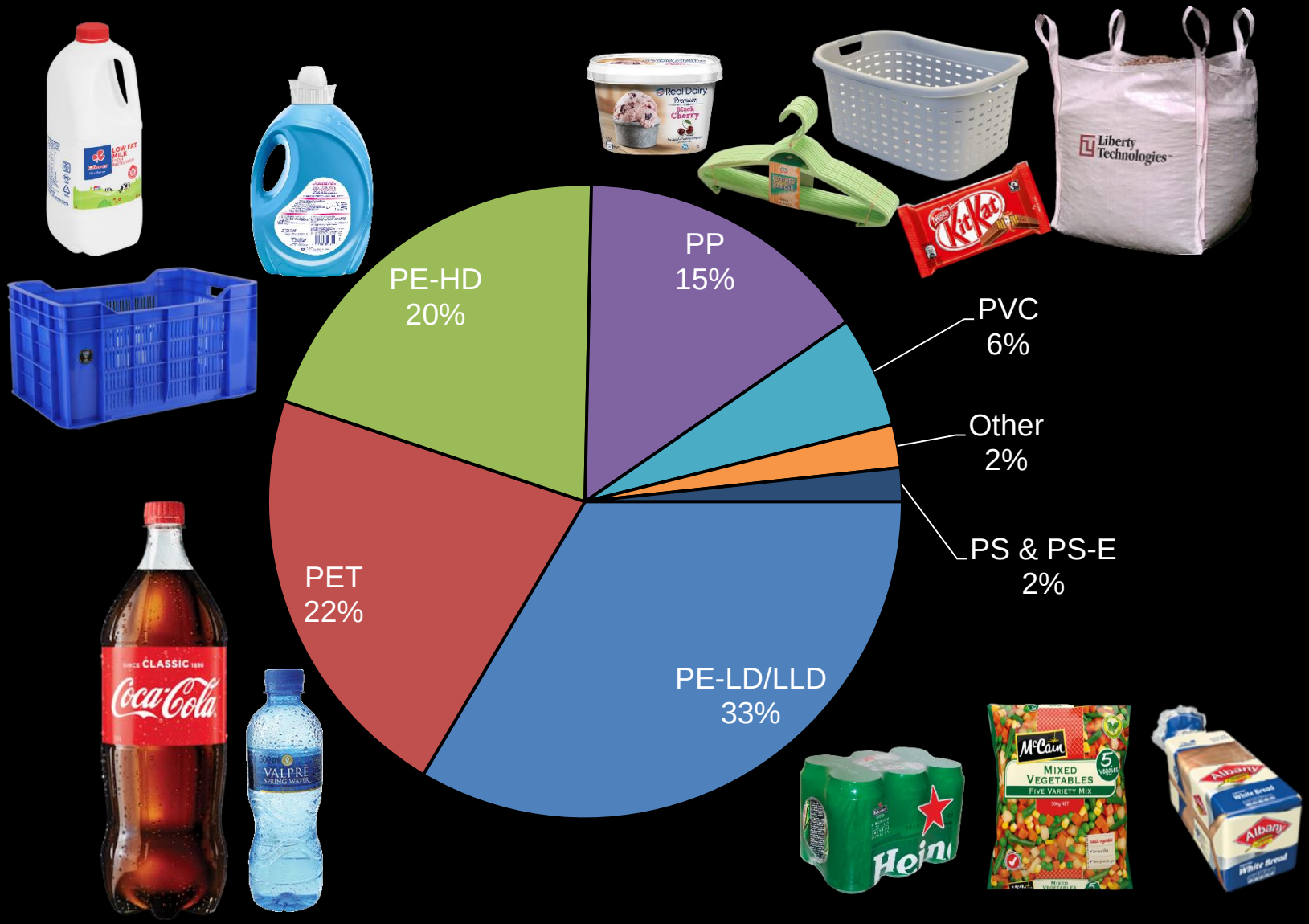
560x A380 Airbus aeroplanes

17 million milk bottles every day for one year

Fuel equivalent of 178 000 cars on the road for 1 year

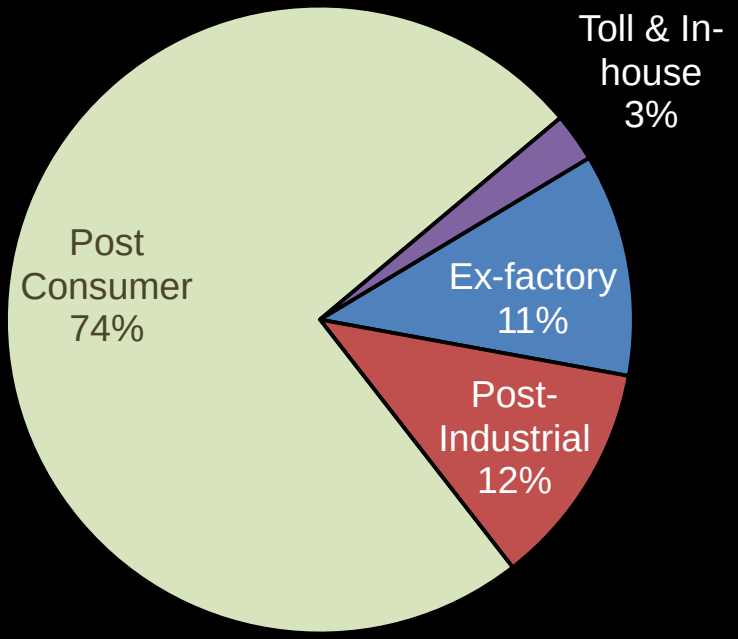
Materials recycled in 2017

Materials recycled in 2017



Where does it come from?

Where does it come from?



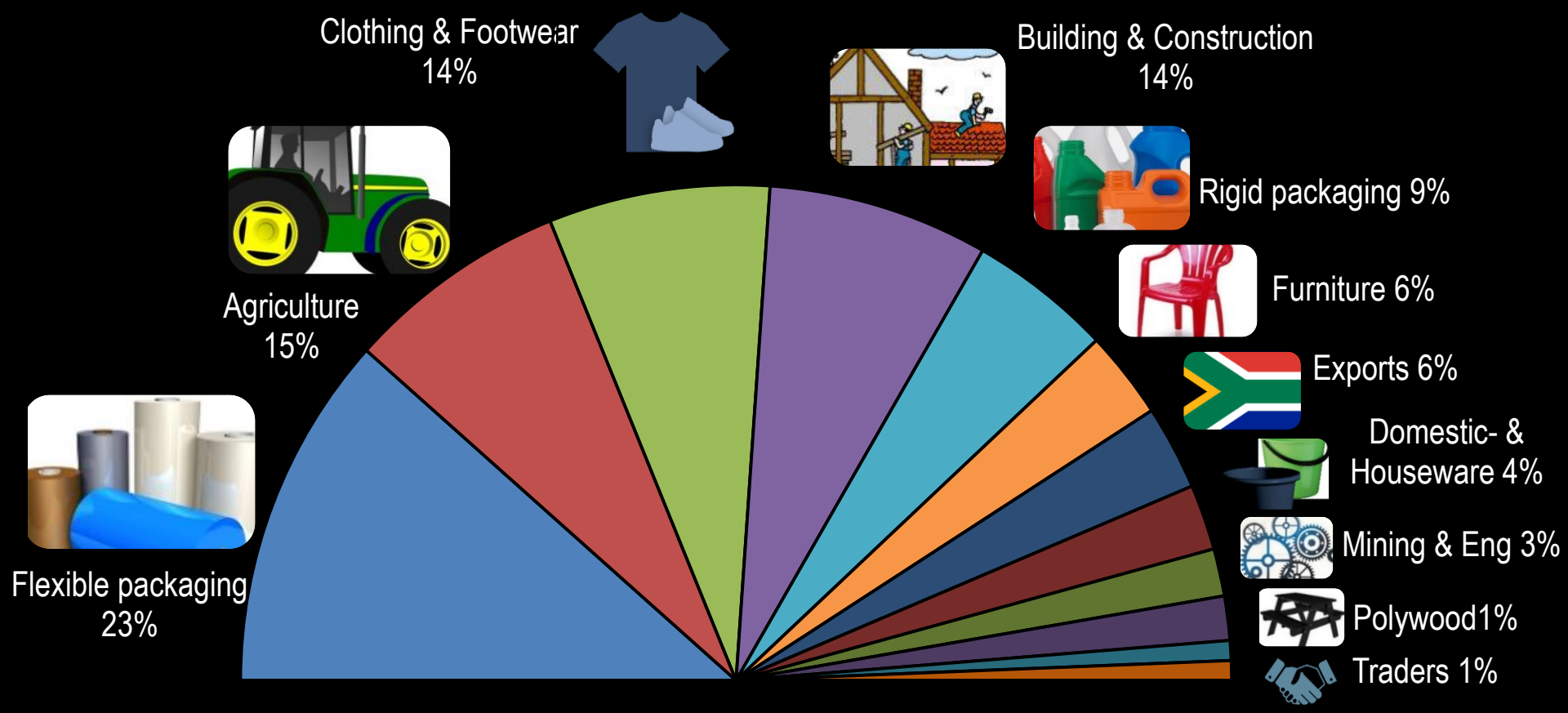

Mixed &
Colour
PE-LD film

Post Consumer Recycling

- High contamination levels – 25 to 38%
- Costly to clean material
- Separation at Source – DEA is busy developing national guidelines
- Relying on contractor to pick “profitable” materials
- Indirect communication to consumer

Recyclate Markets 2017

Recyclate Markets 2017



End Markets

- Demand is driver for recycling in SA
- Traditional markets saturated
- Have to create new end markets
- Brand owner commitment towards recycled content
- Consistency and Reliability

Why are we not recycling more?

Not being recycled

- Not recyclable
  - Multi-material
  - Multi-layer

Clean, post-industrial material is recycled by “polywood” recyclers

Not being recycled

- Not recyclable
- Too small to be picked

Not being recycled

- Not recyclable
- Too small to be picked

Caps, closures and wrappers are recycled if in the formal waste system

Not being recycled

- Not recyclable
- Too small
- No market for recyclate

rPET trays

Too much $CaCO_3$

Not being recycled

- Not recyclable
- Too small
- No market for recyclate
- Uneconomical to collect / recycle
  - Not enough

Not being recycled

- Not recyclable
- Too small
- No market for recyclate
- Uneconomical to collect / recycle
  - Not enough
  - Transport costs

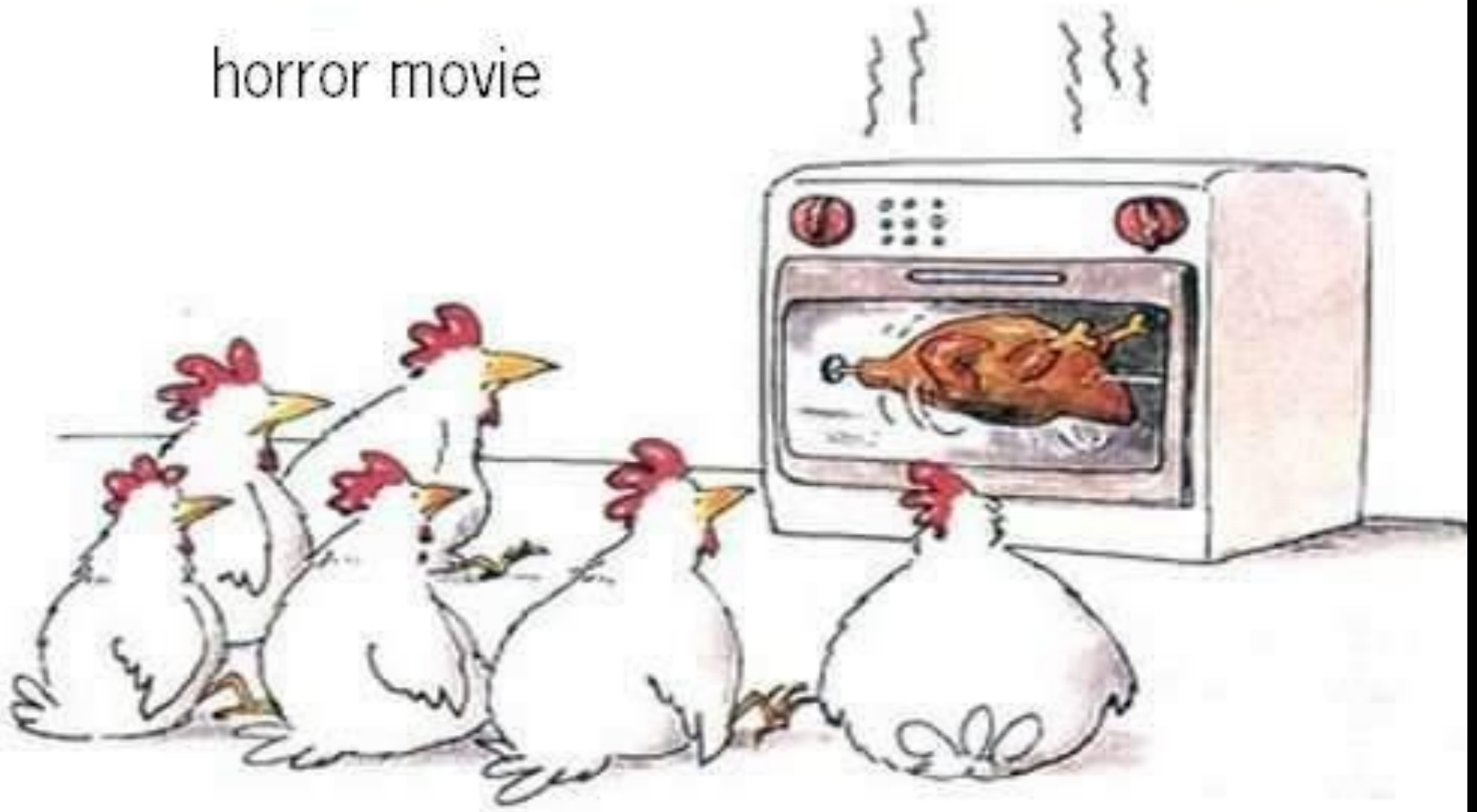
Developing solution-hubs

Not being recycled

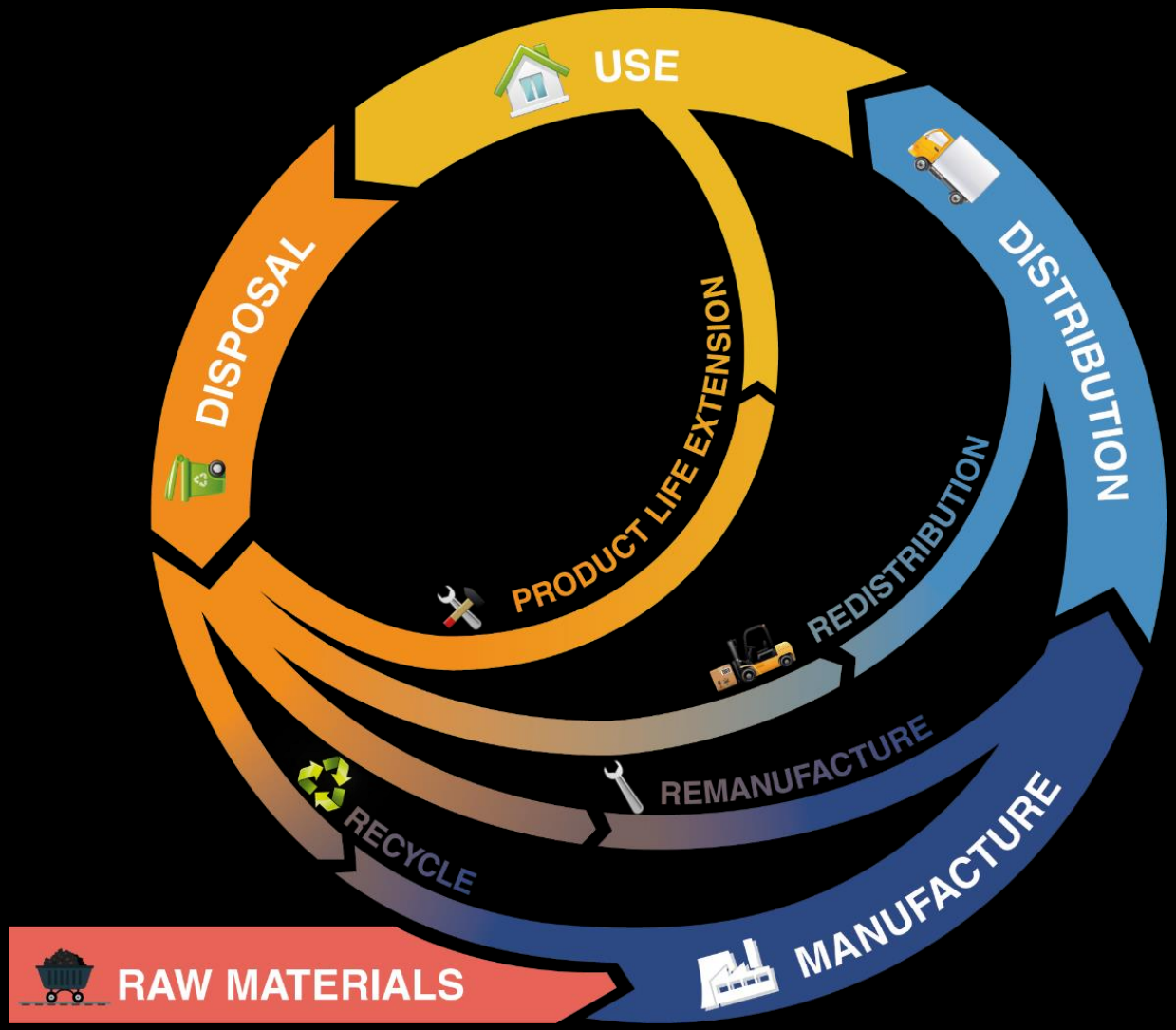
- Not recyclable
- Too small
- No market for recyclate
- Uneconomical to collect / recycle
- Not recognisable

Not being recycled

- Not recyclable
- Too small
- No market for recyclate
- Uneconomical to collect / recycle
- Not recognisable
- Biodegradable or Compostable

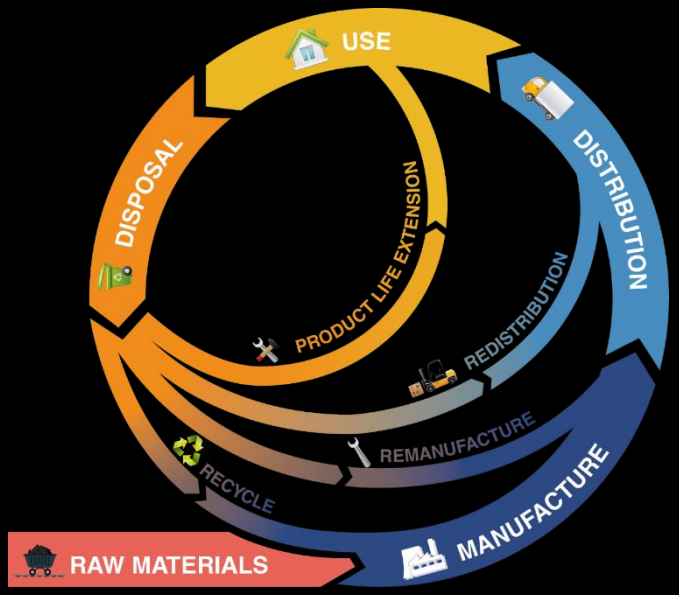

horror movie

Circular Economy



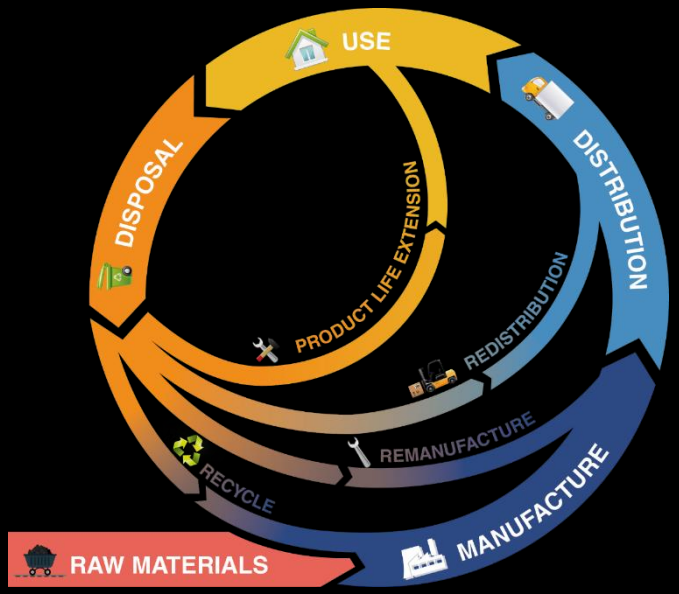
Circular Economy

1. Raw material sourcing
2. Manufacturing
3. Distribution
4. Consumer & Retailing
5. Separation at Source
6. Recycling
7. Remanufacture - recycled content



Circular Economy

1. Raw material sourcing
2. Manufacturing
3. Distribution
4. Consumer & Retailing
5. Separation at Source
6. Recycling
7. Remanufacture - recycled content



Design for

Useful tools

- ISO 14021 & 14025 – Environmental claims
- ISO 17098 – materials that may impede packaging recycling
- ISO 18604 – mechanical recycling

Useful tools

- ISO 14021 & 14025 – Environmental claims
- ISO 17098 – materials that may impede packaging recycling
- ISO 18604 – mechanical recycling

- http://www.recyclass.eu

Useful tools

- ISO 14021 & 14025 – Environmenta
- ISO 17098 – materials that may imp
  recycling
- ISO 18604 – mechanical recycling

- http://www.recyclass.eu
- Packaging SA – Design for Recycling Guide

Useful tools

- ISO 14021 & 14025 – Environmental claims
- ISO 17098 – materials that may impede packaging recycling
- ISO 18604 – mechanical recycling

- http://www.recyclass.eu
- Packaging SA
- Basic fundamentals

Design fundamentals

- End-of-Life

Design fundamentals

- [x] Fit for purpose
- [x] Price
- [ ] End of Life

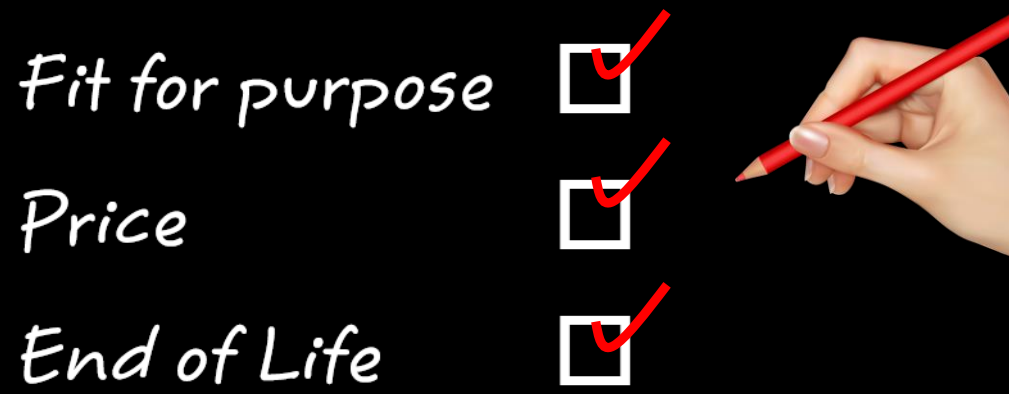
Design fundamentals

Fit for purpose ☑

Price ☑

End of Life ☑

Design fundamentals



- Is it labelled / marked accordingly?
- Is it the best we can do for now?
- What should we be doing to be more environmentally responsible?

Design fundamentals

- End-of-Life
- Material identification codes

Material identification codes

1 PET

2 PE-HD

3 PVC

4 PE-LD

5 PP

6 PS

7 Not one of the first 6, e.g. ABS, PC, PETG

Tell us what “7” is

Perfect !

Should have said:
No 2 PE-HD

No material identification code!

PP tub and PS lid – how must the recycler guess??

Design fundamentals

- End-of-Life
- Material identification codes
- Labels and Sleeves

Labels & Sleeves

Not recyclable

PET bottle, PVC sleeve

Recyclable

PE-HD bottle, PVC sleeve

What material to be used?

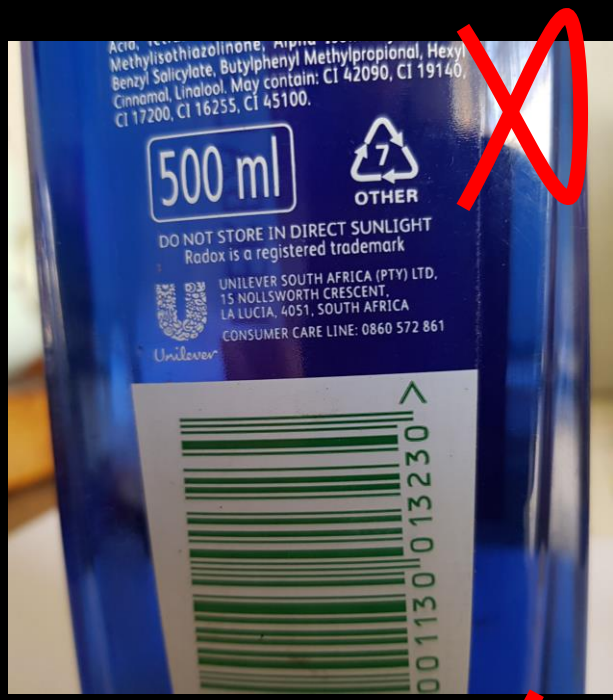

EISH !!
If not removed - PS tub and PVC label cannot be recycled together

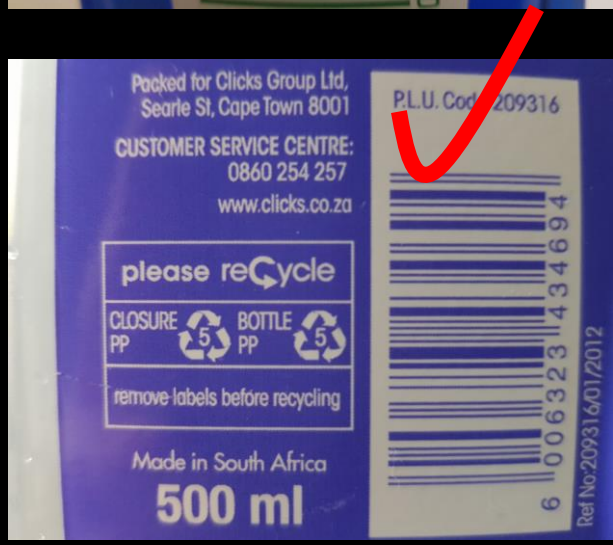
Labels & Sleeves

What adhesive to be used?

Labels & Sleeves

Anything the consumer must do?





Design fundamentals

- End-of-Life
- Material identification codes
- Labels and Sleeves
  - Material
  - Adhesive
  - Instructions where necessary

Design fundamentals

- End-of-Life
- Material identification codes
- Labels and Sleeves
- Additives

$CaCO_3$

Design fundamentals

- End-of-Life
- Material identification codes
- Labels and Sleeves
- Additives
- Multi-layers where not necessary

Eco / Econo Packaging

- Seldom the cheaper option for consumer
- Residual contents
- Non-recyclable sachet vs. fully recyclable bottle
- Imported materials

A+

Excellent !

Fully recyclable
Local materials

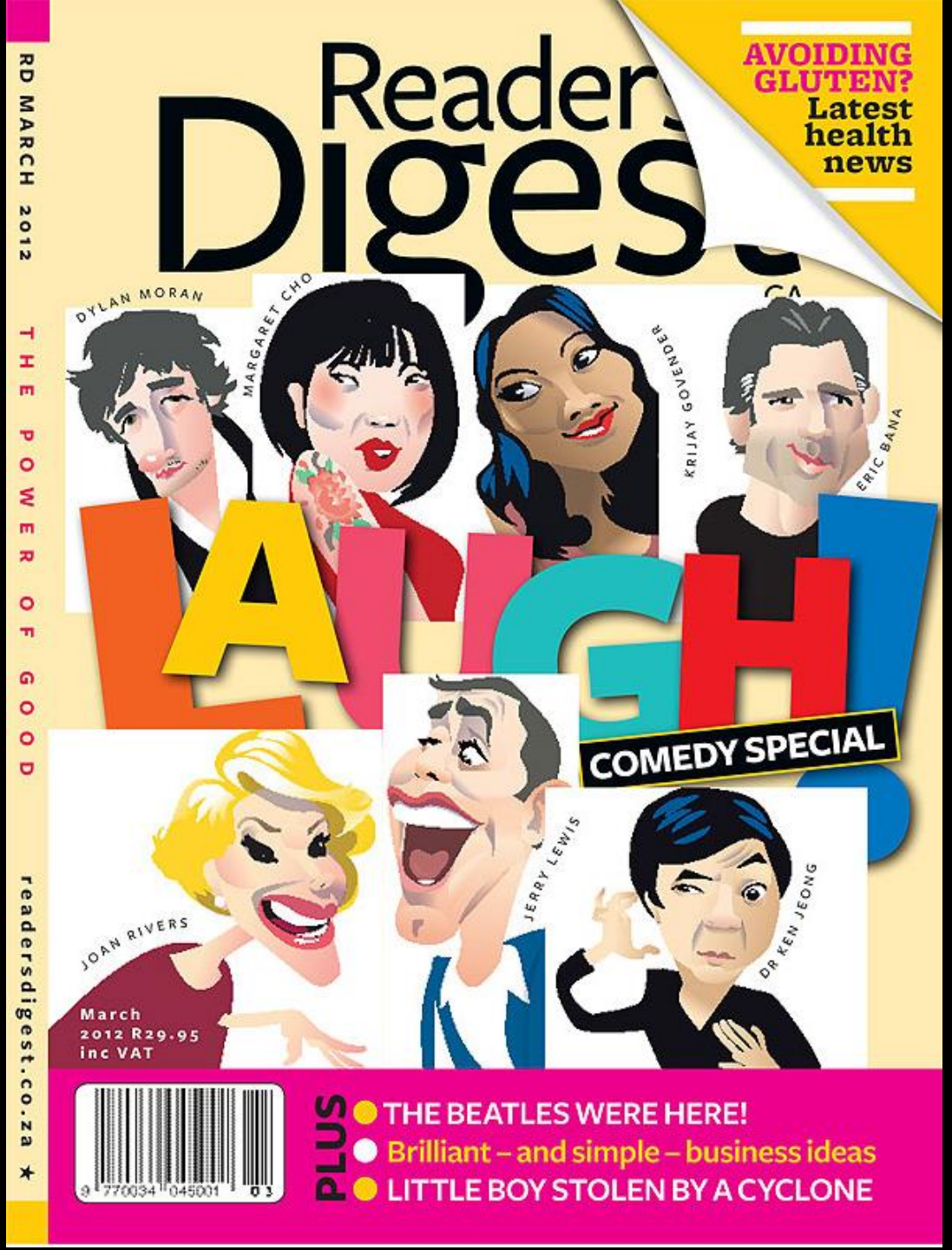
ZIMALL

Design fundamentals

- End-of-Life
- Material identification codes
- Labels and Sleeves
- Additives
- Multi-layers where not necessary
- Oxo-biodegradable additives

“Going Green” with “100% biodegradable poly-wrap bag”

March 2012



Design fundamentals

- End-of-Life
- Material identification codes
- Labels and Sleeves
- Additives
- Multi-layers where not necessary
- Oxo-biodegradable additives
- Don’t lie


Not
Plastic!
bag
for
good
Woolworths

Design fundamentals

- End-of-Life
- Material identification codes
- Labels and Sleeves
- Additives
- Multi-layers where not necessary
- Oxo-biodegradable additives
- Don’t lie
- On pack labelling

Design fundamentals

- If you don’t know – find out!

Guideline table for PP bottles and jars[5]

1. *Clarified PP is acceptable when bottles are shown to be compatible with end uses for recyclate*
2. *A limited number of recyclers can tolerate PVC components and for this reason its use is permitted.*
3. *Acceptable provided firstly labels are attached using water soluble adhesives and are not coated in a manner that prevents separation and removal during reprocessing; and secondly they do not pulp in the wash tanks. Paper labels that do not satisfy these criteria should be avoided.*
4. *The total level of PE-HD should be kept below 5% by weight.*
5. *Also see Appendix 7*

	Green Guidelines	Orange Guidelines	Red Guidelines
Colour	Unpigmented; White	Coloured	
Barriers and Coatings		EVAL; PA	PVDC
Additives	No additive that could amend the product density.	Clarifier[1]; Limited amounts of additives as long as the overall density remains below 0.995 g/cm^3	Fillers like $CaCO_3$ that will increase the product density to more than 1g/cm^3; Oxo-biodegradables;
Caps and Closures	PE-LD; PP	PE-HD	PS; Thermosets; Al; Steel
Cap liners	PE-HD; PE-LD; PE+EVAC; PP	PVC[2]	PS; EVAC; Al
Seals	PE-HD[4]; PE-LD; PP; BOPP	Al; PVC[2]	Silicone with density less than 1g/cm^3
Direct Printing	No direct printing on bottle unless it is production or expiry date	Limited direct printing	
Labels	PE-HD[4]; PE-MD: PE-LD; PE-LLD; PP or BOPP[1]; sleeves and wraparound or collar labels manufactured from PE-HD[4]; PP in-mould labels	Paper[3]; PET; PETG; PS; PVC[2]	Al; Metallised labels
Sleeves (incl. tamper evidence)	PP; BOPP; PE-MD: PE-LD	PE-HD[4]; PVC[2] ; Paper[3];	PS; PS-E
Adhesives		Water-soluble adhesive or alkali soluble adhesives up to 80°C; No adhesive residue on body	Non-soluble adhesive in water or alkali at 80°C; Hot melt glues
Ink	No printing	Good manufacturing practices, i.e. no heavy metals containing inks	Inks that bleed and dye wash- solution


KEEP
WELL
LEFT

environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

Private Bag X447, Pretoria, 0001, Environment House, 473 Steve Biko Road, Pretoria, 0002 Tel: +27 12 399 9000, Fax: +27 86 625 1042

Ref: EDMS
Enquiries: Anben Pillay
Tel: 012 399 9827 Email: apillay@environment.gov.za

Dear Stakeholder

INVITATION TO A WORKSHOP ON THE PACKAGING DESIGN GUIDELINE

You are hereby invited to a consultation workshop to discuss the Packaging Design Guideline aimed at providing guidance on the recyclability of waste packaging material.

This project is one of the Chemicals and Waste Economy Phakisa initiatives and its objective is to produce a guidance document that is sufficiently detailed to assist designers in all forms of packaging and to facilitate recycling and promote sustainable consumption and production.

It will provide packaging and print designers, in particular, with a better understanding of the environmental implications of their design decisions, thus promoting good environmental practices without unnecessarily restricting choice while reducing waste generation.

Today's content

- Environmental messages
- The need for packaging
- Plastics Recycling in South Africa
- Why are we not recycling more?
- Circular economy
- Design for Recycling fundamentals

SAPRO
South African Plastics Recycling Organisation

Thank you

Annabe Pretorius

083 654 8967

Annabe@absamail.co.za

SAPRO

South African Plastics Recycling Organisation