



Designing for the Environment

The Interface Between Brand Owners and Converters



Areas of Discussion

1. The Importance of Designing for the Environment
2. Material Choice
3. Waste Hierarchy and Designing for Circularity
4. Importance of Brand Owner Alignment
5. Impact of Marketing
6. Addressing Consumer Awareness
7. Correct Information
8. It's What's Inside that Counts
9. The Role of Available Technology
10. Systems Thinking
11. Starting Over
12. Closing

Sustainable Development Goals and Design for Environment

SDG's and Design For Environment

Design for Environment can assist in achieving the SDG's

- **Goal 12: Ensure sustainable consumption and production patterns**

- 12.3: by 2030, halve per capita global food waste at the retail and consumer levels...
- 12.4: by 2020, achieve the environmental sound management of chemicals and **all wastes throughout their life cycle**...
- 12.5: by 2030, substantially reduce waste generation through prevention, **reduction, recycling and reuse**.

- **Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development**

- 14.1: by 2025, prevent and **significantly reduce** marine pollution of all kinds, in **particular from land based activities, including marine debris** and nutrient pollution

- Not to mention the positive Carbon Impact...

TARGET 12-3



HALVE GLOBAL PER CAPITA FOOD WASTE

TARGET 12-4



RESPONSIBLE MANAGEMENT OF CHEMICALS AND WASTE

TARGET 12-5



SUBSTANTIALLY REDUCE WASTE GENERATION

TARGET 14-1



REDUCE MARINE POLLUTION



Choice of Material



Choice of Substrate

- Glass, Paper, Metal...
- 6 mono-plastic substrates with a multitude of combinations making #7
- **Is choice made fit for purpose or because of what we know?**
- Example - Fresh Milk in HDPE vs PET
 - HDPE:
 - recyclable but mainly to lower value applications (cascaded recycling)
 - Requires crate for transportation (re-usable but resource intensive)
 - PET:
 - Recyclable and bottle-to-bottle application possible
 - Doesn't require heavy crate – can be shipped in cardboard packaging which is also recyclable (LCA versus crate not known)

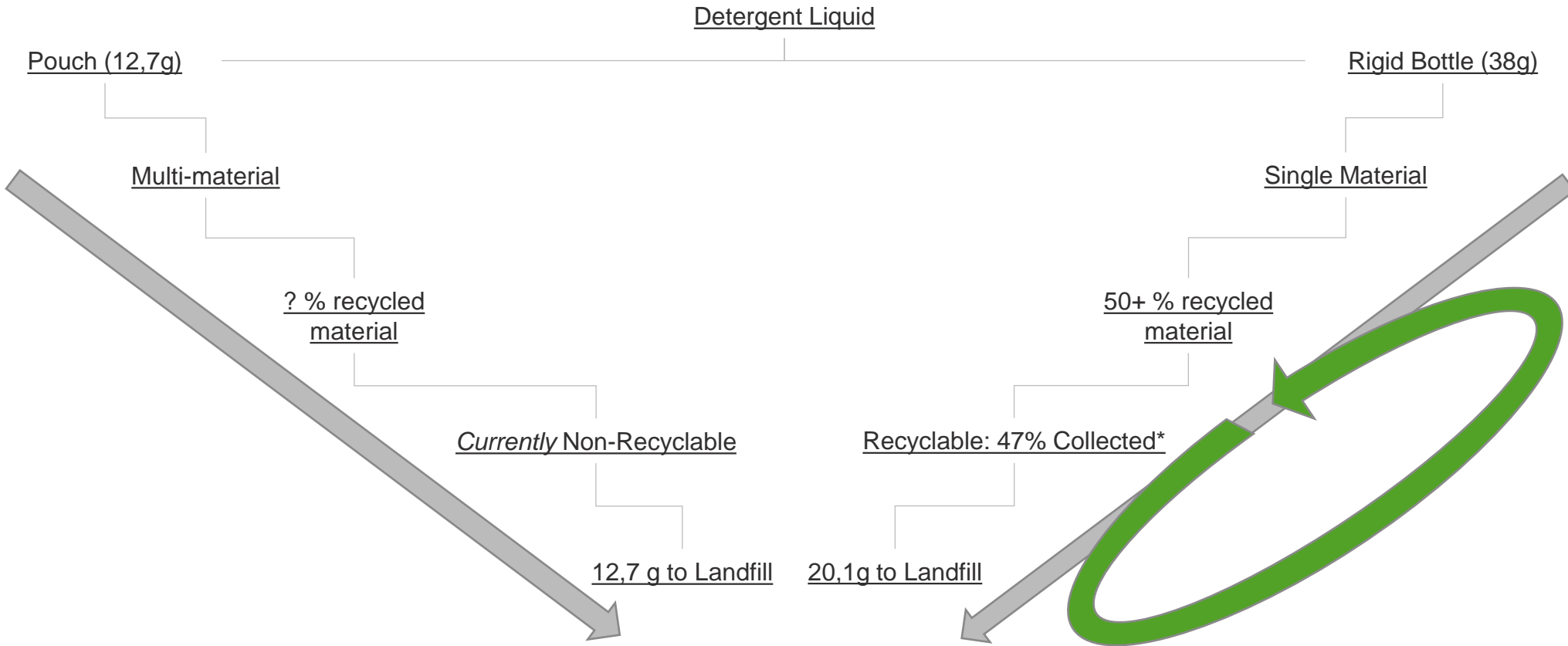
Understanding the material choice is the first step in design for environment



Waste Hierarchy and Design for Circularity



Reduce vs Reuse vs Recycle

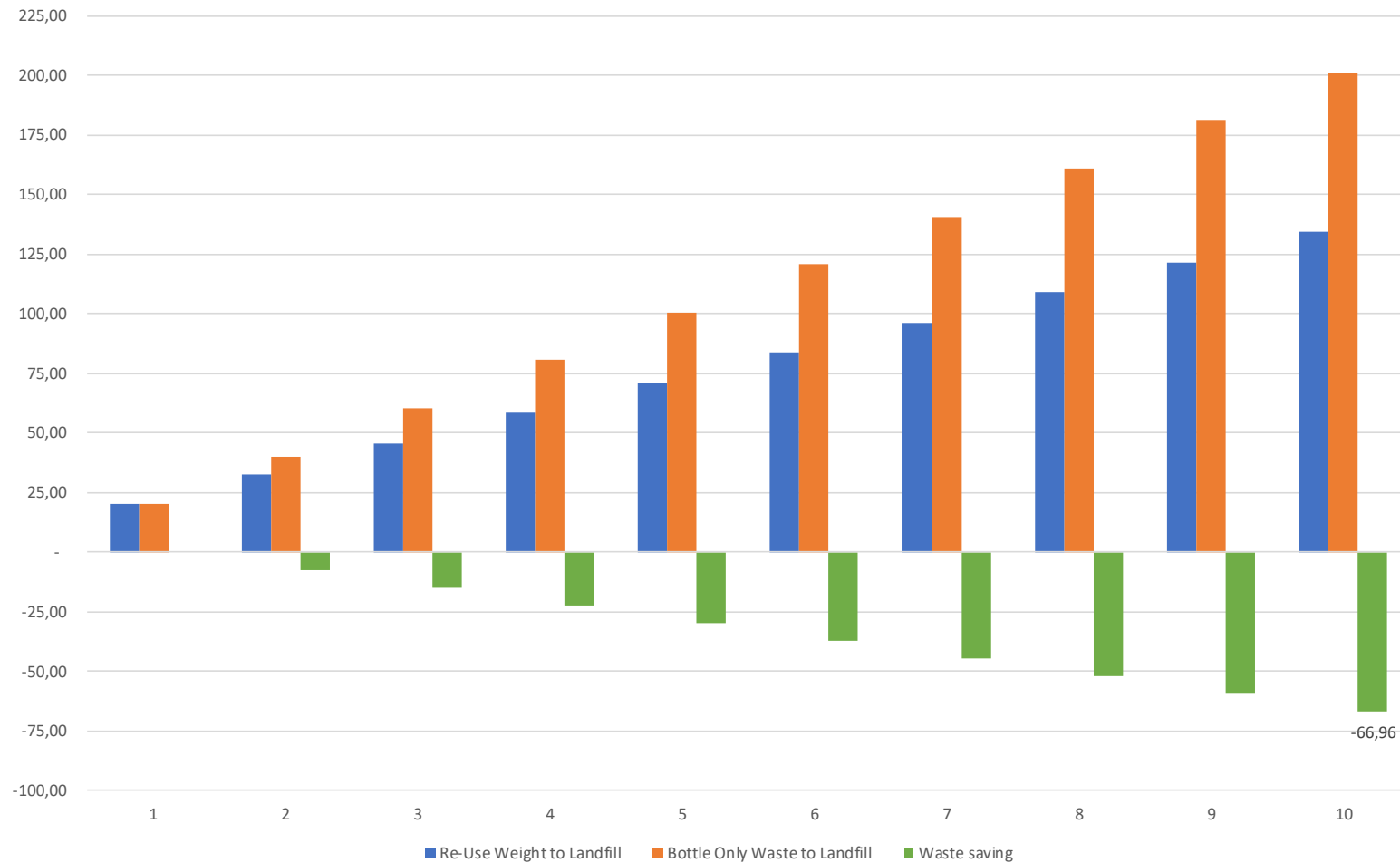


* 47% reflects total estimated material collected for recycling. Actual material recycled for secondary use may vary.



Reduce & Reuse & Recycle

Packaging Waste to Landfill Saving - Pouch and Bottle (kg / 1000)



Reduce – What if

The package itself is a sheet of perforated laundry pods, printed using soap-soluble ink.





Brand Owner Alignment



Fair Cape Milk from Zero to Hero

- White PET bottles – recyclable but not recycled
- Original white colourant included based on Functionality
 - White colourant was believed to improve shelf life – reduce light ingress
 - Extensive testing by both parties, a focus on cold chain and filling conditions showed difference was around 1 day
- **New milk range is 100% clear (1L & 2L)**
- **& 50% rPET**
- What about the Cream range (250ml and 500ml) and Amasi (2L)
 - Still in white / ivory
 - Remains currently not recycled
 - Both cream and Amasi separate when standing and is visually unappealing
 - Function over Form
 - BUT – looking at alternative options



Impact of Marketing



Marketing

- The marketing / NPD teams drive the design,
 - unfortunately, the majority are not equipped / knowledgeable on design for environment complexity
 - and/or design briefs and the environmental considerations are in conflict

- Common issues that arise:
 - choice of substrate predetermined before conversation even started
 - it can't have ribs = reduced structural integrity limiting light weighting
 - must feel like glass = fear that plastic 'feels' non-premium, try emulate glass' premium image through heavy plastic.
 - product packed at altitude and shipped to the coast = paneling, resolved through adding weight

Marketing

- Designers also face limited decoration choice: each with pro's and con's

“It must ‘POP’ of the shelf” ...

“It must look different” ...

“It has to have all the information and logos and, and, and” ...

| Type | Pro's | Con's |
|------------------|-----------------------|----------------------------|
| Wrap Around: | Recyclable | Shape dependent (straight) |
| Self Adhesive: | Water Soluble? | Shape dependent (straight) |
| Stretch: | Easily separated | Limited stretch ratio |
| Shrink: | HDPE +ve / Full cover | PET -ve |
| Screen Printing: | Visually 'premium' | Contaminates PET |

Marketing – What if

- Brand identity, marketing material and product details are all screen-printed directly on to the surface of the container **with soap-soluble inks.**





Addressing Consumer Awareness



Consumer Awareness

- Recycled isn't 'perfect' but it is safe
 - Example rPET is an off grey colour and can contain tiny black specs
 - 100% Safe

 - Very little by way of educating consumers as to the differences between recycled and virgin materials
 - result is that brand owners reluctant to be 'first to market' or to be the ones with "grey looking vanilla drinking yoghurt"

 - Other brand owners face the concern "customers believe the flavor is different if it is in a clear bottle"
 - Green,
 - Brown PET...

 - How do you convince the consumer that a LD milk pouch is the better design choice for the environment when it "looks cheap"
-



Correct Information



OPRL

- On Pack Recycling Logo's (OPRL) the GOOD, the BAD and the UGLY
- GOOD
 - Improved information to consumer
 - Allow for informed recycling at home
 - Drive increased recyclable material through consumer actions (demand more recyclable packaging)
- BAD
 - Wrong information on pack
 - Creates confusion, diminishes trust
- UGLY
 - OPRL instead of polymer identification number (need both)
 - Materials that are currently NOT recyclable never end up in the recycling stream
 - No supply generated / problem materials "lost" in non-recyclable stream

All packaging should be separated from 'wet waste' to allow for secondary sorting at MRF / recycler thus ensuring no material unduly "lost"



What's Inside?



Contents

- Contamination from the actual contents (or left overs) can make recyclable packaging non-recyclable or difficult to recycle
 - Yoghurt
 - Mayonnaise
 - Peanut Butter
 - Edible Oil
 - Etc

 - Consideration of alternative materials
 - Bio-degradable?

 - Filled Product contribution to packaging EPR schemes to facilitate recycling investment? (Wash bays?)
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The Role of Available Technology



Available Technology – the tale of three halves

- Design = ½ the solution

- Other ½ = available recycling technology
 - Manual vs Automated?
 - Secondary sorting (post manual / shredding / washing)?
 - Quality?
 - PET already at highest quality bottle to bottle
 - Where is HDPE equivalent (can we get there?)
 - Ongoing investment in new technology?

- Remaining ½ = production technology
 - Existing production technology – ROI
 - Ease of substitution – embedded supply chain
 - HDPE vs PET for Fresh Milk...

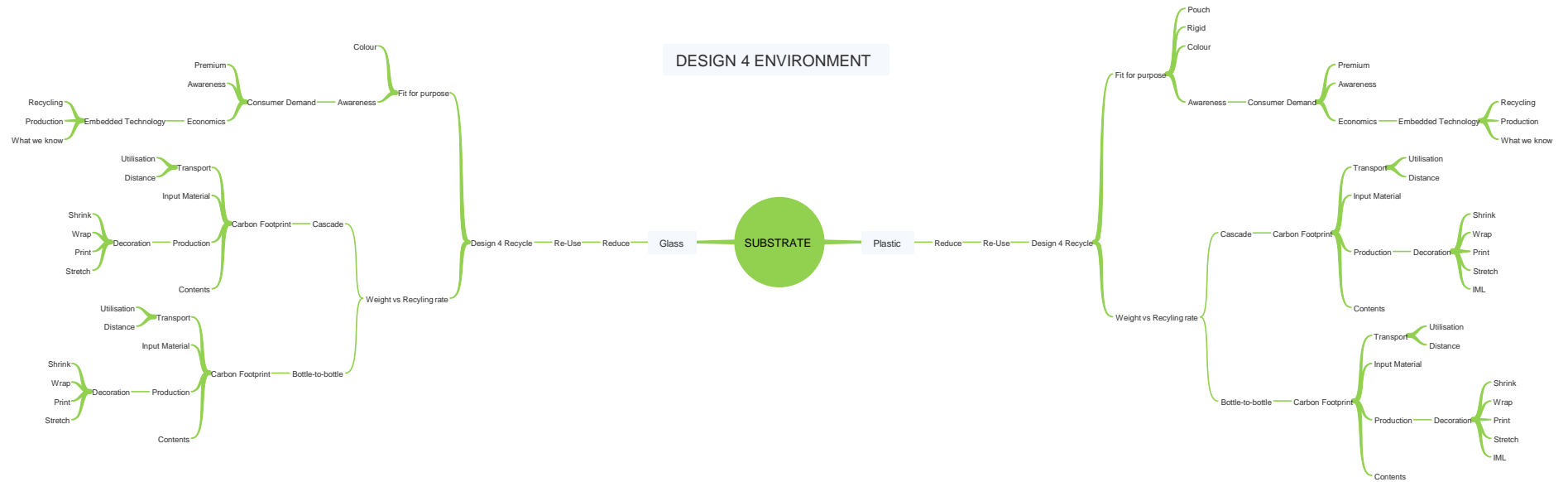


A Systems Approach



Systems Thinking

DESIGN 4 ENVIRONMENT





Starting Over



Design for a Circular Economy

- What if we could re-design the way fresh milk is delivered?
- Dairy industry collaboration to establish a centralized return / re-use hub on milk bottles
 - Regional/municipal (Western Cape) dairy return facility
 - similar system/technology to existing PET returnable bottle
- Used bottles collected from stores, returned to central hub
 - Washed
 - Contaminated bottles sent for recycling
 - Labels removed and re-labelled for re-use
- Central hub distributes bottles back to dairies
- Producer supplied central hub with replacement bottles
- Design considerations
 - Technology
 - HDPE vs PET vs Glass
 - Increased Weight vs lightweight
 - Use of Recycled Material
 - Economics – economies of scale, reverse logistics



In Closing



In Closing

- Designers face an extensive “decision tree”
 - Material choice
 - Waste Hierarchy vs Circularity
 - Form vs Function
 - **Recycled content**
 - **Decoration**
 - Consumer Awareness
 - End of life expectations
 - Existing technology

 - Currently only **two** feature in most discussions between brand owners and ourselves.

 - One reason for this is that there is limited readily available / accessible information on the other factors to really assist with decision making.
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In Closing

“It's time to move beyond simply treating the symptoms of a wasteful economy, and to go back to the root cause to design products, services and systems differently.”

#circulareconomy

#ellenmacartherfoundation



Thank You

