What do drums have to do with CSR?

Carbon reduction through use of drum packaging in juice processing.

Jason St Hill
A model aimed at:

Reducing packaging related costs per ton of juice moved

as well as;

reducing the environmental impacts
Establishing the strategic business drivers aimed at:

- Realising cost & environmental savings benefits, derived from:
  - Using the drum known as “That Drum” in developing a REDUCTION programme by reducing the amount drums produced and reducing reconditioning practices
  - Participation in a drum rotation program to REUSE drums

- Understanding the reduction in Environmental Impacts via RECYCLING by introducing the use of innovative packaging and exploiting potential sustainable benefits.

- Establishing a cooperative model that will support the objectives of the participating partners and add value to their businesses.
2. DRIVERS TOWARDS SUSTAINABILITY

Fruit Juice Producer

Add Value, Reduced Costs & Enviro Impacts

Key Drivers Too

That Drum International

Juice Decanter

Reduce
Reuse
Recycle
3. REDUCING STORAGE FOOT PRINT

**Reduce the # of Model 210 Litre drums used**

- **Model 210 Litre**
  - Height - 890mm (internal height 840mm)
  - Body steel thickness - 0.86mm minimum with no hoops
  - Inside diameter 571.5mm
  - Volumetric capacity is calculated at **215 litres**
  - Practical internal packing capacity after providing for freezing is **205 litres**
  - Stacking height – max 4 drums as determined by a pressure test
  - Stacking capacity per single drum footprint – **820 litres (205 litre x 4)**

**Model 247 Litre**

- Height - 965mm (internal height 965mm with no loss due to design of lid/bottom end)
- Body steel thickness - 0.76mm - 2 hoops – loss of 10mm in height
- Inside diameter 571.5mm
- Volumetric capacity is calculated at **247 litres**
- Practical internal packing capacity after providing for freezing is **237 litres**
- Stacking height – max 6 drums as determined by a pressure test
- Stacking capacity per single drum footprint – **1422 litres (237 litre x 6)**

The 247lt drum is designed to reduce costs of storing & moving a ton of juice product
4. RE-USE

FRUIT JUICE PRODUCER - FJP

FJP fills drums & stores in freezers awaiting shipment

FJP sends product to decanter using logistics supply chain – container sea freight

TDI Rotation Program

Lower Cost of supply chain Per ton of juice moved

TDI/Decanter recovers & dis-assembles drums back to component form and ships to FJP

JUICE DECANTER

TDI secures supply of new drum kits

THAT DRUM INTERNATIONAL.

Drum Producer

FJP receives drum components & reassembles drums
4. RE-USE: - FOR FJP’s

Benefits to the Fruit Juice Producers:

- The additional drum capacity realises cost benefits throughout the supply chain - effectively realising savings in transport & shipping costs.
- Ability to store around 2000 incoming drum sets in an area that would normally store 40 standard assembled drums.
- Ability to safely stack “That Drum” at least one row higher effectively creates an additional 25% storage capacity at no additional capital cost to increase storage footprint.
- Standardising drum use; introduces operational efficiency benefits.
- Re-use of “That Drum” will significantly reduce the effective cost of drums.
- Customer satisfaction is enhanced through reuse model beneficiation.
Benefits to the Decanters:

Decanters currently processing multiple, non standard mix of poor quality incoming drums causing multiple handling issues. Creating reconditioning environmental impacts.

The ability to return drums for re-use would assist the Decanter in meeting some of its environmental goals.

With standard drums in storage at any one time, the capacity advantages of “That Drum” could approximately add 10-30% freezing capacity at no additional capital cost. This being made up of extra drum capacity and the increased stacking height.

Decanters create a USP, in offering participating producers their recovered decanted drums.

By offering cost saving incentives for using its services, the Decanter would be able to retain and attract break bulk handling revenues.
5. REDUCING ENVIRONMENTAL IMPACTS

Using 247lt drums:

- Allows 10-12% more internal filling capacity, giving 1 free drum in every 10 purchased – less steel used per ton of juice moved.

- The drum is made from zero spangled galvanised steel – requires no incineration, no shot blasting, no painting and is easily re-usable at a low cost.

- The strength of the drum allows increased stacking capability – improves storage footprint efficiencies. Storage costs per ton reduced.

- Reduces logistics costs therefore reducing transport CO\(^2\) emissions. 10% saving on all downstream costs including containers, transport, shipping, freight etc.
5. REDUCING TRANSPORT COSTS

Associated transport costs are a major constraint to recovering and re-using drums, our technology overcomes this by:

- Creating a folded body where 150 units are stored on a pallet or 1200 drum sets in 20ft container.

- Drum components assembled at customers plants – reduced storage area for clients & converted at production rates.

- Potential to dis-assemble a recovered drum over 10 times and convert back to component form for efficient transportation.
6. RECYCLING OF DRUMS

- Utilising “That Drum” technology and its rotation model allows for drums to be recycled into the industry at large, reducing steel consumption.

- Converting to the rotation model decreases the amount of drums being recycled through standard reconditioning processes.

- Disassembling and recycling galvanised drums at strategic collection points globally places second hand drums in the market with lower carbon footprints.

- Recycling of drums adds value back to the supply chain due to multiple usage

- Recycling to achieve 2-Way packaging system ultimately reduces global environmental impacts
7. DRUM SURVEY – CO2e

- A report commissioned by RIPPA in 2014/15, conducted by Ernst & Young (EY), comparing “carbon footprints” (expressed as CO2 equivalents) for reconditioned vs. new packaging solutions.

- Table 1. Are the analysed Carbon footprint results for Steel Drums


- The report does not include the benefits of uncoated galvanized reusable drums which would significantly lower CO2e

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Table 1.
Overview of carbon footprint results

<table>
<thead>
<tr>
<th>Category</th>
<th>Type</th>
<th>New (lbs CO2e)</th>
<th>Reconditioned (lbs CO2e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel drum</td>
<td>Open head</td>
<td>82.3</td>
<td>28.2</td>
</tr>
<tr>
<td></td>
<td>Tight head</td>
<td>75.5</td>
<td>27.2</td>
</tr>
<tr>
<td>Plastic drum</td>
<td>Tight head Plastic PE-mix</td>
<td>54.1</td>
<td>49.5</td>
</tr>
<tr>
<td>IBC</td>
<td>275 gallon</td>
<td>295.8</td>
<td>91.0</td>
</tr>
<tr>
<td></td>
<td>330 gallon</td>
<td>345.0</td>
<td>101.6</td>
</tr>
</tbody>
</table>

8. CONCLUSIONS

- There are clearly opportunities to reduce the effective cost of packaging and at the same time reduce the packaging related CO2e impacts.

- Conversions away from coated drums, new or recon, to galvanised “That Drums” will begin the process of delivering on CO2e targets.

- A 15% reduction in Drum Packaging through rotation and reuse will not only deliver a significant contribution to the bottom line, it will deliver a significant reduction in CO2e.

- The packaging design and rotation modelling has been proven in South Africa.

- The implementation success simply lies in the introduction of the key stakeholders who have a commitment to make their leg of the rotation process work efficiently.