Extended Producer Responsibility (EPR)

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PSES
Disclaimer

- This presentation has nothing to do with my present or previous employers and their internal practices
  - All the companies I worked for or with, were successful companies in their respective fields
- This presentation is based on presenter’s own interpretation and experience
  - This is a general presentation
  - Please seek advise/opinion from a professional/legal counsel, if any of the contents are currently or potentially applicable to you (your organization)
Terminologies

- Too many acronyms
- Two most important ones are:
  - Supply Chain Management (SCM)
  - Product Life Cycle Management (PLM)
Supply Chain Management - SCM

WHAT IS SUPPLY CHAIN
A **supply chain** is a system of
- Organizations,
- People,
- Activities,
- Information, and
- Resources
involved in moving a product or service from supplier to customer

Simplified Complex Picture of SCM

Application
Price
Technology
Quality
Reliability
Availability
Maintainability
User friendly
Weight
Compliance
Cosmetics Etc.

Hundreds of Standards and Regulations – Workmanship, Safety, Regulatory

Supply Chain Management - SCM

Requirements Drivers:
- Market/Competitor
- Customer/Consumer
- Standards
- Regulations

Compliance Coordinators:
- Marketing/PM
- Engineering
- Document Control
- Procurement
- Quality and Regulatory
- Manufacturing/Stock Management

Compliance Coordinator Support/Extension:
- Distributors, Suppliers, Manufacturers
  - OEM
  - Third Party Manufacturers

Picture: http://www.businessnewsdaily.com/4804-supply-chain-management.html
Supply Chain Management - SCM

- Treat suppliers as an extension/part of your operation
- Supplier is not limited to material, part, sub-assembly or assembly supplier,
- A Supplier can be a short or long term contractor working at your facility or remotely
PLM

- Is the process of managing the entire lifecycle of a product from inception, through engineering design and manufacture, to service and disposal of manufactured products.
- Is a systematic approach to managing the series of changes a product goes through, from its design and development to its ultimate retirement or disposal.
Technology plays an Important Role

- SCM PLM integration?
  - Constant growth and growing importance of sustainability goals
    - Restriction of Hazardous Substances (RoHS),
    - Registration, Evaluation, Authorization and Restriction of Chemical (REACH), and
    - End of Life Vehicle (ELV)
  - Battery
  - Packaging
  - Most importantly Waste Electrical and Electronic Equipment (WEEE)
Technology plays an Important Role

- Companies need to be able to document and track what goes in to their products, where it comes from and, often, what happens to it after it reaches the customer
- 4 Key R’s – Reduce, recover, reuse, recycle
- Product lot A –
  - Placed before the regulation was enforced (RoHS)
- Product lot B – Reduce Hazardous Substances and Waste
  - Compliant to regulation (RoHS 1)
- Product lot C – Reduce Hazardous Substances and Waste
  - Compliant to new regulation (RoHS 2)
- At the end of their useful life:
  - How to dispose of - Recover, Reuse and Recycle based on their compliance status (RoHS 1, RoHS 2) – that may require full traceability either by SN, Lot number, Date Code, Marking etc.
The PLM side of the equation provides a viewpoint based on the creation and manufacture of the product while the supply chain management view offers the opportunity to ensure traceability from cradle to grave.
EPR

- Is an environmental protection strategy to reach an environmental objective of a
- Decreased total environmental impact of a product,
- By making the manufacturer of the product responsible for the
- Entire life-cycle of the product and especially for the
- Take-back, Recycling and Final disposal
A few Key Initiatives

Let take an example of:
- Cell Phones

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country or region</th>
<th>Number of mobile phones</th>
<th>Population</th>
<th>% of population</th>
<th>Last updated date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>China</td>
<td>951,600,000</td>
<td>1,341,000,000</td>
<td>71.0</td>
<td>Oct 2011</td>
</tr>
<tr>
<td>2</td>
<td>India</td>
<td>884,371,296</td>
<td>1,210,193,422</td>
<td>73.44</td>
<td>Nov 2011</td>
</tr>
<tr>
<td>3</td>
<td>United States</td>
<td>327,577,529</td>
<td>310,866,000</td>
<td>103.9</td>
<td>June 2011</td>
</tr>
<tr>
<td>4</td>
<td>Indonesia</td>
<td>250,100,000</td>
<td>237,556,363</td>
<td>105.28</td>
<td>May 2009</td>
</tr>
<tr>
<td>5</td>
<td>Brazil</td>
<td>242,200,000</td>
<td>192,376,496</td>
<td>125.79</td>
<td>December 2011</td>
</tr>
</tbody>
</table>

Some people have more than 1 phone
A few Key Initiatives

Math:
- Estimate is about 5.7 Billion Phones in the world
- What is the average life of a phone
  - 1.5 years (including normal life, unexpected wear and tear)
- 3.8 Billion phones go to grave (land fill) every year
- Weight of the iPhone = 200 grams
- That means 760,000 ton will end up in the landfill
- The iPhone 6s Plus = 6.77 ounces, iPhone 7 Plus weighs 6.63 ounces; That’s a 2.1% weight reduction (15960 ton less waste)

<table>
<thead>
<tr>
<th>Population</th>
<th>Phones in Use</th>
<th>Avg life of a phone (Yrs)</th>
<th>Weight Kg</th>
<th>Phones discarded</th>
<th>Tons going in landfill</th>
</tr>
</thead>
<tbody>
<tr>
<td>70000000</td>
<td>5700000000</td>
<td>1.5</td>
<td>0.2</td>
<td>3800000000</td>
<td>760000</td>
</tr>
</tbody>
</table>
A few Key Initiatives

- **Math:**
  - What is the heaviest part in your phone
  - Battery
  - Do the battery contain hazardous substances?
  - Is it OK to dump batteries anywhere?
A few Key Initiatives

• Math:
  ○ What is the next biggest waste when you discard your phone
  ○ Chargers?
  ○ Do you typically save them for the new phone?
  ○ How many chargers do you have?
  ○ Home, office, may be more....
  ○ Car Chargers
A few Key Initiatives

- **Math:**
  - What is the next biggest waste that people do not pay attention to:
  - Packaging
    - ~155mm x ~90mm x ~60mm
  - iPhone size
    - ~138mm x ~67mm x ~7.1mm
  - Keep in mind when shipping – besides weight another factor that is important = volume (air space)
  - Plus literature, primary, secondary, tertiary packaging etc.
Packaging

- Levels of details:
  - Internal part number
  - Description
    - Primary
    - Secondary
    - Tertiary
- Component Elements breakdown:
  - Bottle
  - Tip
  - Cap
  - Temper Proof Seal
  - Insert
  - Box
  - Outmost box (of any)
- Metal
  - Brass, Steel, Tin, Other
- Natural
  - Ceramic, Rubber, Textile, Wax, Wood, Other
- Paper
  - Bleached Corrugate/non corrugated, Bleached paperboard corrugate/un-corrugated, Half Bleached, Magazine, Molded pulp, Newsprint, others
- Plastics
  - HDPE, LDPE, LLDPE, Mixed Resin, other etc.
- Others
Packaging

- **Majority Material Type**
  - Percentage

- **Majority (level 2, 3, 4) Material Type**
  - Percentage

- **Pre Consumer recycled material**
  - Recycled in original form
  - Ex: Plastic bottle reuse

- **Post Consumer material**
  - Recycled
  - Ex: Plastic bottle is modified, melted

- **If Plastic, form:**
  - Film, wrap, Bags, Rigid, Component (bottle, jug, tubs, lids, closures, trays, cups etc.)
  - Color
    - Glass or Plastic
    - Amber
    - Blue
    - Red
    - Clear
    - Orange etc.
Challenge

- Each member country has their own competent authorities
  - Government Agency
  - Non-Government Agency
- May be more than one
  - Some countries have more than one authorities
- Reporting
  - Language, format etc.
- Timeline
  - Quarterly, bi-yearly, yearly, etc.
- Fee:
  - Varies based on Primary, Secondary, Tertiary, Material Type, Pre and post Consumer recycled material etc.
- Keeping it current
  - Systematic approach, database, training (internal and external), BOM structuring etc.
Paris Agreement

- 2015 United Nations Climate Change Conference
- First time in over 20 years of UN negotiations, a binding and universal agreement on climate, from all the nations of the world
  - Global warming temperature may go up to 2.7 deg C by 2100
  - Keep it down to 1.5 deg C
    - Requires zero net anthropogenic (resulting due to human involvement)
    - The 1.5 °C goal will require zero emissions sometime between 2030 and 2050, according to some scientists
Bottom Line

- **Global warming is a reality - We can run but can not hide**
- More Retailers, Distributors Dealers and countries are coming up waste reduction program
  - Lesser use of natural resources and replenishing (maintaining a balance)
  - Walmart (Commercial)
  - Kaiser (Medical)
- EPR is a regulatory (legal) requirement
  - Promote diverting of waste from landfills to reusing, recycling and recovering treatments and every country in the world is coming up with their own requirements