Comparative Packaging Assessment

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BizNGO webinar - 12 April 2013
agenda

• Intro
• Background
• COMPASS model
• Data
• Streamlined LCA
• Material health
• Discussion / Q&A
leveraging the design process
the whole system perspective
implications of design choices

MARKET SIGNALS
- demand for certification
- reduced energy intensity
- reduced impacts

DISTRIBUTION
- transport efficiency
- product loss

CONSUMER
- product appeal
- safety
- satisfaction

WASTE DISCARD
- effective recovery
- reduce disposal

BRANDS
- image
- perception

RETAIL
- on shelf appeal
- shelf life
- safety
the model
a design-phase web application that provides comparative environmental profiles of packaging alternatives based on life cycle assessment metrics and attributes
build scenarios using components

SIMPLE COMPONENTS

COMPOSITE COMPONENTS
packaging system
multi-pack scenario

COMPONENT A × 6
• Bottle
• Label
• Cap

COMPONENT B × 1
• Carry case

COMPONENT A × 6
• Can

COMPONENT B × 1
• six-pack rings
refill scenario

APPLICATIONS: liquid soap, cosmetics, wipes and cleansers, etc.

**Waste Reduction Model**
The entire package is reused and is refilled from another package (forms and capacity can vary).

**Extended Life Model**
A critical component(s) is reused while the rest of the components are discarded and replaced with a refill package.

Refill scenarios requiring washing or industrial cleaning are excluded.
account for distribution legs

<table>
<thead>
<tr>
<th>MODE</th>
<th>VEHICLE</th>
<th>DISTANCE: km and m</th>
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</thead>
<tbody>
<tr>
<td>Road</td>
<td>relevant trucks to the region</td>
<td>diesel, gasoline, kerosene, other as available</td>
</tr>
<tr>
<td>Rail</td>
<td>freight train</td>
<td>DATA: USLCl and ecoinvent</td>
</tr>
<tr>
<td>Sea</td>
<td>barge and transoceanic freight ship</td>
<td></td>
</tr>
<tr>
<td>Air</td>
<td>cargo plane</td>
<td></td>
</tr>
</tbody>
</table>

![Distribution legs diagram](image)
life cycle coverage in COMPASS
transport model (being developed)

Add distribution related transport for components, packages and shipping the system to the DC
DATA
data

• Consistent background data modeling for common packaging materials and processes
• Apples to apples comparisons based on common functional unit
• Region specific solid waste profiles for US, CA, EU
• Verified by industry and external reviewers
data sets

• Data sets for U.S., Canada, Europe
  – Background data from ecoinvent and USLCI
• End of Life (EoL) treatments for packaging
  – Landfill, WtE, compost, incineration, litter
• EoL solid waste profile
  – Regional recover and discard information from USEPA, EuroStat, StewardEdge Canada
materials and processes

• Polymers
  – HDPE, LDPE, LLDPE, PET, PP, PS, EPS, PVC, PVDC, PLA, EVA, Nylon 6, PC, Modified starch (Mater-bi)
  – PU, SAN, ABS
• Fibers
  – Solid Bleached and unbleached Sulfate Board (SBS and SUS), Recycled Folding Boxboard, Corrugated, Supercalendered Paper, Bleached and Unbleached Kraft Paper, Liquid Packaging Board
  – Jute, Kenaff, Cotton (coming soon)
• Metals
  – Steel, stainless steel and aluminum
• Container glass

• Polymers
  – Blow molding
  – Extrusion, plastic film
  – Foaming, expanding
  – Injection molding
  – Stretch blow molding
  – Thermoforming, with calendaring
• Fibers
  – Production of paper bags
  – Production of carton
  – Production of corrugated boxes
  – Cutting
  – Weaving (coming soon)
• Metals
  – Sheet rolling
  – Production of steel can
informed prototyping
comparative packaging assessment
COMPASS® (comparative packaging assessment)

Component level assessment during the concept and prototype stages to optimize the system.
component in relation to package
package to package comparison
attributes and material health
material health
A business to business online registry that provides sustainability information about materials used in a variety of product and industrial sectors.
Material profiles for product intelligence


Tools for Transparency

Profiles in Sustainability

Vestibulum erat wisi


Nike

Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Vestibulum tortor quam.
TUB 121 Polyethylene Copolymer
INEOS Olefins & Polymers USA


Continuous Improvement Index

<table>
<thead>
<tr>
<th>Benchmark 1 Chemicals</th>
<th>Chemical</th>
<th>CAS #</th>
<th>%</th>
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<tbody>
<tr>
<td>Ethylene-Hexene-1 Copolymer (pure)</td>
<td>25213-02-9</td>
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<tr>
<td>Carbon Black</td>
<td>1333-86-4</td>
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<tr>
<td>Proprietary #2</td>
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<td>1.00%</td>
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</tr>
<tr>
<td>Anti-oxidant</td>
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Ecolabels

<table>
<thead>
<tr>
<th>Standards</th>
<th>Ecolabels</th>
<th>Banned/Restricted Substances</th>
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<tr>
<td>LEED</td>
<td>ECOLOGO</td>
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<td>BIFMA</td>
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<td>Voluntary</td>
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<td></td>
<td></td>
<td>Google</td>
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</table>
material health summary view
material health detailed view
next generation tools

• COMPASS + ArtiosCAD
  – Combine rapid virtual prototyping with environmental profile based on BOM
  – Baseline and track environmental changes performance over

• COMPASS + CAPE
  – Combine cube and vehicle load optimization with environmental implications associated with assets deployed
  – Investigate alternate solutions with expanded analytical data

• COMPASS + MIQ
  – Combine LCA with hazard screens for materials to allow a holistic view
  – Develop a lower cost entry into risk assessment for product development
discussion

• Limitations
  – Current and representative life cycle inventory (LCI)
  – Data transparency and uncertainty
  – Methodologies

• Drivers
  – Retailer and corporate scorecards
  – Global Packaging Protocol for Sustainability (GPPS)
  – The Sustainability Consortium (TSC)
  – GS1 Global Data Standard

• Opportunities
  – Measurements ≠ Sustainability
  – Use LCA to improve environmental performance of package and product, DfE and/or DfR, not for making claims
  – Informing public policy
Thank you!

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