COMPASS

Comparative Packaging Assessment

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BizNGO webinar - 12 April 2013

SUSTAINABLE PACKAGING COALITION®
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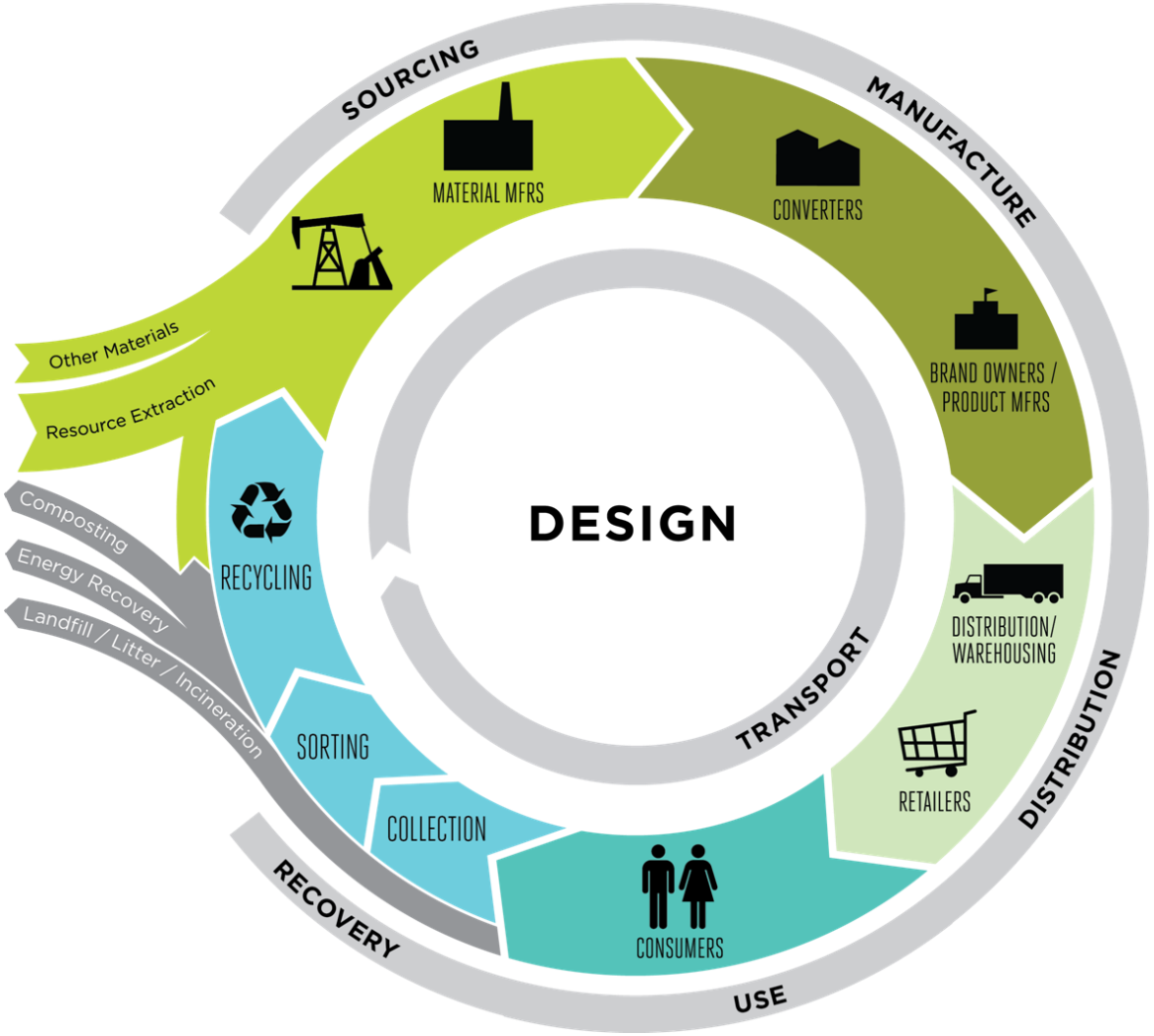
agenda

- Intro
- Background
- COMPASS model
- Data
- Streamlined LCA
- Material health
- Discussion / Q&A

leveraging the design process

the whole system perspective



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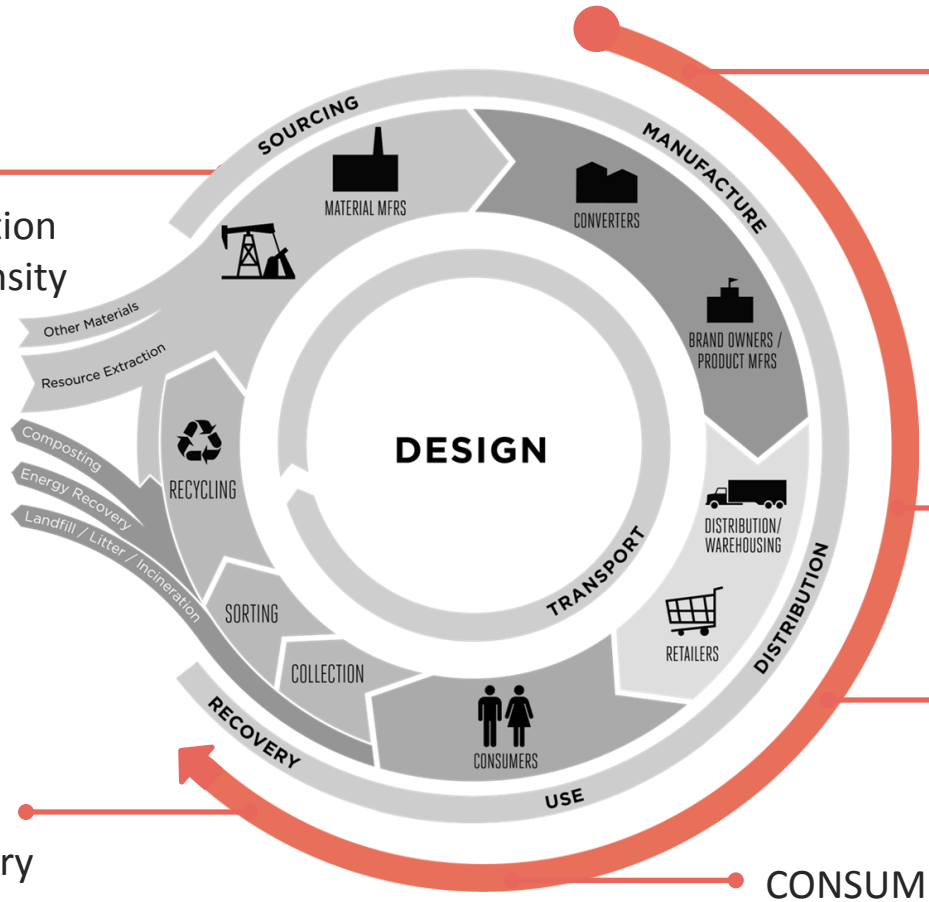
implications of design choices



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

BRANDS
- image
- perception

DISTRIBUTION
- transport efficiency
- product loss

RETAIL
- on shelf appeal
- shelf life
- safety

CONSUMER
- product appeal
- safety
- satisfaction

WASTE DISCARD
- effective recovery
- reduce disposal

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the model

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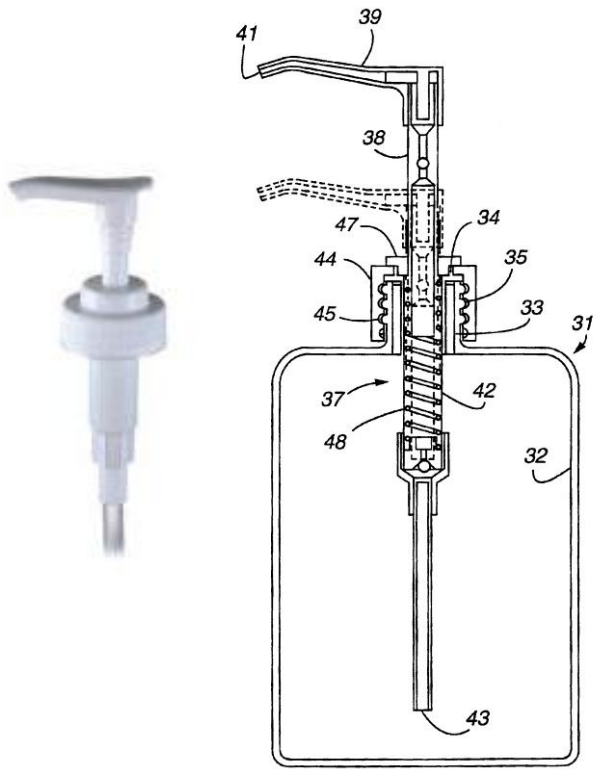
a **design-phase** web application that provides

comparative **environmental profiles** of **packaging** alternatives

based on **life cycle** assessment **metrics** and **attributes**

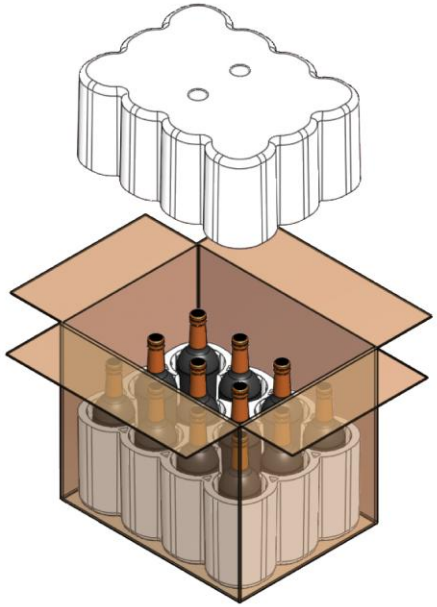
build scenarios using components

SIMPLE COMPONENTS



COMPOSITE COMPONENTS

packaging system

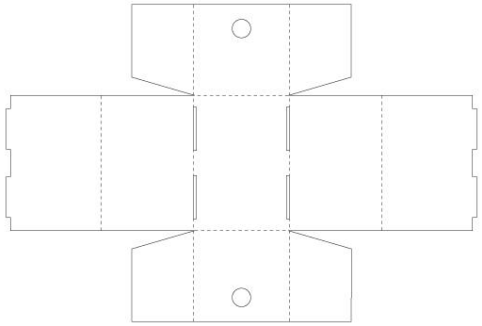


PRIMARY PACKAGE

SECONDARY PACKAGE

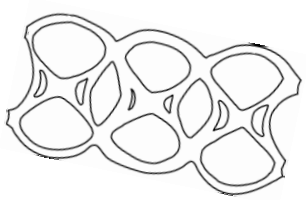
PACKAGING SYSTEM

multi-pack scenario



COMPONENT A x 6
- **Bottle**
- **Label**
- **Cap**

COMPONENT B x 1
- **Carry case**



COMPONENT A x 6
- **Can**

COMPONENT B x 1
- **six-pack rings**

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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 reset of the components are discarded and replaced with a refill package.

Refill scenarios requiring washing or industrial cleaning are excluded.

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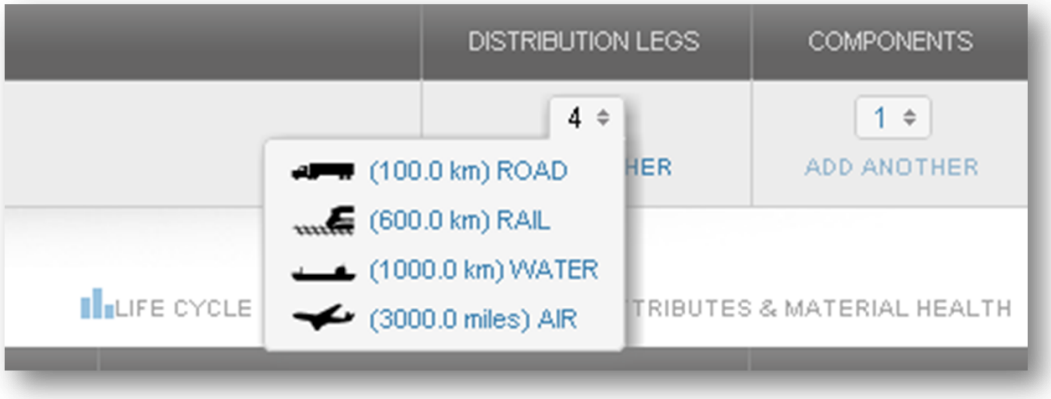
account for distribution legs

MODE	VEHICLE	DISTANCE: km and m
Road Rail Sea Air	- relevant trucks to the region - freight train - barge and transoceanic freight ship - cargo plane	**FUEL:** diesel, gasoline, kerosene , other as available **DATA:** USLCI and ecoinvent



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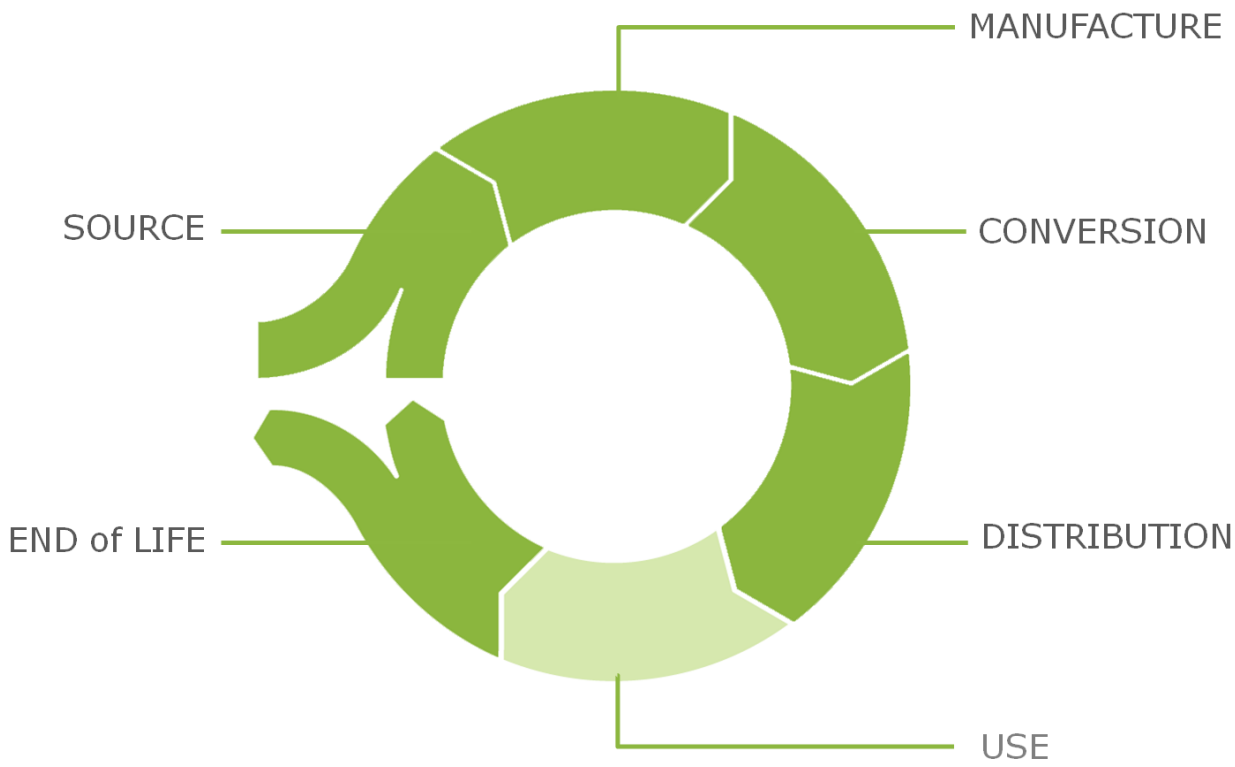
life cycle coverage in COMPASS



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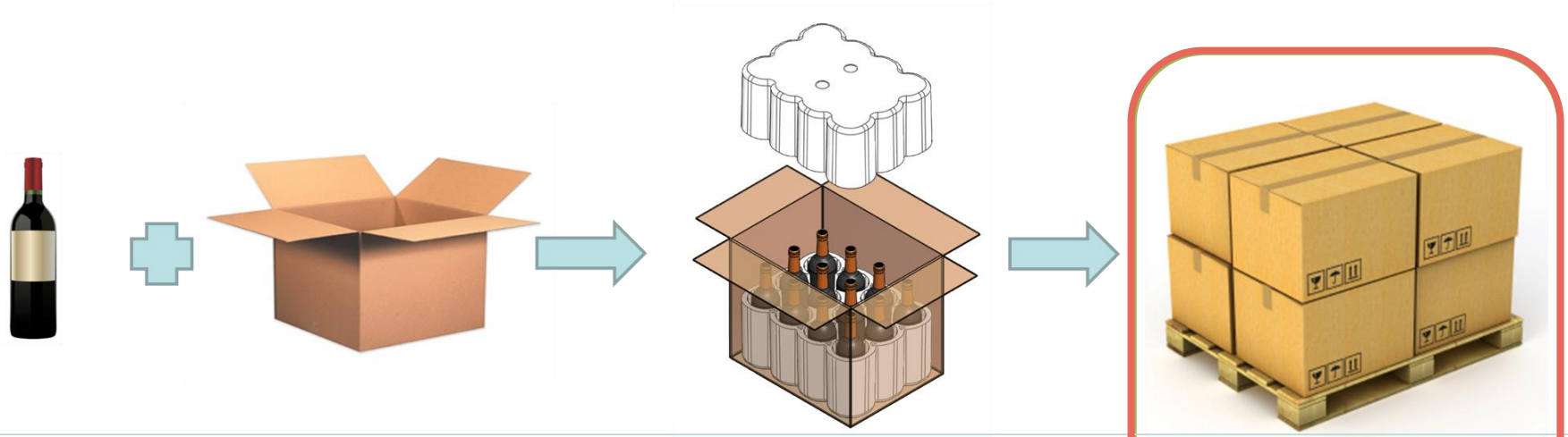
transport model (being developed)



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

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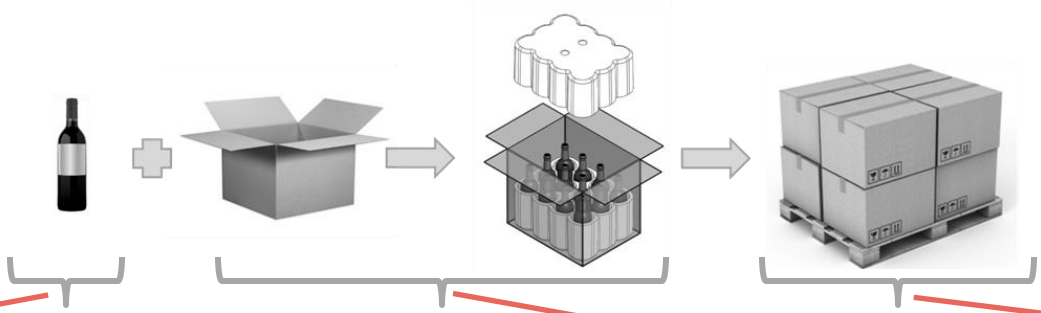
COMPASS® (comparative packaging assessment)



component level assessment during the concept and prototype stages to optimize the system

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component in relation to package

PRIMARY PACKAGE OVERVIEW:

SOAP IN A PUMP DISPENSER + REFILL POUCH

EXPORT | DELETE PACKAGE

NAME

Soap in a Pump dispenser + refill pouch

DESCRIPTION

Primary package: PET bottle and pump assembly, composite pouch with 4x volume. Compared to five units of the pump dispenser.

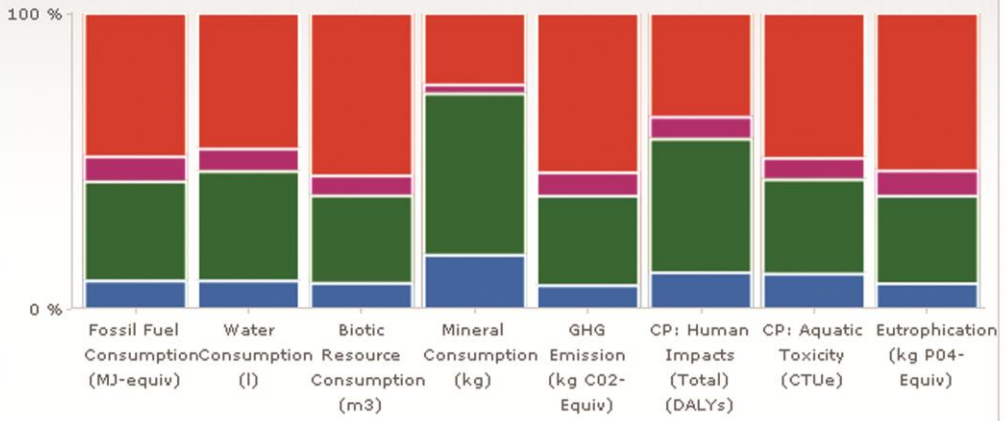
TOTAL CAPACITY 1,250 ml

DATA SET US

DISTRIBUTION LEGS ADD LIST

UPDATE

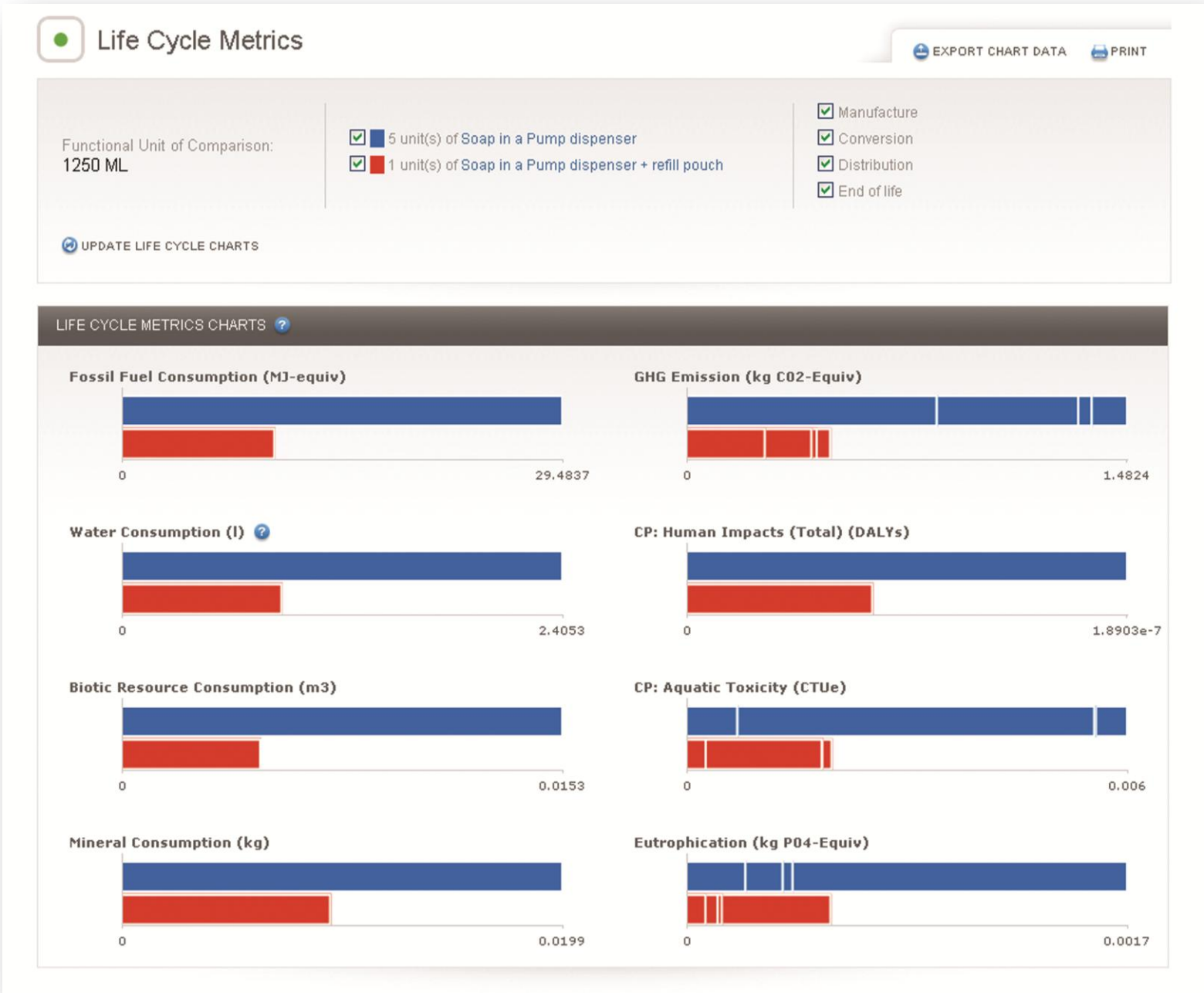
COMPONENT CONTRIBUTION



COMPONENT DETAILS NEW ADD EXISTING COMPONENT

NAME	MATERIAL AND CONVERSION	% PCR	% CERT.	DISTRIBUTION LEGS	COMPONENTS
Bottle EDIT | COPY | DELETE	50.0 g of Polyethylene Terephthalate (PET) converted using Injection Molding	0.0	0.0	(None Yet) ADD FIRST	(None Yet) ADD FIRST
Cap EDIT | COPY | DELETE	7.0 g of Polystyrene (PS) converted using Injection Molding	0.0	0.0	(None Yet) ADD FIRST	(None Yet) ADD FIRST
Pouch EDIT | COPY | DELETE	Composite (total weight: 32.5 grams)	0.0	0.0	(None Yet) ADD FIRST	2 ADD ANOTHER
Pump assembly EDIT | COPY | DELETE	Composite (total weight: 10.0 grams)	3.5	0.0	(None Yet) ADD FIRST	4 ADD ANOTHER

package to package comparison



attributes and material health

Packaging Attributes & Material Health

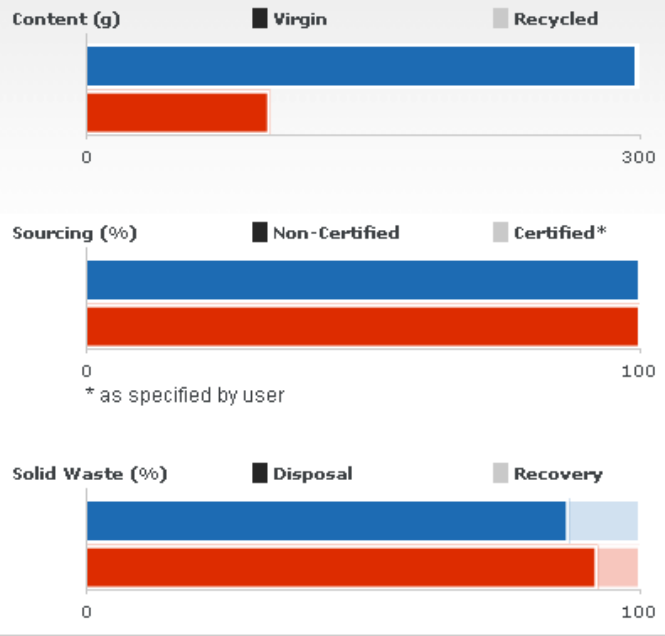
EXPORT CHART DATA PRINT

Functional Unit of Comparison:
1250 ML

- 5 unit(s) of Soap in a Pump dispenser
- 1 unit(s) of Soap in a Pump dispenser + refill pouch

UPDATE PACKAGING ATTRIBUTES CHARTS

PACKAGING ATTRIBUTES



MATERIAL HEALTH

Material Health	Weight	C	R	PBT
5.0 unit(s) of Soap in a Pump dispenser	300.00g	8	1	0
1.0 unit(s) of Soap in a Pump dispenser + refill pouch	99.50g	11	1	0
Bottle	50.00g	3	1	0
Cap	7.00g	2	0	0
Pouch	32.50g	1	0	0
Pump assembly	10.00g	5	0	0
Pump top	4.00g	2	0	0
Spring assembly	2.00g	1	0	0
Polypropylene (PP)	3.00g	1	0	0
High-Density Polyethylene (HDPE)	1.00g	1	0	0
Heavy fuel oil *Burned in industrial furnace; not present in final material*	0.01g	1	0	0

C: Carcinogen
R: Reproductive Toxicant
PBT: Persistent, Bioaccumulative, and Toxic

material health

MATERIAL IQ

GREENBLUE®

A business to business online registry that provides sustainability information about materials used in a variety of product and industrial sectors.

MATERIAL IQ

GREENBLUE

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Material profiles for product intelligence

Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Vestibulum tortor quam, feugiat vitae, ultricies eget, tempor sit amet, ante. Donec eu libero sit amet quam egestas semper. Aenean ultricies mi vitae est. Mauris placerat eleifend leo.

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Tools for Transparency

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Profiles in Sustainablility

Nike→

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Polymer »

TUB 121 Polyethylene Copolymer

INEOS Olefins & Polymers USA

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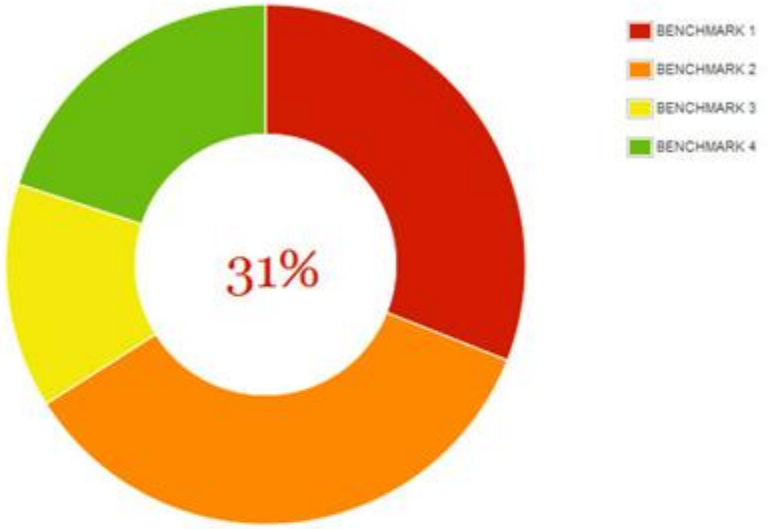


Continuous Improvement Index

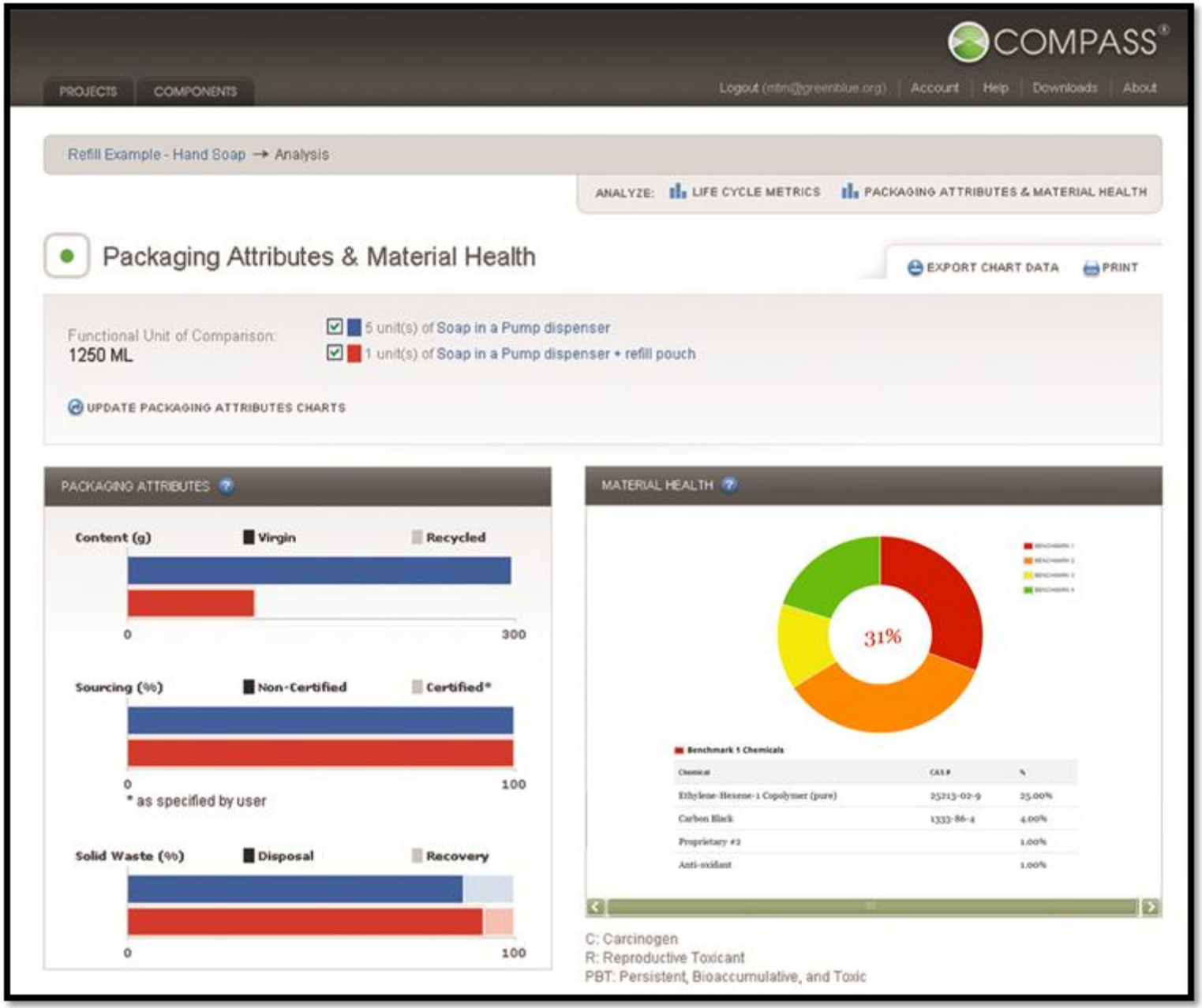
Benchmark 1 Chemicals

Chemical	CAS #	%
Ethylene-Hexene-1 Copolymer (pure)	25213-02-9	25.00%
Carbon Black	1333-86-4	4.00%
Proprietary #2		1.00%
Anti-oxidant		1.00%

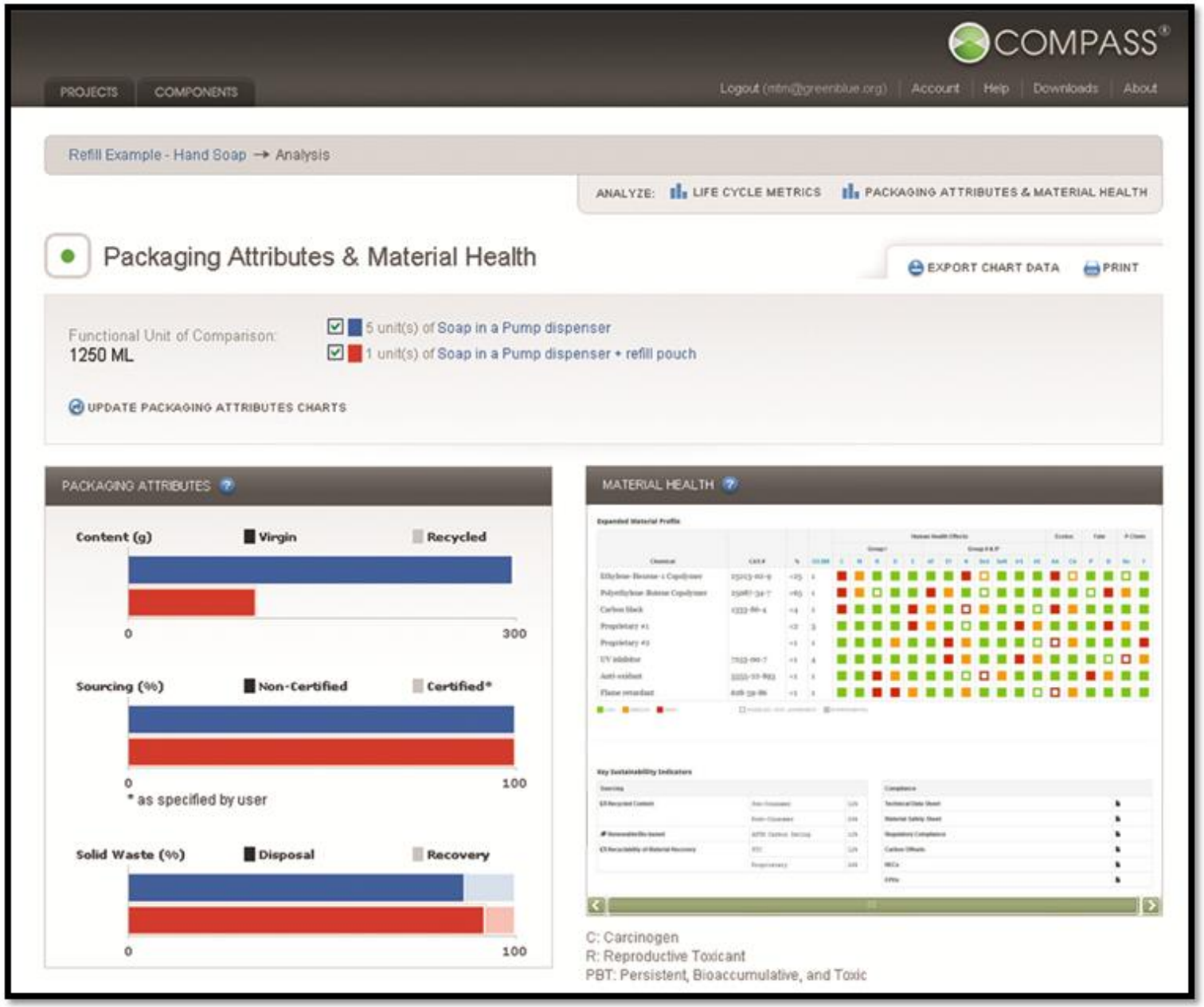
Ecolabels

Standards		Ecolabels		Banned/Restricted Substances	
				Regulatory	Voluntary
LEED	BIFMA	ECOLOGO	NIKE SUS. INDEX	ROHS 1 & 2	GOOGLE RED LIST

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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