



Safer Chemical Strategies: BizNGO & Green Screen

October 7, 2011

Mark Rossi, PhD





A non profit organization that collaborates with industry, government and other NGOs to design and deliver strategic solutions for:

Green chemicals



Sustainable materials



Environmentally preferable products







Our mission

To promote the creation and adoption of safer chemicals and sustainable materials in a way that supports market transitions to a healthy economy, healthy environment, and healthy people.

Our objectives include ...

- Model new type and degree of collaboration
- Develop tools and continuous improvement criteria
- Advance policy initiatives





BizNGO

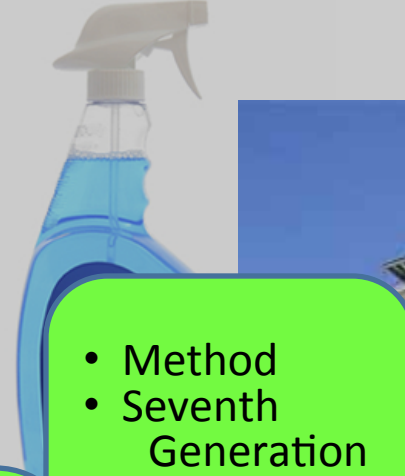
FOR SAFER CHEMICALS AND SUSTAINABLE MATERIALS



- Dell, Inc.
- Electronics Take Back Coalition
- Hewlett-Packard
- Seagate



- Catholic Healthcare West
- Kaiser Permanente
- Health Care Without Harm
- Hospira, Inc.
- Practice Greenhealth
- Premier, Inc.



- Method
- Seventh Generation
- Staples
- Whole Foods



- Construction Specialties
- Healthy Building Network
- Perkins+Will

- Breast Cancer Fund
- Clean Water Action
- Ecology Center
- EDF
- Env'l Health Strategy Center
- Investors Env'l Health Network
- NRDC



BizNGO Projects

Chemicals

- BizNGO Guide to Safer Chemicals

Materials

- Principles for Sustainable Plastics
- Plastics Scorecard - tool for integrating green chemistry into material assessments

Policy

- Gov't Initiatives – TSCA, CA Green Chemistry
- Industry Standards – GRI, Sustainability Consortium, ULE



BizNGO Principles for Safer Chemicals

Endorsers include ...

- Brooks Sports
- Catholic Healthcare West
- Construction Specialties, Inc.
- Health Care Without Harm
- Hewlett-Packard Company
- Hospira, Inc.
- Kaiser Permanente
- Method
- Novation
- Perkins+Will
- Practice Greenhealth
- Premier, Inc.
- Seventh Generation
- Staples, Inc.
- Whole Foods Market, Inc.

1. Know and disclose
product chemistry

2. Assess and avoid hazards

3. Commit to continuous
improvement

4. Support public policies and
industry standards

Demand for Safer Chemicals

WAL★MART®

bypasses federal regulators to ban controversial flame retardant (2/26/11)



Race to the Top: The Staples Supplier Collaboration Initiative



KAISER PERMANENTE®

Launches health care industry's first sustainability scorecard (5/4/10)

Latex-free? PVC-free? Phthalate-free?

RoHS-free? Chlorine-/Bromine-free? BPA-free?

California Proposition 65 chemical?



BizNGO Guide to Safer Chemicals – **Benchmarks for Knowing Ingredients**

Trailhead
- Know only regulated substances

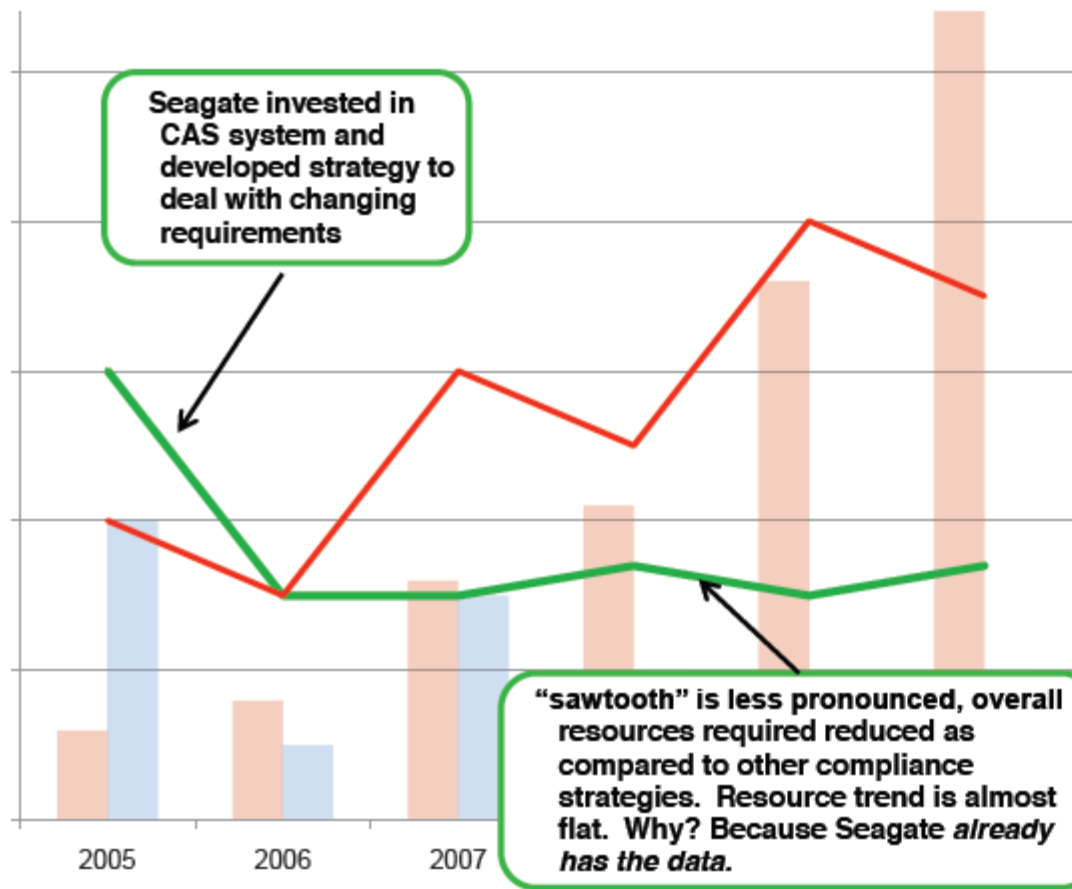
Base Camp
- Ask suppliers if they know chemicals in products, but do not require disclosure

High Camp
- Require disclosure of chemicals of high concern

Summit
a. Know all ingredients
b. Know chemistries across lifecycle
c. Detailed supply chain requirements

Full Lifecycle Insights

By investing 'early' in full data disclosure, Seagate has been able to flatten the 'sawtooth' in resource requirements for gathering substance data



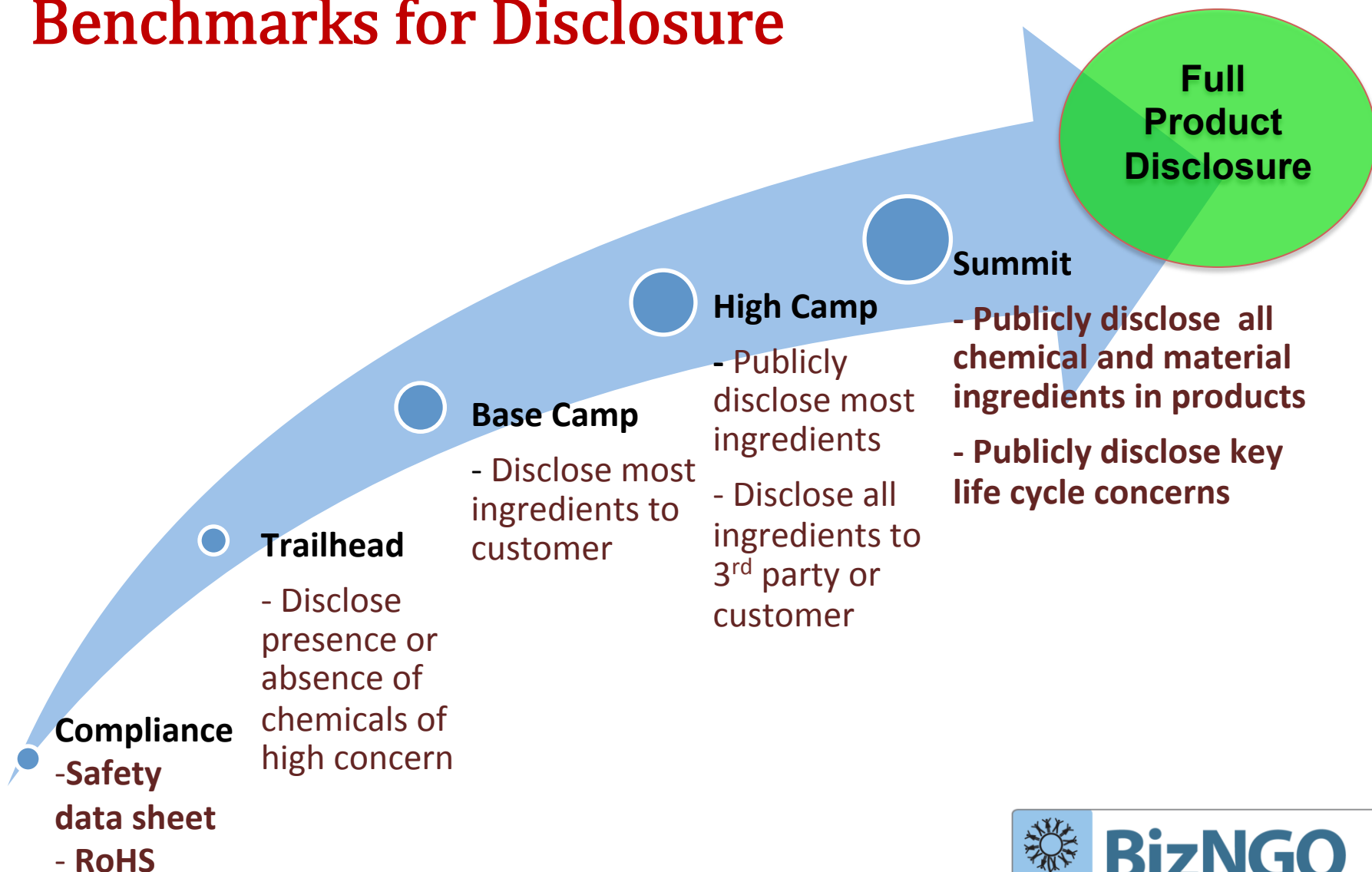
Seagate is able to respond to new substance restrictions within current resources

- Number of Restricted Substances
- NRE (materials and process changes)
- Resources Required - Strategic Approach
- Typical Total Resources Expended

Seagate manages substance restrictions at low overall cost and with high credibility



BizNGO Guide to Safer Chemicals – **Benchmarks for Disclosure**



Disclosing Ingredients in Products



maintains pH balance based dish liquids.

PEEL BACK THIS LABEL TO VIEW OUR FULL INGREDIENTS LIST

Safety Information: Please keep all cleaning products out of the reach of



BizNGO Guide to Safer Chemicals – **Benchmarks for Assess & Avoid**

○ **Trailhead**
- Prioritize known chemicals of high concern to avoid (e.g., SIN List)

○ **Base Camp**
- Assess hazards of chemicals in products and process chemistry

○ **High Camp**
- Benchmark chemicals using Green Screen

○ **Summit**
- Select safer substitutes for both products and process chemistry

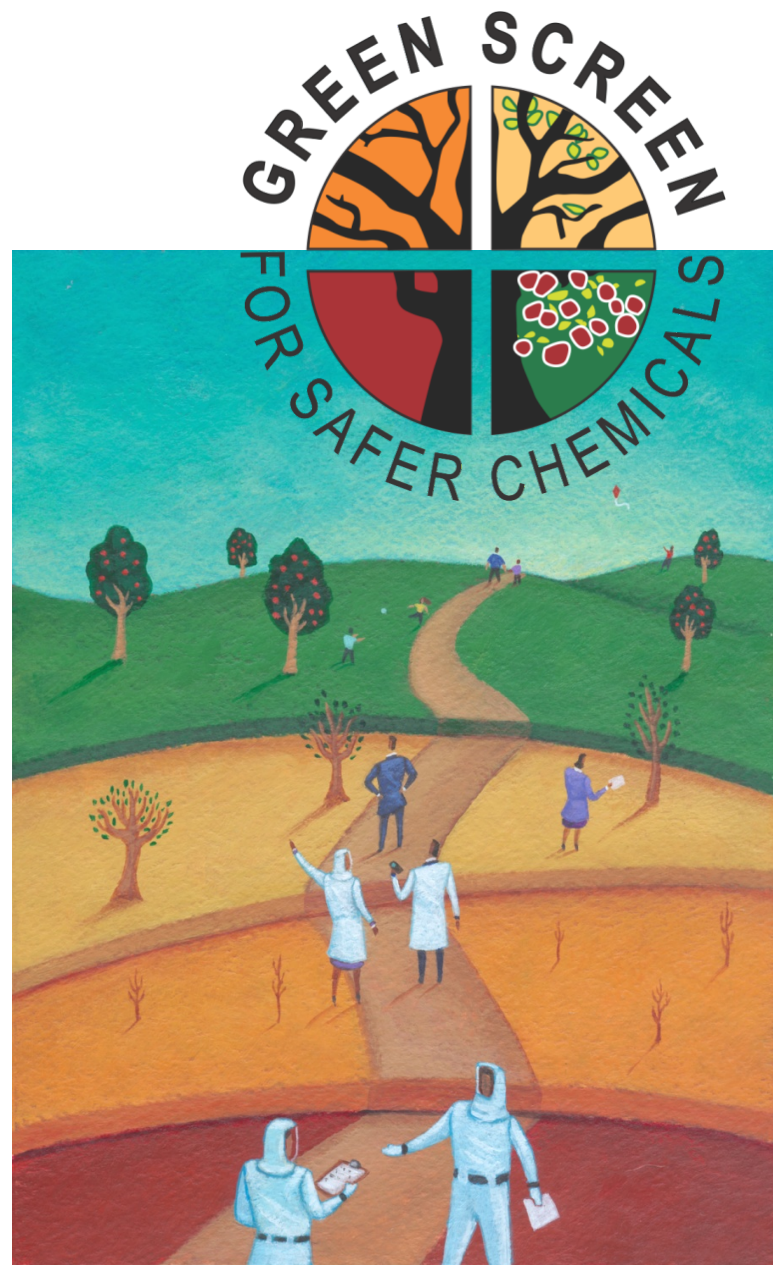
Safer Substitutes



ALLISON ACHAUER

Green Screen

- Comparative chemical hazard assessment tool
- Open source and transparent
- Data driven, systematic and scientifically robust
- Necessary but not always sufficient for sustainability
- Builds from:
 - 12 Principles of Green Chemistry
 - US EPA DfE Alternatives Assessment model



Identifying safer substitutes for BFRs, CFRs and PVC



Platform for Walmart chemical screening program



Basis for alternative assessments in state regulatory programs



Aligning hazard thresholds with EPA



How it works

1. Assess and classify hazards
2. Apply the benchmarks
3. Make informed decisions


Hazard Summary Table

Chemical	CAS#	% in Formulation	Human Health Effects											Ecotox.		Fate		Breakdown Products			
			Priority Effects						Acute Toxicity	Systemic/Organ Effects	Sensitization (skin)	Sensitization (respiratory)	Irritation/Corrosion (skin)	Irritation/Corrosion (eyes)	Immune System Effects	Acute	Chronic	Persistence	Bioaccumulation	Metabolites	Degradation Products
			Carcinogenic	Mutagenic	Reproductive	Developmental	Endocrine Disruption	Neurological													
Decabromodiphenyl ether (decaBDE) - CAS# 1163-19-5																					
DecaBDE	1163-19-5	97	M	L	L	M	M	M	L	L	L	nd	L	L	nd	L	L	vH	M	penta- to nona-BDE	tri- to nona-BDE
Breakdown Products																					
PentaBDE	32534-81-9		nd	L	M	M	H	M	L	H	L	L	M	M	nd	H	H	vH	vH		
OctaBDE	32536-52-0		nd	L	M	H	M	M	L	H	L	nd	L	L	nd	L	L	vH	M	nd	low er PBDEs
Bold text = based on experimental data. <i>Black italics text</i> = based on analog data or expert judgment.																					

Apply the Benchmarks

Benchmark 4

Prefer – Safer Chemical

A green rectangular box with a white border. The top portion is a solid green bar containing the text "Benchmark 4" in white. Below this is a white area containing a green rounded rectangle with the text "Prefer – Safer Chemical" in white. To the right of the box is a stylized illustration of a tree with green leaves and clusters of red fruit.


Benchmark 3

Use but Still Opportunity for Improvement

An orange rectangular box with a white border. The top portion is a solid orange bar containing the text "Benchmark 3" in black. Below this is a white area containing an orange rounded rectangle with the text "Use but Still Opportunity for Improvement" in black. To the right of the box is a stylized illustration of a tree with black branches and green leaves.

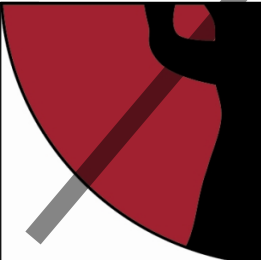
Benchmark 2

Use but Search for Safer Substitutes

An orange rectangular box with a white border. The top portion is a solid orange bar containing the text "Benchmark 2" in white. Below this is a white area containing an orange rounded rectangle with the text "Use but Search for Safer Substitutes" in white. To the right of the box is a stylized illustration of a tree with black branches and a yellow background.

Benchmark 1

Avoid – Chemical of High Concern

A red rectangular box with a white border. The top portion is a solid red bar containing the text "Benchmark 1" in white. Below this is a white area containing a red rounded rectangle with the text "Avoid – Chemical of High Concern" in white. To the right of the box is a stylized illustration of a tree with black branches and a red background.

Benchmarking DecaBDE

Chemical	Reason for Benchmark	Benchmark
DecaBDE and Breakdown Products		
CAS# 1163-19-5 (decaBDE)	<ul style="list-style-type: none"> vH - persistence M - bioaccumulation M - cancer, development, endocrine, neurological 	Benchmark 2(a), 2(c), 2(d)
CAS# 32536-52-0 (pentaBDE)	<ul style="list-style-type: none"> vH - persistence + bioaccumulation H - acute + chronic ecotox. H - endocrine disruption 	Benchmark 1(a), 1(b), 1(c), 1(d)
CAS# 32536-52-0 (octaBDE)	<ul style="list-style-type: none"> vH - persistence H - reproductive effects 	Benchmark 1(c), 1(d)

Chemical	Reason for Benchmark	Final Benchmark
DecaBDE and its breakdown products	<u>Breakdown products:</u> <ul style="list-style-type: none"> pentaBDE = PBT, vPvB, vPT, vBT, + H-endocrine -- Benchmarks 1(a),(b),(c),(d) octaBDE = vPT + H-developmental -- Benchmark 1(c), (d) 	Benchmark 1: Avoid - Chemical of High Concern

Make Informed Decisions



- Scores can be used without toxicology training
- Drives wider adoption of preferred materials across the supply chain
 - White list
 - Guide new product development
- Replacing materials multiple times is expensive

Material ID	Score	Material Name	Category
1000001	95	Acetic Acid	Green
1000002	85	Acetone	Green
1000003	75	Acrylonitrile	Yellow
1000004	65	Adipic Acid	Yellow
1000005	55	Aluminum	Yellow
1000006	45	Ammonia	Orange
1000007	35	Aniline	Orange
1000008	25	Antimony	Orange
1000009	15	Asbestos	Orange
1000010	5	Azobenzene	Orange
1000011	0	Benzene	Red
1000012	0	Bisphenol A	Red
1000013	0	Chromium VI	Red
1000014	0	Cyanide	Red
1000015	0	Dioxin	Red
1000016	0	Lead	Red
1000017	0	Mercury	Red
1000018	0	Nickel	Red
1000019	0	Phenol	Red
1000020	0	Polychlorinated Biphenyls	Red

Trends in Chemical Management

- **↑** Transparency – disclose chemicals in products
- **↑** Responsibility -- Supply Chain and Life Cycle
- **↑** Demand for comprehensive hazard data on chemicals
- **↑** Demand for safer alternatives
- Leadership across many sectors, including: Health Care, Electronics, Buildings, Retail, Cleaning Products, Personal Care Products, Apparel & Footwear, Outdoor Industry





Thank You!

Mark Rossi, PhD

Co-Director, Clean Production Action

Chair, BizNGO

Mark@CleanProduction.org

t) 781.391.6743