# Green Chemistry Education Webinar Series

## Advancing Sustainability Through the Supply Chain

### Effective Communication and Transparency

March 31, 2016

GREEN CHEMISTRY & COMMERCE COUNCIL

Business Mainstreaming Green Chemistry

# What is the GC3?

- Cross-sectoral, B2B network of over 70 companies and other organizations
- Formed in 2005
- Collaboratively advances green chemistry across sectors and supply chains

# Today's Speakers

## Howard Williams

SVP Sustainability, New Ventures & Acquisitions, Construction Specialties, Inc.

## Andrea Schmidt

Senior Staff Program/ Project Manager Product Sustainability, Seagate Technology

## Todd Copeland

Environmental Responsibility Manager, Patagonia

# Ground Rules

- Due to the number of participants in the webinar, all lines will be muted
- If you have a question or comment, please type it in the “Questions” box located in the control panel
- Questions will be answered at the end of the presentation

# Advancing Sustainability

**Howard Williams**

SVP Sustainability, New Ventures & Acquisitions

Construction Specialties, Inc.

# It all starts with “Why”

- From beginning to end, all involved need to know what you want to achieve and why you’re doing it.
- Your/our supply chain must know why you’re doing this in order to effectively support the work.
- Your/our product development teams need access to information as they select materials.
- Your/our procurement staff
- Your/our facilities staff
- Your/our Business Unit Managers
- Your/our Senior Managers

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# Basic, but essential…

1. Policy
    1. Product
    2. Processes
2. Standards
3. Communications
4. Outcome
5. Audit

# Color is an important part of our product offerings

- Approximately 80 colors had to be retro-optimized
  - Discovered 18 pigments create the 80 colors
  - Optimize pigments and the colors come with it

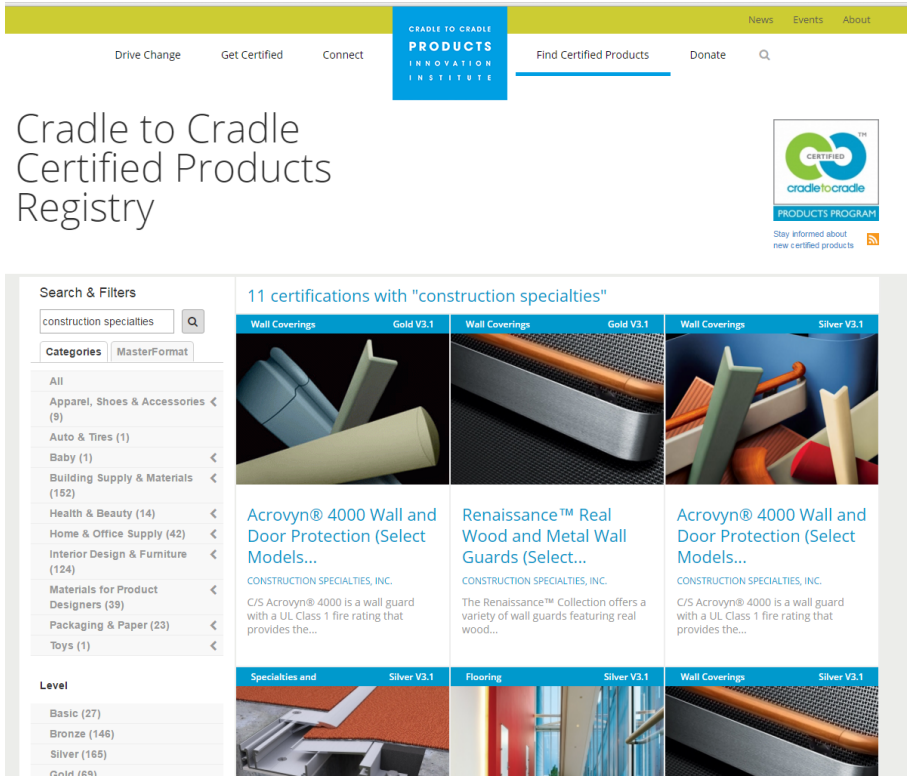
- Cradle to Cradle looks at each homogenous mass at the 100 ppm level
  - 100 ppm captures intentionally added ingredients

# 360-degree communication

- Business unit frustrated by supplier of flexible compound
- Our purchasing manager's conversations with supply chain were going nowhere for 8 – 10 months
- When manager of suppliers sales department understood we were not expecting them to pay for our certification the information became available
- We did not effectively support and communicate with our purchasing manager

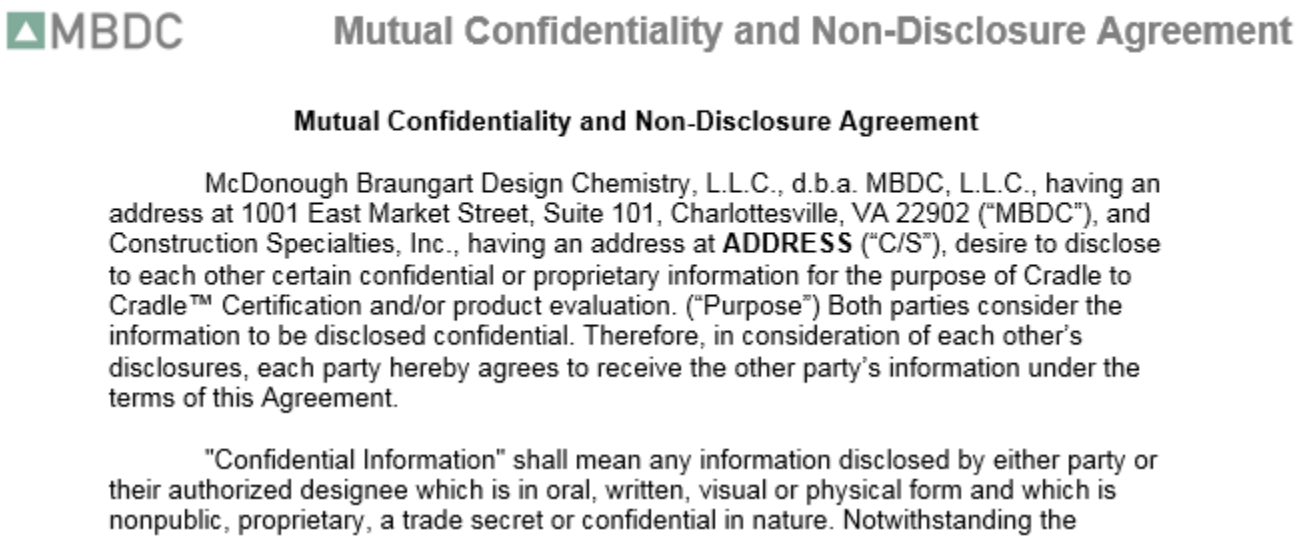
# Pilot & Export

## North American Divisions




## Exporting knowledge gained in N.A. to Other Division(s)

# Transparency:
## From? To? Why?
## (How) Are you protecting your supplier's business interests?



MBDC

**Mutual Confidentiality and Non-Disclosure Agreement**

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McDonough Braungart Design Chemistry, L.L.C., d.b.a. MBDC, L.L.C., having an address at 1001 East Market Street, Suite 101, Charlottesville, VA 22902 ("MBDC"), and Construction Specialties, Inc., having an address at **ADDRESS** ("C/S"), desire to disclose to each other certain confidential or proprietary information for the purpose of Cradle to Cradle™ Certification and/or product evaluation. ("Purpose") Both parties consider the information to be disclosed confidential. Therefore, in consideration of each other's disclosures, each party hereby agrees to receive the other party's information under the terms of this Agreement.

"Confidential Information" shall mean any information disclosed by either party or their authorized designee which is in oral, written, visual or physical form and which is nonpublic, proprietary, a trade secret or confidential in nature. Notwithstanding the

# Collaboration saves reinventing best practices

# Persistence wins (most of the time)

# Towards Seagate’s supply chain transparency

**Annie Schmidt**
**Seagate Technology**
**Product Sustainability**
**Senior Staff Program/Project Manager**

SEAGATE | EHS & Sustainability

You May Know Seagate as a

# Hard Drive Manufacturer…

- 1st and only to ship over 2 billion drives
- Stores more than 40% of the world’s data
- #1 OEM storage – over 2 billion drives

# But We're Also a Company That:

- Serves many types of customers and businesses
- Delivers deep expertise and unique IP in storage & data management
- Combines UX, software & design capabilities to create new categories of storage solutions
- Ranks as one of the top 25 companies worldwide in supply chain operations

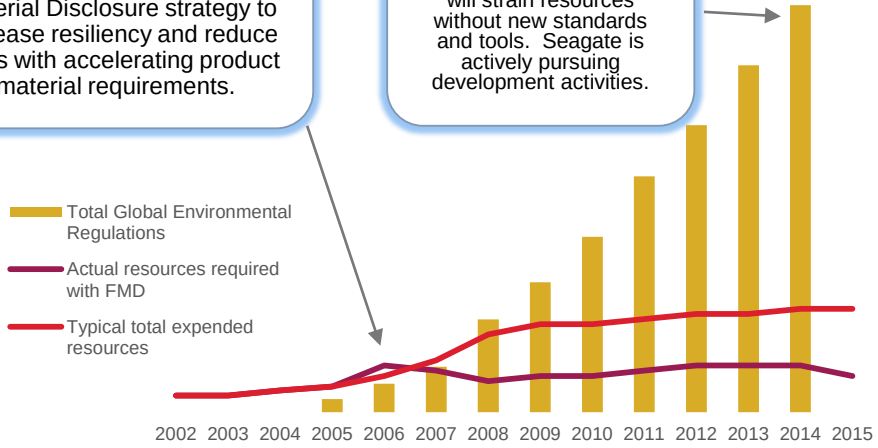
# Seagate's Move Into Supply Chain Transparency: Full Material Disclosure (FMD)

- What is FMD?
  - Seagate's system for collecting supplier component, parts and materials information on all products
  - Data loaded to database supported by restricted substance lab reports
- What drives FMD?
  - Global regulatory and customer requirements
  - Customers require documented product material content compliance to RoHS, REACH, and their specific product substance restrictions
  - More cost effective for Seagate
- How does Seagate accomplish FMD?
  - Compliance Assurance System (CAS) database loads supplier data via IPC 1752
  - CAS informs supplier annually to refresh data
  - Database evaluates supplier data against global regulations and customer requirements
  - Produces data for customer/customs inspection reports

# Substance restrictions: compliance with specifications and data/documentation requirements


Seagate invested in CAS* System and developed Full Material Disclosure strategy to increase resiliency and reduce costs with accelerating product material requirements.

Accelerating restrictions and data output demands will strain resources without new standards and tools. Seagate is actively pursuing development activities.




**Compliance to all applicable regulatory and customer requirements**

- RoHS, REACH, RoHS 2, China RoHS, Regional restrictions (Canada, etc.)
- Halogen-free, phthalate-free, and myriad other voluntary restrictions

**Alignment to standards**

- IPC 1752 materials reporting format
  - Open, industry data standard
  - IPC 1753 is a new lab report data standard. Seagate led this effort.

**'FMD' – Full Materials Disclosure**

- Manage compliance to changing regulations and customer specifications restricting toxic substances

**Stability**

- Supplier reporting requirements and formats seldom change

**Security**

- Supplier data are kept confidential

**Supplier responsibility**

- Suppliers must participate and must provide all required data

**Closed loop resourcing**

- The same resources manage both supplier data AND customer reporting

**Low cost, best-practice compliance**

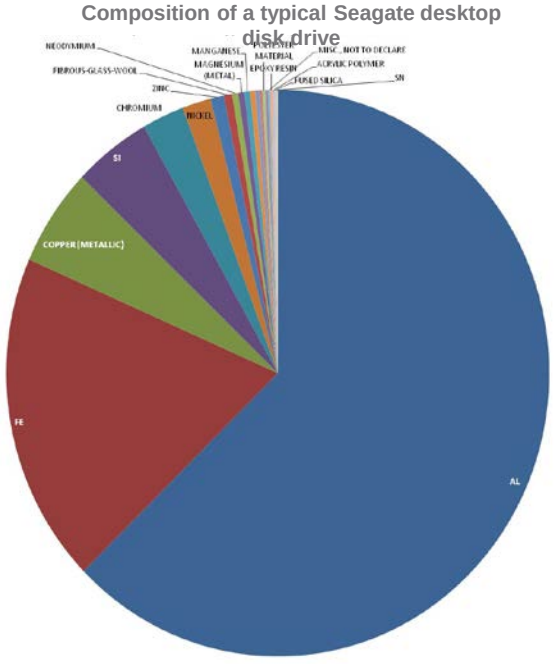
- Best compliance, fastest response, lowest cost

# Product-level Lab Test Requirement

**Requirement to report what is in our products**

- What is the Product Lab Test Requirement?
  - Final audit product test prior to customer ship authorization
  - Use samples with materials representative of normal production
  - ISO 17025 certified independent 3rd party product teardown, “grind and find” analysis for restricted substances
- What drives Lab Test Requirement?
  - Global regulatory and customer requirements
  - Requirement for doing business globally and with specific customers
  - Customers require documented product material content compliance to RoHS, REACH, and their specific product substance restrictions
- How does Seagate meet this requirement?
  - Seagate’s standard operating procedure
  - Product Stewardship specification
  - Audit Lab Test Specification

# Assembled Bill of Substance for a Desktop Disk Drive




| Substance | CAS Number | Cumulative Concentration |
|---|---|---|
| AL | 7429-90-5 | 61.9451 |
| FE | 7439-89-6 | 80.5984 |
| COPPER (METALLIC) | 7440-50-8 | 86.12 |
| SI | 7440-21-3 | 90.705 |
| CHROMIUM | 7440-47-3 | 93.1778 |
| NICKEL | 7440-02-0 | 94.862 |
| ZINC | 7440-66-6 | 95.6614 |
| FIBROUS-GLASS-WOOL | 65997-17-3 | 96.141 |
| NEODYMIUM | 7440-00-8 | 96.5053 |
| MAGNESIUM | 7439-95-4 | 96.8692 |
| MANGANESE | 7439-96-5 | 97.1983 |
| LCP polymer | 147310-94-9 | 97.5019 |
| POM, Polyoxymethylene copolymer | 24969-26-4 | 97.7305 |
| "DOPO" halogen free flame retardant | 35948-25-5 | 97.9132 |
| POLYESTER MATERIAL | 79-14-1 | 98.086 |
| ACRYLATE URETHANE OLIGOMER | 73324-00-2 | 98.2507 |
| PROPRIETARY | SYSTEM | 98.3749 |
| EPOXY RESIN | 129915-35-1 | 98.4961 |
| ACRYLIC POLYMER | 37325-11-4 | 98.6128 |
| FUSED SILICA | 60676-86-0 | 98.7214 |
| SN | 7440-31-5 | 98.8116 |

*The Seagate supplier specification restricts almost 2000 CAS numbers*

# Chemical Transparency and FMD

- Core Products
  - Fully compliant with FMD
  - Up to 5% can be undisclosed at the homogeneous material level
- Products from Seagate acquisitions
  - In varying stages of progress toward FMD compliance
  - Product and supply chain complexity drive time to compliance

# FMD and Software Tools

- Ten years on and we need more capacity
  - Expanding global regulatory climate and customer demands
    - Conflict Minerals / Responsible Sourcing
    - Process Chemistry
- Requirement for software houses to provide integrated solutions
  - With current technology
  - Can’t be accomplished manually
    - More expensive
    - Lower data quality

# New FMD Frontier:
# Process Chemistry and Responsible Sourcing

**Customer and NGO process chemistry disclosure requirements**

- Manual process
- "**People are dying to make our phones and computers."***
- While most sustainability efforts focus on product sustainability, the volume of process chemicals not incorporated into products is conservatively estimated to be 4 times that of product chemistries

*http://goodelectronics.org/news-en/no-more-deaths-in-electronics-sweatshops, accessed 11/18/15.

**Conflict Minerals and responsible sourcing**

- Emerging requirements to expand conflict minerals into other extractives and other geographies
- Focus growing toward responsible sourcing throughout the supply chain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# Mission Statement

**Make the best product, cause no unnecessary harm, and use business to inspire and implement solutions to the environmental crisis**

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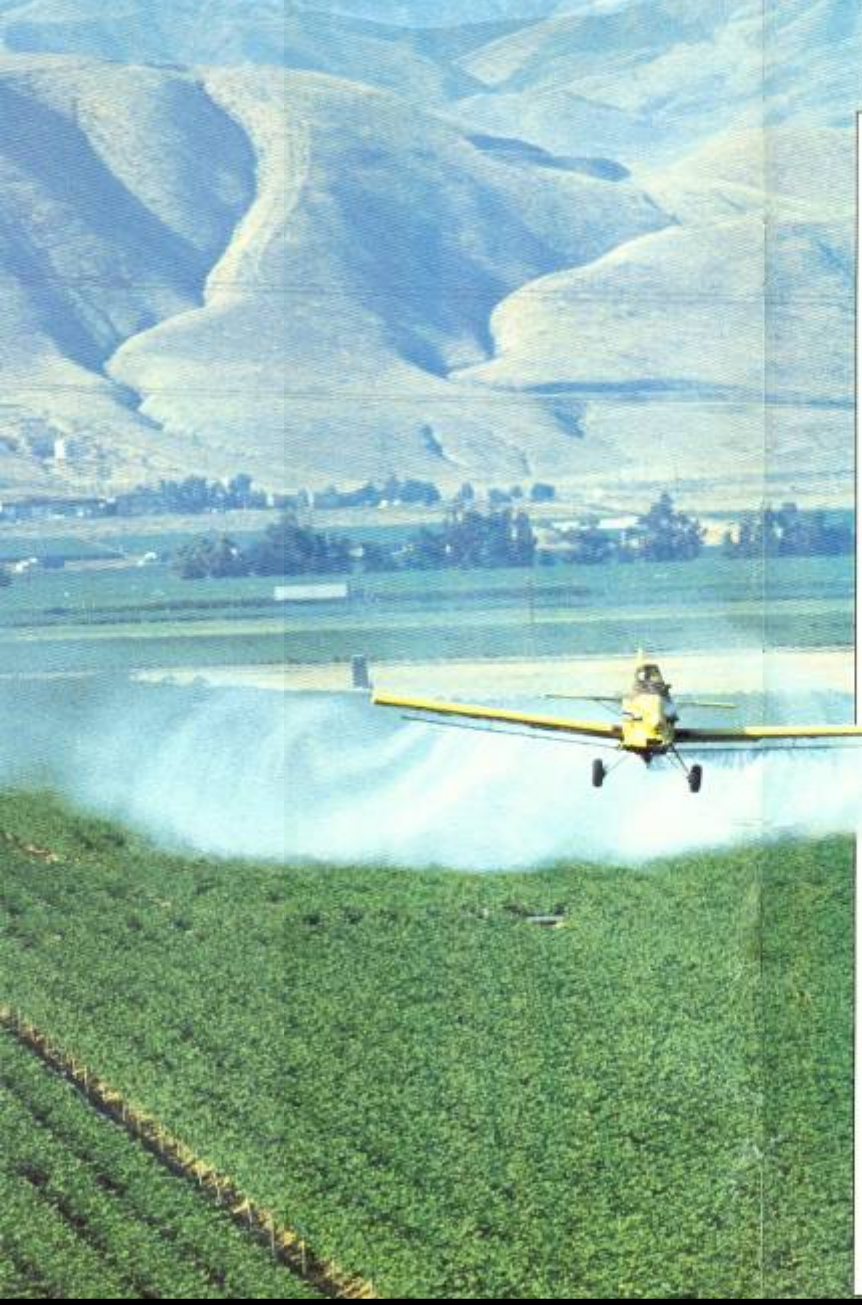
patagonia®



# CHOOSING ORGANIC

Twenty years ago, I changed my eating habits after I read how much harm cattle grazing inflicts on the earth. That was an easy choice for me – especially when I realized I did not need a steady diet of red meat to sustain my health.

As a company, we face a similar choice. In the course of our ongoing environmental assessment, we discovered that the most damaging fiber used to make our clothing may actually be conventionally grown, 100% "pure" cotton. That's because the process of growing conventional cotton involves the heavy use of chemicals that toxify the soil, air and ground water. And since many of these chemicals were originally formulated as nerve gases for warfare, it is no surprise that where spraying occurs, health problems follow, including higher rates of cancer and birth defects in humans and wildlife. These are outrageous costs to pay for the battle against bugs. And it's a battle we'll never win: while the bugs adapt to the chemicals, the rest of us sustain the long-term damage.

Gregoire Mancheiss

Meanwhile, in our own backyard, a handful of farmers have been growing cotton without chemicals for years. Their yields are just as high, or nearly as high, as those of their "conventional" counterparts and the quality of their fibers is equal or sometimes better. The environmental difference? Of all the potential fibers for clothing, organically-grown cotton may be the least damaging and the most sustainable.

Knowing how destructive conventionally-grown cotton is, and that there's a viable alternative, Patagonia has to choose organic. Now that we know, it would be unconscionable for us to do anything less. That is why, as of this spring, we no longer use conventional cotton in any part of the line.

To change to organic cotton has its price. Organic farming is labor-intensive, and so it is more costly. And after the cotton leaves the field, nearly every step in production – ginning, spinning, and knitting or weaving – incurs added costs for our relatively small runs.

These higher costs also create new risks for our business. We've had to drop some products that no longer make economic sense to produce. And we have to be prepared for a loss in revenue should higher prices translate to fewer sales. We undertake another risk, too: we can't go back. To do so would violate our basic principles: to make a quality product and to reduce our environmental harms. Making clothes out of conventional cotton is something our company can no longer afford to do.

Cotton sportswear makes up a small part of our product line. As we look ahead, we see immense challenges in making our other products in ways less harmful to the landscape. Those challenges prove that our organic cotton project is a single step in a very long process – but an important step nonetheless.

We are betting that we have enough loyal customers who will make the same choice we have made here at Patagonia: to pay more now for organics rather than the hidden environmental costs later. It's a simple, personal choice, of course, to act on what we learn. We've all made such choices: to give up or cut down on red meat, to pay more for an energy-efficient appliance, or forego a purchase entirely because it's not needed.

If these choices are simple and individual, their ripple effects are profound. The market is laserlike in its response to changes in what people want. Together we can create a significant business base for the organic cotton movement. We should. Organic farmers are returning to the only model we have for sustainable commerce, one that gives back to the planet as much as it takes out. Their success will be a quiet revolution in modern life. Let's follow their lead.

Yvon Chouinard

patagonia®

patagonia®

bluesign®

The independent industry textile standard

## Dyeing & Finishing

- Chemicals Management
- Water and energy consumption
- Air pollution and water pollution
- Worker and consumer safety

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SHOP
INSIDE PATAGONIA
What are you looking for?
Map
Satellite
Hudson Bay
North Atlantic Ocean
United States
Mexico
Gulf of Mexico
Cuba
Puerto Rico
Caribbean Sea
Nicaragua
Venezuela
Colombia
Guyana
Suriname
Ecuador
Peru
Brazil
Bolivia
Finland
Norway
Russia
Ireland
United Kingdom
Denmark
Germany
Poland
Belarus
Ukraine
France
Austria
Romania
Italy
Spain
Portugal
Greece
Turkey
Kazakhstan
Mongolia
Uzbekistan
Kyrgyzstan
Turkmenistan
Syria
Iraq
Iran
Afghanistan
Pakistan
China
South Korea
Japan
Sea of Japan
East China Sea
Nepal
India
Myanmar (Burma)
Thailand
Vietnam
South China Sea
Philippines
Bay of Bengal
Arabian Sea
Gulf of Thailand
Laccadive Sea
Malaysia
Indonesia
Banda Sea
Arafura Sea
Morocco
Western Sahara
Algeria
Tunisia
Libya
Egypt
Saudi Arabia
Oman
Yemen
Gulf of Aden
Mauritania
Mali
Niger
Chad
Sudan
Burkina Faso
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# Our DWR Problem [Updated]


***Update:*** *The majority of this post first appeared on March 6, 2015. It has been updated here with the most recent information about Patagonia's work to improve chemical safety in our supply chain.*

Patagonia—as well as other high-quality outdoor outerwear suppliers—for years relied on a Durable Water Repellent (DWR) of a certain chemistry (described below) to bead up, then disperse, surface moisture from rainwear

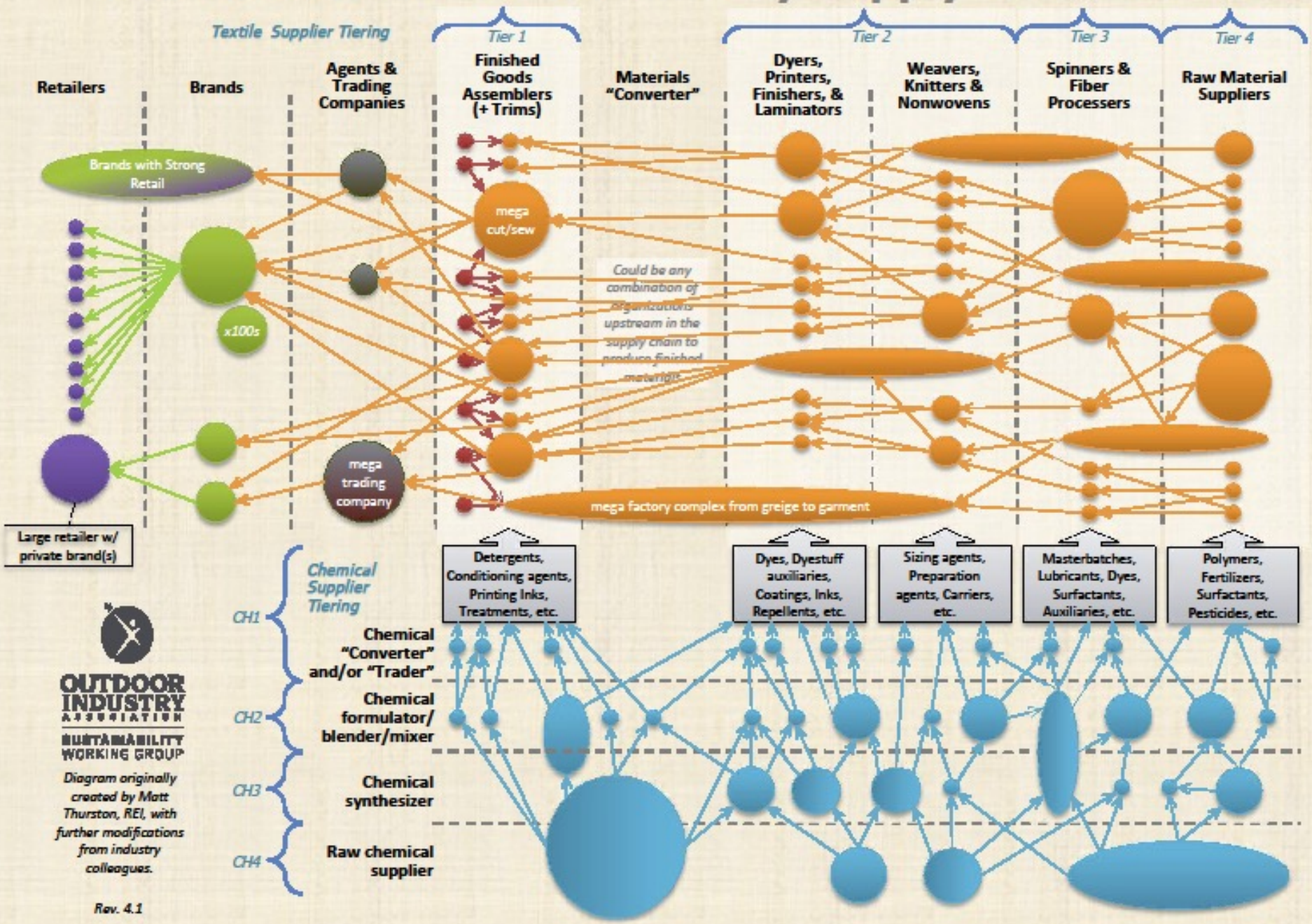
patagonia

# “Patagonia Bets $1 Million on Biochemistry”

## - Environmental Leader


patagonia®

# The Textile & Textile Chemistry Supply "Network"




OUTDOOR INDUSTRY ASSOCIATION
SUSTAINABILITY WORKING GROUP

*Diagram originally created by Matt Thurston, REI, with further modifications from industry colleagues.*

*Rev. 4.1*

# Question & Answer

- If you have a question or comment, please type it in the “Questions” box located in the control panel
- Questions will be answered in order as they are received.

# Upcoming Events


## Green Chemistry Careers in Industry

April 12, 2016, 1:30 pm EDT

WEBINAR

## Innovating with Intent: Science & Sustainability at Eastman

April 13, 2016, 12:00 pm EDT

GC3 INNOVATORS ROUNDTABLE
MAY 24-26, 2016 | BURLINGTON, VT
hosted by seventh generation

## GC3 Innovators Roundtable

Burlington, VT

May 24-26, 2016

# Thanks for joining us!

For more information about the GC3:
www.greenchemistryandcommerce.org

GC3 GREEN CHEMISTRY & COMMERCE COUNCIL
Business Mainstreaming Green Chemistry