6th Annual Green Chemistry and Commerce Council Innovators Roundtable

Hosted by Hewlett Packard
Cupertino, California

May 4-5, 2011

Meeting Summary

Introduction
The sixth annual Green Chemistry and Commerce Council (GC3) roundtable was hosted by Hewlett Packard in Cupertino, CA, from May 4-5, 2011. Over 80 individuals from industry, government, non-government organizations, and academia attended this two day meeting, including over 20 who were attending the business-to-business forum for the first time. Presentations and discussions focused on implementing green chemistry and design for environment practices along supply chains, sharing strategies to overcome barriers to these efforts, and promoting education and information about green chemistry and design for environment. The overall objectives for the meeting were to:

- Share information, experience and understandings among a diverse group of companies and other stakeholders on advancing implementation of green chemistry and design for environment (DfE); and
- Develop projects and strategies to advance the application of green chemistry and DfE across supply chains.

Wednesday, May 4th

Welcome and Introductions

Judy Glazer, Director of Social and Environmental Sustainability and Compliance at Hewlett Packard (HP) welcomed participants to the meeting on behalf of HP. HP is the world's largest technology company which shapes the way sustainability problems are addressed at HP. They start by thinking about optimizing resources and how to apply IT to reduce waste and increase efficiency; they build intelligent infrastructure to create more efficient ways to use resources and they drive sustainable transformation by using innovative IT that provides industry with more productive and viable alternatives. An example of their innovative technology is the HP Visual Collaboration Studio which allows face to face interaction without the need to travel.

HP is recognized for its environmental leadership in many areas. Some recent products exemplify this leadership. The HP Envy 100 E-All-In-One is the world's first PVC-free printer. HP's "Closed Loop " Recycling Process combines plastics from recycled HP ink cartridges and recycled PET resins from water bottles to produce new HP ink cartridges with over 70% recycled materials. HP's HDPE reinforced banner is an alternative banner material to PVC that can be easily recycled through an HP take-back program.

HP has a very large supply chain and a lot of influence to generate change, but the electronics supply chain is complicated. There are a relatively small number of formulators, a large number of intermediate suppliers and a small number of Original Equipment Manufacturers (OEMs). They are finding that communicating their environmental requirements directly to formulators is most effective. Formulators are being introduced to the Green Screen approach as a way to identify environmentally preferable materials from the beginning. HP moved to this approach in response to concerns over potentially harmful, regulated or "soon to be" regulated materials that could lead to regrettable substitutions.

Joel Tickner, Lowell Center for Sustainable Production presented a year in perspective for the GC3, highlighting marketing and outreach strategies which have included quarterly newsletters, webinars and outreach; transitioning to a membership organization with guidelines and dues; and moving from working groups to project groups with deliverables. Accomplishments for 2011 have included:

- Holding a two day retreat to discuss the structure and content of the chemicals data publication and how it could be used more effectively to facilitate chemical data along supply chains, November, 2010.
- Publishing *Meeting Customers' Needs for Chemical Data: A Guidance Document for Suppliers,* February 2011.
- Publishing *Compilation of Terms Marketing Green Products: A Green Glossary,* November 2010.
- Holding a meeting for retailers, *Product Chemicals Management for Retailers: Moving Beyond Compliance Toward Safer, Less-Toxic Product Lines,* in Watsonville, CA on May 3rd, 2011.
- Developing a model for industry/academic collaboration for advancing green chemistry research and application.
- Hosting quarterly webinars attended by 40-50 people: Green Chemistry Education; Overview of EPA Safer Alternatives Activities; CA Draft Consumer Product Alternatives Regulations; and Nike's Green Chemistry Activities.
- Facilitating trips to Washington DC in Fall 2010 and Winter 2011 to meet with EPA, Congressional Staff and the National Science Foundation.
- Supporting passage of America COMPETES Act with green chemistry research and education provisions.
- Supporting and providing input into EPA's Design for Environment (DfE) transparency and alternatives assessment efforts.
- Engaging in discussions on Green Chemistry Research and Development policy at a federal level.
- Participating in panels and presenting at major conferences and webinars.

He also presented an overview of challenges and opportunities facing businesses over the past year including: chemicals policy development at the state level and the development of the Interstate Chemicals Clearinghouse (IC2); federal level activities including the reintroduction of TSCA reform legislation, continued EPA initiatives on green chemistry and safer alternatives, and NIOSH prevention through design efforts; the first REACH registration submission by companies including the first authorization requirements, and the release of SIN List 2.0; continued consumer concern about toxic substances in products coupled with a rise in the use of websites that help consumers make product choices; and increased retailer and chemical user engagement in demanding greater information and safety through supply chains.

Lastly, he highlighted some strategic directions for the GC3 that focused on: expanding the GC3 in key sectors such as retail, pharmaceutical, personal care, electronics and the auto sectors; ensuring active participation so members take ownership of the network and its projects; linking to other efforts to avoid duplication; and ensuring adequate resources are available for the coordination, administration and research of GC3 and its projects.

Keynote Address: Robert von Goeben, President & Co-Founder, Green Toys Inc.

Robert von Goeben, President, Green Toys Inc.'s presentation was entitled: *How We Created a New Product Category With No Money Or Brains* and tells the story of Green Toys' journey in creating environmentally sound toys made from curbside collected milk jugs from the Bay Area. They started this journey in 2007 with $200,000 of their own money. Currently sold in over 5,000 retail locations, with 80% annual growth, and exported to 35 countries, Green Toys is now the market leader in socially responsible and environmentally friendly children's products.

Green Toys started with three premises: that products would be made from 100% recycled materials; that these materials would be locally sourced and manufactured; and that the products would contain no BPA, PVC or phthalates. Their first step was to adopt bioplastics as their base material but they quickly abandoned these as the corn based material melted in summer heat. After a lot of research into different plastics, they decided to shift from bioplastics to making toys from recycled plastic. They settled on using milk jugs as they are made from high density polyethylene plastic, and the milk jugs are recycled and widely available locally. Using this material also had great marketing advantage as it tells the story of the benefits of recycling to families in a way they can understand: if you recycle, great products can be made from your efforts.

Green Toys now has its headquarters, manufacturing, warehouse, packaging, printing and assembly all in the Bay Area with recycled milk jugs from Los Angeles. Development of the business has not been without challenges including the difficulty in getting the material to function in the way they required. Challenges also arose with testing labs and results. When Green Toys started production, testing products was voluntary and they were told they could test for as little or as much as they liked. Green Toys tested for a wide range of chemical contaminants and received a fail on one of the tests. After Green Toys had spent a lot of time and effort to find out why the toy had failed, they were told the lab had made a mistake. A similar incident occurred after all the toy recalls in 2008 and the implementation of the Consumer Product Safety Improvement Act when every manufacturer was testing its toys. Green Toys received another test fail, only to be told later that the lab made a mistake. For Green Toys, a company for which transparency equals credibility in the green market, these mistakes created a big challenge.

He ended his presentation by summarizing the company's original corporate goals: to find green materials; to be made in the San Francisco Bay Area of the USA; and for the materials and processes to be safe. The products that result fulfill all three goals.

Overview of Working Group Activities

There were four GC3 working groups for 2010-2011. One participant from each group provided a brief summary of their group's work.

GC3 Pilot Project for Business and Academic Partnerships: Greg Morose of the Toxic Use Reduction Institute (TURI) gave an overview of the pilot project for business and academic partnerships. The goals of the project were to: provide valuable input to support materials decision-making for GC3 companies and supply chain partners; develop a repeatable research methodology to identify possible alternatives for chemicals of concern, evaluate their toxicity, assess their technical performance, and evaluate the economic implications of selecting one alternative over another; demonstrate project success and form the basis of a model for university/business partnerships; and share pilot project results with the public for more rapid adoption of safer chemicals and materials in supply chains.

The working group chose to focus on phthalates as the chemical of concern as they are chemicals of concern across sectors. Specifically they have focused on wire and cable applications for the electronics sector. Based on literature review, over 100 plasticizers that could be potentially used in wire and cable applications were identified. The group asked the membership of the GC3 to review the list to identify chemicals that would fail as alternatives. They then used the Red List of chemicals developed by Clean Production Action to narrow the list to 10 plasticizers. Quick screenings using QCAT (a rapid screening tool using eight endpoints) were conducted on the plasticizers and graded from A to F (A being a safer chemical and F being a more toxic chemical). From this analysis 3 chemicals were selected to receive a full Green Screen assessment.

Next steps for the project could include more QCATs, Green Screens, conducting performance tests and implementing a second pilot project.

Chemical Data Working Group: Monica Becker of Monica Becker and Associates reported on the work of the Chemical Data working group. The history of this group includes the following:
2007 – Report on tools for chemical assessment
2008 – Report on RSLs
2009 – Case studies report of NIKE, HP, and SC Johnson
2010 – A two day retreat was held in November 2010 to discuss the structure and content of the chemicals data publication and how it could be used more effectively to facilitate chemical data along supply chains.
2011 – Report released February 2011: *Meeting Customers' Needs for Chemical Data: A Guidance Document for Suppliers.*

The motivation for the recently released guidance document was to improve business to business communication for chemical data along supply chains as this information is critically important for regulatory compliance, safer product design, green certification, chemicals disclosure, etc. The guidance document describes what chemical data are, why companies need chemicals data, where to get data, why MSDS are not adequate, how to address Confidential Business Information (CBI), how to use these data, and what benefits accrue to suppliers that provide data. The appendices include resources for companies such as a customizable letter to suppliers and a materials information form. The document has received good publicity including an article in Green Biz.

The working group would like GC3 members to review the guidance document, send it to their suppliers, and get feedback about how to make it more useful.

Next steps could include a Data Summit to expand on the issues raised in the guidance document.

Retail Working Group: Yve Torrie of the Lowell Center for Sustainable Production reported on the Retail working group. The goal of this group is to engage the retail sector in dialog about safer products as they have enormous potential to influence supply chains. The first project of this group was a report on best practices in product chemicals management in the retail industry (December 2009) that included a number of case studies. In 2010 the working group decided to focus on one of the best practices outlined in the report, that of determining which approach to product chemicals management is the best fit for a retail organization. The group has developed a web resource for retailers that describes four types of tools across 20 retail product sectors. The tools are: RSLs; standards, certification and labels; third-party evaluation tools and systems; and consumer guides. These tools can enable retailers to evaluate chemicals for potential human health and environmental impacts, identify chemicals of concern not yet regulated, and go beyond compliance. The Web resource and a summary document are in final editing and will be available on the GC3 Web site.

Members of this working group also helped plan a meeting held on May 3, 2011, at West Marine in Watsonville, CA, designed to engage retailers in a discussion about product chemicals management. There were over 40 participants representing a variety of retailers. The meeting focused on the role of retailers to effect change in supply chains, drivers for safer chemicals and products, and challenges and solutions for retailers.

Next steps could include promoting the web resource to retailers, mapping the different sustainability efforts in the retail arena, and creating a webinar series for retailers (for those not yet engaged in this work and for those who are engaged to share information on tools).

Incentives for Green Chemistry Working Group: Joel Tickner of the Lowell Center for Sustainable Production discussed the Incentives for Green Chemistry project. This working group was initiated by Bob Israel from Diversey who felt that the GC3 needed a statement about incentives for green chemistry. This discussion started 4 years ago when the GC3 issued a report with the National Pollution Prevention Roundtable (NPPR) about advancing green chemistry and Design for Environment at the state level. The group went to Washington, DC to meet with congressional staff on incentives for green chemistry and DfE. The group created a document on different types of incentives for manufacturers, regulators, etc. and decided to create a GC3 statement on incentives focused on partnership programs such as the DfE Safer Products Labeling Program.

As a next step, the GC3 needs to articulate a few bold ideas to advance and incentivize green chemistry and DfE. There was not enough GC3 leadership for this group to continue in the coming year but it was considered an important topic for future group project discussion.

Discussion on New Working Group Projects: This brief discussion focused on a project to advance green chemistry education by developing a statement on the need for green chemistry education and training for manufacturers. The group agreed there is a need for a new generation of chemists and designers who understand toxicity and how to design more sustainable materials. They expressed interest in working with Beyond Benign in developing a statement from manufacturers on the need for green chemistry education, training and research and how that will enhance industry efforts to advance safer chemistry. It was agreed that this should be a working group for the coming year.

Advancing Green Chemistry Education

This session addressed key green chemistry education questions:
1. What is the current state of green chemistry education?
2. What are the key barriers to adopting green chemistry education practices?
3. Where are the opportunities?
4. What is the role of companies ensuring an "army" of students trained in green chemistry?
5. How can companies' best support the development of green chemists?

Amy S. Cannon, Executive Director, Beyond Benign introduced the work Beyond Benign is doing to provide tools to teach green chemistry and sustainable science in K-12 classes, at the community level and in the workforce. Tools include curriculum development and teacher training, on-line courses for teachers, community events, academic curriculum development and training, and technical training within the workforce. Amy's answers to the questions asked of the panelists were:
1. Current state of green chemistry education: More is being done in green chemistry education than ever before. However it is still too early to tell if these efforts are really changing the ability of a scientist to enter the workforce better prepared to design green chemistry solutions.
2. Key barriers: Lack of awareness of green chemistry which leads to a lack of peer, administrative and financial support.
3. Opportunities: A systematic national / international unifying approach to green chemistry education, a "Green Chemistry Commitment."
4. Role of companies: Provide awareness e.g. student and industrial workshops, provide support e.g. the Green Chemistry Commitment, provide financial support, and provide resources e.g. informational studies, volunteers, speakers.
5. How companies can support the development of green chemists: Take a position and support green chemistry by telling educators what kind of scientists are needed that would be hired by companies, and then hire those scientists.

Jim Hutchison, Director, Safer Nanomaterials & Nanomanufacturing Initiative, University of Oregon spoke about the evolution of organic chemistry in his University. In 1996 the same topics and labs were being taught in organic chemistry as they were 100 years ago. Since then, he and other chemists have been instrumental in developing a text book on green organic chemistry and in developing guidelines for green chemistry in the lab. Now, in his university, organic chemistry as it was known has been replaced by green organic chemistry. This exemplifies a very significant shift in perceptions.

One of principal benefits of this shift is that it changes what students are learning, providing information on application in the real world. They identify hazards or inefficiencies, and look at or develop alternatives where possible. There are also important benefits for the university including recruiting opportunities and the generation of less waste, and benefits for faculty who have the freedom to be creative and innovative. Jim's answers to the questions asked of the panelists were:
1. Current state of green chemistry education: There is a lot of interest in green chemistry and that is growing. Within his university both students and faculty are engaged which brings a lot of energy to the institution. There is a growth in green chemistry support structures e.g. the Green Chemistry Education network which provides regional support for green chemistry educators and has more than 500 participants.
2. Key barriers: There is a fragmentation of efforts and coordination. Current efforts need to be scaled up to engage more faculty and students.

3. Opportunities: Currently students going into chemistry or health sciences have access to green chemistry but opportunities exist to reach marketers, consumers, voters, etc. so they can learn about green chemical principles and sustainability, life cycle thinking etc. to help them make better decisions.
4. Role of companies: Many undergraduate students pursuing graduate studies want to do green chemistry research which would help ensure an army of green chemists. Companies could provide research and internship opportunities.
5. How companies can support the development of green chemists: Articulate the demand for green chemistry ready students, provide case studies, and partner with universities on curriculum optimization.

Barbara Peterson, Program Director, Sciences and Mathematics, UC Berkeley Extension and Marty Mulvihill, Executive Director of the Berkeley Center for Green Chemistry, UC Berkeley spoke about UC Berkeley's broad approach to green chemistry education; that everyone needs to be engaged to influence chemical design from chemists to those in public health, environmental sciences, etc., and they have to be taught to talk about their shared interest. Currently UC Berkeley offers green chemistry education to both undergraduate and graduate students and now offers a Green Chemistry Certificate Program. Students are eager for internships to develop their green chemistry skills further. Their goals for the coming year with regards to business include building a multi-stakeholder consortium and developing collaborations and partnerships. They are interested to work with businesses to find out what problems exist and plan to build a green chemistry research program to accommodate this.

With regards to the questions asked of the panelists, the speakers agreed with the answers given by the previous two speakers.

Jennifer Young, Manager, American Chemical Society (ACS) Green Chemistry Institute, spoke about the mission of the ACS Green Chemistry Institute as enabling and catalyzing the implementation of green chemistry and green engineering principles into all aspects of the global chemical enterprise. Their focus areas are: education and research; advocacy and policy; industry; and certification / standards. Their efforts around green chemistry education fall into 5 main areas: books which include green chemistry curriculum, laboratory manuals and textbooks; student awards for undergraduate student chapters; summer school for graduate students to influence their career path; workshops at green chemistry and green engineering conferences; and weekly webinars. In answer to question 5 asked of the panelists:

5. How companies can support the development of green chemists: Encourage green chemistry education by creating demand for green chemistry graduates in seeking green chemistry experience in job postings, by supporting green chemistry training and education for employees and professionals as well as at local universities and schools, and by supporting the development of green chemistry education materials. Industry support can be at a company level or by involvement in a consortium of companies such as the ACS Green Chemistry Institute's Industrial Roundtables or the GC3.

The panel was asked a question about green chemistry materials and whether textbooks should be a focus of these materials. Jim Hutchison said in the university setting more and more information is available online and lecturers are bringing their own flavor and examples into both lectures and labs, so textbooks are being used less. A textbook though is still the basis for some work.

A question was asked about integrating green chemistry into job descriptions and how best to do that. A suggestion was made to include this as a topic at a green chemistry and education conference.

Driving Safer Product Innovation Through Communication of Chemical Data in Supply Chains: Part I

This session was aimed at addressing some key issues in chemical data communication: what the key challenges in advancing information through supply chains are; how these challenges have affected company efforts to advance safer products; how firms have addressed key challenges such as CBI and obtaining information beyond Tier 1 suppliers; and how information can be more effectively standardized across sectors and supply chains.

Drummond Lawson, Green Giant, Method, spoke about Method's rapid life cycle assessments for cleaning products. These assessments include identifying and defining material feedstock origins and manufacturing locations. The data challenges experienced by Method include:

- CBI. As a workaround, Method uses McDonough Braungardt Design Chemistry data as an external black box
- Inconvenient Business Information (IBI). Information that is inconvenient to obtain from suppliers is more of a challenge than CBI
- Lack of leverage with suppliers
- Obscure requests (for example packaging material)

He noted that a standard raw materials data request form for suppliers and supplier education to teach them about the value of transparency are critical elements of Method's approach. He identified fragrance data disclosure as a key area of tension and conversation for the future.

Brian Martin, Senior Director, Product Environmental Compliance, Seagate Technology said Seagate first tried to ask suppliers for data on specific substances, but the substance list and requirements kept changing. So now they ask for a full substance disclosure from all of their suppliers including lab testing reports to support the reported data. An overview of Seagate's approach to engage suppliers is as follows:

- Put data requests in the context of business need and mutual benefit
- Build supplier capacity to provide data through standardization, training, and help desk support
- Ask suppliers for data in a stable, standard format
- Ask for sufficient data to avoid having to go back to supplier for more data (avoid "supplier fatigue")
- Use software automation to collect, check ,manage and report supply chain data
- Partner with suppliers and commit to making the process more efficient as long as they provide the data

Seagate uses the IPC 1752 format for collecting data. It is XML based and not user friendly. In general, getting the data from suppliers is easier than reporting the data to OEMs.

Roger McFadden, Vice President, Senior Scientist, Staples, Inc. said that Staples Inc. has 800,000 SKUs and 4,200 suppliers and greater than 90 percent of its environmental impact is embedded in the products they sell. With hundreds of thousands of products, tens of thousands of chemicals in them, thousands of suppliers and retail locations, tracking chemicals and

advancing safer products is a challenge. By working with suppliers on product and packaging sustainability, Staples can reduce their environmental impact and create business value for their company and their suppliers. To be successful, deep collaboration is required with their most strategic suppliers.

Staples has implemented the "Race to the Top" initiative for Staples branded products. They are working with their top 25 suppliers on this initiative, and are trying to eliminate 26 "bad actors" or "chemicals of concerns" in the products they sell. Staples is asking these suppliers for full chemical disclosure; they cannot claim CBI. The overall objective of this initiative is to offer a wide assortment of safer alternative products that are scientifically credible and that meet customer demand. This chemical information will help them to:

- Make better decisions, to evaluate and score environmental, health and safety attributes of products prior to selecting them for distribution or sale.
- Manage risks and costs, to comply with existing and emerging global regulations that restrict the use of certain chemicals or require disclosure of chemical content in formulations or articles.
- Meet sustainability objectives, to comply with a voluntary corporate program restricting certain chemicals in their products. Elimination of chemical hazards of high concern from products and the built environment is becoming part of sustainability objectives and initiatives.
- Identify safer alternatives, to shift towards more sustainable, safer products, advancing the application of green chemistry along supply chains without sacrificing quality, performance or cost.
- Meet customer's request for more information, to build credibility, promote transparency and provide consumers with the information that they are requesting to help them make informed choices.

Martin Wolf, Director, Product Sustainability & Authenticity, Seventh Generation, Inc. discussed supplier CBI and the impact on innovation. Seventh Generation's voluntary ingredient disclosure effort with its suppliers involves the following:

- Lists ingredients in order of predominance
- Uses INCI, IUPAC, CAS, common names
- Covers fragrances, dyes, and preservatives
- Uses Functional names for proprietary ingredients (e.g. "anionic surfactant")
- Information is provided on the product label, website, and through an 800-number

Martin provided an example of how Seventh Generation mapped the supply chain for sodium lauryl sulfate from the growing and harvesting of palm fruit and coconuts, all the way to the production of sodium lauryl sulfate from lauryl alcohol as an example of the challenges and opportunities for obtaining data from supply chains.

Discussion after the presentations focused on several specific issues:

- Much of claimed confidential information is actually embarrassing information that cannot and should not be protected.
- If data are not available many firms consider worst case toxicity situations for particular chemicals.
- Compliance is easier if there is full disclosure.
- Electronic data is critical.

- It is easier to have criteria / principles for designers (materials that should be avoided or hazard characteristics to avoid) and full chemical information so manufacturers do not have to continuously go back to suppliers.

Driving Safer Product Innovation Through Communication of Chemical Data in Supply Chains: Part II

Participants broke into 4 groups to discuss different challenges related to the communication of chemical data in the supply chain.

Group 1 - Ensuring the accuracy of chemical data. This group discussed the challenges of ensuring the accuracy of chemical data and strategies for getting these data. They noted that it is often necessary to go back multiple times to get quality data. Some of the biggest challenges are with mixtures, adhesives, and fragrances. Some strategies include 3rd party verification or a request that suppliers pay for testing. Some companies pay for testing in-house. It is important to have a clear contract with suppliers regarding criteria for data requirements and consequences for not providing it. There is no "one size fits all" solution. Companies must meet suppliers where they are in the process. There is a critical role that GC3 can play regarding consistency of data requirements. Suppliers are faced with multiple forms from different companies. It would also be useful to have a clearing house for data that would provide confidentiality.

Group 2 - Providing incentives, assistance and inspiration to suppliers to get chemical data. This group discussed the importance of transparency. Some options are to give preferential treatment to suppliers for disclosing information such as participation in company programs. Suppliers may save money upfront by disclosing information. 3rd party programs like DfE can be helpful also.

Group 3 - Using chemical information to drive innovation toward safer products. This group discussed how the scoring of products is affected by how health and environmental concerns are weighted (e.g., in GreenWercs). This information can be useful early in the product development process. It is important to have industry wide change as "a rising tide lifts all boats." The current project on phthalate alternatives is a good model to drive innovation. It may be useful to participate with Innocentive to stimulate innovative ideas in green chemistry. It was noted that DfE criteria are driving formulators to redesign products.

Group 4 - Standardizing chemical data reporting across companies/sectors. The group discussed the pros and cons of standardized reporting. There are benefits to creating a format to collect a "superset" of data that each company can use for their individual requirements: it will be easier for the supply chain to fill out one complex form than lots of individual forms; the process will likely improve data quality and transparency; suppliers prefer to do the same thing for many companies, rather than something individualized for each company; standardized data can make regulatory compliance easier and it may be at a lower cost; and an automated system will make it easier to respond to requests for information. Possible cons include: a system like this may overwhelm suppliers; it may not be fair to all; it might result in data that are not useful; it may cause a "first mover" to lose its advantage; some companies may want to stay unique and may not want to collaborate; and there is the issue of CBI claims.

Currently there is not one standard for data collection. Global and voluntary requirements differ. A global superset of data would be very large and there are concerns that a superset of data would not be practical and that it would be driven by politics rather than science. The group

discussed the example of GADSL in the auto industry. The group also discussed what sectors would be good candidates for standardization. The electronics sector is further along in collaboration and there is less complexity so it is possible to get good data. In the furniture sector there is a huge variety of materials and complexity in the supply chains. A barrier that exists is that suppliers are unsophisticated about providing information.

There was discussion about the requirements for an overall reporting standard or a reporting standard for an industry sector. It would be necessary to bring representatives together from a sector and determine format, fields and data requirements. It would be important that requirements not be "dumbed down" to the lowest common denominator.

Thursday, May 5th

Working Groups Report Back

Pilot Project for Business and Academic Partnerships (see Appendix A for 2010 work projects): Based on the work of the group to date the group discussed the Quick Chemical Assessment (QCAT) results for the ten plasticizers that were selected: Di (2-ethylhexyl) phthalate (DEHP); Diisodecyl phthalate & di-C10-rich branched C9-C11-alkyl phthalate (DIDP); Bis-2-ethylhexyl isophthalate (Flexol 380); Tri (2-ethylhexyl) trimelliate (TEHTM); Acetylated monoglycerides of fully hydrogenated castor oil (COMGHA); LPLAs 1100 series (Ecolibrium brand proprietary chemistry); Diisonyl cyclohexane-1,2-dicarboxylate (DINCH); Di (2-ethylhexyl azelate (DOZ); Dipropylene glycol bibenzoate (DGZ); and 2,2,4-Trimethyl-1,3-pentanediol diisobutyrate (TXIB).

The group then discussed the differences between the QCAT and the Green Screen chemical evaluations: Green Screen looks at several additional endpoints; Green Screen draws upon a larger dataset, where the QCAT is limited to the data sources listed in the methodology; a Green Screen score is based primarily on the review of experimental data, where the QCAT scoring is primarily based on a chemical's presence on authoritative or screening lists; and Green Screen is designed to be a more thorough screen conducted by a toxicologist, where the QCAT is designed to be a quick screening method able to be completed by a layperson.

The results of the following three chemicals that underwent a full Green Screen evaluation were then discussed:

- *TEHTM* was assigned a Green Screen Benchmark Score of 2 ("Use-But Search for Safer Substitutes") based on a rating of Moderate for Reproductive/Developmental (R/D) toxicity, and a Moderate for Persistence (P).
- *DINCH* was assigned a Green Screen Benchmark Score of 3 ("Use But Still Opportunity for Improvement") based on a Hazard Ranking of Moderate for Persistence (P).
- *DOZ* was assigned a Green Screen Benchmark Score of 4 ("Prefer-Safer Chemical") based on available data indicating that most scored hazard categories receive a rating of Low.

The Green Screen assessment of the alternative plasticizers TEHTM, DINCH, and DOZ indicate that they are environmentally preferred substitutes over traditional plasticizers such as DIDP and DEHP with well established adverse toxicological profiles.

The group then discussed next steps including the following different options:

- Conduct QCATs and Green Screens for additional plasticizer candidates
- Conduct performance testing for promising plasticizer candidates

- Alignment with other plasticizer initiatives (iNEMI, U.S. EPA DfE Program)
- If no viable alternatives, develop new chemicals with Warner Babcock Institute
- Look into fundraising, both direct funding and in-kind contributions
- Implement a second pilot project for another chemical of concern

The group decided on the following next steps:

1. Conduct further research to address data gaps identified for the three alternative plasticizers, TEHTM, DINCH, and DOZ that have undergone the Green Screen evaluation.
2. Conduct Green Screens for the following seven plasticizers: DIDP; DINP; Isophthalate (select one from this chemical family); Teraphthalate (select one from this chemical family); DPHP; Ecolibrium (Dow); and DOS.
3. The primary funding source for these seven Green Screens will come from the chemical manufacturers that supply these plasticizers. Any outstanding funding requirements will come from other GC3 companies interested in the chemical evaluations for these plasticizers.
4. Once the seven Green Screens are completed, then the results will need to be validated. The ultimate goal of the group is to publish the results of the Green Screen assessments. One avenue to pursue is to work with Topher Buck to add a plasticizer in wire and cable category in CleanGredients, in order to publish the Green Screen results.
5. For performance testing of the most promising plasticizers, the group will pursue a combination of the following:
    a. Collaborate with the University of Massachusetts Lowell Plastics Engineering department to conduct performance testing
    b. Coordinate with a new iNEMI workgroup through Helen Holder to conduct performance testing on the most promising plasticizer candidates
    c. Work with GC3 members to conduct performance testing
6. The possibility of addressing other chemicals of concerns at a later time was discussed. Two potential chemicals of concern mentioned were durable water repellants and antimicrobials.

Retail Project Group (see Appendix B for 2010 work projects): At the Retailer meeting earlier in the week, some ideas for next steps for a retail group were discussed. These were further flushed out in this group discussion. Currently, retailers are engaged in a number of different groups and sustainability efforts but are unsure how and if the efforts relate to each other. The group thinks an important role for the GC3 is to map the "green retail space" to determine who the players are, what they are doing and what their purpose is, and what the gaps or overlaps in efforts are. The focus of this green retail space mapping project is to map efforts that address toxics in products (materials and chemicals).

In addition, the group discussed developing a one page document that makes the business case for green chemistry in the retail sector. It would be developed to help retailers "sell" green chemistry and safer products to others in their organization and would provide a statement for the group about why the work of the GC3 and this project group in particular is important to the retail industry.

The group is also interested in creating an educational program for retailers – both for those who are new to "green product retailing" and for those who are already engaged. Discussions centered on a webinar series with the understanding this may require some funding. The focus

of the education program would be to make green chemistry relevant to more retailers and their supply chains.

The group decided on the following next steps:

1. Within 3 months a small working group will have a first draft of the green retail space "mapping" document as it relates to toxics in products. It is estimated the project will take up to six months to complete.
2. A small group will develop a one page business case for green chemistry and why it is important to retailers. It is estimated this will be completed within six months.
3. After the mapping and business case documents are developed, the work group will determine how to implement the educational component. A goal of this effort is to engage more retailers in these issues.

Chemical Data Group (see Appendix C for 2010 work projects): From the two GC3 meeting sessions on *Driving Safer Product Innovation Through Communication of Chemical Data in Supply Chains* and in general discussions, the main idea for next steps for the chemical data work was the pursuit of standardization in chemical data collection and reporting. The discussion focused on the possibility of developing an actual standard / standardized data format such as an XML format. Although there is an interest in standardization of data collection and reporting which would bring efficiencies to this process, the group is not sure it has the band width to come up with a data format standard. To begin, the group thought it would be worthwhile to conduct a scoping exercise / needs assessment / feasibility study, focused on several sectors. This study would examine:

- The drivers and challenges for chemical data
- Existing systems to see how data is collected and reported, such as IPC 1752 and IMDS
- What data is collected
- What format is used
- If these systems could serve as models

The group discussed the possibility of focusing on a sector and engaging companies within that sector on standardization of data collection systems. They would discuss existing data collection and how a standardized tool would help. The creation of a standard may require some coalescing around a dataset, maybe a "super dataset." Past attempts within the Apparel and Footwear sector found that they could relatively easily agree on 80% of a dataset but the other 20% was very difficult.

There was also discussion about how the NSF/GCI 355 Greener Chemical and Process Standard may begin to address these challenges.

Detailed next steps will be discussed further by the group in the first project call.

Green Chemistry Education Group: As a new project group the group focused on brainstorming ideas rather than determining firm next steps. The group first listed what green chemistry efforts are underway and what resources are available. They discussed how new and older employees in chemical and product manufacturing firms (chemists and non-chemists at all levels in firms such as purchasers, sustainability coordinators, designers) need retraining in green chemistry to learn non-traditional skills such as systems thinking, sustainability, and toxicology.

Students need more opportunities for applied knowledge. Internships provide good opportunities for work experience and applying theoretical concepts to real world situations. It is important that internships have clear expectations. It may be useful to survey companies about their internship programs (to superimpose the GCEd Map on a GC3 member map). Further, externships where industry chemists and designers work in an academic role to teach problem-based learning could play an important role in green chemistry education. The GC3 can help support best practices in green chemistry internships developing clear guidelines for programs, including working in collaborative teams. The GC3 can promote collaborations such as a boot camp on green chemistry, design for environment, alternatives assessment, life cycle assessment, etc for firms. The GC3 can support funding for K-12 and university education in green chemistry. And the GC3 can play a role in engaging with NSF and Congressional staff on advancing the green chemistry research and education. Finally, GC3 can engage with Beyond Benign in advancing the university green chemistry compact. A follow-up call will be scheduled to identify clear next steps and deliverables.

Green Chemistry and Safer Materials in the Electronics Sector: Lessons Learned

This session was aimed at addressing some key green chemistry issues in the electronics sector: what the primary challenges are to developing safer materials and products; whether these challenges are unique to this sector and whether solutions need to be unique; whether success stories can be translated into other sectors; and what emerging issues around materials selection could benefit from green chemistry approaches and supply chain collaboration.

Thorne Bartlett, New Business Development Director, Dow Chemical Company provided an overview of Dow Chemical's business, sustainability vision, and operating segments. He discussed the new Dow Ecolibrium bio-based plasticizer. This product is designed to replace phthalate plasticizers in PVC or other polar polymers. It is produced from virtually 100% renewable feedstocks, and is available in two different grades covering low and high use temperatures (>105C). This new product reduces greenhouse gas emissions by 40% compared with existing PVC compounds

Thorne also discussed the Dow Sustain Halogen free compounds. These compounds are designed to replace PVC systems for power cords and electronic wiring. One product family is designed to meet UL requirements, and the second product family for Europe (lower smoke) requirements.

Erin Gately, EPEAT Registry Services Manager, Green Electronics Council provided an overview of the EPEAT product rating system used for electronics products. EPEAT is not a company performance assessment, but a product-specific rating. A single manufacturer may have EPEAT Gold, Silver, Bronze and unrated products. The intent of this rating system is to help electronics purchasers find products that would help their own organization's environmental performance.

EPEAT is a consensus driven model. The environmental criteria and the actual EPEAT system are developed and guided by stakeholders. EPEAT covers the following eight performance categories: environmentally sensitive materials; materials selection; design for end of life; product longevity / life cycle extension; energy conservation; end of life management; corporate performance; and packaging.

EPEAT has 51 criteria (23 required and 28 optional). EPEAT was developed in the U.S., but has been adopted in 42 other countries.

John Harland, Principal Engineer, Intel Corporation provided an overview of silicon wafer manufacturing, and the specific challenges that the semiconductor industry faces with advanced materials and manufacturing at the nanoscale. For example, precision manufacturing is required for 65nm interconnect technologies. For sustainable manufacturing, Intel is pursuing design for environment strategies as well as renewable energy approaches. Intel is the largest purchaser of renewable energy in the country.

John explained why some materials of concern are harder to replace than others. For example, for some materials there are limits to the laws of physics that inhibit substitution such as arsenic, and some materials are costly to replace such as PFOS and PFCs.

Helen Holder, Corporate Material Selection Manager, Hewlett Packard Company discussed some of the barriers that companies have encountered in their pursuit of incorporating safer materials into products. For example, there is often a lack of resources available to investigate safer materials. Also, people don't know how to evaluate or implement safer materials because of limited technical knowledge. They are often afraid of making poor choices, and this has typically led to the use of list based approaches.

HP creates specifications and approved material lists. When HP talks to suppliers about replacing materials of concern, they often describe the business case from a financial perspective.

The panel was asked a question about the extent to which they are able to talk with competitors to harmonize efforts. Helen Holder replied that HP has decided that materials should not be a competitive issue, and therefore that information can be shared. Albert Tsang from Dell responded that Dell doesn't view environmental benefits as a competitive advantage. Instead, Dell wants to change the industry as a whole and tries to collaborate with competitors.

HP was asked how they can make their safer material needs known to suppliers. The response was that requests for new materials are put into requests for proposals and requests for quotations.

New Collaborations to Advance Safer Materials

This session was aimed at learning how collaborative efforts can advance safer materials: how specific sectors have addressed chemicals and materials concerns through collaborations; what the key leverage points, challenges, and opportunities have been; and what can be learned from these examples in solving other problem material challenges.

Jill Dumain, Director of Environmental Strategy, Patagonia, Inc. gave a chronology of different collaborative efforts affecting Patagonia:

- The National Organic Cotton Association began in 1992/3 but it wasn't until the Organic Exchange came into being six years later that the supply and demand of organic cotton matched up. The Organic Exchange has been successful for growers and has now evolved into the Textile Exchange. As the industry has matured, it hasn't had to dig into organics anymore so there is no longer a need for the Organic Exchange. The timing had to be right for both of these transitions.

- Bluesign technologies, which looks at the sustainability of dyeing and finishing of products has evolved into a third party review system for suppliers focused on chemicals toxicity concerns. This has further evolved into a collaboration with the outdoor industry so that now a core group of companies collaborate to work with their suppliers, with whom there is a lot of overlap.
- The Eco Working Group's Eco-index is being developed to support companies in the outdoor industry in making better products across the life cycle, in a continuous improvement approach. Currently 150 companies in the US and EU are involved in testing the Eco Index.
- The Sustainable Apparel Coalition was an idea that came from Patagonia and Walmart as they asked what they can do better together than as individual companies. The Eco Index model and Nike's Manufacturing Assessment Tool for example have been brought to larger retailers so they can be used by a larger audience.

Jill then summarized the key lessons she has taken away from these efforts:

- The project has to be better done collaboratively rather than individually
- It is important to stay focused on core competencies
- It is important to engage people in workgroups but ones that overlap with their day jobs
- It is important to know the boundaries of collaboration. Collaboration is important in the pre-competitive stages but there is a line where competition starts and at this point business has to take over.

John Frazier, Director of Chemistry, Nike, Inc. spoke about Nike's efforts to successfully tie innovation to green chemistry as it enables sustainability and helps eliminate risk. Even though Nike is very large, change in certain parts of the supply chain can only be achieved if a good number of product manufacturers are asking for that change. So Nike is interested in moving some of its efforts to a public arena in order to harmonize and make more progress. Recent examples include:

- The Green Exchange. This is an independent group whose goal is to park Intellectual Property patents in a non competitive space so other brands / industries may use them. Nike has provided information on environmentally preferred rubber, potentially cutting out years of work for other companies. Some brands have used the information and others have been suspicious. The only thing Nike has asked is if in using the environmentally preferred rubber, a company finds a way to do it better, they have to bring it back to the Green Exchange.
- Water Stewardship. Dyeing and finishing require large amounts of water. However, if suppliers can come up with a dye that has a great fixation rate, fewer rinses are needed, the cleanup is less and water use is less. Nike developed an online reporting water program to track water use in production. This tool has recently become public and is available to all in the industry.
- Material Assessment. Nike's Material Assessment Tool ranks every material in a product. It's based on life cycle thinking and assigns points based on their publicly available restricted substances list and green chemistry program. Suppliers can use the tools to change materials and find out how to get higher scores. This tool is also being shared and companies can use it as is or tweak it to suit their specific needs.

Kathy Gerwig, VP Workplace Safety and Environmental Stewardship Officer, Kaiser Permanente said Kaiser Permanente is dedicated to advancing safer materials and

environmental stewardship as it is part of preventative medicine. Most of their collaborative efforts are with NGOs as they are the voice of the community, allowing Kaiser Permanente to learn what communities care about. Some of Kaiser Permanente's collaborations include:

- The BizNGO Working Group. This multi-sector forum developed *Guiding Principles for Chemicals Policy,* which outlines a path for businesses to implement greener and safer chemicals in consumer products. Kaiser Permanente was involved in the development of these principles and has adopted them.
- Health Care Without Harm and Safer Chemicals, Healthy Families Coalition. Both of these organizations are involved in public policy and Kaiser Permanente has been involved to engage with the Toxic Substances Control Act's reform.
- Practice Greenhealth. This group has developed a product sustainability supplier scorecard requiring supplier disclosure for medical products. Suppliers have been positive about the scorecard and have provided feedback about what works and what doesn't. Practice Greenhealth brought healthcare organizations together so this scorecard could be adopted.

Kathy noted that the collaborative efforts they are involved with include: board membership; funding; hosting events; cosponsoring activities; references, and endorsements. They have learned that collaborative efforts must benefit everyone involved, that you must be clear what you can give to the collaboration and what you want to get out of it, that it must be able to improve or accelerate what the parties can do on their own, and that it must build and sustain trust.

Kathy was asked what process Kaiser Permanente went through to decide what NGO to work with. She said Kaiser Permanente strives to work with NGOs that are moving the market and who have expertise that they can gain from.

Steve Johnson, Sustainable Development Manager / Scientific Advisers Manager, Boots UK Ltd, said Boots UK's collaborative efforts to advance safer materials are focused around three areas:

- Working with NGOs. Boots works with ChemSec, a Swedish NGO that has developed an alliance of NGOs and businesses working on safer chemicals. This forum allows both businesses and NGOs to discuss what they are doing. It is a safe space to speak about shared best practices and responsibilities. ChemSec has developed the Sin List and has asked companies to consider it in their chemicals management and to let them know where the hotspots are.
- Research into Sustainable Production. Boots in Nottingham has worked with a marine laboratory to use waste and heat from Boots power station to grow marine algae in photobioreactors. The algae water is recycled and they are trying to extract chemicals from the algae. Raw material suppliers can take this technology to the next level.
- Supporting Future Generations. There is a lack of chemists, especially green chemists. Boots is trying to get kids interested in green chemistry so they have developed the SHOP project, an interactive touch screen display unit to introduce consumers to the chemistry behind personal care products. The units have been displayed at different science museums and festivals.
- Sustainability Product Assessment Tool. This assessment is designed to assess the overall sustainability footprint of a product. It is a web-based tool that analyses and scores 23 sustainability indicators across the lifecycle of an individual product, including consumer use. It collects data on all Boots brand products and provides a sustainability

product “footprint” to compare relative performance and identify “hotspots”. This tool is available to others.

A question was asked of the panel about what they do with data gaps. In using the supplier scorecard developed by Practice Greenhealth, Kathy Gerwig said companies take the supplier’s word about the data provided as it would be a breach of contract if they did not provide truthful information. If a supplier doesn’t have data they have to assume the worst. This pushes them to go back to the supply chain to find out. It shifts the data burden back up the supply chain.

A follow up question was how data gaps could be addressed with tools. John Frazier, Nike, said you can’t collect all data and if you did, you couldn’t act upon it. So it’s important to collect data for the materials that make the most sense. For Nike, it makes sense to focus on rubber as it is used in so many of their products.

Emerging Issues in Green Chemistry and Design for Environment and Next Steps

Joel Tickner, Lowell Center for Sustainable Production led this session which looked at the emerging issues in Green Chemistry and DfE that could become focal points for the GC3 in the future. Given that the companies present at the meeting represented $834billion in purchasing power and 8 sectors it is critical for the GC3 to identify areas where it can have significant impact. Four attendees were asked to share their experience and ideas for the future:

Jill Dumain, Patagonia spoke as a retailer at the meeting for the first time. She said it is important to get more people to the meeting who sit where she does in the supply chain and address the issues relevant to retailers. She would have liked more engagement on broad visions and big ideas that leave one inspired about green chemistry, specifically the opportunities for green chemistry in the future..

Dennis McGavis, Shaw Industries agreed that the GC3 needs to get more retailers into the discussion as they can build the business case for green chemistry, develop standards or guidance, and influence the buying and purchasing community.

Tod Arbogast, Avon Products, Inc. spoke about the challenges of safety and efficiency of ingredients in the personal care industry. There is wide acceptance, for example, that parabens are of relatively low risk. He would like green chemistry to be used not just to replace ingredients but to validate lower hazard materials. He would like to expand from concerns over effects on human health to effects on environmental health e.g. triclosan.

Helen Holder, Hewlett Packard said the GC3 is complimentary to the BizNGO as this is the business to business group that adds the additional value of industry-wide collaborations with large buying power. She suggested the focus remain very practical e.g. the phthalates project because leaders in the field need new materials to use.

A general discussion followed, including:

- Design the GC3 meetings so real deliverables come out of the GC3 meetings as well as the working groups. People who have been involved in GC3 meetings for some time said they would like deliverables from the meeting to take back to their companies so they can educate coworkers. It was agreed that project deliverables - reports and work projects - are extremely valuable.

- Change the meeting format to respond to the evolution of the group. The current meeting format has worked very well to date but members made suggestions for future meetings including: that panel discussions be conversations rather than powerpoint presentations; and that sector supply chain groups work together on common challenges. Practical topics like the phthalates project or the retail work were given as examples of what works well. After sector level discussions, report back sessions are still very important so common challenges can be discussed.
- Include a couple of sessions in the 2012 GC3 meeting: a Green Screen training; a session on states' work on green chemistry; and sessions on nanotechnology and science and technology policy.
- Develop a detailed compilation of GC3 results especially for newer people. This allows them to see the development of the GC3 work. It is also a way for the GC3 to map its successes and achievements to make the case for membership.
- Promote the GC3 in the press and get more exposure. The GC3 should be recognized and people should know what is and what it does. Then the GC3 will be sought after for research and information. Suggestions included sending the GC3 newsletter to bigger lists including the philanthropic community. A broader outreach will make it easier for GC3 members to introduce the GC3.
- Collaborate with other green chemistry groups e.g. Green Chemistry Institute. The green chemistry field is expanding and it is important for there to be collaboration with other groups who are working on similar things so we are supporting each other's efforts.

Appendix A

Business and Academic Partnerships: A Pilot Project for Wire anable

Assessing Phthalate and non-Phthalate Plasticizers in Wire and Cable Applications

Following the 2010 GC3 Innovators Roundtable, a working group was formed to initiate a pilot project designed to test how GC3 companies might be able to partner with academic researchers to find green chemistry solutions to problems they face. The working group aimed to find solutions to a chemical problem that would be useful to multiple GC3 members. The working group determined that the use of phthalates in products was a challenge faced by many companies in many sectors.

The working group engaged GC3 members to discover which application of phthalates was of most interest to them. Based on GC3 member input and conversations with EPA's Design for Environment program about their work on chemical action plans for several phthalates, the working group decided to focus on wire and cable applications for the electronics sector. The Red List, Quick Screen, and Green Screen methodologies developed by Clean Production Action were used to assess DEHP, and nine other plasticizers.

An inventory was developed listing more than 100 commercially available plasticizers. A survey that included the plasticizer inventory was distributed to GC3 members and to other interested companies. Survey respondents were asked to identify which of the plasticizers were of interest for EH&S concerns, how high of a priority this interest was, and whether the plasticizers were used for PVC and/or non-PVC materials.

Over the course of three weeks, GC3 staff received and consolidated the survey responses. GC3 staff also compared the plasticizer inventory with the "Red List", a list of chemicals restricted by many governments developed by Clean Production Action. The "Red List" is designed to identify chemicals that would be screened out of the Green Screen at the first benchmark because they are known or suspected carcinogens, mutagens, reproductive toxins (CMRs), persistent, bioaccumulative or an aquatic toxin (PBT), etc. Based upon the survey input and the Red List results, a short list of plasticizers was then presented to the working group for review.

The following ten plasticizers selected for inclusion in this project were chosen to represent phthalates and a range of non-phthalate chemical families:

- 3 phthalates
- 1 castor oil-based
- 1 dibenzoate
- 1 dicarboxylate
- 1 azelate
- 1 timellitate
- 1 diisobutyrate
- 1 proprietary chemistry

The results of this first phase of the project are outlined in an interim report, available at the 2011 GC3 Innovators Roundtable in hard copy.

Appendix B

Product Chemicals Management Web Resource for Retailers

The GC3 recognizes that retailers are in a unique and important position to make significant changes in supply chains. Nonetheless, retailers and other consumer-oriented businesses face numerous challenges in innovating towards safer products, including lack of good data, limited incentives, and technical barriers. They are also increasingly the targets of media, consumer, and regulatory attention with regards to chemicals of concern in the products they sell. Given their influence on supply chains, a GC3 project group has focused on engaging the retail sector. In 2009 the project group published a report focused on sharing best practices in product chemicals management: *Best Practices in Product Chemicals Management in the Retail Industry*.

Web Resource for Retailers

In 2010, the project group focused on one of the best practices identified in this report: determining which product chemicals management approach may be the best fit for a retail operation. As many retailers lack the resources to educate themselves about the tools and systems available to them, the project group developed a web resource for retailers intended to help them in developing chemicals management systems. This resource provides detailed information about the tools and systems currently available and in use in twenty product sectors: Apparel & Footwear; Automotive; Building Materials & Products; Cleaning & Janitorial Products (Residential & Commercial/Industrial); Electronics; Food & Beverage; Furniture; Hard Goods & Appliances; Health & Beauty, Cosmetics, & Pharmacy; Jewelry & Crafts; Lawn & Garden; Outdoor/Sporting Goods; Packaging; Paints & Coatings; Pet; Photo & Printing; Pool & Spa; Textiles; Tools, Hardware& Plumbing; and Toys. Tools are categorized into: restricted substances lists; standards, labels and certifications; third party evaluation systems; and consumer guides. The kind of information captured about each tool includes the focus of the tool's evaluation, product stage of life evaluated, impacts evaluated, process description, data needs, cost, evaluation frequency, similar tools and some retailers who use it.

The web resource includes a short analysis which defines a "tool", describes the tool categories in more depth, and explains their use by retailers. In educating retailers in this way, a baseline of product ingredient information can be established, chemical ingredients in the products being sold can be tracked, chemicals of concern in products can be identified, and a transition to safer alternatives can be made.

Some members of this group have also been involved in developing a one day meeting for retailers: *Product Chemicals Management: Moving Beyond Compliance Toward Safer, Less-Toxic Product Lines*, hosted by West Marine in Watsonville, CA on May 3rd, 2011. Discussions will include: the web resource; efforts by leading retailers such as Patagonia, Target, Walmart, Staples, REI, and Boots to enhance product chemicals management activities including identifying and reducing chemical hazards in products and the challenges they face; and opportunities for more enhanced cross-sectoral collaboration.

Appendix C

Facilitating Chemical Data Flow Along Supply Chains

Meeting Customers' Needs for Chemical Data: A Guidance Document for Suppliers
Following the 2010 GC3 Innovators Roundtable, a working group convened to develop a guidance document for fabricators and formulators to use when communicating with their suppliers about their need for chemical data. The group met regularly by phone over the past year to build the report and in November, 2010, met for a day-long to discuss the structure and content of the document and how it could be used most effectively to facilitate chemical data flow along supply chains.

The final guidance document was released in February, 2011 and includes sections on: the shortcomings of MSDSs and SDSs; how companies can address confidential business information (CBI); and benefits suppliers can realize when sharing chemical data information with their customers. Extensive appendices include:

- Examples of corporate data collection practices (developed from a survey of GC3 member companies)
- Customizable letters and forms that can be used by companies to communicate with suppliers
- A summary of key regulations driving chemical data collection
- Industry initiatives to streamline the data collection process
- Examples of software available to manage data collection
- Sources of information on chemical hazards and on safer chemicals
- Systems for evaluating the safety and design of chemicals, chemical products, and processes

Currently, several workgroup member companies are piloting the guidance document and will reconvene to discuss whether to develop a second, expanded edition. The group will meet at the 2011 GC3 Roundtable Meeting to develop an agenda for future projects.

The document is available at www.greenchemistryandcommerce.org/publications.php