Green Chemistry and Commerce Council Innovators Roundtable: Opportunities and Challenges in a New Era

Staples, Inc.
1 Environmental Way
Broomfield, Colorado
May 4- 6, 2009

Meeting Summary

Background
The Green Chemistry and Commerce Council (GC3) is now in its fourth year, having grown out of a 2005 conference hosted by the Lowell Center for Sustainable Production and the Darden School of Business on "Safer Chemistry Through Supply Chains." Since the initial conference, the GC3 has grown into a vibrant informal, business-to-business discussion network of about 85 organizations across industrial sectors dedicated to advancing green chemistry and design for environment. From May 4-6, 2009, over 70 individuals from industry, government, non-governmental organizations, and academia gathered for the fourth GC3 Roundtable at Staples in Broomfield, Colorado to discuss current opportunities and challenges for green chemistry and design for environment approaches. The desired outcomes of the Roundtable were to:

- Share information, experience, and understanding among a diverse group of companies and other stakeholders on advancing implementation of green chemistry and design for environment (DfE); and
- Expand participation in the GC3 by new companies and industrial sectors.

The meeting was a mix of presentations and small and large group discussions, and ended with recommendations and next steps for GC3 participants. Speaker presentations, when slides were used, are available on the GC3 website at http://www.greenchemistryandcommerce.org/news.php.

MONDAY, MAY 4TH

Welcome and Introduction to GC3 Innovators Roundtable: Opportunities and Challenges in a New Era
Roger McFadden, Chief Scientist at Staples, Inc. welcomed participants to the meeting and introduced three leaders from Staples, Inc. to highlight the company's commitment to sustainability:

> *Jay Mutschler, Former President of Corporate Express and Senior Vice President of Contracts*, discussed Staples' approach to environmental responsibility as a true

commitment. He highlighted a number of activities that help move the company towards its goal of sustainability: greening their trucking fleet, use of wind and other alternative energy in buildings, and establishing recycling and composting programs at Staples facilities. Jay stressed the importance of full-time commitment to sustainability goals, especially when their fulfillment becomes inconvenient.

Lisa Hamblet, Vice President of Facility Supplies, explained that Staples, Inc. is taking many steps to ensure that they are fulfilling their customers' demands for greener products. She noted the need to understand scientific innovations in order to meet these demands, and successfully deliver safer, healthier products.

Mark Buckley, Vice President of Environmental Affairs, detailed the broader sustainability ethic within Staples, Inc., which includes four main focal points: 1) development of environmentally preferable products; 2) waste reduction and recycling; 3) energy and climate; and 4) environmental education and benchmarking. He noted that sustainability is a process of continuous improvement that should ultimately lead beyond sustaining the earth to actively restoring it. Mark suggested that the challenges of sustainability should be seen as a business opportunity rather than a burden.

Joel Tickner, Project Director, Lowell Center for Sustainable Production, opened a discussion of the new opportunities that exist to make green chemistry and DfE top environmental priorities now that the tone and tenor in Washington have changed with the Obama Administration. It is now time to begin integrating a positive view of chemistry into the chemicals policy dialog—there needs to be a discussion about what will be created, not simply what will be phased out. There are numerous important drivers increasing the demand for products of green chemistry and design for environment, including: new state policy initiatives; the implementation of REACH in the EU; retailer and chemical user demands; and advocacy and engagement of non-governmental organizations for greater attention to green chemistry and DfE. Joel detailed the accomplishments of the GC3 over the last year, which include:

- Publication of "An Analysis of Corporate Restricted Substance Lists and Their Implications for Green Chemistry and Design for Environment;"
- Publication of "Growing the Green Economy Through Green Chemistry and Design for Environment: A Resource Guide for States and Higher Education" with the National Pollution Prevention Roundtable;
- Development of a GC3 Business Plan and Advisory Committee Elections;
- Research on supply chain information flows for publication;
- Presence at the 2008 RILA Conference and subsequent engagement with retailers;
- Research on product chemicals management in the retail industry for publication;
- Development of a "green glossary;"
- Significant progress in discussions towards a formulators DfE "standard;" and
- Increased recognition of GC3 as a powerful network of leading firms dedicated to advancing safer chemicals and products.

He outlined a series of challenges to the application of green chemistry and design for environment in practice, including lack of funding for R&D; limited information flow through

supply chains; and and lack of education of many purchasers and consumers. Similarly, he highlighted some programmatic challenges to the growth of the GC3, including identification of focal areas of work that provide value added for participants; growing the network; and engaging more "champions."

Overview of Working Group Activities in 2008[*]

Advancing Design for Environment and Green Chemistry in Government

Richard Cottrell, SYSCO Corporation, introduced the document created by the GC3 and the National Pollution Prevention Roundtable entitled "Growing the Green Economy Through Green Chemistry and Design for Environment: A Resource Guide for States and Higher Education." (Available http://www.greenchemistryandcommerce.org/publications.php) This publication is a guidance document to assist state policy-makers move their green chemistry and DfE initiatives forward.

Clive Davies, US EPA, introduced a document created by EPA's DfE program that enhances the transparency of the DfE Safer Product Recognition Program for cleaning products by detailing the minimum requirements for identifying cleaning products that meet the program criteria.

Drivers for Innovation and Marketing Safer Products

Mark Buczek described the working group's two areas of focus: (1) understanding the role retailers play in driving safer material selection and green chemistry through the supply chain, and (2) developing a common set of definitions for frequently used marketing terms that manufacturers, retailers, and consumers could use as a guide in the absence of clear consumer labels and a definition of "green." He also detailed the working group's major projects, which include the identification of best practices in product chemicals management within the retail industry through case studies and the development of a green glossary.

Tools for Chemical Assessment and Safer Design

Joel Tickner presented the working group's efforts to compile and analyze corporate restricted substance lists. He noted that there needs to be a shift from discussing what should be restricted to discussing what should be used. *Monica Becker, Monica Becker & Associates*, presented the working group's efforts to detail examples of processes used by leading companies to manage chemicals in products and to create safer products using chemical information. She described and presented findings from the series of case studies (Nike, SC Johnson, and Hewlett Packard) she has undertaken to better understand supply chain dialogs and identify best practices.

Discussion of Future GC3 Strategy

Joel Tickner facilitated a group discussion of longer term GC3 strategy. He reviewed a thoughtstarter for participants on Strategic Directions for the Green Chemistry and Commerce Council. This discussion focused on both project objectives and organizational strategy for the next few years. A number of ideas emerged from this discussion, including:

[*] See Appendices A through C for a complete listing of 2008-2009 working group activities.

- Developing business-academic partnerships to advance green chemistry and DfE, such as grand challenges that would engage academics in helping to solve major technical and design problems faced by firms;
- Leveraging the diversity of GC3 participants to engage actors up and down the supply chain and across sectors to create an engine to drive green chemistry and DfE;
- Continuing to engage retailers and procurement offices about chemicals management and green chemistry including how to obtain adequate data to make decisions and in what form;
- Developing a minimum chemical dataset needed by firms to make informed decisions on chemicals and alternatives and/or a list of chemicals for which safer alternatives are needed;
- Encouraging supply chain dialog for chemical product information, especially between suppliers and procurement professionals; and
- Developing a GC3 communications plan, including a brochure to enhance outreach and impact and to build the network.

A significant portion of the discussion focused on the GC3's mission after 4 years and how the application of green chemistry and DfE are achieved in practice. For example, is education for new participants on the GC3 mission and the 12 green chemistry principles needed? Additionally, what is the whole package of policy, incentives, and reforms needed to achieve application of green chemistry and DfE in practice? How does green chemistry relate to TSCA reform for example? What is the GC3 an active agent for?

<u>Key New and Existing Project Areas Were Assigned to Individual Workgroups:</u>

Advancing Design for Environment and Green Chemistry in Government. Developing business-academic partnerships; advancing DfE and green chemistry in the federal government, including passage of the federal Green Chemistry Research and Development Act; developing a "package" of incentives and policies for DfE/green chemistry; enhancing the transparency of the EPA's DfE process; and outreach of the GC3/National Pollution Prevention Roundtable report Growing the Green Economy.

Drivers for Innovation and Marketing Safer Products. Advancing dialog on green chemistry in the retail sector, including finalization of the retailer survey; applying the "green glossary" of marketing terms.

Tools for Chemical Assessment and Safer Design. Outreach on the analysis of Restricted Substances Lists; development of a minimum chemical data information set; publishing case studies of supply chain information flows.

New Politics: Chemicals Policy in the Obama Administration

The shift in tone and tenor in Washington has opened up new opportunities for green chemistry and design for the environment in the US. There is increased acknowledgement of the limits of the Toxic Substances Control Act (TSCA) and the need for reform. At the same time, international actions on chemicals, including REACH registration, the Stockholm POPs

Convention, and SAICM, as well as state actions on chemicals, have been moving forward. Given this shift, how will chemicals policy, including the implementation of TSCA, change under the Obama Administration? What are the prospects for chemicals policy reform? How can the GC3 provide input into new chemicals initiatives?

> *David Bennett, US Government Accountability Office*, described the role, function, and work of the Government Accountability Office (GAO) and discussed the more than thirty GAO reports on TSCA published since 1976. With the publication of "Transforming EPA's Processes for Assessing and Controlling Toxic Chemicals," the GAO moved chemicals policy issues to their list of high risk issues in January of 2009. David also summarized the key findings of the February 2009 GAO testimony on TSCA, which found that: EPA lacks adequate information on risks of chemicals; TSCA's framework impedes efforts to control chemicals; and TSCA's CBI provisions limit information sharing.
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> *Cheryl Hogue, Chemical and Engineering News*, presented a brief history of TSCA and discussed the forces for change, including existing chemicals policies, demand for more data about chemicals, and emerging issues (i.e. green chemistry, nanomaterials). Cheryl also highlighted the key players for TSCA reform in the House, Senate, agencies, and the Obama administration.
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> *Richard Denison, Environmental Defense Fund*, detailed problems with TSCA, the High Production Volume (HPV) Chemicals Program, and the Chemical Assessment and Management Program (ChAMP). He discussed a number of essential elements of TSCA reform, which included: developing and applying criteria to identify and control chemicals of concern; fixing TSCA's all-or-nothing approach; shifting the burden of proof from government to demonstrate harm to industry to demonstrate safety; requiring at least hazard basic data on all chemicals; and broadening public access to such information. Richard also described the major components of the Kid-Safe Chemicals Act (KSCA), which is meant to reform and expand TSCA. He noted the importance of driving both supply and demand for green chemistry.

Participants were eager to discuss the actions that are currently being undertaken in Congress, such as any follow up actions to the February GAO testimony and progress on the federal Green Chemistry Research and Development Act that had been introduced in previous sessions. There has been subsequent testimony in the House of Representatives which has a commitment to hold oversight hearings on every item on the GAO High Risk Series list (which now includes chemicals management). The Federal green chemistry bill did not move through Congress last year, but it will be reintroduced in the coming legislative session.

There was discussion of the details of KSCA and the existing critiques of the bill, including that it does not cover chemical uses regulated by other agencies or legislation, that it does not reform current confidential business information provisions, and that it does not sufficiently address chemicals in articles. Richard noted that many of the critiques are summarized in his article "Ten Essential Elements in TSCA Reform." Finally, there was some discussion about the role of GC3 in TSCA reform and how the group might be able to move green chemistry and design for the

environment forward within broader TSCA reform efforts. Cheryl mentioned that it is always necessary to have those invested in these issues come to the table and participate in the development of better legislation. Supporting the federal Green Chemistry bill efforts is a way to engage immediately.

TUESDAY, MAY 5TH

Discussion of DfE Documentation Efforts

Clive Davies, US EPA, discussed the DfE Program's efforts to date on safer cleaning products and enhancements for the future. He noted that the DfE Program wants to encourage people to make the safest products they can, enhance transparency, and deliver the most value to the NGO community, manufacturers, retailers, and those specifying products for environmentally preferable purchasing programs. At the same time, it is important for the DfE Program to be flexible enough to add new elements, to maintain its focus on green chemistry in products, and to expand to other product areas as necessary. Clive then discussed two possible steps for moving forward to increase transparency of the cleaning products program, which include an ANSI process or an EPA-led process. He detailed some potential benefits and concerns with each of these options. This discussion was taken up in the Advancing Design for Environment and Green Chemistry in Government working group.

Dialogs Up and Down the Supply Chain: Challenges of Getting Safer Products to the Market Place

As supply chains become increasingly complex, it becomes more and more challenging to deliver safe products to the marketplace. Given this problem, what is the role of supply chains and dialog across them in advancing safer products, green chemistry, and DfE? How can downstream users more effectively engage chemical manufacturers in providing chemical hazard information? What are key needs, challenges, and opportunities?

> *Roger McFadden, Staples, Inc*., outlined his approach to achieving Staples' vision of eliminating chemicals of concern from their cleaning products supply chain and replacing them with safer alternatives. To do this, Staples has applied the principles of green chemistry and selected supply chain partners that have adopted a paradigm shift towards cradle-to-cradle management. He also described barriers he'd encountered including: confusion about what is a "green"/ safer alternative, public perception that green products are expensive and ineffective, data gaps, poor quality data, and resistance to change.
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> *Anne Wallin, The Dow Chemical Company,* described how sustainability has been and continues to be an important goal at Dow. In 2006, Dow launched 2015 Sustainability Goals, which include: local protection of human health and the environment, contributing to community success, energy efficiency and conservation, addressing climate change, sustainable chemistry, product safety leadership, and solving world challenges. She noted that the goal of sustainable chemistry drives Dow to use resources more efficiently to minimize their footprint, provide value to customers and stakeholders, deliver solutions for customer needs, and enhance the quality of life of current and future

generations. She also highlighted Dow's leadership in product safety, as they are the first chemical company to make non-technical language summaries of product safety assessments accessible to the public. Overall, she noted the need for collaboration to achieve sustainability and deliver solutions.

Janet Mostowy, Bayer Material Sciences, highlighted that sustainability is woven into how business is done at Bayer, including: the use of innovative materials and solutions to make sustainable and effective products; communication with direct customers with regards to product safety, workplace safety, storage and transfer safety; and the inspection and evaluation of safety at customer sites. She noted that one of the biggest challenges is communication all the way down the supply chain since Bayer has access to only its initial customers and not customers of distributors that purchase their products. Janet suggested that links along the supply chain need to identify chemical uses and applications in addition to improved communication and partnership with stakeholders.

Mary Ellen Mika, Steelcase, discussed the challenges she faces in trying to get the chemical content information that she needs for her company's furniture products, for both regulatory and certification (Cradle to Cradle, BIFMA sustainability standard) purposes. She described her attempt to get full formulation information on the components that will go into the product after designers choose materials based on fit, form, and function. She noted the need to engage with all tiers of the supply chain and the challenges to getting this information, including: limited data available to some suppliers, language and cultural barriers, large numbers of components and suppliers, confidential business information, and the loss of leverage further down in the supply chain. She highlighted the fact that due to these difficulties, Material Safety Data Sheets (MSDS) are now used for many purposes for which they were never intended and suggested the need for a universal tool to make full-formulation data readily available up and down the supply chain.

Drummond Lawson, Method, discussed how he engages with suppliers to ensure that Method's products do not contain any chemical that is on their "Dirty Ingredient List." He described his attempts to engage suppliers and especially chemical manufacturers to find off-MSDS information and identify "hidden ingredients" in the materials that are selected for use in products.

Participants noted a number of challenges in trying to engage upstream and downstream dialog on chemical information and safer chemicals management. In many cases, companies don't have access beyond a level or two of the supply chain and lose significant market power beyond a specific level of the supply chain; distributors often don't have access to good toxicity information often chemical manufacturers are uninformed as to how their chemicals are being used and find that they are sometimes used in ways that were not intended; designers often state specific materials for functionality and it is often difficult to get designers to think about toxicity; and even if toxicity data are available, many firms do not have the toxicological capacity to review such data and hence must rely on third parties.

Participants were eager to discuss what a universal tool for chemical content/minimum chemical data set might look like, as many agreed this information was needed in a common format to eliminate friction and costs along the supply chain. Some elements mentioned included: materials to 10 ppm level, feedstock origins, locations of manufacture, and methods of transport. Upstream producers of chemicals noted that there also needs to be communication back upstream from end users about how the products are being used.

There was discussion about the role of confidential business information in supply chain dialogs. It was noted that confidential business information is important to upstream producers of chemicals. Some companies will be more likely to share information if a third party entity that preserves confidentiality is engaged in the process, but some companies will not divulge at all. Participants discussed some of the challenges to getting the necessary information, which included: the size of the company requesting information, trust, changes in product formulations, difficulty of attaining data necessary to meet certain certification standards, quality of data, and conflicts in data that is received.

There was also discussion about the opportunities to engage supply chains for green chemistry and DfE. Participants suggested that the development of lists of safer alternatives might be a way to use collaborative efforts to reinforce this positive view of chemistry. However, the need for performance requirements and the difficulty of getting companies to retool products to incorporate new alternatives was noted as a barrier to this type of effort.

Trade Groups as Leaders in Advancing Green Chemistry and Design for Environment

Industry associations are not necessarily known for their forward looking positions on chemicals management, green chemistry and design for the environment, but some have managed to move forward on these issues while protecting the interests of their members. Given this, what is the role of industry trade groups in advancing green chemistry and designed for the environment? How can trade groups become effective leaders in these areas? How can trade groups increase member company awareness about raising industry standards?

> *Bill Balek, ISSA,* detailed how industry associations that represent all components of the supply chain can be a powerful force in green chemistry, design for environment, and green procurement. He described the role ISSA played in greening the cleaning industry, which included: promoting environmental preferability among members, demonstrating the possible business opportunities, and raising awareness through seminars, workshops, publications, and guidance. He noted that when trade associations convey the message of green in a constructive, friendly way, it is more likely to persuade businesses to follow suit.
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> *Stephen Lamar, American Apparel and Footwear Association (AAFA),* highlighted the role AAFA's Environmental Committee plays in creating opportunities for member companies to continuously improve industry environmental standards and practices, ensuring that member companies are apprised of global environmental legislative and regulatory developments, and educating policy makers on the industry's efforts to be responsible environmental sustainability stewards. He detailed the efforts to create a

restricted substance list, as well as the efforts to develop other environmental standards and best practices for the industry.

Christopher Cleet, Information Technology Industry Council (ITI), described the trade association as a networking forum for industry leaders, a conduit for promoting sound science and educating members on important issues, and a place for leading manufacturers to talk pre-competitively about product stewardship, health, and safety. He noted that this forum has been used to promote cost benefits to green chemistry.

Participants further discussed the role that trade associations can play in advancing green chemistry and DfE. Trade associations are good at getting the word out to industry and developing objective information that companies can use. One barrier is translating broad concepts like green chemistry and DfE into specific industry actions. Some participants inquired about the role trade associations could play in facilitating information sharing with regard to ingredient disclosure and life cycle information. Panelists noted that new requirements have increased conversations about this and attempts toward transparency.

Participants also engaged in conversation about how trade associations could provide better guidance at the federal level to move away from state-by-state regulation. Although panelists expressed a preference for a federal approach, including a preference for preemption in some areas, no role to engage federal discussions was identified. Participants inquired about the trade associations' support for the federal green chemistry bill and other state-level green chemistry initiatives. None of the trade associations represented on the panel had taken a position on the legislative initiatives, but noted that this could possibly be an area of collaboration with other GC3 members.

Products Chemicals Management: Best Practices in the Retail Industry

Retailers play an increasingly important role in the supply chain and have recently, along with states, called "the new regulators." They therefore have a key role in advancing green chemistry and DfE. Given this, how can retailers provide leadership in advancing green chemistry and DfE? What are the needs, barriers, and opportunities retailers face?

Sarah Beatty, Green Depot, described how her company makes green building and living solutions accessible, affordable, and gratifying. She detailed how all products offered by the company must meet their standard for quality, efficiency, functionality, design, and innovation. She highlighted Green Depot's green icon navigation system that connects a rigorous back-end product "filter," used for vetting products, to a simple, front-end system that clarifies what and why a product can claim it is "green."

Jody Villecco, Whole Foods Market, detailed the Premium Body Care standard that recognizes the highest quality personal care products sold by Whole Foods Market. She described how her company worked with outside chemists to evaluate each and every body care ingredient on the shelf with regards to efficacy, source, environmental impact, and safety, and ultimately developed a list of over 300 unacceptable ingredients. Jody highlighted the collaboration with vendors in this process, which has led to many

reformulations and exclusive products. She also described how the Premium Body Care designation helps to educate customers.

John Leyenberger, Wal-Mart Stores Inc., described how Wal-Mart is getting information from suppliers to drive compliance and sustainability efforts and has created a tool for buyers and suppliers to reduce the environmental impact of chemical products. He detailed how this tool serves to provide accurate and consistent regulatory information for a variety of hazardous waste applications, to assist the company in meeting impending GHS, REACH, and sustainability requirements, and to spur supplier innovation to potentially reduce products that could pose environmental and/or health hazards. John also highlighted the company's involvement in the Global Data Synchronization Network Product Ingredient Reporting Project, which is another supply chain data transfer process.

Participants noted the variety of systems being used and developed by retailers to gather information and evaluate the chemical content of products. Participants inquired about where companies look to support these systems and the possibility of creating centralized, harmonious standards for gathering and sharing this type of information. Panelists noted that trade associations, vendors, and the NGO community have been helpful in developing standards and collecting information. Panelists also noted that uniform information requests would help suppliers and benefit retailers. Participants also discussed the role of "retailer as regulator" and conversed about how this role related to public sector needs for information.

Innovation and Sustainability Opportunities in a New Era

There is potential for innovative approaches to sustainability to grow and expand under the new Administration. What are some of these approaches and what can we learn about successful partnerships and new ideas?

David Levine, Green Harvest Technologies, discussed current and future opportunities for green chemistry, green jobs, and a sustainable economy. He also highlighted many opportunities for the GC3 and its participants to drive green chemistry, which included: engaging in federal green chemistry policy efforts, engaging in other related federal policy efforts, engaging in policy efforts at the state level, and inserting green chemistry and DfE initiatives into the stimulus package and the Green Jobs Act.

Noran Eid, RiskMetrics Group, discussed her work on the development of a sustainability solution innovation benchmark to make the investment case for green chemistry innovation. She noted that R & D spending is on the rise for commodity chemicals and that much of this investment is in clean-tech. She also noted that her analysis confirmed a return on investment for those with a strategy for innovation and that there is a need for more investment in R & D to thrive and maintain competitiveness in an economic downturn.

Andrea Larson, Darden School of Business, discussed the need to shift from traditional economic and business models, which do not factor in environmental considerations, to clean commerce. She noted the ability for companies to prosper by integrating

sustainability into the business model. She also noted the need for entrepreneurial innovation that develops new ways of meeting human needs that depart from traditional models.

WEDNESDAY, MAY 6TH

Using REACH Compliance to Advance Green Chemistry and DfE: Challenges and Opportunities Ahead

REACH has changed the way both the private and public sector approach chemicals management and has posed a number of challenges with regards to implementation and compliance. What are some of these challenges faced by the private and public sector and how can REACH preparation and implementation be a stimulus for green chemistry and DfE?

Anita Jain, Rogers Corporation, spoke about the challenges of REACH compliance in a small/medium-size company. Some of these challenges included: figuring out who was responsible for REACH compliance, providing basic training to all key personnel throughout the corporation, finding out what products were being exported to Europe, protecting intellectual property, navigating the pre-registration process, and obtaining chemical content information from manufacturers. She also described some of the options available to deal with these challenges. She noted that her company is now looking at REACH as a business opportunity rather than a liability and has begun to spend fewer resources on compliance and more resources on DfE programs. She detailed the creation and use of a material review program, a robust system for reviewing all incoming raw materials, and efforts to design out the use of problematic chemicals.

Christopher Blum, German Federal Environment Agency, discussed how REACH is an important step towards the sustainability of chemicals since REACH will generate information on hazardous properties of chemicals and close data gaps, improve information up and down the supply chain, encourage substitution of the most hazardous chemicals, and allow the use of chemicals only if it is proven that the identified use is safe. He detailed the development of a guidance document for enterprises that includes requirements for production, processing, and use characteristics with respect to sustainability and assists users of chemicals in identifying the most sustainable solutions. He noted that sustainability in the product chain is only achievable when economic actors share the corresponding information.

Ethel Forsberg, Swedish Chemicals Agency, spoke via teleconference about the progress of REACH to date, remaining challenges of implementation, and some of the unexpected results of the implementation process. She noted that 150,000 chemical substances were preregistered by the December deadline and 2.75 million pre-registrations have been filed. She described the challenges with regards to downstream information flow, information on articles, and the application of criteria for PBT and vPvB. She discussed REACH's results so far, which include the confirmation of the lack of knowledge about chemicals on the market, the clean-up of industry's cupboards, the rapid buildup of knowledge about chemicals, and the beginning of market communication on chemicals.

Session discussion focused on specific challenges of implementation of REACH at the firm level focusing on questions raised in Anita Jain's presentation.

Meeting Today's Chemicals Management Challenges with New Approaches and Collaborations

A number of innovative new tools, approaches, and collaborations exist for advancing green chemistry and DfE in commerce. What are some of these new tools?

> *Lauren Heine, Clean Production Action*, provided a description of the Green Screen for Safer Chemicals, an effort that outlines a path to chemicals that are safer for humans and the environment. The tool provides benchmarks to identify and substitute chemicals of high concern that are based on hazard criteria (e.g. persistence, bioaccumulation, ecotoxicity, carcinogenicity, and reproductive toxicity) to reach the goal of safer chemicals.
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> *Berkeley "Buzz" Cue, BWC Pharma Consulting, LLC*, provided an update on the pharmaceutical industry's efforts to advance green chemistry and DfE principles in the marketplace. He described the ACS Green Chemistry Institute Pharmaceutical Roundtable, whose mission is to encourage innovation while catalyzing the integration of green chemistry and green engineering in the pharmaceutical industry. He detailed the Roudtable's members, strategic priorities, accomplishments, and objectives for the upcoming year. Buzz also outlined the ACS Green Chemistry Institute's ANSI Standard Initiative, whose goal is to accelerate the development and adoption of green chemistry products and processes by creating a highly credible, easy to use multi-attribute ANSI standard.
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> *Julie Manley, ACS Green Chemistry Institute*, described the ACS Green Chemistry Institute Formulator's Roundtable. She detailed the Roundtable's mission, membership, accomplishments, and strategic priorities. She noted that the Roundtable provides a discussion forum for common technical challenges, a unified voice on emerging issues, research funding (indirectly) on areas of particular interest to formulators, an opportunity to pool intellectual resources, and an avenue to emphasize good science in standard setting.

Participants were interested in discussing the controversy over the development of a Green Chemistry ANSI standard and expressed concern that this process might set the bar low for green chemistry. A number of participants acknowledged that this standard could be a driver for green chemistry, but were concerned that the standard would not go far enough.

The role of the Pharmaceutical Roundtable's involvement with end-of-life issues around pharmaceuticals was also discussed. Participants also questioned why the ACS Green Chemistry Institute decided to limit membership in the Roundtables to industry and wondered whether there are opportunities for those outside of industry to engage in these efforts.

Concluding Speaker: Dr. Theo Colborn, TEDX (The Endocrine Disruption Exchange)
Dr. Colborn described her lifelong work examining endocrine disrupting chemicals and their impact on human health. She presented the scientific research that shows why endocrine disruption should be the "E.D." we are all talking about.

Working Groups Report Back: <u>Advancing Design for Environment and Green Chemistry in Government</u>
The Working Group focused on five areas for discussion:

- Next steps for the GC3/NPPR guide for Green Chemistry and DfE in the states;
- Next steps for the DfE program criteria document;
- Beginning a business/academic partnership to advance green chemistry and DfE;
- Beginning a project building green chemistry incentives along supply chains; and
- Developing a workplan for supporting the federal green chemistry bill.

GC3/NPPR Report
The group agreed that, barring any changes from NPPR, the document was final, and then went on to brainstorm outreach opportunities for disseminating the document. Ideas for outreach included: 1) NPPR; 2) higher education networks; 3) ISSA distribution lists; 4) National Caucus of State Legislators/National Caucus of Environmental Legislators; 5) the education program at the Green Chemistry Institute; 6) business education opportunities; 7) Dr. Andy Larson's new website; 8) websites of Clean Production Action and other GC3 participants; 9) GSA website; and 10) OFFE. The group will further explore the details of this dissemination on their next conference call.

Next steps: The Lowell Center will check in with NPPR and work to finalize the document.

DfE Criteria Document
There was a brief discussion of the available options for finalizing the document, including making it a document internal to EPA, pursuing an ANSI standard, some kind of middle ground solution, or turning each of the individual screens of the DfE program into standards as a first step in a larger standard.

The group decided that the next steps were to 1) finish the document to include auditing criteria, defining a closed loop system, and quality control from EPA NSF; and 2) collect data to understand what is needed of this criteria document to meet the needs of policy makers (i.e., is an ANSI standard necessary to appeal to a policy audience?). The goal for the document is to address the main criticisms of the DfE program—lack of transparency and no audit provisions—and to ensure that there is support for the program within EPA.

Next steps: Clive Davies will continue to work on finalizing the document and moving the process forward within EPA, seeking guidance from GC3 members where appropriate.

Business/Academic Partnerships
The federal Green Chemistry R&D bill now pending in the US Senate includes provisions for funding academic interests in green chemistry, and for student internships with companies. Were the bill to pass, it could provide the foundation for working group efforts to expand collaborations between the GC3 and green chemistry programs. Andy Larson (Darden School of Business) and David Levine (Green Harvest Technologies) volunteered to lead an exploratory sub group interested in moving this idea forward. Theresa McGrath (NSF International), Sheri Franjevic (Clean Production Action) and Roger McFadden (Staples) also agreed to participate.

Next steps: The sub-group should brainstorm a short list of potential projects and present it to the rest of the working group on our next conference call.

Incentivizing Green Chemistry Along Supply Chains
Bob Israel (Johnson Diversey) volunteered to take the lead on a new project for the working group, to create an incentives engine to drive green chemistry/DfE policy through supply chains in an effort to speed up green chemistry adoption. An example of an incentive might be providing a green chemistry exemption in pre-manufacture notices. Other volunteers for this project included: Clive Davies (EPA), Christine Chase (GreenSeal), Jack Daley (Daley International) Andy Larson (Darden School of Business), Ernesto Lippert (BASF), and Sheri Franjevic (Clean Production Action).

Next steps: Bob will take the lead on creating an outline of a white paper the working group will write. The outline will be done by August 1st.

Support for the Green Chemistry Bill
The group decided that support for the passage of the federal green chemistry bill would be a priority for the coming year.

Next steps: Jessica Schifano (Lowell Center for Sustainable Production) and Chris Pearce (SC Johnson) will follow the bill's progress through Congress.

Working Groups Report Back: <u>Drivers for Innovation and Marketing Safer Products</u>
The Working Group focused on two major areas of discussion:

- Next steps on retail engagement, communication, and education efforts; and
- Next steps with the green glossary.

Retail Engagement, Communication, and Education
<u>Case Studies.</u> The Workgroup has been working on a project that would develop best practices in product chemicals management within the retail industry. The initial step in the project is to conduct interviews with leading retailers who have or are developing product chemicals management systems. Several retailers have been identified as case studies for this project and two interviews have already taken place. The Workgroup decided to conduct at least 10 interviews with leading retailers and to add a couple of interview questions about consumer

education. Four members of the Workgroup will conduct the interviews. The goal is to both highlight the innovative work of some retailers in addressing the issue of product chemicals management and to provide options for other retailers who are not currently addressing this in their organizations. The case studies will look at the drivers of product chemicals management systems, the structure of the different systems, obstacles encountered, benefits recognized and lessons learned. The case studies will be completed by August 2009.

Ten Best Practices in Retail. Based on these retailer case studies, 10 best practices for retailers developing product chemicals management systems will be drafted by the 4 interviewers and vetted by the entire Working Group. These will also be completed by the end of August 2009.

RILA Sustainability and Compliance Conference. John Leyenberger from Walmart will take the lead on approaching RILA to see if they would be interested in us speaking about our retailer research work at a session at their September 2009 RILA sustainability and compliance conference. The goal for such a session would be to set a context of the direction of chemicals policy by having a representative from CA and/or Canada speak about the work they are doing in this area, followed by a summary of the case studies and best practices in product chemicals management in the retail industry this Working Group has developed. We would be offering retailers solutions in the face of what may be impending regulations.

Survey. Once the retailer case studies and best practices have been developed, we would like to partner with either RILA or state trade associations to develop a base survey of retailers and their development of product chemicals management systems.

Report of Findings. The survey of retailers, case studies, 10 best practices, and case studies that CPA and Innovest have done in previous years will be developed into a report on *Best Practices in Product Chemicals Management Systems in the Retail Industry* by the Spring of 2010.

Next steps: Four members of the working group will conduct additional interviews over the next couple of months. Based on the ten case studies, best practices will be drafted. This will all be completed in time for the RILA conference in early October 2009.

Green Glossary

In an ongoing effort to help distinguish green products in the market place from greenwashing, the Working Group began developing a glossary of "green" marketing terms over a year ago to define some of the terms used on products, for example, natural, green, sustainable, biodegradable, etc. The interest in the green glossary has always been about collectively, as the GC3, agreeing to and using or not using a set of defined words in explaining and marketing products up and down the supply chain. There is currently no commonly agreed to glossary and the FTC green guides is not filling this role.

It was thought that CA is in the process of developing a wiki of terms that may influence the glossary. Once this has been developed, what is relevant from that will be added to the existing glossary and then we will seek a stamp of approval on words within the glossary that the GC3 can agree to use or not. Three members of the Working Group will spearhead this project.

Next steps: Four members of the working group will provide input into the glossary based on the work their respective companies have done. The glossary is being seen as another tool for retailers.

Working Groups Report Back: <u>Tools for Chemical Assessment and Safer Design</u>
The Working Group focused on three major areas of discussion:

- Next steps with the RSL report and spreadsheet;
- Finalization and next steps with the supply chain case studies; and
- Development of a new project on minimal chemical dataset.

RSL Report
The report could use some better outreach than simply placement on the GC3 website. One option is to explore a way to add to the list: criteria based lists; regulatory-based lists; lists developed through company screening processes. However, it would also be useful to come up with a "green" list of chemicals, design criteria (desirable/undesirable traits). The Endocrine Disruptor Exchange is developing a list of endocrine disruptors that should be published by July.

Next steps: The Lowell Center will explore expansion of the RSL list.

Supply Chain Case Studies
Monica Becker presented lessons from the two case studies completed to date as well as options for publishing the case studies. One option is a website like the one hosted by the World Business Council on Sustainable Development that has case study summaries linked to full case studies. This could be accompanied by a dialog box for people to add comments/feedback on lessons. A short report summarizing lessons learned for improving supply chain information and management of chemicals would be developed. The case studies should also be printable. There is no single approach to the case studies so more important is to identify replicable lessons from each and common approaches. One question is whether additional case studies could be done by other universities as these are critical to the educational approach of CEOs and CFOs who learn through such cases. More information monetizing benefits of cases would be good. Cases could be specific companies or taking a product approach and the various actors on the supply chain – such as True Textiles and Steelcase – a more functional approach such as solvents. GC3 talks could also be translated into case studies so the database of cases can keep growing – they shouldn't be a one-time event.

Next steps: A follow up call with Mark Rossi, Mary Ellen Mika, and Eric Harrington to discuss a plan for further case studies, publication on the web, etc.

Minimum Chemical Dataset
During the GC3 Roundtable there were numerous discussions on the amount and types of information firms need to make decisions on chemicals. The workgroup discussed three types of information: ingredient/formulation; hazard; uses. The question is what is the appropriate quantity and quality of information need to make informed decisions. This will vary depending on the firm. Some firms have all hazard assessments completed by outside third parties and thus

do not need hazard data whereas others do this analysis in house and need the data. There are lots of questions regarding percentage thresholds for ingredient information, by product information, and how to get information from Tier II, III and beyond suppliers. Also the types of hazard information on MSDSs tend to be inadequate for assessing product safety. Finally, confidential business information and how much should be publicly available is a critical consideration (including 3rd party vs. full disclosure). Rather than selecting a particular approach for collecting ingredient and hazard information, the group determined that it would be useful to explore different models for collecting such information and the pros and cons of those models depending on the firm. Is there a minimum set of information and what is the gold standard?

Next steps: A follow up call with Tom Carter, Topfer Buck, Mary Ellen Mika, Eric Harrington, Drummond Lawson, Monica Becker and Tara Mullen to develop a next steps plan.

Next Steps for the GC3

Participants discussed next steps for the GC3 and identified four key priorities:

1. Work products – these represent a way to demonstrate value added of the GC3
    a. Passage of the federal Green Chemistry Research and Development Act and elevation of green chemistry and DfE approaches in government programs
    b. Engagement with the retail sector including a session at the 2009 RILA conference and finalization of the retailer survey
    c. Supply chain information flow case studies
    d. Advancing industry-academic partnerships
    e. Minimum chemical information dataset
    f. Packaging green chemistry and design for environment policy and the GC3 purpose
2. Growth, expansion of the network to include suppliers, distributors, government entities, universities, waste managers, designers/materials specialists, procurement professionals, public health professionals, auto industry, personal are products, pharmaceutical industry, venture capital, etc. Part of the growth strategy might include presentations at other conferences and quarterly information webinars and possibly outreach and training.
3. Marketing the GC3 and making GC3 a legitimate, viable entity to promote green chemistry and DfE. This should include development of a 15 minute power point, a GC3 brochure, and possible a GC3 video. The goal would be to demonstrate the value of participating in the GC3, its value throughout product lifecycles, and visibility and exposure to multiple parts of supply chains.
4. Funding to build a financial base so that GC3 is sustainable, consideration of different models, including membership fees, project-based fees, sales of reports, etc.

Participants discussed locations for the next roundtable. Sysco in Houston has confirmed that it will host the 2010 Roundtable with dates still to be determined.

Appendix A: Advancing Design for Environment & Green Chemistry in Government

Following the 2008 GC3 Roundtable, the DfE/Green Chemistry working group prioritized three projects for the coming year: support the federal green chemistry bill, complete a joint report between the GC3 and the National Pollution Prevention Roundtable (NPPR) acting as a guide to states looking to create opportunities for green chemistry and design for environment, and work with EPA to improve the transparency of the DfE program.

The federal green chemistry bill, Green Chemistry Research and Development Act, was introduced to the 2008 legislature but has not been made a priority within Congress. Given the slight chance that that the bill would pass through the session, the working group focused its attention on its other projects.

Karen Thomas, consultant to the Lowell Center for Sustainable Production worked with working group Co-Chairs Richard Cottrell (Sysco) and Roger McFadden (Staples), and with Ken Zarker (Washington State) of NPPR to draft and subsequently finalize the green chemistry report: Growing the Green Economy: A States Guide to Creating Opportunities for Green Chemistry and Design for Environment. Copies of the report will be distributed at both the GC3 Roundtable and the NPPR annual meeting also happening in May, 2009.

In an effort to improve the transparency of the DfE program, Clive Davies of EPAs Office of Pollution Prevention and Toxics convened an ad hoc group of GC3 participants, members of EPA, and representatives from NSF, the Consumer Specialty Products Association, and various state agencies to document the DfE program as it relates to cleaning product formulations. Simply describing how the program works was a first step in identifying opportunities for improving its transparency, a key weakness in the program according to its critics. The document will be available at the GC3 Roundtable for review, and the subject of a breakfast meeting on Tuesday, May 5th.

Potential projects for the coming year include:

- Prioritizing support for the Green Chemistry Research and Development Act.
- Partnering with academic institutions to assist colleges and universities to improve the sustainability of their supply chains and urge them to consider chemicals policy as part of their definition of sustainable.
- Continuing to work with EPA to document the DfE program as it relates to the electronics sector.

2008-2009 Working Group Activities

Appendix B: Drivers for Innovation and Marketing Safer Products

Following the 2008 GC3 Roundtable, the Drivers working group prioritized two areas of work for 2008 -2009. The primary area of focus was the role of retailers in driving the supply chain toward safer chemicals and how the retailers were adjusting to increased customer demands for greener products. The second area of focus was communication, specifically, creating a database of marketing terms that manufacturers, retailers and consumers could use to guide them in the absence of clear consumer labels and a definition of green.

The Role of Retailers in Driving the Supply Chain Toward Safer Chemicals

Attend the Retail Industry Leaders Sustainability and Compliance Conference, September 2008

As discussed at the Roundtable in July 2008, two members of the working group attended the Retail Industry Leaders Association (RILA) Environmental Sustainability and Compliance Conference in September 2008. It was clear from the conference that this is a difficult time for retailers. The main focus of sustainability issues at that conference were green energy or energy reduction, recycling, packaging, green building, and reducing carbon footprints. There was little focus on product chemicals management.

Best Practices in Product Chemicals Management in the Retail Industry

Following our attendance at the RILA conference and a review of data published online by retailers about their chemicals management / sustainability efforts by a University of Massachusetts Lowell graduate student, the group agreed to work on a project that would develop best practices in product chemicals management within the retail industry. Several retailers have been identified as case studies for this project and two interviews have already taken place. The goal is to both highlight the innovative work of some retailers in addressing the issue of product chemicals management and to provide options for other retailers who are not currently addressing this in their organizations. The case studies will look at the drivers of product chemicals management systems, the structure of the different systems, obstacles encountered, benefits recognized and lessons learned. A report of these case studies will be released at the end of the summer 2009.

Supply Chain Communication

Global Data Synchronization Network

Two participants of the working group also participate in the development of the Global Data Synchronization Network (GDSN). The GDSN has been developed by GS1 (a leading global organization dedicated to the design and implementation of global standards and solutions to improve the efficiency and visibility of supply and demand chains globally and across sectors). The intent is for suppliers to supply data into one system that would be used by retailers or buyers they specify. Suppliers would only use it once, providing all data to a third party who would use what they need and keep the data proprietary. The group has been kept abreast of the GDSN development throughout the year. Currently they are working to address full disclosure and how to get around it. Business requirements are also being defined. There will be a set of required information that would be standardized.

A Green Glossary

Manufacturers, retailers and consumers are looking for guidance on the use and understanding of marketing terms. In an ongoing effort to help distinguish green products in the market place from greenwashing, the Drivers group began developing a glossary of "green" marketing terms a year or so ago to define some of the terms used on products e.g. natural, green, sustainable, biodegradable, etc. Some words are defined by the Federal Trade Commission, but others have a variety of definitions, many misused. The goal was that after gathering the assortment of definitions, the GC3 would agree on one definition. A database of about 150 marketing terms and their definitions have been compiled to date. While there has been general interest in the topic, it has been difficult to define the scope and the intended audience for such a project. Until that can be better defined, the group has been reluctant to put more resources into the project despite the overall interest.

Working Group Projects in the Coming Year

There will be a 2 hour breakout session at this year's Roundtable for each of the working groups to discuss which new projects they will take on in the coming year. The overall focus for this group is to develop a set of options for retailers to develop product chemicals management systems, based on case studies of retail leaders, including a strategy for the GC3 to educate consumers around green chemistry and design for environment practices. Specific projects brainstormed to date include:

- Finalize the case studies and report: *Best Practices in Product Chemicals Management in the Retail Industry*
- Engage a retail trade association to conduct a survey and establish a baseline of current chemical policy practices in the retail sector
- Present findings at the 2009 Retailer Industry Leaders Association (RILA) Conference
- Discuss other avenues of outreach for the retailer report and survey
- Develop a strategy for the GC3 to educate consumers around green chemistry and design for environment practices

2008-2009 Working Group Activities

Appendix C: Tools for Chemical Assessment and Safer Design

An Analysis of Corporate Restricted Substance Lists (RSLs) and Their Implications for Green Chemistry and Design for Environment

Companies are increasingly being called upon to demonstrate the safety of their products, particularly their chemical constituents. Given the general lack of information on many chemicals in commerce, some companies have developed screening programs and criteria to guide hazardous materials restrictions. Despite the development of these lists and publication by certain sectors or companies, there has been no effort to date to pool restricted substances lists across sectors and companies to better understand the types of chemicals restricted and rationale for their restriction. The Lowell Center for Sustainable Production issued a call to companies in the GC3 for lists of chemicals that firms have deemed restricted in some way, based on concerns about negative environmental or health impacts, or other factors.

Since the 2009-2009 GC3 Roundtable, the Tools working group made final changes to the Restricted Substances Lists spreadsheet which compiled corporate restricted substance lists. A companion analysis[†] of the spreadsheet and a list of chemicals which are restricted by many of the government lists seen as driving corporate restrictions were also published online. Both the RSL spreadsheet and the companion analysis documents are publicly available on the group's website at www.greenchemistryandcommerce.org/publications.php.

Supply Chain Case Studies

After completing the RSL project, Monica Becker (Monica Becker & Associates) conducted interviews with Nike, SC Johnson & Sons, and Hewlett Packard to offer examples of processes used by leading companies to manage chemicals in products, and to create safer products using chemical information. Each case presents a description of the company's supply chain, an overview of any programs collecting chemical data, insights on how these programs are working, and a listing of the chemical data required, data collection methods, the challenges, and successes. From these analyses a collection of lessons learned and best practices will be presented which could be applied to other firms in other sectors.

The draft of the case study for Nike has been completed and it has been submitted to John Frazier to review before it can be finalized. A draft of the second case study on S.C. Johnson has been completed. The draft is being reviewed by Dan Lawson, Dave Long and the SC Johnson Public Relations Group. SC Johnson like many companies needs approval before it can be released externally. The interviews for a third case study on HP have conducted and Monica is drafting the case study.

Working Group Projects in the Coming Year

The group is now beginning to think about moving beyond restricted substance lists to outlining a minimum chemical data set that is needed to make more informed decisions about chemical uses. The set of hazard endpoints brainstormed at the 2007 GC3 Roundtable will serve as a jumping off point for this data set.

Potential projects for the coming year include:

- Outline a minimum chemical data set that would attempt to eliminate the duplication of effort that comes from firms individually seeking hazard data within supply chains.
- Build upon the case study work to join forces with other groups or networks, such as the World Business Council on Sustainable Development, working on these issues.
- Engage procurement networks as a new "sector" in the GC3 and the working group.