

GC3 GREEN CHEMISTRY & COMMERCE COUNCIL
10th Annual Innovators Roundtable

Beaverton, OR | April 28-30, 2015

2014/2015 GC3 PROJECT GROUP ANNUAL UPDATES

Mainstreaming Green Chemistry

Over the past year, the Mainstreaming Green Chemistry Project has been active in 3 areas:

- Developing the GC3 Agenda for Mainstreaming Green Chemistry (Agenda)
- Hosting educational webinars
- Sponsoring research on barriers and opportunities for mainstreaming green chemistry

Agenda for Mainstreaming Green Chemistry

After the 2014 GC3 Roundtable, there was a wealth of ideas generated to help accelerate the development of green chemistry. These ideas were clarified and organized, and combined with results from the GC3 member survey (conducted in 2013), additional research, and feedback from the Project Advisory Committee for inclusion into the Agenda. A draft of the Agenda has been developed and parts of it will be presented at this year's Roundtable. The draft document suggests actions in five strategic areas: Understanding the Marketplace, Supporting Smart Policies, Fostering Collaboration, Disseminating Information, and Tracking Progress.

The Mainstreaming Green Chemistry Project Advisory Committee met via web 7-8 times over the past year to go over portions of the Agenda and discuss key questions. The following is a list of some of the topics discussed:

- Developing a shared purpose for the Agenda
- Creating a "clarification" of green chemistry to elucidate the roles that each part of the supply chain plays in its adoption (see below)
- Understanding barriers to mainstreaming green chemistry
- Identifying action items that GC3 can take or support to help overcome barriers
- Making the Agenda a living document
- Structuring the report
- Mapping the system of idea to commercialization
- Identifying topics for webinars

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Clarifying Green Chemistry

Green Chemistry is primarily practiced at the chemical development and formulation level. However, product developers, manufacturers, brands, and retailers all play an important role in driving and adopting green chemistry. Several ways they do this are by changing the way that products are designed or fabricated, such as design specifications; specifying and sourcing materials and products that incorporate green chemistry; changing manufacturing practices to substitute or reduce the use of hazardous chemicals in production; and developing and implementing policies restricting certain classes of chemicals or chemical risks in the products they make, source and/or sell. Green Chemistry incorporates every element of business, from feedstock selection through manufacturing to finished products, including the ways that companies manage their businesses and engage their customers throughout the supply chain.

Webinars

The Mainstreaming project sponsored 3 webinars this past year:

- Advancing Green Chemistry Through Business to University Partnerships: Lessons from BASF, held on March 26, 2015, featuring *Chris Hewitt, Science Relations Manager, North America for BASF*
- CEO Perspectives on Sustainability: What this Means for Green Chemistry, held on January 6, 2015, featuring *Don Reed, Managing Director, PwC Sustainable Business Solutions*
- U.S. Department of Commerce (DOC) and its Role in Supporting Green Chemistry, held December 10, 2014, featuring *Blandine Trouille, Strategic Analyst, US Department of Commerce*

Recordings of webinars can be found on the GC3 website in the members section.

Research

In addition to the research done to develop the Agenda, the GC3 sponsored three research projects:

- *Barriers To Green Chemistry Adoption And Means To Accelerate Growth Along The Supply Chain*, T Fennelly & Associates. This report summarizes the results of interviews with 50 industry representatives and identifies 9 key issues holding back progress in green chemistry.

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- *Making the Business and Economic Case for Green Chemistry*, TruCost. Co-sponsored by GC3 and American Sustainable Business Council. This report, explores the business value of green chemistry through 8 themes.
- *Green Chemistry Metrics White Paper*, Anne Blake. This report examines the landscape of different types of metrics that can and are being used to measure green chemistry progress.

All reports will be publicly released and on the GC3 website in late spring

For more information on the Mainstreaming Green Chemistry Group, contact Amy Perlmutter at amy@aperlmutter.com

Retailer Leadership Council

In 2014-15, the Retailer Leadership Council (RLC) focused its work on a dialogue with major chemical manufactures to identify key opportunities to advance safer alternatives and encourage green chemistry innovation.

The RLC is composed of a select group of retail leaders who are pro-actively working to: understand what chemicals are in their products, engage their suppliers in improving chemicals management, identify safer alternatives to chemicals of concern, develop and implement sustainable chemical and product policies, and educate their customers. The RLC was formed following the GC3 Second National Summit for Retailers held in May 2013. The mission of the RLC is to promote safer chemicals, materials, and products across retail supply chains. Members include Best Buy, CVS, Home Depot, Staples, Target, Walmart, and Wegmans. The RLC meets via conference call on a monthly basis and in person as needed.

In May 2014, the RLC began a dialogue with a small group of chemical manufacturers. At that meeting, retailers shared their concerns, challenges, and priorities for safer chemicals and products and heard from chemical companies about their challenges and priorities in regard to green chemistry and safer alternatives. The RLC continued this dialogue with chemical manufacturers through follow up meetings via conference call in October and December 2014. Some of the key questions that the RLC discussed with chemical manufacturers included: How do you measure and assess potential brand, retailer and consumer demand and how does this information play into research and development and commercialization decisions? Where are the points of interaction? How can chemical manufacturers

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work more effectively with retailers to communicate about green chemistry developments and technologies, with the understanding that protection of legitimate confidential business information may be a constraint early on in the process?

The RLC will meet with chemical manufacturers, including representatives from AkzoNobel, BASF, Dow, DuPont, and Eastman, in April 2015. For 2015-16, the RLC will identify concrete projects that can serve to build alignment to advance green chemistry and safer alternatives among retailers, chemical manufacturers, brands, and other key actors along the supply chain.

Presentations and Webinars

Three members of the Retailer Leadership Council — Kate Heiny from Target, Rob Kaplan from Walmart, and Roger McFadden from Staples — were panelists at the RILA Sustainability Conference in Minneapolis in October 2014. Sally Edwards moderated the session, which was entitled "Retailer Initiatives for Sourcing & Selling Safer Products."

A webinar of particular interest to retailers entitled "Training and Incentivizing Merchants to purchase sustainable products" was held in February 2015. Jason Pearson, executive director of the Sustainable Purchasing Leadership Council, discussed broad principles for sustainable purchasing that his organization has recently developed. Larry Garcia, Senior Environmental Analyst at Seattle City Light, discussed the program his organization has implemented to train employees to purchase and use safer chemical products. Rob Kaplan, sustainability director at Walmart, discussed Walmart's chemicals policy and its work with suppliers to incentivize product sustainability.

For more information about the GC3 Retailer Leadership Council, contact Sally Edwards at sally_edwards@uml.edu.

Green Chemistry Education

Education Portal

In 2014-2015, the GC3 education group has been focused on continuing to expand the webinar-based green chemistry and safer alternatives curriculum for GC3 members and other companies. The goal of the training program is to increase knowledge and awareness to advance green chemistry and safer alternatives implementation.

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Four webinars have been presented in the education series this year:

- Introduction To Green Engineering - *Julie Zimmerman, Assoc. Professor of Chemical & Environmental Engineering & Forestry & Environmental Studies, Yale University, Matthew Eckelman, Assistant Professor Department of Civil & Environmental Engineering, Northeastern University and Julie Schoenung, Professor & Vice Chair, Department of Chemical Engineering & Materials Science, University of California, Davis* provided an overview of green engineering principles as well as case examples of how green engineering are applied in practice.
- Building Market Share for Green Products- *Steve Davies, Director of Public Affairs & Communications, NatureWorks, Saskia van Gendt, Captain Planet, Method and Charlie Forslund, Principal, Material Innovation Exploration, Steelcase* shared their approaches to marketing their sustainable practices.
- Training and Incentivizing Merchants to Purchase Sustainable Products - Three Perspectives - *Jason Pearson, Executive Director, Sustainable Purchasing Leadership Council, Larry Garcia, Senior Environmental Analyst, Seattle City Light and Rob Kaplan, Sustainability Director, Walmart* discussed some of their leading efforts to increase the purchase of sustainable products.
- The Role of Policy in Green Chemistry Research and Adoption - *Joel Tickner, Director of Green Chemistry and Commerce Council, Associate Professor of Environmental Health UMASS Lowell and Robert Giraud, Principal Consultant, Environmental Engineering, DuPont Company,* provided an overview of the range of policies that can affect chemical design and product development and adoption.

These webinars will be lightly edited and the training curriculum will be available on the GC3 website this month. The portal will include the webinars as well as supplemental information for each topic. We will continue to develop webinars to complete this series. The next webinar will be on alternative assessments and life cycle thinking.

Fellows Program

In response to the discussions at the Roundtable last year the GC3 has kicked-off its Fellows Program, which will place qualified graduate students into GC3 member companies for a 10-12 week summer internship. The aim is to introduce companies to prospective new hires who meet their green chemistry-related qualifications, while simultaneously helping the students learn skills needed in industry. We plan to expand the program next year to accommodate more companies.

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Webinar for Students

In addition to the GC3 Education Series, which is focused on professional education for individuals in companies, the Education Group partnered with the Network of Early-Career Sustainable Scientists & Engineers (NESSE) on a webinar where three professionals — Cory Robertson, Environmental Chemist, Hewlett Packard; Drummond Lawson, Environmental Chemist, Arcteryx; and Kristi Budzinski, Green Chemistry/BioPharma Program Manager, Genentech — discussed their career paths and provided recommendations to those looking to pursue careers in the field. The aim of this webinar was to increase awareness among early-career scientists about green chemistry knowledge and skills required by industry and to demonstrate the need for green science content in curricula.

For more information on these projects, please contact Saskia van Bergen at Saskia.vanBergen@ecy.wa.gov.

INNOVATION

The Innovation Group has two ongoing projects: the Green Chemistry Innovation Portal and the Collaborative Innovation Project on Preservatives in Personal Care & Household Products.

The Green Chemistry Innovation Portal (“The Portal”)

The Portal is an on-line platform for growing and connecting the green chemistry community – in industry and academia – and for solving green chemistry challenges. After the GC3 meeting in 2014, we created a beta version, tested it and gathered feedback for further development. We submitted the Portal initiative to the LAUNCH Green Chemistry Challenge competition and were selected as a finalist. Monica Becker and Joel Tickner travelled to the LAUNCH Forum at NASA’s Kennedy Space Station in late January where Monica delivered a pitch for the Portal and received targeted feedback and offers to share resources and networks to accelerate the initiative. We are now in a six-month post-Forum period during which the LAUNCH program is facilitating follow-up conversations with strategic partners to help us fine-tune our strategy and development plan, expand our network and resources, and amplify the impact of our work.

One major outcome of the LAUNCH process was the decision to form a strategic partnership with the American Chemistry Society’s Green Chemistry Institute (ACS GCI) for this initiative. This is a natural partnership between two organizations with aligned missions – to advance green chemistry. We are

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excited by the prospect of tapping into the membership of the ACS to expand the scope and impact of the Portal and to benefit from synergistic GCI efforts and infrastructure, such as the ACS Network and Nexus Blog. Since the LAUNCH meeting, the GC3 and GCI have been working together to develop a functional specification for the Portal, operational plan, and a new beta version.

The current design for the Portal consists of two primary components: the Innovation Forum and the Community Map. The Innovation Forum will be an online community where professionals can discuss challenges and needs in green chemistry research and practice, with a flexible categorization system to allow users to easily find the topics they are interested in. The Forum will be open to any individual who creates a free account on the ACS Network. The GC3 will also offer to connect individuals and organizations that have specific needs to research groups, individuals or companies that could address them.

The Green Chemistry Community Map is designed to be an entry point into the green chemistry community. We envision companies, researchers, and even job seekers accessing the map to identify organizations and individuals who are active in green chemistry research and practice. The map will show relationships between companies, organizations, and research groups, and help identify new opportunities for the community to expand by connecting in research that is adjacent to and synergistic with green chemistry. The Community Map will be open for all to view and organizations can request to be added to the map.

We will present the latest Portal concept and design at the GC3 Roundtable and solicit feedback from participants. Our goal is to beta test the new Portal this summer and launch it this fall.

Collaborative Innovation Project on Preservatives in Personal Care & Household Products
("Collaborative Innovation Project")

During a session at the 2014 GC3 Roundtable, Homer Swei from J&J, Steve Domeck from InnoCentive, and Monica Becker discussed the need for new preservative technologies for personal care products; how open/challenge driven innovation could be used to address this need; and whether a GC3-led, pre-competitive, collaborative effort could help accelerate innovation in this space. A new GC3 project was born out of these discussions.

Starting last fall, the GC3's Collaborative Innovation Project on preservatives was launched, initially through one-on-one conversations with formulators/brands. These discussions led to the development of a project prospectus, which established goals for the project, potential tasks, the role for the GC3 and

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for companies participating. The goals are: 1. To accelerate the commercialization of new, safe, effective, and cost competitive preservative systems for personal care products; and 2. To create a new model of pre-competitive collaboration whereby companies with common needs for new safe chemicals, materials, or other technologies, can accelerate the development and scale-up of these technologies.

All agreed that the development of a criteria document would be foundational to any future tasks. The document articulates the need for new preservatives; highlights the significant demand represented by the companies in our group; and provides a set of detailed development criteria for new preservatives, including performance, human and environmental health and safety, regulatory and other business requirements. We are now finalize this document and will begin to disseminate it through multiple channels. We are also beginning to discuss next steps for the project group, which may include collaboratively sponsored research and/or testing and evaluation of promising technologies.

The companies in the project group are: Aubrey Organics, Aveda, BabyGanics, Beautycounter, Johnson & Johnson, Henkel, L'Oreal, Method, Procter & Gamble, Seventh Generation, and Unilever.

If you would like more information on these projects, please email Monica Becker at monica@monicabecker.com or Anna Ivanova at anna_ivanova@uml.edu.

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