FORUM REPORT

Change Chemistry, formerly the Green Chemistry & Commerce Council (GC3), is a community of companies, regulators, and non-governmental organizations (NGOs) focused on advancing the commercialization, adoption, and scale of chemicals, materials, and products that are safer and more sustainable.

At Change Chemistry's European Forum hosted by Covestro, attendees gathered to collaborate and accelerate sustainable chemistry development, commercialization, scale, and adoption. Forum presentations and discussions highlighted the importance of building understanding along the value chain and with regulators and others to address sustainable chemistry challenges, needs, and opportunities.

"Change Chemistry is a convener, connector, and networker with a unique focus on driving growth in sustainable chemistry."
-Joel Tickner, Executive Director of Change Chemistry

Key Takeaways:

1. Changing Chemistry requires a community – one company alone cannot research, develop, implement, and scale alternatives. Many participants brought encouraging examples of sustainable chemistry, from biobased ingredients to circular supply chains, developed through various partnerships. These solutions are now in need of scaling. Such scaling could be supported by supportive government policy, incentives, and strong relationships with customers (including offtake agreements).

Regarding sustainable chemicals, "our [company's] challenge is now building the second and third factory."

2. Mitigating climate change and increasing circularity of materials and products were two key themes driving companies and investors to action. Safe chemicals and materials were a fundamental consideration for these themes. The intersection of these themes encourages holistic solutions that do not adversely impact communities, customers, and the environment.

3. Transparency accelerates the implementation of sustainable chemistry. Downstream companies, regulators, and investors that want to support sustainable chemistry need to understand potential liabilities and benefits as well as see evidence of sustainability in action. Information on chemical ingredients and hazards shared throughout the supply chain can improve decision-making around chemical design and selection.

4. Regulation is driving substitution of hazardous chemicals, but more support is needed in the innovation of sustainable chemicals and materials. Regulators need to design guidance, incentives, and regulations that drive many sustainable chemistry solutions, rather than prioritizing a handful of technologies or products.

5. The transition to sustainable chemicals is tricky. Several key barriers exist for sustainable chemistry innovations including demand, feedstock availability, materials degradation, scaling manufacturing capacity, and the fact that bio renewable chemicals and materials are often held to a higher standard than their petrochemical counterparts. Certain barriers, such as feedstock availability, do not yet have completely clear solutions. However, the Forum showcased many examples of companies progressing in the transition while collaborating to solve such bigger picture challenges. There was clear alignment to not let perfect be the enemy of the better.

"Even though we don't know yet how we will scale feedstock in the long term, that is no excuse for not producing chemicals with available biobased feedstocks now."

A quick note on our rebrand: why Change Chemistry?

We renamed our organization from the Green Chemistry & Commerce Council (GC3) to Change Chemistry this past April, a reflection of the urgent need to accelerate the growth of green and sustainable chemistry solutions across sectors and the value chain. We believe that it will be impossible to address our most pressing global challenges without a supply of safer, more sustainable chemicals, materials, and products. We aim to undertake concrete projects and actions to better reach the key decision-makers in industry, government, and the investment community who can accelerate the transition to safe and sustainable chemistry. Our goal is to build a community that working together CAN Change Chemistry.

Forum Summary:

The Forum began with a keynote presentation by Covestro's Chief Sustainability Officer, Lynette Chung, who laid out the importance of sustainable chemistry to address constant challenges of climate change, environmental destruction, and dwindling resources. The chemical industry has impacts but also holds the key to global sustainability. She stressed that the practice of sustainable chemistry needs collaborations within industries to achieve scale, but also needs the involvement of regulators and consumers. She concluded that we need a vision that goes beyond company boundaries to inspire and encourage others to solve problems that achieve a world where sustainable chemicals are the norm, bringing economic and sustainability benefits.

The first session of the Forum explored the European Commission's Transitions Pathway for the Chemical Industry, which outlined 190 actions for achieving the twin transition of sustainability and digital transformation. Panelists from across the innovation cycle stressed the need for regulations to acknowledge the timelines for transition and the need for collaborations to accelerate the identification and implementation of alternatives. Panelists noted the critical importance of accelerating timeframes to scale of more sustainable chemicals and materials as well as addressing supply chain resiliency.

This was followed by an in-depth look at the Safe and Sustainable by Design (SSbD) Framework, developed by the European Commission to guide innovation in chemical design and selection, as well as potential improvements that could make the framework more accessible for companies across the value chain ("a toolkit and not a textbook"). A breakout session gave participants the opportunity to discuss the sustainability attributes evaluated in their organizations for product design and sourcing as well as how they consider trade-offs between them. Company representatives stressed that although methods are emerging, data collection and verification require intensive relationships with suppliers or trusted certification systems.

The third session focused on how sustainable chemistry innovation can advance circularity, with panelists ranging from upstream chemical companies to downstream consumer-facing companies as well as an NGO representative. When asked about barriers to the circular economy, panelists responded that long term incentives and improved infrastructure were both key. In addition, the panelists stressed the need for better material chemicals transparency, improved collaboration across the value chain to scale solutions and a policy framework that supports safe and sustainable circular chemicals and materials and that does not pass significant costs or inconvenience to consumers.

The following panel on advancing climate neutrality through sustainable chemistry highlighted several important innovations to reduce the climate impact of chemical manufacturing and chemical products, many of which are still under development though some are available today. Some solutions can address the energy intensity of the industry (like electro crackers), but they will not address the need for non-virgin fossil sources of carbon (hence defossilization vs. decarbonization). Importantly, for many downstream companies, Scope 3 emissions are much larger than Scope 1 and 2, meaning that sustainable

chemistry innovation will be needed in the value chain. Panelists agreed that it is important to move ahead towards non-fossil feedstocks as a first step towards the design and application of new molecules (with clear design criteria for better) and to be ahead of demand to start building new capacity while addressing how to secure sufficient renewable feedstock material. As new bio renewable feedstocks are used, new molecules can be functionalized to provide an array of solutions to many value chains. Panelists agreed the chemical industry and molecules on which the economy depends will look very different in 30 years.

The fourth session focused on a case study of the challenges and needs in advancing safer and more sustainable alternatives to PFAS. The multi and interconnected functionality of PFAS and fluoropolymers were presented as important barriers to substitution, in addition to the lack of data on alternatives and support for companies to substitute. Panelists noted the need for better collaboration between regulators and the value chain to proactively steer and accelerate the substitution process to channel resources and focus attention on R&D, adoption, and scale of alternatives. Such collaboration could include rethinking requisite levels of performance for alternatives, creating a level playing field for substitutes, and ensuring that alternatives do not result in regrettable substitutions.

From a policymaker's perspective, "If we want to make sure we replace substances, then we need to fund research and increase support for innovative solutions and companies."

A keynote by Kristin Schreiber of the European Commission, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (DG GROW), emphasized the role of regulators in creating predictability and incentivizing the transition to better solutions while leveraging regulation in a balanced manner to push industry in a smart way to achieve results that benefit the environment and economy. She noted that the regulatory agenda needs to be better connected to the R&D agenda to challenge creativity and drive solutions. Further, new entrants and smaller innovator firms need support to de-risk innovation and buildouts. The following discussion focused on incentives organizations along the value chain believe would be important to drive innovation and adoption of sustainable chemistry solutions, ranging from chemical restrictions to ambitious targets set by regulators and ecolabels.

The final panel focused on ESG reporting to drive sustainable chemistry investing. Panelists noted the need for increased board competence around sustainable chemistry and to balance the backward-looking reporting of ESG with forward-looking metrics and R&D activities. They also urged transparency as it is difficult to channel capital to sustainable chemistry investments without a full picture of risks. Such transparency also enables investors to be able to understand if companies are making progress towards sustainable chemistry while understanding that most are not there yet. Investors are concerned about double materiality, both fiduciary duty (financial risks) and hazardous impacts (how investments impact environment). EU Taxonomy reporting which focused on sustainable investments to achieve six environmental objectives, requires investment firms to indicate how investments contribute to one of these while doing no significant harm to others.

While enhanced ESG reporting is important, it is also critical to align investment for sustainable chemistry as "change requires creativity and money to finance that change."

Participants and Feedback

To ensure a broad range of perspectives and insights, Change Chemistry strives to convene companies from across the value chain, in addition to regulators, consultants, NGOs, investors, and researchers. Company representatives made up the majority (77%) of stakeholders present. Participants were from many different areas of their organizations, holding titles from scientist to marketing director to chief sustainability officer. Each participant brought their unique perspectives for advancing sustainable chemistry.

Responses from the post-event survey indicated that 88% of respondents would likely or highly likely recommend the event to a colleague and that they would likely attend another Change Chemistry forum event. Participants indicated their appreciation for the networking opportunities that enabled them to meet and exchange ideas with other Change Chemistry members.

A hallmark of Change Chemistry events is the ability to engage discussion around complex and often contentious sustainable chemistry challenges in a safe space. For example, participants were open to nuanced dialogue surrounding difficult chemical substitution challenges. In the session focused on PFAS substitution, participants were able to openly discuss critical uses of PFAS in many applications but also the needs for substitution, including discussion on topics such as the concept of essential use, sustainability trade-offs, and responsibility to future generations from diverse perspectives including an NGO, a PFAS manufacturer, a consultant working with firms on substitution, and a PFAS alternatives manufacturer.

"Change Chemistry is unique in its ability to bring together the entire supply chain as well as those that support sustainable chemistry in other important ways – regulators, NGOs, and data providers."

Join Us!

Change Chemistry is hosting its 2023 US Innovators Roundtable on November 14-16 at Millipore Sigma, in St. Louis, MO. For more information, visit our website: https://member.changechemistry.org/events/2023-innovators-roundtable

The 2024 European Forum will be hosted by Dow, with details regarding time and place to follow soon.

If you are interested in becoming a member or sponsoring future Change Chemistry events, please contact Jenny MacKellar, Program Director, jenny@greenchemistryandcommerce.org.