



## Press release

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### **Sustainable Chemistry: Reinventing a 150-year-old industry for the greater good**

**Chemistry is facing the biggest challenge in its history: To meet the needs of a growing population in a world of scarce resources and growing environmental problems chemistry has to reinvent itself to become a key solution provider for a sustainable future. The emerging concept of Sustainable Chemistry offers a new system thinking based approach to transform the more than 150-year-old chemical industry. To promote Sustainable Chemistry innovation worldwide the International Sustainable Chemistry Collaborative Centre (ISC<sub>3</sub>) was established in 2017 as a new international, independent institution.**

Chemistry is one major driving force of innovation and crucial for establishing sustainable consumption and production, designing a circular economy, combating climate change, and much more. Unfortunately, the benefits of chemical innovation are in many cases combined with the consumption of vast quantities of raw materials, energy use and pollution by hazardous substances. The concept of Sustainable Chemistry offers a way to strengthen the benefits of chemical innovation - whilst protecting health and the environment. Based on the application of ecological principles in research and production, by reshaping product design, manufacturing, and consumption of resources in a sustainable way, as well as ensuring health and safety for workers and users, sustainability-based chemical research and production offer broad opportunities for economic progress. Entrepreneurs and researchers all over the world are already contributing to achieving the global Sustainable Development Goals (SDGs) of the UN by developing sustainability-based innovative processes and products.

### **Transforming the chemical industry through collaboration, innovation and education**

Transforming a complex, strongly interconnected industry sector and a highly specialized science branch requires a holistic approach based on dialogue and collaboration. The International Sustainable Chemistry Collaborative Center (ISC<sub>3</sub>) is a new globally acting collaboration center, that connects experts from industry and science with stakeholders from civil society and the public sector to enable innovation on all levels of chemical production and use. Acting as an innovation and dialogue platform, a think tank and an education hub the ISC<sub>3</sub> supports the global breakthrough of Sustainable Chemistry.

The center manages a network of experts, promotes collaboration in the value chain, offers training and support especially for developing countries and carries out innovation scouting



activities to discover new technologies, processes and business models. Being an independent dialogue partner, the ISC<sub>3</sub> engages with stakeholders from all sectors to develop new solutions for the many challenges of sustainable development. To enable dialogue and cooperation several workstreams are being initiated inviting all interested parties to join. The workstreams will address topics regarding the SDGs as well as cross-cutting issues such as: Sustainable Chemistry & Climate Change; Sustainable Chemistry & Buildings and Living; Sustainable Chemistry & Mobility as well as Circular Economy and Digitalization (Chemistry 4.0) and many more.

### **Co-Designing the future of Sustainable Chemistry**

The emerging concept of Sustainable Chemistry needs a joint understanding of the manifold implications of reinventing chemistry. To achieve a shared vision of the benefits and challenges in Sustainable Chemistry the ISC<sub>3</sub> intends to facilitate a scenario process later in 2018, in which experts will have an opportunity to debate how Sustainable Chemistry shapes our future. Based on a holistic view of Sustainable Chemistry - that focuses on the function or service of chemical products - the ISC<sub>3</sub> will invite stakeholders worldwide to discuss questions, such as: What kind of chemical products and chemical production processes do we need to shape a sustainable future? What are the societal, economic and political implications of Sustainable Chemistry? In what areas are chemical innovations key to achieving the UN Sustainable Development Goals? What are the pathways towards a sustainable circular economy given the needs of a growing population for food, housing, energy, transport, health and safety? Is new legislation required to make the change happen?

The scenarios are intended as a dialogue process and provide an opportunity for civil society to voice expectations and concerns, help industry players in the refinement of their strategy and investments, provide input to policy makers in the shaping of regulatory frameworks and instruments, and spur further research.

### **Promoting innovative business models to shape the future of chemistry**

Innovative solutions to improve sustainability in the areas of mobility, energy, urbanisation, and agriculture very often originate in the chemical sector, its research community and in start-up companies. Examples are the replacements for fossil fuels, new energy storage systems and new construction and insulation materials. However, innovative solutions that are able to contribute to sustainable development do not find their way easily to the markets.

With its ISC<sub>3</sub>-Innovation Hub, located at DECHEMA in Frankfurt, the centre has therefore initiated a new global start-up service and network to identify and support start-up companies in the developed as well as in the developing countries. In the first phase, the start-up service will provide communication support, network events, trainings and access to investors. In a further phase, an international Innovation Award will shine the light on outstanding projects all over the world, providing both an incentive and a showcase for the best innovations in the field of Sustainable Chemistry.

## **Making a showcase for Sustainable Chemistry innovation**

At ACHEMA, the ISC<sub>3</sub> showcases innovations in Sustainable Chemistry in cooperation with Think Beyond Plastic™, an innovation accelerator that advances commercialization of research and innovation for circular materials, circular design, green chemistry and innovative packaging design. Think Beyond Plastic™ has been advancing a global, multi-disciplinary effort to accelerate the pace of innovation and to support commercialization of bio-benign materials, associated manufacturing and innovative packaging design utilizing these new materials. Together with Think Beyond Plastic™ the ISC<sub>3</sub> presents five examples of Sustainable Chemistry innovation for the new plastics economy:

Altas Nova, a Spanish start-up, is working in the field of sustainable packaging, proposing alternatives to hard to recycle plastic laminates with a green chemistry and closed-loop life cycle approach. EVOWARE, from Indonesia, provides the eco-solution for plastic waste problems with products that are eco-friendly, biodegradable, compostable or even edible and healthy. The products are designed using seaweed as main material for a positive impact on the environment and the livelihood of seaweed farmers. The German Fraunhofer ISC develops sustainable materials solutions and specializes in (multi-)functional coatings. They offer first-rate expertise in materials science combined with long-standing experience in materials processing, application and analysis. The American team at Grow Bioplastics believes that “There’s Wonder in Waste”. They are developing a platform of naturally degradable and compostable plastics made from lignin, a waste product of the paper and biofuel industry, for applications in agriculture, food service packaging, and beyond. VTT Technical Research Centre of Finland Ltd is one of the leading research and technology organizations in Europe. VTT’s bio-based packaging solution looks like plastic, it performs like plastic, but it is compostable and made from nature’s very own raw material – cellulose.

## **Educating the future professionals in Sustainable Chemistry**

Sustainable Chemistry has the potential to become a game changer for all industries. In order to reach scale, Sustainable Chemistry needs to be able to rely on the sound knowledge of executives, researchers and practitioners. To scale up Sustainable Chemistry knowhow the ISC<sub>3</sub> screens, assesses, develops and implements international study programs of Sustainable Chemistry.

With the establishment of the International School for Sustainable Chemistry the ISC<sub>3</sub> aims at making Sustainable Chemistry an integral part of scientific and executive education. The ISC<sub>3</sub>-Research & Education Hub, located at Leuphana University in Lüneburg, offers scientific courses and trainings on a global level and helps interested third parties to establish similar programs in their institutions. Furthermore, the ISC<sub>3</sub>-Research Hub holds the Summer School on Sustainable Chemistry each year, addressing not only academia but also interlinking young academics with professionals from the industry. The summer school is accompanied by the annual scientific Conference on Green and Sustainable Chemistry.



## **Shaping the future of chemistry as a solution provider for sustainable development**

Sustainable Chemistry promotes a holistic approach that extends far beyond the application of ecological principles in chemical production. It is a process of continuous improvement contributing to a sustainable society through sustainable product design, manufacturing, product use, ensuring health and safety at work and promoting economic success and technical innovation. Thus, Sustainable Chemistry shall help to achieve the Sustainable Development Goals (SDGs) adopted by the UN Assembly in September 2015. The SDGs address the most relevant challenges for our future, like the world's growing population, access to energy, resources and healthcare, against the background of climate change and endangered ecosystems. Sustainable Chemistry will play a crucial role to solve these problems.

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