

# Future-Oriented Chemistry

How we can deliver on the Paris Agreement

7<sup>th</sup> November 2017 / 12:00-13:30

EU Pavilion at COP23, Bonn, Germany



**EuCheMS**  
European Chemical Sciences

VERBAND DER  
CHEMISCHEN  
INDUSTRIE e.V.



VCI



**ISC<sub>3</sub>**  
International Sustainable  
Chemistry Collaborative Centre



**COP23 FIJI**  
UN CLIMATE CHANGE CONFERENCE  
BONN 2017

The organisers would like to thank the European Commission's Directorate-General for Climate Action (DG CLIMA) for their support and for hosting this event at the EU Pavilion at COP23.

## **Agenda**

12:00 – 12:20 **Solar-Driven Chemistry: A Vision of Using Sunlight to make Fuels from Carbon Dioxide**

*Ulrich Schubert, EuCheMS*

12:20 – 12:40 **How We Can Deliver on the Paris Agreement**

*Peter Botschek, ICCA/Cefic*

12:40 – 13:00 **Sustainable Chemistry: Contributions to a Low-Carbon Economy**

*Alexis Bazzanella, ISC<sub>3</sub>*

13:00 – 13:30 **Round-Table Discussion**

*Chaired by Tara Nitz, VCI*

At this side event experts from industry, academia and policy makers will discuss the role chemistry in promoting the SDGs through a low-carbon economy. To this end, our speakers will explore some of the available research possibilities, what processes and products already exist, and how will all of these positively impact climate change and our societies.

This event is organised by the European Association for Chemical and Molecular Sciences (EuCheMS); the International Council of Chemical Associations (ICCA); and the International Sustainable Chemistry Colloboration Center (ISC<sub>3</sub>); and the German Chemical Industry Association (VCI).

## Speakers and Abstracts

### Tara Nitz, VCI

Tara Nitz works at VCI, the German Chemical Industry Association as legal and policy advisor. After completing her law studies and legal clerkship Tara started her career at ECHA, the European Chemicals Agency in Helsinki in 2010. In 2011 she moved to Berlin to start working at BDI, the Federation of German Industries as manager for international climate policy. Tara joined VCI's department for energy, climate and raw materials at the end of 2012. Her responsibilities include national and international climate policy and legal affairs in the field of energy and climate. She is an active member of the climate related working groups at ICC and ICCA.



### Ulrich Schubert, EuCheMS

Ulrich Schubert is Professor Emeritus of Inorganic Chemistry at the Institute of Materials Chemistry of Vienna University of Technology (TU Wien), and member of the Austrian Academy of Sciences and the German Academy Leopoldina. He has served the scientific community as president of the European Association of Chemical and Molecular Sciences (EuCheMS), president of the Austrian Chemical Society, Austrian delegate of IUPAC and member of grants committees of several national and international funding organizations. His research interest is, among others, in inorganic-organic hybrid materials, sol-gel processing, cluster chemistry and nanochemistry. He has published more than 500 research articles and 10 patent applications.



#### **Abstract - Solar-Driven Chemistry: a Vision of Using Sunlight to Make Fuels from Carbon Dioxide**

In plants, algae and some types of bacteria, solar-driven systems are capable of converting carbon dioxide and water into organic compounds, thus storing solar energy in the form of chemical bonds. When using fossil fuels, the energy and carbon dioxide stored millions of years ago by natural photosynthesis are released. Developing artificial systems on an industrial scale that convert solar energy directly into organic compounds, using universally available raw materials such as carbon dioxide and/or water, is a great challenge and the greatest energy opportunity. This approach does not rely on low-carbon electricity from traditional or renewable energy sources, as the photons arriving at the earth are directly used for (photo-)chemical processes, and no intermediate storage or transfer of electricity is needed as in processes driven, for example, by photovoltaic devices. Such man-made, ecologically friendly energy systems should be more efficient and faster than their natural counterparts, to keep pace with our consumption. Furthermore, carbon-based fuels prepared by "solar-driven chemistry" aim to overcome two critical hurdles on the road to a carbon neutral energy system simultaneously: the need for abundant low-carbon energy input and the need to recycle CO<sub>2</sub>. Although the feasibility of several solar-driven chemical approaches has been demonstrated on a laboratory scale, this is still a visionary concept where many fundamental scientific questions have to be answered before it can be implemented on a meaningful technical scale in longer terms. For more information on solar-driven chemistry you can consult EuCheMS' white paper on this topic at <http://bit.ly/2eE4cTZ>.

### Peter Botschek, ICCA/Cefic

Peter Botschek has served since 2006 as director of energy & health, safety and environment with Cefic – the European Chemical Industry Council. Before joining Brussels-based Cefic in 2001, Botschek was seconded from HYDRO Agri, today known as YARA, to the European Fertilizer Manufacturers Association (EFMA) in Brussels, as an issue manager for agriculture and environment. Before, he was part of the application consultancy department Thomasdünger GmbH in Germany after managing fertilizer application experiments at the company's research & development station.



A German national, Botschek is a member of EU and international bodies such as Business Europe, the European Alliance of Energy-Intensive Industries, the IEA energy and greenhouse gas initiatives, Observer Focal Point with UN Climate Change Convention (UNFCCC).

He received his doctorate in agriculture in Bonn, Germany, specialising in plant nutrition and environment issues.

**Abstract - How We Can Deliver on the Paris Agreement**

Using six application areas, the chemical industry's contributions are shown: to increase energy efficiency in multiple sectors, to increase renewable energy supply, to reducing and avoiding emissions in many value chains. Moreover, chemistry potentials for a circular economy are being developed.

**Alexis Bazzanella, ISC<sub>3</sub>**

Alexis Bazzanella is Senior Innovation Manager at the ISC<sub>3</sub> Innovation Hub and Head of Research and Project Coordination at DECHEMA, the organisation hosting the Innovation Hub. He has more than 15 years experience in the management of research and innovation projects in sustainable and resource efficient chemical engineering. He is also lead author of various studies investigating low-carbon technologies for the chemical industry and the use of CO<sub>2</sub> as chemical feedstock. He holds a PhD in Chemistry from Technical University Darmstadt.



**Abstract - Sustainable Chemistry: Contributions to a Low-Carbon Economy**

Innovative solutions to combat climate change in the areas of mobility, energy and urbanisation very often originate in the chemicals sector and its research and development community. Examples include replacement of fossil fuels, energy storage systems and new construction and insulation materials. In the chemicals sector, a transformation process has started to move towards more sustainable chemistry solutions and business models. The use of alternative feedstock and renewable energy provides opportunities for a low-carbon chemical production. However, innovative solutions often do not easily find their way to the markets and to wide implementation. A number of hurdles and barriers exist that hamper the transformation process. The International Sustainable Chemistry Collaborative Centre (ISC<sub>3</sub>) aims at supporting innovations in sustainable chemistry including technologies that allow for substantial mitigation of GHG emissions.

## About the Organisers



EuCheMS, the European Association for Chemical and Molecular Sciences, aims to nurture a platform for scientific discussion and to provide a single, unbiased European voice on key policy issues in chemistry and related fields.

Representing more than 160,000 chemists from more than 40 Member Societies and other chemistry related organisations, EuCheMS relies on a unique network of active researchers involved in all the fields of chemistry. Through this network, EuCheMS organises several specialised academic conferences as well as the biannual EuCheMS Chemistry Congress, the European congress of chemical sciences. EuCheMS also promotes the role and image of the chemical sciences among the general public and policy-makers through social media, newsletters and through the organisation of conferences and workshops open to the society.

Through the promotion of chemistry and by providing expert and scientific advice, EuCheMS aims to take part of the solution to today's major societal challenges.

<http://www.euchems.eu>  <http://on.fb.me/1B8Qa0n>  <https://twitter.com/EuCheMS>



ICCA, the International Council of Chemical Associations, is the worldwide voice of the chemical industry. ICCA represents chemical manufacturers and producers around the world. Our members account for more than 90 percent of global chemical sales, and more than 20 million people around the globe are employed directly or indirectly by our industry. Approved by the Board of Directors in 2001, ICCA's mission is "to help the global chemical industry improve financial performance and

reputation by tackling global issues and by helping the industry to improve continuously its performance through Responsible Care® and other programs."

<https://www.icca-chem.org/>  [https://twitter.com/icca\\_chem](https://twitter.com/icca_chem)



The ISC<sub>3</sub> – International Sustainable Chemistry Collaborative Centre is an independent centre funded by the German Federal Environment Ministry. The centre was launched in May 2017 and is situated in Bonn, with two hubs in Frankfurt (ISC<sub>3</sub> Innovation Hub) and Lüneburg (ISC<sub>3</sub> Research Hub). ISC<sub>3</sub> aims at supporting the global breakthrough of Sustainable Chemistry. ISC<sub>3</sub>'s mission is to initiate innovations, cooperation, business models, and a new way of thinking in order to further

the concept of sustainable chemistry on a global scale, to enable circular economy and allow for the sustainable use of resources, thereby enabling in particular emerging economies and developing countries to achieve the UN Sustainable Development Goals.

<http://www.isc3.org>



VCI, the German Chemicals Industry Association, represents the politico-economic interests of around 1,700 German chemical companies and German subsidiaries of foreign businesses. For this purpose, the VCI is in contact with politicians, public authorities, other industries, science and media. The VCI stands for over 90 percent of the chemical industry in Germany. In 2016 the German chemical industry realised sales of around 185 billion euros and employed over 447,000 staff.

<https://www.vci.de/>  <https://www.facebook.com/chemieverbandVCI>  <https://twitter.com/chemieverband>





This programme and more info on this event at <http://www.euchems.eu/?p=10136>