

SAICM/UCT

Chemicals and Sustainable Development Goals Community of Practice

Discussion 3 2021 Guide

Title	Innovation for achieving the chemical related SDGs
Date	26th October 2021
Time	14:00 pm – 15:30 pm (GMT+2)
Facilitator	Prof Andrea Rother, Univ. of Cape Town
Presenter	Dr Claudio Cinquemani Dr Thomas Homburg from International Sustainable Chemistry Collaborative Centre (ISC₃)
WebEx registration link	https://unep.webex.com/unep/j.php?RGID=r5730b6f985c04c0b96f64dee4a893442
SAICM/UCT CSDG CoP Sign-up link	Make sure you have signed up for the HHP CoP: https://saicmknowledge.org/community
What's App Group	Join the CSDG CoP What's App Group to receive information: https://chat.whatsapp.com/BKTKGwt5cnNCgG9BOzYK1i

Should you require assistance or have questions, contact: uctcops@outlook.com

Discussion Format:

- This is not a Webinar, but rather a discussion among different stakeholder groups.
- The discussion presenter/s will briefly present a verbal introduction and introduce the questions listed in this discussion guide.
- Three questions will be posted during the 1 ½ hour discussion. The presenter/s will address questions and comments posted by members in the chat room and participants are encouraged to respond to each other as well.
- All are encouraged to join the discussion which will be held in English. Feel free to write in another language and members will assist where possible with translation.

Two steps are required to join this discussion:

1) Sign up to the CoP, if you have not done so previously, at:

<https://saicmknowledge.org/community>

Should you require assistance or have questions, contact: uctcops@outlook.com

2) Register for the 26th of October WebEx discussion at:

<https://unep.webex.com/unep/j.php?RGID=r5730b6f985c04c0b96f64dee4a893442>

We encourage you also to join the CSDG CoP WhatsApp group by clicking on this link:

<https://chat.whatsapp.com/BKTKGwt5cnNCgG9BOzYK1i>

Should you **NOT be able to join the discussion** but still wish to contribute please **click the link below** and fill out the Form with your **contributions**:

<https://forms.office.com/Pages/ResponsePage.aspx?id=NUNFkk5Wz0ywsCREW4wD92pVK-1gQzNHlYW4qnc1WNUNII2RkZYMVJSMFpWUIZWVWdHWjRCTFg1RyQlQCN0PWcu>

PRESENTER BIOSKETCH



Dr. Claudio Cinquemani

Dr. rer nat. Cinquemani is a passionate scientist with 15 years of progressive operational experience and business insight. He believes as Director of Research & Innovation at ISC₃ he is in the best position to make a positive impact. Dr. Cinquemani studied Environmental Engineering in Germany, Spain and New Zealand. He additionally holds a Ph.D. in Chemistry. Claudio's interest has always been in developing green and sustainable processes for industrial applications. Academic research in biochemistry and green solvents led to a position in industry, where he optimized polymer use for technical applications. Analysing and fostering innovative ideas and entrepreneurs is his daily business. Especially in the phase II of the ISC₃ program, Claudio and his team will focus on capacity building in developing countries, building, and living, biocides leasing and PtX.



Dr. Thomas Homburg

Dr. Thomas Homburg studied Chemistry in Germany and Sweden while researching and working in an Environmental Chemistry project at the National Oceanography Centre Southampton, in a Biotechnology project at the Hebrew University of Jerusalem, and in a Catalysis project at the Fritz Haber Institute of the Max Planck Society. As a research fellow in several scientific fellow programs, he also investigated proton conductivity at the University Kiel and the University of Calgary. Before joining ISC₃, Thomas worked in the field of polymer adhesives for a Swiss based company. Thomas is very interested in the interplay of research, economics, law and is constantly looking out for alternative

business models and sustainability assessment. At the ISC₃ Innovation Hub he has many opportunities to follow his above-mentioned interests.

About the ISC₃

The ISC₃ is an international centre contributing to a sustainable world. It is a globally acting centre, a multi-stakeholder platform that engages with civil society, politics, and the private sector to contribute to international chemicals policies and the formation of a global network for collaboration, innovation, research, and education on Sustainable Chemistry.

The centre was founded in 2017 on the initiative of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) and the German Environment Agency (UBA). The ISC₃ is anchored in the German GIZ (Gesellschaft für Internationale Zusammenarbeit) and has established a Research & Education Hub at Leuphana University, Lüneburg, and an Innovation Hub at DECHEMA e.V., Frankfurt.

DISCUSSION INTRODUCTION (14h00 – 14h20 CET)

Claudio Cinquemani

Sustainable development depends on scaling up innovation in the chemicals sector to develop intelligent, environmentally benign solutions and production processes. While chemicals are needed to achieve the Sustainable Development Goals (SDGs), chemical pollution remains a threat to human health, ecosystems, and wildlife. We therefore need to rethink how chemicals are designed, produced, used, circulated, and disposed in a way that the SDGs are met in every dimension. Entrepreneurship can be a strong driver in this transition and can help to close the gaps between science, innovation, and business.

While the information technology (IT) sector is a prominent example for a thriving start-up scene, the innovation ecosystem in Sustainable Chemistry is less developed, making it challenging for innovators to forge ahead with commercialization. The specific challenges in Sustainable Chemistry entrepreneurship are manifold, from the difficult transfer from science to business and missing industry guidance and collaboration, to the lack of access to lab infrastructure and the challenge to find tailored financing and support. Building up a global innovation environment for Sustainable Chemistry is therefore an important task, not only to promote entrepreneurship and creativity but also by shedding light on the role of Sustainable Chemistry as a key solution provider for our common future.

With its Global Start-up-Service, the ISC₃ has over 100 globally active start-ups in its pool, that all aim to foster innovative, sustainable innovations in the area of sustainable chemistry. The chemical sector and related key sectors along the value chain (energy, raw material, etc.) and their transformation towards more sustainability will be a driving force in order to decrease greenhouse gas emissions and reach climate neutrality according to global targets.

For the transformation of the global chemical industry every market participant must move and rethink their approaches and innovation strategy. Especially within the start-up ecosystem and its alternative business models lays a high potential for future chemicals innovation. In the following sections the ISC₃ will outline three areas and sectors of innovation that can contribute to achieve chemicals related SDGs while at the same time contribute on ecological, societal, and economic level.

QUESTION 1 (14h20 – 14h40 CET) (20 Min)
Claudio Cinquemani

Background:

Urbanisation and population growth will be the main drivers for the construction sector in the global south, resulting in big impacts, but also challenges. A rising worldwide demand for cheap(er) housing, construction costs will become a challenge across the globe. Another major challenge will be the conflict between land use for construction and climate change mitigation, particularly in densely populated areas. The East African start-up EcoAct Tanzania is tackling economic, environmental, and social challenges at once. EcoAct Tanzania invented an energy-conserving technology which transforms post-consumer plastic garbage and packaging materials into durable plastic building materials. These materials come in handy especially in world regions where wood is scarce or needs to be protected, and where insects and climatic conditions eat away on organic building material. And while pursuing their goal to protect the Tanzanian environment, EcoAct Tanzania also set up a micro health insurance program to provide the local population with access to health care and to help them build a locally organized waste management and waste entrepreneur system.

Target 12.4: Achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment.

Target 11.c: Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials

Question 1: What are potential impacts of relevant megatrends on building and living? Where might innovation go in the wrong direction and how can this be prevented? Do you know sustainable living concepts in your neighbourhood?

Resources/Information for the Discussion:

- Workstream Sustainable Building and Living, Focus on Plastics (Report) under: <https://www.isc3.org/en/activities/collaboration/foresight-workstreams.html>
- ISC₃ Press Release, under: [Start-up of the Month Series](#)

We encourage you to think about the poll questions before the discussion so you can contribute your responses:

POLLS

1. **What issues could you imagine the use of recycled building material would cause?**
 - 1.1 Unknown impact on health
 - 1.2 Degradation of microplastics
 - 1.3 Legacies of unknown substances
 - 1.4 Unknown level of safety in construction (e.g., static)
 - 1.5 Mixing substances
 - 1.6 I don't know
2. **What prerequisites are needed in your country to use recycled materials in buildings?**
 - 2.1 Take back systems
 - 2.2 Market for waste materials
 - 2.3 Material passport
 - 2.4 Acceptance of users
 - 2.5 Fire and smoke safety
 - 2.6 Not sure

QUESTION 2 (14h40 – 15h05 CET) (25 mins)

Thomas Homburg

Background:

As world population rises, so does the demand for energy to power homes, businesses and communities. Innovation and expansion of renewable sources of energy is key to maintaining a sustainable level of energy. Thereby local peculiarities need to be considered to fit sustainable energy sources to market, society and environment in the region. The Gujarat-based Indian start-up REVY Environmental Solutions Pvt. Ltd. specialises in producing bio-methane via anaerobic digestion processes and treating wastewater and organic municipal solid waste (MSW).

With its biotechnological approach, REVY helps provide clean water and sanitation, as well as affordable and clean energy to communities that want to become more climate smart. Beyond this, the start-up is also extracting liquid bio-fertilizers, such as nitrogen and phosphorus from dye waste waters, and is planning on setting out for green hydrogen production from waste in the near future. REVY is a women-led start-up.

Respective SDG (Goal 7): Ensure access to affordable, reliable, sustainable, and modern energy for all.

Target 7.1: By 2030, ensure universal access to affordable, reliable, and modern energy services.

Target 7.2: By 2030, increase substantially the share of renewable energy in the global energy mix

Target 6.a: By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling, and reuse technologies.

Question 2: What are the chemical-related opportunities (e.g., jobs, economic growth) and risks (e.g., health and environment) associated with using a biotechnological approach?

How can standing sustainability targets and ethical questions of biotechnology (e.g., licensing genetic inventions, genetically modified organisms etc.) be weighed up against one another?

Resources/Information for the Discussion:

- ISC₃ Press Release on REVY Environmental Solutions helps provide clean water, sanitation, and clean energy to Indian communities, under: [ISC₃ press corner](#)
- Press article on Vanita Prasa, the founder of REVY in yourstory: “This woman entrepreneur wants to solve India’s water crisis with her wastewater treatment solution, under: <https://yourstory.com/herstory/2020/07/woman-entrepreneur-india-waste-water-management/amp> (14.07.2020).

We encourage you to think about the poll questions before the discussion so you can contribute your responses:

Polls:

- 1. What do you think are key considerations when using biotechnology in wastewater treatment?**
 - 1.1 Infrastructure for wastewater
 - 1.2 Screening for suitable bacteria
 - 1.3 Specific surrounding environment (pH, temperature, and alkalinity)
 - 1.4 Developments of advanced sensors for monitoring processes
 - 1.5 Toxic elements
 - 1.6 Have not thought about this yet
- 2. What are the challenges using wastewater as an energy source in your country?**
 - 2.1 Competition of energy supply and clean water
 - 2.2 False incentives (neglect recovery of nutrients)
 - 2.3 Spread of antibiotic resistance

- 2.4 Methane gas leakage
- 2.5 Unique bacterial profile in every single plant
- 2.6 Currently not using wastewater for energy production

QUESTION 3 (15h05 - 15h30 CET) (25 mins)

Claudio Cinquemani

Background:

Chemicals Leasing and/or Biocides Leasing are innovative business models in line also with the principles and values posted by the concept of “Sustainable Chemistry”. Chemicals Leasing is a performance-based business model that has been successfully applied for 20 years in several industry sectors worldwide. The producer mainly sells the functions performed by the chemical and its functional units are the main basis for payment, rather than the actual amount of chemicals used (see example below).

In the example of disinfection / biocidal products, the supplier will not be paid per volume of disinfectants, but for the achieved benefit, e.g., a room in a hospital disinfected. When applied to the disinfection products, the supplier has a commercial interest to achieve the required disinfection with reduced amounts of disinfectants. (The initial volume delivered turns from a factor of earnings to a cost-driver). In the classical business model with payments per volume the supplier has a commercial interest to sell as much as possible. However, with the paradigm shift supplier and user start an intensified collaboration as both profit from reduced consumption of disinfectants (“fair sharing of benefits”).

The increased and often excessive use of chemicals substances, e.g., biocides lead to overproduction of chemicals, as well as negative side effects such as an increase in waste production, an increase in bacteria immunity and allergies and a hazardous impact on the environment. In a world, where humans feel the consequences of their expansion because the distance between them, animals and nature decrease and diseases spread more easily, biocides leasing can offer a solution for a more sustainable use of chemicals to combat possible future pandemics or zoonotic diseases.

Respective SDG (Goal 9): Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Target 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination

Target 6.3: By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally

Target 12.4: By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks,

and significantly reduce their release to air, water and soil to minimize their adverse impacts on human health and the environment

Question 3: What questions do you have about “chemical leasing”? Would this work in low- and middle-income countries?

Resources/Information for the Discussion:

- Global Chemical Leasing Award 2021 by UNIDO, more information: <https://chemicalleasing.org/global-chemical-leasing-award-2020>
- Chemical Leasing – about the alternative business model: <https://www.unido.org/our-focus-safeguarding-environment-resource-efficient-and-low-carbon-industrial-production/chemical-leasing>

We encourage you to think about the poll questions before the discussion so you can contribute your responses:

Polls:

- Will your country, and particularly the environment ministry, sign a declaration on chemical leasing? (Respond with “yes”, “no”, or “I don’t know” and state your country).
- What problems or barriers is foreseeable when implementing chemical leasing in your country? State your country.

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