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Organized by the SAICM Secretariat and the University of Cape Town



Issue: 4 of 2021

Discussion date: 26th of October 2021

Discussion 4 Digest

Topic of Discussion: Innovation for achieving the chemical related SDGs

Sustainable development depends on the scaling up of innovation in the chemical sector for intelligent, environmentally benign solutions and production processes to be developed. While chemicals are needed to achieve the Sustainable Development Goals (SDGs), chemical pollution remains a threat to human health, ecosystems, and wildlife. It is necessary that we re-think how chemicals are designed, produced, used, circulated, and disposed of 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 of 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, missing industry guidance, collaboration, the lack of access to lab infrastructure and the challenge of finding tailored financing and support. Building up a global innovation environment for Sustainable Chemistry is an important task to not only promote entrepreneurship and creativity but also to shed light on the role of Sustainable Chemistry as a key solution provider for our future. The focus of this CoPs discussion was on the three areas and sectors of innovation that can contribute to achieving chemicals related SDGs while at the same time contributing to ecological, societal, and economic levels. To view the PowerPoint of the discussion, click [here](#).

ABOUT THE PRESENTER



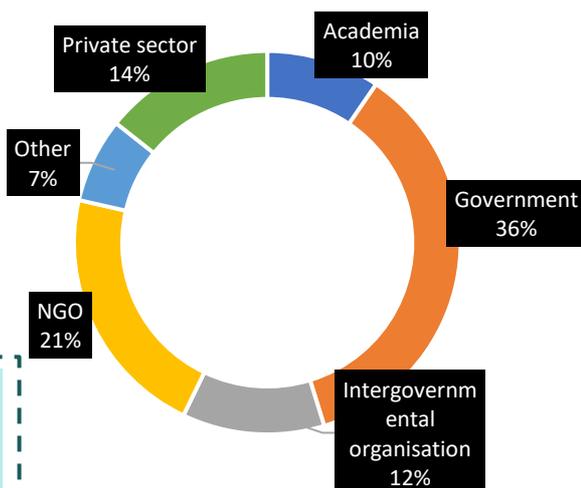
Dr. Claudio Cinquemani is a passionate scientist with 15 years of progressive operational experience and business insight. He believes as Director of Research & Innovation at ISC₃ he is in the best position to make a positive impact. Dr. Cinquemani studied Environmental Engineering in Germany, Spain, and New Zealand. He additionally holds a Ph.D. in Chemistry.



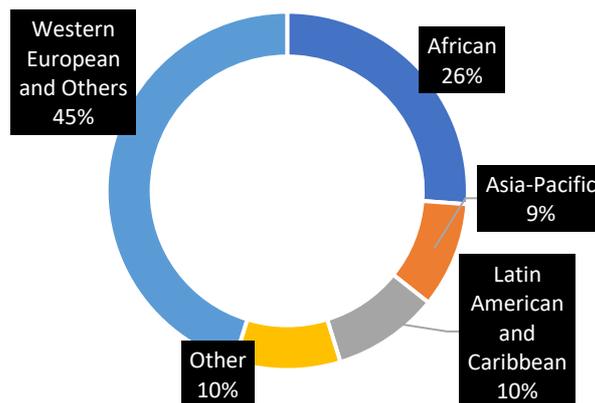
Dr. Thomas Homburg studied Chemistry in Germany and Sweden while researching and working in an Environmental Chemistry project at the National Oceanography Centre Southampton, in a Biotechnology project at the Hebrew University of Jerusalem, and in a Catalysis project at the Fritz Haber Institute of 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.

DISCUSSION 4 ATTENDANCE BREAKDOWN

Sector Representation



Regional Representation



TOTAL ATTENDEES FOR DISCUSSION 4: 42

Female: 22
 Male: 13
 Unknown: 7

Key:
 IGO – Intergovernmental organisation
 NGO – Non-governmental organisation

Chemicals and SDGs Community of Practice Discussion 4. Summary and looking ahead.

1. Innovations play a key role in the promotion of sustainable chemicals management – especially in relation to how chemicals are designed, produced, used, circulated, and disposed of. Chemicals is an under-represented sector in the sustainable development goals.
2. Concerns raised by participants about the impact of megatrends on buildings and living environments were **regrettable substitution, hazardous recycled materials, lack of relevant recycling equipment and lack of safety protocols and measures** for new practices and materials. When considering innovation for buildings and living spaces, it is important **to ensure that safe building materials and non-toxic environments** are accessible to all people.
3. There is a wide range of chemical-related opportunities (e.g., **bioreactors; economic development; social responsibility for industry**) that exist when using a biotechnological approach. However, it is important that the risks (**e.g., creating modified species; capacity to recycle; concentrations of sludge**) associated with this approach are considered.
4. **Chemical leasing** refers to the process where the producer sells the functions performed by a chemical. The functional units of the chemical are the main basis for payment, rather than the actual amount of chemicals used. Participants in the discussion suggested that chemical leasing is as an **innovative approach to reducing hazardous exposures and environmental contamination.**

Many questions on chemical leasing were asked, such as whether the process can be applied in the informal sector, how the agreement on leasing chemicals is adhered to between the different stakeholders involved, the role chemical leasing plays in innovation and competitiveness, and lastly, the role of the United Nations Industrial Development Organization in the process. Considering the questions generated on chemical leasing during the discussion, concepts, and strategies of it must be **made clear to all stakeholders** in future global engagements (useful resources can be found on page 6 of this document).

For a more detailed summary of the discussion, see the Annex below.

ANNEX

DETAILED SUMMARY OF DISCUSSION 4

THE DISCUSSION WAS STRUCTURED AROUND THREE QUESTIONS AND THE KEY DISCUSSION INPUTS FROM PARTICIPANTS ARE PRESENTED UNDER EACH:

Q1. 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?

PARTICIPANTS' COUNTRY	HOW INNOVATIONS CAN GO WRONG, PREVENTED AND EXAMPLES OF LIVING CONCEPTS IN RESPONDENT'S COUNTRY/ NEIGHBOURHOOD:
IRAN	<ul style="list-style-type: none">➤ Considering the importance and extent of chemicals (including pesticides and biocides), the profit, and damage that they provide (and many other related issues can say that chemicals) are underrepresented in the sustainable developmental goals (SDGs).➤ There will be an increase in negative impacts from megatrends in LMICs as compared to HICs. Impacts would be highly different in relation to extent of land and resources. For example, in Iran with rich resources there are possibilities for even increase. However, climate change remains a challenge.➤ "Green Building" is about using proper environmentally friendly designs and materials. Discussions around "asbestos" have been taking place to stop its use in building. Using safe salvage materials would be one of building options toward 2030 that needs a proper Circular Economy strategy. It is necessary to develop and use sustainable chemistry. To use plastic waste as a building material, time and work is necessary but there are big opportunities.
SOUTH AFRICA	<ul style="list-style-type: none">➤ Access to sustainable and affordable housing where exposures to chemicals and other environmental risk factors is a challenge for low-income communities.➤ Many of the packaging and containers put into recycling in the country cannot be recycled due to a lack of the equipment relevant for those materials.
UNITED STATES	<ul style="list-style-type: none">➤ Megatrends could include wealth (e.g., mega mansions with small households) on the one side and homelessness on the other.➤ Often, some urban citizens would develop and use tiny houses to explore and take part in transformation/different well living.➤ Examples like these, can result in transformation:<ul style="list-style-type: none">• Sustainable living actions in a big city would include solar systems, communal gardening, and an attempt toward better waste disposal activities (yet, with possibly, limited impacts and because of a complex national/local recycling systems and responsibilities-accountabilities).• Block-building's where the unit is created at a certain location and transported to the site/location of living, and with possibilities to add/downsize according to the need.
CANADA	<ul style="list-style-type: none">➤ It is important to ensure that affordable housing does not include hazardous materials like asbestos and others. Keeping hazardous chemicals from building materials is crucial to avoid exposure.➤ Canada does not use asbestos or asbestos containing materials in construction. However, there are old buildings which may contain asbestos insulation.
SWITZERLAND	<ul style="list-style-type: none">➤ Innovation could go wrong when we make regrettable substitutions of e.g., substituting for chemicals in products, including in building materials.
GERMANY	<ul style="list-style-type: none">➤ Recycling of used building materials is important for sustainable resource management. To avoid contamination and to allow optimal use of material, documentation of all relevant building materials is necessary.
JAMAICA	Government buildings, institutions, and offices with large occupancies , who are not aware of materials used in buildings, are of a concern .

Throughout the discussion, informal polls were conducted to help encourage discussion among the participants. They do not provide any representative data.

Poll 1: What issues could you imagine the use of recycled building material would cause? (N=17)

- 52.4% - **Unknown impact on health**
- 23,5% - **Degradation of microplastics**
- 11.7% - **Legacies of unknown substances**
- 11.7% - **Unknown level of safety in construction (e.g., static)**

Poll 2: What prerequisites are needed in your country to use recycled materials in buildings? (N=15)

- 33,3% - **Take back systems**
- 13,3% - **Market for waste materials**
- 20% - **Material passport**
- 6,6% - **Acceptance of users**
- 13,3% - **Fire and smoke safety**
- 13,3% - **Other**

Q2. What is the chemical-related opportunities (e.g., jobs, economic growth) and risks (e.g., health and environment) associated with using a biotechnological approach?

PARTICIPANT'S VIEWS ON OPPORTUNITIES

Bioreactors:

- In countries like India, bioreactors are excellent tools.

Economic development:

- Chemical-related opportunities include jobs and economic development.
- Of interest to South Africa is how to use the chemical industry for boosting the economy (which has clear health and environmental implications).
- The question is how policy makers, and the informal economy can be engaged for biotechnology to boost the economy.

Social responsibility:

- Industry should be supported to optimize water consumption and adopt an integrated approach to treat and recycle water in the industry.

PARTICIPANT'S VIEWS ON RISKS:

Modified species:

- If the development of genetically modified organisms (both plants and animals) continues globally, then nature will face "species Identity crisis".

Concentrations of sludge:

- Energy producers would want to have wastewater sludge to burn as a replacement for coal but adding sludge to normal fuel burning plants precludes the recovery of phosphor etc. because the concentration in the ashes is too low.
- Sludge should be burnt only in mono-installations dedicated solely to sludge with a phosphor recovery facility.

Recycling of used construction materials:

- Broadly used materials (e.g., PVC) in construction are hard to recycle as many countries do not have the necessary capacity.
- PVC plastic is full of toxic additives. Under the new plastic amendments to the Basel convention Prior informed consent is required from importing country prior to export PVC containing waste.

Poll 3: What do you think are key considerations when using biotechnology in wastewater treatment? (N=12)

- 25% said **Infrastructure for wastewater**
- 25% said **Specific surrounding environment (pH, temperature, and alkalinity)**
- 50% said **Toxic elements**

Poll 4: What are the challenges using wastewater as an energy source in your country? (N=11)

- 18% said **Competition of energy supply and clean water**
- 27,2% said **False incentives (neglect recovery of nutrients)**
- 54,5% said **Currently not using wastewater for energy production**

Q3: What questions do you have about “chemical leasing”? Would this work in low- and middle-income countries?

PARTICIPANT RESPONSES TO Q3:

COUNTRY	FEASIBILITY
IRAN	<ul style="list-style-type: none"> ➤ Chemical leasing was first introduced by UNIDO and was about leasing solvents to chemical industries instead of selling. ➤ In Iran, big petrochemical industries will support the idea of chemical leasing.
SOUTH AFRICA	<ul style="list-style-type: none"> ➤ Economic Features of Chemical Leasing Environment Directorate.

QUESTIONS FROM PARTICIPANTS	ANSWERS FROM PRESENTERS
Have you seen examples of chemical leasing in the informal market?	<ul style="list-style-type: none"> ➤ No, this happens since chemicals leasing relies on formal agreements. The most profound insight should be found at UNIDO, concretely Gabi Eigenmann, who heads the ChemLeasing Award.
What mechanism will be in place to ensure all stakeholders honour the agreement developed from the chemical leasing model?	<ul style="list-style-type: none"> ➤ The market should provide impetus – the model makes savings accessible and thus both parties, provider and client should be able to benefit. However, a lot of trust is needed between the partners to reach this state.
What is the role of specialty chemicals industry in chemical leasing?	<ul style="list-style-type: none"> ➤ Commodities as application have mostly been seen. It is expected that high priced chemicals would be an ideal area for the model of chemical leasing.
What is the role of innovation/competitiveness?	<ul style="list-style-type: none"> ➤ Best innovations can be developed between provider and client since demand can be perfectly understood and translated into an offer. Therefore, collaborative business models such as ChemLeasing is perfect for innovation.

Poll 5: Will your country, particularly the environment ministry, sign a declaration on chemical leasing? State “yes”, “no”, or “I don’t know” and country. (N=8)

- **South Africa** - Not sure/Don’t know
- **Panama** - Don’t know
- **Iran** - Yes
- **Saint Lucia** -Don’t know

Poll 6: What problems or barriers is foreseeable when implementing chemical leasing in your country? State your country. (N=6)

- **Iran** - For now, sanctions but later Iran will have to support/consider the big petrochemicals industries.
- **Eswatini** - Not sure.
- **South Africa** - Impacting competition and ensuring that health and safety is adhered to.
- **Zambia** - Policies.
- **Jamaica** - Barriers with robust policy, timely implementation and monitoring of the chemical industry.
- **Other** - Stakeholder participation.

Helpful resources:

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

CSDGs CoP: The Secretariat of the Strategic Approach to International Chemicals Management (SAICM) and the Environmental Health Division at the University of Cape Town (UCT) created this Community of Practice (CoP) to foster online discussions and address key issues on Chemicals and SDGs (CSDGs) among stakeholders from governments, international organizations, industry, academia and civil society.

This CoP is contributing to the SAICM/GEF project on Emerging Chemicals Policy Issues Knowledge Management Component. This activity is supported by the Global Environment Facility (GEF) project ID: 9771 on *Global Best Practices on Emerging Chemical Policy Issues of Concern under the Strategic Approach to International Chemicals Management (SAICM)*.

If you have any question or require clarification on this initiative, please contact the SAICM Secretariat at saicm.chemicals@un.org or UCT at uctcps@outlook.com.

Join the CSDGs CoP at: <https://saicmknowledge.org/community>

Disclaimer: The information in this digest represents the opinions of members participating from different stakeholder groups expressed during the discussion. The views expressed in this document do not necessarily represent the opinion or the stated policy of the United Nations Environment Programme, the SAICM Secretariat, the GEF or UCT, nor does citing of trade names or commercial processes constitute endorsement.