Introduce yourself (name, job title, organization and country) in the chat section. Only the presenter and facilitator will speak. Any comments or questions from attendees should be typed in the chat section.

Please kindly keep your microphone muted and cameras off during the discussion.

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Discussion 4 Topic:
- Topic: Innovation for achieving the Chemical related SDGs
- Date: 26 October 2021
- Time: 14:00 pm – 15:30 pm (GMT + 2.00)
- Presenters: Claudio Cinquemani (ISC₃), Thomas Homburg (ISC₃)
- Facilitator: Andrea Rother, University of Cape Town
Chemicals and Sustainable Development Goals
Community of Practice

PRESENTERS

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Director, Science & Innovation at @ ISC3 (Bonn)

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Innovation Manager at @ ISC3 (Frankfurt)

SAVE-THE-DATE FOR OUR GLOBAL SUSTAINABLE CHEMISTRY WEEK! 8-12 November 2021
Discussion introduction: Business, Innovation & SDGs
Presented by: Claudio Cinquemani (15 min)

Today’s agenda

Join us on our journey through innovations in achieving chemicals related SDG: from practitioner’s point of view

1. SDGs
   Overview of respective SDGs
2. Corporate Social Responsibility
   Why does CSR matter
3. Definition
   Definition for sustainable business
4. Drivers, Risks & Opportunities
   That arise in the area of sustainable chemistry entrepreneurship
5. Deep Dive
   Impulse and three discussions along start-ups from ISC pool incl. CB
6. Wrap up of findings
Changemaker in Global Development

Sustainable chemistry contributes to at least 14 of all 17 SDGs.
(Corporate) Social Responsibility/Sustainability

The Pyramid of Corporate Social Responsibility

PHILANTHROPIC Responsibilities
- Be a good corporate citizen. Contribute resources to the community; improve quality of life.

ETHICAL Responsibilities
- Be ethical. Obligation to do what is right, just, and fair. Avoid harm.

LEGAL Responsibilities
- Obey the law. Law is society's codification of right and wrong. Play by the rules of the game.

ECONOMIC Responsibilities
- Be profitable. The foundation upon which all others rest.

Source: https://link.springer.com/referenceworkentry/10.1007%2F978-3-642-28036-8_238

Source: Stockholm Resilience Center
Sustainable Business: Drivers

Digital & technological innovations
AI, IT, and biotechnology revolution, clean-tech and low-carbon technologies...

Regulatory Frameworks
European legislation & incentives for environment and health protection (REACH, EU-Taxonomy)

Systemic risks & impacts
COVID-19, global warming, socioeconomic vulnerabilities and attention to business resilience.

Market Risks & Economic instability
Pressure by the shortage of resources, resource price volatility.

Changing consumer behavior
20% European population is Lifestyle of Health & Sustainability (LOHAS) consumer segment

Drivers for an economic transformation towards sustainability
Successful sustainability startups on the Market

Startups in different sectors have proved that regulatory alignment and impact generation can lead to competitive advantages and favorable internal returns.

**Puraffinity**, Business case related to the use and ban of PFAS. Puraffinity has raised a total of $5.5M in funding.

**Biotrem**, manufacturing of disposable wheat bran tableware. In 2019: value of sales at 1.5 million euros. Ban on single-use plastic in the EU 2021...
What are the main challenges?

Sustainable Chemistry Entrepreneurship faces many challenges:

**Market**
- Market complexity
- High barriers to entry

**Innovation**
- No global innovation ecosystem in SC
- R&D intensive and long-term investment return
- High initial costs and transaction costs
- Corporate innovation is risk-averse and slow
- **Resource intensive** proof of concept (Ej. Lab capacity, inputs, time)

**Entrepreneurship & networks**
- Not access to global R&D (on new materials, SC, benign design)
- Few accelerators with long investor horizons
- Lack of guidance by industry and science on SC
- Lack of business skills in natural science professionals
- Not integrated start-ups network
- Lack of access to Labs and prototyping infrastructure
- Lack of Business Support, technical support and specialized personnel
- Lack of Financial Support
- No tailor-made international support
- Entrepreneurs are not integrated to an international network of start-ups
What is needed?
Three main needs.
1. Access to capital

The chemical sector is extraordinary investment-intensive and the financial support is needed:

- **Impact investors** – aiming for more than financial returns
- **Venture capital** without giving ownership away
- **Corporate investors** with projects in which they are familiar with the market and the technology.
- **Seed funding** to develop a minimum viable product
- **Equity investment** to scale and M&A consultation.

USD $12 trillion in market opportunities in 60 market “hot spots” might be open by the SDGs.

2. Industry guidance and collaboration

The chemical value chain supplies virtually all sectors of the economy...

- innovators need industry guidance and collaboration at different levels of the value chain focus on safer chemicals, materials and production processes.

3. Better coordination and platforms for exchange for Sustainable Chemistry Entrepreneurs

- Invite to Investor Forum (IF)
  - 3rd IF in 11/2021
  - Last year 150 participants
- Networking (>140 Start-ups)
- Invite to Innovation Challenge
- Invite to Cooperate Challenge

- Workshops:
  - Intellectual Property Strategy
  - Negotiations
  - Life Cycle Assessment
- Invites to Pitching Events
- PR through Start-up of the month feature

- Professional Coaching
- Matchmaking
- Show-Casing (IF)
- Access to Mentors & Experts
Background to Question 1
Presented by: Claudio Cinquemani (3-5 min)

Key findings of Plastics in Sustainable Building report:

- Megatrends: Urbanisation & population growth, climate change, pollution, health, need for affordable housing
- Rising demand for cheaper housing
- Conflict between land use for construction and climate change mitigation
- Positive side vs. adverse effects
Plastics in Sustainable Building

Decades of linear, toxic and wasteful production and practices

- No „One-Fits-for-All“- Solution (due to socio-economic & technical conditions, regulations, climate and resources)
- Deconstruction instead of demolition
- Design for separation & recycling, LCA in design & planning phase → Circular Economy
- Creating markets for waste
- New recycling technologies (better quality) & processing methods for residuals (e.g. CreaSolv®)
- Restriction and substitution of harmful additives to non-regrettable alternatives

Start-Up Example: EcoAct Tanzania

Winner of Innovation Challenge Award 2020
Plastic waste → building materials (plastic lumber)

Against:
✓ Wood scarcity & deforestation
✓ Ocean pollution

For:
✓ Social programmes
  ✓ health care for locals

Recycling Method:
Extrusion of polymers
  Pro: Low energy & low costs required.
  Contra: No separation design for different polymers

Garbage Medical Insurance:
A program using plastic garbage as payment for health care for uninsured
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?

This question will be discussed for 20 minutes.
Please use chat only, mute your microphone, and turn your video off.
Thank you!

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What issues could you imagine the use of recycled building material would cause?

- Unknown impact on health: 9
- Degradation of microplastics: 4
- Legacies of unknown substances: 2
- Unknown level of safety in construction (e.g., static): 2
- Mixing substances: 0
- I don't know: 0
What prerequisites are needed in your country to use recycled materials in buildings?

- **Take back systems**: 5
- **Market for waste materials**: 2
- **Material passport**: 3
- **Acceptance of users**: 1
- **Fire and smoke safety**: 2
- **Not sure**: 2
Background to Question 2
Presented by: Thomas Homburg (3 min)

Benefits of biogas production from wastewater
- Reduces GHG, ammonia and particulate emissions
- Captures nutrients for reuse & reduces use of inorganic fertilizers
- Reduces reliance on energy imports

Barriers to biogas from wastewater
- Requirement of energy intensive biogas cleanup
- Biogas quantity and quality
- Lack of knowledge about the merits of biogas production
- Inhibitory substances (ammonia, heavy metals)

Start-up:
- Indian start-up REYV
- Producing biogas via anaerobic digestion processes and treating wastewater

Idea
- Provide Bio-cultures to enhance productivity of wastewater treatment plant.
- Waste treatment and biogas production through Anaerobic Digestion (AD)
- Innovation and expansion of renewable sources by cross industry collaborations
Question 2:

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?

NOTE:

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Thank you!

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What do you think are key considerations when using biotechnology in wastewater treatment?

- Infrastructure for wastewater: 3
- Screening for suitable bacteria: 0
- Specific surrounding environment (pH, temperature, and alkalinity): 3
- Developments of advanced sensors for monitoring processes: 0
- Toxic elements: 6
- Have not thought about this yet: 0
What are the challenges using wastewater as an energy source in your country?

- Competition of energy supply and clean water: 2
- False incentives (neglect recovery of nutrients): 3
- Spread of antibiotic resistance: 0
- Methane gas leakage: 0
- Unique bacterial profile in every single plant: 0
- Currently not using wastewater for energy production: 6
Background to Question 3:
Presented by: Claudio Cinquemani (5 min)

Sustainable business models
- Improve resource efficiency
- Reduce use of chemicals of concern
- Lower impact of its products and processes
- Include life cycle design.

This can lead to:
- Access to new markets.
- Increased profitability across the value chain.
- Being ahead of regulations and standards.
Chemical Leasing

- A performance-based business model.
- Supplier and user exchange **product** AND **knowledge**.
- Leads to reduced usage of chemicals.
- Triple win: supplier, user and **environment**.
- Areas of application: adhesives, lubrication, coatings, **biocides**.
Joint Declaration of Intent on Chemical Leasing

- Drafted by UNIDO, Germany, Austria and Switzerland.
- Supported by Peru, Serbia, El Salvador and Sri Lanka and in 2021 by Uruguay.
- Aims to increase awareness of Chemical Leasing at the political level and strengthens the cooperation of the partners in global promotion activities.
Biocides have negative effects:

- Usage of biocides increased sharply during the Covid-19 epidemic, leading to negative effects on the environment and shortages in raw materials.
- Legacy: accumulation in human tissue, groundwater.
- Biocides are used in agriculture, healthcare and industry.
- Overusage of biocides is a suitable subject to apply chemical leasing to.
Question 3:

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

This question will be discussed for 20 minutes.
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Thank you!

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Will your country, particularly the environment ministry, sign a declaration on chemical leasing? State “yes”, “no”, or “I don’t know” and country.

South Africa - not sure

I dont know Panama

I don't know.

I don't know - South Africa

I don't know

I don't know

Iran, yes.

Dont know. Saint Lucia

I don't know.
What problems or barriers is foreseeable when implementing chemical leasing in your country? State your country.

Iran - policies: For now I think sanctions but later surely Iran will support considering big petrochemicals industries here.

Eswatini: I am not sure.

South Africa: impacting competition; ensuring health and safety is adhered to.

Jamaica: For Jamaica, I foresee barriers with first robust policy and secondly timely implementation, thirdly monitoring of the chemical industry.

Zambia: policies.
WRAP UP
Presented by: Claudio Cinquemani, Thomas Homburg
What will you do with the information shared in today's discussion?

- Share with colleagues at work.
- I will engage the environmental authority to gain more information on chemical leasing, Eswatini.
- Use in the Caribbean going forward.
- This discussion will help me in future chemical discussions with colleagues at work and in the industry.
- Finding more about chemical industry related to economy improvement.
- Share information and gather more knowledge on the issue.
- Consider sustainable building and living styles more in future planning, building etc.