Workshop on Innovations for a New Age of the Chemical Industry

Chemicals and Fuels from the Sun and Recycled Carbon Dioxide

4th November 2022

Kyambogo University – CTF Building

In the face of increasing global warming, ambitious climate targets have been set to limit the emission of carbon dioxide (CO_2) emissions. The chemical and energy industries particularly require urgent transformation and replacement with more sustainable and environmentally friendly alternative technologies and processes due to their heavy reliance on fossil fuels with a massive carbon footprint. The direct conversion of recycled CO_2 into fuels and chemicals using renewable energies is a promising way to decrease net CO_2 emissions. Africa is well placed to be a market leader in implementing solar to chemicals conversion technologies due to the seasonal abundance of sunshine and existing needs to scale-up energy supply and strengthen local sustainable chemical manufacturing capabilities.

The objectives of the FlowPhotoChem Workshop on Innovations for a New Age of the Chemical Industry are to:

- explore the market readiness of the African public, businesses and enterprises to take up and commercialise FlowPhotoChem innovations, and
- serve as a networking platform for the European partners and African researchers and businesses to seek future collaborative projects that advance the conversion of sunlight and CO_2 into chemicals and fuels.

FlowPhotoChem is a multi-national, EU-funded research project, Coordinated by Dr Pau Farràs (Ryan Institute, University of Galway), that is developing new and sustainable ways to manufacture chemicals using carbon dioxide (CO_2) and sunlight. There is great potential to replace much of the fossil fuels used today to make fuels and useful chemicals, by using solar energy and advanced catalysts to convert CO_2 into, for example, ethylene, as a precursor for plastics. The project addresses key challenges faced when using solar energy and advanced catalysts to convert carbon dioxide (CO_2) into valuable chemicals, including more effective solar light management, more efficient reactors, and more durable catalysts, among others. Three types of modular flow reactors are being developed: photo-electrochemical (PEC), photocatalytic (PC) and electrochemical (EC)). They will be integrated in a demonstrator reactor to manufacture ethylene, a high value chemical, using solar energy and CO_2. The project brings together many of Europe's leading R&D teams in this and related fields, from computer scientists and modellers to chemists, reactor designers and catalyst companies.

@flowphotochem FlowPhotoChem flowphotochem.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 862453. The material presented and views expressed here are the responsibilities of the author(s) only. The EU Commission takes no responsibility for any use made of the information set out.

Agenda

Time (EAT)	Item
8:50 – 9:00 am	**Official opening: Mr. James Bulenzibuto (MC)**
9:00 –9 :10 am	**Innovations for a New Age of the Chemical Industry** **Chemicals and Fuels from the Sun and Recycled CO_2** *Dr. Justus Masa,* FlowPhotoChem Principal Investigator & Senior Lecturer, Kyambogo University
9:10 – 9:25 am	**FlowPhotoChem Integrated Reactors** *Dr. Pau Farràs*, Project Coordinator, National University of Ireland Galway
9:25 – 9:40 am	***Welcome Remarks*** *Prof. Elly Katunguka,* Vice Chancellor of Kyambogo University
9:40 – 10:00 am	***Chief Guest*** *Hon. Dr. Monica Musenero,* Minister of Science, Technology and Innovation, Office of the President
10:00 – 10:30 am	***KEY NOTE*** **Government strategy for diversification and incentivization of Renewable Energy Use in Uganda** *Dr. Brian Isabirye,* Commissioner for Renewable Energy - Ministry of Energy and Mineral Development (MEMD)
10:30 – 10:50 am	**BREAK**
Session Chair	**Dr. William Wanasolo**
10:50 - 11:30 am	**The role of the petroleum industry in supporting the green energy transformation** *Mr. Felix Ocittti,* Petroleum Authority of Uganda (UPA).
11:10 – 11:30 am	**Solar Hydrogen for Clean Cooking: Status and perspectives** *Dr. Fredy Nandjou,* Soft power
11:30 – 11:50 am	**Constructing a roadmap towards market readiness of solar chemicals production** *Dr. Ursa Podbevsek and Dr. Gareth Williams,* Johnson Matthey PLC (UK)
11:50 – 12:10 pm	**Towards optimal design of photoelectrochemical fuel generation with concentrated light** *Alexandre Cattry,* EPFL (Switzerland)
12:10 – 12:30 pm	**Solar cooking and thermal energy storage research at Kyambogo University** *Dr. Oyirwoth Patrick Abedigamba,* Kyambogo University

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12:30 – 2:00 pm	**LUNCH**
Session Chair	**Dr. Hannington Twinomuhwezi**
2:10 – 3:10 pm	**EU-Africa Cooperation and Mission Innovation** *Philippe Schild,* European Research Council (Brussels, Belgium)
3:10 – 3:30 pm	**BREAK**
3:30 – 3:50 pm	**Concentrated solar light for the production of sustainable chemicals – Solar test facilities at the German Aerospace Center** *Dr. Michael Wullenkord,* DLR (Germany)
3:50 – 4:10 pm	**Electrolyzer development for a sustainable future** *Csaba Janaky,* eChemicles Zrt (Hungary)
4:10 – 4:30 pm	**Membranes in Electrochemical Cells** *Dr. Jelena Stojadinovic,* Membrasenz GmbH (Switzerland)
4:30 – 4:50 pm	**Preliminary Report on Market analysis** *Dr. James Kizza,* Kyambogo University
4:50 – 5:00 pm	Closing Remarks
5:00 - 6.00 pm	Networking and Contact Exchange (In person attendees only)

FlowPhotoChem Organising Team

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