AquaEnviro

# The Art of the Possible:

## RESOURCE RECOVERY FROM WASTEWATER AND BIORESOURCES

### 13th May 2021, Virtual Conference

| | |
|---|---|
| **Conference Opening & Welcome** | |
| 9.30 – 9.45 | Céline Vaneeckhaute, Université Laval, Canada |
| **Embracing the circular economy – challenges and opportunities** | |
| 9.45 – 10.00 | **Physical and digital innovations to deliver safe circular economy in wastewater management**<br>Professor Francesco Fatone, Università Politecnica delle Marche, Ancona, Italy<br>• Scaled-up innovations to deliver Circular Economy<br>• Digital support for water-health nexus and risk-based management<br>• Legislation and regulation: current achievements and barriers |
| 10.00 – 10.15 | **Beyond net zero – resource recovery from the urban water cycle**<br>Amanda Lake[1], Andy McLeod[1], Chris Kyne[1], Sandra Sibby[1], Evina Katsou[2] and Jos Boere[3], [1]Jacobs, UK [2]Brunel University, UK, [3]Allied Water, The Netherlands<br>• Maximising resource recovery is critical for water industry climate action and 2030 net zero<br>• If we go beyond biogas and biosolids we can go beyond net zero - and have the ability to reduce national greenhouse gas emissions at a country level if we think creatively<br>• Success will benefit current and future customers and requires inclusive, collaborative and engaged industry action |
| 10.15 – 10.30 | **Regulatory barriers and opportunities for wastewater resource recovery in Europe**<br>Chris Thornton, European Sustainable Phosphorus Platform, France<br>• Unblocking EU regulatory obstacles to resource recovery<br>• Implementation of the new EU Fertilising Products Regulation<br>• Organic Farming, Animal Feed regulations, plants and algae grown in wastewater |
| 10.30 – 10.45 | **NEREUS Decision Support Tool: Informing Resource Recovery Options for Urban Wastewater**<br>Dr Kevin Willis, Dr Seda Sucu, MSc Ramazan Esmeli, MSc Maria van Schaik, Prof Djamila Ouelhadj, Prof John Williams, Dr Brett Martinson, Dr Peter Cruddas and Dr Graham Wall, University of Portsmouth<br>• Introduction - Interreg 2-Seas NEREUS Project and DST framework/interface<br>• Performance of DST - Treatment Trains and Optimization<br>• Applications for Supporting Business Decisions |
| 10.45 – 11.15 | Questions & Discussion |

| | |
|---|---|
| 11.15 – 11.45 | Break and Networking |
| **Capturing nutrients and other inorganic resources** | |
| 11.45 – 12.00 | **Nutrient Recovery**<br>Professor Ana Soares, Cranfield University |
| 12.00 – 12.15 | **A holistic approach to performance assessment and process optimisation of the nutrients recovery plant at Slough Sewage Treatment Works**<br>Xiaobo (Agnes) Shen, Thames Water, UK<br>• Optioneering, design and operation of nutrient recovery plant at STWs shall be based on full understanding of incoming sewage characteristics and whole site process.<br>• A holistic approach is vital to the nutrient recovery plant performance assessment and process optimisation.<br>• A holistic approach is also key to the net zero agenda. |
| 12.15 – 12.30 | **The recovery of beneficial fertigation products from nitrate removal plant**<br>Mike Waite, Agua DB<br>• Ion exchange is accepted as best available technology for nitrate removal from potable water, but its Achilles heel is the volume of waste brine/nitrate, which often has to be tankered to a large waste water treatment works for disposal<br>• Agua DB have developed a novel regeneration process for producing low chloride fertigation products from nitrate treatment plant, rather than waste, which uses ~25% of the salt compared to conventional process<br>• This talk will discuss 'proof of process' work and next stages of development undertaken by Agua DB in conjunction with CHAP (Crop Health and Protection Ltd), Carbon Data Resources, Affinity Water and Anglian Water with funding support from Innovate UK's Sustainable Innovation Fund |
| 12.30 – 12.45 | **Ammonia to energy – a critical step toward net zero?**<br>Professor Ewan McAdam, Cranfield University<br>• Challenges and opportunities for thermal ammonia separation<br>• Options for converting recovered ammonia direct to power or to hydrogen<br>• Technology integration into the existing flowsheet |
| 12.45 – 13.15 | Questions & Discussion |
| 13.15 – 14.30 | Break and Networking |
| **Carbon for materials and energy** | |
| 14.30 – 14.45 | **Sustainable Paperwork!**<br>Coos Wessels, CirTec, The Netherlands<br>• CellCap, direct extraction of marketable cellulose from the main stream of a STP (without additional pumping) and upgrading and valorisation of a recovered resource (by Cellvation, a sister company of CirTec). |
| 14.45 – 15.00 | **WoW! - New value chains for carbon-based raw materials from wastewater**<br>Zuzana Dedova, Universität of Luxemburg and Jappe de Best, Avans University of Applied Sciences, The Netherlands<br>• Utilization of 5 carbon based elements from wastewater |

| | |
|---|---|
| | • First results from the Lipid - PHA- and Cellulose pilot plant<br>• Development of bioproducts from wastewater (bioplastics, biofuels, biochar)<br>• Market potential investigation in comparison to conventional products |
| 15.00 – 15.15 | **Evaluating the Business Case for the UK's First Kaumera Nereda® Gum Production Facility**<br>Paul Lavender[1], Barry Oliver[1], Lisa Mansell[2] and Callum Grundy[2], [1]Royal HaskoningDHV, UK, [2]United Utilities, UK<br><br>• Update on deployment and performance of Kaumera technology<br>• Applications of Kaumera product<br>• Evaluation of UK's first Kaumera facility at Blackburn WwTW |
| 15.15 – 15.30 | **Pyrolysis - the solution to biosolids management, resource recovery and increased energy production?**<br>Oda Kjorlaug Svennevik, Gudny Oyre Flatabo, Paal Jahre Nilsen, Asgeir Wien, Vow/Scanship, Norway<br><br>• Pyrolysis represents an alternative to land application and incineration of biosolids.<br>• Carbon- and nutrient capture is possible in the form of biochar.<br>• Integration of pyrolysis could boost your biogas production |
| 15.30 – 15.45 | **Pyrochar for production of containerized spruce tree seedlings with fertilizer**<br>Martyna Zywalewska, Maria Sandberg, Karin Granström, Ali Muhammadi, Karlstad University, Sweden<br><br>• Biosludge from pulp and paper mill wastewater was upgraded to biochar<br>• Biochar was used as a growth medium, mixed with peat, in an industrial scale nursery producing spruce seedlings.<br>• At a ratio of 15/85 biochar/peat, the seedlings root system was significantly improved. |
| 15.45 – 16.15 | Questions & Discussion |
| **Looking to the future** | |
| 16.15 – 16.35 | **Resources recovery for future Mars missions**<br>Christophe Lasseur, The European Space Agency<br><br>• Mars, missions and resources challenges<br>• How to go from waste to food, water and oxygen<br>• High circularity<br>• MELiSSA Project |
| 16.35 | **Close** |