



Wednesday, 14 September

Track 1
WATER UTILITY
MANAGEMENT

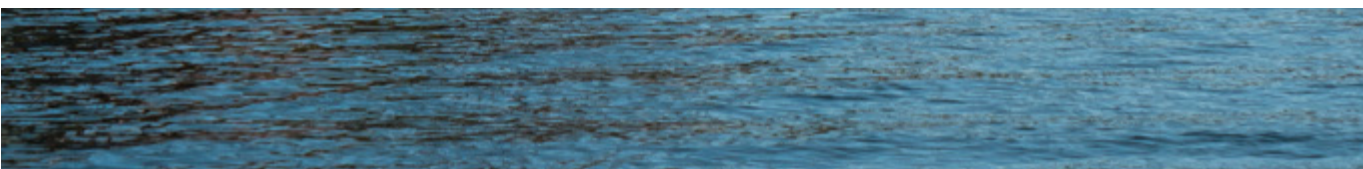
Track 2
WASTEWATER
TREATMENT AND
RESOURCE RECOVERY

Track 3
DRINKING WATER
AND POTABLE REUSE

Track 4
CITY-SCALE
PLANNING AND
OPERATIONS

Track 5
COMMUNITIES,
COMMUNICATION
AND PARTNERSHIPS

Track 6
WATER RESOURCES
AND LARGE-
SCALE WATER
MANAGEMENT



Wednesday | Programme

Keynote Plenary	09:00 - 09:50		
Keynote: Uniting Youth for Water, Farokh Laqa Kakar Panel: Jacob Amengor , Inês Breda , Andrea Montuori , Yang Villa			
Coffee Break	09:50 - 10:30		
Session 1	10:30 - 12:00		
UTILITY LEADERS FORUM IV — LIVING IN THE DIGITAL WORLD Chair: Shane Morgan , <i>COO Urban Utilities, Brisbane, Australia</i> Igniting talks: Jason Tucker , <i>Director of Strategic Delivery and Commercial Assurance Anglian Water, UK</i> , Maree Lang , <i>MD, Greater Western Water, Australia</i> , Riksta Zwart , <i>MD, Waterbedrijf Groningen, NL</i> , Kishia Powell , <i>COO, DC Water, US</i> Roundtables and panel discussion facilitator: Adam Lovell , <i>CEO Water Services Association of Australia</i>	Room A2 Forum	REGULATORS FORUM I — "EXCEPT IN CASES OF FORCE MAJEURE": THE IMPACT OF ENVIRONMENTAL AND SOCIAL DISRUPTIONS ON ECONOMIC REGULATION. WHO PAYS FOR THE INCREMENTAL RISK? Chair: Patrick Lester N. Ty , <i>Philippines</i> The 7th International Water Regulators Forum offers a platform for water sector regulators from all over the world to exchange experiences, transfer skills and build new partnerships. It gathers high-level representatives of regulatory authorities and officials of agencies with regulatory and supervisory functions over the provision of water, sanitation, and drainage services, as well as their peers from public health and environmental regulators. The discussions will focus on how regulatory functions are being supplied in times of increasing natural, social, and economic uncertainty. During the Forum, discussions are structured around highly interactive sessions that combine short inspirational presentations and roundtable discussions led by the speakers.	Room A3 Forum
Lunch	12:00 - 13:30		
Session 2	13:30 - 15:00		
UTILITY LEADERS FORUM V — CELEBRATING 2022 CLIMATE SMART UTILITIES — SUCCESSES FROM AROUND THE GLOBE AND RECOGNITION EVENT Chairs: Corinne Tromsdorff , <i>Water Cities</i> and Carlos Diaz , <i>IWA</i> Opening of recognition event: Kala Vairavamoorthy , <i>Executive Director, IWA</i> Presentation of Climate-Smart Stories	Room A2 Forum	REGULATORS FORUM II — DEMONSTRATING THE ADDED VALUE OF REGULATION TO COPE WITH GREATER POLITICAL INSTABILITY: HOW REGULATORS ARE RINGFENCING FROM POLITICAL INSTABILITY AND ITS PERVERSE IMPACTS ON THE GOVERNANCE OF THE REGULATORY FRAMEWORKS? Chair: Tone Madsen , <i>Denmark</i> The 7th International Water Regulators Forum offers a platform for water sector regulators from all over the world to exchange experiences, transfer skills and build new partnerships. It gathers high-level representatives of regulatory authorities and officials of agencies with regulatory and supervisory functions over the provision of water, sanitation, and drainage services, as well as their peers from public health and environmental regulators. The discussions will focus on how regulatory functions are being supplied in times of increasing natural, social, and economic uncertainty. During the Forum, discussions are structured around highly interactive sessions that combine short inspirational presentations and roundtable discussions led by the speakers.	Room A3 Forum
Coffee Break	15:00 - 15:45		
Session 3	15:45 - 17:15		
LATIN AMERICA & THE CARIBBEAN — LATIN AMERICA DAY AT THE 2022 IWA WORLD WATER CONGRESS The workshop will bring together key representatives from the Latin American water sector (led by the Inter-American Association of Sanitary and Environmental Engineering – AIDIS) to discuss how IWA can add value to Latin American water professionals (from young water professionals to seniors), and how they can engage in and contribute to IWA communities and programmes. Speakers: José Luis Inglese , <i>Elected President – AIDIS (AR)</i> , Daniel Nolasco , <i>Former Chair of IWA's Strategic Council (AR)</i> , Juan Pablo Rodríguez Sánchez , <i>Universidad de Los Andes (CO)</i> , Daniela Bemfica , <i>IWA Secretariat (BR / UK)</i> , Agustin Landaburu , <i>IWA YWP Steering Committee member (AR)</i>	Room A2 LAC	REGULATORS FORUM III — COPING WITH CLIMATE CHANGE: CLIMATE SMART REGULATION TO BOOST UTILITIES UPTAKE OF CLIMATE ACTION AND CIRCULARITY Chair: Itai Sagi , <i>Israel</i> The 7th International Water Regulators Forum offers a platform for water sector regulators from all over the world to exchange experiences, transfer skills and build new partnerships. It gathers high-level representatives of regulatory authorities and officials of agencies with regulatory and supervisory functions over the provision of water, sanitation, and drainage services, as well as their peers from public health and environmental regulators. The discussions will focus on how regulatory functions are being supplied in times of increasing natural, social, and economic uncertainty. During the Forum, discussions are structured around highly interactive sessions that combine short inspirational presentations and roundtable discussions led by the speakers.	Room A3 Forum
Break	17:15 - 17:30		
Keynote Plenary	17:30 - 18:20		
Keynote: Learning to Dance in the Rain — How to Thrive in an Era of Climate Change, Paul O'Callaghan Panel: Ana Soares , Anna Delgado , David Flinton , Amanda Lake , Zhiyong Jason Ren , Lila Thompson			

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Session 1	10:30 - 12:00		
		INNOVATORS PLATFORM I	Room C1 Innovators
		<p>The Water Innovation Accelerator is the latest event to be held as part of the Innovators Platform initiative.</p> <p>The Innovators Platform is a collaborative effort to inspire innovation around water. The Innovators Platform frames innovation in a wide context, looking beyond technologies. It anticipates the broad benefits to society can be realised with innovation 'through' water. International participants will, over three sessions, explore opportunities arising from water's potential to be a vehicle for transformation through the adoption of a circular economy water journey for climate change mitigation and adaptation.</p> <p>The Water Innovation Accelerator event is facilitated by Water Valley Denmark.</p>	
Lunch	12:00 - 13:30		
Session 2	13:30 - 15:00		
UPSCALING FAECAL SLUDGE AND SEPTAGE MANAGEMENT (FSSM) TO CITY WIDE INCLUSIVE SANITATION (CWIS): EXPERIENCE FROM INDIA (STATE OF UTTAR PRADESH) AND GLOBAL SOUTH	Room C0 Sanitation	INNOVATORS PLATFORM II	Room C1 Innovators
<p>Speakers: Depinder Kapoor, <i>Centre for Science and Environment (IN)</i>, Jay Bhagwan, <i>Water Research Commission (ZA)</i>, Amrit Abhijaat, Sumit Singhal, <i>Centre for Science and Environment (IN)</i>, Dhruv Pasricha, <i>Centre for Science and Environment (IN)</i>, Hasin Jahan, <i>WaterAid Bangladesh (BG)</i>, Malcolm Madeira, Sudhir Pillay, <i>Water Research Commission (ZA)</i>, Jennifer Williams</p>		<p>Continuing from Session 1. The Innovators Platform is a collaborative effort to inspire innovation around water. The Innovators Platform frames innovation in a wide context, looking beyond technologies. It anticipates the broad benefits to society can be realised with innovation 'through' water. International participants will, over three sessions, explore opportunities arising from water's potential to be a vehicle for transformation through the adoption of a circular economy water journey for climate change mitigation and adaptation.</p>	
Coffee Break	15:00 - 15:45		
Session 3	15:45 - 17:15		
NFSSM WORKSHOP: COLLABORATIVE APPROACH TO RESILIENT AND INCLUSIVE CITY SANITATION: BEST PRACTICES FOR A MULTI-STAKEHOLDER ECOSYSTEM	Room C0 NFSSM	INNOVATORS PLATFORM III	Room C1 Innovators
<p>Speakers: Roshan Shrestha, Shri. G Mathi Vathanan, Tanvir Ahmed, <i>BUET (BG)</i>, Mahreen Matto, <i>National Institute of Urban Affairs (IN)</i>, Depinder Kapoor, Vedala Srinivas, Chary, <i>Administrative Staff College of India (IN)</i>, Anju Dwivedi, <i>Centre for Policy Research (IN)</i>, Drishti Bassi, Hasin Jahan, <i>WaterAid Bangladesh (BG)</i>, Ananya Ghosh, <i>Athena Infonomics (IN)</i></p>		<p>Continuing from Session 2. The Innovators Platform is a collaborative effort to inspire innovation around water. The Innovators Platform frames innovation in a wide context, looking beyond technologies. It anticipates the broad benefits to society can be realised with innovation 'through' water. International participants will, over three sessions, explore opportunities arising from water's potential to be a vehicle for transformation through the adoption of a circular economy water journey for climate change mitigation and adaptation.</p>	
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Session 1		10:30 - 12:00		
1.4 SKILLS FOR A DIGITAL WATER FUTURE Chairs: Emma Weisbord , Canada and Lloyd Fisher-Jeffes , South Africa In this session, we will introduce participants to the various flavours of skills and expertise needed for the future of digital water. We will provide a taste of two of these: machine learning concepts and agile ways of working. Speakers: Emma Weisbord , IWA Emerging Water Leaders , SWAN Rising Smart Water Professionals (CA) , Lloyd Fisher-Jeffes , City of Cape Town (ZA) , Irina Pulyakhina , Xcelerated , (RU)		Room C2 Workshop	2.1.3B ACTIVATED SLUDGE PROCESSES: THE NITROGEN CYCLE Chairs: Anna Katrine Vangsgaard , Denmark and Andrea Carranza Muñoz , Colombia Novel ammonia-oxidizing bacteria (AOB) to enhance wastewater and sludge management, Zhiyao Wang , The University of Queensland, Australia Exploring the microbial influence on seasonal nitrous oxide emission in a full-scale wastewater treatment plant using genome-centred metagenomics, Miriam Peces Gomez , Aalborg University, Denmark Effect of the aeration strategy on the competition between comammox-nitrosipira, canonical nitrifiers and anammox bacteria in a deammonification system, Dominika Sobotka , Gdańsk University of Technology, Poland Effect of dissolved oxygen on Simultaneous Nitrification and Denitrification (SND) in a Sequencing Batch Reactor (SBR), Susan James , Indian Institute of Technology Delhi, India ---- POSTERS ---- Nitrous oxide emission at Ornum wastewater treatment plant - deep learning assisted process analysis, Gürkan Sin , Technical University of Denmark, Denmark Sulfamethoxazole and COD removal by a novel anaerobic/aerobic SBR supplemented with magnetite, Tong Shen , Waseda University, Japan	Room C3 Technical
Lunch		12:00 - 13:30		
Session 2		13:30 - 15:00		
6.11 CIRCULAR ECONOMY 1 Chairs: Evina Katsou , United Kingdom and Maria Faragó , Denmark Preliminary evidence of advanced bio-based fertilizer production and water reuse from fishery wastes, Corinne Andreola , UNIVPM, Italy Exploring the legitimisation of circular economy initiatives in the water sector, Marine Poncet , Cranfield University, United Kingdom Water in circular economy and resilience (WICER) framework, Anna Delgado , World Bank, United States From lab to field: transforming biogas digestates to instruments for mitigating nitrous oxide emissions from food production, Kjell Rune Jonassen , Vestfjorden Avløpssekskap (Veas) , Norway ---- POSTERS ---- Assessing the economic, social, gender and environmental impact of clean water and sanitation in Buenos Aires, Gonzalo Meschengieser , Agua y Saneamientos Argentinos (AySA) , Argentina		Room C2 Technical	2.1.1-1 INNOVATIVE MAINSTREAM WASTEWATER TREATMENT Chairs: Thammarat Koottatep , India and Maria Concetta Tomei , Italy Developing and deploying the next generation of mainstream nitrogen removal technology through Partial Denitrification-Anammox (PdNA), Stephanie Klaus , Hampton Roads Sanitation District, United States Two birds one stone - achieving simultaneous removal of nitrogen and dissolved methane in mainstream wastewater, Tao Liu , The University of Queensland, Australia Impact of improving nitrogen removal efficiency on the energy autarky of anaerobic-based sewage treatment plants, Thiago Bressani Ribeiro , Ghent University, Belgium Nanoscale zero valent iron enhanced mainstream anammox application: a long-term evaluation with real sewage, Bilge Alpaslan-Kocameci , Marmara University, Turkey ---- POSTERS ---- Aerated anoxic condition promotes simultaneous biological nutrient removal by coupling SND, anammox and EBPR processes, Quan Yuan , Beijing Technology and Business University, China	Room C3 Technical
Coffee Break		15:00 - 15:45		
Session 3		15:45 - 17:15		
6.12 CIRCULAR ECONOMY 2 Chairs: Amit Chanan , Fiji and Chataigne Djuma , Congo DR Assessing circularity of multi-sectoral systems under the water-energy-food-ecosystems (WEFE) nexus, Elisa Nika , Brunel University London, United Kingdom Holistic circularity assessment of a biorefinery process utilising an action-oriented approach, David Renfrew , Brunel University London, United Kingdom An integrated approach to sustainable industrial water use, Eric Rosenblum , Water Resource Consultant, United States Water circularity measurement in urban context, Pradip Kalbar , Indian Institute of Technology Bombay, India ---- POSTERS ---- Water reuse in northern Europe — a German perspective? Juliane Bräcker , University of Duisburg-Essen, Germany Systematic review of low-cost waste material to eliminate pollutants in wastewater: technology and life cycle analysis perspective, Małgorzata Szałachta , Geological Survey of Finland, Finland		Room C2 Technical	2.1.1-2 OPTIMISATION AND CONTROL OF NUTRIENT REMOVAL Chairs: Laurence Strubbe , Belgium and Thiago Bressani Ribeiro , Brazil Cold climate biological nutrient removal with the hias process, Torgeir Saltnes , Hias How20, Norway Predictive control of wastewater treatment aeration: experiences from full-scale tests on Nørre Snede WRRF, Peter Stentoft , Krüger A/S, Veolia Water Technologies, Denmark Sensor based dynamic control of aerobic granular sludge treating industrial wastewater, Jan Dries , University of Antwerp, Belgium Double-line anammox-mediated nitrogen removal system provide new insight into co-treatment of sidestream and mainstream, Xiangchen Li , Beijing University of Technology, China ---- POSTERS ---- Model-based verification of an aeration upgrade for the Tilburg WRRF (NL), Lorenzo Benedetti , Waterways d.o.o, Croatia New solution combines tertiary and stormwater treatment to minimize the phosphorus discharge from Skanderborg WWTP, Thomas Bugge , SUEZ, Denmark	Room C3 Technical
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Session 1	10:30 – 12:00		
2.6 DIGITAL TOOLS FOR WASTEWATER PROCESS OPTIMISATION Room B5 a Technical Chairs: Juan Antonio Baeza , <i>Spain</i> and Saba Daneshgar , <i>Belgium</i> Benchmarking plant-wide monitoring strategies in wastewater treatment plants, Pedram Ramin , <i>Technical University of Denmark, Denmark</i> Comparison of guideline and model-based WWTP design for uncertain influent conditions, Erik Lindblom , <i>IVL Swedish Environmental Research Institute AB, Sweden</i> How to enable responsible consumption & production (SDG12) and reduce the climate impact (SDG13) on a WWTP by digitally enhanced primary treatment, Patricia Aubeuf-Prieur , <i>Kemira</i> ---- POSTERS ---- SAC254 on-line measurement: a key surrogate parameter for micropollutants removal, Marie Inizan , <i>Hach Lange GmbH, Germany</i> Model-based assessment of alternative modes of operation in a full-scale industrial water treatment system, Xavier Flores-Alsina , <i>DTU, Denmark</i>		3.6 EMERGING CONTAMINANTS (PFAS, PESTICIDES AND OTHERS) – I Room B5 b Technical Chairs: Vânia Serrão Sousa , <i>Portugal</i> and Jiaying Li , <i>Australia</i> Challenges with emerging contaminants in groundwater and possible removal options, Mathilde Hedegaard , <i>Hofer A S, Denmark</i> An answer to DMS removal from groundwater in drinking water applications — a collaboration-based solution, Inês Breda , <i>YWPDK, Denmark</i> Per- and polyfluoroalkyl substance (PFAS) removal using nanofiltration (NF) systems: influence of steady state and operating conditions on performance, Gilda Carvalho , <i>Australian Centre for Water and Environmental Biotechnology (ACWEB)/The University of Queensland, Australia</i> PFas removal from drinking water using nanofiltration with foam fractionation treatment of membrane concentrate, Philip McCleaf , <i>Uppsala Vatten och Avfall AB, Sweden</i> ---- POSTERS ---- 1,4-dioxane decomposition with VUV and its computational prediction taking into account effects of inorganic ions, Taku Matsushita , <i>Hokkaido University, Japan</i> Removal of pesticide metabolites, e.g. DMS (N,N-dimethylsulfamide) from drinking water by H ₂ O ₂ -UV oxidation, Manuela Schliemann-Haug , <i>NIRAS, Denmark</i>	
Lunch	12:00 – 13:30		
Session 2	13:30 – 15:00		
2.6 DATA-DRIVEN TOOLS FOR WASTEWATER TREATMENT PROCESSES Room B5 a Technical Chairs: Glen Daigger , <i>United States</i> and Achim Ried , <i>Germany</i> Data reconciliation for activated sludge plants — effects of data time span, Christoffer Wärf , <i>RISE Research Institutes of Sweden, Sweden</i> Prediction of mass and volumetric flows in a full-scale industrial wastewater treatment plant, Xavier Flores-Alsina , <i>DTU, Denmark</i> Including the fate of products generated at a full-scale wastewater treatment plant, in applying decision support tools to evaluate phosphorus removal strategies, David Ikumi , <i>University of Cape Town, South Africa</i> Modelling and mitigating greenhouse gas emissions from sewage treatment plants using an integrated mechanistic and deep learning approach, Haoran Duan , <i>The University of Queensland Australia</i> ---- POSTERS ---- Process using bayesian optimized long short-term memory network, Esmaeel Mohammadi , <i>Krüger, Denmark</i> Process monitoring and fault detection using a soft sensor for the return activated sludge flow rate at Henriksdal WRRF, Hanna Molin , <i>Lund University/IVL Swedish Environmental Research Institute, Sweden</i>		3.6 EMERGING CONTAMINANTS (PFAS, PESTICIDES AND OTHERS) – II Room B5 b Technical Chairs: Wolfgang Uhl , <i>Norway</i> and Gilda Carvalho , <i>Australia</i> A new biotechnology for pesticide removal at drinking water sand filters, Sanin Musovic , <i>Danish Technological Institute, Denmark</i> Adsorption and biodegradation of organic micropollutants in biologically activated carbon filtration, Bert van der Wal , <i>Evides Water Company, Netherlands</i> Different fates of intact deteriorated microplastics, viruses, activated carbon, and kaolin montmorillonite clay particles during water treatment processes, Yoshifumi Nakazawa , <i>National Institute of Public Health, Japan</i> Optimization of adsorption processes for removal of small polar groundwater contaminants from drinking water, Sonsolés Quinzanos , <i>Hofer A S, Denmark</i> ---- POSTERS ---- Advanced monitoring of activated carbon to guarantee organic contaminant removal and efficient media renewal, Olivier Danel , <i>SUEZ, France</i> Micropollutant degradation by wasted spent mushroom substrate, Brigit van Brenk , <i>Utrecht University, Netherlands</i>	
Coffee Break	15:00 – 15:45		
Session 3	15:45 – 17:15		
2.3.1 MEMBRANE APPLICATIONS IN WASTEWATER MANAGEMENT Room B5 a Technical Chairs: Miklos Patziger , <i>Hungary</i> and Irina Pulyakhina , <i>Netherlands</i> Development of an integrated urine collection and treatment process for fertilizer and water production, Caitlin Courtney , <i>University of Cape Town, South Africa</i> Pre-coagulation of UASB effluent for ultrafiltration membrane fouling mitigation: a comparative study of aluminum and tannin-based coagulants, Eduardo Lucas Subtil , <i>Federal University of ABC, Brazil</i> Pulse dosing of submicron-sized powdered activated carbon avoids irreversible fouling in submerged ceramic membranes while not in monolithic ones, Zhao Yuanjun , <i>Hokkaido University, Japan</i> Low-pressure nanofiltration coupled with ultrafiltration: an efficient solution for drinking water treatment, Philippe Sauvignet , <i>Veolia, France</i> ---- POSTERS ---- Removal of pharmaceuticals and wastewater pollutants with hybrid ceramic membranes, Henning Oeltze , <i>Hochschule Magdeburg-Stendal, Germany</i>		3.9 EMERGING PATHOGENS AND THEIR MANAGEMENT IN DRINKING WATER AND WATER REUSE Room B5 b Technical Chairs: Palsiri Srirungruang , <i>Thailand</i> and Bhairavi Sawant , <i>Ireland</i> Metagenomic analysis of RNA Viruses in wastewater for comprehensive detection of viral infectious diseases, Suntae Lee , <i>National Institute of Technology, Hachinohe College, Japan</i> Comparison of in-building disinfectants for the control of opportunistic pathogens in drinking water systems, Abraham Cullom , <i>Virginia Tech, United States</i> Triclosan promotes conjugative transfer of antibiotic resistance genes to opportunistic pathogens in activated sludge, Ji Lu , <i>University of Queensland-ACWEB, Australia</i> Early warning system for enhancing microbiological safety in drinking water treatment plants, Ester Aguilera , <i>Universitat de Girona, Spain</i> ---- POSTERS ---- Possible performance indicators for virus removal by membrane processes at a potable reuse facility, Midori Yasui , <i>The University of Tokyo, Japan</i> Microbiological risk management by continuous sampling and regular analysis of indicator organisms in large water volumes, Ann-Katrin Pedersen , <i>Hofer, Denmark</i>	
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Session 1	10:30 - 12:00		
3.14 DIGITAL WATER		Room B4 a Technical	5.5 WASH AND COMMUNITY-SCALE WATER MANAGEMENT
Chairs: Hector Monclus , <i>Spain</i> and Tamlyn Sasha Naidu , <i>South Africa</i>			Chairs: Kenneth Johnson , <i>Canada</i> and Albert Acheampong , <i>Ghana</i>
How to improve management of storm-water planning using green-growth technology and machine learning?, Andreja Ostoic , <i>BI Norwegian Business School, Norway</i>			Technology transfer barriers of frugal water treatment technologies: a case study on solar drinking water disinfection, Anni Juvakoski , <i>Aalto, Finland</i>
Benefits and challenges of pre-paid water meter installation piloted in Jenin City of Palestine, Ryuji Ogata , <i>Japan International Cooperation Agency (JICA), Japan</i>			Abandonment factors in villages triggered by the implementation of the Community Led Total Sanitation (CLTS) approach in Burkina Faso, Hemez Ange Aurélien Kouassi , <i>International Institute for Water and Environmental Engineering (2IE), Burkina Faso</i>
High-resolution automated monitoring of microbial concentrations in greywater effluent by online flow cytometry, Konstanze Schiessl , <i>ONCyt Microbiology AG, Switzerland</i>			Justice and sanitation wellbeing: a case of slippage in sanitation in Two Gram Panchayats, Shrivasti, UP, India, Kopal Khare , <i>Birla Institute of Technology and Science, Pilani-Hyderabad Campus, India</i>
Microbiological dynamics and risk assessment of drinking water and reclaimed water processes, Susana Gonzalez , <i>CETAQUA (Water Technology Center), Spain</i>			Water consumption patterns in rural households in Ghana, Anise Sacranie , <i>Grundfos Holding A/S, Denmark</i>
--- POSTERS ---			--- POSTERS ---
Use of soft sensors for improved drinking water treatment, Stephan Köhler , <i>Swedish University of Agricultural Sciences, Sweden</i>			Improving decentralized sanitation solutions in Ethiopia through market-based interventions, Lars Osterwalder , <i>IRC Wash, Ethiopia</i>
			Community empowerment for the successful implementation of alternative technology applied to access to safe drinking water in Brazil: a comparative study, Yannick Duchesne , <i>University of Brasília, Brazil</i>
Lunch	12:00 - 13:30		
Session 2	13:30 - 15:00		
3.3 HEALTH RISK ASSESSMENT OF ANTIMICROBIAL RESISTANCE IN WATER SYSTEMS		Room B4 a Workshop	5.3 ONLINE AND HYBRID APPROACHES TO KNOWLEDGE EXCHANGE AND CAPACITY BUILDING FOR WATER OPERATOR PARTNERSHIPS (WOPS)
Chairs: Gertjan Medema , <i>Netherlands</i> and Stephanie Rinck-Pfeiffer , <i>Australia</i>			Chairs: Jeanne Cole , <i>United Kingdom</i> and Anke Verheij , <i>Netherlands</i>
The Global Water Research Coalition (GWRC) recognised the need for the water sector to understand the health risk associated with antimicrobial resistance (AMR) in water. As a follow-up of a GWRC workshop, WRF issued a project to evaluate the health risk that is now ongoing. In the workshop, we plan to present the state-of-the-art on health risk assessment of AMR in water and solicit feedback from all participants (through a web-based polling system) to help translate this scientific state-of-the-art to water policy and water utility practice.			At this session, attendees will hear from WOP participants and supporting agencies who will present the latest thinking on fostering improved knowledge exchange, including several pilots of new, or adapted, online tools and hybrid strategies.
Speakers: Gertjan Medema , <i>KWR/TU Delft/Michigan State University (NL)</i> , Stephanie Rinck-Pfeiffer , <i>GWRC (AU)</i> , Kate Medicott , <i>WHO (GE)</i> , Amy Pruden , <i>Virginia Tech (US)</i> , Kerry Hamilton , <i>Arizona State University (US)</i>			Speakers: Jeanne Cole , <i>WaterAid (UK)</i> , Anke Verheij , <i>VEI (NL)</i> , Patrick Kayizzi , <i>Eastern Umbrella of Water and Sanitation (UG)</i> , Eunice Tejan , Faustina Boachie , <i>Ghana Water Company Limited (GH)</i> & Guiliana Ferrero , <i>IHE Delft (NL)</i>
Coffee Break	15:00 - 15:45		
Session 3	15:45 - 17:15		
3.2 GROUNDWATER AS A SUSTAINABLE SUPPLY RESOURCE		Room B4 a Workshop	5.4 WATER ORIENTATED LIVING LABS AS A MEAN TO ENGAGE STAKEHOLDERS IN THE DEVELOPMENT AND DEMONSTRATION OF WATER TECHNOLOGIES
Chairs: Jens Dyrberg Niels , <i>Denmark</i> and Peter Henriksen , <i>Denmark</i>			Chairs: Jens Prismus , <i>Denmark</i>
We ask the question Why Groundwater?			The workshop presents cases and discusses WOLL's as a means to engage stakeholders to co-develop water technologies and speed up the demonstration of innovation.
Fly the groundwater helicopter and get perspective on why and how groundwater-based water supply can contribute to the Sustainable Development Goals by providing a sustainable and affordable domestic water supply.			Speakers: Jens Prismus , <i>DNNK, The Danish Climate Adaption Network (DK)</i> , Durk Krol , <i>Water Europe (BE)</i> , Beatriz Medina , <i>REWAISE (ES)</i> , Ruth McNeil , <i>Scottish Water (UK)</i> & Henrik Aspegren , <i>Sweden Water Research (SE)</i>
We offer the participants an introduction to the key steps around groundwater detection, challenges, treatment, protection, and management. You will meet leading international experts, who will inspire and showcase examples of technologies, threats and solutions that make groundwater a favourable source for water supply.			
We land safely on the ground and open up for a sparkling panel discussion, involving additional leading experts and challenging questions from the audience.			
Speakers: Jens Dyrberg Niels , <i>Envidan(DK)</i> , Peter Henriksen , <i>Aarhus University (DK)</i> , Mette Ryom , <i>Ramboll (DK)</i> , Torben Bach , Doris van Halem , <i>TU Delft (NL)</i> , Max Halkjær , <i>Ramboll (DK)</i> & Charles Niesen , <i>TREFOR (DK)</i>			
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Session 1	10:30 – 12:00		
5.9 GLOBAL MEGATRENDS AND WORKFORCE OF TOMORROW	Room B4 c Workshop	1.1 NON-REVENUE WATER — CASE STUDIES	Room B4 d Technical
Chairs: Nerea Uri Carreño , <i>Denmark</i> and Ashton Mpofo , <i>South Africa</i> The Young Water Professional organisations of Denmark and South Africa have joined forces to highlight the importance of adapting to the challenges of tomorrow. In a world café setting, young and senior water professionals will discuss future challenges and how we should adapt to the future workforce requirements. Global megatrends will be the focus of the discussions. Speakers: Nerea Uri Carreño , <i>VCS Denmark (DK)</i> & Ashton Mpofo , <i>YWP-ZA GreenCape (ZA)</i> , Anya Eilers , Inês Breda , <i>Silhorko-Eurowater A/S (DK)</i> , Nontando Vungwana , Dorottya Wágner-Zafirov , <i>DTU Chemical Engineering (DK)</i> , Lee-Ann Modley , <i>University of Johannesburg (ZA)</i> , Sibusiso Mhlongo , <i>Rand Water (ZA)</i> & Giulia Dottorini , <i>Aalborg University (DK)</i>	Chairs: Pradip Kalbar , <i>India</i> and Jacob Amengor , <i>Ghana</i> Water loss estimation and associated financial cost in water distribution networks: large scale application to the city of Patras in western Greece, Athanasios Serafeim , <i>University of Patras, Greece</i> From 54% to 15% of NRW — strategies and tools of an excellence program of Porto to increase efficiency & sustainability, Flávio Oliveira , <i>Águas e Energia do Porto, Portugal</i> Non-revenue water reduction with performance based contract — AdRA's case study, Marco Costa , <i>AdRA-Águas da Região de Aveiro, SA, Portugal</i> Application of leak detection techniques and the DMA approach to NRW management — a case study of Lilongwe City's water supply system, Kenneth Kuntambila , <i>Lilongwe Water Board, Malawi</i> ---- POSTERS ---- Adapting different measures for water loss reduction — a case study from Trondheim, Pranab Raj Dhakal , <i>Trondheim kommune, Norway</i>		
Lunch	12:00 – 13:30		
Session 2	13:30 – 15:00		
1.5 THE FUTURE OF WATER COOPERATION PROGRAMMES: HOW TO ENSURE EQUAL ACCESS TO THE BEST AVAILABLE SOLUTIONS AND TECHNOLOGY	Room B4 c Workshop	1.1 NON-REVENUE WATER MANAGEMENT IN LOW AND MIDDLE INCOME COUNTRIES — A	Room B4 d Workshop
Chairs: Jorgen Erik Larsen , <i>Denmark</i> and Moloko Raletjena , <i>South Africa</i> The session will give insights into the efficiency and successes of water cooperation programmes and give the contributors and audience an opportunity to discuss and give directions for future international partnership and programme modalities. Speakers: Jorgen Erik Larsen , <i>Danish Embassy in Pretoria South Africa (DK)</i> , Moloko Raletjena , <i>Department of Water and Sanitation (ZA)</i> , Sean Phillip , <i>Department of Water and Sanitation (ZA)</i> , Henrik Studsgaard , <i>Miljøministeriet (DK)</i> , Lotte Machon , <i>Danish Ministry of Foreign Affairs (DK)</i> , Oswald Chanda , <i>African Development Bank (CI)</i> & Pia Yasuko , <i>GRUNDFOS (DK)</i>	Chairs: Roland Liemberger , <i>Austria</i> Non-Revenue Water (NRW) management always delivers significant benefits, but many water professionals do not know where and how to start. This training will provide participants with an understanding of assessing Non-Revenue Water to develop and implement improvement plans. Workshop participants will learn how to do a first NRW assessment, what needs to be done to reduce physical and commercial losses, and how to get started. Note: Participants are encouraged to attend both parts of the workshop to get the full benefits. In Part A, the assessment of NRW will be discussed, and participants will then work together on an example of how to do a Rapid NRW assessment. Speakers: Roland Liemberger , <i>Water Loss Specialist Group (AT)</i> & Stuart Hamilton , <i>Water Loss Specialist Group Chair (UK)</i>		
Coffee Break	15:00 – 15:45		
Session 3	15:45 – 17:15		
1.22 FOSTERING INNOVATION AND PARTNERSHIPS AT UTILITY LEVEL	Room B4 c Technical	1.1 NON-REVENUE WATER MANAGEMENT IN LOW AND MIDDLE INCOME COUNTRIES — B	Room B4 d Workshop
Chairs: Stanley Liphadzi , <i>South Africa</i> and Yang Villa , <i>Philippines</i> Fostering partnerships — a collaboration between the municipality, the utility and local stakeholders on privately owned areas, Sara Kirstine Bastholm , <i>Hofor, Copenhagen, Denmark</i> Effect-based monitoring in global water safety planning, Stefab Kools , <i>KWR Water Research Institute, Netherlands</i> Successful field deployment of an arsenic treatment technology in a resource scarce region, Dana Hernandez , <i>UC Berkeley, United States</i> International exchange of knowledge between wastewater treatment plants in Buenos Aires and Copenhagen — partnerships for success, Nahuel Arce , <i>AySA S.A, Argentina</i> ---- POSTERS ---- Safe, smart systems; regulators and industry working together to unlock the first steps to a fully automated future, Fionn Boyle , <i>Anglian Water, United Kingdom</i> Great collaboration ensures high quality waterworks, Anders Refsgaard , <i>COWI A/S, Denmark</i>	Chairs: Roland Liemberger , <i>Austria</i> Non-Revenue Water (NRW) management always delivers significant benefits, but many water professionals do not know where and how to start. This training will provide participants with an understanding of assessing Non-Revenue Water to develop and implement improvement plans. Workshop participants will learn how to do a first NRW assessment, what needs to be done to reduce physical and commercial losses, and how to get started. Note: Participants are encouraged to attend both parts of the workshop to get the full benefits. In Part B, the interventions required to reduce physical and commercial losses will be discussed, and participants will then work together to develop a plan to get started on NRW reduction. Speakers: Roland Liemberger , <i>Water Loss Specialist Group (AT)</i> & Stuart Hamilton , <i>Water Loss Specialist Group Chair (UK)</i>		
Break	17:15 – 17:30		
Keynote Plenary	17:30 – 18:20		
Keynote: Learning to Dance in the Rain — How to Thrive in an Era of Climate Change, Paul O'Callaghan Panel: Ana Soares , Anna Delgado , David Flinton , Amanda Lake , Zhiyong Jason Ren , Lila Thompson			

Wednesday | Programme

Keynote Plenary		09:00 - 09:50	
Keynote: Uniting Youth for Water, Faroq Laqa Kakar Panel: Jacob Amengor , Inês Breda , Andrea Montuori , Yang Villa			
Coffee Break		09:50 - 10:30	
Session 1		10:30 - 12:00	
1.16 COVID-19 PANDEMIC SCIENTIFIC RESPONSES AT UTILITY LEVEL Chairs: Pawel Chudzinski , Poland and Annelie Hedström , Sweden Quantification of SARS-CoV-2 in wastewater as an epidemiological tool in early stages for public health surveillance, Ane López Saiz , Aigües de Barcelona, Spain The need for wastewater quality monitoring as part of wastewater-based epidemiology best practice, Andrew Engeli , Kando, Israel Wastewater-based virus surveillance as a pandemic preparedness tool — a WastPan subproject, Sami Oikarinen , Tampere University, Finland Wastewater Test Of SARS-CoV-2 Provide Early Detection Of Variants Of Concern (VOC), Simone S. Møller , Eurofins Environment Testing, Denmark ---- POSTERS ---- A cyber-physical all-hazard risk management approach: the case of the WWTP of Copenhagen, Camillo Bosco , SINTEF, Norway		Room B3 a Technical 4.4.7 THE URBAN WATER CYCLE: MONITORING AND MODELLING Chairs: Rolf Johnsen , Denmark and Timo C. Dilly , Germany Drinking water pollution event in Frederiksberg Denmark, quickly located with hydraulic aqis online network model, Jesper Jorgensen , NIRAS A/S, Denmark Development and implementation of a large-scale real time control system: the Rotterdam case study, Jeroen Langeveld , TU Delft, Netherlands What is the socio-economic cost of sewer infiltration-inflows?, Anna Ohlin , Chalmers University of Technology, Sweden ---- POSTERS ---- Field measurements for surface permeability for permeable asphalt: the effects of site design and maintenance techniques, Jan Støvring , University of Copenhagen, Denmark The Three Points Approach (3PA) applied as rainfall depth to two Chinese and four European cities for comparison of stormwater challenges and strategies, Chris Zevenbergen , UN-IHE, Denmark Assessment Of Groundwater Level Fluctuation Trends In Grootfontein Dolomite Aquifer, North West Province, South Africa, Hulisani Rananga , Department of Water and Sanita, South Africa	
Lunch		12:00 - 13:30	
Session 2		13:30 - 15:00	
1.17 COVID-19 PANDEMIC IMPACTS AND CASE STUDIES AT UTILITY LEVEL Chairs: Banu Örmeci , Canada and Mohammad Azari , Germany Wastewater surveillance for SARS-CoV-2 in Copenhagen — an evaluation of decentralized wastewater sampling, Jes Clauson-Kaas , Hofor A/S, Denmark Rethinking risk management: how Covid-19 highlighted existing vulnerabilities in the UK water sector, Sarah Cotterill , University College Dublin, Ireland Survival factors and managerial decisions in the face of a pandemic in water utilities in Peru and Poland, Pawel Chudzinski , Aquanet, Poland Investigation of Corona viruses in wastewater in Iran, Ali Rostamiiranagh , Water and Wastewater Company East Azarbaijan Province @ Azarbaijan Shahid Madani University, Iran		Room B3 a Technical 4.4.10 DIGITAL WATER CITIES Chairs: Dragan Savic , Netherlands and Ziling Zang , United Kingdom OpenH2odata: an open high-resolution residential water use dataset with ground truth end-use labels, Andrea Cominola , Technische Universität Berlin, Germany PyNIWM: An open-source Python toolbox for machine learning-based water end use classification, Marie-Philine Becker , Technische Universität Berlin, Germany A toolchain for the data-driven decision support in waste water networks — a level-based approach, Krisztian Mark Balla , Grundfos Holding A/S, Denmark Machine-learning for anomaly detection and aided data cleaning for water level sensors in urban drainage systems, Phillip Aarestrup , Dryp, Denmark ---- POSTERS ---- Digitalized stormwater management approach, Lene Stolpe Meyer , Frederiksberg Kommune, Denmark	
Coffee Break		15:00 - 15:45	
Session 3		15:45 - 17:15	
1.15 MANAGEMENT OF EXTREME EVENTS Chairs: Bruno Nguyen , France and Varsha Sivagurunathan , Australia Consideration of individual decision-making under uncertainty such as heavy rainfall when creating effective action strategies, Mirjam Lawens , Mainz University of Applied Sciences, Germany Four measures to rebuild an ecologically liveable city, and the role of the integrated PGS in river environment improvement, Thomas Bille Bohn , Grundfos Pumps (Shanghai) Co., Ltd, Denmark and Mick Eriksen , Grundfos Pumps (Shanghai) Co., Ltd, Denmark Extreme events — key lessons from recent events & recovery challenges, Alexandra Cristóvão , EPAL, Portugal Integrated modelling of the clogging processes of plastic grid permeable pavement, Ziling Zang , Cranfield University, United Kingdom ---- POSTERS ---- Risk analysis of water-sanitation-public health nexus facing flood events in a Brazilian megacity, Maria Tereza Pepe Razzolini , University of Sao Paulo, Brazil Renewal of the Nakagawa-Nijuku water pipe bridge with consideration for risks of storm and flood, Yoriko Doi , Bureau of Waterworks, Tokyo Metropolitan Government, Japan		Room B3 a Technical 4.4.11 NATURE-BASED SOLUTIONS, SPONGE CITIES AND BLUE-GREEN INFRASTRUCTURE Chairs: Pedro Carvalho , Denmark and Deyvid Wavel Barreto Rosa , Brazil Prioritising nature-based solutions in urban catchments, Jarrod Luxton , Ramboll, Finland Missing link — when the waters meet in the city suggesting catchment neighbourhood as a method for engaging diverse stakeholders in holistic waterwise climate adaptation and urban development, Katrina Wiberg , Aarhus School of Architecture, Denmark Using green and blue infrastructure to urban flood mitigation: simulating scenarios for GBI technologies and land policy, Nilo Nascimento , Federal University of Minas Gerais, Brazil The Green Valley Park in Tongzhou, making a sponge city more liveable, Jes Clauson-Kaas , HOFOR, Copenhagen, Denmark ---- POSTERS ---- Realising local green infrastructure opportunities: stormwater harvesting in public parks and open spaces in Delhi, Dhruv Pasricha , Centre for Science and Environment (CSE), India Modernisation of recreational park Enghaveparken helps mitigate flooding in Copenhagen, Annie Fuursted , COWI A/S, Denmark	
Break		17:15 - 17:30	
Keynote Plenary		17:30 - 18:20	
Keynote: Learning to Dance in the Rain — How to Thrive in an Era of Climate Change, Paul O'Callaghan Panel: Ana Soares , Anna Delgado , David Flinton , Amanda Lake , Zhiyong Jason Ren , Lila Thompson			

Keynote Plenary	09:00 - 09:50		
Keynote: Uniting Youth for Water, Farokh Laqa Kakar Panel: Jacob Amengor , Inês Breda , Andrea Montuori , Yang Villa			
Coffee Break	09:50 - 10:30		
Session 1	10:30 - 12:00		
4.10 SYSTEMIC MANAGEMENT FOR WATER WISE CITIES — SCANDINAVIAN EXPERIENCES	Room B3 c Workshop	1.4 DIGITAL WATER: BENEFITS AND RETURN ON EXPERIENCE FOR THE WATER SECTOR	Room B3 d Workshop
Chairs: Henrik Aspegren , <i>Sweden</i> Water issues need to be better integrated into urban strategic management and planning. The purpose of this session is to highlight these issues by exploring progress and challenges in major cities in three neighbouring countries. Speakers: Henrik Aspegren , <i>Sweden Water Research (SE)</i> , Bent Christen Braskerud , <i>City of Oslo Water and Sewerage Works (NO)</i> , Lena Blom , <i>City of Gothenburg (SE)</i> , Lykke Leonardsen , <i>City of Copenhagen (DK)</i> & Rasmus Fredriksson , <i>Environmental Dept, City of Malmö (SE)</i>		Chairs: Nico Caradot , <i>Germany</i> and Samuela Guida , <i>United Kingdom</i> The workshop will provide direct feedback on the most recent outcomes of digital water projects to a wide range of stakeholders interested in discussing the current challenges of digitalization in the water sector. In particular, it will focus on quantifying the benefits obtained by utilities in implementing innovative digital solutions. Speakers: Nico Caradot , <i>Kompetenzzentrum Wasser Berlin (DE)</i> , Samuela Guida , <i>IWA (UK)</i> , Dragan Savic , <i>KWR Water Research Institute (NL)</i> , Dan Angelescu , <i>Fluidion (CA)</i> , Regina Gnirss , <i>Berliner Wasserbetriebe (DE)</i> , Alex van der Helm , <i>Waternet (NL)</i> , Nikolette Xanthopoulou , Elena Rumenova & Apostolos Tzimas , <i>EMVIS Water Resources Management (GR)</i>	
Lunch	12:00 - 13:30		
Session 2	13:30 - 15:00		
4.6 WATER FOR SMART LIVEABLE CITIES	Room B3 c Workshop	2.2.2-1 ENERGY EFFICIENCY AND RECOVERY — GROUP 1	Room B3 d Technical
Chairs: Peter Steen Mikkelsen , <i>Denmark</i> and Miriam Feilberg , <i>Denmark</i> A discussion of how the water sector can connect to the broader smart cities agenda may contribute to making the sector more efficient, innovative, and sustainable and guide development towards resilient, healthy, and green liveable cities that are able to provide clean drinking water, efficient sanitation, and safe stormwater management. We will examine how, using global examples, a water smart city can become a cornerstone of the green transition and a low-carbon economy. We will learn from different international approaches to avoid replicating mistakes and specifically discuss innovation needs. The workshop is based on the Water for Smart Liveable Cities Workshop held in Tokyo in 2018 on: - Speeding up implementation of the SDGs - Partnerships with industries and stakeholders in the cities - The contribution of digitalization to making cities smarter, more liveable and contributing to action on SDGs Speakers: Peter Steen Mikkelsen , <i>Technical University of Denmark (DK)</i> , Miriam Feilberg , <i>DANVA (DL)</i> , Dragan Savic , <i>KWR (NL)</i> & Emma Weisbord , <i>Royal HaskoningDHV (NL)</i>		Chairs: Julian Sandino , <i>United States</i> and Chelsea Hayward , <i>Australia</i> Modelling treatment processes and integrated systems: real time decision making, Ian Rodgers , <i>Xylem Inc, United Arab Emirates</i> Circular economy in full scale, Dines Thornberg , <i>BIOFOS, Denmark</i> Using a simple balancing tool to estimate operational changes for a transformation to anaerobic digestion with co-digestion on a large WWTP in China, Verena Hilgenfeldt , <i>University of Kaiserslautern, Germany</i> Demonstration of a more stable mainstream short-cut nitrogen removal process at pilot-scale with improved control strategies, Haoran Duan , <i>The University of Queensland, Australia</i> ---- POSTERS ---- Reduced global warming potential from a wastewater treatment plant by wisely use of chemistry, Bengt Hansen , <i>Kemira, Sweden</i>	
Coffee Break	15:00 - 15:45		
Session 3	15:45 - 17:15		
4.1 ASSESSING PROJECT IMPACTS ON ALL SDGS WITH THE WATER4ALLSDGS APP	Room B3 c Training	2.2.2-2 ENERGY EFFICIENCY AND RECOVERY — GROUP 2	Room B3 d Technical
Chairs: Gerard Payen , <i>France</i> and Corinne Trommsdorf , <i>France</i> Come with your laptop to learn how to use the digital app "Water4allSDGs"! Despite their concrete characteristics, SDGs are still very little used by water and sanitation professionals, who often lack the time to discover and analyse all the details of the 169 SDG targets. The easy-to-use digital app "Water4allSDGs" makes up for the complexity by using basic concepts well-known in the sector, thus creating a breakthrough in the operational use of the SDGs. In the first part of the session, participants will be updated on the 20 global targets related to water and sanitation and their precise operational content. In a second part, they will learn how to use the Water4allSDGs web application on their laptops. This practical training does not require any previous knowledge of the SDGs. Case studies will illustrate how the SDG targets are precise and concrete. At the end of the session, participants will understand the operational value of the SDGs to support planning and evaluation of water related projects. Speakers: Gerard Payen , <i>French Water Partnership (FR)</i> & Corinne Trommsdorf , <i>Water-cities (FR)</i>		Chairs: Norbert Järdin , <i>Germany</i> and Chris Hertle , <i>Australia</i> SENTRY: Real time microbial performance monitoring for energy optimisation in wastewater treatment, Natalie Lamb , <i>QCL (QuadraChem Laboratories), United Kingdom</i> Investigating the feasibility of applying an integrated FO - UasB process for energy recovery from municipal wastewater, Stavroula Kappa , <i>National Technical University of Athens, Greece</i> Optimization of reactor start-up strategy for selecting hydrogen-producing microorganisms in cheese whey dark fermentation, Isabela Augusto , <i>São Carlos School of Engineering, São Paulo University (EESC/USP), Brazil</i> Commercial application of hydrothermal liquefaction for sewage sludge management with resource recovery, Ib Johannsen , <i>Circlia Nordic Aps, Denmark</i> ---- POSTERS ---- Thermophilic anaerobic digestion of whey in sequencing batch reactors: process optimization and comparison between single and two-stage systems, Giovanna Lovato , <i>São Carlos School of Engineering, São Paulo University (EESC/USP), Brazil</i> Mainstream Microaerobic Nitrogen Removal: Carbon Redirection, Anammox Contribution And Aeration Optimization, Mohammad Azari , <i>Karlsruhe Institute of Technology (KIT), Germany</i>	
Break	17:15 - 17:30		
Keynote Plenary	17:30 - 18:20		
Keynote: Learning to Dance in the Rain — How to Thrive in an Era of Climate Change, Paul O'Callaghan Panel: Ana Soares , Anna Delgado , David Flinton , Amanda Lake , Zhiyong Jason Ren , Lila Thompson			

Wednesday | Programme

Keynote Plenary	09:00 - 09:50		
Keynote: Uniting Youth for Water, Farokh Laqa Kakar Panel: Jacob Amengor , Inês Breda , Andrea Montuori , Yang Villa			
Coffee Break	09:50 - 10:30		
Session 1	10:30 - 12:00		
2.2.3-1 RECOVERY OF NUTRIENT AND CHEMICALS — GROUP 1	Room B3 e Technical	6.8 WATER RESOURCE MANAGEMENT AND ADAPTATION TO CLIMATE CHANGE IMPACTS	Room B3 f Technical
<p>Chairs: Norbert Jardin, <i>Germany</i> and Jungbin Kim, <i>Korea</i></p> <p>Hydrothermal liquefaction as a technology for carbon and nutrient recovery from sewage sludge, Patrick Biller, <i>Aarhus University, Denmark</i></p> <p>Evolution of alternative fertilizers: from resource recovery in WWTPs to biorefineries (WRRFs) producing smart biofertilizers, Alvaro Pillado, <i>Cetaqua, Spain</i></p> <p>Implications of fundamental aspects of purple phototrophic bacteria for process upscaling, Gabriel Capson-Tojo, <i>INRAE, France</i></p> <p>Ash2®Phos: closing the phosphorus cycle: value added recycling from incinerated sewage sludge, Yariv Cohen, <i>EasyMining Services Sweden AB, Sweden</i></p> <p>---- POSTERS ----</p> <p>Acetate and ammonia recovery and enrichment from wastewater intended for single cell protein (SCP) production by electrodiagnosis-forward osmosis (ED-FO), Danfei Zeng, <i>Technical University of Denmark, Denmark</i></p> <p>Valorisation of brines for on-site production of disinfectants, Ignacio Casals, <i>CETAQUA, Spain</i></p>		<p>Chairs: Maryam Imani, <i>United Kingdom</i> and Thomani Manungufala, <i>South Africa</i></p> <p>Pumped storage hydro power down under — the antipodean energy transition, Mike Westerman, <i>GHD, Australia</i></p> <p>A new digital twin for climate change adaptation, water management and disaster risk reduction (DK-model HIP), Hans Jørgen Henriksen, <i>Geological Survey of Denmark and Greenland GEUS, Denmark</i></p> <p>Declining groundwater levels: a challenge for the drinking water supply in northern Germany, Agnes Sachse, <i>Christian-Albrechts-Universität zu Kiel, Germany</i></p> <p>LIFE GREENADAPT — Nature-based solutions for climate change resilient waste infrastructures: a focus on landfill leachate and rainwater run-off, Luz Herrero Castilla, <i>AIMEN Technology Centre, Spain</i></p> <p>---- POSTERS ----</p> <p>Integration of UasB and vertical flow constructed wetlands to produce reclaimed water for irrigation, Taxiarchis Seintos, <i>National Technical University of Athens, Greece</i></p> <p>National N₂O mapping and reduction of N₂O-emission from fornaes WWTP through advanced online-control, Ellen Marie Drastrup, <i>Krøger A/S, Denmark</i></p>	
Lunch	12:00 - 13:30		
Session 2	13:30 - 15:00		
2.2.3-2 RECOVERY OF NUTRIENT AND CHEMICALS — GROUP 2	Room B3 e Technical	6.9 CATCHMENT MANAGEMENT AND NATURAL CAPITAL APPROACHES ON DIFFERENT SCALES	Room B3 f Technical
<p>Chairs: Sudhir Pillay, <i>South Africa</i> and Ana Soares, <i>United Kingdom</i></p> <p>Implementing alkaline urine dehydration in Sweden, Finland, and France: lessons learnt, experiences and the way forward in technology upscaling, Natnael Demissie, <i>Swedish University of Agricultural Sciences, Sweden</i></p> <p>Nutrient recovery from wastewater using forward osmosis: from lab to pilot scale, Maria Salud Camilleri-Rumbau, <i>Aquaporin A/S, Denmark</i></p> <p>Reagent recovery from dairy industry wastewater through membrane processes, Rubén Rodríguez-Alegre, <i>Leitat Technological Center, Spain</i></p> <p>Large-scale biopolymer extraction from aerobic granular sludge: first results of Kaumera Nereda gum extraction and application from industrial and municipal wastewater, Sjoerd Kerstens, <i>Royal HaskoningDHV, Netherlands</i></p> <p>---- POSTERS ----</p> <p>Cost effective phosphorus recovery from biological wastewater treatment, Morten Christensen, <i>Aalborg University, Denmark</i></p> <p>Assessing the significance of heavy metals, pesticides and other contaminants in products recovered from water resource recovery facilities, Juan Antonio Baeza, <i>Universitat Autònoma Barcelona, Spain</i></p>		<p>Chairs: Katharine Cross, <i>Australia</i> and Shagun Chaudhary, <i>India</i></p> <p>Improvement of stormwater retention pond performance for the treatment of highway runoff using floating treatment wetlands, Jan Ruppelt, <i>Ruhrverband, Germany</i></p> <p>Consideration of climate change-induced droughts and sustainable water use in preparation of sectoral water allocation plans (SWAPs) in Turkey, Elif Erdem, <i>Turkey, Ministry of Agriculture and Forestry, General Directorate of Water Management, Turkey</i></p> <p>Importance of economic diversification for sustainable agricultural basin development under uncertain future climate and economic conditions, Saravanamuthu Vigneswaran, <i>University of Technology Sydney, Australia</i></p> <p>The human right to water in Argentina: courts vs. constitution, Rachel Wagner, <i>Tufts University, United States</i></p> <p>---- POSTERS ----</p> <p>In-situ Treatment of the polluted Pinheiros River in Sao Paulo, Brazil. Wastewater oxygenation and treatment strategies in urban environments, Tyler Elm, <i>ChartWater / BlueinGreen LLC, United States</i></p> <p>Assessing the limnological characteristics of a man-made urban lake pre, during and post artificial aeration, Ndomupei Masawi, <i>SRK Consulting (Pty) Ltd, South Africa</i></p>	
Coffee Break	15:00 - 15:45		
Session 3	15:45 - 17:15		
2.2.3-3 RECOVERY OF NUTRIENT AND CHEMICALS — GROUP 3	Room B3 e Technical	6.10 HOLISTIC ASSESSMENTS AND APPROACHES	Room B3 f Technical
<p>Chairs: Jacek Makinia, <i>Poland</i> and Ashton Busani, <i>South Africa</i></p> <p>From urban biowaste to animal feed — production of single cell protein from biogas, Jacob Andersen, <i>EnviDan, Denmark</i></p> <p>Study on ammonia generation from digested sludge by subcritical water treatment, Takahiro Kato, <i>SHIMIZU Corporation, Japan</i></p> <p>Towards a sustainable biorefinery: integrated treatment of the liquid fraction of digestate from the organic fraction of municipal solid waste, Caroline Sielfeld, <i>Eurecat, Spain</i></p> <p>Addressing the identity crisis for water biofilm exopolymers, Thomas Seviour, <i>Department of Biological and Chemical Engineering, Aarhus University, Denmark</i></p> <p>---- POSTERS ----</p> <p>Influence of nitrogen supply on a microalgae-bacteria consortium treating wastewater, Julie Farinacci, <i>Université de Strasbourg, France</i></p> <p>Microalgal-bacterial biofilm-based systems to recover nitrogen and optimize biomass production, Paula Peixoto Assemany, <i>Federal University of Lavras, Brazil</i></p>		<p>Chairs: Esther Shaylor, <i>Denmark</i> and Danish D R, <i>India</i></p> <p>Embedding SDGs into water research agendas for contextualised understanding and impactful innovation, Doris van Halem, <i>Delft University of Technology, Netherlands</i></p> <p>Assessing impacts on all SDGs of water and sanitation projects and policies by using the Water4allSDGs Methodology, Gérard Payen, <i>French Water Partnership, France</i></p> <p>Setting SDG 6 in a national context by identifying policy relevant indicators and options for action for Austria, Verena Germann, <i>University of Natural Resources and Life Sciences, Vienna, Austria</i></p> <p>Private sector approaches to SDG #6; strategy development for social entrepreneurship in established companies, Pia Rask, <i>Grundfos Ltd, Denmark</i></p> <p>---- POSTERS ----</p> <p>Using deep learning to combine satellite observations, topographic information and rainfall spatial data for large-scale flood predictions, Roland Loewe, <i>Technical University of Denmark, Denmark</i></p> <p>The Freshman Project: extraction of brackish groundwater in the coastal dunes of the Netherlands to secure drinking water supply, Gertjan Zwolsman, <i>Dunea, Netherlands</i></p>	
Break	17:15 - 17:30		
Keynote Plenary	17:30 - 18:20		
Keynote: Learning to Dance in the Rain — How to Thrive in an Era of Climate Change, Paul O'Callaghan Panel: Ana Soares , Anna Delgado , David Flinton , Amanda Lake , Zhiyong Jason Ren , Lila Thompson			

Keynote Plenary	09:00 - 09:50	
Coffee Break	09:50 - 10:30	
Session 1	10:30 - 12:00	
1.1 THE ROAD TOWARDS CLIMATE AND ENERGY NEUTRAL WATER UTILITIES		Room B3 g Workshop
<p>Chairs: Pär Dalhielm, Sweden and Marie Sagen, Norway</p> <p>We will share lessons from leading water utilities in a number of countries on steps taken to be energy efficient, recover energy and later become climate neutral. Based on global lessons learned, we will discuss key principles for a climate neutral water sector.</p> <p>Speakers: Pär Dalhielm, Swedish Water and Wastewater Association (SE), Marie Sagen, Bergen Water (NO), Miriam Feilberg, DANVA (DK), Jacob Kragh Andersen, EnviDan A/S (DK), Amanda Lake, Jacobs (UK), Corinne Trommsdorf, Water Cities (FR), Felipe Andres Sanchez Ihl, Aguas Andinas (CL), Sara Ekström, VA SYD (SE), Anna Kuokkanen, Helsinki Region Environmental Services Authority HSY (FI), Natalie Adamczyk, Bergen Water (NO), Kees Roest, KWR Water Research Institute (NL) & Morten Rebsdorf, Aarhus Vand A/S (DK)</p>		
Lunch	12:00 - 13:30	
Session 2	13:30 - 15:00	
1.1 WATER EFFICIENCY: THE FASTEST, CHEAPEST, LARGEST SOURCE OF NEW WATER		Room B3 g Workshop
<p>Chairs: Stuart White, Australia</p> <p>The purpose of the session is to promote and make progress against Goal 6.4 of the Sustainable Development Goals and to emphasise and share experience of the potential benefits of focusing on the demand side of the water supply-demand planning process, and in particular customer water efficiency.</p> <p>Speakers: Stuart White, Institute for Sustainable Futures, UTS(AU), Shannon Spurlock, Ochotona LLC (US) & Aaron Burton, Landscape Institute (UK)</p>		
Coffee Break	15:00 - 15:45	
Session 3	15:45 - 17:15	
1.2 SUSTAINABLE SMALL WASTEWATER TREATMENT PLANTS: PRESENT, FUTURE, OPPORTUNITIES AND CHALLENGES		Room B3 g Workshop
<p>Chairs: Zouhayr Arbib, Spain and Carlos Arias, Denmark</p> <p>Economically and environmentally sustainable wastewater treatment (WWT) for small communities remains a challenge all over the world, especially in countries with significant numbers of small and scattered settlements. Water and resource recovery must be tackled efficiently to prevent water scarcity and avoid high operation and maintenance costs.</p> <p>Conventional WWT implies processes with high costs and energy demand. A change of paradigm at the small scale is essential, where low cost, simple maintenance, and efficiency are the major principles within a decentralised approach.</p> <p>The workshop will create a framework for scientists and practitioners to exchange knowledge about the different alternatives to WWT in small communities. The workshop will support sustainable water management, resource recovery and the mitigation of global climate change.</p> <p>Speakers: Zouhayr Arbib, Aqualia (ES), Carlos Arias, Aarhus University (DK), Hans Brix, Mirko Hänel, Alain Petitjean, Laila Mandi, Katharine Cross, Australian Water Partnership (AU)</p>		
Break	17:15 - 17:30	
Keynote Plenary	17:30 - 18:20	

Keynote Plenary

09:00 - 09:50

BUSINESS FORUM ROOM 1 (HALL E)

11:15 — 12:00 | BENTLEY

How the digital twin journey helps water utilities become more resilient - regulatory, financially and operationally

We aim to tackle the key challenges and discuss solutions in the digital transformation journey of the water utilities sector. We will explain the different maturity levels in this transformation journey. Every utility can embrace digital twins in different forms and generate immediate benefits or business outcomes.

- *Slavco Velickov, Thomas Krom, Dennis Nygaard Hoyer*

12:15 — 13:00 | DENMARK PAVILION

The road towards a climate and energy neutral water sector

The water and wastewater sector uses 4 % of all electricity globally. The Danish government have set the goal that Denmark's water sector shall be climate and energy neutral by 2030. This seminar presents some of the key technologies, making this possible as well as an estimation of the global emission reduction effect by implementing these concepts globally

- *John Buur Christiansen, CEO, BIOFOS*
 - *Mads Peter Philipsen Warming, Global Head, Water & Waste Water, Danfoss Power Electronics A/S*
 - *Jeanette Agertved Madsen, Head of R&D, Waste water, Envidan A/S*
 - *Morten Riis, Group Director, Grundfos Holding A/S*

13:30 — 14:15 | GRUNDFOS

Building a strong decentralised water treatment platform

Industrial water treatment is an important and necessary part in solving global water challenges via intelligent and efficient water management and water reuse. Grundfos is creating a strong water treatment platform, enabling direct treatment of water at end-users. Advancing further requires partnerships to leverage combined capabilities and save water resources.

14:15 — 15:00 | ALLENGRA

Benefit of Ultrasonic flow metering in Water systems

We all see the value of water growing. Reducing water consumption and elimination of leakages, while keeping high hygienic standards, is nowadays mandatory. Monitoring of water flows is the starting point for reducing consumption. Simple but robust Ultrasonic Flow Meters could a reliable and clean game changer in that domain.

- *Magnus Manderbach (Director Marketing and Sales)*

15:45 — 16:30 | CLEAN

Meet the buyer: Better Carbon and Phosphor recycling

The Danish SME AquaGreen has found a way to remove harmful and unwanted compounds through a pyrolyse process and, extract phosphor from sludge into biochar. You are invited to hear their results through the Danish-German innovations project, NEPTUN and give them feedback on how to improve their product.

- *CLEAN*

16:30 — 17:15 | CLEAN

Meet the World's leading water clusters

Meet the world's leading water clusters and see how cleantech clusters collaborate and facilitate the acceleration of innovative water technologies across the globe! The session will showcase how the international network connect innovative solutions and how international and cross-sector collaboration is essential to sustainable water use in the future.

- *ICN*

BUSINESS FORUM ROOM 2 (HALL C)

10:30 — 11:15 | IIT ROORKEE

Indian Institute of Technology Roorkee

Indian Institute of Technology Roorkee being the first engineering institution in India established in 1847 is playing a vital role in providing water resources related technical manpower and know-how to a large number of countries in Asia and Africa. Specialised departments Water Resources, Hydrology, Hydro Energy and Earth Sciences in addition to Civil Engineering with specialization in hydraulic and environmental engineering offer unique master and Ph.D. Programmes. Institute undertakes studies related to drinking water, irrigation, floods, droughts, erosion, siltation, sanitation, hydropower, pollution etc

11:15 — 12:00 | XYLEM

Road to Net Zero

Net Zero target for wastewater treatment plants is becoming a strategic outcome for large water Utilities across EU. Xylem Is a major partner in developing the roadmap to meet these ambitious goals. Water Utilities will express their core strategic goal and challenges in their implementation.

- *Alexis de Kerchove, Sr. Director, Business Development-Marketing*

12:15 — 13:00 | INNOVATION PAVILION

What's Hot at the Innovation Pavilion

Isle Utilities proudly presents "What's Hot?" in a round-up of technology pitches delivered in a dolphin-tank and interactive format. The Innovation Pavilion showcases exciting emerging technologies (start-ups and scale-ups) that are seeking their way into the global water industry and has been made possible by the generous support of Grundfos FutureLab, Royal HaskoningDHV and IoTa.

- *Dr Michael Storey, Managing Director, Isle Utilities Asia-Pacific*
 - *Yang Villa, Head of the Philippines, Isle Utilities Asia-Pacific*
 - *Technology pitches by AppOrchid, Aqua Metrology, AquaReal Time, Card Technologies, Fluidion, HAL24K Water, Techion and Watura.*

13:30 — 14:15 | HACH

Hach Global Company – Ensuring water quality for people around the world

We ensure water quality and make water analysis better - faster, simpler, greener, and more informative for our customers to "Be Right". As part of Danaher, we reach globally in Manufacturing, Engineering, Sales and Service. Hach offers a complete portfolio of solutions from Laboratory/Field, to Process/Online, to Software/Information and Service/Support.

- *Bart Verdonk - Vadim Malkov*

14:15 — 15:00 | SUEZ

Reuse to tackle water scarcity - the experience of Suez in Qatar, Mexico and Australia

With climate change reuse appears to be a good approach to decrease water stress by reducing the need of potable water, keeping it for domestic usage, bringing security of water supply for agriculture when water restrictions are required. Through aquifer replenishment it increases the resource. Finally it decreases use conflicts due to scarcity.

- *Yvan Treal - Development Director – Suez TI*

15:45 — 16:30 | VEOLIA

Optimizing of wastewater treatment plants

With the cloud-based Hubgrade system developed by Veolia we have at +100 plants achieved 20 to 40% reduction in energy and chemical use and furthermore enhanced nitrogen removal using the same process volumes. Cases from plants in Italy, Denmark, France and Lithuania will be presented.

Keynote Plenary

17:30 - 18:20