Tuesday, 13 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
### Programme

**Tuesday**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tr>
<td>09:50 - 10:30</td>
<td>Coffee Break</td>
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<tr>
<td>10:30 - 12:00</td>
<td>Session 1</td>
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<tr>
<td>Room A2</td>
<td>Utility Leaders Forum I — Water Utilities as Community Leaders — Creating Integrated Water Management for Cities of the Future</td>
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<td></td>
<td>Chair: Hamanth Kasan, IWA Vice President</td>
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<td></td>
<td>Igniting talks: Diane Taniguchi-Dennis, CEO, Clean Water Services, Hillsboro, Oregon, Dr. Eng. Silver Mugisha, MD National Water &amp; Sewerage Corporation, Uganda, William Fernandes, Director, Toronto Water, Canada, Claudia Castell-Enner, President, Eureau, Brussels, Belgium</td>
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<td>Panel discussion facilitator: Ed McCormick, Chair of IWA SC Utility Engagement Group</td>
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<tr>
<td>Room A3</td>
<td>Jury Forum for Industrial Water Users I — Perspectives on Water Stewardship</td>
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<td>Through better water management, many industries can not only reduce their environmental impact and meet societal demands for clean water, but also improve process performance and ultimately reduce costs. The Forum for Industrial Water Users was formed to exchange ideas and approaches for industries to mitigate and overcome water-related challenges in a sustainable manner.</td>
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<tr>
<td>12:00 - 13:30</td>
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<td>13:30 - 15:00</td>
<td>Session 2</td>
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<td>Room A2</td>
<td>Utility Leaders Forum II — Accelerating Adoption of Innovation</td>
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<td>Chair: Jonathan Clement, IWA LET Chair</td>
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<td></td>
<td>Igniting talks: Claus Homann, CSO/COO, Aarhus Water, Denmark, Chris Rockey, Director South West Water, UK, Bernard Koh, Assistant CE, PUB Singapore, Dr Asma El Kasmi, Director Cooperation and Communication, ONEW, Morocco, Rik Thijsen, Director Business Development &amp; Innovation, Vitens NL</td>
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<td>Roundtables and panel discussion facilitator: Helle Katrine Andersen, CDO DANVA</td>
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<tr>
<td>Room A3</td>
<td>Forum for Industrial Water Users II — Incentivising Sustainability: From SDGs to Regulation &amp; Sustainable Tools and Applications</td>
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<td>15:00 - 15:45</td>
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<td>15:45 - 17:15</td>
<td>Session 3</td>
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<td>Room A2</td>
<td>Utility Leaders Forum III — Evolving with Climate Change</td>
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<td>Chair: Shaunnia Berendse, Head of Innovation Engagement, Anglian Water</td>
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<td>Igniting talks: Simon Parsons, Director, Scottish Water, United Kingdom, Pat McCafferty, MD, Yorba Valley Water, Australia, Dan Naidoo, Regional Manager of Umgeni Waterboard, KwaZulu Natal, South Africa and chair of WISA Water Institute of Southern Africa, Brian Hansen, Head of Planning, Utility of Greater Copenhagen, Denmark, Matt Collins, Assistant GM, Moulton Niguel Water District, California, United States, Garis Villa-Landa Sokolova, Head of International Affairs, AEAS, Spain</td>
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<td>Roundtables and panel discussion facilitator: Miriam Feilberg, Head of Climate, DANVA</td>
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<tr>
<td>Room A3</td>
<td>Forum for Industrial Water Users III — Table-top Group Discussions of Issues Pertaining to and Associated with the Panels Earlier in the Day</td>
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<td>17:15 - 17:30</td>
<td>Break</td>
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<td>17:30 - 18:20</td>
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</tbody>
</table>
### Keynote Plenary 09:00 - 09:50

**Keynote:** Empowering Communities to Shape Sustainable Water Solutions — Incorporating Indigenous Knowledge, **Dawn Martin-Hill**  
Panel: Tom Mollenkopf, Louise Dudley, Liby T. Johnson, Bradley Moggridge, Tanja Nielsen

### Coffee Break 09:50 - 10:30

### Session 1 10:30 - 11:15

**Panel:** Corinne Cheeseman, Pernille Ingildsen, Ramón Dolz Molía, HP Nanda & Enrique Cabrera Rochera

**Oliver Grievson**

**Keynote Plenary 11:30 - 12:20**

### Coffee Break 12:00 - 12:30

### Lunch 12:00 - 13:30

### Session 2 13:30 - 15:00

**Chair:** Emily Ryan, Australia

The Emerging Water Leaders Forum is an open platform for young and emerging water leaders to work with peers to start planning for the future of the water sector that they will lead. The topic of this year’s Forum is Challenges in the Water Sector and How to Make an Impact as a Young Water Professional (YWP). Participants are invited to discuss and design solutions among their peers to address big challenges in the water sector across their region.

**Chair:** Emily Ryan  
Australia

**Lunch**  
12:00 - 13:30

### Session 3 15:00 - 16:45

**Chair:** Lykke Leonardsen, Denmark

The purpose of this session is to present the results and work of the global partnership between C40 Cities and Grundfos and to introduce the participants to how active partnerships can lead to focused action that can accelerate the work in cities. It will also discuss the complexity of water management in cities and the importance of involving all stakeholders in policy planning, implementation, and financing. The session will: 1. Present the results from Water Safe Cities and 2. Introduce Water Safe Cities II

**Speakers:** Lykke Leonardsen, Resilient and Sustainable City Solutions (DK), Daniela Bemfica, IWA (UK), Kevin Austin, C40 (UK), Rohit Aggarwala & Daryl Johnston

**Break**  
15:00 - 15:45

### Keynote Plenary 17:00 - 17:50

**Keynote:** Digital Water Unpacked, **Oliver Grievson & Enrique Cabrera Rochera**  
Panel: Corinne Cheeseman, Pernille Ingildsen, Ramón Dolz Molía, HP Nanda

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**Room C0**

**Session 3**  
15:00 - 17:15

**Room C1**

**Sanitation**

**Room C2**

**Forum**

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**WATER SAFE CITIES**

**Chair:** Lykke Leonardsen, Denmark

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**Break**  
17:15 - 17:30

### Keynote Plenary 17:30 - 18:20

**Keynote:** Digital Water Unpacked, **Oliver Grievson & Enrique Cabrera Rochera**  
Panel: Corinne Cheeseman, Pernille Ingildsen, Ramón Dolz Molía, HP Nanda
Tuesday  |  Programme

Keynote Plenary  
09:00 - 09:50
Keynote: Empowering Communities to Shape Sustainable Water Solutions — Incorporating Indigenous Knowledge, Dawn Martin-Hill  
Panel: Tom Mollenkopf, Louise Dudley, Lilly T. Johnson, Bradley Moggridge, Tanja Nielsen

Coffee Break  
09:50 - 10:30

Session 1  
10:30 - 12:00

5.3 | PUTTING CROSS BORDER COLLABORATION INTO PRACTICE

**Chair:** Elena Torfs, Belgium and Borja Valverde-Pérez, Denmark

The purpose of this session is to discuss the value of working across borders between utilities, to provide evidence of what has been achieved through the coalition set up between Anglian Water, Global Omnium and Vitens; and to develop strategies that others can use to establish coalitions.

A focus of the workshop will be mapping priorities between companies as well as implementing the use of a matrix to discover relative strengths and weaknesses between those involved, which can then be used as the basis to target the sharing of knowledge, skills, and expertise between utilities.

The ideal output from this workshop would be the commitment of other utilities across the world to establish their own coalitions, which could then target another strategic area of utility management and become part of a larger framework of delivery and dissemination of knowledge.

**Speakers:** Fionn Boyle, Anglian Water (UK) & Jan Gooolier, Vitens N.V. (NL), Andrew Smith, Anglian Water Services (UK), Rik Thijssen, Vitens N.V. (NL), Joulke Keuning & Jaime Castillo Soria, Global Omnium (ES)

Lunch  
12:00 - 13:30

Session 2  
13:30 - 15:30

1.4 | DEVELOPING CONSENSUS AND GOOD PRACTICES FOR DIGITAL TWIN APPLICATIONS — A

**Chair:** Elena Torfs, Belgium and Borja Valverde-Pérez, Denmark

The workshop brings together water professionals from different backgrounds (academics, utilities, etc.) and sectors (wastewater, urban drainage, drinking water, etc.) to build consensus on the state-of-the-art, challenges, and good practices in the application of digital twins. Discussions will be built around real cases of successful digital twin projects in different water domains for design, control, and decision-making.

**Speakers:** Elena Torfs, Ghent University (BE), Borja Valverde-Pérez, Technical University of Denmark (DK), Peter Steen Mikkelsen, Technical University of Denmark (DK), Niels Nicolai, Université Laval (CA), Gigi Karmous-Edwards, Karmous-Edwards Digital Consulting (US), Agnethe Nedergaard Pedersen, VCS Denmark (DK), Saba Daneshgar, Ghent University (BE), Andrew Smith, Anglian Water Services (UK), Peter Alexander Stentoft, Krüger-Veolia (DK), Bruce Johnson, Jacobs (US), Jorge Helmbrecht, AQUARELLA (ES), Min Zhong, NEDOM (SA)

Coffee Break  
15:00 - 15:45

Session 3  
15:45 - 17:15

1.4 | DEVELOPING CONSENSUS AND GOOD PRACTICES FOR DIGITAL TWIN APPLICATIONS — B

**Chair:** Elena Torfs, Belgium and Borja Valverde-Pérez, Denmark

The workshop brings together water professionals from different backgrounds (academics, utilities, etc.) and sectors (wastewater, urban drainage, drinking water, etc.) to build consensus on the state-of-the-art, challenges, and good practices in the application of digital twins. Discussions will be built around real cases of successful digital twin projects in different water domains for design, control, and decision-making.

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Keynote Plenary  
17:15 - 17:30

Keynote: Digital Water Unpacked, Oliver Grieveon & Enrique Cabrera Rochera  
Panel: Corinne Cheeseman, Pernille Inglisén, Ramón Doblé Mollá, HP Randa
Keynote Plenary 09:00 - 09:50

Keynote: Empowering Communities to Shape Sustainable Water Solutions — Incorporating Indigenous Knowledge, Dawn Martin-Hill
Panel: Tom Mollenkopf, Louise Dudley, Liby T. Johnson, Bradley Moggridge, Tanja Nielsen

Coffee Break 09:50 - 10:30

Session 1 10:30 - 12:00

2.4.1 | BIOSOLIDS MANAGEMENT & REUSE
Chairs: Francesco Fatone, Italy and Zhiyao Wang, Australia
Presence of antibiotic resistance genes (ARGs) and Taxonomic composition of sludge originating from five Northern wastewater treatment plants, Maria Valtari, Aalto University, Finland
Biogas residues as feedstock for hydrothermal conversion: bio-oil yield optimisation and fate of drugs, Stian Hegdahl, University of Bergen, Norway
Lipophilic substances in grease traps on WRRFs: an Auxiliary parameter to optimize resource recovery, Anastasia Rid, Universität der Bundeswehr München, Germany
Agronomic waste-derived biocrust for stabilization of multiple heavy metals in paddy soils: effect of feedstock variety and pyrolysis temperature, Van Bien Dao, National Central University, Chinese Taipei

POSTERS
Assessment of new sludge management strategies in the Cape Flats wastewater treatment works, South Africa, Xavier Flores-Aina, DTU, Denmark

Room B5 a Technical

Room B5 b Technical

Lunch 12:00 - 13:30

Session 2 13:30 - 15:00

2.4.2 | BIOSOLIDS MANAGEMENT & REUSE
Chairs: Srikanth Mutuuri, India and Matia Mainardi, Italy
Pyrolysis/Gasification: a hot approach to energy independence, resource recovery and decarbonization, Julian Sandino, Jacobs, United States
Integrated drying and pyrolysis of biosolids for optimal resource recovery, ground water, and climate protection, Christian Want, AquaGreen, Iceland
Characterisation of HTC-biocoal from sewage sludge, Aleksandra Lazic, Roslagstulls AB, Sweden
Cascade systems to recover resources from sludge by integrating pre-treatments to fermentation-based anaerobic process, Barbara Taroni, Water Research Institute C.N.R, Italy

Room B5 a Technical

Room B5 b Technical

Coffee Break 15:00 - 15:45

Session 3 15:45 - 17:15

2.4.3 | MICROPLASTICS AS EMERGING CONTAMINANTS OF CONCERN
Chairs: Innocent Ntapi, Zimbabwe and Linda Li, Canada
Microplastics as hubs enriching antibiotic-resistant bacteria and pathogens in municipal activated sludge, Mengyan Li, Aalto University, Finland
Threat of microplastic release due to COVID-19 Generated plastic waste, Chihtao Fan, Veolia Research & Innovation, France
Microplastics in Toulon Area: Occurrence and efficiency of wastewater treatment plants (MEDITPlasT Project), Marie-Pierre Denieul, Veolia Research & Innovation, France
Microplastics & organics — a comparative study of sorption of triclosan & malachite green onto polyethylene, Gihan Ciftci, Middle East Technical University, Turkey

POSTERS
Microplastics removal from wastewater with coagulants, Olli Grönfors, Kemira Oyj, Finland
Microplastics from textile industry: facts and solutions, Johann van Aartsen, Ramboll, Singapore

Room B5 a Technical

Room B5 b Technical

Break 17:15 - 17:30

Keynote Plenary 17:30 - 18:20

Keynote: Digital Water Unpacked, Oliver Grievson & Enrique Cabral-Rocha Rocha
Panel: Corinna Cheeseman, Pernille Ingildsen, Ramon Dolf Molina, HP Nanda

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### Tuesday | Programme

**Keynote Plenary**  
09:00 - 09:50

**Keynote:** Empowering Communities to Shape Sustainable Water Solutions — Incorporating Indigenous Knowledge, **Dawn Martin-Hill**  
Panel: Tom Molekaakpo, Louise Dudley, Lily T. Johnson, Bradley Mugendi, Tanja Neelsen

**Coffee Break**  
09:50 - 10:30

**Session 1**  
10:30 - 12:00

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<tr>
<th>3.1</th>
<th>WATER MANAGEMENT IN DIVERSE CONTEXTS</th>
<th>Room B4 a</th>
<th>Technical</th>
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<tbody>
<tr>
<td>Chairs: S. Mohan, India and Liudmila Oud, Ukraine</td>
<td>Achieving universal access to safely managed water services in rural Cambodia: The case for the complementarity of water supply solutions, Julien Ancole, 1001fontaines, France</td>
<td>— POSTER —</td>
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<tr>
<td>The use of water safety planning to modernise and improve water supply and quality in Lilongwe, Malawi, Charles Kangwane, Lilongwe Water Board, Malawi</td>
<td>Water demand management in the medical manufacturing industry, Johan van Aatsen, Ramboll, Singapore</td>
<td>Collaborative water management in Northwest England, Dan Turner, The Rivers Trust, United Kingdom</td>
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<td>— POSTER —</td>
<td>Countermeasures against a long-term blackout in the Sendai City waterworks bureau in light of the great east Japan earthquake, Akio Arato, Sendai City Waterworks Bureau, Japan</td>
<td>Water science and Human Rights: a case study from the Niger Delta, Gustaf Olsson, Lund University, Sweden</td>
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**Lunch**  
12:00 - 13:30

**Session 2**  
13:30 - 15:00

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<th>6.5</th>
<th>COORDINATED MANAGEMENT FROM SOURCE TO SEA — IN THE BALTIC SEA AND OTHER BASINS</th>
<th>Room B4 a</th>
<th>Workshop</th>
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</thead>
<tbody>
<tr>
<td>Chairs: Torkil Janch Clausen, Denmark and Agnieszka Iloła, Finland</td>
<td>Our seas suffer serious degradation from land-based activities in basins and cities; only holistic approaches from source to sea can reverse that. The Sustainable Development Goals on water (SDG 6) and oceans (SDG 14) need hand-in-hand implementation. The Nordic/Baltic region is a case in point. Highly developed with strong governance frameworks and organizations to facilitate cooperation, ie. the EU Water Framework Directive, EU Strategy for the Baltic Sea Region and the Helsinki Convention, but still facing serious challenges related to water quality, eutrophication, plastics and pharmaceuticals, emerging pollutants, pesticides, urban water management etc.</td>
<td>We aim to discuss approaches to address burning water and environmental challenges from source to sea, with the Baltic Sea region as the prime example.</td>
<td>Speakers: Torkil Janch Clausen, Sea Management (DK) &amp; Agnieszka Iloła, Union of the Baltic Cities Sustainable Cities Commission (FI), Miriam Fellberg, Danka (DK), Lars Moeisland Swendsen, Ivar Ammos, Frank Zhang, Despo Fatta-Kassimos, Kai Bester &amp; Torgny Holmgren, Stockholm International Water Institute (SE)</td>
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**Break**  
15:00 - 15:45

**Session 3**  
15:45 - 17:15

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<th>3.2</th>
<th>ALLEVIATING WATER SCARCITY USING GROUNDWATER: THE ROLE OF KNOWLEDGE EXCHANGE THROUGH INTERNATIONAL COOPERATION</th>
<th>Room B4 a</th>
<th>Workshop</th>
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<tr>
<td>Chairs: Ryle Gejl, Denmark</td>
<td>The session aims at sharing experiences and understanding good practises in terms of international cooperation between public authorities. Denmark is cooperating with a number of partners (South Africa, India, and the State of California) to alleviate water scarcity, which is key to obtaining liveable cities. Three different projects with groundwater challenges and strategies for alleviating groundwater stress will be presented. In South Africa, &quot;Day Zero&quot; initiated new solutions/cooperations and practices in and around Cape Town. In California, the management of groundwater use has changed due to overexploitation. In India, the need for increased knowledge of aquifers and the possibilities of recharge is key. Finally, a Danish partner will present the reciprocal benefits of bilateral cooperation – the benefits go both ways.</td>
<td>The impacts of climate change on urban water management threaten the capacity of utilities to deliver safe water, protect rivers and oceans, as well as protect people and assets from flooding. While water, sanitation, and urban drainage utilities are the cornerstone of cities’ climate adaptation strategies, they can also contribute up to 15% of their cities’ greenhouse gas (GHG) emissions. This workshop will discuss actions taken by utilities on the following three interconnected topics: • Measuring and reducing GHG emissions; through reducing consumption, producing and using resources, and making strategic decisions • Planning for resilient adaptive infrastructure that combines centralised and decentralised approaches, as well as natural and built infrastructure • Leadership: engaging citizens, industries, and planning stakeholders to embrace the change needed for resilient and low-carbon water and wastewater utilities; engaging regulators, and inspiring other utilities at a national and international level.</td>
<td>Speakers: Ryle Gejl, Danish Environmental Protection Agency (DK), Candice Lasher Scheepers, City of Cape Town (ZA), John Siyabonga, Breede-Gouritz Catchment Management Agency (ZA), Bjørn Kaare Jensen, Danish Water Forum (DK) &amp; Saaena</td>
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**Break**  
17:15 - 17:30

**Keynote Plenary**  
17:30 - 18:20

**Keynote:** Digital Water Unpacked, **Oliver Grievson** & **Enrique Cabrera Rochera**  
Panel: Corinne Cheeseman, Pernille Ingildsen, Ramón Dolfi Mollá, HP Nanda

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**Room B4 a**  
Technical

**Room B4 b**  
Technical
Keynote Plenary  
09:00 - 09:50

Keynote: Empowering Communities to Shape Sustainable Water Solutions — Incorporating Indigenous Knowledge, Dawn Martin-Hill
Panel: Tom Mollenkopf, Louise Dudley, Liby T. Johnson, Bradley Mogridge, Tanja Nielsen

Coffee Break  
09:50 - 10:30

Session 1  
10:30 - 12:00

5.7 | CREATING AN EFFECTIVE INNOVATIVE ECO-SYSTEM. HOW THE UK ENHANCES & ENABLES INNOVATION AND WHAT WE CAN CONTINUE TO LEARN  
Room B4 C Workshop

Chairs: Shaunnah Berendsen, United Kingdom and Lila Thompson, United Kingdom
The UK has undergone a radical transformation to enable and enhance innovation in recent years. Ofwat, our economic regulator, has created a £200m innovation fund, a national innovation strategy has been created* an Innovation Centre of Excellence (Spring) has been established and companies are more collaborative than ever, working closely with the supply chain with the aim of unlocking transformational innovation and fast-tracking the UK to being one of the smartest liveable cities.

This session takes us through those changes, what projects have been unlocked and how continuing to work and learn From other sectors, regions and centres of excellence will continue to transform the sector for the better, setting a higher standard for smart, holistic and liveable city solutions, utilising synergies and adapting to a changing climate, amongst other challenges.

Speakers: Shaunnah Berendsen, Spring (UK), Lila Thompson, British Water (UK), John Russell, Ofwat (UK), Nate Allen, Jason Tucker, Anglian Water (UK) & Adam Lovell, WSAA (AU)

Lunch  
12:00 - 13:30

Session 2  
13:30 - 15:00

1.5 | RESEARCH TO TECHNOLOGY — TURNING HIGH IMPACT RESEARCH INTO BREAKTHROUGH TECHNOLOGY  
Room B4 C Workshop

Chairs: David Garman, Australia and Anver Adin, Israel
This workshop will look at 3 areas that have had intensive research activity over recent years, with significant numbers of high-impact published papers. The presenters will show those advances that show a future as operational technologies and have the potential to become standard technologies.

Speakers: David Garman, Western Sydney University (AU) & Anver Adin, Hebrew University of Jerusalem (IL), Rongcheng (Alex) Liu, Helena Alegre, LNEC (PT) & Paul Reiter

Coffee Break  
15:00 - 15:45

Session 3  
15:45 - 17:15

6.7 | WATER STRESS, DROUGHTS AND FLOODS, INCLUDING IMPACT OF CLIMATE CHANGE  
Room B4 C Workshop

Chairs: Joatham Sempewo, Uganda and Meg Cummins, Australia
Industry water scarcity assessment and mitigation, Mads Terkelsen, Ramboll, Denmark
The importance of water in the emergence of the hydrogen rainbow, Rod Nayler, GHD, Australia
An environmental-economic view on the climate change induced trade-off between drinking water availability from reservoirs and downstream water flow, Clemens Strehl, IWW Water Centre, Germany
Life cycle assessment, water efficiency, water footprint, virtual water: asset condition assessment, Ian Rodgers, Xylem inc, United Arab Emirates

A Key component of the sustainable urban water cycle: water resource gardens, Attila Bodnar, Organico Water, Hungary

1.11 | ASSET MANAGEMENT AND OPTIMISATION CASE STUDIES  
Room B4 C Workshop

Chairs: Matt Rollis, United States and Helena Alegre, Portugal
Improving inflow & infiltration control in wastewater systems — a methodology applied to a real case study, Ana Neto, AGS, Portugal
Asset management maturity level - a self-check to verify the quality of the management of assets, Maxim Juschk, IWW Water Centre, Germany
Including odour and corrosion in asset management of sewer system, Søren Højmark, EnviDan, Denmark
National rehabilitation guidelines to boost rehabilitation of the pipe networks, Annika Malm, Kungsbacka municipality, Sweden

Cost-benefit analysis as decision support for legal requirements for leakage control, Johanna Morisalu, Chalmers University of Technology, Sweden

--- POSTERS ---

Break  
17:15 - 17:30

Keynote Plenary  
17:30 - 18:20

Keynote: Digital Water Unpacked, Oliver Grievson & Enrique Cabrera Rochera
Panel: Corinne Cheeseman, Pernille Ingildsen, Ramón Dolz Molina, HP Nanda

--- POSTERS ---
## Keynote Plenary 09:00 - 09:50

**Keynote: Empowering Communities to Shape Sustainable Water Solutions — Incorporating Indigenous Knowledge, Dawn Martin-Hill**

Panel: Tom Mollenkopf, Louise Dudley, Lily T. Johnson, Bradley Moggridge, Tanja Nielsen

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## Session 1 10:30 - 12:00

### 1.5 | UTILITIES WATER REUSE THROUGHOUT THE WATER CYCLE

**Room B3 a**

**Chairs:** Josef Lahnsteiner, Austria and Bhairavi Sawant, Ireland

Water Reuse in agriculture irrigation at Mediterranean Alentejo region: two success stories in the AdP Group, Joana Pinto Coelho, AdP VALOR, Serviços Ambientais, Portugal

A simplified methodology for assessing the microbiological risk to human health in agricultural water reuse, Ana Santos, Universidade da Estada do Rio de Janeiro, Brazil

Towards a closed water cycle: combining technology and an instrumental framework, Roland Koolen, Dutch Water Authority HWNL, Netherlands

P(3) and water management, Lars Nørkild Halmegaard, Lemvig Vand, Denmark

**--- POSTERS ---**

Effect-based monitoring: a literature review of applications in wastewater, drinking water and reuse treatment schemes, Jerome Enault, Suez, France

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## Coffee Break 09:50 - 10:30

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## Session 2 13:30 - 15:00

### 1.5 | HOW TO BUILD INTEGRATIVE, REGIONAL STRATEGIES FOR RESPONSIBLE WATER REUSE?

**Room B3 a**

**Chairs:** Klaasjan Raat, Netherlands and Shaffick Adams, South Africa

Participants will learn to see how water reuse can be part of a regional strategy to improve water system robustness in their own region. Examples of regional strategies across the globe will be provided.

**Speakers:** Ruud Bartholomeeus, KWR Water Research Institute & Wageningen University (NL), Han Vervaeren, De Watergroep (BE) & Heather Smith, Cranfield University (UK)

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## Lunch 12:00 - 13:30

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## Session 3 15:45 - 17:15

### 1.2 | ON-SITE REUSE OF WATER ACROSS THE WORLD

**Room B3 a**

**Chairs:** Pia Jacobsen, Denmark and Krishna Pagilla, United States

On-site reuse of water is becoming more widespread around the world for different reasons and purposes. There are opportunities for the water sector to develop sustainable water reuse solutions to address the SDG6. Each water supplier gathers experience with different solutions, including structural, organizational, and technical ones. The speakers will give inspiration to discuss different experiences and the value (business-case) of water reuse systems. This workshop will share cases from around the world and provide knowledge from one another in an interactive setting.

**Speakers:** Pia Jacobsen, Aarhus Vand (DK), Krishna Pagilla, University of Nevada (US), Steve Muir, South East Water (AU), Paula Kehoe, San Francisco Public Utilities Commission (US), Nonhlanhla Kalebaila, Water Research Commission (ZA), Carsten Fjorback, Cowi (DK), Nuno Bróco, Águas de Portugal (PT) & Martin Rygaard, The Technical University of Denmark (DK)

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## Coffee Break 15:00 - 15:45

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## Session 4 17:15 - 18:20

### 4.4.1 | DATA-DRIVEN MODELLING AT CITY SCALE

**Room B3 b**

**Chairs:** Jyoti Gautam, India and Ivo Daniel, Germany

Optimizing data quality assurance for operational intelligence and predictive analytics in water industry, Christian Kazadi Mlimba, The University of Queensland, Australia

Data-driven modelling of urban water demands across multiple spatio-temporal scales: the case study of Milan, Italy, Wenjin Hao, Politecnico di Milano, Italy

Exploiting machine learning to radically change the way hydrodynamic simulations support planning and operation of smart liveable cities, Morten Grum, WaterZerv, Denmark

Water DataPaths: graph-based solution for works data management tool, Juan José Iervasi Scokin, Agua y Saneamientos Argentinos (AySA), Argentina

**--- POSTERS ---**

A LSTM AI based model to forecast inflows-outflows from-to SMABA Reservoir (Rabat-Morocco) at medium-long run, Mustapha Halil, Office National de L’Electricité et de L’Eau Potable, Morocco

Drainman — unintended water and intelligent management, Preben Simonsen, NIRA A/S, Denmark

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## Keynote Plenary 17:30 - 18:20

**Keynote: Digital Water Unpacked, Oliver Grievson & Enrique Cabrera Rochera**

Panel: Corinne Cheeseman, Pernille Ingildsen, Ramón Dolz Mollá, HP Randa

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The resilience of cities depends greatly on efficiently used and sustainably managed urban groundwater. Urban groundwater is a critical dataset for the development of resilient cities, and the needs of a wide range of urban groundwater stakeholders have to be addressed. Several mechanisms for involving these stakeholders in supporting groundwater monitoring networks and knowledge have been identified. These include sharing and informing local and regional authorities, improving legislation (including EU law), applying properly open data and information regulations, counselling utilities companies, and increased attractiveness for civil engineering and geotechnical companies. A set of mid-term actions supporting city planning will be drawn up for companies, and Increased attractiveness for civil engineering and geotechnical (EU law), applying properly open data and information regulations, counselling utilities groundwater monitoring networks and knowledge have been identified. These include sharing and informing local and regional authorities, improving legislation (including EU law), applying properly open data and information regulations, counselling utilities companies, and increased attractiveness for civil engineering and geotechnical companies. A set of mid-term actions supporting city planning will be drawn up for companies, and Increased attractiveness for civil engineering and geotechnical companies, and Increased attractiveness for civil engineering and geotechnical companies, and Increased attractiveness for civil engineering and geotechnical companies, and Increased attractiveness for civil engineering and geotechnical companies, and Increased attractiveness for civil engineering and geotechnical companies, and Increased attractiveness for civil engineering and geotechnical companies, and Increased attractiveness for civil engineering and geotechnical companies, and Increased attractiveness for civil engineering and geotechnical companies, and Increased attractiveness for civil engineering and geotechnical companies, and Increased attractiveness for civil engineering and geotechnical companies, and Increased attractiveness for civil engineering and geotechnical companies, and Increased attractiveness for civil engineering and geotechnical companies, and Increased attractiveness for civil engineering and geotechnical companies, and Increased attractiveness for civil engineering and geotechnical companies, and Increased attractiveness for civil engineering and geotechnical companies, and Increased attractiveness for civil engineering and geotechnical companies, and Increased attractiveness for civil engineering and geotechnical
Tuesday | Programme

Keynote Plenary 09:00 - 09:50

Keynote: Empowering Communities to Shape Sustainable Water Solutions — Incorporating Indigenous Knowledge, Dawn Martin-Hill
Panel: Tom Mollenkopf, Louise Dudley, Lily T. Johnson, Bradley Moggridge, Tanja Neelsen

Coffee Break 09:50 – 10:30

Session 1 10:30 - 12:00

6.1 | GROUNDWATER HOLISTIC APPROACHES AND REGULATION FOR WATER SECURITY

Chairs: Sophie Tremolet, France and Titilola Bright-Oridami, Nigeria
Accessible on-site system for detection of heavy metals in potable water, Tommi Tihonien, University of Eastern Finland, Finland
Tracking salinity sources and mechanisms in groundwater from the water cycle and anthropogenic activities through a hybrid approach, Huguette Emvoutou, Regional Water and Environmental Sanitation Centre, KNUST, Senegal
How the history of contaminated site remediation has evolved in an effective, economically and sustainable way, John Flyvbjerg, Capital Region of Denmark, Denmark
Integration of electromagnetic and electrical resistivity for groundwater exploration in Kintampo South district, Bono East region of Ghana, Albert Acheampong, KNUST (RWESCK) (World Vision Ghana), Ghana
California’s state-wide AEM surveys, Max Falkhjär, Ramboll, Denmark
The availability of arsenic in vaal catchment area as a result of acid mine drainage in South Africa, Sibusiso Mnguni, Rand Water, South Africa

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Lunch 12:00 - 13:30

Session 2 13:30 - 15:00

6.2 | GROUNDWATER MANAGEMENT — KEYS TO SDGS

Chairs: Stephen Foster, United Kingdom and Julia Gathu, Kenya
Water sector governance & operations — the Danish model, Peter Mikkelsen, Technical University of Denmark, Denmark
Towards water security and climate resilience in Kenya Through effective water resources management and planning, Maturia Bayeini, DHI, South Africa
Building sustainable water services: subsidiarity, multi-level governance and resilience approach, Jarmo Hukka, Tampere University, Finland
Lowering of groundwater levels and their effect on water, sanitation and hygiene services in the savagulu district, northern region of Ghana, Albert Acheampong, KNUST (RWESCK) (World Vision Ghana), Ghana
An investigation of unexplained exceedances of DOC and fluoride from landfill at Kulo in Norway, Lulum Manumperuma, Aquateam COWI AS, Norway
The web-based OMEGA Platform for supporting reservoir management in Portugal, Ana Oliveira, Instituto Superior Técnico, Portugal

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Coffee Break 15:00 - 15:45

Session 3 15:45 - 17:15

2.3 | HIGH VALUE PRODUCTS BASED ON CARBON IN WASTEWATER — HOW DO WE SELECT AND IS IT SUSTAINABLE?

Chairs: Mark van Loosdrecht, Netherlands and Jeanette Agerved Madsen, Denmark
Discussion of new processes as well as R & D within the production of high-value products based on carbon in wastewater. Upscaling, value chain development, handling requirements from end users and regulatory.
Speakers: Irini Angelidakis, Prof., Technical University of Denmark (DK), Francesco Fatone, Prof., University Politecnica delle Marche (IT), Olaf van der Kolk, CEO Aquaminerals, Co-chair Cluster Resource Recovery IWA (NL), Frank Rogalla, Director of Innovation and Technology, Aqualia (ES) & Alan Werker, Co-owner, Promiko AB (SE)

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Break 17:15 - 17:30

Keynote Plenary 17:30 - 18:20

Keynote: Digital Water Unpacked, Oliver Grievson & Enrique Cabrera Rochera
Panel: Corinne Cheeseman, Pernille Ingildsen, Ramon Dohl Molila, HP Nanda

Room B3 e Technical

2.3.3 | NANOMATERIALS AND NANOTECHNOLOGY

Chairs: Jan Hofman, United Kingdom and Jenny Radeva, Germany
Reusable carbon nanotubes embedded polystyrene|polyacrylonitrile nanofibrous sorbent for oil clean-up, Swayang Byun, Pusan National University, Republic of Korea
Quantification of metal-based nanoparticles in wastewater treatment plants, Pabel Cervantes-Aviles, Tecnologico de Monterrey, Mexico
High efficiency, stable, easily separable, and recovery novel magnetic nanocomposite adsorbent for phosphate removal, Denny Dermawan, Chung Yuan Christian University, Chinese Taipei
Piezo-photo coupling effect of ultrathin Bi$_2$O$_2$Cl$_2$ nanosheets for carbamazepine degradation, Feiyun Wu, DUTU environment, Denmark
Recovery of water and valuable metals by low pressure nano filtration and sequential adsorption from Acid Mine Drainage (AMD), Charith Dalinda Jude Fonseka, Australia

Room B3 e Technical

6.6 | STRATEGIC DIGITAL CONTROL OF WATER MANAGEMENT

Chairs: Mads Leth, Denmark and Elif Erdem, Turkey
How digital transformation streamlines sewer infiltration-inflows management, Anna Ohlin Saletti, Chalmers University of Technology, Sweden
Towards Soil Aquifer Treatment (SAT) optimization: a SAT basin dynamic simulation with a machine learning prediction model for the infiltration rate, Roy Elsayem, Mekorot water company, Israel
Comparing disposal strategies for arsenic-rich water treatment residuals using life cycle assessment, Case van Genuchten, Geologic Survey of Denmark and Greenland, Denmark
Delivering Strategic water supply resilience in the UK — water recycling solutions for London, Christopher Kyne, Jacobs, United Kingdom
Level of water stress: the contribution by reductions in the water loss in Brazilian water supply systems, Marcelo Libinário, UFMG, Brazil
Mapping pharmaceuticals in the environment using sales data and modelling — a risk assessment tool, Kristina Buus Kyae, DHI, Denmark

Room B3 e Workshop

6.3 | GROUNDWATER — RESILIENCE APPROACHES

Chairs: Gabriel Racoviteanu, Romania and Craig Tinashe Tanyanyiwa, South Africa
Comparative analysis of regulation, definition and classification of relevant and non-relevant metabolites in the EU and Denmark, France and Germany — status and outlook, Steffen Foss Hansen, Technical University of Denmark, Denmark
Innovative real-time sensing of flow dynamics in groundwater and sediments to map anthropogenic & climate change impact, Gabriela Verrevest, iFLUX - Universiteit Antwerpen, Belgium
Groundwater data and decision support tools at local to Pan-European scale for sustainable and integrated management of water resources in support of EU, Klaus Hinbey, Geological Survey of Denmark and Greenland (GEUS), Denmark
Applying SkyTEM to improve sustainable management of groundwater systems in a built-up area — the Hawkes Bay 3D aquifer mapping project in New Zealand, Steven Johnson, SkyTEM Australia Pty Ltd, Australia
Assessing risks to shallow groundwater wells in cold climate conditions using real-time online monitoring, Stable Water Isotopes, and 165 Amplicon Sequencing, Kevin Lyons, University of Oulu, Finland

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Keynote Plenary  09:00 - 09:50

Coffee Break  09:50 - 10:30

Session 1  10:30 - 12:00

1.6 | SUSTAINABLE UTILITY MANAGEMENT — THE NORDIC EXPERIENCE

Chairs: Martin Rygaard, Denmark and Magnus Arnell, Sweden

Energy positive and carbon neutral wastewater treatment in Copenhagen, Carsten Thirring, BIOFOS A/S, Denmark

From a vision to a sustainable preliminary concept for New Sjölanda WWTP using an innovative and holistic approach, Jeanette Madsen, EnviDan, Denmark

Using carbon footprint from the construction phase as a parameter in asset management and rehabilitation planning, Sarah Brudler, EnviDan, Denmark

Application of sustainability index in municipal water and wastewater organizations in Sweden for improved asset management: some case studies as good, Nasik Najar, School of Engineering | Jönköping University, Sweden

--- POSTERS ---

A systematic concept for the extension of Copenhagen’s WWTPs, Jeanette Madsen, EnviDan, Denmark

Lunch  12:00 - 13:30

Session 2  13:30 - 15:00

1.7 | SUSTAINABLE UTILITY MANAGEMENT

Chairs: Ed Smeets, Netherlands and Abdul Majeed Osman, Ghana

Prague Water Net Zero Strategy 2025 — methodology and roadmap, Martin Sr., Pražské vodovody a kanalizace, a.s, Czech Republic

Environmentally and socially responsible activated carbon filtration, Panu Laurell, Helsinki Region Environmental Services, Finland

Normalized approach for carbon footprint determination: long term measurements in real wastewater treatment plants, Enrico Marinelli, UNIVPM, Italy

Implementation at full scale of demand-driven biogas production from anaerobic digestion of sewage sludge, Mauro Lafratta, University of Surrey | Thames Water Utilities, United Kingdom

--- POSTERS ---

Methane emissions on small wastewater treatment plants, Johannes Blattenberger, Bundeswehr University Munich, Germany

Effect-based monitoring: perception and perceived barriers to implementation, Magali Deschamps, Veolia Research & Innovation, France

Coffee Break  15:00 - 15:45

Session 3  15:45 - 17:15

1.8 | GREENHOUSE GAS EMISSIONS IN DENMARK

Chairs: Eveline Volcke, Belgium and Haoran Duan, Australia

Reduction of greenhouse gas emissions in the water sector — a Danish perspective, Jacob Kragh Andersen, EnviDan, Denmark

Quantification and assessment of greenhouse gas emissions from wastewater treatment plants, Charlotte Schewitz, Technical University of Denmark, Denmark

Direct effect of activated sludge concentration on N₂O emission and CO₂-eqv accounting at full-scale, Mikkil Andersen, Universe, Denmark

N₂O abatement from WWTPs by catalytic treatment, Britta Lauritzen, Hillerød Forsyning, Denmark

--- POSTERS ---

Emissions of nitrous oxide from danish WWTPs and their effect on global warming — a nationwide study, Anna Katrine Vanggaard, EnviDan, Denmark

Predicting N₂O production in activated sludge process using data-driven modelling, Laura Hansen, Krüger, Denmark

Break  17:15 - 17:30

Keynote Plenary  17:30 - 18:20
Keynote Plenary 09:00 - 09:50

**BUSINESS FORUM ROOM 1 (HALL E)**

10:30 — 11:15 | KEMIRA

**How to reduce the global warming potential (GWP) of wastewater treatment plants**

How do you calculate the overall global warming potential of a WWTP and which levers can move the needle towards net-zero and contribute to UN SDG13.

- Energy sourcing and consumption (BOD/COD, sludge treatment) vs. energy production (i.e. biogas)
- Chemistry – responsible sourcing and efficient consumption
- Nutrient removal/recovery
- Data-driven process automation

- Dr. Jing Liu, CEO & prof. Gustaf Olsson

11:15 — 12:00 | XYLEM

**Let’s redefine what’s possible for Water**

Xylem Vue is our full suite of digital solutions that combines smart and connected technologies. Intelligent systems and services, and 100+ years of problem-solving expertise – empowering utilities to deliver transformative outcomes to their communities. We will discuss how we can help utilities use digital innovation to help improve performance and bottom-line... so they can better serve their community.

- Joost Aloserij, Director Business Development Vue Solution Team

12:15 — 13:00 | DENMARK PAVILION

**Alternative water sources for water supply**

The scarcity of water supply is a serious and increasing threat for many communities around the world, and this challenge calls for investigation and development of alternative sources. The session will show examples of urban water planning and present some of the innovative solutions to overcome water scarcity.

- Kristian Brummark, Project Manager, Aarhus Vand
- Søren Duch-Hennings, Product and process Manager, SILHORKO-EUROWATER A/S
- Ole Silkjær, Business Development Director, Eurofins Environment Denmark

13:30 — 14:15 | NOURYON

**UV-C and Hydrogen Peroxide: the sustainable route to micropollutant free waters by Nouryon and Van Remmen UV**

In an interactive and multimedia approach the societal need, technical features, technology benefits and experiences in the UV-H2O2 application will be presented. The experiences shared are ranging from scientific papers to long term full-scale trials to commercial installations. External independent parties will make statements and open up for discussions with the audience.

- Clara Thege, Thomas Greschik

14:15 — 15:00 | VEOLIA

**Optimisation of energy production at wastewater treatment plants**

Stakeholders from the industry will present solutions and operating results from their WWTPs in this business forum.

Through interesting discussions, the participants will gain a valuable understanding of the mechanisms involved in obtaining energy-efficient and sustainable solutions for their WWTPs.

- Andrea Cirino Pomicino, CEO

**BUSINESS FORUM ROOM 2 (HALL C)**

10:30 — 11:15 | AVK/NIRAS

**Moving Towards Smart Water Network**

We will look at smart water networks in a holistic context of drinking water systems. By pin-pointing challenges that many utilities face we will present new and upcoming technologies that will improve smart water systems further by combining technologies, creating digital twins and adding new IoT sensors and smart devices.

- Klaas Hagh, Gerner H. Knudsen, Michael Ramlau Hansen

11:15 — 12:00 | PALADERI

**Mechanical and hydraulic behaviour of hdpe spiral pipes with steel reinforcement under extreme loads**

Politecnico Milano’s study concerning mechanical tests on polymeric pipes with steel reinforcements, with results of creep tests on different plastic pipes types.

- Ring stiffness tests, ring flexibility and resistance to collapse of steel-reinforced polyethylene spiral pipe.
- Collapse test male-female joint of steel-reinforced polyethylene spiral pipe.
- Polymeric material pipes creep tests

- Andrea Cimino Pomicino, CEO

12:15 — 13:00 | NETHERLANDS (NWP)

**The Dutch Water Sector is constantly moving forward and happy to attend the IWA WWCE in Copenhagen!**

Please meet: Netherlands Water Partnership, Water Alliance, PB International, Sensoterra International B.V., Water Test Network, EBC Foundation, Vewin, Hydraloop, Join the Pipe and others. In this session we will give you an update on the latest developments and solutions from the Netherlands. We are actively looking for cooperation.

- NL pavilion participants

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- Clara Thege, Thomas Greschik

14:15 — 15:00 | BPC INSTRUMENTS

**Gas Endeavour® from BPC Instruments**

Gas Endeavour® from BPC Instruments (formerly Bioprocess Control) allows for an easy execution of microbial activity analysis based on volumetric gas methodology. The instrument is a fully automated respirometer for continuous gas volume measurement. It is an ideal solution for anaerobic and aerobic respirometry using samples of sludge and wastewater.

- Dr. Jing Liu, CEO & prof. Gustaf Olsson

15:45 — 16:30 | IDROTHERM

**Underground polyethylene pipe networks in the frame of circular economy**

A sustainable approach has been explored with recycled materials providing a remarkable outlet for disposable plastics. Selected grades of HDPE from post-use recovery and industrial scraps combined with multilayer pipe extrusion technology have been the basis for renovated sewerage networks and electric cables protection of a major multiutility for one of the biggest project for wastewater in Italy.

- Dr. Marco Michelotti – Technical Manager

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- Dr. Marco Michelotti – Technical Manager

Keynote Plenary 17:30 - 18:20

**FINNISH WATER FORUM EMBASSY OF FINLAND IN COPENHAGEN**

**Finnish Water Way – Network Reception**

Finnish Water Forum together with Embassy of Finland in Copenhagen invites you to explore the leading practices of Finnish Water Way through showcases of Smart Water Management, Managed Aquifer Recharge and Resource & Energy Recovery. Join us to expand your networks with Finnish water sector – the world-leaders in Sustainable Water Management!

- Finland at IWA WWCE 2022
- Bjoern Biedermann