

Programme Overview

Pre-congress trainings, workshops and learning sessions

Saturday 8	
	Room M5 / M6
08:30 - 10:30 session 1	TRAINING: Modelling Activated Sludge Plants
10:30 - 10:45	Coffee Break
10:45 - 12:30 session 2	TRAINING: Modelling Activated Sludge Plants
12:30 - 13:30	Lunch
13:30 - 15:30 session 3	TRAINING: Modelling Activated Sludge Plants
15:30 - 15:45	Coffee Break
15:45 - 17:00 session 4	TRAINING: Modelling Activated Sludge Plants

Sunday 9						
	Room M5 / M6	Room M7 / M8	Room P3	Room P5	Room P2	
08:30 - 10:30 session 1	TRAINING: Modelling Activated Sludge Plants	TRAINING: Assessing Climate & Energy Performance of Water and Wastewater Utilities	TRAINING: NRW Assessment and Management in Low and Middle Income Countries	TRAINING: Crisis Management at Water Utilities: Concept, Preparedness and Latest Technology Development in Decision Support System using Artificial Intelligence	WORKSHOP: Performance-Based Contracts - PBCs for Improving Utilities Efficiency	
10:30 - 10:45	Coffee Break					Room M1 / M2
10:45 - 12:30 session 2	TRAINING: Modelling Activated Sludge Plants	TRAINING: Assessing Climate & Energy Performance of Water and Wastewater Utilities	TRAINING: NRW Assessment and Management in Low and Middle Income Countries	TRAINING: Crisis Management at Water Utilities: Concept, Preparedness and Latest Technology Development in Decision Support System using Artificial Intelligence	WORKSHOP: Performance-Based Contracts - PBCs for Improving Utilities Efficiency	12:30 - 14:30 LEARNING: Global Water Shapers: a Networking Event to Start the Congress
12:30 - 13:30	Lunch					14:30 - 15:30
13:30 - 15:30 session 3	TRAINING: Modelling Activated Sludge Plants	TRAINING: Assessing Climate & Energy Performance of Water and Wastewater Utilities	TRAINING: NRW Assessment and Management in Low and Middle Income Countries	TRAINING: Crisis Management at Water Utilities: Concept, Preparedness and Latest Technology Development in Decision Support System using Artificial Intelligence		LEARNING: Make the Most Out of the Congress: First Time Attendees
16:00 - 18:00	OPENING CEREMONY					
18:00 - 19:30	WELCOME RECEPTION					

Programme Overview

Track 1: Cities, Utilities & Industries Leading Change
Track 2: Water & Wastewater Processes & Treatments
Track 3: Re-charting the Course of Water Resources
Track 4: Enabling Progress
Track 5: Water Quality, Safety & Human Health

Monday 10															
	Sky Room	Room S1	Room GH Q2	Room M1	Room M2	Room M3	Room M4	Room M9	Room M0	Room P1	Room P2	Room P3	Room P4	Room P5	Career Development Hub
09:00 - 09:45	KEYNOTE PLENARY The Sustainable Development Goals: An Opportunity Too Good to Miss <i>John Thwaites</i>														Great Hall Q2
09:45 - 10:30	Coffee Break														
10:30 - 12:00 session 1	WATER SCARCITY AND DROUGHT SUMMIT	WATER REGULATORS FORUM	TECHNICAL / PROCESSES & TREATMENTS: Biosolids	TECHNICAL / PROCESSES & TREATMENTS: Technology for Energy Efficiency	TECHNICAL / PROCESSES & TREATMENTS: Drinking Water I: Nanofiltration	TECHNICAL / CITIES, UTILITIES & INDUSTRIES: Climate Change: Adaptation and Resilience	TECHNICAL / CITIES, UTILITIES & INDUSTRIES: Transition to Sustainable Cities of the Future I	TECHNICAL / CITIES, UTILITIES & INDUSTRIES: Water and Waste Management in Agroindustries	TECHNICAL / CITIES, UTILITIES & INDUSTRIES: Resource Efficiency	TECHNICAL / WATER QUALITY, SAFETY & HUMAN HEALTH: Drinking Water Quality and Health	WORKSHOP / ENABLING PROGRESS: Putting the Community at the Centre of Decision Making	TECHNICAL / RE-CHARTING THE COURSE OF WATER RESOURCES: Integrated Water Resources Management- Governance Aspects	TECHNICAL / ENABLING PROGRESS: Instrumentation, Control and Automation	SESSION / Emerging Technologies & Innovation	LEARNING / Building Leadership in the Water Sector
12:00 - 13:30	Lunch														
13:30 - 15:00 session 2	WATER SCARCITY AND DROUGHT SUMMIT	WATER REGULATORS FORUM	TECHNICAL / PROCESSES & TREATMENTS: Activated Sludge Processes	TECHNICAL / PROCESSES & TREATMENTS: Energy Efficient Integrated Plant Design	TECHNICAL / PROCESSES & TREATMENTS: Drinking Water II: Physical Processes	WORKSHOP / CITIES, UTILITIES & INDUSTRIES: Targeting and Measuring Resilience in Water Service	TECHNICAL / CITIES, UTILITIES & INDUSTRIES: Transition to Sustainable Cities of the Future II	TECHNICAL / CITIES, UTILITIES & INDUSTRIES: Advances in the Supply Chain, Environmental and Industrial Biotechnology I	TECHNICAL / CITIES, UTILITIES & INDUSTRIES: Water and Waste Management in Chemicals and Pharmaceuticals I	TECHNICAL / WATER QUALITY, SAFETY & HUMAN HEALTH: Drinking Water & Chemical Risk Assessment	WORKSHOP / CITIES, UTILITIES & INDUSTRIES: Building Climate Resilience in Coastal Areas	TECHNICAL / RE-CHARTING THE COURSE OF WATER RESOURCES: Integrated Water Resources Management- Case Studies	TECHNICAL / RE-CHARTING THE COURSE OF WATER RESOURCES: Water and Energy Nexus	TECHNICAL / ENABLING PROGRESS: Data and Information Technology	LEARNING / The Curious Power of Story: How to Win Friends, Persuade Heroes, and Influence Outcomes With Narrative
15:00 - 15:30	Coffee Break														
15:30 - 17:00 session 3	WATER SCARCITY AND DROUGHT SUMMIT	WATER REGULATORS FORUM	TECHNICAL / PROCESSES & TREATMENTS: Membrane Bioreactors	WORKSHOP / PROCESSES & TREATMENTS: Carbon Recovery from Water	TECHNICAL / PROCESSES & TREATMENTS: Drinking Water III: Physical Biosolid Treatment	WORKSHOP / CITIES, UTILITIES & INDUSTRIES: Drought Resilient Water Management	TECHNICAL / CITIES, UTILITIES & INDUSTRIES: Water Sensitive Urban Infrastructures	TECHNICAL / CITIES, UTILITIES & INDUSTRIES: Advances in the Supply Chain, Environmental and Industrial Biotechnology II	TECHNICAL / CITIES, UTILITIES & INDUSTRIES: Water and Waste Management in Chemicals and Pharmaceuticals II	TECHNICAL / WATER QUALITY, SAFETY & HUMAN HEALTH: Diffuse Pollution and Cyanobacterial Blooms	WORKSHOP / WATER QUALITY, SAFETY & HUMAN HEALTH: Quantitative Microbiological Risk Assessment for Safe Water (Re)use	TECHNICAL / RE-CHARTING THE COURSE OF WATER RESOURCES: Water Quality Restoration	TECHNICAL / RE-CHARTING THE COURSE OF WATER RESOURCES: Biogas, Co-digestion and Co-generation	TECHNICAL / ENABLING PROGRESS: Modelling and Systems Analysis	
17:00 - 17:15	Break														
17:15 - 18:00	KEYNOTE PLENARY Ending Extreme Poverty, What Do the SDGs Mean for Access to Water, Sanitation and Hygiene? <i>Barbara Frost</i>														Great Hall Q2
evening	POSTER RECEPTION														
Tuesday 11															
	Sky Room	Room S1	Room GH Q2	Room M1	Room M2	Room M3	Room M4	Room M9	Room M0	Room P1	Room P2	Room P3	Room P4	Room P5	Career Development Hub
09:00 - 09:45	KEYNOTE PLENARY Managing Water Security in a Rapidly Urbanising Environment <i>Xianbin Yao</i>														Great Hall Q2
09:45 - 10:30	Coffee Break														
10:30 - 12:00 session 1	UTILITY LEADERS FORUM	CITY LEADERS FORUM	TECHNICAL / PROCESSES & TREATMENTS: Biological Treatment I: Mainstream Amx	TECHNICAL / PROCESSES & TREATMENTS: Alternative WWT Concepts	TECHNICAL / PROCESSES & TREATMENTS: Disinfection	WORKSHOP / RE-CHARTING THE COURSE OF WATER RESOURCES: Water Reuse for Sustainable Agriculture, Regulation and Technology	TECHNICAL / CITIES, UTILITIES & INDUSTRIES: Utilities and Economics	TECHNICAL / CITIES, UTILITIES & INDUSTRIES: Water and Waste Management in Energy and Petrochemicals	TECHNICAL / CITIES, UTILITIES & INDUSTRIES: Urban Water Infrastructure Rehabilitation	TECHNICAL / WATER QUALITY, SAFETY & HUMAN HEALTH: Micropollutants	TECHNICAL / ENABLING PROGRESS: Regulation-Finance	TECHNICAL / RE-CHARTING THE COURSE OF WATER RESOURCES: Climate Change, Floods and Droughts on Watershed Scale I	TECHNICAL / RE-CHARTING THE COURSE OF WATER RESOURCES: Resource Recovery I	SESSION / Emerging Technologies & Innovation	LEARNING / To Publish You Must Review: A How to Discussion
12:00 - 13:30	Lunch														
13:30 - 15:00 session 2	UTILITY LEADERS FORUM	CITY LEADERS FORUM	TECHNICAL / PROCESSES & TREATMENTS: Biological Treatment II: Novel Biological Treatment Concepts	TECHNICAL / PROCESSES & TREATMENTS: Wastewater Reclamation	TECHNICAL / PROCESSES & TREATMENTS: Advanced Oxidation Processes	WORKSHOP / WATER QUALITY, SAFETY & HUMAN HEALTH: Conflicts and Collaborations, a Dialogue on Water, Fisheries and Biodiversity	TECHNICAL / CITIES, UTILITIES & INDUSTRIES: Climate Change: Adaptation and Resilience	TECHNICAL / CITIES, UTILITIES & INDUSTRIES: Reticulations and Distribution Systems	TECHNICAL / CITIES, UTILITIES & INDUSTRIES: Water and Waste Management in Food Industries	TECHNICAL / WATER QUALITY, SAFETY & HUMAN HEALTH: Micropollutant Treatment Technologies I	TECHNICAL / ENABLING PROGRESS: Water-Finance	TECHNICAL / RE-CHARTING THE COURSE OF WATER RESOURCES: Climate Change, Floods and Droughts on Watershed Scale II	TECHNICAL / RE-CHARTING THE COURSE OF WATER RESOURCES: Resource Recovery II	LECTURE / CITIES, UTILITIES & INDUSTRIES: Rainwater Harvesting	LEARNING / The Art of Scientific Publishing for Scholars
15:00 - 15:30	Coffee Break														
15:30 - 17:00 session 3	EMERGING WATER LEADERS FORUM	CITY LEADERS FORUM	TECHNICAL / PROCESSES & TREATMENTS: Biological Treatment III: Biotreatment of Textile/Chemical WW	TECHNICAL / PROCESSES & TREATMENTS: Water Reuse	TECHNICAL / PROCESSES & TREATMENTS: Photo-catalytic Advanced Oxidation	WORKSHOP / CITIES, UTILITIES & INDUSTRIES: Asset Management Leading Practices and Issues	WORKSHOP / CITIES, UTILITIES & INDUSTRIES: Water, Human Rights and the Affordability Conundrum	TECHNICAL / CITIES, UTILITIES & INDUSTRIES: Utilities and Benchmarking	WORKSHOP / CITIES, UTILITIES & INDUSTRIES: Unlocking Financial Resources to Decarbonize the Water Sector	TECHNICAL / WATER QUALITY, SAFETY & HUMAN HEALTH: Micropollutant Treatment Technologies II	WORKSHOP / RE-CHARTING THE COURSE OF WATER RESOURCES: Reverse Osmosis in Direct Potable Reuse	TECHNICAL / ENABLING PROGRESS: Regulation- Governance / Sustainability	TECHNICAL / RE-CHARTING THE COURSE OF WATER RESOURCES: Rainwater Harvesting		
17:00 - 17:15	Break														
17:15 - 18:00	OXFORD DEBATE Opening Statement: H.E. Lyonchen Tshering Tobgay (Prime Minister of Bhutan, BT) Re-use of Wastewater as a Drinking Water Source: Technically Feasible but Socially Unacceptable?														Great Hall Q2
evening	BRISBANE NIGHT Enjoy an Evening of Art, Food and Networking Set in Brisbane's Queensland Gallery of Modern Art Precinct														

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Wednesday 12															
	Sky Room	Room S1	Room GH Q2	Room M1	Room M2	Room M3	Room M4	Room M9	Room M0	Room P1	Room P2	Room P3	Room P4	Room P5	Career Development Hub
09:00 - 09:45	KEYNOTE PLENARY PANEL Solutions to Shape Our Water Future: a Voice for Our Waterways <i>Eva Abal</i>														
09:45 - 10:30	Coffee Break														
10:30 - 12:00 session 1	BASIN LEADERS FORUM	UTILITIES OF THE FUTURE FORUM	TECHNICAL / PROCESSES & TREATMENTS: Biofilm Processes	TECHNICAL / PROCESSES & TREATMENTS: Metagenomics of Water Systems	TECHNICAL / PROCESSES & TREATMENTS: Adsorption	WORKSHOP / WATER QUALITY, SAFETY & HUMAN HEALTH: WHO Sanitation Safety Planning, from Concept to Implementation	TECHNICAL / CITIES, UTILITIES & INDUSTRIES: Asset Management I	TECHNICAL / CITIES, UTILITIES & INDUSTRIES: Water and Industrial Innovation - Pollution Control	TECHNICAL / CITIES, UTILITIES & INDUSTRIES: Urban Drainage and Sewerage	TECHNICAL / ENABLING PROGRESS: Regulation-Future Planning	WORKSHOP / ENABLING PROGRESS: Smart Plants, Smart Network: Water Operations Go Digital	WORKSHOP / RE-CHARTING THE COURSE OF WATER RESOURCES: The Future of Direct Potable Water Reuse	TECHNICAL / RE-CHARTING THE COURSE OF WATER RESOURCES: Groundwater Management I	SESSION / Emerging Technologies & Innovation	LEARNING / Building Leadership in the Water Sector
12:00 - 13:30	Lunch														
13:30 - 15:00 session 2	BASIN LEADERS FORUM		TECHNICAL / PROCESSES & TREATMENTS: GHG Emissions from WWTP	WORKSHOP / PROCESSES & TREATMENTS: Applying Molecular Tools in the Real World	TECHNICAL / PROCESSES & TREATMENTS: Ion Exchange	WORKSHOP / CITIES, UTILITIES & INDUSTRIES: Water's Strategic Role in the Resources Industry	TECHNICAL / CITIES, UTILITIES & INDUSTRIES: Asset Management II	TECHNICAL / CITIES, UTILITIES & INDUSTRIES: Water Management and Urban Planning I	TECHNICAL / CITIES, UTILITIES & INDUSTRIES: Water and Industrial Innovation - Recovery and Reuse	WORKSHOP / CITIES, UTILITIES & INDUSTRIES: The Workforce of Tomorrow, a Global Responsibility	WORKSHOP / ENABLING PROGRESS: Communications in a Crisis Situation	WORKSHOP / WATER QUALITY, SAFETY & HUMAN HEALTH: Water Safety Plans, a Lifeline for Climate Change and Extreme Events	TECHNICAL / RE-CHARTING THE COURSE OF WATER RESOURCES: Groundwater Management II - ASR Applications	WORKSHOP / RE-CHARTING THE COURSE OF WATER RESOURCES: Powering the Wastewater Renaissance: the Path to Cutting Emissions and Saving Billions in Wastewater Sector	LEARNING / How to Bring your idea to the Market With Using the Lean Startup and Rapid Prototyping
15:00 - 15:30	Coffee Break														
15:30 - 17:00 session 3	JOINT REGULATORS, BASINS, UTILITIES AND CITIES FORUM	WATER CAREER OPPORTUNITIES AND DEVELOPMENT	TECHNICAL / PROCESSES & TREATMENTS: Anaerobic Processes	TECHNICAL / PROCESSES & TREATMENTS: Nanotechnology/ Nanomaterial Applications	TECHNICAL / PROCESSES & TREATMENTS: Membrane Processes	WORKSHOP / CITIES, UTILITIES & INDUSTRIES: The Purpose of Benchmarking: Operational Improvement or Regulatory Intervention?	TECHNICAL / CITIES, UTILITIES & INDUSTRIES: Customer Management and Communication	TECHNICAL / CITIES, UTILITIES & INDUSTRIES: Water Management and Urban Planning II	TECHNICAL / CITIES, UTILITIES & INDUSTRIES: Water and Industrial Innovation - Efficiency Improvement	TECHNICAL / ENABLING PROGRESS: Customer Experience	WORKSHOP / ENABLING PROGRESS: Digital Interactions for the Customer Centric Utility	TECHNICAL / RE-CHARTING THE COURSE OF WATER RESOURCES: Soil Aquifer Treatment in Waste Water Reclamation	WORKSHOP / PROCESSES & TREATMENTS: Water in the Driest Continent - New Sources when Climate is Changing	LECTURE / PROCESSES & TREATMENTS: Granular Systems (Anaerobic and Aerobic)	LEARNING / Sustainable Delta Game – Adaptation Pathways
17:00 - 17:15	Break														
17:15 - 18:00	PLENARY DEBATE Participative Societies Creating New Challenges for the Water Sector <i>Ben Schouten</i>														
evening	PROJECT INNOVATION AWARDS & GLOBAL AWARDS CEREMONY														
Thursday 13															
	Sky Room	Room S1	Room GH Q2	Room M1	Room M2	Room M3	Room M4	Room M9	Room M0	Room P1	Room P2	Room P3	Room P4	Room P5	Career Development Hub
09:00 - 09:45	KEYNOTE PLENARY Can the Water Microbiome Save the Biohealth of the Planet? <i>Joan Rose</i>														
09:45 - 10:30	Coffee Break														
10:30 - 12:00 session 1	SCIENCE & TECHNOLOGY LEADERS FORUM	TECHNICAL / WATER QUALITY, SAFETY & HUMAN HEALTH: Pathogen Occurrence Sources at the Watershed Scale I	TECHNICAL / PROCESSES & TREATMENTS: Modelling Wastewater Processes	TECHNICAL / PROCESSES & TREATMENTS: Water-Energy-Carbon Connections in The Urban Water Environment	TECHNICAL / PROCESSES & TREATMENTS: Seawater Desalination	WORKSHOP / PROCESSES & TREATMENTS: Is The Future Decentralised?	WORKSHOP / CITIES, UTILITIES & INDUSTRIES: Bringing Liveable Cities to Life I	WORKSHOP / WATER QUALITY, SAFETY & HUMAN HEALTH: Meeting the Multiple Requirements for Disinfection	WORKSHOP / CITIES, UTILITIES & INDUSTRIES: Natural Disasters and Emergency Preparedness	TECHNICAL / WATER QUALITY, SAFETY & HUMAN HEALTH: Assessment, Impacts and Controls of Microbial Pathogens in Wastewater Treatment Systems and Reuse Schemes I	WORKSHOP / ENABLING PROGRESS: Mind the Gap: Building a Prepared, Diverse Workforce	WORKSHOP / RE-CHARTING THE COURSE OF WATER RESOURCES: Sustainable Water Solutions	WORKSHOP / CITIES, UTILITIES & INDUSTRIES: Not Waiting for a Crisis: Drawing Lessons from Effective Behaviour Change Communication in Practice	LECTURE / WATER QUALITY, SAFETY & HUMAN HEALTH: Abatement Options for Mixtures of Emerging Contaminants	
12:00 - 13:30	Lunch														
13:30 - 15:00 session 2	SCIENCE & TECHNOLOGY LEADERS FORUM	TECHNICAL / WATER QUALITY, SAFETY & HUMAN HEALTH: Pathogen Occurrence Sources at the Watershed Scale II	TECHNICAL / PROCESSES & TREATMENTS: Modelling Drinking Water System	WORKSHOP / PROCESSES & TREATMENTS: Intermittent Water Supply: The Challenge of Transitioning to 24/7	TECHNICAL / PROCESSES & TREATMENTS: Novel Desalination Technologies	WORKSHOP / CITIES, UTILITIES & INDUSTRIES: Utilities sharing knowledge on sustainable urban water management	WORKSHOP / CITIES, UTILITIES & INDUSTRIES: Bringing Liveable Cities to Life II	WORKSHOP / WATER QUALITY, SAFETY & HUMAN HEALTH: Low Impact Strategies to Manage Diffuse Pollution and Improve Water Quality	WORKSHOP / CITIES, UTILITIES & INDUSTRIES: Appropriate Technologies for Disasters and Humanitarian Crises	TECHNICAL / WATER QUALITY, SAFETY & HUMAN HEALTH: Assessment, Impacts and Controls of Microbial Pathogens in Wastewater Treatment Systems and Reuse Schemes II	WORKSHOP / ENABLING PROGRESS: Pricing Policies and Human Rights in a Water Scarce World	WORKSHOP / WATER QUALITY, SAFETY & HUMAN HEALTH: Protection of Wetland, Eco-systems Services Form Water Quality Risks	WORKSHOP / ENABLING PROGRESS: Reducing Non-Revenue Water and Energy Costs for Utilities	WORKSHOP / PROCESSES & TREATMENTS: Addressing Complexity in Water through Design Thinking	LEARNING / How to Engage Stakeholders in the Water Sector
15:00 - 15:30	Coffee Break														
15:30 - 17:00	CLOSING CEREMONY														
evening	GALA EVENING A Truly Fantastic Evening is in Store at the IWA World Water Congress & Exhibition Gala Evening														

IWA Learning Events

Pre-congress Trainings*

These are technical trainings that are offered by IWA's Members and or partners and aim to enhance professional competence in the specific topic, hence improve abilities to perform professional tasks or functions.

Saturday 8 and Sunday 9	08:30 - 17:00**	Sunday 9	08:30 - 15:30
<p>MODELLING ACTIVATED SLUDGE PLANTS Room M5/M6</p> <p>Organiser: IWA Good Modelling Practices Task Group Chair: Gunter Langergraber <i>BOKU University Vienna, Austria</i></p> <p>How to use Activated Sludge Models in Practice?</p> <p>There is an ample need for hands on practice of mathematical modelling of Activated Sludge plants. The two day modelling course provides detailed instruction on mathematical models, their structure and use in practice such as design, operation and control in activated sludge plants, and ample hands-on opportunity to use these models in a class-room setting. The learner will gain an understanding of structure of the IWA Activated Sludge Models (ASMs) and get a hands-on opportunity to use these models. The target audience is consultants, plant managers/operators, water boards and academics in modelling wastewater treatment</p> <p>** Sunday until 15:30</p>		<p>ASSESSING CLIMATE AND ENERGY PERFORMANCE OF WATER AND WASTEWATER UTILITIES Room M7/M8</p> <p>Organisers: IWA and GIZ on behalf of the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) Chair: Jose Porro <i>IWA</i></p> <p>How can urban water utilities assess and reduce their carbon emissions and improve their energy performance?</p> <p>Participants will learn to use the Energy performance and Carbon Emissions Assessment and Monitoring (ECAM) tool via interactive lectures, hands-on computer sessions, and game-based learning. With this free, web-based tool, you will be able to better assess your baseline GHG emissions and highlight water utility inefficiencies and areas that can be improved. The tool is a critical component of an international roadmap guiding decision makers through the process of actually doing something about climate change and implementing measures to mitigate it. The target audience is water professionals (practitioners, academics etc.) who want to lead the sector in applying this tool, integrate it into their current practice, decision making, and research, and possibly train others to follow.</p>	
Sunday 9	08:30 - 15:30	Sunday 9	08:30 - 15:30
<p>NRW ASSESSMENT AND MANAGEMENT IN LOW AND MIDDLE INCOME COUNTRIES Room P3</p> <p>Organiser: Water Loss SG Chair: Roland Liemberger <i>Miya, Austria</i> Contributors: Dr. Ronnie McKenzie <i>Chair WLSG, South Africa</i> Bambos Charalambous <i>Past Chair, WLSG, Cyprus</i> Tim Waldron <i>WLSG Past Chair, Australia</i></p> <p>One of the major challenges facing water utilities is the high level of Non-Revenue Water (NRW). While the benefits of reducing NRW are well known, decades of effort have not delivered much improvement in low and middle income countries (LAMIC). While there are many explanations and excuses, much of the failure is due to underestimating the technical difficulties and complexity of NRW management, along with the potential benefits of taking action. The participants will gain in-depth knowledge on NRW assessment, using the IWA methodology, and get a good overview of the available NRW reduction interventions. Finally, they will get an update on latest trends and developments in the use of performance based NRW management contracts. In this interactive training, groups will work on a case study and participants are encouraged to bring their laptops or tablets. Target audiences are those dealing with urban water supply in low and middle income countries; in particular: water utility managers, water sector key decision makers, consultants and representatives from funding agencies.</p>		<p>CRISIS MANAGEMENT AT WATER UTILITIES: CONCEPT, PREPAREDNESS AND LATEST TECHNOLOGY DEVELOPMENT IN DECISION SUPPORT SYSTEM USING ARTIFICIAL INTELLIGENCE Room P5</p> <p>Organiser: IWA Water Security and Safety Management SG Chair: Bruno Nguyen <i>UNESCO International Hydrological Program, Paris</i> Contributors: Ilan Juran</p> <p>How can water utilities get operations ready for crisis situation through preparedness, Decision Support Tools, and Smart Water Systems?</p> <p>In a context of global change, population growth, and increase of environmental risks, water utilities need to share experience and best practices in order to be best prepared against upcoming crisis situations, and to develop efficient resiliency for water services. Trainees will understand through practical cases and simulated exercise how they can be prepared and respond to extreme events, and how they can make use of the latest development in Smart Water Systems. Beyond the concepts and recommendations, special attention will also be given on how to improve mitigation and response by regularly practicing drills, and on the need for appropriate communication under stressed situations. The target audiences are: Engineers in charge of urban water services; Technicians in charge of urban water services; Decision-makers in charge of urban water services. And Anyone who would want to know more about crisis management and Smart Systems.</p>	
Sunday 9	08:30 - 12:30		
<p>PERFORMANCE-BASED CONTRACTS FOR IMPROVING UTILITIES EFFICIENCY Room P2</p> <p>Moderator: Didier Carron <i>Naldeo</i></p> <p>The workshop presents case studies, lessons learned and valuable insights from the newly published IWA Book: <i>Performance-Based Contracts (PBC) for Improving Utilities Efficiency</i>. Finding that much progress has been made in the past 10 years, the book concludes that results are uneven and many challenges remain; it looks at innovative public-public and public-private partnership approaches, including Water Operator Partnerships, service and management contracts, and the alliance approach. The workshop includes contributions from the book's editors and authors, who have experience with PBCs in different regions and different types of services. Presenters include Didier Carron (Naldeo, FR), Philip Giantris (Valuadd, AL), Silver Mugisha (NWSC, UG) and other leading international experts. This workshop will be beneficial to all those who are involved in or support water, wastewater and sanitation service delivery through operations, regulation or financing.</p>			

*The trainings are subject to change or cancellation and are offered at an additional cost, requiring separate registration. Please check at registration desk.

Soft Skills Learning Sessions and Career Development

In the Programme as well as the Exhibition area - **Career Development Hub** – IWA, its members and partners will host sessions that are aimed at providing guidance in career development or development of soft skills relevant for diverse audiences of water professionals.

Sunday 9	12:30 - 14:30	Sunday 9	14:30 - 15:30
<p style="text-align: right; background-color: #003366; color: white; padding: 2px;">Room M1/M2</p> <p>GLOBAL WATER SHAPERS: A NETWORKING EVENT TO START THE CONGRESS</p> <p>Organiser: International WaterCentre Chair: Dr. Brian S. McIntosh <i>International WaterCentre, Australia</i></p> <p>How should we respond to the key challenges and opportunities facing the water sector?</p> <p>Shaping our water future is the central theme of the 2016 IWA World Water Congress. What are the key challenges and opportunities facing the water sector from your perspective? How can and should we seek to respond to those challenges and opportunities? Join us on the opening day of the Congress to answer these questions and be part of a group of (young) water professionals to shaping the conversation about our water future. The Global Water Shapers session will be a structured, light-hearted and engaging evening providing you with an opportunity to meet, discuss and create collaborative opportunities with professionals from around the world.</p>		<p style="text-align: right; background-color: #003366; color: white; padding: 2px;">Room M1/M2</p> <p>MAKE THE MOST OUT OF THE CONGRESS: FIRST TIME ATTENDEES</p> <p>Organiser: IWA Chair: Kirsten de Vette <i>IWA</i></p> <p>How can you make the most out of attending the Congress?</p> <p>First time attendees, and those that are interested to learn more about attending the Congress and making the most of the congress. The key persons behind the Congress - Keith Robertson, the programme - Joao Grilo, exhibition - Roy Agterbos, learning events - Diana Guio, and social events - Chrysa Triantafyllidou, together with IWA members and knowledgeable congress attendees will be providing tips and tricks and share lessons learned. This session will teach participants how to make a success of their attendance, and help them reach their goals for attending.</p>	



Soft Skills Learning Sessions

- **Building Leadership in the Water Sector (Monday and Wednesday)** *IWA Career Development Hub*
- **The Curious Power of Story: How to Win Friends, Persuade Heroes and Influence Outcomes with Narrative (Monday)** *IWA Career Development Hub*
- **To Publish You Must Review: A How To Discussion** *IWA Career Development Hub*
- **The Art of Scientific Publishing for Scholars (Tuesday)** *IWA Career Development Hub*
- **How to Bring Your Idea to the Market With Using the Lean Startup and Rapid Prototyping (Wednesday)** *IWA Career Development Hub*
- **Sustainable Delta Game – Adaptation Pathways (Wednesday)** *IWA Career Development Hub*
- **Water Career Opportunities and Development (Wednesday)** *Room S1*
- **How to Engage Stakeholders in the Water Sector (Thursday)** *IWA Career Development Hub*

Master Lectures

1. RAINWATER HARVESTING

When: Tuesday 11
Time: 13:30 - 15:00
Place: Room P5

Lecturer: [Mooyoung Han](#)

Seoul National University- Korea
 IWA Rainwater Harvesting and Management Specialist Group Chair

2. GRANULAR SYSTEMS (AEROBIC AND ANAEROBIC)

When: Wednesday 12
Time: 15:30 - 17:00
Place: Room P5

Lecturers: [Prof. Mark van Loosdrecht](#)

Delft University of Technology - The Netherlands IWA Management Committee member on SG Biofilms, SG Microbial ecology and Water Engineering, SG Nutrient removal and recovery
[Prof. Damien Batstone](#) *University of Queensland - Australia* IWA Anaerobic Digestion Specialist Group Chair, Generalized Physicochemical Framework Task Group Chair

3. ABATEMENT OPTIONS FOR MIXTURES OF EMERGING CONTAMINANTS

When: Thursday 13
Time: 10:30 - 12:00
Place: Room P5

Lecturer: [Stefan Kools](#)
KWR Watercycle Research Institute- Netherlands

If you have any questions contact Kirsten de Vette:
kirsten.devette@iwahq.org

Specialists Groups

IWA specialist groups, task groups and clusters

Schedule for open meetings

IWA Specialist Groups are central to IWA's work and mission. Group members are engaged in activities such as organising conferences, seminars and workshops; writing books, reports, newsletters and journal papers. Working groups also produce scientific and technical reports, manuals of best practice and position papers.

During the IWA World Water Congress, many specialist Groups (SG), task groups (TG) and clusters have open meetings **to which all congress delegates are welcome**. This provides a unique opportunity to connect and network with specialists and leaders in their respective fields, and to update your knowledge on the issues that interest you.

Monday 10 October

PUBLIC CUSTOMER COMMUNICATION 12:00 - 13:30 / Room M7

How do water services effect society? How to raise awareness? Why public participation? The specialist group on Public & Customer Communications is all about sharing and developing best practices. At our meeting on Monday during lunch we will look back on the work the Specialist has done the last two years and discuss the priorities for the coming year.

ALTERNATIVE WATER RESOURCES CLUSTER 15:30 - 17:00 / Room M7

This meeting will focus on the review of the current Cluster's progress, but also on the planning of future steps towards the final aim of proposing New Water Solutions. Besides, we will review the main conclusions obtained at the Workshop in order to identify new opportunities and possible areas of interest.

WATERSHED AND RIVER BASIN MANAGEMENT 15:30 - 17:00 / Room M8

The SG promotes the understanding, benefits and utilisation of integrated catchment management approaches for the beneficial and sustainable use of rivers, lakes and groundwater basins worldwide. This informal session will explore opportunities for networking and sharing knowledge including programmes exploring different water resource options for a growing global population within the constraints of climate change.

BEST PRACTICES FOR CONTROL OF ARSENIC IN DRINKING WATER 15:30 - 17:00 / Board Room 2

Arsenic in drinking water has been recognized as a major public health concern, affecting more than 200 million people around the world. The best practices to control arsenic from source to tap will be outlined and elaborated in the open meeting of IWA Specialist Group on Metals and Related Substances in Drinking Water.

Tuesday 11 October

WATER SECURITY AND SAFETY MANAGEMENT 10:30 - 12:00 / Room M5+M6

This meeting aims at giving the attendees some examples of what is being done through illustrations on recent crisis management case studies lived at water utilities; as well as latest report on researches focusing on technology solutions for early warning systems. Presentations will open for discussion with the audience.

SUSTAINABILITY IN THE WATER SECTOR 10:30 - 12:00 / Room M7

The SG performs the role of making sure that economic, social, and environmental aspects are addressed in every aspect of water use. Working groups of the Specialist Group are applying sustainability principles to workforce sustainability; the inter-relationships between water quality and the environment; energy and water in the urban environment; and industrial use of water. Please attend our open meeting; we would welcome your participation.

INTERMITTENT WATER SUPPLY TG 10:30 - 12:00 / Room M8

The open meeting will provide an opportunity to inform participants of the purpose, objectives and deliverables of the Group and to exchange ideas and thoughts on the way forward in assisting water utilities and governments in improving the level of service to the consumers and water supply conditions in general reflecting on technical, financial, institutional, social and communication issues.

PRETREATMENT OF INDUSTRIAL WASTEWATER 10:30 - 12:00 / Board Room 1

This SG meeting will provide a place for older and new members to discuss the future and evolution of our strategic objectives; debate areas presented by the Committee in the report on SG trends; discuss our conference for 2018; and find new regional Committee members to enhance our annual activities.

INDUSTRIAL WATERS AND WASTEWATERS 12:00 - 13:30 / Room M5+M6

This meeting aims to brainstorm with Congress participants on how IWA can better work on industrial waters: which pressing problems and challenges from industries IWA can tackle, who to involve (both within and beyond IWA's network), how to work on it, etc.

DESIGN, OPERATION AND COSTS OF LARGE WASTEWATER TREATMENT PLANTS 12:00 - 13:30 / Room M7

The meeting will highlight the last specialist conference of the group and will give an outlook to the next conference. As a new format it has been decided that in between the regular conferences of the group (every four years) an additional event will be organized, preferably in Asia or in the Americas. It is now planned to have a conference in China in November 2018 together with the SG on Nutrient Removal and Recovery. New information concerning this event will be given.

Tuesday 11 October

INSTRUMENTATION, CONTROL AND AUTOMATION

12:00 - 13:30 / Room M8

This meeting will provide you with the latest updates on our upcoming conferences (IT&Water 2016, ICA2017), management committee elections and other activities. We look forward to interacting with you on how to make ICA SG a true forum for all members.

BENCHMARKING AND PERFORMANCE ASSESSMENT

12:00 - 13:30 / Board Room 1

The Benchmarking Specialist Group welcomes any IWA World Water Congress attendant to join us for the SG meeting. During the meeting, topics to be discussed will include the upcoming SG conference in Vienna, Austria, the publication of the new IWA Performance Indicators Manual and the options to actively participate in our group.

SLUDGE MANAGEMENT

13:30 - 15:00 / Room M8

During our group open meeting, the Specialist Group on Sludge Management (SGSM) will discuss our future conferences and workshops, and also new projects that are in the planning phase.

WATER REUSE

15:30 - 17:00 / Room M5+M6

Topics to be discussed include organizational issues and planning of special sessions for the 2017 11th IWA Water Reclamation and Reuse Conference in Long Beach, update from members of the editorial board of our newsletter, and topics brought forward by members of the WRSG.

MEMBRANE TECHNOLOGY

15:30 - 17:00 / Room M7

This meeting will be the opportunity to meet fellow Membrane Professionals and to hear about the latest activities of the IWA's Membrane Specialist Group, including the next IWA Membrane Technology Conference (Singapore, September 2017), and next Regional conference in 2018, the upcoming renewal of the Committee next year, and the selection of membrane representatives in the Young Water Professional Group.

DESIGN, OPERATION AND MAINTENANCE OF DRINKING WATER TREATMENT PLANTS

15:30 - 17:00 / Room M8

The open group meeting will start with an introduction of the scope of the SG activities, priorities, general trends and key challenges. In a second part we will focus the discussion on a specific issue such as plant operation data management and share experience on what data is needed and gathered, for which purpose, how it is used and what tools can be recommended.

Wednesday 12 October

WATER LOSS

10:30 - 12:00 / Room M7

This is an open meeting, and is about the groups activities on water loss, in particular Non Revenue Water. Techniques focussed on are leak detection, pressure control, apparent losses, flow measurement, water distribution management, water audits, strategic planning for water loss reduction, and many other factors impacting on losses.

MODELLING AND INTEGRATED ASSESSMENT

12:00 - 13:30 / Room M5+M6

The MIA SG will present the new Management Committee and its associated YWPs and how the MC intends to work to move the MIA group forward and further strengthening its role during the upcoming years. Ongoing activities relating to MIA Task Groups and Working Groups, upcoming group events and conferences will be revealed. The group's new communication policy will also be discussed. As always, it will be possible for SG members to bring up their own topics and ideas for discussion during the open meeting. Welcome!

HOT TOPICS IN RESOURCE RECOVERY FROM WATER

12:00 - 13:30 / Room M7

The cluster open meeting aims to summarize the overall goal, strategic objective and expected outcomes of the 'resource recovery from water' cluster. Second, the activities conducted and progress made in the last year will also be reviewed. Finally, activities and objectives outlined for the coming 2 years will be discussed.

EFFICIENT URBAN WATER MANAGEMENT

12:00 - 13:30 / Room M8

The Efficient Urban Water Management Specialist Group promotes knowledge, research, best practices and programs regarding efficient management and use of water in urban zones. We focus on topics like end use efficiency, customer demand management, water losses management, performance assessment, water resource planning, and technological innovation. All stakeholders are welcome.

DIFFUSE POLLUTION AND EUTROPHICATION

12:00 - 13:30 / Board Room 1

The objective of the SG is to understand and solve contamination and eutrophication of natural water resources by diffuse or non-point sources. By organizing biennial worldwide and regional conferences ("DIPCON"), the Group exchanges knowledge about the state-of-art research, monitoring/modelling/management approaches, innovative solutions and policy development. Please join us at this meeting. We would welcome your participation!

SMALL WATER AND WASTEWATER SYSTEMS

15:30 - 17:00 / Room M5+M6

This meeting will update you about the last SG conference in Athens, Greece and the election of new Management Committee. Challenges and future activities of the SWWS SG will be discussed, and more detailed information about the proposals and announcements of the next specialized Conference will also be introduced.

STRATEGIC ASSET MANAGEMENT

15:30 - 17:00 / Room M7

The SAM SG is pleased to invite you to our open meeting where we will engage you in the groups' latest developments and future events, namely a joint-conference on infrastructure asset management and utility bankability in Chile, the next LESAM in Norway, and many more.

Thursday 13 October

ASSESSMENT AND CONTROL OF HAZARDOUS SUBSTANCES IN WATER

12:00 - 13:30 / Room M7

This specialist group focuses on analytical methods, bioassays, occurrence, fate and effects of substances in in water and the environment, risk assessment, management and communication and regulatory aspects to improve water quality for a safe environment. This meeting will share and update the audience about the future events on micropollutants and hot topics for micropollutants.

Programme

Monday

Keynote Plenary

09:00 - 09:45

The Sustainable Development Goals: An Opportunity Too Good to Miss
John Thwaites

Great Hall Q2

Coffee Break

09:45 - 10:30

Session 1

10:30 - 12:00

WATER SCARCITY AND DROUGHT SUMMIT

Sky Room
Forum

Building resilience to drought and scarcity requires global leadership. We have an unprecedented opportunity to act on water scarcity and drought at the world's first multi-stakeholder Water Scarcity & Drought Summit 2016. The Summit will engage and challenge 200 leaders from the private and the public sector including ministers, business leaders, scientists and civil society on new ways of collaboration between countries, industries and sectors to address water scarcity and drought.

WATER REGULATORS FORUM

Room S1
Forum

Master of Ceremonies: **Seamus Parker** *Queensland Treasury Corporation, AU*

Regulatory and Enforcement regimes for future quality service

Chair: **David Cunliffe** *South Australia Department of Health, AU*

The session will explore why economic regulatory frameworks, enforcement regimes and better asset management practices are needed to encourage long-term infrastructure resilience to services running. It also looks at the tools being used to deal with financial challenges, incentives for non-infrastructure solutions, tariff design and value sharing infrastructure investments. The session will open with *Helmut Kroiss* (IWA President) and be followed by presentations and roundtable discussions led by *Maria Sonabel S. Anarna* (Department of Health, PH); *Alan Sutherland* (Water Industry Commission for Scotland, UK); *Dan Spiller* (Seqwater, AU); *Pranav S. Joshi* (National Environment Agency, SG); concluding with an open plenary discussion and key messages for resilient cities and water systems at large.

Lunch

12:00 - 13:30

Session 2

13:30 - 15:00

WATER SCARCITY AND DROUGHT SUMMIT

Sky Room
Forum

Building resilience to drought and scarcity requires global leadership. We have an unprecedented opportunity to act on water scarcity and drought at the world's first multi-stakeholder Water Scarcity & Drought Summit 2016. The Summit will engage and challenge 200 leaders from the private and the public sector including ministers, business leaders, scientists and civil society on new ways of collaboration between countries, industries and sectors to address water scarcity and drought.

WATER REGULATORS FORUM

Room S1
Forum

Balancing resilience while ensuring affordable services

Chair: **Darryl Day** *Northern Territory Water Directorate, AU*

Mitigation measures and environmental regulations are increasing costs and challenging sustainable, reliable services, as well as public trust. Connecting regulations for drinking water and sanitation, and those for environmental safeguarding of water sources is needed, but building resilience cannot become an obstacle to the progressive realization of these human rights. The session commences with *Hon. Mlungisi Johnson* (Chairperson of Portfolio Committee on Water and Sanitation, Parliament of the Republic of South Africa, SA), and continue with presentations and roundtable discussions led by *David Johnston* (Queensland Treasury Corporation, AU); *Richard Khaldi* (OFWAT, UK); *Alberto Biancardi* (AEEGSI, IT and WAREG); Peter Njaggah (WASREB, KE); concluding with an open plenary discussion.

Coffee Break

15:00 - 15:30

Session 3

15:30 - 17:00

WATER SCARCITY AND DROUGHT SUMMIT

Sky Room
Forum

Building resilience to drought and scarcity requires global leadership. We have an unprecedented opportunity to act on water scarcity and drought at the world's first multi-stakeholder Water Scarcity & Drought Summit 2016. The Summit will engage and challenge 200 leaders from the private and the public sector including ministers, business leaders, scientists and civil society on new ways of collaboration between countries, industries and sectors to address water scarcity and drought.

WATER REGULATORS FORUM

Room S1
Forum

Governance for sustainable urban environments

Chair: **Jaime Baptista** *National Laboratory of Civil Engineering, PT*

This session will review different approaches taken at various governance levels to build resilience in their systems, the gaps and the opportunities with other sectors and stakeholders. The session commences with *Paulo Marcelo* (ERSAR, PT), and continue with presentations and roundtable discussions led by *Kelvin Chitumbo* (NWASCO, ZM and ESAWAS); *Kevin Parks* (Alberta Energy Regulator, CA); *Kazuhsa Matsuda* (Ministry of Health, Labour and Welfare, JP); *Zelmira Mackova* (Ministry of Agriculture, CZ); concluding with an open plenary discussion and key messages for resilient cities and water systems at large.

The day will conclude with a closing panel and closed by *Diane D'Arras* (IWA President Elect).

Break

17:00 - 17:15

Keynote Plenary

17:15 - 18:00

Ending Extreme Poverty, What Do the SDGs Mean for Access to Water, Sanitation and Hygiene?
Barbara Frost

Great Hall Q2

Programme

Monday

Keynote Plenary

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Great Hall Q2

Coffee Break

09:45 - 10:30

Session 1

10:30 - 12:00

BIOSOLIDS

Room GHQ2
Technical

Chair: **Richard Tsang** *CDM Smith Inc., NL*

- 10:30 Introduction
- 10:35 Dewatering Optimization With In-Line And Real-Time Measurement Of Polymer Dose: Results From Full-Scale Treatment Plants *Banu Ormezi, Carleton University (CA)*
- 10:55 Carbon Footprint Analysis Of Biosolids Disposal In The United States *Daniel Nolasco, NOLASCO y Asociados S.A. (US)*
- 11:15 Future Proof Decentralised Sludge Recycling: Pyreg *Bert Geraats, Eliquo Water & Energy B.V. (NL)*
- 11:35 Free Nitrous Acid Pre-treatment Enhances Degradation Of Anaerobically Digested Sludge In Post Aerobic Digestion *Qilin Wang, The University of Queensland (AU)*
- 11:55 Closing summary

TECHNOLOGY FOR ENERGY EFFICIENCY

Room M1
Technical

Chair: **Stuart White** *Institute for Sustainable Futures, AU*

- 10:30 Introduction
- 10:35 A Key Issue In Developing Constructed Wetland-Microbial Fuel Cell (CW-MFC): Is The Separator Necessity? *Yaqian Zhao, University College Dublin, Ireland (IE)*
- 10:55 Inducing Biomass Granulation To Achieve Improved Settleability In Biological Nutrient Removal (BNR) Processes *Julian Sandino, CH2M (US)*
- 11:15 Energy Efficiency At Belgian Demo Cases Within The EU-project R3water *Marjoleine Weemaes, Aquafin nv (BE)*
- 11:35 Smouldering: A Revolutionary Approach To Sludge Management *Ilje Pikaar, The School of Civil Engineering, The University of Queensland (AU)*
- 11:55 Closing summary

Lunch

12:00 - 13:30

Session 2

13:30 - 15:00

ACTIVATED SLUDGE PROCESSES

Room GHQ2
Technical

Chair: **Guoren Xu** *Harbin Institute of Technology, CN*

- 13:30 Introduction
- 13:35 Influence Of Silver Nanoparticles On Nutrient Removal And Microbial Communities In SBR Process At Long-term Exposure *Yujie Feng, Harbin Institute of Technology (CN)*
- 13:55 Effect Of Foam On Temperature Prediction And Heat Recovery Potential From Biological Wastewater Treatment *Eveline Volcke, Ghent University, BE*
- 14:15 Primary Treatment To Optimize Secondary Biological Processes And Anaerobic Digestion *Dang Ho, Trojan Technologies (CA)*
- 14:35 Proliferation Of Legionella Pneumophila In Activated Sludge Systems: Stimulating Factors And Control Strategies *Regina Nogueira, Leibniz Universität Hannover (DE)*
- 14:55 Closing summary

ENERGY EFFICIENT INTEGRATED PLANT DESIGN

Room M1
Technical

Chair: **Nobert Jardin** *Ruhrverband, DE*

- 13:30 Introduction
- 13:35 From Wastewater To Bioenergy: Reaching Energy Self-sufficiency In WWTPs *Zouhayr Arbib, FCC aqualia (ES)*
- 13:55 Rebuilding a WWTP into a Circular Economy *Theis Gadegaard, Krüger A/S (DK)*
- 14:15 Management Tool To Assess, Benchmark And Support Energy Efficiency Actions In More Than 800 WWTP *Nuno Bróco, AdP Serviços (PT)*
- 14:35 Evaluating Environmental Performance Of Operational Strategies At WWTPs *Magnus Arnell, SP Technical Research Institute of Sweden (SE)*
- 14:55 Closing summary

Coffee Break

15:00 - 15:30

Session 3

15:30 - 17:00

MEMBRANE BIOREACTORS

Room GHQ2
Technical

Chair: **Roger Ben Aim** *Ifts, FR*

- 15:30 Introduction
- 15:35 Soluble Microbial Products (SMPs) In A Submerged Anaerobic Membrane Bioreactor (SAMBR) Under Transient Load Conditions *David Stuckey, NTU, Singapore (SG)*
- 15:55 Cell Entrapment As An Effective Way To Reduce Fouling In Membrane Bioreactor *Chaipon Juntawang, North Dakota State University (US)*
- The Research Activities Behind The Australian Validation Guidelines Of Membrane Bioreactors Used For Water Recycling *Pierre Le-Clech, UNSW Australia (AU)*
- 16:15 Can Bio-entrapped Marine Sediment Membrane Bioreactor Improve The Treatment Of High Saline Pharmaceutical Wastewater? *How Yong Ng, National University of Singapore (SG)*
- 16:35
- 16:55 Closing summary

CARBON RECOVERY FROM WATER

Room M1
Workshop

Chairs: **Willy Verstraete** *Ghent University, BE*
Olaf van der Kolk *Aquaminerals, NL*

Can carbon recovery from water become a model for the whole water sector?

Exploring academic, utility, and technology provider experiences and approaches to carbon recovery, this workshop looks at technical issues, but also social, economic, market and other external factors influencing the successful uptake of innovative solutions. The speakers Marc Caligaris (SUEZ, FR); Chris Hertle (GHD, AU), Paul Jensen (University of Queensland, AU); Xiaohu Dai (National Engineering Research Center for Urban Pollution Control, CN); Nuno Bróco (Águas de Portugal Serviços, PT) will highlight inspiring success stories of value retention beyond carbon to energy within the water sector. Their insights on the 'roadmap' ahead will set up an interactive discussion to identify 'out of the box' solutions.

Break

17:00 - 17:15

Keynote Plenary

17:15 - 18:00

Ending Extreme Poverty, What Do the SDGs Mean for Access to Water, Sanitation and Hygiene?
Barbara Frost

Great Hall Q2

Programme

Monday

Keynote Plenary

09:00 - 09:45

The Sustainable Development Goals: An Opportunity Too Good to Miss
John Thwaites

Great Hall Q2

Coffee Break

09:45 - 10:30

Session 1

10:30 - 12:00

DRINKING WATER I: NANOFILTRATION

Chair: **Josef Klinger** *TZW, DE*

- 10:30 Introduction
- 10:35 Production Of Biostable And Taste & Odor Free Drinking Water - A Multi-barrier Concept Pilot Testing In Singapore *Louis Wiart, Xylem Services GmbH (DE)*
- 10:55 Office Building Drinking Water Microbiome Characterization By DNA- And RNA-based Methods *Jenni Inkinen, Aalto University (FI)*
- 11:15 Simulation Of NOM Events In Pilot Plant Evaluation Of DAF/Ozone/BAC For Drinking Water Treatment *Yaode Yan, Hunter H2O Holdings Pty Limited (AU)*
- 11:35 Investigation Into The Potential For Introducing Granular Activated Carbon Treatment When Updating Purification Plants *Taro Watanabe, Yokohama Waterworks Bureau (JP)*
- 11:55 Closing summary

Room M2
Technical

CLIMATE CHANGE: ADAPTATION AND RESILIENCE

Chair: **Ioannis Alexiou** *Scientists International, UK*

- 10:30 Introduction
- 10:35 An Interdisciplinary Approach To Identify Adaptation Strategies That Enhance Flood Resilience And Urban Liveability *Briony Rogers, Monash University (AU)*
- 10:55 Cities: Survival Of The Resilient *John Batten, Arcadis (US)*
- 11:15 Building A Flood Resilient Brisbane *Mark Tinnion, Brisbane City Council (AU)*
- 11:35 Joint Efforts To Create The Waterproof Recipe For Climate Adaptation In An Existing Urban Area *Gerda Hald, VCS Denmark (DK)*
- 11:55 Closing summary

Room M3
Technical

Lunch

12:00 - 13:30

Session 2

13:30 - 15:00

DRINKING WATER II: PHYSICAL PROCESSES

Chair: **Marco Sheurer** *TZW, DE*

- 13:30 Introduction
- 13:35 Rapid And Complete As(III) Oxidation In A Rapid Sand Filter Bed *Jink Gude, TU Delft (NL)*
- 13:55 Optimizing Nitrification In Biological Rapid Sand Filters For Drinking Water Production *Hans-Jørgen Albrechtsen, Technical University of Denmark, (DK)*
- 14:15 Optimisation Of Conventional Groundwater Treatment Systems For Achieving <1 µg/L Effluent Arsenic Concentration: Tips And Tricks From The Netherlands *Arslan Ahmad, KWR Water Cycle Research Institute (NL)*
- 14:35 An Integrated System Approach To Operating Australia's First Iron And Manganese Removal Biological Treatment Plant *Eric Vanweydevel, Power and Water Corporation (AU)*
- 14:55 Closing summary

Room M2
Technical

TARGETING AND MEASURING RESILIENCE IN WATER SERVICE

Chair: **Francisco Cubillo** *Canal de Isabel II Gestión, ES*

How can alternative water resources enhance resilient planning and management?

Resilience should be accurately defined and quantified. New solutions to guarantee an appropriate supply service and contingency management should be supported by specific goals for resilience and efficiency. Speakers will explore approaches for resilience from different points of view, and then the audience will be invited to participate in reaching a redefinition of the new opportunities to implement resilience assessments in planning and management practices. Presentations by *Helena Alegre* (LNEC, PT); *Greg Claydon* (Western Australian Government, AU); *Francisco Cubillo* (Canal de Isabel II Gestión, ES); *Mary Anne Dickinson* (Alliance for Water Efficiency, US); *Patricia Gómez* (Canal de Isabel II Gestión, ES); *Mooyoung Han* (Seoul National University, KR); *Roland Liemberger* (Miya, AT); *Xiaochang C. Wang* (Xi'an University of Architecture & Technology, CN); *Stuart White* (Institute for Sustainable Futures, AU)

Room M3
Workshop

Coffee Break

15:00 - 15:30

Session 3

15:30 - 17:00

DRINKING WATER III: PHYSICAL BIOSOLID TREATMENT

Chair: **Guoren Xu** *Harbin Institute of Technology, CN*

- 15:30 Introduction
- 15:35 A Nitrosamines Survey In Drinking Water Systems Around China *Chao Chen, Tsinghua University (CN)*
- 15:55 Proposition Of A Water Treatment Plant Quality Index Basing On The Fuzzy Logic *Marcelo Libanio, Federal University of Minas Gerais (BR)*
- 16:15 Autonomous Intake Selection Optimisation Model For A Dual Source Drinking Water Treatment Plant *Edoardo Bertone, Griffith University (AU)*
- 16:35 THM And HAA Formation From NOM In Raw And Treated Surface Waters *Dan Golea, Cranfield University (UK)*
- 16:55 Closing summary

Room M2
Technical

DROUGHT RESILIENT WATER MANAGEMENT

Chair: **Raül Glotzbach** *IWA*

Flood and drought management across scales, what is the road to resilience?

How are current planning practices and tools used to ensure drought resilient? Can they be improved? Drought is a critical issue for integrated water resources management. Decision Support Systems for drought planning and management give decision makers an effective, systematic means of assessing current and future drought conditions, developing mitigation and response options to minimize economic stress, environmental losses, and social hardship. The workshop includes presentations from *Paul Belz* (QUU, AU), *Dr. Sutat Weesakul* (HAIL, TH), and *David Dreverman* (Murray-Darling Basin Authority, AU), discussing how current planning practices and tools are used to ensure drought resilient solutions. The workshop concludes with a discussion with the audience on improving drought management in the future.

Room M3
Workshop

Break

17:00 - 17:15

Keynote Plenary

17:15 - 18:00

Ending Extreme Poverty, What Do the SDGs Mean for Access to Water, Sanitation and Hygiene?
Barbara Frost

Great Hall Q2

Programme

Monday

Keynote Plenary

09:00 - 09:45

The Sustainable Development Goals: An Opportunity Too Good to Miss
John Thwaites

Great Hall Q2

Coffee Break

09:45 - 10:30

Session 1

10:30 - 12:00

TRANSITION TO SUSTAINABLE CITIES OF THE FUTURE I

Room M4
Technical

Chair: Günter Hauber-Davidson *Water Group, AU*

- 10:30 Introduction
- 10:35 The Climate Laboratory In Middelfart -- Urban Development By Climate Adaptation In Denmark *Allan Bruus, Middelfart Wastewater Utility (DK)*
- 10:55 Beyond Benchmarking: A Water Sensitive Cities Index *Chris Chesterfield, Cooperative Research Centre for Water Sensitive Cities (AU)*
- 11:15 The Location Choice Of Water Sensitive Urban Design Within A City: A Case Study Of Melbourne *Martijn Kuller, Monash University (AU)*
- 11:35 Rainwater Harvesting In Australia For Water Supply And Urban Stream Restoration *Benjamin Taylor, CQUniversity (AU)*
- 11:55 Closing summary

WATER AND WASTE MANAGEMENT IN AGROINDUSTRIES

Room M9
Technical

Chair: Therese Flapper *ARUP, AU*

- 10:30 Introduction
- 10:35 What Happened To Antibiotic Resistance Genes During Anaerobic Co-digestion Of Food Waste And Sewage Sludge Based On Microwave Pretreatment? *Yuansong Wei, Chinese academy of sciences (CN)*
- 10:55 Multi-phase Distribution Of Polycyclic Aromatic Hydrocarbons (PAHs) In The Songhua River, Northeastern China *Fansheng Meng, Chinese Research Academy of Environmental Sciences (CN)*
- 11:15 Pressure Assisted Forward Osmosis For Treating Reverse Osmosis Concentrate From Water Reclamation Plant *Shahzad Jamil, University of Technology Sydney (AU)*
- 11:35 Beneficial Use Of Coal Seam Water For Agriculture In Queensland, Australia *David Monckton, University of Queensland (AU)*
- 11:55 Closing summary

Lunch

12:00 - 13:30

Session 2

13:30 - 15:00

TRANSITION TO SUSTAINABLE CITIES OF THE FUTURE II

Room M4
Technical

Chair: Günter Hauber-Davidson *Water Group, AU*

- 13:30 Introduction
- 13:35 Transforming Stony Creek: Delivering Livability In Melbourne *Dan O'Halloran, Alluvium (AU)*
- 13:55 Whether South-to-North Water Diversion Project Is A Sustainable Choice To Resolve Water Shortage In Northern China *Xiong Wei, Hohai University (CN)*
- 14:15 An Economic Model To Identify The Economic And Lifestyle Benefits That Brisbane Derives From Its Creeks, River And Bay *Greg Tucker, Brisbane City Council (AU)*
- 14:35 How Has Urban Metabolism Been Interpreted And Communicated? *Suzanne King, N/A (US)*
- 14:55 Closing summary

ADVANCES IN THE SUPPLY CHAIN, ENVIRONMENTAL AND INDUSTRIAL BIOTECHNOLOGY I

Room M9
Technical

Chair: Ioannis Alexiou *Scientists International, UK*

- 13:30 Introduction
- 13:35 A Holistic Approach To Water Supply Network Operation - Using Desalination To Improve Cost Efficiency *Amelia Jewell, Seqwater (AU)*
- 13:55 The Improvement Of The Supply Chain Performance Of The Société Wallonne Des Eaux Leads To Optimised Operational Cost Control *Philippe Boury, La Société wallonne des eaux (BE)*
- 14:15 Benefits Of Implementing Water Safety Plans In A High Resource Setting Such As The Netherlands *Ans Versteegh, RIVM (NL)*
- 14:35 Distribution Of Microbes Among Different Phases In An Unchlorinated Drinking Water Distribution System *Gang Liu, Tu Delft / Oasen DrinkWater (NL)*
- 14:55 Closing summary

Coffee Break

15:00 - 15:30

Session 3

15:30 - 17:00

WATER SENSITIVE URBAN INFRASTRUCTURES

Room M4
Technical

Chair: Rob Skinner *Monash University, AU*

- 15:30 Introduction
- 15:35 Application Of Low Impact Stormwater Mitigation Techniques In Adapting To Climate Change *Marla Maniquiz-Redillas, Kongju National University (KR)*
- 15:55 Urban Landscape Infrastructure Design In Water Sensitive Cities *Taneha Kuzniecowa Bacchin, TU Delft (NL)*
- 16:15 Aura, The City Of Colour - Australia's Shining Example Of Widescale Integrated Water Cycle Management *Tony Mcalister, Water Technology (AU)*
- 16:35 A Selection Of Innovative Watercycle Management Projects In Brisbane *Alan Hoban, Bligh Tanner (AU)*
- 16:55 Closing summary

ADVANCES IN THE SUPPLY CHAIN, ENVIRONMENTAL AND INDUSTRIAL BIOTECHNOLOGY II

Room M9
Technical

Chair: Ana Lahnam *University of BATH, UK*

- 15:30 Introduction
- 15:35 Treatment Of Selenite-containing Wastewater With High Salinity By The Activated Sludge Process *Satoshi Soda, Osaka University (JP)*
- 15:55 Assessing The Impact Of Water Treatments On Microbial Ecology In Pilot Drinking Water Distribution Systems *Gang Liu, Delft University of Technology/Oasen DrinkWater (NL)*
- 16:15 Global Perspectives On Activated Sludge Community Composition Analyzed Using 16S RRNA Amplicon Sequencing *Marta Nierychlo, Aalborg University (DK)*
- 16:35 Treatment Of Wastewater By Pond Technology Using Granular Sludge *Rania Hamza, University of Calgary (CA)*
- 16:55 Closing summary

Break

17:00 - 17:15

Keynote Plenary

17:15 - 18:00

Ending Extreme Poverty, What Do the SDGs Mean for Access to Water, Sanitation and Hygiene?
Barbara Frost

Great Hall Q2

Programme

Monday

Keynote Plenary

09:00 - 09:45

The Sustainable Development Goals: An Opportunity Too Good to Miss
John Thwaites

Great Hall Q2

Coffee Break

09:45 - 10:30

Session 1

10:30 - 12:00

RESOURCE EFFICIENCY

Chair: **Stanley Liphdazi** *WRC, ZM*

10:30 Introduction

10:35 Comparison Of Struvite And Hydroxyapatite Precipitation For Phosphate Removal In Wastewater From Potato And Vegetable In *Boudewijn Meesschaert, KU Leuven (BE)*

10:55 Performance Of Anammox On Anaerobically Pre-treated Sewage: A Pilot Study On The Influence Of The Pretreatment *Maxime Rattier, The University of Queensland (AU)*

11:15 The Role Of Water In The Hydrogen Economy *Frank Oesterholt, KWR Watercycle Research Institute (NL)*

11:35 Macro-scale Urban Hydrological Performance Indicators *Marguerite Renouf, University of Queensland (AU)*

11:55 Closing summary

Room M0
Technical

DRINKING WATER QUALITY AND HEALTH

Chair: **Hamanth Kasan** *Rand Water, ZM*

10:30 Introduction

10:35 RYSMOWA - GIS Assisted Monitoring Of Drinking Water Quality *Martin Rygaard, Technical University of Denmark (DK)*

10:55 Enhancing Biological Stability Of Drinking Water By Using Membrane Filtration As A Post-treatment Step *Bert van der Wal, Evides (NL)*

11:15 Evaluating The Chemical Stability In Drinking Water Distribution System By Corrosivity And Precipitation Potential *Baoyou Shi, Chinese Academy of Sciences (CN)*

11:35 High-Efficient And Green Phosphate Scavengers For Phosphorus-Starvation Antibacteria *Jiaojie He, State Key Laboratory of Urban Water Resource and Environment (SKLUWRE) (CN)*

11:55 Closing summary

Room P1
Technical

Lunch

12:00 - 13:30

Session 2

13:30 - 15:00

WATER AND WASTE MANAGEMENT IN CHEMICALS AND PHARMACEUTICALS I

Chair: **Jiangyong Hu** *National University of Singapore, SG*

13:30 Introduction

13:35 Evaluation Of Resource Recovery Potential From Industrial Wastewaters *Bruce Jefferson, Cranfield University (UK)*

13:55 Coupling Of MgO/Pd0 Mediated Reduction And Bacterial Oxidation For Detoxification Of Endosulfan *Sumathi Suresh, Indian Institute of Technology Bombay (IN)*

14:15 Distribution Of Pharmaceutically Active Compounds In Clinical Wastewater From Hospital Effluent In Japan *Takashi Azuma, Osaka University of Pharmaceutical Sciences (JP)*

14:35 Quantification Of Flame Retardants From Environmental Samples And Evaluation Of Its Effect On Zebrafish By Metabolomics *Ryan De Sotto, Korea University (KR)*

14:55 Closing summary

Room M0
Technical

DRINKING WATER & CHEMICAL RISK ASSESSMENT

Chair: **Hamanth Kasan** *Rand Water, ZM*

13:30 Introduction

13:35 Formation Of Toxic Iodinated Moieties From Degradation Of Iodinated Contrast Media By Combination Of UV And Chlorinated *Sebastien Allard, Curtin University (AU)*

13:55 Investigating Mechanism Underlying Removal Of Trichloramine With Super-powdered Activated Carbon *Miki Sakuma, National Institute of Technology, Kisarazu Colledge (JP)*

14:15 Reframing Risk: A New Method For Identifying Improvement Through Control And Threat Analysis *Shona Fitzgerald, Sydney Water (AU)*

14:35 Bow Tie Analysis In The Water Industry *Annalisa Contos, Atom Consulting (AU)*

14:55 Closing summary

Room P1
Technical

Coffee Break

15:00 - 15:30

Session 3

15:30 - 17:00

WATER AND WASTE MANAGEMENT IN CHEMICALS AND PHARMACEUTICALS II

Chair: **Bruce Jefferson** *Cranfield University, UK*

15:30 Introduction

15:35 Accelerated Establishment Of Biocathode By Polarity Inversion For Efficient Degradation Of Nitrobenzene And Azo Dye AO7 *Hui Yun, Chinese Academy of Sciences (CN)*

15:55 Optimization Of Cost By HRT For Membrane Bioreactor (MBR) Treating Antibiotic Production Wastewater *Dawei Yu, Chinese Academy of Sciences (CN)*

16:15 In-sewer Biotransformation Of Common Pharmaceuticals *Ludwika Nieradzik, The University of Queensland (AU)*

16:35 Simulating Pesticides In Urban Runoff: Model Development And Evaluation *Ting Tang, Vrije Universiteit Brussel (VUB) (BE)*

16:55 Closing summary

Room M0
Technical

DIFFUSE POLLUTION AND CYANOBACTERIAL BLOOMS

Chair: **Mi-Hyun Park** *UMassAmherst, US*

15:30 Introduction

15:35 Toxic Cyanobacteria In Source Water: A Global Treatment Challenge *Arash Zamyadi, University of New South Wales (AU)*

15:55 Monitoring, Predicting, Preventing And Controlling Of (toxic) Cyanobacteria Blooms In Lakes And Reservoirs *Lisa Brand, LG SONIC (NL)*

16:15 Probabilistic Fugacity Modelling Of Cyanobacterial Toxins In A Drinking Water Reservoir *Stuart Khan, University of New South Wales (AU)*

16:35 A Pollution Source Assessment Tool For Sydney's Drinking Water Catchments *Ben Scott, WaterNSW (AU)*

16:55 Closing summary

Room P1
Technical

Break

17:00 - 17:15

Keynote Plenary

17:15 - 18:00

Ending Extreme Poverty, What Do the SDGs Mean for Access to Water, Sanitation and Hygiene?
Barbara Frost

Great Hall Q2

Programme

Monday

Keynote Plenary

09:00 - 09:45

The Sustainable Development Goals: An Opportunity Too Good to Miss
John Thwaites

Great Hall Q2

Coffee Break

09:45 - 10:30

Session 1

10:30 - 12:00

PUTTING THE COMMUNITY AT THE CENTRE OF DECISION MAKING

Room P2
Workshop

Chair: [Alan Hoban](#) *Bligh Tanner, Australia*

Citizens Juries – can (and should) water professionals trust the community to make good water management decisions?

Water professionals are increasingly being asked to listen to what the community wants, and many utilities are moving to 'customer-led' strategies. Some cities are using participatory democracy approaches such as citizens' juries to make decisions about everything from capital budget programs to waste management strategies. How effective have these programs been? Should they be used in decision making about water planning? What impact does this have on the role of the water expert? The workshop will provide an overview of participatory decision making strategies; examine the shift to a customer focus in water utilities; consider benefits and challenges of applying these practices. Speakers include [Professor Kelly Fielding](#) (University of Queensland, AU).

INTEGRATED WATER RESOURCES MANAGEMENT-GOVERNANCE ASPECTS

Room P3
Technical

Chair: [Katerina Schilling](#) *IAWD, AT*

- 10:30 Introduction
- 10:35 Catchment Management: A Local And Global Challenge [Cameron Wearing](#), *Water Research Foundation (US)*
- 10:55 Reporting On The Condition And Benefits Of Waterways To Drive Management Actions [James Udy](#), *Healthy Waterways (AU)*
- 11:15 Finding The Right Balance: Science/policy/stakeholder Partnership To Provide Water For The Community And The Environment [Andrew Mcdougall](#), *Department of Natural Resources and Mines (AU)*
- 11:35 Boundaries Of Benefit Sharing: Mapping Conflict And Cooperation In The Lake Malawi/Niassa/Nyasa Sub-basin [Joanna Fatch](#), *University of the Western Cape (ZA)*
- 11:55 Closing summary

Lunch

12:00 - 13:30

Session 2

13:30 - 15:00

BUILDING CLIMATE RESILIENCE IN COASTAL AREAS (PEARL)

Room P2
Workshop

Chairs: [Zoran Vojinovic](#) *UNESCO-IHE*
[Pritha Hariram](#) *IWA*

How do we improve resilience to disaster for coastal regions?

Carefully planned and implemented adaptative risk management strategies are a valuable way of reducing disaster risk, while protecting socio-economic and environmental assets by using a holistic approach. This workshop will share experiences and knowledge from the PEARL project (Preparing for Extreme And Rare events in coastal regions) that better inform management and policy frameworks. Roundtable discussions will provide an opportunity to identify common ground on the perception of extreme events to guide the planning and preparedness; and show how resilience measures can be applied effectively in coastal communities to address the cascading effects of floods. These discussions will be initiated by presentations from [Prof. Zoran Vojinovic](#) (UNESCO-IHE), [Prof. Christos Makropoulos](#) (NTUA, Greece) and [Dr. Sutat Weesakul](#) (Hydro and Agro Informatics Institute, TH)

INTEGRATED WATER RESOURCES MANAGEMENT-CASE STUDIES

Room P3
Technical

Chair: [Shafick Adams](#) *Water Research Commission, ZA*

- 13:30 Introduction
- 13:35 Norman Creek 2012-2031 Master Plan: From Planning To The Challenges Of Implementation [Greg Tucker](#), *Brisbane City Council (AU)*
- 13:55 Joint Catchment Protection [Knud Søndergaard](#), *Odense Municipality (DK)*
- 14:15 Decision Support Tools For Integrated Water Resources Planning, Management And Operation [Verno Jonker](#), *Aurecon (ZA)*
- 14:35 A Catchment Perspective On Planning For Excess Recycled Water Release On The Gold Coast [Anna Hollingsworth](#), *City of Gold Coast (AU)*
- 14:55 Closing summary

Coffee Break

15:00 - 15:30

Session 3

15:30 - 17:00

QUANTITATIVE MICROBIOLOGICAL RISK ASSESSMENT FOR SAFE WATER (RE)USE

Room P2
Workshop

Chair: [Gertjan Medema](#) *KWR, NL*

How does QMRA support water safety management?

QMRA is embedded in the water guidelines of the WHO and of several countries. This workshop will review experiences with applying QMRA, discuss strengths and limitations, best practices and next steps to better support water safety management. To set the scene, [Susan Petterson](#) (Water & Health, AU), discusses lessons learned when applying QMRA from the WHO perspective; [Jean Francois Loret](#) (Suez, FR) discusses the utility perspective; and [David Cunliffe](#) (Department of Health, AU) addresses the regulatory perspective. Presentations are followed by a facilitated debate between utility and government professionals on how QMRA can be applied today, and to guide the future application and development of the WHO's guidelines.

WATER QUALITY RESTORATION

Room P3
Technical

Chair: [Anik Bhaduri](#) *Griffith University, AU*

- 15:30 Introduction
- 15:35 PSI Drentsche Aa: Pesticide Scene Investigation [Theodoros Vlaar](#), *Watercompany Groningen (NL)*
- 15:55 Characteristics Of Adsorption Of Cesium (Cs) In Solution Using Carbonized Rice Hull And Beech Sawdust [Asa Miura](#), *University of Fukui (JP)*
- 16:15 Understanding Pollutant Generation To Support Predictions Of Pollutant Hotspots In A Low Intensity Rainfall Climate [Aisling O'Sullivan](#), *University of Canterbury (NZ)*
- 16:35 Retention Of Metals In Various Components Of A Newly Constructed Root-channel Wetland (China) From Source Water [Weidong Wang](#), *Chinese Academy of Sciences (CN)*
- 16:55 Closing summary

Break

17:00 - 17:15

Keynote Plenary

17:15 - 18:00

Ending Extreme Poverty, What Do the SDGs Mean for Access to Water, Sanitation and Hygiene?
Barbara Frost

Great Hall Q2

Programme

Monday

Keynote Plenary

09:00 - 09:45

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John Thwaites

Great Hall Q2

Coffee Break

09:45 - 10:30

Session 1

10:30 - 12:00

INSTRUMENTATION, CONTROL AND AUTOMATION

Room P4
Technical

Chair: **Eveline Volcke** *Ghent University, BE*

- 10:30 Introduction
- 10:35 Potential Use Of Fluorescence To Indicate Physicochemical Properties Of DOM In Water And Wastewater Treatment Systems *Kang Xiao, University of Chinese Academy of Sciences (CN)*
- 10:55 Early Non-destructive Fouling Detection In Spiral-wound RO Membranes Using A Portable Low Magnetic Field NMR *Einar Fridjonsson, University of Western Australia (AU)*
- 11:15 Reagent-free Measurement Of Nitrate, Nitrite And COD In Waste Water Treatment Plants and In The Laboratory *Frank Honold, Xylem - WTW GmbH (DE)*
- 11:35 Clean Water Monitoring (CWM) Project *Pauline Perdaems, SIG / Geneva Water (CH)*
- 11:55 Closing summary

EMERGING TECHNOLOGIES AND INNOVATION

Room P5
Session

Chair: **Ignaz Worm** *Isle Utilities, UK*

The Emerging Technologies & Innovation TAG-forum:

Start-up tech companies specially selected to present cutting edge solutions for the topics 'Water reuse to desalination' & 'Smart networks, making them work'. Chair: *Ignaz Worm*, Managing Director Isle Utilities Start up's: Clear Water Science – Memfree: Removes pollutants from water, be *Vivian Robinson*; Emefcy - MABR: Produces electricity directly from the treatment of different types of wastewater, by *Ely Cohen*; Hydro-dis: Water disinfection technique that uses the electrocatalytic break down, by *Mark Carey*

Lunch

12:00 - 13:30

Session 2

13:30 - 15:00

WATER AND ENERGY NEXUS

Room P4
Technical

Chair: **Enrique Cabrera - Rochera**
Universitat Politècnica de Valencia, ES

- 13:30 Introduction
- 13:35 Water And Energy Integrated Planning And Capacity Building *Steven Kenway, The University of Queensland (AU)*
- 13:55 Energy Implications Of The Millennium Drought On The Urban Water Cycles In Southeast Australian Cities *Steven Kenway, The University of Queensland (AU)*
- 14:15 Reducing Energy Use For Water Supply To Urban China's High-rises *Kate Smith, Tsinghua University (CN)*
- 14:35 Utilization Of Renewable Energy In Metropolitan Waterworks *Toshihiko Tanaka, Bureau of Waterworks, Tokyo Metropolitan Government (JP)*
- 14:55 Closing summary

DATA AND INFORMATION TECHNOLOGY

Room P5
Technical

Chair: **Simon Bunn** *Suez, NZ*

- 13:30 Introduction
- 13:35 Making Australian Groundwater Data Accessible: The Value Of Collaboration *Eloise Nation, Bureau of Meteorology (AU)*
- 13:55 Developing Water Accounts For Australia Using The United Nations System Of Environmental-Economic Accounting (SEEA) *Mark Lound, Australian Bureau of Statistics (AU)*
- 14:15 Updating Australia's Atlas Of Groundwater Dependant Ecosystems *Eloise Nation, Bureau of Meteorology (AU)*
- 14:35 Efforts Of System Optimization Of Information Systems In The Bureau Of Sewerage, Tokyo Metropolitan Government *Kazunori Harada, Tokyo Metropolitan Government (JP)*
- 14:55 Closing summary

Coffee Break

15:00 - 15:30

Session 3

15:30 - 17:00

BIOGAS, CO-DIGESTION AND CO-GENERATION

Room P4
Technical

Chair: **Richard Tsang** *CDM Smith Inc., NL*

- 15:30 Introduction
- 15:35 Effects Of Co-digestion On Biogas Quantity And Quality At An Australian Municipal WWTP *Jennifer Dreyfus, Allwater (AU)*
- 15:55 Biogas Upgrading And Methanation Projects Facilitates An Energy Producing WWTP *Dines Thornberg, BIOFOS (DK)*
- 16:15 Effects Of Biomass Addition On Organic Composition Of Supernatant In Sludge Digestion Process *Ryoko Yamamoto-Ikemoto, Kanazawa University (JP)*
- 16:35 Core Fermentative-methanogenic Microbiota Of Biomethane Producing Systems *Yu Tao, Imperial College London (UK)*
- 16:55 Closing summary

MODELLING AND SYSTEMS ANALYSIS

Room P5
Technical

Chair: **Peter Vanrolleghem** *Université Laval, CA*

- 15:30 Introduction
- 15:35 Two-phase Flow CFD Simulation Of Hydrodynamics Coupled With Biological Reactions In An Aerated Biological Reactor *Javier Climent, Universitat Jaume I (ES)*
- 15:55 Smoothed Particle Hydrodynamics -- An Innovative Method For Solving Fluid Dynamics Problems In Urban Water Management *Wolfgang Rauch, University of Innsbruck/Unit of Environmental Engineering (AT)*
- 16:15 DAnCE4Water - A Collaborative Decision Support Tool To Test Urban Water Management Strategies *Christian Ulrich, Monash University (AU)*
- 16:35 Integrated Water Distribution System Modelling: Two Case-studies From Poland *Patryk Wójtowicz, Wrocław University of Technology (PL)*
- 16:55 Closing summary

Break

17:00 - 17:15

Keynote Plenary

17:15 - 18:00

Ending Extreme Poverty, What Do the SDGs Mean for Access to Water, Sanitation and Hygiene?
Barbara Frost

Great Hall Q2

Programme

Monday

Keynote Plenary 09:00 - 09:45

Coffee Break 09:45 - 10:30

Session 1 10:30 - 12:00

BUILDING LEADERSHIP IN THE WATER SECTOR

Organiser: [International WaterCentre](#)

Chair: [Dr. Andre Taylor](#) *International WaterCentre, AU*

How to drive positive change through building leadership capacity in the water sector?

Advancing integrated and innovative solutions in the water sector often involves managing complex or wicked problems. Driving positive change in the sector requires skilled leadership; leadership to influence change, build partnerships, anticipate and plan for change, and also to lead high-performing, cross-boundary and multidisciplinary teams. In this session, the International WaterCentre, with its reputation as a global leader in the design and delivery of leadership development products in the water sector, will provide practical guidance on how to build leadership capacity at an individual, team, organisational and/or regional level.

Career Development Hub
Learning

Lunch 12:00 - 13:30

Session 2 13:30 - 15:00

THE CURIOUS POWER OF STORY: HOW TO WIN FRIENDS, PERSUADE HEROES, AND INFLUENCE OUTCOMES WITH NARRATIVE

Organiser: [IWA](#) and [The Source Magazine](#)

Chair: [James Workman](#) *The Source Magazine, US*

You were trained to write dry, impersonal abstracts for a 3-person peer review panel. Now discover how to reach everyone else. This refreshingly practical workshop will show you how your ideas can draw an audience of tens of thousands. By the end you will grasp the need to create a narrative, write a catchy title, and hook readers on the first sentence, paragraph, and question at the heart of each story. You will be challenged and helped to complete and submit a concise, clear, and compelling blog to IWA for publication in the weeks following the Congress.

Career Development Hub
Learning

Coffee Break 15:00 - 15:30

Break 17:00 - 17:15

Keynote Plenary 17:15 - 18:00

Programme

Tuesday

Keynote Plenary 09:00 - 09:45

Managing Water Security in a Rapidly Urbanising Environment
Xianbin Yao

Great Hall Q2

Coffee Break 09:45 - 10:30

Session 1 10:30 - 12:00

UTILITY LEADERS FORUM

Sky Room
Forum

The Changing role of Water Utilities: New Service Models and Innovation for Resource Stewardship

As the role of water and wastewater utilities shifts focus from resource provision to leading and enabling resource stewardship, innovating to navigate political and regulatory constraints and looking beyond traditional boundaries will be pivotal for securing resources. The Forum is an opportunity for C-level executives to share, learn and discuss the pathways in adopting new technologies and practices to enable this transition. The first part of the Forum focuses on Resource Stewardship. It is introduced by *Diane D'Arras*, (President Elect, IWA), and *Adam Lovell* (CEO, WSAA, AU). *Roelof Kruize* (CEO, Waternet, NL) will give a keynote and presentation will come from *Lucia Cade* (Chair & Non Executive Director, South East Water, UK); *Olaf van der Kolk* (Director, Aquaminerals, NL); *Louise Dudley* (CEO, Queensland Urban Utilities, AU); *Sue Murphy* (CEO, Water Corporation, AU)

CITY LEADERS FORUM

Room S1
Forum

Part 1: Launch of the Principles for Water Wise Cities - Invitation only

The City Leaders Forum will host the Launch of the IWA Principles for Water Wise Cities for urban stakeholders to develop a shared progressive water vision. This will underpin the collaborative action of local governments, urban professionals, and individuals actively engaged and finding solutions for sustainably managing all waters of the city. Applying the Principles contributes in many ways to the local implementation of the SDGs, the COP agreement, and the New Urban Agenda. *Dr. Ger Bergkamp* (IWA Executive Director) will open the Forum and launch the Principles, followed by a welcome message from Councillor *David McLachlan* of the Brisbane City Council. The Councillor will share Brisbane's inspiring city water story, followed by other cities on their urban water journey. **12:15 - 13:15 Lunch in the Exhibition Hall** at the Cities Pavilion to Celebrate the Launch of the Principles for Water Wise Cities / *Rob Skinner*, IWA Chair of the Cities of the Future Programme, will give a speech on the context of this initiative

Lunch 12:00 - 13:30

Session 2 13:30 - 15:00

UTILITY LEADERS FORUM

Sky Room
Forum

The Changing role of Water Utilities: New Service Models and Innovation for Resource Stewardship

The second session the theme is New Service and Business Models, focuses on customer centric business planning with innovative technologies and 'going digital'. Key elements are enabling customer centricity and real-time situational intelligence in operations. In addition utility partnerships to scale innovations, though joint city and utility work, will be discussed. Beginning with a keynote from *Taqsem Khan* (Managing Director & CEO, Dhaka WASA, BD), the session continues with presentations from *Mark Vanhoek* (CEO SUEZ Australia, AU); *Anders Buur Bækgaard* (CEO, VCS, DK); *George Hunt* (CIO, Sydney Water, AU); and the session will be closed by *Adam Lovell* (CEO, WSAA, AU).

CITY LEADERS FORUM

Room S1
Forum

Part 2: City Leaders Retreat - invitation only

The afternoon session will be fully interactive, giving cities the opportunity to learn from each other on how to best tackle water challenges and seize the opportunities water offers. The exchange will focus first on the water security challenges for cities - health, floods, droughts. We will then move the discussion to another set of challenges related to liveable, efficient, low carbon cities contributing to global targets and the cities attractiveness.

Coffee Break 15:00 - 15:30

Session 3 15:30 - 17:00

EMERGING WATER LEADERS FORUM

Sky Room
Forum

Chair: *Norhayati Binti Abdullah UTM, MY*
Arlinda Ibrahimlari UKKO, AL

What actions should we take to achieve a water wise world?

In this open platform young professionals aged 35 and under will be challenged with the task to continue to build an action agenda. Building on previously defined key visions - Water sector proactively influences policy, Innovative and adaptive water sector, a resilient and sustainable water sector, Healthy collaboration between research and industry and Customer & Community are at forefront of decision making - the roundtable discussions are aimed at developing a solution, three actions (1) for academia (2) for industry and (3) for themselves and the key competencies needed to make it happen. In plenary this will be presented and discussed with both audience and senior professionals - *Diane D'Arraz* (SUEZ Water Europe, France), *Bruno Nguyen* (Independent, France) *Simon Griffiths* (Who gives a crap Australia), *Bushra Nishat* (IWA, Bangladesh) *Paul Bowen* (WEF, USA), *Szilvia Szalóki* (HEA, Hungary).

CITY LEADERS FORUM

Room S1
Forum

Part 3: City Leaders Retreat - invitation only

The afternoon session will be fully interactive, giving cities the opportunity to learn from each other on how to best tackle water challenges and seize the opportunities water offers. The exchange will focus first on the water security challenges for cities - health, floods, droughts. We will then move the discussion to another set of challenges related to liveable, efficient, low carbon cities contributing to global targets and the cities attractiveness.

Break 17:00 - 17:15

Oxford Debate 17:15 - 18:00

Re-use of Wastewater as a Drinking Water Source: Technically Feasible But Socially Unacceptable?

Great Hall Q2

Programme

Tuesday

Keynote Plenary

09:00 - 09:45

Managing Water Security in a Rapidly Urbanising Environment
Xianbin Yao

Great Hall Q2

Coffee Break

09:45 - 10:30

Session 1

10:30 - 12:00

BIOLOGICAL TREATMENT I: MAINSTREAM AMX

Room GHQ2
Technical

Chair: **Mark van Loosdrecht** *TU Delft, NL*

- 10:30 Introduction
- 10:35 Mainstream Deammonification With AnitaMox Process *Hannah Lockie, Veolia (FR)*
- 10:55 Mainstream Deammonification At The Western Treatment Plant *Janelle Watson, Melbourne Water Corporation (AU)*
- 11:15 Systems With Anammox For Mainstream Wastewater Treatment; Pilot Scale Studies *Elzbieta Plaza, Royal Institute of Technology (SE)*
- 11:35 Full-scale Mainstream Deammonification For Sustainable Nitrogen Removal And Energy Optimization In Wastewater Treatment *Julian Sandino, CH2M (US)*
- 11:55 Closing summary

ALTERNATIVE WWT CONCEPTS

Room M1
Technical

Chair: **Arash Zamyadi** *Unsw, AU*

- 10:30 Introduction
- 10:35 Novel Process For Removal Of Phosphorus Based On Crystallization-filtration Using Limestone Material *Hyangyoung Chang, University of Science and Technology (KR)*
- 10:55 Performance And Sustainability Of Urban Waste Water Treatment Plants In Four Countries Of The Danube River Basin *Marion Colonerus, European Court of Auditors (LU)*
- 11:15 Removal Of Anthropogenic Chemicals In Selected Waste Stabilisation Ponds In Western Australia *Yolanta Gruchlik, Curtin University (AU)*
- 11:35 Large-scale Ozonation For Advanced Treatment Of Municipal Wastewater - Design And Dimensioning *Christopher Keyzers, Wasserverband Eifel-Rur (DE)*
- 11:55 Closing summary

Lunch

12:00 - 13:30

Session 2

13:30 - 15:00

BIOLOGICAL TREATMENT II: NOVEL BIOLOGICAL TREATMENT CONCEPTS

Room GHQ2
Technical

Chair: **Per Halkjær Nielsen** *Aalborg University, DK*

- 13:30 Introduction
- 13:35 Autotrophic Nitrate Removal In Bioelectrochemical System For Increased Water Reuse In Recirculating Aquaculture Tanks *Elisa Sander, AWMC/UQ (AU)*
- 13:55 Evaluation Of The Microalgae-based Activated Sludge (MAAS) Process For Municipal Wastewater Treatment On Pilot Scale *Sebastian Schwede, Mälardalen University (SE)*
- 14:15 Methane Anaerobic Oxidation Coupled To Sulfate Reduction By Consortium Enrichment From Anaerobic Sludge *Lin Li, Research Center for Eco-Environmental Sciences, CAS (CN)*
- 14:35 Assessment Of Wastewater Treatment And Energy Recovery Through Cultivation Of Microalgae *Ignacio De Godos, FCC Aqualia (ES)*
- 14:55 Closing summary

WASTEWATER RECLAMATION

Room M1
Technical

Chair: **Ioannis Alexiou** *Scientists International, UK*

- 13:30 Introduction
- 13:35 Demonstrating Organic Contaminant Removal In An Ozone-based Water Reuse Process At Full Scale *Karl Linden, University of Colorado Boulder (US)*
- 13:55 Water Reuse By An OMBR-RO System: Trace Organic Contaminant Removal And Salinity Build-up Mitigation *Long Nghiem, University of Wollongong (AU)*
- 14:15 Hybrid Ceramic Membrane Bioreactor Combined With Nanofiltration (CMBR-NF) For Wastewater Reclamation *Feiyun Sun, Harbin Institute of Technology Shenzhen Graduate School (CN)*
- 14:35 Separating Grey- And Blackwater; A Necessary Approach For Urban Water Reuse? -- The Example Of SEMIZENTRAL *Johanna Tolksdorf, Technische Universität Darmstadt (DE)*
- 14:55 Closing summary

Coffee Break

15:00 - 15:30

Session 3

15:30 - 17:00

BIOLOGICAL TREATMENT III: BIOTREATMENT OF TEXTILE/CHEMICAL WW

Room GHQ2
Technical

Chair: **Per Halkjær Nielsen** *Aalborg University, DK*

- 15:30 Introduction
- 15:35 Effect Of SBR Feeding Strategy And Feed Composition On AGS Stability In The Treatment Of A Simulated Textile Wastewater *Rita Franca, Instituto Superior Técnico, ULisboa (PT)*
- 15:55 Treatment Of A Chemical Industry Wastewater Aiming At Reuse By Integrating Biofilm And Membrane Separation Processes *Joao Bassin, Federal University of Rio de Janeiro (BR)*
- 16:15 Biological Technologies For High-strength Wastewater Treatment *Rania Hamza, The University of Calgary (CA)*
- 16:35 Two-Phase Partitioning Bioreactors Applied To Colour Removal From Real Textile Wastewater *Maria Concetta Tomei, Water Research Institute CNR (IT)*
- 16:55 Closing summary

WATER REUSE

Room M1
Technical

Chair: **Günter Hauber-Davidson** *Water Group, AU*

- 15:30 Introduction
- 15:35 Integrated Forward Osmosis - Low Pressure Reverse Osmosis System: A Novel Approach Towards Direct Potable Reuse *Rodrigo Valladares Linares, King Abdullah University of Science and Technology (SA)*
- 15:55 Treatment of high strength polyester wastewater containing dioxane in combination with grey water via integrated system *Mohamed Saad, Egypt-Japan University of science and technology (EJUST) (EG)*
- 16:15 Direct Membrane Filtration Of Municipal Wastewater With Ultrafiltration And Reverse Osmosis Membranes *Haruka Takeuchi, Kyoto University (JP)*
- 16:35 An Investigation Of Membrane Dissolved-ozone Flotation (MDOF) Process For Tertiary Wastewater Treatment *Xin Jin, Xi'an University of Architecture and Technology (CN)*
- 16:55 Closing summary

Break

17:00 - 17:15

Oxford Debate

17:15 - 18:00

Re-use of Wastewater as a Drinking Water Source: Technically Feasible But Socially Unacceptable?

Great Hall Q2

Programme

Tuesday

Keynote Plenary

09:00 - 09:45

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Xianbin Yao

Great Hall Q2

Coffee Break

09:45 - 10:30

Session 1

10:30 - 12:00

DISINFECTION

Chair: **Chao Chen** *Tsinghua University, CN*

- 10:30 Introduction
- 10:35 Potential Pathogenic Bacterial Communities & Their Resistance Towards Disinfectant In Chloraminated Distribution System *Bal Krishna Kc, Western Sydney University (AU)*
- 10:55 Novel Method For Estimation Of RNA Virus Inactivation Utilizing Platinum-containing Compounds *Jason Torrey, University of Tokyo (JP)*
- 11:15 Application Of UV-CLEDs For Water Disinfection: E. Coli, MS2 Phage, B. Subtilis Spore *Joon-Wun Kang, Yonsei University (KR)*
- 11:35 Reactivity Of Antibiotic Resistant Bacteria (ARB) With Chemical Oxidants And Their Persistence In Natural Environment *Julie Gladly-Croue, Curtin University (AU)*
- 11:55 Closing summary

Room M2
Technical

WATER REUSE FOR SUSTAINABLE AGRICULTURE, REGULATION AND TECHNOLOGY

Chair: **Melissa Meeker** *WaterReuse Association, US*

Is water regulation or technology the bottleneck to water reuse for agriculture?

Recent fears for health security have led to strict regulations and high water quality requirements for water reuse in agriculture. This has imposed the use of costly treatment processes in order to treat effluents to high standards, only to be returned to a lower quality environment. The challenges created by these regulations, and by the costs associated with the required technologies, have sometimes resulted in the direct use of wastewater on agricultural land, jeopardizing human and environment health. With a focus on the key steps needed to facilitate water reuse in agriculture, workshop speakers include *Melissa Meeker* (WaterReuse Association, USA); *Jörg Drewes* (TUMunchen, DE); *Peter Donaghy* (Queensland Urban Utility, AU); *Stanley Liphadzu* (Water Research Commission, ZA). The workshop will also include an interactive panel discussion with the audience.

Room M3
Workshop

Lunch

12:00 - 13:30

Session 2

13:30 - 15:00

ADVANCED OXIDATION PROCESSES

Chair: **Shang-Lien Lo** *National Taiwan University, TW*

- 13:30 Introduction
- 13:35 Decentralized Greywater Treatment System Based On Combined Adsorption And Electrochemical Oxidation *Elisabet Andres Garcia, AWMC - University of Queensland (AU)*
- 13:55 AOP Using UV-LEDs With Novel Immobilized Doped TiO2 Photocatalysts *Wolfgang Uhl, Norwegian Insitute for Water Research (NIVA) (NO)*
- 14:15 Persulfate Oxidation Of Phenol Activated By Polymer Coated Nano-sized Zero-valent Iron *Inseong Hwang, Pusan National University (KR)*
- 14:35 Evaluating Impact Of Large-scale Ozonation On Receiving Water's Biocenosis *Ira Brueckner, Waterboard Eifel-Rur (WVER) (DE)*
- 14:55 Closing summary

Room M2
Technical

CONFLICTS AND COLLABORATIONS, A DIALOGUE ON WATER, FISHERIES AND BIODIVERSITY

Chairs: **Joan Rose** *Michigan State University, US*
Simon Funge-Smith *FAO*

How do we improve the water sector's relationship with aquatic biodiversity?

The transformation and losses of aquatic biodiversity, particularly fisheries, in historic water developments have often been harmful. There are also innovative and sensitive approaches, both in engineering and management, which capture benefits and sustain ecosystem services. As the relationship between water management and other users matures, the economic drivers for water development are increasingly balanced by the realization that ecosystem services and biodiversity can be supported at reasonable cost. Examples can be seen around the world but, in developing countries where inland waters are important for food security and important for biodiversity, dialogue may rapidly reach an impasse. Is this inevitable? Are there no solutions? The workshop explores the challenges and solutions. Presentations from *Angela H. Arthington* (Australian Rivers Institute, AU); *Jan Cowx* (University of Hull, UK); *John Riddiford* (John Riddiford & Associates, AU); *Matt Verbyla* (Ecole Polytechnique Fédérale de Lausanne, FR); *Diane d'Arras* (Water Europe for Suez, FR)

Room M3
Workshop

Coffee Break

15:00 - 15:30

Session 3

15:30 - 17:00

PHOTO-CATALYTIC ADVANCED OXIDATION

Chair: **Karl Linden** *University of Colorado Boulder, US*

- 15:30 Introduction
- 15:35 Economically-feasible Removal Of 1,4-dioxane By VUV Irradiation With Limited Disinfection By-product Formation *Wataru Sugita, Hokkaido University (JP)*
- 15:55 Integrated Experimental And Theoretical Approach For Predicting Transformation Products In Advanced Oxidation Processes *Daisuke Minakata, Michigan Technological University (US)*
- 16:15 Monitoring Of OH Radical Scavenging Factor To Determine The Optimal Operating Conditions For The UV/H2O2 Process *Joon-Wun Kang, Yonsei University (KR)*
- 16:35 Intimate Coupling Of Visible-light-responsive Photocatalysis And Biodegradation For Degrading Phenol *Shuangshi Dong, Jilin University, Northeast Normal University (CN)*
- 16:55 Closing summary

Room M2
Technical

ASSET MANAGEMENT LEADING PRACTICES AND ISSUES

Chair: **Scott Haskins** *CH2M, AU*

Can asset management be applied globally with success?

Participants from all regions of the globe, including developed and emerging economies, will participate in a dialogue that reflects on their own context in relation to other regions, and to gain a more comprehensive awareness of asset management. The workshop will engage asset management leaders, primarily from IWA's Strategic Asset Management Specialist Group, in a review and discussion with workshop participants, on the status, issues, strengths and opportunities, and future directions surrounding asset management. This will highlight, compare and contrast similarities and differences globally. All levels of asset management maturity will be engaged. Presentations by *Helena Alegre* (LNEC, PT); *Takayuki Sawai* (JWWA, JP); *Jeff Leighton* (Portland Water, US); *Greg Ryan* (WSAA, AU); *Peter Cheung* (Federal University of Mato Grosso do Sul, BR)

Room M3
Workshop

Break

17:00 - 17:15

Oxford Debate

17:15 - 18:00

Re-use of Wastewater as a Drinking Water Source: Technically Feasible But Socially Unacceptable?

Great Hall Q2

Programme

Tuesday

Keynote Plenary

09:00 - 09:45

Managing Water Security in a Rapidly Urbanising Environment
Xianbin Yao

Great Hall Q2

Coffee Break

09:45 - 10:30

Session 1

10:30 - 12:00

UTILITIES AND ECONOMICS

Room M4
Technical

Chair: **Francisco Cubillo** *Canal de Isabel II Gestion S.A., ES*

- 10:30 Introduction
- 10:35 Efficiency Benchmarking Of Australian And New Zealand Water Utilities
Junayd Hollis, Third Horizon Consulting Partners (AU)
- 10:55 EBC's Regional Benchmarking Hubs: Removing Barriers In Establishing Improvement Programmes For Water Services
Peter Dane, EBC Foundation (NL)
- 11:15 Benchmarking Water Processes Done Right
Manu De Backer, University Ghent, University of Antwerp (BE)
- 11:35 Water And Energy Efficiency In Water Supply Systems - A Cross Relation Analysis From A Collaborative Project
Helena Alegre, National Laboratory for Civil Engineering (PT)
- 11:55 Closing summary

WATER AND WASTE MANAGEMENT IN ENERGY AND PETROCHEMICALS

Room M9
Technical

Chair: **Mitch Laginestra** *GHD, AU*

- 10:30 Introduction
- 10:35 Water Contamination By Hydraulic Fracturing Chemicals: Implications For Water Treatment & Reuse
William Stringfellow, University of the Pacific (US)
- 10:55 Biochemical In-Situ Analysis Of The Oil Contaminated Subsurface Water At Different Depths
Lu Sidan, College of Water Sciences Beijing Normal University (CN)
- 11:15 Evaluation Of COD Cr Removal By Pilot-scale O3 And H2O2 O3 Oxidation Processes From RO Brine Of Petrochemical Wastewater
Jiane Zuo, School of Environment, Tsinghua University (CN)
- 11:35 The Economic Pre-treatment Of Coal Mine Drainage Water With Caustic And Ozone
Brace Boyden, CNF & Associates (AU)
- 11:55 Closing summary

Lunch

12:00 - 13:30

Session 2

13:30 - 15:00

CLIMATE CHANGE: ADAPTATION AND RESILIENCE

Room M4
Technical

Chair: **Bruno Nguyen** *UNESCO*

- 13:30 Introduction
- 13:35 Development Of Quantitative Evaluation Model For Disaster Resilience Of Water Distribution System
Nagahisa Hirayama, National Institute for Environmental Studies (JP)
- 13:55 Quantifying Water Availability -- Preparing For The Future
Bruce Rhodes, Melbourne Water (AU)
- 14:15 Comparison Of Alternative Groundwater Desalinating Technologies For Remote Communities Based On Resilience Modelling
Keng Han Tng, University of New South Wales (AT)
- 14:35 A Risk-based And Adaptive Approach For The Management And Regulation Of Wet Weather Overflows
Catherine Port, Sydney Water (AU)
- 14:55 Closing summary

RETICULATIONS AND DISTRIBUTION SYSTEMS

Room M9
Technical

Chair: **Roland Liemberger** *Miya, PH*

- 13:30 Introduction
- 13:35 Renewal Of Water Pipelines In Tokyo: Towards Achieving An Earthquake-resistant Waterworks System
Kazuo Kato, Tokyo Metropolitan Government (JP)
- 13:55 Analysis Of Energy Consumption Of Water Distribution And Supply System Based On Digital Residential Map Data
Yasuhiro Arai, Tokyo Metropolitan University (JP)
- 14:15 Key Findings Of A 2-year Pilot Distribution System Investigation
Rolando Fabris, SA Water Corporation (AU)
- 14:35 Dealing With The Complex Interrelation Of Intermittent Supply And Water Losses
Bambos Charalambous, J2C Water (CY)
- 14:55 Closing summary

Coffee Break

15:00 - 15:30

Session 3

15:30 - 17:00

WATER, HUMAN RIGHTS AND THE AFFORDABILITY CONUNDRUM

Room M4
Technical

Chair: **Robert Bos** *IWA*

Is universal and equitable access to safe and affordable drinking water for all by 2030 realistic?

Applying human rights to water and sanitation has proved challenging. Effective service provision relies upon collective actions by interdependent stakeholders; climate change, migration and economic growth will not make this task easier. We will review the practicalities of progressive implementation of these human rights incorporating the affordability criteria. Presentations by *Amanda Loeffen* (WaterLex, Switzerland); *Bruno Tisserand* (EurEau, BE); *Pascale Guiffant* (SUEZ, FR); and panel discussion with *Richard Khaldi* (OFWAT, UK); *Alberto Biancardi* (Aeegsi, IT); *Gerard Payen* (AquaFed, FR); *Hon. Mlungisi Johnson* (Member of Parliament, SA); *Maria Sonabel Anarna* (Department of Health, PH).

UTILITIES AND BENCHMARKING

Room M9
Technical

Chair: **Petrus Dane** *EBC Foundation, NL*

- 15:30 Introduction
- 15:35 A Critical Comparison Of Methods For Benchmarking Energy Performance In WWTPs
Miguel Mauricio Iglesias, Universidade de Santiago de Compostela (ES)
- 15:55 Demand Forecasting Using Support Vector Machine And Pump Scheduling Optimization Using Genetic Algorithm
Jeewon Seo, University of Seoul (KR)
- 16:15 Utility Survival In An Environment Of Mandated Conservation
Trevor Hill, FATHOM (US)
- 16:35 Decision-making Support Tool For Water Management In Cities Based In Eco-efficiency
Desirée Marin, CETaqua, Water Technology Center (ES)
- 16:55 Closing summary

Break

17:00 - 17:15

Oxford Debate

17:15 - 18:00

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Great Hall Q2

Programme

Tuesday

Keynote Plenary

09:00 - 09:45

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Xianbin Yao

Great Hall Q2

Coffee Break

09:45 - 10:30

Session 1

10:30 - 12:00

URBAN WATER INFRASTRUCTURE REHABILITATION

Room M0
Technical

Chair: **Chris Hertle** *GHD, AU*

- 10:30 Introduction
- 10:35 Leak-before-break In Cast Iron Mains: A Failure Analysis Of A Catastrophic Pipe Burst On Harris Street, Sydney *Rui Jiang, Monash University (AU)*
- 10:55 Development Of A Simulation System For Water Failure Rate In The Event Of Large Earthquakes - A Tool For Optimizing Water *Tsutomu Shioda, Bureau of Waterworks, Tokyo Metropolitan Government (JP)*
- 11:15 Introducing A Methodology For Water Pipe Condition Assessment Using Dimensional Analysis Method *Savalan Pour Akbarkhiavi, Swinburne University of Technology (AU)*
- 11:35 Toilet Revolution: From Waste To Resource *Mooyoung Han, Seoul National University (KR)*
- 11:55 Closing summary

MICROPOLLUTANTS

Room P1
Technical

Chair: **Frederic Leusch** *Griffith University, AU*

- 10:30 Introduction
- 10:35 Source Tracking Of Nitrification And Urease Inhibitors In The Aquatic Environment *Marco Scheurer, DVGW Water Technology Center (DE)*
- 10:55 Budget Of Phosphorus And Heavy Metals In Shahe Reservoir, A Heavily Loaded Shallow Reservoir In Beijing City *Pei Lei, Chinese Academy of Sciences (CN)*
- 11:15 Micropollutant Reduction Strategy At The Scale Of An Urban Area: The « Micropollutant Project » Of Bordeaux Metropolis *Zdravka Doquang, Lyonnaise des Eaux (FR)*
- 11:35 Water Cycle In Euro-Mediterranean Hotels And Resorts: From Water Management Practices To Neglected Water Quality Issues *Gianluigi Buttiglieri, ICRA - Catalan Institute for Water Research (ES)*
- 11:55 Closing summary

Lunch

12:00 - 13:30

Session 2

13:30 - 15:00

WATER AND WASTE MANAGEMENT IN FOOD INDUSTRIES

Room M0
Technical

Chair: **Santino Diberardino** *LNEG, PT*

- 13:30 Introduction
- 13:35 Manganese Greensand Solution Stability And Comparison Of Activation Methods For Acid Mine Drainage Treatment *John Outram, Queensland University of Technology (AU)*
- 13:55 Metagenomic Analysis Of Granular Sludge From A Full-scale UASB Reactor Treating Brewery Wastewater *Abimbola Enitan, Durban University of Technology (ZA)*
- 14:15 Failure Of Classical Enumeration Methods To Detect Some Escherichia Coli Populations *Min Jin, Tianjin institute of health and environmental medicine (CN)*
- 14:35 Novel Bio-electrochemical Process For Water Recycling And Sulfur/metals Recovery From Mining Wastewater *Guillermo Pozo, Advanced Water Management Centre, The University of Queensland (AU)*
- 14:55 Closing summary

MICROPOLLUTANT TREATMENT TECHNOLOGIES I

Room P1
Technical

Chair: **Josef Klinger** *TZW, DE*

- 13:30 Introduction
- 13:35 Removal Of Diclofenac By Chlorella Vulgaris *Sarah Zydorczyk, University Duisburg-Essen (DE)*
- 13:55 Enhancing Sulfamethoxazole Biodegradation In Wastewater Treatment By Bioaugmentation With Achromobacter Denitrificans *Yen Nguyen, New University of Lisbon, (PT)*
- 14:15 Biodegradation Of Atenolol By An Enriched Nitrifying Sludge *Yifeng Xu, Advanced Water Management Centre/The University of Queensland, AU)*
- 14:35 Feasibility Study Of Using A SPAC/PAC-UF Hybrid System For Emerging Organic Pollutants Removal In A Source Water *Jiangyong Hu, National University of Singapore (SG)*
- 14:55 Closing summary

Coffee Break

15:00 - 15:30

Session 3

15:30 - 17:00

UNLOCKING FINANCIAL RESOURCES TO DECARBONIZE THE WATER SECTOR

Room M0
Workshop

Chair: **Tom Williams** *IWA*

What are the challenges for financing utilities to combat climate change and improve energy performance?

Climate change poses an increasing burden to how water utilities maintain the security of their supply and the operational performance of infrastructure. There are opportunities to access finance for low-carbon, climate-resilient infrastructure, but the flow of resources is slow, caused by a lack of awareness of financial instruments and a dearth of bankable projects to invest in. The issue exists in developed and developing countries, needing closer dialogue and collaboration amongst the finance, utility and government sectors. Presenting examples of successful project investments in Australia and United States, representatives from the financial sector, water utilities and development partners will debate the bottlenecks and opportunities related to matching financial resources with demand for low carbon, climate resilient infrastructure.

MICROPOLLUTANT TREATMENT TECHNOLOGIES II

Room P1
Technical

Chair: **Josef Klinger** *TZW, DE*

- 15:30 Introduction
- 15:35 Biological + PAC Compact System For Micropollutants Removal From Pharmaceutical Wastewater *Alexandre Gali Serra, Cetaqua, Water Technology Centre (ES)*
- 15:55 Phthalic Acid Ester Removal In Conventional Activated Sludge, SBR And UASB Based Sewage Treatment Plants In India *Khalid Gani, Indian Institute of Technology Roorkee (IN)*
- 16:15 Change In Mutagenicity Of ICM Iopamidol During Chlorination: Estimating TPs Inducing Toxicity By MS/MS And QSAR Analyse *Takashi Kondo, Hokkaido University (JP)*
- 16:35 Pharmaceutically Active Compounds Removal In Sequential Batch Reactor (SBR) And SBR Followed By Nanofiltration *Chun-Hai Wei, King Abdullah University of Science and Technology (SA)*
- 16:55 Closing summary

Break

17:00 - 17:15

Oxford Debate

17:15 - 18:00

Re-use of Wastewater as a Drinking Water Source: Technically Feasible But Socially Unacceptable?

Great Hall Q2

Programme

Tuesday

Keynote Plenary 09:00 - 09:45

Managing Water Security in a Rapidly Urbanising Environment
Xianbin Yao

Great Hall Q2

Coffee Break 09:45 - 10:30

Session 1 10:30 - 12:00

REGULATION-FINANCE

Chair: Jennifer McKay *UNISA, AU*

- 10:30 Introduction
- 10:35 Forfeiting, An Output-Based Component For Sustainable Water Finance *Karl Rudolph, the Witten/Herdecke University (DE)*
- Logan Water Alliance -- The Value Of Public And Private Sector
- 10:55 Collaboration In A Local Government Water Business *Tony Goodhew, Logan City Council (AU)*
- 11:15 "The Regulation On The European Countries And The CPLP. Comparisons And The Opinions Of Municipalities" *Octavio Almeida, Open University - Lisbon (PT)*
- 11:35 Financial Issues Facing Tokyo Sewerage And Initiatives Towards The Stabilized Business Management *Shimpei Endo, Tokyo Metropolitan Government (JP)*
- 11:55 Closing summary

Room P2
Technical

CLIMATE CHANGE, FLOODS AND DROUGHTS ON WATERSHED SCALE I

Chair: John Riddiford *John Riddiford & Associates, AU*

- 10:30 Introduction
- 10:35 An evidence based approach to a national climate change adaptation policy for water - implementation and progress *Trevor Bishop, United Kingdom Environment Agency (UK)*
- 10:55 Managing the worst drought in 100 years for London and the SE England - lessons for the future in an unstable climate *Trevor Bishop, United Kingdom Environment Agency (UK)*
- 11:15 Dry And Wet Spell Durations Of Daily Rainfall Analysis For Jeddah City, Western Saudi Arabia *Ali Subyani, King Abdulaziz University (SA)*
- 11:35 Strategies To Address The Impacts Of Climate Change On Water Resources -- Lessons From Western Australia *Greg Claydon, Department of Water, Western Australia (AU)*
- 11:55 Closing summary

Room P3
Technical

Lunch 12:00 - 13:30

Session 2 13:30 - 15:00

WATER - FINANCE

Chair: Ed Smeets *Edmadi BV, NL*

- 13:30 Introduction
- 13:35 Water Markets - Re-charting The Course Of Water Resources *Alister Walsh, Waterfind Australia 9AU*
- 13:55 The Urban Water Security Index: Conceptualisation And Pilot Of A New Index *Huijuan Wu, National University of Singapore (SG)*
- 14:15 Demonstrating And Monetizing The Multiple Benefits From Using Sustainable Drainage *Richard Ashley, University of Sheffield (UK)*
- 14:35 For A Sustainable Water Management -Investment Planning And Financial Planning On Waterworks *Takayuki Takahashi, Bureau of Waterworks, Tokyo Metropolitan Government (JP)*
- 14:55 Closing summary

Room P2
Technical

CLIMATE CHANGE, FLOODS AND DROUGHTS ON WATERSHED SCALE II

Chair: John Riddiford *John Riddiford & Associates, AU*

- 13:30 Introduction
- 13:35 Adapting To A Changing Climate - A Best Practice Guideline For The Australian Water Industry *Nicola Nelson, WaterNSW (AU)*
- 13:55 Adapting To A Changing Climate - A Best Practice Guideline For The Australian Water Industry *Nicola Nelson, WaterNSW (AU)*
- 14:15 Adaptive Management Of Water Supplies And Dams *Richard Priman, Department of Energy and Water Supply (AU)*
- 14:35 How To Manage Flood Risk And Prepare The Country For Flood? *Krzysztof Kutek, Arcadis (PL)*
- 14:55 Closing summary

Room P3
Technical

Coffee Break 15:00 - 15:30

Session 3 15:30 - 17:00

REVERSE OSMOSIS IN DIRECT POTABLE REUSE

Chair: Olivier Lefevbre *National University of Singapore, SG*

What is the future for reverse osmosis in direct potable reuse?
Increasing water scarcity is driving the debate on water reuse. We are witnessing a slow paradigm shift from indirect to direct potable water reuse (DPR), where highly purified recycled water is introduced directly into a drinking water system. A key treatment in potable reuse schemes is reverse osmosis (RO) to minimize the risk from chemical and microbial contaminants. This is an expensive treatment process, and generates a brine requiring proper disposal, limit the use of RO or DPR in certain locations. This panel discussion will look at 'out of the box' ideas and discuss ways to ensure virtually fail-safe treatment for microbial and chemical hazards via multiple, redundant barriers not involving RO. The format is a moderated panel discussion by experts in potable reuse, who have been involved in evaluating and practicing RO-free potable water reuse schemes. Presentations from *Shane Snyder* (University of Arizona, US), *Josef Lahnsteiner* (WABAG, AT), *Stuart Khan* (The University of New South Wales, AU), *Shane Trussell* (Trussell Tech, US) and *Jörg Drewes* (Technical University of Munich, DE)

Room P2
Workshop

REGULATION-GOVERNANCE / SUSTAINABILITY

Chair: Hamanth Kasan *Rand Water, ZM*

- 15:30 Introduction
- 15:35 Sustainable Management Of Water Sources For Remote Community Water Supply In The Northern Territory, Australia *Len Griffiths, Power and Water Corporation (AU)*
- 15:55 Balancing Financial And Social Objectives In Water Provisioning: Pro-poor Services In Two Kenyan Water Utilities *Klaas Schwartz, UNESCO-IHE Institute for Water Education (NL)*
- 16:15 Tightening Sewage Discharge Standards In Municipal Wastewater Treatment Plants: Does It Increase Sustainability? *Xu Wang, Chinese Academy of Sciences (CN)*
- 16:35 Understanding Water Resources In Australia's Murray Darling Basin Better Using The Bureau Of Meteorology's National Water Account *Shobhit Chandra, Bureau of Meteorology (AU)*
- 16:55 Closing summary

Room P3
Technical

Break 17:00 - 17:15

Oxford Debate 17:15 - 18:00

Re-use of Wastewater as a Drinking Water Source: Technically Feasible But Socially Unacceptable?

Great Hall Q2

Programme

Tuesday

Keynote Plenary

09:00 - 09:45

Managing Water Security in a Rapidly Urbanising Environment
Xianbin Yao

Great Hall Q2

Coffee Break

09:45 - 10:30

Session 1

10:30 - 12:00

RESOURCE RECOVERY I

Chair: **Willy Verstraete** *Ghent University, BE*

10:30 Introduction

10:35 Enhanced Elemental Sulfur Recovery By Efficient Regulation Of Denitrifying Sulfide Oxidation Bacterial Community *Aijie Wang, Harbin Institute of Technology (CN)*

10:55 Feasibility Of The Power-to-protein Concept In The Circular Economy Of The City Of Amsterdam *Frank Oosterholt, KWR Watercycle Research Institute (NL)*

11:15 Urine Collection And Nitrogen Recovery In Paris: A Common Practice In The 1800s, A Future Practice In The 2000s? *Fabien Esculier, University of Paris - LEESU (FR)*

11:35 Electrolysis For Resource Recovery From Wastewater: Technical Analysis *Emma Thompson Brewster, Advanced Water Management Centre, UQ (AU)*

11:55 Closing summary

Room P4
Technical

EMERGING TECHNOLOGIES AND INNOVATION

Chair: **Ignaz Worm** *Isle Utilities, UK*

Start-up tech companies specially selected to present cutting edge solutions for the topics 'Water reuse to desalination' & 'Smart networks, making them work'. Utilities Start up's: LG Sonic: Algae control devices, by *Lisa Brand*; Metaflush: A valveless toilet flushing system, by *Tony Lake*; Geointeractive: Rapid 3D Photomapping, by *Robert Lee*

Room P5
Session

Lunch

12:00 - 13:30

Session 2

13:30 - 15:00

RESOURCE RECOVERY II

Chair: **Willy Verstraete** *Ghent University, BE*

13:30 Introduction

13:35 Identification And Treatment By Adsorption On Biomaterials Of Platinum Based Antineoplastic Waste Streams *Karel Folens, Universiteit Gent (BE)*

13:55 Decentralised Nutrient Recovery From Urine Without Added Power Or Chemicals *Stefano Freguia, University of Queensland (AU)*

14:15 Enabling Extractive Nutrient Recovery - A Sustainable Nutrient Management Approach For A Circular Economy *Julian Sandino, CH2M (US)*

14:35 The Transition Towards Urban Recovery Wastewater Systems In Northern Europe -- Experiences From Pilot Demonstrations *Marinette Hagman, Hamburger Stadtentwässerung AöR (DE)*

14:55 Closing summary

Room P4
Technical

RAINWATER HARVESTING

Chair: **Mooyoung Han** *Seoul National University, KR*

How can the RAIN CITY help achieve the Sustainable Development Goals?

Floods, droughts, water shortages, all are related to rainwater. Appropriate Rainwater Harvesting and Management (RWHM) can mitigate many water management challenges. This is at the heart of the Rain City, where all citizens understand the benefits of rainwater, and laws and regulations support collecting rainwater instead of allowing it to drain away. Based on social consensus, and bringing together technology and economics, the Rain City will help achieve the SDGs. Mooyoung Han (Seoul National University, KR), known as Dr. Rain, gives a master lecture based on 15 years research, practice and case studies on multi-purpose RWHM, and how it can assist politicians, researchers and practitioners find solutions for SDG 6 and SDG 11

Room P5
Lecture

Coffee Break

15:00 - 15:30

Session 3

15:30 - 17:00

RAINWATER HARVESTING

Chair: **Mooyoung Han** *Seoul National University, KR*

15:30 Introduction

15:35 Stormwater Harvesting And Reuse Systems In Brisbane *Adrian Crocetti, Brisbane City Council (AU)*

15:55 Implications And Opportunities For Rainwater Harvesting, Optimizing The Urban Water Cycle *Sandra Ungerson, AloPluvia (CA)*

16:15 Using Water From Fog And Moisture: A Solution To Deal With Migration From Rural To Urban Areas *Zahra Elmi, Sistan and Baluchestan Water and Waste Water Company (IR)*

16:35 A Case Study For An Integrated Systems Approach To Low-Cost Water Resource Utilization In Rural, Tanzania *Onita Basu, Carleton University (CA)*

16:55 Closing summary

Room P4
Technical

Break

17:00 - 17:15

Oxford Debate

17:15 - 18:00

Re-use of Wastewater as a Drinking Water Source: Technically Feasible But Socially Unacceptable?

Great Hall Q2

Programme

Tuesday

Keynote Plenary	09:00 - 09:45	
Coffee Break	09:45 - 10:30	
Session 1	10:30 - 12:00	<p>TO PUBLISH YOU MUST REVIEW: A HOW TO DISCUSSION</p> <p>Organiser: IWA and IWA Publishing Chair: Michelle Herbert IWA Publishing</p> <p>How can we empower our future reviewers to ensure that everyone has an opportunity to publish their work?</p> <p>The objective of this session is to give novice reviewers guidance and help on how to review manuscripts. In this session, Michelle Herbert (IWA Publishing, UK) and Jo Burgess (WRC, SA) will assist you in understanding what is expected when taking on the role of reviewer. Participants will receive a manuscript to review ahead of the session, and will be able to compare their review with reviewer feedback from IWA Publishing. Participants will also receive notes prepared by Gustaf Olsson (Distinguished Fellow, SE) on how he approaches manuscript reviewing</p>
Lunch	12:00 - 13:30	
Session 2	13:30 - 15:00	<p>THE ART OF SCIENTIFIC PUBLISHING FOR SCHOLARS</p> <p>Organiser: IWA and UTM Chair: Norhayatibinti Abdullah UTM, MY</p> <p>Publishing is evolving rapidly. Whilst quality publication is highly synonymous with the pulse of academic accomplishments, it also sets the scholarly measures in academia as well as being indicative for an institution's progress in research. This shift may provoke a new form of academia by not only demonstrating unique and original achievements in particular research areas but also to determine new publishing models to redefine the credence of academic publications. This learning session provides an instantaneous outlook of publishing as ways to communicating research findings and transferring knowledge based on scientific scholarly writing. The session targets Young water professionals, academia, academic institution representatives.</p>
Coffee Break	15:00 - 15:30	
Break	17:00 - 17:15	
Keynote Plenary	17:15 - 18:00	

Career Development Hub
Learning

Career Development Hub
Learning

Programme

Wednesday

Keynote Plenary

09:00 - 09:45

Solutions to Shape Our Water Future: a Voice for Our Waterways
Eva Abal

Great Hall Q2

Coffee Break

09:45 - 10:30

Session 1

10:30 - 12:00

BASIN LEADERS FORUM

Sky Room
Forum

Chair: Dr. Ger Bergkamp *International Water Association*
What are the potential pathways towards strengthening and maintaining resilience within basins?

The first session of the Forum will focus on innovative approaches that are being applied within basins and how these are building resilience. This session will align with the keynote from the congress plenary which will precede the Basin Leaders Forum. The discussions will kick off with an introduction to the Basin Leaders Forum by *Prof. Paul Greenfield* (Emeritus professor, University of Queensland). Afterwards a panel discussion with *Prof. James E. Ball* (Vice-President, International Association for Hydro-Environment Engineering and Research), *Dr. Paul Bowen* (Director of Sustainability, Coca-Cola Company) and *Dr. Christian H. Severin* (Senior Environmental Specialist, Global Environment Facility) will reflect on how basins can move beyond 'engineering resilience' towards a more dynamic system. Next, a roundtable session facilitated by *Dr. John Riddiford*, Chair, IWA Watershed and River Basin Management Specialist Group will focus on experiences including tools, approaches and case studies highlighting how to achieve resilience now and in the future.

UTILITIES OF THE FUTURE FORUM

Room S1
Forum

Utility Leadership; the Missing Link for Water Technology Innovation

Attendance by invitation only.

The last decade has seen great innovation in the water technology sector, but despite strong drivers minimal technology adoption has taken place. Utilities face the challenge of often being bound into politics, procurement rules that drive low cost selection and fears that a new, unproven technology will fail. There are a few select utilities that has overcome these obstacles to embrace new technologies that ensure sufficient water supply and quality delivered in a sustainable manner. This session will address the critical changes needed to bring innovation forward. Speakers include *Bev Stinson* (AECOM, US), *Jonathan Clement*, (PWN, ND), *Sudhir Murthy* (DC Water, US), *Roelof Kruize* (WaterNet, ND) *Sue Murphy* (Water Corp, AU), *Frank Rogalla* (Aquila, ES), *Rob Renner* (WRF, US)

Lunch

12:00 - 13:30

Session 2

13:30 - 15:00

BASIN LEADERS FORUM

Sky Room
Forum

Chair: Dr. Ganesh Pangare *International Water Association*
How can long term engagement and investment within a basin be sustained?

The second session of the Forum will reflect on transformational actions that have supported development in basins along with obstacles and how they were addressed. *Dr. Sanjay Pahuja* (Senior Water Resources Specialist, World Bank) will give the keynote on 'Too Many Good Intentions? A Common Roadblock to Sustaining Engagements and Investments in River Basins'. This will be followed by a panel discussion with *H.E. Yue Zhongming* (Commissioner, Yellow River Conservancy Commission), *James Purtil* (Director-General, Department of Natural Resources and Mines, Queensland Government) and *Prof. Jane Doolan* (Professorial Fellow in Natural Resource Governance, University of Canberra). Next, participants will be invited to join the roundtable discussions facilitated by *Dr. John Dore*, Senior Water Resources Specialist, Department of Foreign Affairs and Trade (DFAT) focusing around specific basin timelines and sharing experiences including challenges of water management across a basin, how they were overcome and how this has affected different stakeholders (especially cities and industries).

Coffee Break

15:00 - 15:30

Session 3

15:30 - 17:00

JOINT REGULATORS, BASINS, UTILITIES AND CITIES FORUM

Sky Room
Forum

The complexities of how water impacts and influences sustainable development requires an integrated approach across different basin and city related systems; critical to this is the working relationship between key stakeholders including national and local governments, service providers, water resource managers and regulators.

A team from the Sydney-based Institute for Sustainable Futures opens the forum with a session reflecting on the Australian experience of drought, focusing on partnerships for water efficiency and policy. An interview-style panel will examine the critical lessons learned on the way in which key stakeholders in the Australian sector responded to the Millennium drought. This is followed by a panel discussion with representatives of the Leaders Forums: Cities, Utilities, Regulators and Basins. The outcome will inform how partnerships between these different stakeholders can be facilitated at a local, national and international level.

WATER CAREER OPPORTUNITIES AND DEVELOPMENT

Room S1
Forum

Chair: Randolf Webb *Xylem, US*

The session will provide participants with a deep insight into the professional life in various segments of the water sector through dynamic interaction with the senior leaders on the panel. Starting with round table discussions the participants will determine the questions that will be asked to the Senior leaders in the panel - *Jo Burgess*, Water Research Commission, South Africa; *Jennifer de France*, WHO, Switzerland; *Diane D'Arras*, IWA, *Philip Giantriss*, Water Supply and Sewerage Association, Albania; *Kevin Young*, Sydney Water, Australia; *Aleksandra Lazić*, Xylem, Sweden, *Jane Mumbi*, Nairobi City Water and Sewerage company

Break

17:00 - 17:15

Keynote Plenary

17:15 - 18:00

Participative Societies Creating New Challenges for the Water Sector
Ben Schouten

Great Hall Q2

Programme

Wednesday

Keynote Plenary

09:00 - 09:45

Solutions to Shape Our Water Future: a Voice for Our Waterways
Eva Abal

Great Hall Q2

Coffee Break

09:45 - 10:30

Session 1

10:30 - 12:00

BIOFILM PROCESSES

Room GHQ2
Technical

Chair: **Kuruvillea Matthew** *Murdoch University, AU*

- 10:30 Introduction
- 10:35 Biological Nutrient Removal In A Continuous Biofilm Process *Torgeir Saltnes, (NO)*
- 10:55 A New Concept For Mainstream Deammonification In MBBRs -- From Lab Studies To Full Scale Evaluation *Maria Piculell, Veolia Water Technologies, AnoxKaldnes (SE)*
- 11:15 State-of-the-art Non-destructive Biofilm Characterization Techniques In Membrane Systems *Johannes Vrouwenvelder, King Abdullah University of Science and Technology (SA)*
- 11:35 Operation Of Membrane Aerated Biofilm Reactor For The Complete Secondary Treatment Of Municipal Wastewater *Eoin Syron, Oxymem Ltd (IE)*
- 11:55 Closing summary

METAGENOMICS OF WATER SYSTEMS

Room M1
Technical

Chair: **Aijie Wang** *Chinese Academy of Sciences, CN*

- 10:30 Introduction
- 10:35 Transcriptomics And Quantitative Proteomics Reveal Metabolic Networks Of Hydrogen-producing Bacterium *Defeng Xing, Harbin Institute of Technology (CN)*
- 10:55 The Use Of RT-PCR Techniques Of E.coli And Enterococci For Fast Detection Of Fecal Pollution In Drinking Water *Gerhard Wubbels, WLN (NL)*
- 11:15 Wastewater Nitrogen Budgets Can Be Resolved By Complementary Functional Gene And Physicochemical Methods *Alea Rose, Charles Darwin University (AU)*
- 11:35 Metagenomic Profiling Of Antibiotic Resistance Genes And Mobile Genetic Elements In A Full-scale WWTP *Jianhua Guo, AWMC, The University of Queensland (AU)*
- 11:55 Closing summary

Lunch

12:00 - 13:30

Session 2

13:30 - 15:00

GHG EMISSIONS FROM WWTP

Room GHQ2
Technical

Chair: **Eveline Volcke** *Ghent University, BE*

- 13:30 Introduction
- 13:35 Modelling Of Methane Production In A Sewer System *Keshab Sharma, Advanced Water Management Centre, The University of Queensland (AU)*
- 13:55 Quantification Of Greenhouse Gases Emissions From Reusing Sewage Sludge *Ying-Chu Chen, National Taipei University (TW)*
- 14:15 Characterization Of Nitric Oxide And Nitrous Oxide Emissions From A Full-scale Activated Sludge A2/O Process *Ximao Lin, Tongji University (CN)*
- 14:35 Sludge Drying Lagoon - A Potential Significant Methane Source In Wastewater Treatment Plants *Zhiguo Yuan, The University of Queensland (AU)*
- 14:55 Closing summary

APPLYING MOLECULAR TOOLS IN THE REAL WORLD

Room M1
Workshop

Chair: **Per Nielsen** *Aalborg University, DK*

Can microbiological methods transform the water industry?

Microbiological methods are making the leap from the laboratory into the real world of wastewater and water treatment. As DNA sequencing costs decline, the water industry faces demand for greater efficiency and reliability. Sequencing is just one of the technologies that can be of service to the water industry, less well-known technologies such as proteomics or flow cytometry may have a role. There has never been a better time to bring together researchers and practitioners working in this field. Speakers and IWA BioCluster award winners *Mads Albertsen* (Aalborg University, SE), *Holger Daims* (University of Vienna, AT) and *Tom Curtis* (University of Newcastle, UK) discuss future possibilities and the technical and cultural barriers faced by researchers and practitioners.

Coffee Break

15:00 - 15:30

Session 3

15:30 - 17:00

ANAEROBIC PROCESSES

Room GHQ2
Technical

Chair: **Glen Diagger** *University of Michigan, US*

- 15:30 Introduction
- 15:35 Electrical Stimulation Enhanced Denitrification Of Nitrite-dependent Anaerobic Methane-oxidizing Bacteria *Xia Huang, State Key Joint Laboratory of Environment Simulation and Pollution Control (CN)*
- 15:55 Methanogenesis Process Stimulated By Short-term Exposure To Graphene During Anaerobic Digestion *Tian Tian, Dalian University of Technology (CN)*
- 16:15 Environmental Compliance And Biohydrogen Production By Anaerobic Co-digestion Of Glycerin And Whey In An AnSBBR *Giovanna Lovato, Instituto Mauá de Tecnologia - Escola de Engenharia Mauá (BR)*
- 16:35 Decomposition Of Sewage Sludge And Control Of Phosphorus Release By Sulphate Reduction *Ryoko Yamamoto-Ikemoto, Kanazawa University (JP)*
- 16:55 Closing summary

NANOTECHNOLOGY/ NANOMATERIAL APPLICATIONS

Room M1
Technical

Chair: **Tao Li** *IWA*

- 15:30 Introduction
- 15:35 Encapsulation Of Bacterial Degraders And Nanoscale Zero-valent Iron In Alginate For Remediation *Eakalak Khan, North Dakota State University (US)*
- 15:55 Enhanced Anaerobic Digestion Using Nano-zero Valent Iron (NZVI) To Achieve High Efficient Energy Recovery *Yayi Wang, Tongji University (CN)*
- 16:15 Identifying, Counting And Reducing Residual Superfine Powdered Activated Carbon Particles At < 1 G/L In Treated Water *Yoshihiko Matsui, Hokkaido University (JP)*
- 16:35 Removal of trihalomethanes from drinking water by modified nano-zeolite *Mohammad Reza Mirbaloochzahi, Sistan and Baloochestan Water and Wastewater co. (IR)*
- 16:55 Closing summary

Break

17:00 - 17:15

Keynote Plenary

17:15 - 18:00

Participative Societies Creating New Challenges for the Water Sector
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Great Hall Q2

Programme

Wednesday

Keynote Plenary

09:00 - 09:45

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Great Hall Q2

Coffee Break

09:45 - 10:30

Session 1

10:30 - 12:00

ADSORPTION

Chair: **Reynald Bonnard** *Suez, FR*

10:30 Introduction

10:35 Efficient Adsorption Of PFOS And F53B From Chrome Plating Wastewater And Their Subsequent Degradation In The Regeneration Process *Shubo Deng, Tsinghua University (CN)*

10:55 Enhancing Adsorptive Removal Of Radioactive Iodide By Low-dose Chlorine And Superfine Powdered Activated Carbon *Yoshihiko Matsui, Hokkaido University (JP)*

11:15 Encapsulation Of Fe3O4 Nanoparticles In Porous Materials For Removal Of Arsenic From Water *Karel Folens, Ghent University (BE)*

11:35 Suitable Characteristic Numbers To Test Granular Activated Carbons For The Removal Of Pharmaceuticals *Frank Benstoem, RWTH Aachen University (DE)*

11:55 Closing summary

Room M2
Technical

WHO SANITATION SAFETY PLANNING, FROM CONCEPT TO IMPLEMENTATION

Chair: **Günter Langergraber** *BOKU University, AT*

How do Sanitation Safety Plans help deliver a sustainable water future?

Growing populations and increasing urbanisation make investing in sanitation, to reduce pollution of rivers and other water bodies, a priority. *Darryl Jackson* (WHO consultant, AU) introduces the SSP concept; *Joan Rose* (Michigan State University, USA) presents the Global Water Pathogens Project (GWPP) and the links to SSP; *Susan Petterson* and *David Cunliffe* (Health Australia, AU) present the Australian risk management approach; *Gertjan Medema* (TU Delft, NL) presents case studies from developing contexts drawing on scientific evidence within the GWPP; and *Thor Axel Stenstrom* (Durban University of Technology, SA) presents practical considerations for SSP in a resource limited context. A panel discussion on practical experiences implementing SSP completes the program. Results of the workshop will be published in Sustainable Sanitation Practice.

Room M3
Workshop

Lunch

12:00 - 13:30

Session 2

13:30 - 15:00

ION EXCHANGE

Chair: **Tao Li** *IWA*

13:30 Introduction

13:35 Towards The Application Of Chalcogenides In The Environmental Remediation: Granulation Of KMS-1 Based Composite For Cs+ Removal *Ming-Lai Fu, Chinese Academy of Sciences (CN)*

13:55 Low Waste Solutions For The MIEEX® Ion Exchange Treatment Process *Antony Gibson, Ixom (AU)*

14:15 Metal-organic frameworks: potential application in wastewater treatment *Chong-Chen Wang, Beijing University of Civil Engineering and Architecture (CN)*

14:35 Removal Of Anionic Pollutants By Nano Iron-based Magnetic Hydrogel For Water Purification With Adsorbent Regeneration *Baile Wu, The Hong Kong University of Science and Technology (CN)*

14:55 Closing summary

Room M2
Technical

WATER'S STRATEGIC ROLE IN THE RESOURCES INDUSTRY

Chair: **Neil McIntyre** *The University of Queensland, AU*

What can the water sector learn and resource industries learn from each other?

Water is an essential medium to the resources industry and its management has become a strategic part of resource extraction. For oil, gas and mining industries effective water management is important not only due to increasingly stringent regulatory requirements but also as it allows more hydrocarbons or minerals to be extracted. Indeed, these sectors are amongst the fastest growing markets for water treatment technologies. This workshop will showcase experiences, innovative solutions and progressive water management practices, beyond operational results and efficiency, including improved community acceptance. Presentations by *Phil Tuckett* (SUEZ, AU); *Ross Carruthers* (Queensland Government, AU); *David Post* (CSIRO, AU) & *Patrick McKelvey* (Shell, AU); and a panel discussion with *Kevin Parks* (Alberta Energy Regulator, CA).

Room M3
Workshop

Coffee Break

15:00 - 15:30

Session 3

15:30 - 17:00

MEMBRANE PROCESSES

Chair: **Xia Huang** *Tsinghua University, CN*

15:30 Introduction

15:35 The Synthesis, Characterization And Industrialization Of Novel Reverse Osmosis Membrane Using Aquaporin Inside Technology *Lunliang Zhang, Poten Environmental Group (CN)*

15:55 Using ACH To Control Irreversible Membrane Fouling By Neutralizing Zeta Potential Of Meso-particles At Pre-coagulation *Hiroshi Yamamura, Chuo University, Japan (JP)*

16:15 Evaluating Membrane Performance In Recycled Water Treatment Plants For Assets Replacement Strategy *Petra Reeve, South Australian Water Corporation (AU)*

16:35 Treating Domestic Wastewater In A Forward Osmosis Membrane Reactor: Performance, Problems And Perspectives *Nur Halizah Ab Hamid, The University of Queensland (AU)*

16:55 Closing summary

Room M2
Technical

THE PURPOSE OF BENCHMARKING: OPERATIONAL IMPROVEMENT OR REGULATORY INTERVENTION?

Chair: **Enrique Cabrera** *Universitat Politècnica de Valencia, ES*
Is benchmarking a carrot for utilities or a stick for regulators?

Efficiency improvement is one of the main focuses of the entrepreneurial world. Driven by competition, it greatly impacts growth and ultimately the survival of any company. With natural monopolies dominating the water sector, demands for efficiency are nevertheless of increasing relevance as consumers take a more proactive role demanding that their payments reflect efficient costs. Comparative Performance Assessment has been presented as one of the most relevant tools for the improvement of water services. But is it an effective tool for operational improvement or is it hindering efficiency with additional regulatory intervention? An Oxford Debate-style session with *Peter Dane* (European Benchmarking Co-operation, NL) and *Rob Fearon* (Queensland Water Directorate, AU), and perspectives from *Bruno Tisserand* (EurEau, BE); *Magalhães Miguel* (CRA, MZ); *Kelvin Chitumbo* (NWASCO, ZM); *Brian Carrick* (Queensland Treasury Corporation, AU)

Room M3
Workshop

Break

17:00 - 17:15

Keynote Plenary

17:15 - 18:00

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Programme

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Eva Abal

Great Hall Q2

Coffee Break

09:45 - 10:30

Session 1

10:30 - 12:00

ASSET MANAGEMENT I

Chair: **Helena Alegre** *Lnec, PT*

- 10:30 Introduction
- 10:35 Business Case Development For Critical Civil Assets *David Marlow, WISER Analysis (AU)*
- 10:55 Shanghai Water Supply Security Risk And Vulnerability Assessment *Songchuan Fang, Mott MacDonald (CN)*
- 11:15 Dynamic Asset Management: Asset Management Evolution With Smart Network *Didier Sinapah, SUEZ (FR)*
- 11:35 Achieving Capital Efficiency From Pipe Condition Research Project *David Zhang, Sydney Water Corporation (AU)*
- 11:55 Closing summary

Room M4
Technical

WATER AND INDUSTRIAL INNOVATION - POLLUTION CONTROL

Chair: **Ioannis Alexiou** *Scientists International, UK*

- 10:30 Introduction
- 10:35 Fouling Phenomena And Filtration Surface Property Changes Of TFC And CNT Blended CA Forward Osmosis For Oil Recovery *Mohiuddin Khan, Pacific Northwest National Laboratory (US)*
- 10:55 A Novel Pilot-scale Stacked Microbial Fuel Cell For Power Generation Enhancement And Its Performance Analysis *Xia Huang, Tsinghua University (CN)*
- 11:15 Increased Carboxylate Production In High-rate Activated A-sludge By Forward Osmosis Thickening *Cristina Cagnetta, Ghent University (BE)*
- 11:35 Novel Kits For Determination Of Sulphate And Iron Reductive Bacterias In Water *Hassan Masoudi, Khorasan Razavi Rural Water and Wastewater (KR)*
- 11:55 Closing summary

Room M9
Technical

Lunch

12:00 - 13:30

Session 2

13:30 - 15:00

ASSET MANAGEMENT II

Chair: **Helena Alegre** *Lnec, PT*

- 13:30 Introduction
- 13:35 The Optimal Renewal Planning Of Multi-regional Water Supply Pipelines Using Dynamic Programming *Kibum Kim, University of Seoul (KR)*
- 13:55 Decentralized Treatment Impacts On Dissolved Oxygen And Sulfide Concentrations In Sanitary Sewers *Adam Shypanski, University of Queensland (AU)*
- 14:15 Sustainability Index For Progress In Municipal Water And Wastewater Services *Annika Malm, City of Gothenburg (SE)*
- 14:35 Australian-made Technology Renews Sydney's Oldest Sewers *John Monro, Interflow Pty Limited (AU)*
- 14:55 Closing summary

Room M4
Technical

WATER MANAGEMENT AND URBAN PLANNING I

Chair: **Jean-Luc Bertrand-Krajewski** *DEEP, FR*

- 13:30 Introduction
- 13:35 Influencing Water Use: Using Behavioural Science To Manage Household Water Demand *Sarah Kneebone, Monash University (AU)*
- 13:55 The Experience Of Implementing IWA's Water Balance In Iran *Hamidreza Tashauoei, National Water and Wastewater Engineering Company (NWWEC) (IR)*
- 14:15 Water For Life - Securing Water For South East Queensland *Karen Campisano, Seqwater (AU)*
- 14:35 Evaluating Runoff Treatment Efficacy Of Three Lightweight Media For Suspended Raingardens *Lokesh Padhye, The University of Auckland (NZ)*
- 14:55 Closing summary

Room M9
Technical

Coffee Break

15:00 - 15:30

Session 3

15:30 - 17:00

CUSTOMER MANAGEMENT AND COMMUNICATION

Chair: **Kari Elisabeth Fagernaes** *Oslo Water and Wastewater Works, NO*

- 15:30 Introduction
- 15:35 The Influence Of Elicitation Method On Customer Preferences For Water And Wastewater Services *Rebecca Sayles, Cranfield University (UK)*
- 15:55 Transforming The Water Utility Customer Experience Using Human Centred Design *Michael Storey, Sydney Water (AU)*
- 16:15 Think H2O! - An Educational Partnership To Raise Students' Awareness Of The Water Challenges *Kenneth Persson, Sydsvatten (SE)*
- 16:35 Networks Vs. Hierarchy - Barriers And Stakeholder Networks In The Urban Water-energy Planning Process *Lisa Scholten, Delft University of Technology (NL)*
- 16:55 Closing summary

Room M4
Technical

WATER MANAGEMENT AND URBAN PLANNING II

Chair: **x x**

- 15:30 Introduction
- 15:35 Norman Creek 2012-2031 Master Plan: From Planning To The Challenges Of Implementation *Greg Tucker, Brisbane City Council (AU)*
- 15:55 Integrated Hydrological Modelling System For Managing Water Resources In Australia Under Changing Climate *Amgad Elmahdi, Bureau of Meteorology (AU)*
- 16:15 Water Scarcity And Affordability In Urban Water Pricing: A Case Study Of Chile *Guillermo Donoso, Pontificia Universidad Catolica de Chile (CL)*
- 16:35 From Masterplanning Towards Political Agreement *Trine Stausgaard Munk, Rambøll (DK)*
- 16:55 Closing summary

Room M9
Technical

Break

17:00 - 17:15

Keynote Plenary

17:15 - 18:00

Participative Societies Creating New Challenges for the Water Sector
Ben Schouten

Great Hall Q2

Programme

Wednesday

Keynote Plenary

09:00 - 09:45

Solutions to Shape Our Water Future: a Voice for Our Waterways
Eva Abal

Great Hall Q2

Coffee Break

09:45 - 10:30

Session 1

10:30 - 12:00

URBAN DRAINAGE AND SEWERAGE

Chair: **Jean-Luc Bertrand-Krajewski** *DEEP, FR*

- 10:30 Introduction
- 10:35 Towards Optimized And Reconstructable Sampling Inspection Of Pipe Integrity For Improved Efficiency Of NDT *Lei Shi, University of Technology, Sydney (AU)*
- 10:55 Model Based Predictive Control Of Ferrous Dosing To Reduce Odour And Corrosion In Sewers: Modelling And Field Validation *Guangming Jiang, The University of Queensland (AU)*
- 11:15 Determining Factors Controlling Sewer Corrosion Using Long-term Well Controlled Laboratory Based Studies *Philip Bond, University of Queensland (AU)*
- 11:35 The Role Of Greater Copenhagen Utility In Implementing The City's Cloudburst Management Plan *Julie Ziensen, HOFOR, Greater Copenhagen Utility (DK)*
- 11:55 Closing summary

Room MO
Technical

REGULATION-FUTURE PLANNING

Chair: **Hamanth Kasan** *Rand Water, ZM*

- 10:30 Introduction
- 10:35 Increased Water Use Efficiency: ¿Does It Lead To Increased Water Productivity? *Guillermo Donoso, Pontificia Universidad Católica de Chile (CL)*
- 10:55 Water Availability, Allocation And Use In Australia -- A National Water Account Perspective *Wijedasa Alankarage, Bureau of Meteorology (AU)*
- 11:15 Understanding Water Resources In Murray - Darling Basin Better Using The Bureau Of Meteorology's National Water Account *Alankarage Wijedasa, Bureau of Meteorology (AU)*
- 11:35 Integrated Wastewater System Modelling: A New Approach For The Development Of Long Term Integrated Plans For Wet Weather *Gerda Hald, VCS (DK)*
- 11:55 Closing summary

Room P1
Technical

Lunch

12:00 - 13:30

Session 2

13:30 - 15:00

WATER AND INDUSTRIAL INNOVATION - RECOVERY AND REUSE

Chair: **Santino Diberardino** *LNEG, PT*

- 13:30 Introduction
- 13:35 Using Open Innovation To Address The Challenge Of Water Treatment Residue At Rand Water *Mogan Padayachee, Rand Water (ZA)*
- 13:55 South Africa's Water Research, Development, And Innovation (RDI) Roadmap: 2015-2025 *Jo Burgess, Water Research Commission (ZA)*
- 14:15 Thin-Film Composite Forward Osmosis Membranes Of Thin-Film Layers On Novel Hydrophilic Substrates For Desalination *Xinyu Zhang, State Key Laboratory of Urban Water Resource and Environment, Harbin Institute of Technology (CN)*
- 14:35 Sustainability In Industry: Making It Real *Cheryl Davis, CKD Consulting (US)*
- 14:55 Closing summary

Room MO
Technical

THE WORKFORCE OF TOMORROW, A GLOBAL RESPONSIBILITY

Chair: **Trine Stausgaard Munk** *Ramboll, DK*

Can workforce diversity deliver the vision for cities of the future?

Cities are the future for humanity and by 2050 some 3 billion additional people will be living in urban areas. To be fit for this urbanised future, the water sector needs to recruit and train the skilled workers capable of delivering the future vision for cities. Diversity in professional skills, background, age, gender, culture will enhance the water sector's ability to provide robust and innovative solutions for the water wise, liveable cities of tomorrow. *Diane D'arras* (SUEZ, FR) and *Sue Murphy* (Water Corporation of Western Australia, AU) will discuss and invite debate on the challenges and solutions to providing the workforce of tomorrow and overcoming the diversity drought. Participants will be key to identifying actions needed for success.

Room P1
Workshop

Coffee Break

15:00 - 15:30

Session 3

15:30 - 17:00

WATER AND INDUSTRIAL INNOVATION - EFFICIENCY IMPROVEMENT

Chair: **Rod Naylor** *Veolia, AU*

- 15:30 Introduction
- 15:35 A More Adaptable Tech For Renewable Energy Powered RO With Hydraulic Driven Pump And Energy Recovery Integrated Device *Ronghui Zhu, CN*
- 15:55 The research on properties of aerobic granular sludge and analysis of microbial community in GSBP *Xiao Wang, Harbin Institute of Technology (CN)*
- 16:15 Targeted Loss Reduction For Water Supply Systems To Achieve Savings In Water Resources *Eddy Renaud, IRSTEA (FR)*
- 16:35 Multi-objective Optimization Of A Self-recirculation A/O-MBR: A Numerical Study Of DO Distribution And Membrane Scouring *Min Yang, Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences (CN)*
- 16:55 Closing summary

Room MO
Technical

CUSTOMER EXPERIENCE

Chair: **Lucia Cade** *Seaford, AU*

- 15:30 Introduction
- 15:35 Alliancing To Drive Operational Efficiency And Provide A Great Customer Experience - The Adelaide Services Alliance *Annelise Avril, Allwater (AU)*
- 15:55 The Role Of State Water Departments In Supporting Successful Community Managed Water Services In Three Indian States *Urmila Brighu, Cranfield University (IN)*
- 16:15 Engaging Communities In Management Of Stormwater Pollution: Building Awareness Through Effective Communication *Angela Dean, The University of Queensland (AU)*
- 16:35 What Influences Public Responses To Potable Water Reuse And How Can We Promote Greater Acceptance? *Kelly Fielding, The University of Queensland (AU)*
- 16:55 Closing summary

Room P1
Technical

Break

17:00 - 17:15

Keynote Plenary

17:15 - 18:00

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Great Hall Q2

Programme

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Great Hall Q2

Coffee Break

09:45 - 10:30

Session 1

10:30 - 12:00

SMART PLANTS, SMART NETWORK: WATER OPERATIONS GO DIGITAL

Room P2
Workshop

Chair: **David Lamy** *Suez, AU*

Will going digital transform the water operations?

The workshop is introduced by **Renaald Gallis** (Suez, AU) on the transformation of water operations through key enabling connectivity for water metering; **Andreas Weingartner** (S::can, AT) discusses innovative sensors for on-line water quality monitoring and early warning systems; a presentation from **Zdravka Doquang** (Suez, FR) will explore smart water distribution networks and how data analytics has become a key driver for new products and solutions. This is followed by **Michael Storey** (Sydney Water, AU) will then discuss how Sydney Water is creating a digitally connected utility, and the opportunities this creates to improve operations, and services to their customers. **David Lamy** (Suez, AU) will moderate the session and lead a final panel discussion focused on sharing feedback and identifying a vision for the future.

THE FUTURE OF DIRECT POTABLE WATER REUSE

Room P3
Workshop

Chair: **Jörg E. Drewes** *Technical University of Munich, DE*

Is Direct Potable Reuse the future for recycled water?

Growing water scarcity, drought and other environmental challenges are fueling an intense debate on reusing wastewater for drinking water. Indirect potable reuse (IPR) has been the main approach adopted so far, but that is being challenged by direct potable reuse (DPR), where recycled water is fed directly into the raw water supply. From Namibia to the USA, Australia to South Africa, DPR is either already happening or being considered. This workshop will present the state-of-the-art of the prospects of DPR from the point of view of reliability and safety. **Jörg Drewes** (TU Munich, DE) presents on the feasibility of DPR in California, USA; **Shane Trussell** (Trussell Technologies, US) on lessons learned from a demonstration-scale facility in San Diego; **Frederic Leusch** (Griffith University, AU) on the potential adverse human health risks; **David Cunliffe** (South Australia Department of Health, AU) on developing global DPR guidelines.

Lunch

12:00 - 13:30

Session 2

13:30 - 15:00

COMMUNICATIONS IN A CRISIS SITUATION

Room P2
Workshop

Chair: **Kari Elisabeth Fagernaes**
Oslo Water and Sewage Works, Norway

How can our communications toolkit help in a crisis?

Communications, marketing, consumer behaviour and partnerships are vital to the future of the water sector. Parts of the industry have embraced new engagement methods and communication tools, but there are lessons to be learned and best practice to be determined. We will explore the resources and tools available, effective uses of new technologies and the power of social media. Groups will discuss different tools and allow participants to share experiences. Attendees will then be put into a fictional crisis, review the crisis from every communication angle, from speechwriters, online communities, media and even the research engineer. Workshop speakers include **Greg Kail** (American Water Works Association, US); **Dennis Mwanza** (Sustainable Water and Sanitation for Africa, KE); **Sandra Hall** (The University of Queensland, AU); and **Helen Stratton** (Griffith University, AU).

WATER SAFETY PLANS, A LIFELINE FOR CLIMATE CHANGE AND EXTREME EVENTS

Room P3
Workshop

Chairs: **Marion Savill** *Affordable Water, NZ*
Zdravka Doquang *Suez, France*

What can 12 years of WSP implementation tell us about coping with Extreme Events?

Looking at achievements from both a microbial and a practical treatment plant implementation perspective, how can WSPs help with Extreme Events and what kind of issues will WSPs need to address in the future? **Jennifer De France** (WHO) presents on the achievements of WSPs in large and small water supplies; using case studies from France and Spain; **Jean-François Loret** (Suez, FR) discusses benefits to operational performance and how they have been achieved; **Paul Byleveld** (New South Wales Department of Health, AU) looks at emerging future trends and how WSPs assist with Climate Change; **Kenneth Persson** (Sydvattn AB, SE) explores the long-term impact of climate change on raw water resources quality and on drinking water plant operation. A panel discussion ends the session.

Coffee Break

15:00 - 15:30

Session 3

15:30 - 17:00

DIGITAL INTERACTIONS FOR THE CUSTOMER CENTRIC UTILITY

Room P2
Workshop

Chairs: **Eve Rodrigues** *Water Services Association of Australia*
Peter Prevos *Coliban Water, Australia*

How can digital engagement benefit Water Cities of the Future?

Finding new ways to engage with customers, and developing strategies for effective ICT and social media use, is critical for water service providers. This workshop opens with three talks on utilizing digital tools to engage customers and deliver a better experience. **Dr Silver Mugisha** (National Water and Sewerage Corporation, UG) discusses social media and other digital tools to provide an immediate customer response to service delivery problems; **Pheona Smoczynska** (Yarra Valley Water, AU) addresses the changing service and communication needs of customers; **Tim Davis** (WaterAid, AU) discusses using customers to provide water quality data through mobile phones. Attendees will then join working groups on how to identify the right digital tools for the right job to provide better service.

SOIL AQUIFER TREATMENT IN WASTEWATER RECLAMATION

Room P3
Technical

Chair: **x x**

- 15:30 Introduction
- 15:35 Sustainable Wastewater Reuse Solutions For Managed Aquifer Recharge For Non-potable Application **Aleksandra Lazic, Xylem Inc. (SE)**
- 15:55 Study Of Impacts Of Recycled Water Irrigation On Soils **Matthew Hudson, City West Water (AU)**
- 16:15 Reclaimed Water And Subsurface Water Solutions Provide Solution For Water Scarce Maneadero Valley In Mexico **Petra Ross, Arcadis Nederland BV (NL)**
- 16:35 Empirical Formulas To Predict Virus Attachment In Aquifers As A Function Of Redox Conditions **Jack Schjven, Utrecht University (NL)**
- 16:55 Closing summary

Break

17:00 - 17:15

Keynote Plenary

17:15 - 18:00

Participative Societies Creating New Challenges for the Water Sector
Ben Schouten

Great Hall Q2

Programme

Wednesday

Keynote Plenary

09:00 - 09:45

Solutions to Shape Our Water Future: a Voice for Our Waterways
Eva Abal

Great Hall Q2

Coffee Break

09:45 - 10:30

Session 1

10:30 - 12:00

GROUNDWATER MANAGEMENT I

Chair: **Shafick Adams** *Water Research Commission, ZA*

10:30 Introduction

10:35 Managing Australia's Largest Groundwater Resource *Mark Foreman, Department of Natural Resources and Mines (AU)*

10:55 Safe Drinking Water Abstraction And Nature Management At Winksele-Belgium: The Story Of A Happy Marriage Under Pressure *Tom Diez, De Watergroep (BE)*

11:15 Requirements And Efficiency Of Agricultural Nitrogen Reduction Measures In The Federal State Of Mecklenburg-Vorpommern *Ralf Kunkel, Research Centre Jülich (DE)*

11:35 Near-well Subsurface Water Treatment For A Sustainable And Reliable Drinking Water Supply *Alexander Vandenbohede, De Watergroep (BE)*

11:55 Closing summary

Room P4
Technical

EMERGING TECHNOLOGIES AND INNOVATION

Chair: **Ignaz Worm** *Isle Utilities, UK*

Start-up tech companies specially selected to present cutting edge solutions for the topics 'Water reuse to desalination' & 'Smart networks, making them work'. Start up's: Liquid Integrity Sensors: Provides a solution to detect leaks in large liquid storage facilities, by *Kelly Keates*; RedEye: Is the first purpose built cloud and mobile engineering drawing management solution, by *Gavin Tye*; UVS Trenchless Technology: Develops, supplies and services reliable equipment used for condition assessment of pipeline networks and water resources, by *Darren Burrowes*

Room P5
Session

Lunch

12:00 - 13:30

Session 2

13:30 - 15:00

GROUNDWATER MANAGEMENT II: ASR APPLICATIONS

Chair: **Shafick Adams** *Water Research Commission, ZA*

13:30 Introduction

13:35 Meeting Melbourne's Growing Demand For Water Using Aquifer Storage And Recovery *Matthew Hudson, City West Water (AU)*

13:55 The Economic And Operational Potential Of Subsurface Water Solutions For Freshwater Management *Gerard Van Den Berg, KWR Watercycle Research Institute (NL)*

14:15 The Legacy Of Sugar And Salt - A Success Story In Managing Bundaberg's Coastal Aquifers *Camille Jendra, Water Services (AU)*

14:35 Economics Of Aquifer Storage And Recovery In Comparison To Its Alternatives In Korea *Jae-Ho Choi, Dong-A University (KR)*

14:55 Closing summary

Room P4
Technical

POWERING THE WASTEWATER RENAISSANCE: THE PATH TO CUTTING EMISSIONS AND SAVING BILLIONS IN WASTEWATER SECTOR

Chair: **Randolf Webb** *Xylem, US*

How can smart technology cut GHG emissions and energy costs in the wastewater sector?

Chronic underinvestment in wastewater infrastructure has led to inefficient and fragile infrastructure that wastes energy, generates significant greenhouse gas emissions, and routinely fails. Xylem's latest research – Powering the Wastewater Renaissance – shows that smart technology investments can cut its electricity-related greenhouse gas emissions by 50% and save nearly \$40 billion in the wastewater sector. A multi-stakeholder roundtable discussion – with representatives from utilities, regulators, financiers, and technology providers – explores the opportunities, the challenges, and the potential solutions and next steps. Presentations and case studies set the scene, group discussions explore potentially solutions, and a panel discussion closes the session. A summary report will be provided to all participants. Presenters include *Aleksandra Lasic* (Xylem, SE), *Steven Kenway* (University of Queensland, AU), *Roelof Kruize* (Waternet, NL).

Room P5
Workshop

Coffee Break

15:00 - 15:30

Session 3

15:30 - 17:00

WATER IN THE DRIEST CONTINENT - NEW SOURCES WHEN CLIMATE IS CHANGING

Chair: **Dr Emilio Gabbrielli** *IDA, BR*

Is Australia a model for delivering climate independent water infrastructure?

During the Millennium Drought, between 1997 and 2009, South-Eastern Australia suffered its greatest rainfall deficit since the start of the 20th Century. The rush to secure water supply led to substantial fast-track investment in seawater desalination and wastewater reuse facilities in parallel with measures to reduce consumption. *Dr. Matt Hardy* (Bureau of Meteorology, AU), *Sue Murphy* (Water Corporation of Western Australia, AU), *Christopher Gasson* (GWI, UK) and *Peter Beattie* (Former Premier of Queensland, AU), discuss the impact of climate change and approaches to develop alternate water sources, particularly desalination and water reuse. *Ian Law* (IBL Solutions, AU) and *Dr Alistair Grinham* (University of Queensland, AU) discuss in more detail the delivery of Australian facilities and marine environmental impact.

Room P4
Workshop

GRANULAR SYSTEMS (ANAEROBIC AND AEROBIC)

Chair: **Mark van Loosdrecht** *TU Delft, NL*

How are granular sludge systems changing the face of wastewater management?

Granules are large, self-supporting biofilms that form under engineered conditions in aerobic and anaerobic systems. Due to the large amounts of biomass that can be accumulated as granules, they can substantially reduce footprints of wastewater treatment units. High-rate anaerobic granular sludge systems have been extensively used in industrial wastewater treatment systems since the late 60s, but following development in the 90s, domestic aerobic granular sludge systems, such as the Nereda process, have enabled low footprint domestic wastewater treatment systems. This master lecture presents common concepts, design principles, and research and development directions for aerobic and anaerobic granular systems that will assist utility and design engineers, researchers, planning and operators in their work.

Room P5
Lecture

Break

17:00 - 17:15

Keynote Plenary

17:15 - 18:00

Participative Societies Creating New Challenges for the Water Sector
Ben Schouten

Great Hall Q2

Programme

Wednesday

Keynote Plenary 09:00 - 09:45

Coffee Break 09:45 - 10:30

Session 1 10:30 - 12:00

BUILDING LEADERSHIP IN THE WATER SECTOR

Career Development Hub
Learning

Organiser: [International WaterCentre](#)

Chair: [Dr. Andre Taylor](#) *International WaterCentre, AU*

How to drive positive change through building leadership capacity in the water sector?

Advancing integrated and innovative solutions in the water sector often involves managing complex or wicked problems. Driving positive change in the sector requires skilled leadership; leadership to influence change, build partnerships, anticipate and plan for change, and also to lead high-performing, cross-boundary and multidisciplinary teams. In this session, the International WaterCentre, with its reputation as a global leader in the design and delivery of leadership development products in the water sector, will provide practical guidance on how to build leadership capacity at an individual, team, organisational and/or regional level.

note: This is a repetition from the session on Monday

Lunch 12:00 - 13:30

Session 2 13:30 - 15:00

HOW TO BRING YOUR IDEA TO THE MARKET WITH USING THE LEAN STARTUP AND RAPID PROTOTYPING

Career Development Hub
Learning

Organiser: [IWA](#)

Chair: [Simon Griffith](#) *Who Gives A Crap, AU*

You have developed a technology, a method, an idea, and you want to bring this idea to market. That means launching in the least amount of time, spending the least amount of money, yet doing everything you can to ensure success. However, 90% of new ideas and innovations will fail. This session will teach you the basics informed by Eric Ries' *The Lean Startup* to help ensure that your idea is in the 10% that succeed. The session will include real life examples from *Who Gives A Crap's* experience with *The Lean Startup* method, as well as a short workshop in rapid prototyping.

Coffee Break 15:00 - 15:30

Session 3 15:30 - 17:00

SUSTAINABLE DELTA GAME – ADAPTATION PATHWAYS

Career Development Hub
Learning

Organiser: [Deltares](#)

Chair: [Simone De Kleermaeker](#) *Deltares, NL*

Given the uncertainties about the future, what constitutes a sustainable water management plan?

Water management is increasingly challenged by pressures from stresses such as population growth, potential sea level rise and climate change. Exploring adaptation pathways for the future provides indispensable decision making support in achieving sustainable water management in a changing environment.

Sustainable Delta is a serious game that informs and enables communities, stakeholders, elected officials and the general public to better understand water systems and their related restoration and protection measures. It teaches players the importance of negotiation in decision making as well as how to make smarter investment decisions given an uncertain future. Two teams of participants will develop and implement a Sustainable Water Management Plan for the coming 100 years in a fictional setting. number of participants is limited to 20 (*first-come, first-served*).

Break 17:00 - 17:15

Keynote Plenary 17:15 - 18:00

Programme

Thursday

Keynote Plenary

09:00 - 09:45

Can the Water Microbiome Save the Biohealth of the Planet?
Joan Rose

Great Hall Q2

Coffee Break

09:45 - 10:30

Session 1

10:30 - 12:00

SCIENCE AND TECHNOLOGY LEADERS FORUM

Sky Room
Forum

The Forum brings together research and technology leaders to discuss and identify shared research agendas, and effective pathways to accelerate innovation and solutions for sustainable water management. Opened by *Helmut Kroiss* (IWA President), *Glen Daigger* (IWA Past President) introduces the Forum and *Mark van Loosdrecht* (TU Delft, NL) presents the current status on water science and technology. Presentations follow on research needs from service providers by *Carlos Campos* (SUEZ, FR), cities by *Rob Skinner* (Monash University, AU), regulators by *Trevor Bishop* (Environment Agency, UK) and basins by *John Riddiford* (John Riddiford & Associates, AU). The session takes into account the research needs identified from other Leader Forums. Attendees will be fully engaged in identifying research priorities, and developing the agenda through a panel discussion.

PATHOGEN OCCURENCE SOURCES AT THE WATERSHED SCALE I

Room S1
Technical

Chair: *Christobel Ferguson* *DPI Water, AU*

- 10:30 Introduction
- 10:35 Towards The Development Of An Automated ATP Measuring Platform To Monitor Microbial Quality Of Drinking Water *Hans-Jørgen Albrechtsen, Technical University of Denmark (DK)*
- 10:55 Prevalence Of Free-Living Amoeba And Associated Amoeba Resistant Bacteria In Two Farming Communities In South Africa *Clarissa Kruger, University of Johannesburg (ZA)*
- 11:15 Water Quality Risk Management Strategies For Remote Operations *Kathy Northcott, Veolia Australia-New Zealand (AU)*
- 11:35 Applying QMRACatch In A River-floodplain Area For Estimating Sustainable Virus Reductions To Produce Safe Drinking Water *Andreas Farnleitner, TU Wien (AT)*
- 11:55 Closing summary

Lunch

12:00 - 13:30

Session 2

13:30 - 15:00

SCIENCE AND TECHNOLOGY LEADERS FORUM

Sky Room
Forum

Session two focuses on global science and technology collaborations. In order to reach effective collaboration and application, critical analysis of what works / doesn't work for water research collaboration, and how we will need to adapt and change in the future will be shared through a panel discussion, including: *Dean Amhaus* (The Water Council, US); *Shaun Cox* (Water Research Australia Limited, AU); *Stephanie Rinck-Pfeiffer* (GWRC, CA); *Cora Uijterlinde* (STOWA, NL), *Xiaochang Wang* (Xi'an University of Architecture and Technology, CN). Small group discussions will look at how to move further with research priorities within the IWA's work; what potential new initiatives might be established in the future; and the roadmaps ahead. The Forum is closed by Diane D'arras (IWA President Elect).

PATHOGEN OCCURENCE SOURCES AT THE WATERSHED SCALE II

Room S1
Technical

Chair: *Christobel Ferguson* *DPI Water, AU*

- 13:30 Introduction
- 13:35 Towards The Development Of An Automated ATP Measuring Platform To Monitor Microbial Quality Of Drinking Water *Hans-Jørgen Albrechtsen, Technical University of Denmark (DK)*
- 13:55 Prevalence Of Free-Living Amoeba And Associated Amoeba Resistant Bacteria In Two Farming Communities In South Africa *Clarissa Kruger, University of Johannesburg (ZA)*
- 14:15 Water Quality Risk Management Strategies For Remote Operations *Kathy Northcott, Veolia Australia-New Zealand (AU)*
- 14:35 Applying QMRACatch In A River-floodplain Area For Estimating Sustainable Virus Reductions To Produce Safe Drinking Water *Andreas Farnleitner, TU Wien (AT)*
- 14:55 Closing summary

Coffee Break

15:00 - 15:30

Closing Ceremony

15:30 - 17:00

Great Hall Q2

Programme

Thursday

Keynote Plenary

09:00 - 09:45

Can the Water Microbiome Save the Biohealth of the Planet?
Joan Rose

Great Hall Q2

Coffee Break

09:45 - 10:30

Session 1

10:30 - 12:00

MODELLING WASTEWATER PROCESSES

Room GHQ2
Technical

Chair: **Harro Bode** *DE*

- 10:30 Introduction
- 10:35 Full-scale Modeling Explaining Large Spatial Variations Of Nitrous Oxide Fluxes In A Step-feed Plug-flow Wastewater Treatment Reactor *Bing-Jie Ni, The University of Queensland (AU)*
- 10:55 A Model-based Analysis Of Operating Conditions To Minimise Methane Stripping From An Anaerobic Digester Effluent *Miguel Mauricio-Iglesias, Universidad de Santiago de Compostela (ES)*
- 11:15 Potential Of 2-pathway Models For Describing The Combined Effect Of DO And Nitrite On The N₂O Production By AOB *Horan Duan, LISBP-INSA (FR)*
- 11:35 A New Approach To Simultaneous Ammonium And Dissolved Methane Removal From Anaerobic Digestion Liquor *Xueming Chen, The University of Queensland (AU)*
- 11:55 Closing summary

WATER-ENERGY-CARBON CONNECTIONS IN THE URBAN WATER ENVIRONMENT

Room M1
Technical

Chair: **Steven Kenway** *University of Queensland, AU*

- 10:30 Introduction
- 10:35 Coupling Plant-wide Process Models With Overall Energy Use- And Production-accounting *Imre Takacs, Dynamita (FR)*
- 10:55 Energy Cost Savings For Households And Utilities Via Water Demand Management - New Options For Efficient Cities *Amanda Binks, The University of Queensland (AU)*
- 11:15 Stable Partial Nitrification Under Mainstream Conditions Through NOB Inhibition *Angeles Val del Rio, University of Santiago de Compostela (ES)*
- 11:35 Energy And Nutrient Factory At Amersfoort WWTP In The Netherlands *Bert Geraats, Blue Horizon Solutions (AU)*
- 11:55 Closing summary

Lunch

12:00 - 13:30

Session 2

13:30 - 15:00

MODELLING DRINKING WATER SYSTEM

Room GHQ2
Technical

Chair: **Maria João Benoliel** *EPAL, PT*

- 13:30 Introduction
- 13:35 The Importance Of Flow Behaviour In Spiral Wound Membrane Systems *Szilard Bucs, King Abdullah University of Science and Technology (SA)*
- 13:55 Autonomous Intake Selection Optimisation Model For A Dual Source Drinking Water Treatment Plant *Edoardo Bertone, Griffith University (AU)*
- 14:15 Operational Implementation Of Soft Sensor Model In The Process Control Of A Surface Water Treatment *Mark Schaap, Water Company Groningen (NL)*
- 14:35 A Study On Prediction Method For Ozone Dosage And Residual Ozone Concentration In Advanced Ozone Water Treatment *Jinseok Hyung, University of Seoul (KR)*
- 14:55 Closing summary

INTERMITTENT WATER SUPPLY: THE CHALLENGE OF TRANSITIONING TO 24/7

Room M1
Workshop

Chair: **Bambos Charalambous** *Hydrocontrol Ltd, CY*

Can container-stored water be the solution to consumers' intermittent supply?

Transitioning from Intermittent Water Supply (IWS) to 24 hours per day 7 days per week is one of the most difficult conundrums for water utilities. This workshop addresses the many challenges involved, and will explore the bottlenecks entailed in this transition. *Bambos Charalambous*, will set the scene presenting the deeply rooted "beliefs" about IWS and the need for a paradigm shift; *Roland Liemberger* (MIYA, AT) will outline a way forward in transitioning from IWS to 24/7. *Ronnie McKenzie* (WRP, SA) discusses South Africa's current problems caused by prolonged drought, and the ongoing efforts to avoid IWS conditions; *Chrysi Laspidou* (University of Thessaly, GR) will highlight policies and how the water-energy-land use-climate Nexus is influencing Intermittent Water Supply.

Coffee Break

15:00 - 15:30

Closing Ceremony

15:30 - 17:00

Great Hall Q2

Programme

Thursday

Keynote Plenary

09:00 - 09:45

Can the Water Microbiome Save the Biohealth of the Planet?
Joan Rose

Great Hall Q2

Coffee Break

09:45 - 10:30

Session 1

10:30 - 12:00

SEAWATER DESALINATION

Room M2
Technical

Chair: **Victor Verbeek** *Toray Membrane, AU*

- 10:30 Introduction
- 10:35 Vacuum Membrane Distillation (VMD) With Crystallizer For Mineral Recovery From Hypersaline Reverse Osmosis Concentrate *Saravanamuthu Vigneswaran, University Technology Sydney (AU)*
- 10:55 Faradaic Reactions In Batch-mode Capacitive Deionization *Di He, University of New South Wales (AU)*
- 11:15 Fouling Prevention And Cleaning Strategies In Submerged Vacuum Membrane Distillation And Crystallization *Helen Julian, University of New South Wales (AU)*
- 11:35 Treatment Of RO Brine From CSG-produced Water Using Graphene/PVDF Flat-sheet Membrane Distillation *Hokyong Shon, University of Technology Sydney (AU)*
- 11:55 Closing summary

IS THE FUTURE DECENTRALISED?

Room M3
Workshop

Chair: **Kuruville Mathew** *Murdoch University, AU*

Is decentralisation the only way that universal access to sanitation is possible?

The Sustainable Development Goals have set us a target of universal access to sanitation by 2030. This is a critically important part of the overall sustainability agenda, and impacts on the health and wellbeing for entire populations. Building the infrastructure for this will be an enormous challenge, but decentralised systems can play a major role in achieving this goal. The workshop will share the experiences from different parts of the world, including India, China and Australia, and discuss the role of decentralised systems in the future. Different case studies will be introduced by *Marcus Starkl* (BOKU University, AT); *Guoren Xu* (Harbin Institute of Technology, CN); and *Cynthia Mitchell* (University of Technology Sydney, AU).

Lunch

12:00 - 13:30

Session 2

13:30 - 15:00

NOVEL DESALINATION TECHNOLOGIES

Room M2
Technical

Chair: **Victor Verbeek** *Toray Membrane, AU*

- 13:30 Introduction
- 13:35 Solar-powered Reverse Osmosis: a Near-future Milestone To Achieve Sustainable Water Production In The UAE *Hassan Arafat, Masdar Institute of Science and Technology (AE)*
- 13:55 Development Of A SWRO-PRO Hybrid Desalination System: Pilot Plant Investigations *Yong Gyun Park, GS E&C (KR)*
- 14:15 Assessing Bacterial Growth In Seawater Reverse Osmosis Systems: A New Method For Measuring Bacterial ATP *Almotasembelleh Abushaban, UNESCO-IHE Institute for Water Education (NL)*
- 14:35 An Experimental Investigation Of A Low Temperature Thermal Pump For Reverse Osmosis Desalination *Jack Nihill, RMIT (AU)*
- 14:55 Closing summary

UTILITIES SHARING KNOWLEDGE ON SUSTAINABLE URBAN WATER MANAGEMENT

Room M3
Workshop

Chair: **Anders Bækgaard** *WaterCentre South - Odense, DK*

How can utilities initiate a paradigm shift to implement best practice and innovation?

In a world where utilities are faced with demands for improved efficiency against a backdrop of challenges to water supply and sanitation caused by growing populations, rapid urbanisation and increasing water scarcity in all global regions, there is a need to cooperate to overcome the challenges. We will demonstrate how leading utilities have implemented close co-operation on all levels in their organisations. In this workshop we will discuss new solutions and trends in water management and share experiences. Examples are utilities working together to increase energy efficiency, to handle the seismic shift from wastewater treatment to resource recovery, or new solutions for climate change adaptation that improves urban livability while managing storm water. Speakers include *Amit Pramanik* (WE&RF, USA), *Guihe Tao* (PUB, SG), and *Roelof Kruize* (WaterNet, NL).

Coffee Break

15:00 - 15:30

Closing Ceremony

15:30 - 17:00

Great Hall Q2

Programme

Thursday

Keynote Plenary

09:00 - 09:45

Can the Water Microbiome Save the Biohealth of the Planet?
Joan Rose

Great Hall Q2

Coffee Break

09:45 - 10:30

Session 1

10:30 - 12:00

BRINGING LIVEABLE CITIES TO LIFE I

Room M4
Workshop

Chair: **Jill Fagan** *Water Services Association of Australia, AU*

How can we capture the value from calling liveable cities to action?

Water wise cities that are more liveable, sustainable and resilient have become a major global sustainability issue. The purpose of this workshop is to share novel ideas about how the water sector and water professionals can contribute to more liveable cities. In addition, attention will also be given to what other people and professions should be involved? And how do we engage with them? The session will be highly interactive, with a range of speakers from inside and outside the industry that will inform, inspire, and challenge the audience. Presentations by *Jamie Wart* (CRC Water Sensitive Cities, AU); *John Batten* (Arcadis, US); *Stuart Waters* (Twyfords Consulting, AU).

MEETING THE MULTIPLE REQUIREMENTS FOR DISINFECTION

Room M9
Workshop

Chair: **John Bridgeman** *University of Birmingham, UK*

What are the future demands for disinfection in developing and developed countries?

Disinfection is required in treating multiple kinds of water and in addressing multiple water quality issues all over the world. The panelists and audience will discuss the future demands for disinfection in developing and developed countries. This includes facility, reagent, practice, regulation and research, under the condition of multiple demands for disinfection during drinking water supply, wastewater and reclaimed water treatment. The workshop invites four speakers to share their opinions and knowledge on disinfection: *Joe Jacangelo* (MWH/John Hopkins University, US), *Shane Trussell* (Trussell Technologies, US), *Joan Rose* (Michigan State University, US), *Chao Chen* (Tsinghua University, CN).

Lunch

12:00 - 13:30

Session 2

13:30 - 15:00

BRINGING LIVEABLE CITIES TO LIFE II

Room M4
Workshop

Chair: **Jill Fagan** *Water Services Association of Australia, AU*

How can we capture the value from calling liveable cities to action?

Water wise cities that are more liveable, sustainable and resilient have become a major global sustainability issue. The purpose of this workshop is to share novel ideas about how the water sector and water professionals can contribute to more liveable cities. In addition, attention will also be given to what other people and professions should be involved? And how do we engage with them? The session will be highly interactive, with a range of speakers from inside and outside the industry that will inform, inspire, and challenge the audience. Presentations by *Jamie Wart* (CRC Water Sensitive Cities, AU); *John Batten* (Arcadis, US); *Stuart Waters* (Twyfords Consulting, AU).

LOW IMPACT STRATEGIES TO MANAGE DIFFUSE POLLUTION AND IMPROVE WATER QUALITY

Room M9
Workshop

Chair: **Lee-hyung Kim** *Kongju National University, KR*

What are the next innovations to improve Water Quality Management and prevent eutrophication?

Raising awareness of current significant diffuse pollution issues amongst the international community, and encouraging discussion on the latest research, is vital to improving water quality management. The workshop will explore cutting-edge technology for monitoring and modeling diffuse pollution; diffuse pollution impacts on urban land use, agricultural and coastal areas; advance water quality management approaches dealing with diffuse pollution; and innovative solutions and policy development, resulting in the reduction of diffuse pollution and eutrophication. The workshop will have contributions from *Brian D'Arcy* (Abertay University, UK); *Michael K. Stenstrom* (University of California, US); *Ana Deletic* (Monash University, AU); and *Lee-Hyung Kim* (Kongju National University, KR).

Coffee Break

15:00 - 15:30

Closing Ceremony

15:30 - 17:00

Great Hall Q2

Programme

Thursday

Keynote Plenary

09:00 - 09:45

Can the Water Microbiome Save the Biohealth of the Planet?
Joan Rose

Great Hall Q2

Coffee Break

09:45 - 10:30

Session 1

10:30 - 12:00

NATURAL DISASTERS AND EMERGENCY PREPAREDNESS

Room M0
Workshop

Chair: **Matsui Yoshihiko** *Hokkaido University, JP*

Can the water sector prepare and respond to large scale disasters?

Over the last decade we have witnessed numerous natural disasters around the world, including huge earthquakes that have caused catastrophic damage during, and immediately following, the quake itself, as well as secondary damage in the following weeks and months. Water and sanitation are vital components of any large-scale humanitarian and reconstruction responses. This workshop will highlight lessons learned from recent experience and showcase preparedness planning for a large-scale disaster from various points of view. Presentations by *Sangam Shrestha* (Asian Institute of Technology, TH); *Yang-Long WU* (Chinese Taiwan Water Works Association, TW); *Ozeki Gen* (Bureau of Waterworks Tokyo Metropolitan Government, JP), followed by a group discussion and audience participation.

ASSESSMENT, IMPACTS AND CONTROLS OF MICROBIAL PATHOGENS IN WASTEWATER TREATMENT SYSTEMS AND REUSE SCHEMES I

Room P1
Technical

Chair: **Tobias Barnard** *University of Johannesburg, ZA*

- 10:30 Introduction
- 10:35 How Safe Is Safe? -Advanced Risk Management For Indirect Potable Reuse Using Soil Aquifer Treatment *Sadahiko Itoh, Kyoto University (JP)*
- 10:55 Understanding Pathogen Concentrations In Sewage To Inform Reuse Treatment Goals *Rebecca Ives, Michigan State University (US)*
- 11:15 Cryptosporidium Removal And Inactivation Across The Wastewater Treatment Train: Recycled Water Fit For Purpose *Brendon King, SA WATER (AU)*
- 11:35 New Tools For Quantification And Detection Of Rotavirus In Untreated Sewage *Nicholas Kiulia, Michigan State University (US)*
- 11:55 Closing summary

Lunch

12:00 - 13:30

Session 2

13:30 - 15:00

APPROPRIATE TECHNOLOGIES FOR DISASTERS AND HUMANITARIAN CRISES

Room M0
Workshop

Chair: **Pierre Le Clech** *UNSW, AU*

Which water technologies are suitable in humanitarian crises?

Many water and wastewater treatment processes have now reached technological maturity, but implementation in disaster zones or developing countries remains challenging. It is therefore critical to assess the limitations of implementation, and develop systems more suitable and resilient in highly challenging environments. During the workshop audience members will have the opportunity to interact with the panellists, consider future activities and discuss the multi-disciplinary challenges of providing water and sanitation in disaster zones. *Bruno Nguyen*, (UNESCO-IHP), provides an overview from IWA's Water Security and Safety Management Specialist Group. *Gavin Blakey* (Engineers without Borders, AU) reports on his Cambodian experience. *Rhett Butler* (Skyjuice Foundation, AU), and *Franz Frechen* (Kassel University, DE) share experiences from the development of gravity-fed microporous membrane modules. *Roger Ben Aim* (FIS, FR) on opportunities for renewable energy systems for desalination of brackish waters.

ASSESSMENT, IMPACTS AND CONTROLS OF MICROBIAL PATHOGENS IN WASTEWATER TREATMENT SYSTEMS AND REUSE SCHEMES II

Room P1
Technical

Chair: **Tobias Barnard** *University of Johannesburg, ZA*

- 13:30 Introduction
- 13:35 Wastewater Ponds - Effective Treatment Technology For The Future, Today *Louise Weaver, Institute of Environmental Science & Research (ESR) (NZ)*
- 13:55 Virus-Particle Associations In Full-scale UASB Reactors And Waste Stabilization Ponds *Matthew Verbyla, Civil and Environmental Engineering, University of South Florida (US)*
- 14:15 Infectious Risk Assessment Of Reclaimed Water By UF Membrane Treatment Process Focusing Attention On Norovirus *Nobuhito Yasui, National Research and Development Agency Public Works Research Institute (JP)*
- 14:35 Validation And Monitoring Of Reverse Osmosis Membrane For Virus Removal: The Current Challenge In Water Reuse *Marie-Laure Pype, The University of Queensland (AU)*
- 14:55 Closing summary

Coffee Break

15:00 - 15:30

Closing Ceremony

15:30 - 17:00

Great Hall Q2

Programme

Thursday

Keynote Plenary

09:00 - 09:45

Can the Water Microbiome Save the Biohealth of the Planet?
Joan Rose

Great Hall Q2

Coffee Break

09:45 - 10:30

Session 1

10:30 - 12:00

MIND THE GAP: BUILDING A PREPARED, DIVERSE WORKFORCE

Room P2
Workshop

Chair: **Cheryl David** *CKD Consulting, US*

How can water/wastewater utilities build diverse workforces that are prepared to meet their responsibilities to customers and the environment?

Skilled, prepared employees do not happen by accident. This workshop will explore the diverse components that ensure workforce sustainability, followed by five different experiences across three continents. The session is going to include presentations on candidate development (*Nora Hanke*, EWSETA-ZA); staff development, with a focus on diversity (*Anne Farquhar*, Yarra Valley Water-Australia; and *Bhakti Devi*, Sydney Water-AU); and technical training (*Philip Giantris*, *Shukalb-AL* and *Joel Solikume* from PHWC - NG). Workshop participants will divide into three workgroups (candidate development, staff development, and technical training) to discuss their programs in these areas, challenges and lessons learned, and how IWA can help them move forward together.

SUSTAINABLE WATER SOLUTIONS

Room P3
Workshop

Chair: **Gerard van den Berg** *KWR, NL*

How do we accelerate the development, uptake and implementation of self-sufficient water systems?

Climate change and urban population growth negatively affect freshwater availability. Self-sufficient water systems increase the resilience of industries, agriculture and drinking water supply, but initiating a breakthrough of such systems is difficult. This workshop starts with five pitches by *Paul Jeffrey* (Cranfield University, UK) on the human, natural and technological dimensions of water management; *Christos Makropoulos* (NTUA, GR) on knowledge sharing; *Klaasjan Raat* (KWR, NL) on uptake of ASR by the greenhouse industry; *Seunghak Lee* (KIST, KR) on drivers to initiate large scale ASR demonstrations, and *Petra Ross* (Arcadis, NL) on valorisation of water innovations. The following discussion focuses on strategies for large-scale market uptake of subsurface water solutions to promote self-sufficient water systems.

Lunch

12:00 - 13:30

Session 2

13:30 - 15:00

PRICING POLICIES AND HUMAN RIGHTS IN A WATER SCARCE WORLD

Room P2
Workshop

Chair: **Ed Smeets** *Edmadi BV, NL*

How do we improve and enlarge statistical information for pricing policies?

Using information from the international survey performed by the IWA Specialist Group on Statistics and Economics, as well as case studies, we will analyse cost optimisation, tariff affordability and possible measures to adopt in the future. *Ed Smeets* (Edmadi BV, NL) will introduce the workshop context; *Teodor Popa* (Romanian Water Association, RO) gives a bird's eye view of the water tariffs used in different countries and other key findings of the survey; *Anita Bento Ferreira* (EPAL, PT) gives a case study of water pricing and the social tariffs in a country facing water scarcity; *Guillermo Donoso* (Pontificia Universidad Católica de Chile, CL) will explain the water tariff system, and how the human right to water is ensured even in severe drought.

PROTECTION OF WETLAND, ECO-SYSTEMS SERVICES FROM WATER QUALITY RISKS

Room P3
Workshop

Chair: **Stuart Bunn** *Griffith University, AU*

How do ecosystem services and risk management tools help deliver the SDGs?

How do ecosystem services and risk management tools help deliver the SDGs? Healthy water-related ecosystems and adequate water quality are essential for livelihoods and human health, mostly in areas of low socio-economic development. Wetlands and water quality are interlinked: wetlands can be at risk from poor water quality but can also be vital to improve it. We explore interlinkages and risk management tools to ensure both ecosystem services and human health in achieving the Sustainable Development Goals, particularly on ambient water quality, wastewater treatment and protecting and restoring water-related ecosystems –with presentations by *Paul Glennie* (UNEP-DHI Partnership, AU) and *Bushra Nishat* (IWA, BD) and a panel discussion where they will be joined by *Stuart Bunn* (Griffith University, AU); *Simon FungeSmith* (FAO); *Brian D'Arcy* (Abertay University, UK); *Mike Ronan* and *Fernanda Adame* (Queensland Government, AU).

Coffee Break

15:00 - 15:30

Closing Ceremony

15:30 - 17:00

Great Hall Q2

Programme

Thursday

Keynote Plenary

09:00 - 09:45

Can the Water Microbiome Save the Biohealth of the Planet?
Joan Rose

Great Hall Q2

Coffee Break

09:45 - 10:30

Session 1

10:30 - 12:00

NOT WAITING FOR A CRISIS: DRAWING LESSONS FROM EFFECTIVE BEHAVIOUR CHANGE COMMUNICATION IN PRACTICE

Room P4
Workshop

Chair: **Lucia Cade** *Water Secure Innovations*

What do effective behaviour change campaigns look like, and how are they designed?

Renewed emphasis in the water industry on customer and community engagement and sustainable behavior change, means many service providers recognise the need to go beyond tradition forms of communication. This is important if issues of demand management, water security and alternative water sources are to be understood by the community, policy makers and elected representatives. *Lucia Cade* (Water Secure Innovations, US) takes a provocative look at how the water sector is performing in its communication with the community. This is followed by case studies from *Melissa Meeker* (Water Environment and Research Foundation, US); *Catherine Ferrari* (Water Corporation, Western Australia, AU). There will be an open discussion and exchange of experiences between the audience participants from international community and the panelists.

ABATEMENT OPTIONS FOR MIXTURES OF EMERGING CONTAMINANTS

Room P5
Lecture

Chair: **Stefan Kools** *KWR, NL*

Should we be worried about emerging contaminants?

Emerging contaminants, the threats they pose and how to deal with them are not fully understood. The lecture will highlight state-of-the-art knowledge on the subject and present some examples of prioritisation efforts on chemicals in the environment. Solutions-focused, we will focus on possible technological and non-technological abatement options throughout the chemical life cycle to improve water quality. The removal efficiencies are presented from gathered information, for example made available by the Watershare tool AbetES. The data and various abatement options will be discussed with the audience, based on the existing assessments regarding their efficiencies to improve water quality and their potential for implementation. This Master lecture will be of particular interest to water quality managers.

Lunch

12:00 - 13:30

Session 2

13:30 - 15:00

REDUCING NON-REVENUE WATER AND ENERGY COSTS FOR UTILITIES

Room P4
Workshop

Chair: **Kenneth Thompsom** *CH2M, US*

How do we Reduce Non-Revenue Water and Energy Costs for Utilities?

It has been estimated that the average amount of non-revenue water for utilities worldwide is around 30%, which impacts the cost of service and overall water resources management. Non-revenue water can be associated with pipeline breaks, old leaking infrastructure, water theft, poor metering techniques, and operations such as distribution system flushing, fire demand. Eighty percent of the non-labor cost of water is associated with energy for treatment and pumping, creating a very strong link between water and energy. This highlights the importance of reducing water loss for utilities located in dry and wet climates because of the impact on their overall cost of service. The purpose for the workshop will be to highlight the latest approaches to reducing non-revenue water. Presentations from *Amir Telog* (Takadu, IL), and *Attija Stahlot* (Queensland Urban Utility, AU), *Keith Hilson* (i2o, UK), *Raju Dharani* and *Aed MacPhaidin* (Queensland Urban Utilities, AU), *Russell Considine* (Itron, AU)

ADDRESSING COMPLEXITY IN WATER THROUGH DESIGN THINKING

Room P5
Lecture

Chair: **Dr Piet Filet** *QUT Business School, AU*

What is a Charrette and how can it make planning more effective?

Solutions to complex water issues require diverse views from across disciplines and communities to identify key actions. A planning charrette enables this collaborative approach. This workshop highlights 4 charrette approaches: *James Davidson* and *Sam Bowstead* (South East Queensland WaterFutures, AU) look at combined flood and drought options for Brisbane; *Dr Briony Rogers* (Monash University, AU) discusses a shared vision for a water sensitive Melbourne; *Dr Assela Pathirana* (UNESCO-IHE, NL) investigates climate adaptation for water supply of Ho-Chi-Minh City; and *Prof Jeroen Rijke* (UNESCO-IHE, NL) looks at the implementation of measures for a Water Sensitive Rotterdam. Small groups will question how each derived their results; a panel will describe how the charrettes advanced their solutions, highlighting the range in effectiveness of the approach.

Coffee Break

15:00 - 15:30

Closing Ceremony

15:30 - 17:00

Great Hall Q2

Programme

Thursday

Keynote Plenary	09:00 - 09:45
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Coffee Break	09:45 - 10:30
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Lunch	12:00 - 13:30
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Session 2	13:30 - 15:00
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HOW TO ENGAGE STAKEHOLDERS IN THE WATER SECTOR

Career Development Hub
Learning

Organisers: IWA, Seqwater, Engagement Plus

Chairs: Robert Goedecke *Seqwater, AU*

Michelle Feenan *Engagement Plus, AU*

To shape the future of the water sector, we must look to develop solutions which are adaptable to the changing environment. This requires collaboration, leadership, and extensive stakeholder engagement throughout decision making processes. Stakeholder engagement is not an easy skill to develop. Further, it is recognised that this skill is becoming increasingly important in all aspects of the water sector. Experts in Stakeholder Engagement will provide you with insights into their profession, while Seqwater's Water Security Program will be used as a practical exercise for delegates to learn how to map stakeholder influence and interest as well as develop the engagement goal that will help drive the stakeholder engagement process.

Coffee Break	15:00 - 15:30
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Closing Ceremony	15:30 - 17:00
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