

SINGAPORE INTERNATION

THE GLOBAL PLATFORM TO SHARE AND CO-CREATE INNOVATIVE WATER SOLUTIONS

WATER CONVENTION

CALL FOR PAPERS



WATER CONVENTION IS JOINTLY ORGANISED BY:













MESSAGE FROM THE CHIEF EXECUTIVE OF PUB, SINGAPORE'S NATIONAL WATER AGENCY



PETER JOO HEE NG Chief Executive PUB, Singapore's National Water Agency

Mark your calendars. The next Singapore International Water Week (SIWW) takes place from 5 to 9 July 2020.

The biennial SIWW is where both thought leaders and practitioners in water management, from governments, industry and academia the world over, gather every other year. Last year, a record-breaking 24,000 from 110 countries and regions attended SIWW 2018, which also witnessed an unprecedented US\$16 billion in deal announcements.

As was in 2018, SIWW 2020 will be held alongside the World Cities Summit and the CleanEviro Summit Singapore. Together, this trio of conventions present a most compelling destination for anyone responsible for maintaining high-functioning cities or has a stake in creating sustainable urban growth and development.

The Water Convention is the technology pillar in the SIWW programme. The 2018 edition saw 1,200 come together to hear presentations, share best practices and be briefed on the latest technologies. For SIWW 2020, Water Convention will focus on strategy, innovation and ready solutions for potable water delivery, wastewater management, and water quality and health. I am certain that participants will again find insight and inspiration at the Water Convention SIWW 2020.

As we wait for SIWW 2020 to come around, we are planning for a smaller SIWW Spotlight 2019 event this off year, on 6 to 7 June in Singapore. We want Spotlight 2019 to help industry make better water decisions. As such, we have designed the agenda around the four areas—making water a priority in the boardroom; establishing the right strategic framework; adopting technologies to reduce, replace and reuse; and recognising the intrinsic value of water—that I believe would be top-of-mind for every industrial user in the world.

We fully intend to assemble an unmatched roster of expert speakers, presenters and panellists in the four areas. Participants in Spotlight 2019 can expect to hear world-leading practitioners and industries share first-hand accounts of their experiences in managing industrial water demand.

My colleagues and I are highly anticipative of a productive and instructive Water Convention at SIWW 2020. In the interim, I urge everyone to respond resoundingly to this call for papers, and keep those contributions and submissions coming in.

I look forward to seeing you in Singapore in July 2020!

MESSAGE FROM THE PRESIDENT OF THE INTERNATIONAL WATER ASSOCIATION



DIANE D'ARRAS
President
International Water
Association

In a world that is increasingly water scarce, impacted by global issues such as rapid urbanisation and climate change, and facing a growing demand for water, we need cooperation between all stakeholders within and beyond the water sector. It is by working together that we can address and find solutions to our most pressing challenges. We can only become water wise and water smart by shaping our water future together.

The Water Convention, developed by PUB, Singapore's National Water Agency together with the International Water Association, provides a forum to engage with these priority issues. It is at the heart of the wider Singapore International Water Week, where leaders and experts from the water sector, industry, academia and government meet every other year to explore and share solutions that help in the task of achieving the globally agreed 2030 Sustainable Development Goals.

I am therefore especially pleased to invite you to make your contribution to this process by responding to the call for papers for the 2020 edition of the Water Convention. This important event will connect people working in different regions, in different settings, and with different approaches to water and sanitation service management. It seeks to connect stakeholders and foster innovation and the exchange of knowledge.

Now in our 11th year of partnership, the International Water Association and Singapore International Water Week can reflect proudly on the progress made through our long-standing collaboration. Ours is a partnership that helps establish and strengthen the profile of water issues on the international agenda, shaping and promoting holistic water cycle policies and practices from catchment to consumer.

The event offers a stimulating agenda and I look forward to joining you all in Singapore to debate the future of water management. Let's inspire innovation and change for our tomorrow's water world.

MESSAGE FROM THE CO-CHAIRS OF THE WATER CONVENTION 2020 PROGRAMME COMMITTEE





We warmly welcome you to join us for the 9th edition of the Water Convention, one of the flagship events of the Singapore International Water Week (SIWW).

Over the past decade, the Water Convention has grown to be a global platform where researchers, practitioners and technology providers from all continents gathered and fostered collaborations through several workshops, technical sessions and poster presentations. In 2018, it drew more than 1,200 delegates from 59 countries worldwide and featured over 300 oral and poster presentations in 6 Hot Issues Workshops and 36 technical sessions.

The Water Convention 2020 aims to showcase the latest developments in technologies and best practices that promote sustainability in providing high quality, safe and

reliable water and in managing wastewater effectively. Discussions and debates over strategic approaches and innovations that are necessary to sustain the resiliency and liveability of our cities for the future remain as key focus areas.

We hope these discussions and presentations will continue to spur cooperation amongst the various stakeholders in the water sector globally as we pursue our common goal to ensure an effective and efficient water supply for all. On this note, we welcome you to share your ideas and experiences by submitting your abstracts on the latest water technologies and innovations for the Water Convention 2020.

WATER CONVENTION 2020

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THEMES FOR WATER CONVENTION 2020

The Water Convention brings together professionals and technology providers to share their knowledge, experiences, case studies and applied solutions to solve global water challenges under the following themes:

- 1. Delivering Water from Source to Tap
- 2. Effective and Efficient Wastewater Management
- 3. Cities of the Future
- 4. Water Quality and Health

The Water Convention technical programme serves as a platform for sharing knowledge, engaging discussions and debates among water leaders and practitioners through high quality presentations showcasing sustainable technological solutions, processes and management strategies that address current and emerging water issues.

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THEME 1A: DELIVERING WATER FROM SOURCE TO TAP (NETWORK)

With urbanisation, water supply networks are becoming increasingly complex. Water utilities worldwide face challenges in planning and operating their networks, optimising the performance of their existing supply systems, and managing water demand. To mitigate these issues, water utilities have been driving the adoption of new technologies, and the development of smart water network systems, which harness hydraulic modelling for network planning and operations simulation, as well as data analytics for network management. Real time monitoring through advanced sensors and analysis of network behaviour allows for more effective prevention of and response to incidents within the networks and mitigates the downstream impact on customers. Advanced robotics and condition assessment tools have also made it possible to conduct pre-emptive checks on network health and prioritise pipes for replacement or rehabilitation. Automatic meter reading will help improve the productivity and influence water users towards proactive consumption monitoring and conservation. Abstracts on latest trends, best case studies and innovative strategies in intelligent water supply management and effective customer engagement practices for water conservation are welcomed.

Network Planning, Design and Implementation

- Sustainable and resilient network modelling
- Peak water demand management tools to sustain system pressure
- Key performance indicators for network management
- Decentralisation of water supply systems
- Construction materials, automated or mechanised processes for pipe laying

O Network Asset Management

- Maximise capital productivity in the water network
- Pipeline failure analysis and risk-based analytics for network monitoring/renewal
- Condition assessment, maintenance and pipe rehabilitation technologies
- Advanced leak detection capabilities/strategies
- Reduction in non-revenue water

Smart Water Grid

- Advanced sensor technologies
- Data analytics, digital twin, simulations and application tools for demand forecasting, network planning, optimisation and operations & maintenance

- Integrated control and command system for incident management
- Virtual district metered areas

O Smart Metering

- Solid state water meters
- Automated Meter Reading/Advanced Meter Infrastructure systems
- Transformation of business processes for better productivity and customer service
- Data analytics on behavioural influences for water conservation

O Water Conservation and Efficiency Measures

- Water conservation strategies/programmes for households and industries
- Water efficiency measurements/indices and analytical tools for cooling towers, commercial usage and industrial processes
- Building plumbing and management systems for water and energy conservation

THEME 1B: DELIVERING WATER FROM SOURCE TO TAP (TREATMENT)

As the global population increases and many cities face challenges with the sustainability of existing water sources, the discourse on development of alternative water sources is now more pertinent than ever. This year will introduce a new perspective by featuring advanced technologies for brackish groundwater management in addition to the traditional focus on water reuse and desalination. Furthermore, as seawater desalination technologies have become more established over the last two decades, we will now delve deeper into how these processes can be advanced by examining cost barriers, integration with water reuse and beneficial reuse of brine. Topics on the use of sensors and artificial intelligence will also be explored along with asset management. As the pace of technological advancement quickens and the race for sustainability intensifies, the fundamentals need to remain central to the discussion in order to achieve treatment goals. Theme 1B aims to profile innovative water treatment technologies and processes specifically in the following areas:

O Basic and Advanced Water Treatment Processes

- Characterisation, impact and removal of natural organic matter
- Emerging pollutants
- Post-treatment processes
- Waste management in water treatment
- Advanced oxidation processes

Membrane Technologies

- Pre-treatment for desalination and water reuse
- Advances in membrane science and technology
- Membrane process innovation

O Water Reuse

- Innovations in direct and indirect potable reuse
- Ecological reuse
- Non-potable urban reuse
- Planning and implementation of water reuse projects

O Seawater Desalination

- Breaking desalination cost and energy barriers

- One Water joint desalination and reuse
- Brine concentration and beneficial reuse
- Process innovation and optimisation
- Pre-treatment processes for algal bloom management

O Brackish Groundwater Treatment

- Novel low energy technologies
- Alternative applications and technologies
- Recent planning and implementation experience

Sensors and Artificial Intelligence in Water Treatment Processes

- Source and product water quality monitoring
- Predictive and corrective automated process operation and optimisation
- Asset management with smart technologies
- Artificial intelligence systems for remote monitoring and control
- Application of virtual reality systems in plant operations and training

THEME 2: EFFECTIVE AND EFFICIENT WASTEWATER MANAGEMENT

Conventional wastewater treatment, although reliable, is not sustainable in consideration of its environmental impacts and increasing resources (e.g. energy and chemicals) cost. Fundamentally, the energy potential and resources present in untreated wastewater and associated wastes is much higher than that required to treat them. For a sustainable future, a transformation in mindset and approach to capture and recover energy and valuable resources from wastewater is crucial. Additionally, it is important to safeguard the overall health of the envisioned centralised or decentralised wastewater treatment-recovery-reuse networks through next generation monitoring systems and smart technologies. Abstracts looking into best practices and the application of innovative intensified technologies for wastewater treatment processes and networks, with an emphasis on economically viable technologies in the following areas are welcomed:

O Overall Process Sustainability and Asset Management

- Efficient management of existing and future assets
- Experiences in condition monitoring and predictive maintenance of wastewater treatment assets and equipment
- Resilience and adaptation to climate variability

Application of Advanced Molecular Tools to Understand Wastewater Treatment Systems

- Microbial ecology of wastewater treatment and resource recovery systems
- Degradation of conventional and emerging pollutants
- Antimicrobial resistance in wastewater treatment systems

O Process Intensification at Wastewater Treatment Facilities

- Integrated bio-physical-chemical approaches for process intensification
- Advances in aerobic granular sludge and biofilm processes
- Novel combinations of processes to achieve process intensification

Wastewater Treatment, Resource Recovery and the Circular Economy

 Resource- and carbon-efficient (neutral or positive) wastewater management

- Advances in nutrient recovery and removal
- Synergies between centralised and decentralised treatments

Next Generation of Process Sensing, Monitoring and Control

- New sensing models for process monitoring and control
- Applications of AI and machine learning to enable process automation and digitalisation
- Workforce and skills needs for an autonomous wastewater treatment plant of the future

Wastewater Treatment and Management in Developing Countries

- Wastewater treatment and the UN Sustainable Development Goals
- Best management practices for treatment, recovery and reuse of wastewater from fit-for-purpose treatment to zero liquid discharge
- Non-sewered and onsite sanitation systems
- Integrated treatment of wastewater with other streams including faecal sludge and septage

THEME 3: CITIES OF THE FUTURE

Traditional citywide approaches to urban water management gave us the water services that support our cities and towns today. However, business-as-usual approach cannot provide water safety and security to future proof cities in a cost effective or timely way. Climate change and economic constraints amplify these challenges. Recent droughts, floods, and environmental and ecological degradation are stark reminders of how vulnerable cities and towns are to climate change. These events focus community and business attention on, and heighten expectations for, governments to improve climate resilience and adaptation, including via infrastructure delivery and operation. We need flexible systems that can respond quickly to rapid population growth, opportunities provided by technological changes, changing investment patterns and strategies, urban renewal and densification patterns, linkages beyond water services, climate change and extreme weather events. Cities are complex adaptive systems, involving multiple interconnected elements. We must embrace this complexity city by city, to harness new opportunities and overcome threats. We invite presentations on well-developed concepts for, and case studies of, city transformations into more sustainable, resilient, productive and liveable communities, with particular focus on the following sub-themes of the Water Wise Cities principles.

Regenerative Water Services

- Harnessing the emerging role of digital technologies in innovation in integrated urban water management
- Facilitating a circular economy for water, and its nexus, in urban systems in a resource-constraint future cities scenario
- Operationalising the changing roles of urban water utilities
- Designing hybrid centralised-decentralised systems for urban densification
- Water Sanitation and Hygiene (WASH) innovations in urban environments for public health outcomes

O Water Sensitive Urban Design

- Operationalising water for life to water for liveability
- Methods for addressing deep uncertainty in building water resilience in cities
- Social-technical approaches in strengthening water resilience in cities
- Striking the appropriate balance between grey and green infrastructure in urban water resilience
- Water sensitive urban design in the low sociodemographic context – leaving no one behind

O Basin Connected Cities

- Is there an optimal city size for effective connection of water, energy, food and waste across its region?
- Governance model for trans-boundary city/municipal planning and infrastructure investment
- Building urban resilience to basin-scale fluvial flooding
- City economic valuation of basin-scale ecosystem services of nature-based solutions for water
- Integrated delivery of multiple Sustainable Development Goals

O Water-Wise Communities

- Innovative business models for fostering public-private co-investment in nature-based solutions for water
- Multi-sector/private-public partnership business models for sharing risk, cost and benefits of integrated urban water management
- Strengthening social resilience of communities to climate extremes
- Methods for fostering community co-design of urban water systems and fit-for-purpose level of service



THEME 4: WATER QUALITY AND HEALTH

Rapid urbanisation, extreme weather events and increasing human mobility continue to challenge the realisation of universal drinking water, sanitation and wastewater management services. This leaves water security out of reach for billions of people. The dedicated Sustainable Development Goal (SDG) for water and sanitation projects a "One Water" vision with a comprehensive set of 2030 targets. The health sector must cope with the global challenge of antimicrobial resistance (AMR). The current annual global death rate due to AMR is estimated to be 700,000 and predicted to mount to 10 million by 2050. The "One Health" concept aims to rally human and veterinary public health, animal health and ecosystem health professionals around the AMR theme.

A systems approach to water and sanitation management is now vital to achieving the SDG6 targets. Water quality management is one of the critical building blocks and requires an integrated research, policy and practice framework. Molecular genetics now allow us to better detect, identify and trace pathogens while water and sanitation safety plans provide a systematic approach to specific risk analysis and management along the drinking water and sanitation chains. Poor management of urban and industrial wastewater continues to threaten surface and groundwater quality and requires new facility designs. Economic analyses support a shift to re-use and recycling: the circular economy translates the concept of the hydrological cycle into economic opportunities.

Source management, regulatory frameworks and contaminants of emerging significance are central to this theme. This is a call for papers directed at practitioners, policymakers and decision-makers dealing in the topics listed below:

Systems Approach to Drinking Water Supply and Sanitation Services

- Building blocks in master planning of water supply and sanitation service systems
- Actors on the water quality management stage: shifting roles, responsibilities and water quality interconnections at a time of transformation
- Across the spectrum: environmental water quality, drinking water quality, wastewater quality – assessment and management
- WSPs, SSPs, WASH normative guidance: standards, norms and good practices

Policy, Regulatory and Institutional Frameworks Supporting Effective Drinking Water Quality Management

- Institutional arrangements and financial mechanisms to strengthen links between urban water users and rural water source managers
- Policy and regulatory framework for drinking water quality and protection: what is needed to transform a solid framework into a dynamic platform for effective action?
- Regulation as the engine for policy implementation, and tools to start and run the engine
- Contextual priority setting of service delivery criteria (access, availability, quality/safety, acceptability and affordability)

O Emerging Contaminants in Water

- Detection and management of microplastics pollution in water
- Antimicrobial resistance including AMR/ARG, PFAS, nanomaterials
- Water pollution and contamination indicators: recent progress in measurement and analysis

 Metagenomics and rapid detection methods for identification, classification and source detection of traditional and emerging microbial contaminants

O Wastewater Hazards, Risks, Treatment and Disinfections

- Wastewater disinfection: regulation, specification and appropriate technologies
- Microbial gene exchange in wastewater treatment environments as a significant source of antimicrobial resistance
- Disinfection-resistant pathogens
- New microbial indicators, including coliphages
- Reuse fit-for-purpose: criteria and protective measures for safe use of untreated, partially treated and treated wastewater

Integration of Multiple Uses of Water Resources in Inner Catchments/Reservoirs

- Safe and reliable drinking water supply services
- Recreational water safety
- Aquifer safety in the light of changing patterns of animal husbandry
- Safe management of reservoirs: algal blooms, vector control and protection from pollution and contamination

O Water Quality in Distribution Systems and Buildings

- Impacts of plumbing as a source of corrosion metals (e.g. lead, copper, nickel and chromium)
- Microbial impacts from growth of biofilms including growth of Legionella, Pseudomonas and mycobacteria
- Identification and management of impacts
- Protecting water quality in distribution systems and buildings

ABSTRACT SUBMISSION PROCEDURES

- Prospective authors can submit abstracts for either oral or poster presentations.
- Abstracts should be limited to three A4sized pages including figures, tables and references, and must contain adequate information to allow a sound referee review.
- The author must fill in all the information requested by the submission system and attach the abstract using the provided template.
- Submission should be made online. Further information regarding submission of abstracts, registration for SIWW and paper presentation, including a template for the abstract, is available at http://bit.ly/siww_wc.
- The deadline for submission of abstracts is 16 August 2019. The abstracts will be peerreviewed for selection and the authors will be notified about the acceptance of their paper for presentation from 16 December 2019.
- Selection criteria include high technical quality, relevance to the themes/topics, and high information content. Abstracts which are deemed commercial in nature will not be accepted.
- The authors are strongly encouraged to submit the full papers once their abstracts have been accepted. Full papers will be further reviewed and considered for publication in IWA's Journal of Water Practice & Technology. The selected abstracts will be included in the Water Convention 2020 Conference Proceedings.

REGISTRATION FEES

All accepted oral and poster presenters are required to register for the Water Convention and pay for the conference registration fees. The presentations will only be listed in the Convention programme upon receipt of the registration fees.

IMPORTANT DATES

Submission deadline for abstracts	16 August 2019
Notification of acceptance	16 December 2019
Deadline for presenters' registration	30 April 2020
Deadline for authors' registration	
Submission deadline for full papers and poster softcopies	
SIWW Water Convention 2020	5 to 9 July 2020

CONTACT INFORMATION

For any enquiries, please email the Water Convention Secretariat at waterconvention@siww.com.sg.

Detailed information will also be available at http://bit.ly/siww_wc.



WATER CONVENTION IS JOINTLY ORGANISED BY:





PUB is a statutory board under the Ministry of the Environment and Water Resources. It is the national water agency, and manages Singapore's water supply, water catchment and used water in an integrated way.

PUB has ensured a diversified and sustainable supply of water for Singapore with the Four National Taps (local catchment water, imported water, NEWater, desalinated water).

PUB calls on everyone to play a part in conserving water, in keeping our waterways clean, and in caring for Singapore's precious water resources. If we all do our little bit, there will be enough water for all our needs – for commerce and industry, for living, for life.



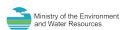
INTERNATIONAL WATER ASSOCIATION (IWA)

The International Water Association is the organisation that brings together science and practice of water management in order to reach a world in which water is wisely managed to satisfy the needs of human activities and ecosystems in an equitable and sustainable way.

The IWA is a global knowledge hub and international network for water professionals and anyone concerned about the future of water. We bring together know-how and expertise to instigate ground-breaking solutions.

Organised by:

Singapore International Water Week Pte Ltd, a company set up by Singapore's Ministry of the Environment and Water Resources and PUB, Singapore's National Water Agency.







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SINGAPORE INTERNATIONAL 5 – 9 JULY WATER WEEK 2020

THE GLOBAL PLATFORM TO SHARE AND CO-CREATE INNOVATIVE WATER SOLUTIONS

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