

thejapan times

IWA World Water Congress & Exhibition

SEPTEMBER 16-21, 2018



Above: The Tokyo skyline with Rainbow Bridge from the Odaiba district. Right: The Tokyo Metropolitan Government supports the construction of water-related facilities in Myanmar. Left: Sanitation of tap water is essential for human life. GETTY IMAGES, TOKYO METROPOLITAN GOVERNMENT, GETTY IMAGES

Future water sustainability a major priority

YURIKO KOIKE
GOVERNOR OF TOKYO
PRESIDENT OF THE HOST COUNTRY COMMITTEE, IWA WORLD WATER CONGRESS & EXHIBITION 2018

It is truly a pleasure and great honor to host the first International Water Association congress held in Japan and to welcome so many people who have come to our city from all over the world. May I take this opportunity to express my deepest gratitude to IWA President Diane d'Arras and her staff, and everyone from industry, academia and government for their hard work and dedication to ensure the success of this congress.

Water is a precious resource that is crucial to people's lives and urban activities. However, the water environment in the world faces many challenges including more frequent natural disasters brought on by climate change, water shortages and water quality deterioration due to rapid urbanization.

To overcome such challenges, the key themes of the IWA Tokyo congress are sustainability of water supply and sewer systems into the future, and their resilience against various risks. I hope that the participants will share their latest insights and technologies through active discussions and interactions at the sessions and produce outcomes that will greatly contribute to resolving the world's water challenges.

Tokyo has been working for over a century to ensure the provision of safe and delicious water and to improve the living environment by expanding sewer system coverage, and has built a resilient water supply and sewage system that can hold up against various risks such as disasters and the impacts of climate change. At this congress we will actively share the expertise and technologies we have gained and developed in this process. I also plan to speak on the theme of a sustainable urban water



cycle as a keynote speaker on Sept. 17. Some 200 exhibitors will also be displaying their water-related products at the exhibition hall. There will be a Japan Pavilion featuring Japanese companies and organizations, as well as business forums by exhibitors, which will present a golden opportunity for Japanese companies to promote their world-leading technologies.

This year is a landmark year for Tokyo. We are celebrating the 150th anniversary of the renaming of Edo to Tokyo. During those many years, Tokyo overcame many difficulties and grew dramatically in many areas including economy, culture, and safety. Tokyo is also a city that boasts traditions passed down over the generations. I hope that all of the congress participants will take this opportunity to really experience such attractions of Tokyo.

The Tokyo Metropolitan Government will also use the insights and outcomes of this congress for the Olympic and Paralympic Games Tokyo 2020 and for Tokyo's sustainable development.

My best wishes for the great success of the IWA congress in Tokyo.

Nation hopes to share international water technology

MINORU MATSUTANI
STAFF WRITER

Tokyo will host the IWA World Water Congress & Exhibition 2018 from Sunday to Friday. The event is expected to attract 6,000 people from more than 100 countries to discuss technology, public policies, international collaboration and other subjects to achieve sustainable water management practices.

The International Water Association is a large international organization that aims to secure water supplies and manage water quality around the world.

The first edition of the biennial IWA World Water Congress & Exhibition was held in Paris in 1998, followed by meetings in Berlin, Melbourne, Marrakech, Beijing, Vienna, Montreal, Busan, Lisbon and Brisbane.

It is significant that Tokyo hosts the event because Japan is home to important technologies for general water management and has experience tackling water hazards, urbanization and other water-related problems.

The event is a place for Japan to showcase its technologies and know-how to the world.

The government acknowledges the importance of Japan's position in the field. The Ministry of Economy, Trade and Industry (METI) released the Overseas Development Strategy of Water Industry paper on July 27, which lays out Japan's

overall strategy to contribute to water management to the world.

"Japan has been the world's top donor in the field of water. We have made contributions toward implementing hard infrastructure via yen-based loans, as well as soft infrastructure such as providing know-how on legal structures on water and training human resources," according to a translation of the METI paper. "Japan has taken initiative in tackling global challenges on water. It is expected that Japan will continue to play a major role by way of advanced technologies and know-how."

Expectations are high for Japan. Demand for water will continue to increase in the world amid increasing populations, economic development and improvement of quality of life. In 2015, roughly 660 million people had no access to a water supply service and an estimated 2.4 billion people were without sanitation facilities, according to the METI paper. The world is expected to face a 40 percent shortage of usable water sources by 2030, the paper said, citing the Japan International Cooperation Agency.

Japan's contribution to secure water supply is also in line with Sustainable Development Goals that the United Nations adopted in 2015. Goal 6 is to "ensure availability and sustainable management of water and sanitation for all."

Japan provided official development assistance worth about \$6.5 billion in the field of water and sanitation from 2012

to 2016, making the world's third-largest economy the largest contributor with a 30.7 percent share, followed by Germany's 17.9 percent, France's 11 percent and the U.S.'s 8.9 percent, according to the Cabinet Secretariat citing data from the Ministry of Foreign Affairs.

Still, Japanese companies are squeezed out by major global companies such as Veolia Water SA and Suez SA — which provide comprehensive, water-related services — and smaller, local companies in developing countries that use their cost competitiveness to win bids.

As such, Japanese companies do not have a high market share globally and thus have plenty of room to expand. The market size of water-related fields, including water supply systems, sewage systems and desalination, was \$67 trillion globally in the year ending in March 2017, with Japanese companies accounting for \$287.8 billion, obtaining only a 0.4 percent as reported by the Cabinet Secretariat citing data from the Ministry of Foreign Affairs.

The METI document suggests Japanese companies have a chance to expand globally with their advanced technologies.

For example, Kubota Corp., the principal sponsor of the IWA World Water Congress & Exhibition 2018, has a technical advantage with its membrane bioreactor (MBR) system that cleans sewage water through special membranes. An MBR system does not produce drinking water, but processes sewage water into clean water; it needs to go through additional purification processes to be safe for consumption.

An alternative method of cleaning sewage water to the MBR system is via a conventional activated sludge (CAS) system that causes impurities to sink. The MBR system is more expensive, but makes water much cleaner than CAS. It also takes less space and is easier to maintain.

"Sewage water processing equipment is to be used as long as 20 or 30 years and thus maintenance is very important. We would like (our potential customers) to think of the importance and use our products," said Shinichi Fukuhara, general manager of Kubota's Environment Systems Business Unit.

Kubota has business chances where environmental regulations are strict and potential customers opt for high-quality

sewage water cleaning systems. For example, Fukuhara shared that Europe has regulations allowing very small amounts of chlorine in water, which makes an MBR system more desirable because it does not require the use of chlorine, adding that China is also very strict on the cleanliness of processed water.

Fukuhara also said there is a high demand for reusable water solutions and systems producing clean water in the Middle East because of the low rainfall.

He expressed that Kubota is one of the biggest MBR system makers and commands about 17 or 18 percent of the global market share in terms of the amount of water processed, but also said there are no statistics showing the exact market share. There are MBR system makers in Japan, China, the U.S., France, Germany, Singapore and other countries.

Another product that gives Japan a technical edge over other countries is *jokaso* — tanks that house a sewage cleaning system. These can include MBR, CAS or other systems that function as small water-processing plants. They are designed to allow trucks to pick up the clean water from *jokaso*, resulting in less water pipes needing to be built.

"*Jokaso*" is a Japanese word translating closely to septic tank, but Kubota and other Japanese manufacturers use the Japanese word to sell their products to the world instead of the English term to differentiate their product from regular septic tanks.

"Japan's *jokaso* quality is by far the highest and our customers understand the word *jokaso*," Fukuhara said. Japan has *jokaso* laws regulating quality standards. Makers have to pass certain tests to gain the government's approval to sell *jokaso*. "That's only (in) Japan," he said.

Japan's *jokaso* exports are steadily increasing. The cumulative shipments were about 1,334 as of February 2014 and surged to around 12,846 as of last December, according to the *Jokaso* System Association. According to Fukuhara, of the 12,846 exports, 8,190 were sent to China, where demand is very strong thanks to the government's efforts to improve sewerage systems in rural areas.

He went on to share that demand is expected to rise regarding government

efforts to improve the water quality in certain buildings. For example, hospitals and airports have a relatively strong demand for *jokaso* because they need clean water and tend to be recipients of government

subsidies for them.

Japan also excels in other areas of technology. The IWA World Water Congress & Exhibition 2018 will be a great opportunity for Japan to showcase these to the world.



An exhibition area at the IWA World Water Congress & Exhibition 2016 in Brisbane, Australia. JAPAN WATERWORKS ASSOCIATION

Shaping Our Water Future



World Water Congress & Exhibition

16-21 SEPTEMBER, 2018



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IWA World Water Congress & Exhibition

Global Water Award shows water-sensitive urban design

Tony Wong, chief executive of the Cooperative Research Centre for Water Sensitive Cities, Australia, is the winner of the 2018 IWA Global Water Award. The award is to be presented on Sept. 16 at the IWA Water Congress & Exhibition in Tokyo.

The Japan Times had an opportunity to interview Wong via email in cooperation with the IWA, asking him his thoughts on receiving the award, future aspirations and other topics.

Question: Could you give us your comments on receiving the 2018 IWA Global Water Award?

Wong: I am honored to receive this award and feel very privileged to be in the good company of the caliber of previous awardees.

The award acknowledges my lifetime of work in water sensitive urban design — an approach to urban water management that is based on biomimicry and urban design that involves multidisciplinary collaboration.

It recognizes significant collaboration over the past 30 years on an integrated cross-disciplinary approach: from the social to the technical, from engineering innovations to nature-based solutions and in using urban design as an integrative platform.

Genuine collaboration holds the key and I hope the Global Water Award will give this approach greater impetus for widespread global adoption.

Question: Could you briefly explain your field of study and work? What are some of the characteristics of your work?

Wong: My early work on water sensitive urban design (WSUD) adopted a biomimicry approach to integrating nature-based

solutions (solutions that mimic natural biophysical processes) into urban form through landscape and building architecture.

I combined the science of water with engineering hydrology and hydraulics, biomimicry and landscape architecture to create a platform for exerting a positive, transformative influence on the nature of cities, and the health and well-being of their citizens.

My WSUD approach is now globally diffused, and my subsequent reimagining of WSUD has helped develop a new program of work — the water sensitive cities approach — that concurrently addresses the social, environmental and economic challenges of traditional urban water management.

This work advanced new understanding of the relationship between the societal and biophysical dimensions of water security, from drought, floods and environmental pollution and city waterscapes.

The aim is to deliver sustainable urban water outcomes that are underpinned by creative design and technical and scientific rigor.

My work and influence have taken tangible shape in the transformations of multiple global cities.

Singapore, for example, applied the water sensitive cities approach to create a more self-reliant water supply, including by harnessing stormwater as a valuable resource using nature-based solutions in the city as “kidneys” to cleanse stormwater. Similarly, the city of Kunshan has achieved a level of sustainability, resilience and livability through the adoption of WSUD that is unprec-

edented in China.

Question: What made you choose the field of water?

Wong: I have always found water profoundly intriguing and calming. Whether in tranquil conditions or highly turbulent conditions, I have been fascinated by its properties, its dynamic movements and sound; its fundamental utility as a source of life and its power to cleanse; its many forms in vapor, liquid and solid states; and the cultural and emotional connections it invokes.

However, it was at university, inspired by my mentor the late professor Eric Laursen, that I took the engineering science of water seriously as a career.

Since then, I have used my new knowledge about the physics of water to innovate in ways that combined and connected the many facets of water into urban design, engineering, art and architecture.

Question: What would you like to achieve further in the future?

Wong: My aspiration is for my colleagues and I to continue helping developing cities attain the urban design, urban water systems and associated institutions and governance structures needed to “leapfrog” traditional approaches, to create more sustainable, resilient and livable urban communities.

I am particularly passionate about extending the work to change the lives of the millions of people who live in urban slums.

Question: Do you have any other comments?

Wong: Collaboration is the key to solving many of the global challenges we face; not just those related to water. I am



Tony Wong, chief executive of the Cooperative Research Centre for Water Sensitive Cities, Australia, is the winner of the 2018 IWA Global Water Award. IWA

very honored to have worked with my colleagues in helping define the organizing framework and solution space

to address some of today's most urgent global water challenges. Receiving this award was made possible only because

of my collaborations with colleagues, motivated by a common sense of purpose and mission.

On accelerating sanitation, clean water access

Faced with a fast rate of urbanization and population growth, national and local governments are finding it difficult to provide essential services such as safe drinking water and sanitation, especially in the socioeconomic context of lower and middle-income countries. Performing utilities have a key role to play in accelerating access to water and sanitation to all in compliance with Goal 6 of the U.N.'s Sustainable Development Goals. The best approach must take into account all forms of capital — social, technological, financial, political and cultural. How can the utilities transition to better serve the populations, particularly the poor? Chief Executive Officer Silver Mugisha of the National Water and Sewerage Corporation of Uganda (NWSC), who will be giving a keynote address on Sept. 17 at the IWA World Water Congress & Exhibition 2018, shares the best ways to address the institutional issues and meet the new challenges.

Question: What is required to improve access to drinking water and sanitation for periurban areas and secondary centers, which would make it possible to better fight against poverty? What needs to change?

Mugisha: Improving access to drinking water and sanitation for periurban areas and secondary centers requires a joint and concerted effort by all stakeholders involved, including the government, utilities and communities. There is a need for all stakeholders to refocus their priorities and implement aggressive measures to accelerate service provision in these areas. In the case of the NSWSC, prior to 2013, the corporation operated in only 23 towns. Working together with all stakeholders and closely collaborating with the government, we changed our focus and prioritized acceleration of access to safe water for all. Currently, the NSWSC is operating in 240 large and secondary centers. This has only been possible with the dedicated support and engagement of all stakeholders, including government and communities.

Question: To have more efficient water and sanitation companies, on the basis of your experience, between the big plants and other decentralized ones, what is the best option?

Mugisha: The answer lies not in one system or the other, but in the appropriate use of each system. Our experience in the NSWSC has shown that none of the options could be excluded a priori, but we have generally been able to opt and adopt the different options on the basis of the specific, required situation in a given town.

Question: In which ways are new technologies offering opportunities for developing countries to accelerate progress?

Mugisha: New technologies offer significant potential for developing countries to accelerate access to water and sanitation for all. They provide opportunities for potentially lowering investment and operational requirements, making optimal decisions, providing better

customer experiences, as well as opening the possibility of delivering more ambitious plans in respect to acceleration of access to water and sanitation. Countries and utilities that grasp the opportunities of the new technologies will be able to accelerate progress and narrow or even leapfrog any gaps in respect to provision of sustainable water and sanitation for all.

Question: How can the adoption of innovative technology in developing countries be improved?

Mugisha: Focusing on new technology alone as a solution to water access issues has contributed to high failure rates. Adopting an innovative technology requires due consideration for the context of the community (or) organization where it will be operated, as well as its applicability and the potential for it to be used widely considering economic, technological, social, environmental, organizational, institutional and legal issues. The readiness of the organization to adopt the technology is a very important aspect that also needs to be assessed.

Question: Concerning the gap in human resources, how can we face this constraint and have water and sanitation companies performing better?

Mugisha: In addressing the issues of water and sanitation sustainably, one needs to consider the role of all forms of capital — social, technological, financial and cultural — and the complex ways in which they interact. All forms of capital derive their value, utility and application from human capital. This makes human capital the central determinant of sustainable service provision of any form. At the NSWSC we have placed human capital and its development at the core of our strategy. We have established in-house vocational development facilities for the lower cadre and a state-of-the-art resource center for top and middle management. This is in addition to several regional and international partnerships we have established to support our human capital development. Our focus is to develop knowledge, skills and attitude.

Question: The NSWSC is a successful African water company, which is not the case for many water companies on the continent. Do you think this situation will improve in the future?

Mugisha: The NSWSC's success has been attributed to a number of factors, mainly, an appropriate, enabling environment and the autonomy provided by the government, the servant leadership approach practiced at every level of the organization, staff capacity, a do-it-yourself approach and a strong focus on performance and performance-based incentives. Many governments and companies in Africa have acknowledged the need to implement internally driven reforms with a focus on homegrown solutions and the future is very promising for many such companies.

Question: Why should institutional aspects be better taken into account in placing water



Chief Executive Officer of the National Water and Sewerage Corporation of Uganda Silver Mugisha IWA

and sanitation companies in low- and middle-income countries in a more favorable context for their development?

Mugisha: Water and sanitation companies in low- and middle-income countries are experiencing several challenges — technical, institutional, financial and also social and cultural. There seems to be a wide range of solutions that can be adopted to address these challenges apart from the institutional issues, which have proved to be the most difficult because it is not easy to transpose one context to another. In addition, most of the solutions are sustainable only if the institutional aspects have been adequately and appropriately addressed.

Question: How can we make political decision-makers better understand the need to put in place such institutional solutions?

Mugisha: Our experience in engaging with the political decision-makers is creating a win-win situation for all parties. It's a known fact that water is a political good and in many places used as a tool for soliciting political capital. We have managed to mobilize the support of the political decision-makers by supporting them in fulfilling the commitment they make to their constituents of providing better services and extending water and sanitation services to unserved areas.

Question: Are the many changes, particularly among the authorities in charge of the water sector, a hindrance to the implementation of sustainable policies?

Mugisha: Sustainable implementation of any policies in whatever form requires a certain degree of leadership continuity. The current practice in a number of countries and the nature in which the leadership of the authorities changes has definitely been a hindrance to the implementation of sustainable policies. The NSWSC is one of the few unique cases where leadership continuity has enabled continuous and progressive performance improvement.

This text was provided by the IWA.

IWA Awards: Recognizing excellence in global water sustainability

With 71 years of history in bridging science and technology with other sectors, the International Water Association is committed to recognizing the special contributions and achievements of its members and water sector professionals.

The IWA Awards recognize and celebrate the broad range of excellence, leadership and innovation, the invaluable contribution to key innovations in water science and management, which IWA members and network participants bring to both the association, as well as the industry at large.

With this celebration and official distinction, the association encourages their role of innovation in contributing to the sustainable management of water.

IWA Global Water Award / professor Tony Wong

The IWA Global Water Award is awarded by a panel of experts from across the water cycle, and recognizes the exceptional contribution made by an individual to improve sustainable water and sanitation globally.

IWA Women in Water / professor Akissa Bahri, Tunisia

The IWA Women in Water award acknowledges and celebrates female leadership in the field of water. The award showcases an individual's excellence in leadership as demonstrated by outstanding initiatives, impact of work and inspiration to others.

IWA Young Leadership / Jacob Kwasi Amengor, Ghana

The IWA Young Leadership Award is granted to an exceptional water professional under the age of 35 who has demonstrated significant achievements in their career to date and who signify outstanding leadership potential and the ability to play a large and influential role in the water industry in the future.

IWA Professional Development Award / Black & Veatch

The Professional Development Award recognizes water sector companies that are making a significant contribution to the professional development of their employees, and through that support the attraction, development and retention of the next generation of water leaders.

IWA Publishing Award / professor Damir Brdjanovic

Publication is a key activity within

the IWA, carried out through IWA Publishing; this award recognizes significant contributions to IWA Publishing activities.

IWA Outstanding Services Award / professor Wolfgang Rauch, Austria

The IWA Outstanding Service Award is given for consistent and outstanding service to the association. Awardees may be individual members, representatives of corporate members, members of editorial boards and permanent staff of the association.

IWA Project Innovation Awards (PIA) categories and finalists:

Category: Market-changing Water Technology and Infrastructure

This award celebrates innovations in water and wastewater technologies and infrastructure that embrace forward-thinking applications and solutions to advance clean and safe water goals.

Aqua-Q AB, “AQUATRACK”
Carollo Engineers and the city of Altamonte Springs, “pureaALTA”
Suez, Hengli Petro and LPEC, “Embedded Wastewater Treatment Plant”

Category: Performance Improvement and Operational Solutions

This award celebrates new and innovative approaches that improve performance, efficiency, resilience and sustainability in water operations and maintenance.

Anglian Water, “Shop Window”
VCS Denmark, “Beyond Energy Neutrality: Setting a Vision and Empowering Your Staff”

Waternet, TU Delft and Sanquin, “Thermal Energy Recovery from Drinking Water: Exploitation of a Renewable Energy Source”

Category: Breakthroughs in Research and Development

This award celebrates research that is challenging existing markets and addressing future needs to create new opportunities. It is open to research of all types, as well as early stage business projects that are not yet market-ready.

Cranfield University, “Nano Membrane Toilet”
Hong Kong University of Science and Technology, HKSAR Government Drainage Services Department, University of Cape Town and TU Delft, “Large-scale Study on Realization and Application of SANI Process in Sewage Treatment in Hong Kong”
Professor R.D. Tyagi and Research Group, INRS-ETE, Université du Québec, “Bioconversion of Wastes (Wastewater

sludge and Glycerol) to Biodiesel”

Category: Exceptional Project Execution and Delivery

This award celebrates projects that developed and implemented: creative practices during their execution; excellent client relationships beyond expectations; and outstanding responses to unexpected difficulties.

AECOM, “Building Resilience in the Philippines with Systems, Technologies and Partnerships: The USAID Be Secure Project”

Beijing Drainage Group, “Beijing's Sustainable Solution for Ecological Water Reuse – Huaifang Underground Water Reclamation Plant (HWRP)”
GHD, “Birmingham Resilience Project”

Category: Governance, Institutions and Social Enterprise

This award celebrates social innovation, social enterprise and social entrepreneurship and their contribution to sustainable water management. In addition, it recognizes innovations in governance and institutional transitions and the role this plays in supporting the circular and digital water economies.

AMCOW, “Web-based Monitoring and Reporting System for the Water Sector in Africa”

Water Corporation, “Water Recycling: Creating Benefits for Indigenous Australia”

Waterwise, “Water Efficiency Strategy for the UK”

Category: Smart Systems and the Digital Water Economy

This award celebrates digital solutions with the potential to reshape the water sector. Harnessing and aligning this technology between the physical and digital worlds creates a smarter way of managing and protecting water resources and building a water-wise society.

Anglian Water, “Integrated Leakage and Pressure Management System”
SA Water, “Smart Water Network”
Sewern Trent Water, “Smart Abstraction Management”

The IWA World Water Congress & Exhibition is the moment and platform to celebrate the outstanding professionals that have been awarded by the IWA Award Committees following the respective categories. The awards will be given in ceremonies at the IWA World Water Congress & Exhibition 2018, to be held Sept. 16–21 in Tokyo.

For more information, visit <http://www.iwa-network.org/>.

This text was provided by the IWA.

IWA World Water Congress & Exhibition

Recovery, reuse of phosphorus from wastewater

Phosphorus (P) is essential to human life and vital for food production. It is the critical building block of DNA, cell membrane and bones, and plays a crucial role in cellular energy metabolism. Today, P is mostly obtained from mined phosphate (Pi) rock, but natural reserves of Pi rock are concentrated in a limited number of countries such as Morocco, China and the U.S. On the other hand, an inefficient use of P and the leakage of phosphate-containing fertilizers, detergents and sewage into water bodies are causing irreversible eutrophication problems. Moreover, mined Pi rock is largely contaminated with toxic heavy metals such as cadmium and radioactive uranium. From health and environmental perspectives, there are increasing concerns about the long-term application of chemical fertilizer to farmland.

Increasing attention has been paid to the development of P refinery technology that can recover P from waste streams and reuse recovered P products for agricultural and industrial purposes. In the wastewater treat-

ment sector, P is removed from wastewater using chemical or bio-based technologies. Removed P ends up in sewage sludge, which is then subjected to anaerobic digestion, dewatering and incineration. This offers hot spots for P recovery from (i) the rejected water from sludge dewatering, (ii) digested sludge and (iii) incinerated sludge ash.

More than 70 full-scale P recovery plants are currently operating in Europe, North America and East Asia. Basically, the P recovery technologies are (i) chemical Pi leaching from incinerated sludge ash, (ii) Pi salts precipitation and (iii) struvite crystallization after anaerobic sludge digestion. Incinerated sludge ash having a high P content is also used as a raw material for the manufacture of phosphoric acid in a wet acid process.

P recovery practices are now expanding not only to the wastewater treatment sector, but also to the manufacturing sector. In the manufacturing sector, Pi must be removed from wastewater to meet stringent effluent regulation in areas vulnerable to eutrophication. The recycling of recovered P products

as a fertilizing material can save the costs of sludge disposal and leads to the significant reduction of plant operating expenses. P recovery is also practiced from solid waste streams such as animal manure and steel-making slag. In East Asian countries, including China, Korea and Japan, slag is one of the most important secondary P resources. Recovering P from slag allows the rest to be reused as raw material in blast furnaces. This has the enormous potential to improve the resource efficiency of the steelmaking process.

Except for some European countries such as Switzerland and Germany, no regulations require P recovery and recycling for the wastewater treatment sector. This allows the wastewater treatment sector to consider P recovery as an extra service. On the other hand, fertilizer companies cannot accept recovered P products unless they bring some economic benefits to their business. P recycling practitioners need to establish stable channels for the distribution and sale of recovered P products. To make the P recycling business more attractive, it is critical to develop a new value chain that can extract the maximum value from secondary P resources.

East Asian countries are becoming increasingly the center of high-tech industries in the global economy. They need high-purity P compounds for manufacturing high-value added products, including semiconductors, lithium batteries, liquid crystal panels, medicines and fire-retardant plastics. Elemental P, called white or yellow P, is the essential starting material for the manufacture of high-purity P compounds. The secured supply of elemental P is becoming increasingly difficult in the global market. Actually, the supply risk is much higher than that of Pi rock. EU added elemental P to the list of its critical raw materials, taking into account the potential risk of the secured supply of high-purity P compounds in Europe.



Waseda University professor Hisao Ohtake IWA

Elemental P is now produced by only four countries in the world: China, the U.S., Kazakhstan and Vietnam. The production of elemental P is an energy-intensive process that is strongly dependent on locally sourced electricity, Pi rock and cheap labor forces. It requires approximately 14 megawatt-hours of electricity for each ton of elemental P produced. Moreover, since Pi rock is contaminated with toxic heavy metals and radioactive elements, pollution control is another difficult problem regarding the production of elemental P from Pi rock using a conventional arc process.

To solve these issues, it is necessary to redefine the P value chain through technology and business innovation based

on recycling. The technology innovation needs to promote the development of (i) highly-efficient P recovery from secondary resources, (ii) an improved wet acid process to generate phosphoric acid from recovered P products, (iii) an innovative carbothermal reduction of low-grade Pi to elemental P with minimum electricity consumption and low environmental burden and (iv) new processes for the manufacture of high-value added P compounds to meet the demand from high-tech industries. Among them, the key technology is the innovative carbothermal reduction of low-grade Pi to elemental P.

The technology and business innovation based on P recycling, called P Innovation,

can make a great contribution not only to the sustainability of agriculture, but also to the secured supply of high-purity P compounds to the high-tech industry. There is no significant tradeoff in the use of P between agriculture and industry, because industry needs only a small fraction of recovered P for their business. Rather, redefining the supply chain of high-purity P compounds can offer economic incentives to P recovery from secondary P resources, thereby making a great contribution to the sustainable use of P not only in agriculture but also in industry.

This article was written by Hisao Ohtake, professor at Waseda University in Tokyo, and provided by the IWA.

Master lectures feature professors' insights

Professor Hisao Ohtake delivers a Master Lecture on "Phosphorus Recovery and Recycling" on Sept. 18 from 10:30 to 12:00 at the IWA World Water Congress & Exhibition 2018.

This lecture will present full-scale practices of phosphorus (P) recovery and recycling from waste streams and an innovative P value chain that can extract the maximum value from secondary phosphorus resources and make the P recycling business more attractive and beneficial.

This is one of a series of master lectures, organized by the IWA, that explore technologies and practices central to

transition to a closed-loop water cycle.

Professor Tony Wong, chief executive of the Cooperative Research Centre for Water Sensitive Cities, Australia, will deliver a Master Lecture "Integrating Nature-Based Solutions for Water in Urban Water Infrastructure" on Sept. 19 from 10:30 to 12:00.

Professor Jorg Drewes of the Chair of Urban Water Systems Engineering at the Technical University of Munich, Germany, will deliver a Master Lecture "Recent Trends on Potable Reuse" on Sept. 20 from 10:30 to 12:00.

This text was provided by the IWA.

Digital water solutions: Creating abundance

Water challenges are complex and inter-related. Globally, water demand is threatening to outpace supply. In addition to water stress and scarcity, the world is also faced with the negative effects of extreme weather events, disasters and poor water quality.

Driven by the urgent need to ensure access to safe water now and in the future, the IWA issues the position paper "The 21st Century Digital Water Utility: Creating Abundance" to unlock the digital water revolution to make far more efficient use of the world's dwindling water resources.

"Digital solutions provide a much-needed response to smarter and more effective water strategies for utilities and businesses," said IWA Executive Director Kala Vairavamoorthy. "Without vastly improved data and analytics, public institutions, businesses and society will struggle or fail to meet 21st century demands for water."

The IWA's vision is that the water sector will be the key driver in creating water abundance powered by digital water technologies that seamlessly connect water supply, infrastructure and assets to the customer. "The 21st

Century Digital Water Utility: Creating Abundance" paper identifies a number of trends, technologies and applications that will figure prominently in this digital transformation.

Space and analytics technologies such as satellite imagery and remote sensing are already in use for surface and groundwater resource evaluation, flood protection and upstream water quality monitoring. Blockchain applications, which are already at work in making transparent supply chains, could migrate to the water sector to improve mapping of tap-water quality. Asset management and real-time monitoring of water utility infrastructure performance offer obvious opportunities for digital water technology adoption. Digital solutions such as smart-sensing technology, utility web monitoring portals, social media, gamification and artificial intelligence chatbots can also radically improve the relationship water providers have with their customers, allowing higher rates of engagement, greater knowledge on water usage and increased leverage on their consumption patterns and conservation strategies.

"Digital technologies will enable

real-time water quantity and quality measurements, access to actionable information, analytics of complex data sets, predictive analytics, artificial intelligence and blockchain applications. Vastly improved watershed monitoring, supply and demand projections, asset care and customer connectivity will be the norm," said Will Sarni, CEO and founder of Water Foundry.

"The IWA believes our sector faces a stark choice," Vairavamoorthy said. "Resist the rise of digital solutions, or embrace them in collaboration with innovators to unlock a new era of water abundance."

In response to escalating thirst, new risks, emerging tools and rising stakeholder expectations, the emerging digital water utility holds the promise of fueling sustained economic development, business growth and well-being for human and natural communities.

The report "The 21st Century Digital Water Utility: Creating Abundance," produced by the IWA and powered by Xylem, will be launched on Sept. 19 from 15:00 to 15:45, at the IWA Pavilion.

This text was provided by the IWA.

Over 100 countries to meet on future of water management

Under the overarching theme, "Shaping Our Water Future," the 2018 edition of the IWA World Water Congress & Exhibition will take place from Sept. 16 to 21 in Tokyo.

This global event attracts water professionals from over 100 countries and provides a unique opportunity to learn about the latest trends in leading practices, innovative technologies and pioneering science.

The IWA is the largest international network of water professionals working toward a water-wise world, with members in more than 130 countries. Its work focuses on developing solutions for water and wastewater management. As a knowledge hub for the latest science, technology and best practice in the water sector at large, the IWA works to place water on the global political agenda and influence best practices in regulation and policymaking.

This text was provided by the IWA.

IWA to launch call-to-action agenda geared toward urban stakeholders

The IWA will launch the Action Agenda for Basin-Connected Cities at the IWA World Water Congress on Sept. 19 in Tokyo. Building on the IWA Principles for Water-Wise Cities, the agenda aims to inform, influence and activate urban stakeholders to protect and invest in water resources, together with basin and catchment organizations. The agenda outlines the rationale for urban stakeholders to lead the way in realizing their role as water stewards and the different pathways and activities toward achieving sustainable water management, including securing water resources, protecting water quality and preparing for extreme events.

The action agenda is directed at water and wastewater utilities, city governments, industry (urban and periurban), policymakers and regulators, basin organizations and water resources agencies.

Growing populations and continued economic development of cities within a catchment area requires water security that ultimately depends on healthy basin ecosystems coupled with effective water governance. Challenges of water quality, quantity and resilience to extreme events cannot be solved by individual entities



IWA's agenda is to inform, influence and activate urban stakeholders to protect and invest in water resources, together with basin and catchment organizations. IWA

alone such as water utilities and city governments, as the wider catchment is usually beyond their mandate. Utilities and city governments can play leading roles, but must also engage with stakeholders representing environmental, social and economic interests. Consequently, it is critical to encourage urban leaders to champion water resource protection by connecting in collaboration with basin and catchment organizations, civil society and environmental groups, as well as agricultural, energy and other business interests.

To support the agenda, the IWA has developed and is developing Basin Stories to document some of the best practices and approaches that demonstrate how stakeholders, especially those in urban

areas (e.g. city government, water and wastewater utilities, industries), are taking part or contributing to sustainable management of water resources. For example, how the Superintendencia Nacional de Servicios de Saneamiento, the national water regulator in Peru, together with water utilities and other stakeholders are working to introduce principles and practices to create water-wise basins. Or, how a water fund is bringing together major water consumers in Nairobi — companies and government agencies with a vested interest in a high-quality and reliable water supply — and creating linkages to non-urban communities.

This text was provided by the IWA.



Satellite imagery and remote sensing play a part in surface and groundwater resource evaluation, flood protection and upstream water quality monitoring. IWA



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Tokyo water & diversity

Tokyo to showcase efforts on sustainable water cycle

Tokyo will host the IWA World Water Congress & Exhibition for the first time, bringing together over 6,000 water-related professionals from over 100 countries. Director General of the Tokyo Metropolitan Government's Bureau of Waterworks Masahiro Nakajima shared his expectations on this largest-ever congress.

"The 21st century is called the water century," said Nakajima. "As the global water sector faces huge challenges, this congress is significant since different water professionals from around the world will gather to share, exchange and discuss their knowledge on water-related matters. While Tokyo Waterworks is a supplier of urban water, this congress will cover many areas from water shortages, droughts, agricultural water, environmental water issues, including sustainable development goals and more, meaning the topic of water will be discussed from multilateral perspectives."

Being part of this international congress, Nakajima believes that Tokyo Waterworks' initial goal is to successfully organize and execute this global event. "Then after the congress, we must show specific achievement results and carry them out. What we often call legacy is important," he said. Tokyo Waterworks needs to disseminate its accumulated knowledge and technology while picking up



Director General of the Tokyo Metropolitan Government's Bureau of Waterworks Masahiro Nakajima

cutting-edge techniques shared from around the world.

120 years have passed since a modern waterworks system was established in Tokyo. Although Tokyo has faced challenges in the past, today, Tokyo waterworks provides clean water to around 13 million people. "Tokyo has mountains and rivers that run into Tokyo Bay. Due to Tokyo's landform and steep gradient, rainwater from rivers rapidly flows into the bay. In this sense, Tokyo has some risks in terms of water. We built dams and took other

measures to secure water in this megacity," said Nakajima. With these acquired skills and experiences, Tokyo waterworks is a world-class operation with only a 3 percent leakage rate.

Tokyo waterworks already has a proven track record regarding international cooperation in the field of human resource development, project development and information dissemination. According to Nakajima, an average of 400 water business personnel from Asian countries come every year to Tokyo's Bureau of Waterworks Training and Technical Development Center annually, for lectures and training from the bureau's experienced staff.

As part of official development assistance (ODA) activities classified as non-revenue water projects, Tokyo waterworks dispatches staff to places such as Yangon, Myanmar, and Delhi, India, for technical support, especially regarding leakage detection. "In the case of Myanmar's ODA project, we were involved from initial planning, repairing water pipes and installing water meters. We mainly support the modernization of the water environment, such as water pipes and water technology in Asian countries," said Nakajima.

Tokyo waterworks' staff present and share their knowledge and expertise at various international conferences, such as this con-

gress, for accumulation of innovative cases and cooperation with leading cities.

To welcome overseas guests, the Tokyo Metropolitan Government will hold Tokyo Garden Night, an *omotenashi* (Japanese hospitality) reception, on Sept. 18 in Tokyo's historical Kiyosumi Gardens for guests to experience and understand Japanese culture and enjoy Japanese food and drinks. "We'd like to offer delicious Japanese food and present some Japanese culture so guests can enjoy what Tokyo and Japan have to offer," Nakajima said.

Several technical tours are also scheduled for Sept. 21, where participants can visit Tokyo waterworks and other related facilities to learn about Tokyo's innovative water technologies. The Akigase Intake Weir and Asaka Purification Plant and the Training and Technical Development Center of the Tokyo Bureau of Waterworks are among the planned tour sites.

As the host country and to help support this congress, approximately 200 Tokyo waterworks' staff are involved in various ways. For example, about 100 members wearing white Tokyo waterworks staff jackets will be on site to assist participants.

"There are only a few countries in the world where you can drink tap water and Tokyo is one of them. Considering that Tokyo is a megacity of 13 million, this is amazing," said



An ozone contact pond at a water treatment plant. TOKYO METROPOLITAN GOVERNMENT

Nakajima. To promote the city's safe, potable water, the Tokyo Metropolitan Government is selling bottled tap water, branded as "Tokyo Pure Water." Last year, the label was redesigned to mimic *Edo-kinoko* (traditional Japanese cut glass), with a blue translucent design and the kanji for *mizu* (water).

"Recently, plastic waste has become an issue, so the Tokyo Water Drinking Station, a temporary water dispenser, will be installed at Tokyo Big Sight during the congress. This water dispenser will allow guests to drink cold tap water and fill their bottles," said Nakajima. The Tokyo Water Drinking Station features the

same Edo-kinoko graphic as the Tokyo Pure Water bottles and has a physical design that accommodates all visitors, including those in wheelchairs.

"Tokyo Gov. Yuriko Koike is the keynote speaker on the morning of Sept. 17 and will speak about Tokyo's water situation, global water issues and how to resolve these matters," said Nakajima. "The governor will be delivering an important message, so I hope everyone will take this opportunity to listen to this speech." Gov. Koike's keynote speech is to be themed around a sustainable urban water cycle.

Historical gardens among unique event spaces for rent

Planners appear to be increasingly interested in booking nontraditional venues for their events. From historical buildings to cultural facilities, these unique spaces can transform standard meetings and receptions into exclusive, unforgettable experiences.

A mixture of tradition and modernity, Tokyo is home to a vast array of unique, historic and cultural venues eager to meet this demand, including art museums, classical Japanese gardens, shrines, temples, aquariums, theme parks and skyscrapers.

The Tokyo Metropolitan Government (TMG) and Tokyo Convention & Visitors Bureau (TCVB) are collaborating to promote specifically chosen spaces in Tokyo for MICE (meetings, incentive, conference and exhibition) projects. Starting with the upcoming Rugby World Cup 2019 and the 2020 Olympics and Paralympics, the TMG and TCVB expect to see these facilities widely used. The Tokyo Unique Venues service center was launched within TCVB's office to support those interested in adding a unique spin to their events.

Among the places listed are Kiyosumi Gardens and Hamarikyu Gardens, beautiful and historic gardens with Japanese architectural details, providing the perfect atmosphere for

memorable events thanks to their breathtaking backdrops.

Kiyosumi Gardens are *kaiyushiki teien* (Japanese strolling gardens) from the Meiji Era (1868–1912), located in Koto Ward. Originally believed to be an Edo merchant's residence, Yataro Iwasaki, founder of Mitsubishi Corp., bought the property in 1878 for his employees and to entertain guests.

The Iwasaki family collected many *meiseki* (beautiful landscaping stones) from all over Japan to be placed around the garden. *Iso-watari* (large stepping stone pathways) and stone bridges were created, where guests can stroll while admiring fish, turtles or reflections of surrounding trees in the pond.

The 40-square-meter Ryotei teahouse, known for its refined *sukiya-zukuri* (traditional wooden architecture), appears as if it were floating over the pond, and was built by Iwasaki to welcome Field Marshal Horatio Kitchener in 1909. Interested parties can book dinner receptions featuring a gorgeous view of the garden or hold outdoor parties in front of the 475-square-meter Taisho Kinenkan Hall.

Built in the Edo Period (1603–1868) and formerly owned by the Tokugawa shogun-



Left: Koto Ward's Kiyosumi Gardens with landscaping stones from all over Japan. Right: Chuo Ward's Hamarikyu Gardens are home to Tokyo's last seawater pond. TOKYO METROPOLITAN GOVERNMENT

ate, the Hamarikyu Gardens are located in Chuo Ward in central Tokyo. Originally the Tokugawa shogun's hunting site, the gardens were acquired by the Imperial family after the Meiji Restoration and were donated to Tokyo in 1945. In 1952, the Hamarikyu Gardens were officially named a site of great cultural and historical value.

The approximately 250,000-square-meter gardens are at the mouth of the Sumida River where it flows into Tokyo Bay and are surrounded by a seawater moat with tidal ponds. Upon entering the *otemon* (main

gate), guests will come across an impressive 300-year-old pine tree. The flowery fields and a peony garden in contrast with the surrounding Shiodome skyscrapers make it a truly unique place in Tokyo.

Shioiri no Ike is the only remaining seawater pond in Tokyo; its water levels rise and fall with the tides via a sluice. Nakajima no Ochaya (400 square meters), the tea house originally built in 1704, is surrounded by this tidal pond and is a perfect place where guests can relax and appreciate the view. A mix of outdoor spaces can accom-



modate up to 1,000 guests at a time.

Aside from these two Japanese gardens, there are a variety of other unique venues. These include the Tokyo Sea Life Park aquarium, the TMG building and four museums — the Tokyo Metropolitan Teien Art Museum, Tokyo Metropolitan Art Museum, Tokyo Photographic Art Museum and the Edo-Tokyo Open Air Architectural Museum.

Built in 1933 as the former residence of Prince Yasuhiko Asaka and Princess Nobuko, the Tokyo Metropolitan Teien Art Museum is famous for its art-deco main

building. Receptions can be held in the stylish new annex on the same historic site.

Another interesting space is Nogi Shrine in Minato Ward, where both the inner shrines and shrine grounds can be rented out with an option of a *gagaku* (ancient court music) performance for a culturally inspiring experience.

More information on the many other facilities is also available at the Tokyo Unique Venues website (<https://businesseventstokyo.org/tokyo-unique-venues-brochures/>).



Contact: Tokyo Unique Venues, Tokyo Convention & Visitors Bureau
 Email: tokyouniquevenues@tcvb.or.jp
 Website: <https://businesseventstokyo.org/tokyo-unique-venues-brochures/>



Tokyo tourism & congress schedule

A city on the go: Tradition, interactive art and phenomenal eats

To first-time visitors, welcome to Tokyo. It's a vast, entertaining city bursting with a seemingly immeasurable number of things to do during any visit. Even residents usually try focus on one category — for example, food, as Tokyo has the greatest number of Michelin-starred restaurants in the world; there are thousands of restaurants here and it would take forever to experience them all. It's a place that never stops changing — with new openings all the time, the city boasts various sides and offers many charms. To help you make the most of your stay, here are some of the top must-see venues of this ever-shifting city, from relaxing parks to the latest technological museum. We hope visitors will come back and experience more of the city's different sides in the near future.

Tokyo Skytree

Visitors can climb up the tallest, free-standing tower in the world at a height of 634 meters over the skyline, and take in views of the city from the top level of the 450-meter-high observatory deck.

Those brave enough can also stand on the tower's "window" flooring — a transparent area from which you can see cars moving beneath, almost seemingly smaller than ants.

While it mainly functions as a broadcasting tower, it is also one of Tokyo's most popular tourist destinations. The area around its base, Tokyo Skytree Town, is another fun and complex spot boasting about 310 shops and restaurants. People should visit Ameshin in Tokyo Skytree Town Solamachi to witness very elaborate candy crafts. The store specializes in producing delicately chiseled treats known as *amezaiku* (candy craft), one of Japan's traditional crafts.

When travelers are hungry and want to try a Tokyo-style dining, Toriton sushi restaurant is the place to go. The initial shock of the long line practically counts as a Tokyo experience itself; with a little patience, you'll see why regulars are willing to wait with empty stomachs. You'll be enjoying quality, reasonably priced seafood delivered straight from Hokkaido sooner than you think. Also, no worries for those who can't read Japanese — Toriton has menus in English, Chinese and Korean. Visitors looking to freshen their palates afterward should try the extra-thick green tea cream at Nana's Green Tea Tokyo Skytree. To visit the observatory itself, it is best to reserve tickets through the

website.

URL: www.tokyo-skytree.jp/en

Sensoji Temple area

Local custom suggests that it's usually nice to greet the local god when visiting an area. Therefore, it's worth visiting Sensoji Temple in Asakusa — Tokyo's oldest temple established in 628. Boasting over 30 million visitors a year, this huge temple is a special place for locals. The principal statue of Kannon enshrined in the temple is said to have been saving worshippers ever since first appearing some 1,400 years ago. Its glorious main hall, the five-storied pagoda and the main gate, Kaminarimon, are all very popular photo spots.

Kaminarimon literally means thunder gate, and is famous for its giant, red lantern that was restored after World War II with a donation from Konosuke Matsushita, the founder of Panasonic. There are only two occasions when the lantern is folded up — one is during the huge, local festival Sanja Matsuri to let the tall portable shrine go through. The other occasions are when typhoons are expected.

Between the gate and temple, there is a bustling shopping street called Nakamise-dori — the oldest shopping arcade in Tokyo that sells all sorts of Japanese souvenirs and snacks, some dating back to the Edo Period. When all of the shops close at night, the street is lit up and the store shutters, comprising large paintings, become an entertaining experience for visitors.

URL: http://www.taito-culture.jp/history/sensoji/english/page_01.html

Meiji Jingu

Opened in 1920, Meiji Jingu Shrine is dedicated to Emperor Meiji and his consort, Empress Shoken. Even though it is located in the bustling Harajuku area, the shrine's vicinity remains serene — a noticeably different atmosphere once visitors pass the giant wooden torii. The shrine is located in a forest that covers an area of 170 acres consisting of 120,000 trees of 365 different species, which were donated by people from all parts of Japan when the shrine was established.

The shrine is incredibly popular, especially at New Year's when it draws crowds of over 1 million who pray for their luck in the new year. It is also a popular venue for Shinto-style weddings — if they are lucky, visitors



Left: Sensoji Temple in Asakusa with Tokyo Skytree in the distance. The temple's Kaminarimon Gate is famous for its gigantic red lantern. Right: Ueno Park is home to a pond, zoo and many renowned museums. GETTY IMAGES



can see brides and grooms in their gorgeous kimono. The main building is an impressive example of the austere design and subdued colors typical of Shinto architecture.

URL: <http://www.meijijingu.or.jp/english/about/1.html>

Ueno Park

In 2017, the whole city celebrated the birth of healthy baby panda Xiang Xiang in Ueno Zoo, the nation's oldest zoo located in Ueno Park.

Established in 1873 as one of the capital's first official parks, it has become one of Tokyo's most popular and lively cherry blossom spots with more than 1,000 *sakura* (cherry trees) lining its central pathway. During late March and early April, people throw picnic parties under the trees to admire the cherry blossoms.

This park is also home to many renowned museums, including the National Museum of Nature and Science and the Tokyo National Museum. The museums are located right next to Ameyoko Plaza Food & Clothes Market that sells an array of souvenirs and clothes across 500 jam-packed stalls at reasonable prices. There are also a number of casual *izakaya* (pubs) where locals enjoy bar hopping, too.

URL: http://www.taito-culture.jp/history/ueno_zoo/english/page_01.html

Rikugien Gardens

The Rikugien Gardens is one of the most beautiful traditional Japanese gardens in the city. Covering approximately 89,000 square meters, the park's landscape reflects traditional Edo *kaiyu* style, with winding paths placed around a central pond and miniature

hills built on level grounds. Rikugien is popular all year round — the new leaves in spring and varied colors of autumn are the most stunning. However, the cascading blossoms of the *shidare-zakura* (weeping cherry tree) are one of must-see attractions in the springtime. In the gardens, there is the Fuki-age-chaya teahouse where guests can enjoy a bowl of matcha with snacks for a mere ¥510. The teahouse is open everyday until 4:45 p.m. with some souvenir options. Close by is the nation's first Michelin-awarded ramen restaurant Japanese Soba Noodles Tsuta, for those willing to brave the lines.

URL: <http://teien.tokyo-park.or.jp/en/rikugien/>

Epson teamLab Borderless

Tokyo's latest and hottest opening of

2018, the nation's well-known "ultra-technologists" teamLab have now got their own permanent digital art museum in Odaiba.

In this huge museum covering 10,000 square meters, about 50 works are on display, which visitors can interact with, and it is divided with five sections; some displays can even move beyond a single room.

No explanations or fixed routes are given for the huge space, allowing visitors to explore at their own pace and create their own unique journeys throughout the museum; this layout and presentation resonates with the exhibition's "borderless" theme. It's easy to spend an entire day there, so make sure to block out enough time when you visit. You can buy tickets through their official website.

URL: <https://borderless.teamlab.art>



Rikugien Gardens spans around 89,000 square meters and is a popular place to visit during autumn because of its charming scenery. TCVB

Congress schedule

		Sept. 16 (Sun)	Sept. 17 (Mon, national holiday)	Sept. 18 (Tue)	Sept. 19 (Wed)	Sept. 20 (Thur)	Sept. 21 (Fri)
Congress	AM		keynote speech	keynote speech	keynote speech	keynote speech	
	PM	forum	forum workshop, breakout session				
Exhibitions, etc.	all day		exhibitions				technical tour
			business forum				
Ceremonies, etc.	late afternoon and on	opening ceremony				closing ceremony	
		welcome reception		culture evening		gala evening	

Leading voices and thought leaders shaping the future of water at the IWA World Water Congress & Exhibition 2018

Agenda-setting thought leadership from the most prominent figures within the water sector and beyond. The following keynote speakers are top specialists in their fields and will provide the overarching narrative for the congress. Keynotes and supporting panels will frame the discussions and topics that will be addressed during the week of the congress.

Sept. 16 (Sunday) 4-6 p.m.



Rudy de Waele, conscious business and life design strategist, futurist, humanist, keynote speaker, author and curator will open a week of agenda-setting thought leadership inviting us to re-imagine and transform the future of water.

Sept. 17 (Monday) 9-9:50 a.m.



Tokyo Gov. **Yuriko Koike** (left) will speak about the initiatives taken to realize resilient and sustainable water supply and sewerage systems in Tokyo to support a sustainable urban water cycle. **Toshio Koike** (right), director of the International Centre for Water Hazard and Risk Management in Tsukuba, will address recent developments in the field of risk identification, reduction and management to achieve increased preparedness.

Sept. 17 (Monday) 5:30-6:15 p.m.



Silver Mugisha, chief executive officer of the National Water and Sewerage Corporation, Kampala, Uganda, will provide insights into institutional frameworks that are most conducive to strengthen and expand utilities in low and middle income countries.

Sept. 18 (Tuesday) 9-9:50 a.m.



Claudia Sadoff, director-general of the International Water Management Institute, Colombo, Sri Lanka, will bring in inspiring examples of pursuing resilient solutions in times of increased uncertainty.

Sept. 18 (Tuesday) 5:30-6:15 p.m.



Shinichiro Ohgaki, president of the Japan Water Research Center, Tokyo, Japan, will tap into innovations unleashed in science and technology to tackle many of the challenges water professionals will face when designing our sustainable water future.

Sept. 19 (Wednesday) 9-9:50 a.m.



Sudhir Murthy (left), CEO of NEWhub, Washington D.C., and **Mark van Loosdrecht** (right), chair professor of environmental biotechnology at Delft University of Technology, the Netherlands, will give a joint keynote address on accelerating the diffusion of innovation.

Sept. 19 (Wednesday) 5:30-6:15 p.m.



Rebekah Eggers, global water leader: WW "internet of things" for Energy, Environment, & Utilities Business at IBM, Los Angeles, U.S., will guide us in the journey of digitalization of water impacts on utilities. "From drips and drops to bits and bytes."

Sept. 20 (Thursday) 9-9:45 a.m.



Lars Therikildsen, CEO of HOFOR, Copenhagen, Denmark, will close the congress highlighting the opportunities for a big multipurpose utility.

IWA World Water Congress & Exhibition 2018

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Japan Pavilion Exhibitors

Below is a list of Japan Pavilion exhibitors.

Company name	Booth number
Description	
URL	

1 Abe Nikko Kogyo Co., Ltd. No. 207-G

Abe is a pioneer of pre-stressed concrete (PC) tanks and has maintained the top share in water supply facilities. We have a well-established international reputation in PC bridges and railway sleepers, and we have seen success in the energy field. We will contribute to solving development problems in the world with our durable, economical and safe PC tanks.

www.abe-nikko.co.jp

2 Aqueduct Mapping System Co., Ltd. No. 267-D

Aqueduct Mapping System (AMS) is a company developing and operating information systems for waterworks and sewerage businesses. AMS products include water and sewage pipeline GIS (geographic information system) and its related systems, reception and examination system for application of water supply pipe construction supporting water utilities and construction contractors, and so forth.

www.ams-k.co.jp

3 Chiba Prefectural Waterworks Bureau (CPWB) No. 274-A

Chiba Prefectural Waterworks Bureau (CPWB) was established in 1934. In 1980, CPWB was the first Japanese waterworks to install an advanced water treatment process consisting of ozonation and granular activated carbon adsorption. We supply drinking water to about 3 million people in 11 cities of Chiba Prefecture and important facilities.

www.pref.chiba.lg.jp/suidou

4 Chuou Sekkei Engineering, Co., Ltd. No. 262-F

For over 70 years, we have been promoting activities in several areas – water supply, sewerage, waste, the environment and information processing. We are a comprehensive service company that covers water and the environment that constantly thinks about how to contribute in each field and strives to develop technology based on the needs of the next generation.

www.cser.co.jp

5 Cosmo Koki Co., Ltd. No. 119, 217-C

Cosmo Koki Co., Ltd. was founded in 1959 and achieved fame as a pioneer of pipework under pressure that can construct water pipelines without shutting down the water supply. Our first project abroad was hot tapping on a crude oil pipeline in 1962 in Iran. Since then, we have been providing overseas customers with our cutting-edge products for more than 50 years.

www.cosmo-koki.co.jp

6 Daiichi Techno Co., Ltd. No. 232-B

Daiichi Techno is a construction and maintenance firm that conducts business in the domain of water purification and sewage treatment plants in Japan. We have many construction products, including pumps, valves, gates, solar power plants and small hydraulic power generators.

www.daii.co.jp

7 DEK Co., Ltd. No. 212-G

Since 1961, DEK has concentrated on the construction and maintenance of infrastructure with a focus on welding. We developed a small diameter pipe renewal construction technique (SDF construction technique) that uses flexible stainless steel pipes to contribute to the construction of infrastructure that are earthquake resistant and have a long life span; both needs of society today.

www.dek.co.jp

8 DK Corp. No. 266-D

DK Corp. provides water billing, water supply equipment management and system solutions to support these services. Through our total solution for water supply utilities, we can offer residents fully optimized, efficient and prompt services. DK Corp. will keep the water supply safe and secure to contribute to a sustainable water supply service.

www.daiichikankyo.co.jp

9 DMW Corp. No. 233-B

DMW Corp. was established in 1910 and has since manufactured large water turbines and pumps. Since 1955, we have mainly manufactured pumps, fans, blowers, valves and supplied them all over the world. "DeROs" is the most efficient energy recovery device in its class of seawater desalination industries. In 2016, the company received The Japan Machinery Energy-Efficient Machinery Award.

www.dmw.co.jp

10 The Federation of Japan Water Industries, Inc. No. 272-A

Established in 1966, the Federation of Japan Water Industries, Inc. (Suidanren) was an organization conceived to represent Japan's water supply and sewerage industries. Suidanren has strived to build and enhance the social infra-

structure underlying people's lives and urban environments. The organization comprises virtually every private-sector company in the Japanese water industry, with a total membership of roughly 230 firms.

www.suidanren.or.jp

11 Fuji Tecom Inc. No. 263-D

For 60 years, as a pioneer of water leak detection technology, we have been contributing to the development of instruments used at water facilities. We are a leading manufacturer of equipment for non-revenue water (NRW) reduction and related technology. We have 40 distributors around the world and are also involved in global Japan International Cooperation Agency projects for reduction of NRW.

www.fujitecom.co.jp

12 Fuso Corp. No. 234-B

Fuso is a comprehensive water engineering company that has been engaged in a broad range of business activities related to water infrastructure since 1946. We focus on the four sectors of plant construction, operation and maintenance, product sales and steel pipe manufacturing. With its effective sales network, Fuso has branch offices in Japan's major metropolitan areas.

www.fuso-inc.co.jp

13 Hinode, Ltd. No. 227-C

Hinode has manufactured and sold cast-iron manhole covers and associated products for social-infrastructure development. Manhole covers are part of all essential utility networks constructed below ground, and require performance criteria such as high durability and multifaceted safety performance based on high technological standards.

hinodesuido.co.jp

14 Hitachi, Ltd. No. 135, 242-B

Hitachi, Ltd., headquartered in Tokyo, delivers innovations that answer society's challenges. In the water business, Hitachi has offered a variety of products, systems and services for almost a century. In welcoming the "internet of things" era, we deliver innovations to society and customers by leveraging three strengths – operational technology, information technology and products and systems.

www.hitachi.com

15 Japan Water Research Center No. 273-A

Japan Water Research Center is a nonprofit research institute aiming to solve important challenges facing water supply services in Japan. We implement various investigations, research and development projects, as well as collaborations with utilities, corporations and academics in Japan and abroad. Through these activities, we contribute toward enhanced public health and living environments.

www.jwrc-net.or.jp

16 Japan Water Steel Pipe Association No. 218-C

The Japan Water Steel Pipe Association is promoting technical development and improvement, as the keywords for seismic upgrades and lifespan extension to meet the needs of the age. We are stably supplying excellent steel pipes and working with the aim of expanding our market further.

wsp.gr.jp

17 JFE Engineering Corp. No. 145, 246-B

JFE Engineering is expanding its engineering business that supports people's lives and industries in the fields of environment, energy and social infrastructure. We will continuously contribute to the social development as a company that "creates and ni-na-u" the foundation for life."

"Ni-na-u" is a Japanese word meaning supporting and remaining responsible.

www.jfe-eng.co.jp

18 Kansei Company No. 151, 269-D

Kansei Company continues to improve the maintenance and management of a sewerage system that has become indispensable for over 50 years. At the conference, we will show our latest technologies in sewer pipe inspection robots – the Grand Beaver and Grand Sweeper. Thanks to these, pipe surveys and cleaning can be conducted safely without requiring workers to enter the sewer system.

www.kansei-pipe.co.jp

19 Kawasaki Heavy Industries, Ltd. No. 210-G

Kawasaki Heavy Industries produces diverse products across wide-ranging fields that cover land, sea and air. Kawasaki's gas turbine standby generator sets play important role in the water industry; they keep water treatment facilities running in case of emergencies, such as power outages or natural disasters.

www.khi.co.jp

20 Kimura Technical Co., Ltd. No. 205-G

We provide advanced water treatment technologies. The Upper Biological Contact Filter (U-BCF) is a pre-treatment system for water supply plants. As urbanization proceeds, water sources close to cities suffer from quality deterioration, and new water sources far from the city must be found. U-BCF can be an effective

alternative for long and costly pipelines connecting to such distant water sources.

www.kobelco-eco.co.jp

22 Kubota Corp. No. 125, 206-G

Since 1890, Kubota has worked to provide various products that contribute to people's lives and communities around world. Today, we are developing our business globally through products, technology and services offering upstream to downstream water solutions. Using U.N. Sustainable Development Goals as a compass, Kubota will make continuous efforts to solve social problems and support the future of the Earth.

www.kubota.com

23 Kurimoto, Ltd. No. 152, 222-C

For over 100 years, Kurimoto has contributed to building social infrastructure. Our main products are ductile iron pipes and valves for water supply. We continue to strive to improve and service our products throughout their life-cycles and build more safe and secure lifelines in the world.

www.kurimoto.co.jp

24 Maezawa Industries, Inc. No. 253-B

Maezawa Industries, Inc. has been enjoying a reputation as a leading manufacturer of reliable waterworks valves and water treatment equipment since the establishment of the company in 1937. Our products cover the water and environmental fields and we manufacture valves and equipment for waterworks and wastewater, as well as industrial wastewater treatment and biogas generation.

www.maezawa.co.jp

25 Meidensha Corp. No. 126, 236-B

Meidensha Corp. (Meiden) has been contributing to infrastructure building, including in the areas of power, water processing and rail across public utilities and various industrial fields. At the 2018 IWA event, Meiden will introduce our new technologies such as disaster prevention measures for public sewerage systems and new water processing systems with ceramic membranes.

www.meidensha.co.jp

26 Metawater Co., Ltd. No. 137, 243-B

Metawater is one of the leading companies in the water and wastewater treatment industry in Japan. We can provide total solutions from design and construction up to operation and maintenance. We are going to further accelerate our business into the private market in Japan, as well as the international market, with our proprietary mechanical and electrical technologies.

www.metawater.co.jp/eng

27 Mitsubishi Electric Corp. No. 240-B

Mitsubishi Electric has been delivering our ozone treatment system since the 1960s, assisting water environments in cities globally by recycling high-quality water with great efficiency and supplying water to support a sustainable water-recycling society. Today, we are developing EcoMBR, which utilizes Mitsubishi ozonizer technology, to launch in 2019. The EcoMBR uses ozone to process water with even greater efficiency.

www.mitsubishielectric.co.jp

28 Morita Iron Works Co., Ltd. No. 221-C

Morita has been manufacturing various valves (butterfly, check, sluice, auto and more) during the century since our founding in 1917, in accordance with required uses and purposes. Morita's valves are used in various fields related to water and people. We are exhibiting our valves at this event, including metal-seated butterfly valves and swing check valves.

morita-tekkousyo.co.jp

29 Nagaoka International Corp. No. 247-B

Nagaoka International Corp. is one of the world's leading engineering and wedge wire screen manufacturing firms. Nagaoka manufactures environmentally friendly water intake (NAGAOKA Screen & HISIS), treatment systems (CHEMILES & AERSYS), and screen internals for oil refining and petrochemical complexes, helping to create a better world for society. We have developed our own unique technology to effectively utilize finite resources.

www.nagaokajapan.co.jp

30 NEC Corp. No. 209-G

NEC brings together and integrates technology and expertise to create the information communications and technology-enabled society of tomorrow. We collaborate closely with partners and customers around the world, orchestrating each project to ensure all its parts are fine-tuned to local needs. Every day, our innovative solutions for society contribute to greater security, safety, efficiency and fairness, enabling people to live brighter lives.

www.nec.com

31 Newspaper of Waterworks Industry No. 208-G

Newspaper of Waterworks Industry thinks about the global environment and people's living through water. We are developing a wide range of coverage activities for central government agencies, local public entities nationwide, affiliated companies, research institutes, related organizations and so on, mainly in

water supply and sewage systems.

www.suidou.co.jp

32 Nihon Genryo Co., Ltd. No. 248-B

Nihon Genryo have been supporting the Japanese water supply as provider of filter media, advocating new water supply systems for drinking water in small village areas and for disaster relief. Our mobile water purification unit can provide "the water people can drink with confidence" to those who cannot access sanitary water.

www.genryo.co.jp

33 Nihon Suido Consultants Co., Ltd. No. 260-F

Nihon Suido Consultants Co., Ltd. is a leading water environmental engineering consulting firm in Japan that has been providing comprehensive consultancy services for water supply, wastewater, drainage, sanitation, river engineering and water environment in domestic and global markets, including official development assistance projects over the past six decades.

www.nissuicon.co.jp

34 Nihon Suiko Sekkei Co., Ltd. No. 256-F

Nihon Suiko Sekkei Co., Ltd. is a Japanese leading consulting firm that supports water and wastewater utilities in their decision-making processes at all stages of their assets' life cycles. Our main business is asset planning and improving utilities' asset management, including developing asset planning systems and supporting outsourcing projects.

www.n-suiko.co.jp

35 Nippon Chutetsukan K.K. No. 226-C

Water service is indispensable to daily life to support a stable supply. We always strive for the development of new technology and improving its quality, as well as fulfilling the needs and maintaining the trust of consumers as a ductile iron pipe manufacturer working to protect this indispensable lifeline. We plan to display an earthquake-resistant version of our ductile iron pipe.

www.nichu.co.jp

36 Nippon Koei Co., Ltd. No. 258-F

Nippon Koei is the oldest engineering consulting firm in Japan and has worked on over 5,000 infrastructure projects in 160 countries. Nippon Koei Group provides domestic and international engineering consultation services in a wide range of fields, including water resources and waterways, energy, transportation and environmental management. We will remain committed to contributing to social development all over the world.

www.n-koei.co.jp/english/

37 Nippon Suido Shinbun Company No. 213-B

Nippon Suido Shinbun Company has served to promote the spread and improvement of water supply and sewerage systems for over 60 years. Through our service, we hope to contribute to the building of a sustainable water infrastructure in our country. Our publications include specialist papers Japan Waterworks Newspaper and Japan Sewerage Newspaper, as well as monthly magazine Waterworks Opinion.

www.suido-gesuido.co.jp

38 Nishikawa Keisoku Co., Ltd. No. 235-B

We are an engineering company specializing in measurement control and analysis. In the water supply field, we are involved in various measurement and control systems such as flow rate measurement and control, analysis of ingredients, adjustment of chemical quantity and more at water purification plants.

www.nskw.co.jp

39 Organo Corp. No. 245-B

Organo is a general water treatment engineering company that sells water treatment systems and chemicals to a wide range of industries. Organo operates three businesses, with their plant business selling water treatment systems, their solution business maintaining and managing delivered systems, and their functional product business selling standard products and chemicals.

www.organo.co.jp

40 Original Engineering Consultants Co., Ltd. No. 257-F

OEC is one of the leading Japanese engineering consultancy firms. OEC has developed its business in various fields, including water supply, sewerage works, industrial wastewater, stream pollution and flood control. OEC has expanded its operations overseas, undertaking various projects in Asia and the Pacific islands since 1977.

www.oec-solution.co.jp

41 Pacific Consultants Co., Ltd. No. 261-F

Pacific Consultants is the leading engineering consulting firm in Japan that has been providing wide range of consulting services in fields of infrastructure development since being established in 1951. We have built solid experience with over 1,500 engineering professionals taking holistic approaches to studies, designs and planning, and construction supervision for infrastructure development.

www.pacific.co.jp

42 Pasco Corp. No. 268-D

Pasco Corp., founded as an aerial surveying

company in 1953, has the world's leading technological capabilities in the fields of sensing (surveying and measuring) and geographical information systems (GIS). Pasco's network in Japan and overseas provides information through advanced geospatial technology. We will contribute to the development of sound and sustainable water resources and water use utilizing geospatial technology.

www.pasco.co.jp

43 Politec No. 219-C

Polyethylene pipes and fittings are made of high-quality polyethylene (PE100). The pipes and fittings are integrally combined by EF (electrofusion) jointing. The excellent features of polyethylene piping systems such as long-term hydrostatic performance, lightweight, flexibility, corrosion resistance and earthquake resistance have been highly evaluated.

www.politec.gr.jp

44 PUC Co., Ltd. No. 283-A

As a company that's a member of the Tokyo Waterworks Group, Public Utility Services Center Co., Ltd. has undertaken a portion of the water business in Tokyo. At the IWA event, we will introduce our role in Tokyo Waterworks, our WISH water charge collection system and the mobile meter-reading system that works in conjunction with it.

www.puc.co.jp

45 Sanki Engineering Co., Ltd. No. 237-B

The Sanki Engineering Group contributes to society in various business domains related to social infrastructure, including the facilities construction business that covers air conditioning, electrical systems, information and communications and office relocation. The company also covers the environmental systems business that consists of water and sewage treatment facilities and waste incineration facilities.

www.sanki.co.jp

46 Shimizu Alloy Mfg. Co., Ltd. No. 214-C

Shimizu Alloy Mfg. Co., Ltd. is valve manufacturer for waterworks established in 1947. We are exhibiting the products for protecting the lifelines and supplying safe water, such as a new earthquake resistant isolation valve, which protects fire hydrant and air valve lines, and the AQUA series compact water purification equipment with fully automatic membrane filtration for the mini-scale water supply.

www.shimizugokin.co.jp

47 Showarasekkan Seisakusho Co., Ltd. No. 215-C

48 Suido Kiko Kaisha, Ltd. No. 238-B

49 Suiken Co., Ltd. No. 216-C

As a manufacturer of joints for lifelines, we have been developing unique products since our establishment in 1970. We have been sending our creative technologies and products including Super Flex, flexible expansion joints, and S-Gate, an under pressure valve insertion system, to the world. We will continue contributing to the safety of lifelines throughout the world.

www.suiken.jp

50 Sumitomo Corp. No. 211-G

Sumitomo Corp. engages in multifaceted business activities including sales of a variety of products and services within Japan, imports and exports, trilateral trading and domestic and international business investments. We provide water supply, wastewater treatment, seawater desalination and district cooling services to over 20 million people around the world.

www.sumitomocorp.co.jp/english

51 Sumitomo Electric Industries, Ltd. No. 229-B

Sumitomo Electric Industries, Ltd. would like to introduce Poreflon, a porous hollow fiber membrane made from PTFE polytetrafluoroethylene, which has strong chemical and heat-resistance and durability as a MF/UF membrane module. Through "stable water treatment performance," "high quality and reliability" and "high-quality customer service," we are ready to propose water treatment systems that fully meet various customer needs.

global-sei.com/products/poreflon

52 Swing Corp. No. 136

Swing Corp. is a leading water solutions provider serving both municipal and industrial customers in domestic and overseas markets. We design, build, operate and maintain water and wastewater treatment plants using water and environmental technologies developed and proven in Japan. We currently operate and maintain more than 300 water treatment facilities nationwide and have over 750 plants in 50 countries.

www.swing-w.com

53 Taisei Kiko Co., Ltd. No. 138, 224-C

Since its founding in 1941, Taisei Kiko has pioneered Japan's water and sewage pipeline maintenance sector; continuously engaged on the frontier of technological innovation in product development and maintenance. We have developed retainer glands and various pipe fittings following the concept of water pipeline maintenance. Our quake-resistant

products have become all the more essential for the pipeline infrastructure and network.

www.taiseikiko.com

54 The Victaulic Company Of Japan Ltd. No. 225-C

Victaulic Japan was established in 1929 as a manufacturer of piping joints for water purification plants, agricultural and industrial water supply systems and various kinds of factories. Our products have protected pipelines from many earthquakes. We will continue to make technical improvements and contribute to society.

www.victaulic.co.jp

55 Tokyo Engineering Consultants Co., Ltd./TEC International Co., Ltd. No. 259-F

TEC Group consists of TEC International Co., Ltd. (TECI) serving overseas markets and Tokyo Engineering Consultants Co., Ltd. (TEC) handling domestic markets. We provide consulting services related to the water and environmental sectors, especially for the development of water infrastructure such as water supply, sewerage and urban drainage systems.

www.tecjp

56 Tokyo Gas Engineering Solutions Corp. No. 265-D

Total Utility Mapping System or TUMSY is one of the most popular information systems in the water and sewer industries, used major Japanese cities, including the Tokyo Metropolitan Government that uses the system for pipe maintenance and effective replacement planning. TGES, a subsidiary of Tokyo Gas Co., provides unique engineering solutions to utilities, based on long city gas industry experience.

www.tokyogas-es.co.jp

57 Tokyo Metropolitan Sewerage Service Corp., TGS No. 283-A



The future Runs on Hydrogen

The Toyota Mirai runs on hydrogen, the most abundant element in the universe. We'll never run out of hydrogen — it's easily made from water by electrolysis, using solar, wind, geothermal, hydroelectric and other renewables. Mirai's fast fill-up time and long cruising range are comparable to a conventional car's. And it's as fun to drive as it is friendly to the environment. The only exhaust is pure water. Mirai shows how hydrogen can deliver convenience and performance without compromise. That's why hydrogen will power the sustainable society of tomorrow. No wonder Mirai means "future" in Japanese.

Meet the future



TOYOTA

toyota-global.com