

# SMART WATER ROUNDTABLE 2016

Equinox Private Dining Room, Swissotel, The Stamford, Singapore  
29 August 2016



# SMART WATER ROUNDTABLE 2016 OUTCOME REPORT



Photo credit: ABB

Water is a key building block to life and access to clean, healthy sources of water is one of the 17 Sustainable Development Goals as outlined by the United Nations.

Some 1.8 billion people in Asia currently have no access to clean water, with recent estimates predicting that up to 3.4 billion people could be living in water-stressed areas of Asia by 2050. Issues of water security are compounded by water loss through leakage, and changing weather patterns due to climate change that have wrought longer droughts or disastrous levels of rainfall.

Even in Singapore, with its progressive water management ecosystem, the current demand for 430 million gallons of water (mgd) per day is expected to double to 800 million gallons by 2060.

Singapore has two water agreements with neighbouring Malaysia. The 1961 Water Agreement between the Johor State Government and Singapore expired on 31 August 2011. Singapore continues to import water from Johor under the second 1962 Water Agreement, which allows it to draw

up to 250 mgd from the Johor River till 2061. The race is on to find alternative water sources to keep taps in Singapore running, and Prime Minister Lee Hsien Loong has identified water self-sufficiency as a strategic priority for the country.

The three other "national taps" of Singapore include local catchment areas, NEWater, and desalination. Since the expiry of the first water treaty with Malaysia in 2011, Singapore has increased water catchment areas from half to two-thirds of the island's land surface, with Marina Reservoir able to provide about 10 per cent of Singapore's water needs.

The four NEWater plants can currently supply up to 30 per cent of water needs, while desalination plants are able to generate 25 per cent of what Singapore needs.

Meanwhile the rapid development of new information and communications technologies (ICT) has enabled industries to automate processes and collect data like never before. Internet of Things (IoT) capabilities, cloud computing, and big data analytics are giving industries and business people the ability to make more efficient and effective decisions based on science.

# // How can governments and the water industry bridge this supply-demand gap and deploy systems to meet social needs in a sustainable way? Can a smarter water system change the way societies produce, consume and think about water? //

With the aim of continuing to deliver a pipeline of good water to Singapore, PUB in February 2016 published a white paper "Managing the Water Distribution Network with a Smart Water Grid" that charts how the utility board aims to integrate smart technologies into its mandate of delivering a pipeline of good water to homes and offices in Singapore.

At present, PUB envisions that smart technology can play a role in: managing assets by assessing which pipes require maintenance and how urgently; checking for leaks within the water network; monitoring water quality; reading water meters automatically; and conserving water.

Against the backdrop of a shake-up in water supply and nascent technologies, how can governments and the water industry bridge this supply-demand gap and deploy systems to meet social needs in a sustainable way? Can a smarter water system change the way societies produce, consume and think about water?

With these questions in mind and with the objective of finding new grounds for collaboration and implementing solutions, Swiss technology giant ABB and Eco-Business organised the Smart Water Roundtable 2016.

Nineteen participants drawn from the Singapore government, utility board, water industry, academia, and sustainability sector came together on August 29, 2016 at the Equinox private dining room at Swissotel The Stamford to discuss the future of a Smart Water Grid.

The theme of a Smart Water system builds on the Smarter Cities Roundtable last year, which was also helmed by ABB and Eco-Business. Johan Villiers, managing director of ABB Singapore, said: "As we talked through all the aspects of a Smart City and Smart Nation last year, one of the key things that came out is the want of Smart Infrastructure and that we need to continue to build Smart Infrastructure. Water is one of the key elements."

Estimates say that up to 80 per cent of utilities in advanced economy cities and half of utilities in developing cities will have adopted Smart Water systems by 2025. None of the participants disputed a Smart Water Grid as the way forward but were, however, unanimous that much remains to be done.

Key concerns raised in the discussion were the implementation of new technologies, what to do with the amount of data collected, preparing the labour force for a Smart Water Grid, and how the industry could potentially approach the issues.

At the same time, participants also agreed that a cornerstone to a more sustainable water system is changing user behaviour, whether they are industrial or home water users.

One participant pointed out: "Even with a 30 per cent improvement in efficiency, you still require a 24 per cent increase in supply (to meet global future need). In order to not to have to increase the water supply in the future, you're going to need a 50 per cent improvement in efficiency.

"Even with a smarter grid, how are you going to distribute that water? How are you going to manage its use?"

Achieving a smarter system, reducing waste, and improving the efficiency of water use boils down to whether users understand the true value of water.



Photo credit: ABB

# ROUNDTABLE DIALOGUE

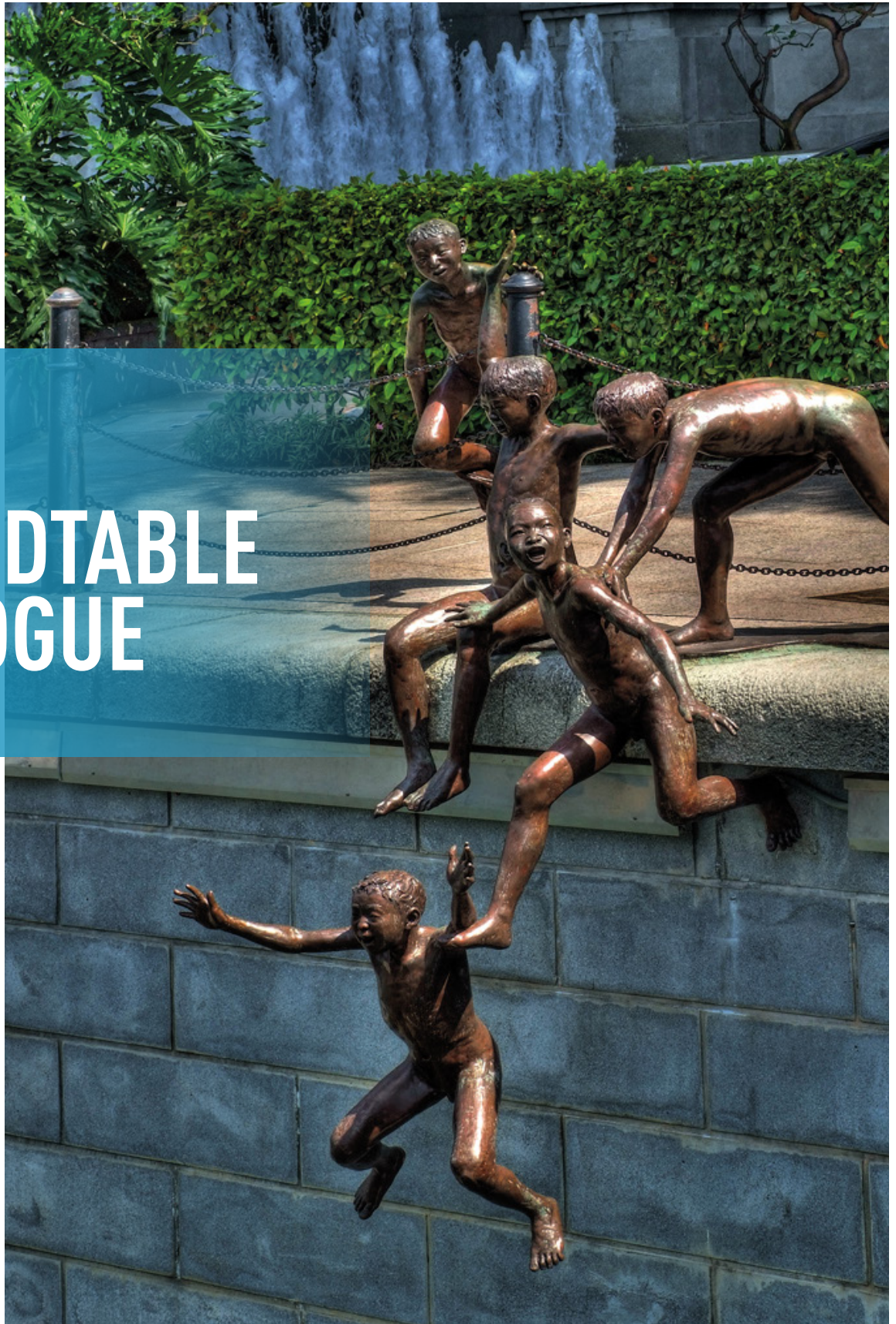


Photo credit: William Cho

# THE ROLE OF TECHNOLOGY



Photo credit: Shutterstock.com

The technology of the future is already here today; the question is, how do we connect the dots to turn that into reality?

Participants at the ABB Smart Water Roundtable said that the technology necessary to transform Singapore's water ecosystem into a smarter one already exists.

For instance, sensor technology is readily available and high-rate pressure sensors have been deployed to a certain extent within PUB's water network to detect leaks, according to PUB's white paper. These sensors feed information to a software system to identify stretches of water mains where the leak is likely to have occurred.

Two issues raised by participants at the roundtable pertaining to integrating smart solutions into their water systems were compatibility and interoperability.

One participant asked whether existing water systems were even compatible with the new wave of technological updates. Operators who want to switch to a new system or upgrade their existing system have to ensure that what they are implementing will be future-ready.

Furthermore, the "fragmented Smart Water market" has many manufacturers coming up with their own innovative products independent of one another. Manufacturers need to ensure there is a certain degree of integration and interoperability for a smoothly-functioning Smart Water Grid. Devices must be able to talk to each other in a seamless way.

Taking the above example, PUB's sensors to detect leakage would not be effective without being connected to the detection software.

Data also presents another rich area of possibilities for water

companies that invest in smart technology, allowing them to collect information regarding behaviour and performance. For one thing, researchers or scientists could use big data analytics to understand water use and subsequently, how to encourage a reduction in consumption.

However, while participants expected big data to be useful and even perhaps profitable, it remained unclear during the course of the roundtable what that would mean. Technology as it currently stands allows companies to collect data, but one participant said there is "inertia" in terms of companies that are willing to upgrade their systems to collect more information.

Just as importantly, there needs to be security systems in place to protect the data, which can be sensitive and even dangerous in the wrong hands, agreed participants.

A water grid with new capabilities will call for a workforce with new skills, and this was another major concern for participants at the roundtable.

They said that the massive amount of data that a Smart Water Grid is capable of producing requires a highly-trained pool of data analysts – who can work with numbers and also possess domain expertise, or a deep knowledge of the day-to-day functioning of the industry – in order to mine the numbers for useful information.

The need to start training people now is urgent, said a participant, explaining that skills training must keep up with advances in technology.

Implementing a Smart Water Grid is all the more crucial when one considers Singapore's shrinking population and dearth in supply of menial labour – two other manpower-related challenges raised by participants. Automating operational processes through smart technology would therefore be killing two birds with one stone.



# CHANGING USER BEHAVIOUR

Photo credit: Shutterstock.com

Participants readily agreed that all the technology in the world would not be as effective without changing user behaviour.

They were very interested in the solutions and changes Smart Water technology could offer industries and businesses. Although industrial water makes up half of Singapore's water requirements today, it has been shown that as much as 20 to 30 per cent of industrial water use is due simply to wastage, said one speaker.

One participant also raised the example of how Coca-Cola was able to cut 30 to 40 per cent of water use when there was a water shortage in China by reexamining its plant processes, highlighting that willpower is central to make necessary and perfectly doable cuts in water consumption.

The discussion moved to how to convince plant operators and business owners that the upfront capital required for upgrading the system will pay off in the long term, and that output will not be affected as a result of water-saving measures.

"People don't bring the same attitude of wanting to conserve water (at home) to the workplace as well," lamented one participant.

In reality, the drive to save water isn't necessarily stronger at home. One participant said that consumers don't necessarily conserve water despite knowing that it's a good thing to do because: changing daily habits can be difficult without accurate information about their water consumption habits; when consumers do have this information, they may not know how to convert that into action.

“ Changing daily habits can be difficult without accurate information about their water consumption habits; when consumers do have this information, they may not know how to convert that into action. ”

A gadget that participants mentioned during the discussion was the Amphiro, a gadget that can be attached to a shower head to provide real-time information on water use. Pilot studies with the gadget have shown that users were able to reduce water consumption by five litres per person per day.

A participant suggested that devices like these could be used in an industry setting as well to encourage water-saving behaviour at work.

Another suggestion was to re-price water to adequately reflect its value in cost and consumption, though participants understood that such a measure would be politically sensitive.



Photo credit: Shutterstock.com

Participants mooted the idea of a cross-industry consortium with partners coming from all sectors of the water industry to work collaboratively on the problems highlighted during the roundtable and make a Smart Water Grid a reality in Singapore.

The consortium solution could solve the problems of:

- Lag time between identifying a problem, and moving into more specific solutions and their implementation
- Brainstorming on what can be done with data collected
- Lowering the costs of installing and implementing new technologies and gadgets
- Ensuring interoperability of proposed solutions

The consortium would allow partners to set up trials and test Smart Water and IoT solutions on an industrial scale, and would be a highly integrated, holistic system with industry consultants on board to “sew up the picture”.

The government-led consortium would pick partners to fill certain roles, but the industry would be kept informed and the process of selecting partners would be transparent.

“ Singapore will soon be setting up a cross-industry consortium to make a smart water grid a reality in the city-state. ”

Though bringing together business rivals as partners could be a sensitive issue, one participant said it is not necessarily the case if the focus of the consortium is on approaches to collaboration rather than the technology per se.

What was clear at the ABB Smart Water Roundtable is that the industry is very much willing and ready to work towards a more intelligent and efficient way of running the water business.

By highlighting the challenges currently facing them, the various players in the industry have the chance to band together to pave a new path for the future of water.





Photo credit: ABB





Photo credit: ABB



**Participants** (by alphabetical order)

- **Bertil Brandin**  
Group Vice President, Country Service Manager Singapore and Regional Service Manager South Asia, ABB
- **Chang Thai Nam**  
Vice President, Discrete Automation and Motion - Automation Products, ABB
- **Jessica Cheam**  
Editor, Eco-Business
- **David Chen**  
Head of Sales - Electrification Solutions, ABB
- **Goh Chee Kiong**  
Executive Director, Cleantech; Executive Director, Cities, Infrastructure & Industrial Solutions, EDB
- **Hazel Gray**  
Solution Consultant, ABB
- **Philip Lee**  
Strategic Account Manager – Water / WasteWater, ABB
- **Lee Tuck Wai**  
Regional Technology Manager, Water Asia, Ch2m Hill
- **Eric Mun**  
Chief Technology Officer, SembCorp Industries
- **William Ng Han Tong**  
Senior Deputy Director (Supply & Demand Management), PUB
- **Ng How Yong**  
Associate Head (Administration) & Dean's Chair, Department of Civil and Environmental Engineering; Director of the Centre for Water, NUS
- **Niwa Terutake**  
General Manager, Meiden Water Group
- **Ong Tze Haung**  
Head of the Water Team, EDB
- **Dharmesh Pandya**  
Senior Project Manager, Ch2m Hill
- **Qian Neng**  
Postdoctoral Fellow, Institute of Water Policy, Lee Kuan Yew School of Public Policy
- **Robert John Terrell**  
Principal Lead Consultant, ABB
- **Cheryl Thiang**  
Senior Officer, Water Team, EDB
- **Andrew Threlfall**  
Manager – Singapore, Blue Ocean Monitoring
- **Johan de Villiers**  
Managing Director, Singapore and South-East Asia, ABB



Photo credit: ABB

For more information about the Smart Water Roundtable, please contact:

**Eco-Business**  
3 Fusionopolis Place  
#03-54, Galaxis Work Lofts  
Singapore 138523

By phone: +65 6250 2488  
partners@eco-business.com  
http://www.eco-business.com

**ABB**  
2 Ayer Rajah Crescent  
Singapore 139935

By phone: +65 6222 7778  
contact.center@sg.abb.com  
http://www.abb.com.sg

© Eco-Business 2016 All Rights Reserved.

SMART WATER  
ROUNDTABLE 2016



© Eco-Business 2016 All Rights Reserved.