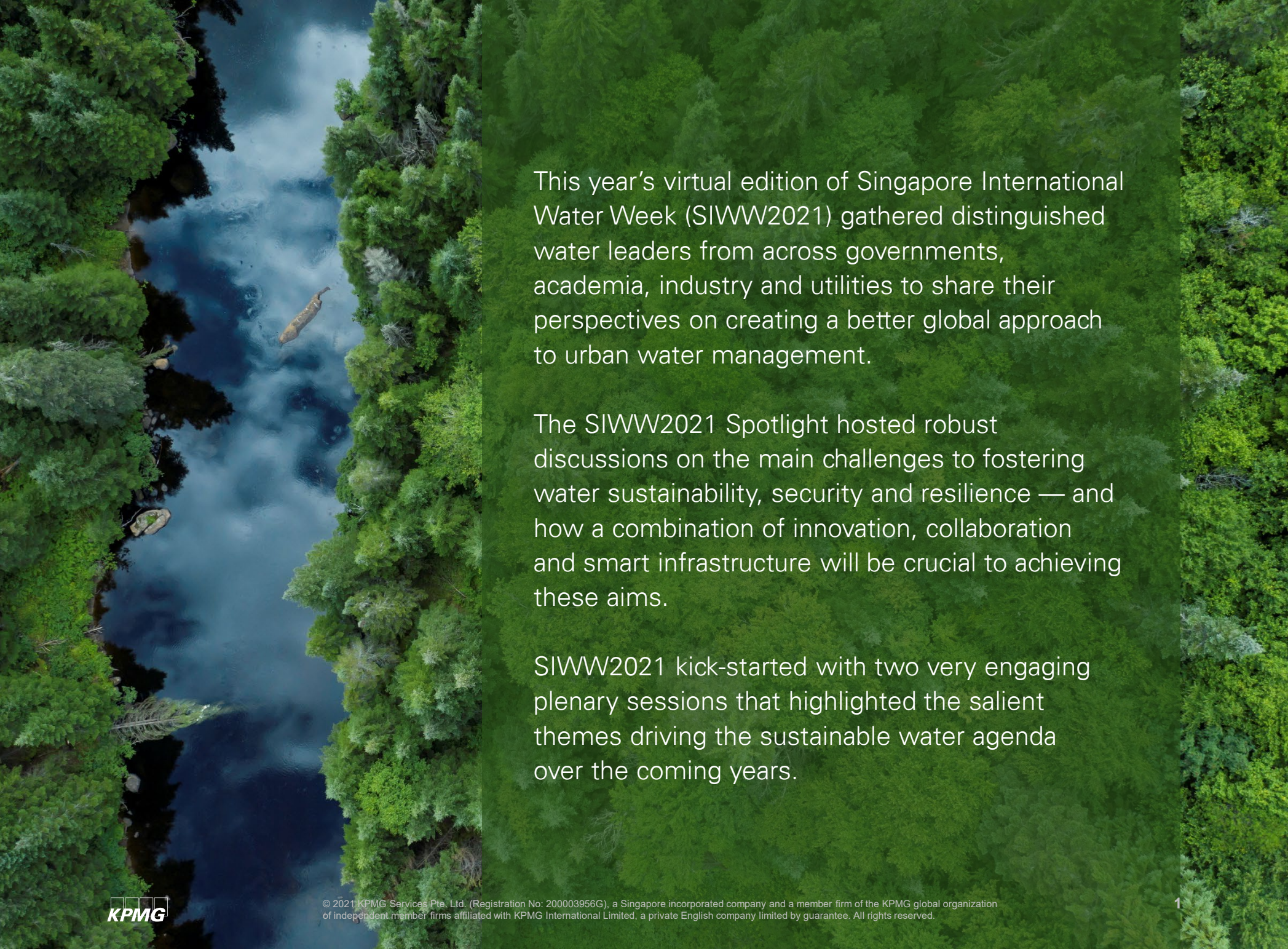




Key insights from Singapore International Water Week 2021

**How innovation, collaboration and smart infrastructure will power
the drive towards building a more sustainable water future**



An aerial photograph of a river winding through a lush, green forest. The water is a deep blue, reflecting the sky and the surrounding trees. The forest is dense with various types of trees, including tall evergreens and shorter deciduous trees. The river flows from the top left towards the bottom right of the frame.

This year's virtual edition of Singapore International Water Week (SIWW2021) gathered distinguished water leaders from across governments, academia, industry and utilities to share their perspectives on creating a better global approach to urban water management.

The SIWW2021 Spotlight hosted robust discussions on the main challenges to fostering water sustainability, security and resilience — and how a combination of innovation, collaboration and smart infrastructure will be crucial to achieving these aims.

SIWW2021 kick-started with two very engaging plenary sessions that highlighted the salient themes driving the sustainable water agenda over the coming years.



Climate change is underscoring the global water access crisis

The acceleration of global warming has resulted in extreme climate events that have exposed the vulnerabilities of current water infrastructure. It has also underscored existing water scarcity issues, particularly in developing countries that have been disproportionately affected by COVID-19 and have less adaptive capacity to recover.

Water is a fundamental requirement for survival, and a lack of access to it inevitably impacts a nation's overall development. Hence, it is imperative that we harness the right solutions to create change.

To tackle these hurdles, stakeholders may approach from three angles: adequacy, resilience and sustainability. Adequacy involves having sufficient water capacity to meet demand. This will require better and more widespread recycling solutions. Resilience entails leveraging technology to bolster water infrastructure so that future pandemics or natural disasters do not compromise water systems that service the population. Collectively, these solutions must be implemented in a sustainable and climate-friendly fashion.



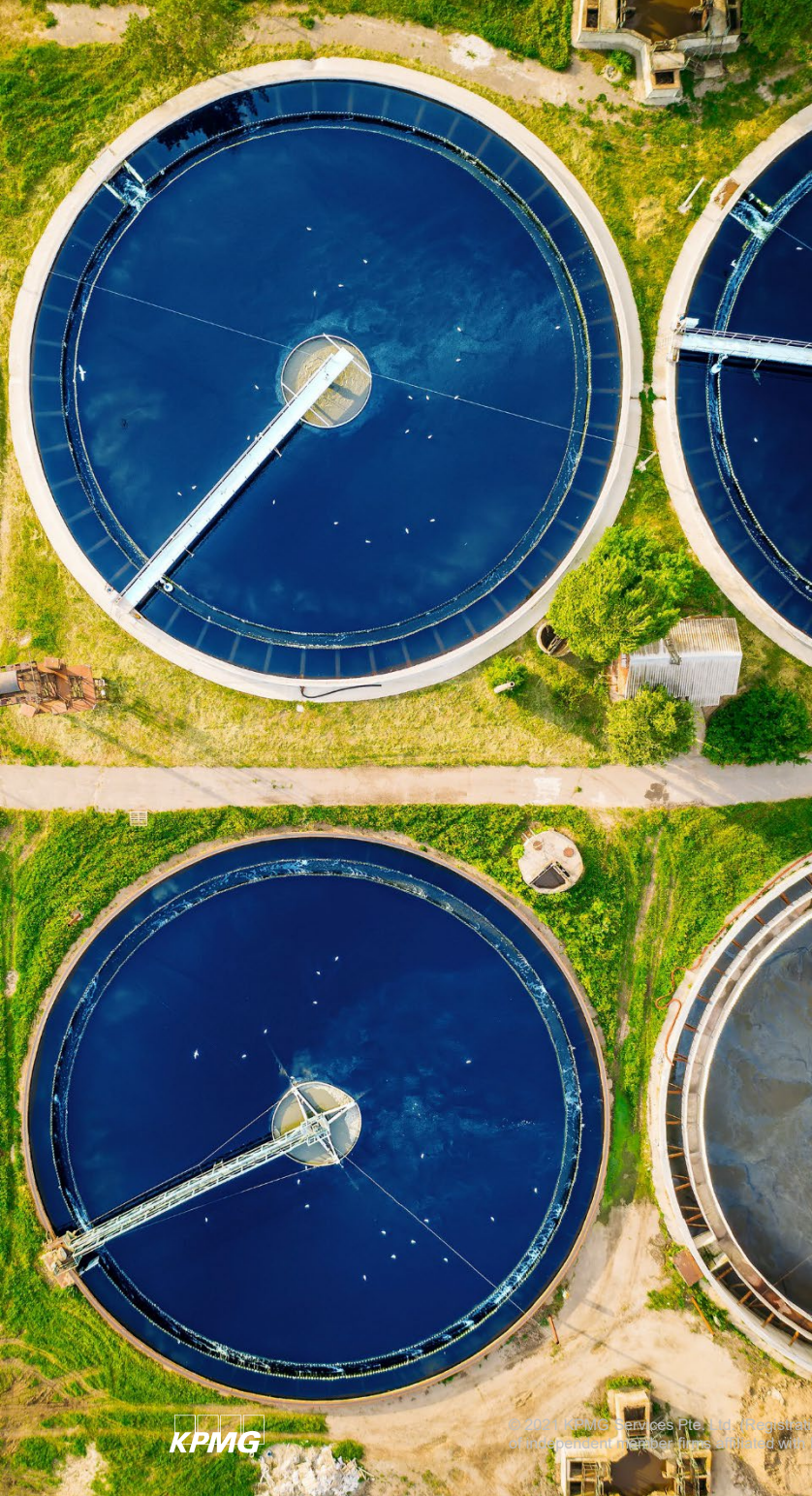
Leveraging technology for better infrastructure

A wide array of technological innovations are available to improve our water infrastructure. Digital solutions such as the Internet of Things (IoT), blockchain and digital twins can be implemented across the water chain, be it to create new projects or optimise existing systems.

For instance, an advanced smart metering system can allow for better demand-side management. Providing customers with accurate and real-time information on their water consumption can help them to monitor and optimise their usage and conserve water efficiently. Such systems can also use predictive analytics to generate insights on people's water footprint. These can be harnessed to calculate reduction targets and goals.

On the supply end, IoT sensors can help prevent water theft and unaccounted consumption. They can also be used remotely to monitor hundreds of kilometres of pipelines to detect leakages. This allows such faults to be pinpointed, isolated and proactively fixed, making the entire network more resilient.

The technology needed to enact these solutions is universal. It is also inexpensive and often finances itself in the long run. Hence, it is imperative that utilities and companies prioritise digital transformation, take ownership of these technologies and incorporate them into their business models as a matter of urgency. Emerging markets, in particular, can harness these proven solutions to leapfrog more mature economies.



Recycling wastewater must be prioritised

Water is a finite resource, and our supplies of groundwater (which is found below surface level) are rapidly declining. It will therefore be essential to develop and implement recycling techniques to address long-term water scarcity.

The technology to power solutions such as seawater desalination, rainwater harvesting and wastewater treatment already exists. To reach more developing countries, we must ensure that these solutions are accessible, inexpensive and easily implemented.

Wastewater treatment will be an essential driver in these recycling efforts. From the United States to Europe and Singapore, countries have already put in place successful infrastructure and policies that can serve as a blueprint for the rest of the world.

Singapore's NEWater project currently generates around 40 percent of the country's water supply from treated wastewater, and there are plans to increase this figure to some 55 percent by 2060. Californian authorities have deployed sophisticated systems to convert wastewater into potable water. In Europe, new regulations have been introduced to facilitate the use of recycled wastewater for agriculture and irrigation.

Commercial models or incentives — similar to a carbon-credit system — may be used to further encourage such efforts by encouraging commercial and industrial customers to install water recycling and management solutions; persuading businesses to develop "closed loop systems"; and incentivising utilities (public and private) to implement innovative technical and commercial solutions, including the installation of advanced metering infrastructure for better demand-side management.



Adopting a holistic and integrated approach

Implementing these solutions will require a holistic and integrated outlook. Technological advancements alone are insufficient; they must be matched with effective policies that consider the entire infrastructure landscape.

The water ecosystem is intricately connected to other industries. Consider, for example, the power sector, which provides the energy required for water production and distribution. The water-energy nexus can thus be leveraged to improve sustainability and resilience across both industries.

A key example of this is Tuas Nexus in western Singapore, an initiative that will integrate water and waste treatment with energy generation. By ensuring that power comes from renewable energy sources, the entire operation is made more sustainable. In Chile's capital, Santiago, SUEZ Group transformed wastewater plants into biofactories that generate clean energy from the treatment process. They will be zero-waste, energy self-sufficient and carbon-neutral by 2022.

In the future, utilities must adopt an integrated approach to water management. This will necessitate thinking through the entire value chain, especially when it comes to energy sourcing. Solutions must be further calibrated and customised according to local contexts.



Collaboration among public and private entities

Building a more sustainable water future requires effective partnerships. It is only when all stakeholders — whether they be governments, multilateral organisations, citizens or technology providers — come together to co-create solutions that successful innovation can occur.

Cities can work together to solve water issues, while sectors should step forward to assist cities in enhancing infrastructure resilience. For instance, 60 percent of the land in Rotterdam, the Netherlands, is privately owned — meaning collaboration between the government and private players to act on water conservation and recycling efforts is essential.

Governments must recognise the potential of the private sector to catalyse innovation and cultivate policies to facilitate these partnerships. The institutional capacity of government-led water organisations to hone such relationships can be further developed, as their ability to engage with the private sector or sophisticated investors may have been limited to date.

Private companies can encourage innovation by offering opportunities for smaller entities to test, commercialise or collaborate on new technologies. An example of this is Singapore company Sembcorp Industries' Nanjing International Water Hub project in China. The water hub grants third-party developers access to its water facilities to test-bed their technologies.



Attracting and allocating innovative financing

Long-term capital is increasingly being channelled into the utilities sector, not just from traditional funding sources such as governments or commercial banks but also through multilaterals and institutional investors.

Green and sustainable financing is also abundantly available, with multiple funds currently in existence. However, more needs to be done to ensure that sufficient capital flows into the water industry, which lags in the energy sector, in terms of funding.

The energy industry is often overseen by a country's government, while the water sector is usually a municipal or sub-sovereign subject. This difference in quality of governance affects the water industry's ability to attract financing. Furthermore, power projects are much bigger and therefore offer a more attractive return on investment.

To solve these issues, the water sector can bundle together multiple projects for economies of scale. Multilaterals and institutions can also assist municipal or sub-sovereign governments in improving credit risks, in order to attract capital allocation.



ESG procedures are vital in the drive towards net zero

There is a widely growing view that burning fossil fuels to power water systems is no longer acceptable. Many countries are committing to achieving carbon neutrality, and the water industry must follow suit.

Utility companies should therefore adopt a long-term view to ensure that current and future water networks are designed, planned and constructed in a sustainable and climate-friendly manner. Cities can facilitate this by monitoring and attempting to reduce the carbon footprint during water treatment and introducing carbon targets.

ESG (environmental, social and governance) reporting standards are now the norm, and are being demanded by governments, investors and consumers alike. Within the next few years, companies will all be asked to fully disclose ESG elements required by law and must expect to be audited.

Industry players should adhere strictly to ESG requirements and enact proper monitoring, reporting and verification procedures. They should also use the appropriate ESG standards and frameworks as a guide when reporting their performance.



Smart water infrastructure will power sustainable cities of the future

As the COVID-19 pandemic has shown, we are living in a globalised world, interconnected across cities, and vulnerable to disruption. To mitigate these risks, digital technologies can be leveraged to equip cities of tomorrow with more efficient, resilient and sustainable infrastructure, so they are better prepared to tackle future crises.

A key aspect of this will be outfitting cities with smart utilities. The energy sector is already achieving these aims, but water has been slow in harnessing the value of incorporating technology or attracting private capital. This will need to change.

As we press on in the journey towards building sustainable cities, smart water utilities will need to be an essential and integral part of the infrastructure backbone. Investing concurrently in green solutions will further advance the sustainability agenda, as well as increase the liveability of urban centres.

To conclude, SIWW2021 Spotlight highlighted specific solutions in our quest to meet the twin objectives of fostering innovation and collaboration to overcome challenges for water sustainability and ensuring security against climate uncertainties. The ecosystem of water sector players — comprising governments, utilities, academia and industry — have the technology, tools and resources today to create a more sustainable future that will not only achieve the United Nations Sustainable Development Goal 6, but also propel us towards creating a smarter and more intelligent ecosystem.

This summary report on SIWW2021 Spotlight is developed in collaboration with KPMG.



About Singapore International Water Week

The Singapore International Water Week (SIWW) is a global platform to share and co-create innovative water solutions. The biennial event gathers thought leaders and stakeholders from the global water industry to share best practices and solutions, showcase the latest technologies and tap business opportunities. SIWW is part of a strategic programme of the Singapore Government to grow the water industry and develop water technologies.

The next edition of Singapore International Water Week will take place from 17-21 April 2022.

Visit www.siww.com.sg for more details.

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