



Observations and recommendations from CEWP Webinar Series in 2021 and two physical events in Shanghai and Wuhan in June 2021 on Management of the Urban Water Cycle

Main findings:

The Urban Water Webinar Series organized by the CEWP Business Program during 1st half of 2021 concluded that challenges facing the Water Sector could to a large extent be addressed, if already existing technical solutions and services were fully utilized. Needs for technological innovation still exists, with the main needs being systemic innovation improving sector integration and allowing for a holistic approach to the full water cycle, e.g. in order to facilitate increased reuse of water.

In addition, state-of-the-art solutions offers stronger resilience to climate change and a better take-up of the potential related to digitalization and circular economy. Digitalization will allow for significant larger amounts of data to be analyzed, hereby de facto leading to actual realization of the intentions behind various concepts about integrated approached developed within the water sector during recent decades. Circular economy-based solutions will in particular imply a stronger integration of water and energy, hereby leading to new business models to be developed.

While state-of-the-art solutions are in general costlier, they have a significantly better Operational and Maintenance costs profile, whereas bulk solutions using simpler technologies are cheaper to procure. However, a.o. due to lack of adequate financing models, economic frameworks promoting long-term sustainability as well as inadequate regulatory frameworks, the cheaper solutions are preferred during a majority of most tender processes. Further, lack of pricing based on true costs of water and energy, as well as total cost of ownership, also adds to the picture of inefficient use of funds in the water sector.

Introduction:

The aim of the CEWP Business Program is to contribute to creation of a well-functioning market, defined as delivering the solutions, which enables government targets to be achieved to be achieved in the most cost-efficient ways to society. The CEWP program therefore facilitates technical discussions but also shed light on efficiency gaps of the market.

In total, four webinars constituted the full series. They were followed by an aggregate of more than *300 participants from 20 countries*, mostly but not only China and European countries, explored the management of the Urban Water Cycle in Europe and China. The webinars presented experiences and case studies and discussed various aspects of Urban Water Management including: blue-green and sponge cities, efficiency of water infrastructure, digitalization and water sector carbon footprint¹. The webinar series were followed up by a physical event at Aquatech

¹ Presentations, recordings of the webinars and webinar reports can be found at <https://www.cewp.eu/waterurban>



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Shanghai in June 2021 as well as a presentation given by the EU SME Centre at the business exchange meeting at Water Expo China in Wuhan also in June 2021.

The *Setting the Scene speeches* as well as the *Company Technology presentations* referred to the following main drivers: *climate change, increased water demand from urbanization and industrialization, and pollution due to inadequate wastewater treatment and inefficient enforcement*. The main enablers referred to were: *digitalization and circular economy inspired solutions*.

In particular, the link between water and energy solutions were central to most webinars. The present discussion report builds on the webinar reports and *take away messages* from the roundtables, the chair and rapporteurs' observations of the key results of the webinars as well as good experiences presented by the speakers of the webinars. The roundtables organized in each webinar focused on the framework conditions, which would be necessary to implement the technologies available, and forms the basis for the recommendations presented in this report.

In the following, the main observation points regarding the two prominent enablers, digitalization and circular economy are presented.

Observations on digitalization.

China and Europe are both aiming at developing new digitalization solutions to improve the efficiency of their urban water management, however in different contexts. Overall, Chinese cities sees increasing urbanization (with the 14th 5 Year Plan setting a target for 2025 of 65% compared to today's 61%) and construction of new, urban areas, compared to a stronger focus on retrofitting existing urban areas in Europe.

Digitalization in the water sector has a big potential and digital water technology is largely already available and the water sector is already using it and benefitting from digital transformation. To get the full benefit of digitalization, a focus on human interaction with technology is still very important and training is needed for those who work with and operate the technology. To many people in the water sector, digitalization is still approached using an "analog" mindset, aiming at optimizing water management, rather than using a "digital" mindset with the aim to transform water management.

Digitalization has entered all water subsectors, including water quality and water quantity management in water supply and waste water systems, leak detection, flood management and early warning, irrigation systems and catchment management.

Digitalization technology is fast developing at all stages of the water management cycle including monitoring and metering systems of data, data collection systems, data management systems and intelligent information systems.



Availability of sensors with a potential for real time monitoring is essential for fast management response both in e.g. flash flood early warning and management and in water quality and quantity protection and management. However, sensors (or other monitoring equipment) able to detect advanced, chemical parameters in real-time on-line are in most cases still to be innovated.

Digital solutions will challenge the existence of silo's and current institutions set-up in urban water management. With increasing ability to perform *data crunching* at an unprecedented scale, the current institutional and geographical boundaries will increasingly constitute a barrier for efficient solutions. Vested interests in existing structures will be a special element to address. Of particular importance is the connection of the silos for water supply and waste water treatment and the integration among decision makers.

Procurement of digital water solutions may not be well specified in tenders. ISO 55000 and other related standards can be used to make the demand/requirements for the IT water solutions more precise. This is particular important in multi-stakeholder water management systems like e.g. catchment system with many different management needs.

Observations on circular economy.

Circular Economy has become prominent in both European and Chinese policymaking. Chinese and European perspectives on a circular economy share a common conceptual basis and exhibit many similar concerns in seeking to enhance resource efficiency. The Chinese perspective on the circular economy is broad, incorporating pollution and other issues alongside waste and resource concerns, and it is framed as a response to the environmental challenges created by rapid growth and industrialization. In contrast, Europe's conception of the CE primarily has an environmental scope, focusing more narrowly on waste and resources, and opportunities.

In Europe circular economy approaches are also emerging as an approach to reduce the emission of CHG's. Globally 4% of all electricity is used in the water sector to supply water for human consumption, food and industrial production and waste water treatment. An increased efficiency of the urban water cycle will make more water available but also reduce the emissions of CHG's and make more resources in waste water available for reuse.

Trends in Europe are towards integrated water and waste water systems, reduction of energy use and CHG emissions per volume of water managed and an emerging integration of water and energy systems. In China energy use and CHG emissions per volume of water managed has been increasing due to a.o. more extended treatment. The potential to reduce the CHG emission and the recovery of resources is

Circular economy-based solutions in the water sector have a big potential and technologies are largely already available and the benefits in terms of water and resource savings and reduction of CHG's has been demonstrated in many countries including Europe. Key elements of reducing the carbon footprint and saving resources in waste water treatment systems are: Increased process control, variable operation of pumps etc. depending of the load, carbon harvesting for biogas



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production, deep process control and knowledge and combined heat and power installations and can even make waste water treatment and water supply systems *energy-positive*.

A move from the concept of Waste water treatment Plants to Water Resource Recovery Factories to save resources has been promoted primarily in research and demonstration projects, however is increasingly emerging as a new concept in advanced larger water organizations.

Circular economy solutions are increasingly supported by digitalization technology including monitoring and metering systems of data, data collection systems, data management systems and intelligent information systems.

Integrated water and energy and resource reuse systems increase the outcome of Circular economy solutions and may reduce the impact of the existence of Silo's among institutions involved in urban water and energy management. Of particular importance is the connection of the silos for water supply and waste water treatment and the integration among decision makers. In these sectors.

Procurement of water and energy solutions may not be well specified in tenders. standards can be used to make the demand/requirements for the solutions more precise. This is particular important in multistakeholder water management systems like e.g. catchment system with many different management needs.

Water supply and waste water treatment organizations are natural monopolies and may need incentives and/or regulations/goals from regulatory bodies to take actions in investing in reduction of carbon footprint and recovery of resources.

Investments in Energy savings, energy production from biogas and utilization of water borne energy may in some cases have short pay- back time. Ring-fencing the economy of water and waste water organizations is a necessary condition for keeping the savings in their own organization. Also, in case a waste water treatment plan can be made energy positive, it should possible for water organizations to sell/provide their energy surplus to the energy network or other energy users.

A special report reg circular economy was developed and presented at the webinar series. The report is available at the CEWP website.

Recommendations for further discussion

The following recommendations builds on the results of the webinar roundtable discussions and aim at identifying measures which could contribute to create a well-functioning market and delivering the solutions, which enables government targets to be achieved.

Recommendations on Digitalization. *Digitalization* has clearly shown its potential to increase efficiencies and support identification of solutions to urban water cycle management challenges. The following recommendations aim at supporting the realization of the potential of digitalization:



Regulatory Frameworks can promote that water sector data are collected and made available to sector stakeholders. Frameworks should support the establishment of a data management structure which makes data accessible free of charge and supports the integration of data across the urban water cycle and basins establishing links also to sectors like energy and sectors interested in using resources recovered from waste water.

Economic incentives. Digitalization can reduce the costs of operation and increase the efficiency of urban water management organizations. Investments in digitalization can have short pay-back time provided the savings and efficiency gains can be ring-fenced and kept by the organizations investing in digitalization.

Monitoring and sensor availability. Water sector stakeholders can make use of the increasing number of sensors to monitor both water quantity and quality. The number and capabilities of sensors expands rapidly and enables a move towards establishment of new environmental targets and control of these. An increasing number of sensors enables a move towards real-time management of the urban water cycle.

Data management, data integration and access to information. Data management infrastructure can be established to support sector integration, integration of water and energy monitoring and identify potentials for savings and utilization. Data can be transformed into information for management of water systems and water users, however also made available for stakeholders outside the water sector aiming at supporting sector integration.

Procurement of digital water solutions can be better specified in tenders through references to management frameworks like ISO 55000 and other related standards. This is particularly important in multistakeholder water management systems like e.g. catchment system with many different management needs.

Recommendations on Circular economy in urban water cycle management. There is increasing evidence that a move towards a circular economy both saves scarce resources, reduces emissions of pollution to the environment and is economically beneficial. The following recommendations aim at supporting the realization of the potential of circular economy.

Regulatory frameworks. Circular economy approaches can be promoted in water sector strategies, policies and programmes. Regulatory bodies can promote research and technology programmes to develop practical approaches and document their efficiencies technically and economically. International sharing of good practices can help in a further acceptance of the circular economy approach as a leading concept also in water management.

Integrating infrastructure systems. Circular economy approaches go across traditional sector boundaries. Measures to reduce institutional silos and establish collaboration across different management fields like water and energy, water and biodiversity etc. can strengthen the impact and economic benefits from circular economy.



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Economic incentives. True cost of ownership and pricing reflecting actual costs can support the impact and economic benefits of circular economy. Business cases for integrated water and energy solutions can be supported by price levels which both internalizes external costs and favors true cost of ownership.

Data management, data integration and access to information. Data management infrastructure can be established to support circular economy in particular sector integration, integration of water and energy monitoring and identify potentials for savings and utilization. Data can be transformed into information for management of water systems and water users, however also made available for stakeholders outside the water sector aiming at supporting sector integration.

Standards for tender-based market requests. Tender issuing organization can secure that standards used for design in public tenders are up to data with the technical solutions available. New technologies may not always be more costly, as they are often more efficient and has a longer life span.

Recommendations for European SME businesses to increase their efficiency in the Chinese Market. According to the EU SME Centre, it has been experienced that 80% of all SME's that fail in China fail because they did not protect their IP in China. However, it is possible to deal with IP rights in China and minimize the risks for SME's. China IP SME Helpdesc offer a range of free services for European SME's.

European consulting companies and technology providers with presence in China has a good understanding of the *Chinese market* and has established strong networks and are able to get contracts and bid on tenders.

The EU-SME Centre, a project supported by EU offers four services which are free of charge to European Small and Medium Sized companies: Knowledge Centre, Advice Centre, Training Centre and SME Advocacy Platform which can assist European SME's to increase their efficiency in the Chinese market.

Recommendations for continued partnerships. Both Chinese and European partners participating in CEWP webinars see a great scope in continuing the cooperation and sharing practices and experiences in China, Europe and globally.

Technologies from the Chinese exhibitors at Aquatech Shanghai showed substantial signs of being able to catch up with the solutions of the European companies, not least within Smart Water Management. Taking into account the overall stronger ability of Chinese Companies to understand local needs, this points to that European Companies will see even stronger competition at the market. Further, several Chinese exhibitors (water purification systems, membrane, water pumps) expressed interest in seeking export opportunities.

Rapporteur of the webinar series: Mr. Palle Lindgaard-Jorgensen, In-Water, plj@in-water.dk



Aquatech Shanghai and EU SME Centre-CEWP Seminars

Participation Recap

Date: June 2nd – June 4th 2021

Venue: National Exhibition and Convention Centre Shanghai (NECC SH)

Conference: Offline at NECC SH + Zoom (Online)

List of Participants:

Louise Lund, EU SME Centre, Amy Li, EU SME Centre, Nicolai Lundsberg, Danish Chamber of Commerce in China, on behalf of EU SME Centre, Matias Zubimendi, China IP SME Helpdesk, Liam Jia, EU SME Centre (moderator), Jingjing Ma, Nordiq China (speaker), Guillaume Gimonet, Siveco China (speaker), Jason Jie, Kruger A/S (speaker), Donald Di Ning, Arvia (speaker)

Summary

On 2-4 June 2021, the EU SME Centre participated in the Aquatech China 2021 in Shanghai.

An EU SME Centre-CEWP booth was organized to represent European SMEs in the Water sector, display the recordings of previous CEWP webinars, provide to other European exhibitors face-to-face consultations with experts from the Centre and China IP SME Helpdesk, providing a platform for Chinese visitors and exhibitors to get in touch with their demands and challenges.

Two seminars on digitalisation and circular economy of the water sector had been held at the conference stage at the Aquatech in Shanghai as follow-up discussions of the webinar series organized previously in this year focusing on different perspectives of Urban Water management. In total, four webinars constituted the full series. They were followed by an aggregate of more than 300 participants from 20 countries including China, explored the management of the Urban Water Cycle in Europe and China. The webinars presented experiences and case studies and discussed various aspects of Urban Water Management including: blue-green and sponge cities, efficiency of water infrastructure, digitalization and water sector carbon footprint.

In total, the seminars had around 70 participants from both online and offline at the stage at Aquatech. In both seminars, the Setting the Scene speeches as well as the Company Technology presentations used the same main drivers of climate change, increased water demand from urbanization and industrialization, and pollution due to inadequate wastewater treatment and inefficient enforcement as main references for the challenges facing the water sector. Also, the main enablers were equal: digitalization and circular economy inspired solutions. As a continuation of the previous discussion held around digitalization and circular economy - in particular the link between water and energy solutions were central to most of the webinars.

Programme:



D1 | 2nd of June (9hr – 16hr)

Booth at exhibition - Participation to the booth includes: CEWP-EU SME Centre, Danish Chamber of Commerce in China, Siveco (FR), Modern Water (IE), China IP SME Helpdesk, NORDiQ (DK)

D2 | 3rd of June (9hr – 17hr)

Booth at exhibition - Participation to the booth includes: CEWP-EU SME Centre, Danish Chamber of Commerce in China, Siveco (FR), Modern Water (IE), China IP SME Helpdesk, NORDiQ (DK)

Seminar Digitalisation of the Water Sector (14.00hr – 15.20hr)

- Main findings of CEWP/EU SME Centre Urban water webinar series 2021 – EU SME Centre
- O&M digitalisation of the Chinese water market – Siveco China
- IPR protection in digital transformation – China IP SME Helpdesk
- The Hubgrade smart water system – Kruger A/S

Seminar Circular Economie and the Water Sector (15.40hr – 17.00hr)

- Main findings of CEWP/EU SME Centre Urban water webinar series 2021 – EU SME Centre
- The China wastewater carbon neutrality path 2030/2060 – NORDiQ
- IPR protection in Circular Economie – China IP SME Helpdesk
- Circular economie and water treatment in China - Arvia

D3 | 4th of June (9hr – 16hr)

Booth at exhibition - Participation to the booth includes: CEWP-EU SME Centre, Danish Chamber of Commerce in China, Siveco (FR), Modern Water (IE), China IP SME Helpdesk, NORDiQ (DK)

Observations and takeaways:

From the exhibition:

- Technologies from the Chinese exhibitors are catching up, particularly in smart water management. The solutions provided by Chinese companies can be more accurately providing an answer to the local demands.
- Some Chinese exhibitors (water purification systems, membrane, Water pumps) are eager to seek for exporting opportunities.

From the seminar/webinars:

- Digitalisation brings up the importance of breaking down the silos which has been addressed multiple times – both from a regulatory framework point of view and from a customer point of view
- More untapped opportunities will request an organizational change that digitalisation could possibly bring
- The conceptual move from WWTP to Water resources recovery factories has been not only promoted primarily in research & demo projects, but also in advanced larger scale water organisations.
- The implementation and stage execution of the environmental focuses of the 14 FYP is key to reaching several government targets.



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- In both seminars, the Setting the Scene speeches as well as the Company Technology presentations used the same main drivers of climate change, increased water demand from urbanization and industrialization, and pollution due to inadequate wastewater treatment and inefficient enforcement as main references for the challenges facing the water sector.

Conclusion drawn:

The urban water management webinars supported the observations made in other CEWP seminars and workshops that challenges facing the Water Sector could to a very large extent be addressed, if already existing solutions were fully utilized. Needs for technological innovation still exists. However, the main needs are for systemic innovation improving sector integration allowing for water supply and wastewater management to be monitored, analyzed, planned and managed by the same organizations, e.g. in order to facilitate increased reuse of water.

While state-of-the-art solutions are in general more costly, they have a significantly better O&M cost profile, whereas bulk solutions using simpler technologies are cheaper to procure. However, due to lack of adequate financing models, economic frameworks promoting long-term sustainability as well as inadequate regulatory frameworks, the cheaper solutions are preferred. Further, lack of full pricing based on true costs of ownership, also adds to the picture.

Recordings and Presentations

Circular Economy and the Water Sector

<https://www.eusmecentre.org.cn/event/2021-06-03/circular-economy-and-water-sector-aquatech-china-2021>

Digitalisation of the Water Sector in China

<https://www.eusmecentre.org.cn/event/2021-06-03/digitalisation-water-sector-aquatech-china-2021>

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China Europe Water Platform Business Exchange Meeting at 16th China International Water Business Summit

Participation Recap

Date: June 9th 2021

Venue: China Optics Valley Convention & Exhibition Center, Wuhan, Hubei China + Zoom (Online)

Participant: Liam Jia, EU SME Centre

Deputy Director of International Cooperation and Science and Technology Department, Ministry of Water Resources of PRC, Mr. Li Ge and the Portuguese Ambassador to China, H.E. Mr. José Augusto Duarte representing the European Secretariat of CEWP attended the conference and gave their opening remarks.

The summit consists of two sections focusing respectively on policy interpretations and technologies exchanges. Target group includes organisations from Chinese and European government bodies, scientific research institutions and enterprises. Introduction to development priorities, market demands had been made. Discussion around potential cooperation opportunities of water conservancy during the "14th Five-Year Plan" period had been held in order to efficiently promote exchanges and cooperation between China and Europe in the field of water.

Takeaways on the implementation planning of the Chinese Ministry:

- 1/ Creating a national water network
- 2/ Creating a rigid restriction policy to limit water use
- 3/ Forming ecological corridors connecting rivers and lakes
- 4/ Improving water resource ecological compensation mechanism
- 5/ Structuring a smart water network

In the policy interpretation section, Huang Yan, deputy chief engineer of the Yangtze River Water Conservancy Commission of the Ministry of Water Resources, gave a report on the support and guarantee of water conservancy to promote the high-quality development of the Yangtze River Economic Belt. Anabella Rebelo, expert from the Portuguese Environment Agency, introduced the urban water development and wastewater reuse policies and opportunities under the EU's carbon neutral goals. Yang Xiaoru, deputy director of the Water Resources and Hydropower Planning and Design Institute of the Ministry of Water Resources, interpreted and analyzed the water conservancy tasks in the "14th Five-Year Plan" outline.

During the technical exchange session, on behalf of CEWP and the EU SME Centre, the Operations Manager Liam Jia gave an introduction to market access for European businesses in the Water sector in China.

Experts and representatives from the Danish Geological Survey Bureau, the Sino-French Haihe River Basin Water Resources Integrated Management Project, Veolia China, Onika Water Treatment from Hungary, UROS from Finland, SOMMER Testing from Austria have shared their experiences and successful cases in their operations in China. More than 100 representatives attended this meeting.

Official Press Release from the Ministry of Water Resources of PR China



[中欧水资源交流平台商务交流会在武汉召开_中心动态_水利部国际经济技术合作交流中心 \(mwr.cn\)](http://www.mwr.cn)

Press Release of the EU SME Centre

<https://www.eusmecentre.org.cn/press-article/china-europe-water-platform-business-exchange-meeting-16th-china-international-water-b>