



Draft Report
Take away messages
in
CEWP Webinar Series

April 19th, 2022- Water Supply and Wastewater Infrastructure in small-medium size cities

Introduction:

Water Supply and Wastewater Treatment Infrastructure is subject to substantial improvements and investments in small and medium cities, as well as villages in rural areas.

The webinar, attended by about 50 participants, discussed investment needs and market opportunities. State-of-the-Art solutions, enabling a circular economy approach with wastewater treatment plants becoming Resource Recovery Facilities and water supply facilities having low water leakage rates were presented. Options for adding a whole water cycle perspective and allowing for substantial water reuse, were presented and discussed.

The present webinar report presents *take away messages* from the roundtable, the chair and rapporteur of the seminar. The webinar program is enclosed as annex to this report and the presentations from the webinar, with more details is available at the CEWP webpage.

Take away messages from the webinar:

The Chinese Water Market is expected to become the World's largest market by 2025.

Almost the entire rural population in China have now gained access to enough clean water. China fulfilled the SDG for water supply in 2019, six years earlier than the global target date. Health issues related to water supply safety has been improved - including microbial contamination, fluoride and brackish water. Also access to tapped water has been improved significantly at the rural level. Both the central and provincial governments have supported this impressive development.

The challenges and targets of the 14th 5-year plan includes an increased supply and coverage in the rural areas as well as securing water for the development of small- scale rural industries.

The plan is to increase the coverage from 83% to 88% in the rural areas. Other plans include improved water source control and restriction of use, standardization of water supply systems, improve management systems, reform of pricing structure and financial mechanisms and also support to ageing infrastructure.



European Chamber
中国欧盟商会



Digital solutions using sensor technologies and modelling tools can significantly improve the management and control of drinking water supply sources, waste water treatment systems and improve flood protection. Standardization systems like ISO 55000 has shown to be a valuable tool to help clients prioritize e.g. their maintenance needs.

Nature based systems like wetlands to treat waste water (both the water phase and sludge) has shown their efficiency globally. Different systems exist with e.g. reeds and trees as the main biomass produced and sludge phase dried and used in agriculture. Application of air into the constructed wetlands increase their treatment capacity and reduces the area of the systems per person equivalent to up to 25%.

From the roundtable discussion it appears that European companies are fully able to find a market position based on offering state-of-the-art solutions, but initiating the relation with the customers via customized offerings, and subsequent building of a partnership, via a dialogue and genuine interest in the performance and operations of the customers, and their actual use of the solutions, hereby gradually creating an interest in the more advanced, and costlier, state-of-the-art solutions.. European technology producers and consultants should aim at building networks and being sub-contractors to these.

It is, however, not possible to copy solutions from one region to another regions (one size does not fit all and that lack of data on locations of e.g. pipes makes it difficult to apply some digital solutions. Further, it should also be noted that there are advantages in cooperating with smaller water companies as they are still quite experienced and has less cooperative political constraints and is more interested in practical solutions.

Setting the scene for the webinar

Mr. Henrik Dissing CEWP as chair of the webinar welcomed the participants and set the scene for the webinar. The Chinese water market is expected to be the worlds largest market by 2025. The Chinese market is driven by government targets and show large regional differences due to a.o. different water situations. In CEWP, the “Market” is understood as the place where investments leads to procurement of technologies. The choice of technologies and solutions have huge implications for the long-term development of the society, industries and citizens.

Ms. Wu Xiaomei, IWHR, China Institute of Water Resources and Hydropower, presented the current status of rural water supply and the Water Management Challenges and 14th 5-Year Plan Target.

Almost the entire rural population in China have now gained access to enough clean water. China fulfilled the SDG for water supply in 2019, six years earlier than the global target date. Health issues related to water supply safety has been improved- including microbial contamination, fluoride and brackish water. Also access to tapped water has been improved significantly at the

rural level. Both the central and provincial governments have supported this impressive development.

Different investment policies are applied in Chinese regions depending on regional needs. User participation has been introduced, as well as safety management systems and a subsidy funds established to secure maintenance of installed systems. A supervision system and inspection mechanism has been established as well as a hot-line to the Ministry of Water Resources.

The challenges and targets of the 14th 5-year plan includes an increased supply and coverage in the rural areas as well as securing water for the development of small scale rural industries.

Two main groups of challenges were mentioned:

Guarantee degree of China's rural water supply is still to be improved

- Existence of regional development disparity
- The problems of rural water supply still exists
- The overall level of rural water supply guarantee in China still needs to be continuously improved.

The demand of rural residents is increasing

- Increase of drinking water demands with the improvement of people's living standard
- Increase of rural water demands for the rural secondary and tertiary industry development
- Improve of drinking water standards
- The target of the 14th 5-year plan is to increase the coverage from 83% to 88% in the rural areas. Other plans include improved water source control and restriction of use, standardization of water supply systems, improve management systems, reform of pricing structure and financial mechanisms and also support to ageing infrastructure.

Ms. Tia Savolainen, SWECO FIN: "White Paper: Small-scale Water Supply and Sanitation in Rural Areas". The White Paper is developed for CEWP by SWECO, a Scandinavian Consulting and Architect firm specialized in building, water, energy and industry and infrastructure with 17500 employees including offices in China.

Ms. Savolainen presented the rural water supply situation in Europe including the types of ownership of plants, existing sources used, and technologies applied in water supply plants and rural waste water treatment systems. Ms. Savolainen stressed the importance of circular economy as the main principle to be used for both water supply and waste water treatment systems. The White paper is expected to be available at the CEWP webpage by early May.

Company presentations - Digital Tools for water management and monitoring

Fenjuan Hu, NIRAS (DEN), presented how lake ecosystem modelling can support drinking water management in lakes and reservoirs. It is important to understand how lake ecosystems function



European Chamber
中国欧盟商会



and to understand how eutrophication can develop in such systems as this may restrict the use of the water as a source for drinking water or require additional pretreatment.

Modelling of the phosphorus level, oxygen and chlorophyll levels were successfully done using a water ecosystem modelling tool called WET in the lake Furesø in Denmark and in a reservoir in China. The model result corresponded well with monitoring results. The model can also be used to forecast developments including coping strategies to reduce eutrophication in lakes and reservoirs.

Luca Bovo, Sommer (AUT), presented how non-contact sensors can improve flow monitoring in wastewater and treatment plants. The sensors use radar technologies to measure water level and water velocity do not need to be in contact with the water thus reducing maintenance to a minimum and not having problems with turbidity or aggressive environments and its easy to install and has low energy needs and can be run on battery or with a solar panel. The data from the sensors can be logged and integrated into systems like SCADA. The sensors have a wide application in water treatment plant, waste water systems, rivers and channels, sewage pipes and can be applied in both pipes and open channels.

Herbert Chan, Uros (FIN), which is part of the Nokia Smart System Operations, presented a digital solution where sensors and other data was integrated into an open interoperable architecture. The system has been used to improve efficiency in operations and functionalities in water management systems like rural areas and shanty towns in the outskirts of large cities. Mr. Chan shared some experiences from their work in China: it is not possible to copy solutions from one region to another regions (one size does not fit all; lack of data on locations of e.g. pipes makes it difficult to optimize shanty town water systems. Uros also experienced that there was lack of maintenance and leakages in rural water systems.

Company presentations – Technologies for small-scale water supply and wastewater infrastructure

Mr. Bruno Lhopiteau, Siveco China, presented their good experience in using ISO 55000 to identify priorities for optimizing operation in Nanchang Shuang Water supply (100.000 m³/day). In this plant maintenance assets data were modernized and mobile inspection was introduced. The system was successfully applied and is now wider uses by Suez in other applications. In Zhejiang Yayao Water Company (population 850.000), ISO 55000 was used to set up a maintenance strategy. They used the smart O&M solution Bluebee, which is flexible and can integrate different data sources. Siveco has experienced that ISO 55000 is an efficient tool in engaging the water supply companies in prioritization and has also experienced that there are advantages in cooperating with smaller water companies as they are still quite experienced and has less cooperative political constraints and is more interested in practical solutions.

Ms. Jingjin Ma, Nordic Group informed about China 2030/2060 CO₂ targets, national restrictions of pollution and national water conservation projects as important drivers for water management in China. She presented results from the Fujian Pingnan Ecological Restoration Demonstration Project, and area with 140.000 residents. A river channel is flowing through the area and the focus



of the project is to restore the ecological function of the river and reduce flood risks. Nordic Group has used models to understand how the river system functions and to analyse different scenarios of interventions. Solutions involved using combined approaches to sewage control and landscaping.

Company presentations - Nature based solutions to water management

Mr. Peder Gregersen, Center for Recirkulation (DK) presented a wastewater treatment system with zero discharge of water. The system is able to treat both the water and sludge in waste water. In the system water and nutrients are taken up by trees (local species) and some water is evaporated from the surface of the system. Sludge deposited in the system is dried and can be applied to agricultural land. Trees also trap CO₂ from the atmosphere and therefore the system is carbon positive. The biomass from trees can be chopped into chips and applied to agricultural land. Wastewater is pumped into the system using pumps driven by batteries or solar power. Removal rates are similar to simple waste water treatment technologies and can be designed to meet local needs for treatment and adapted to the area available for the system.

Mr. Dion van Oirschot, Rietland a Belgian company specialized in Constructed wetlands as natural wastewater treatment plants. Rietland have experiences both from Belgium and the Netherlands as well as from international projects including China. Constructed wetlands mimic natural processes, however is optimized to meet the local wastewater treatment needs. Rietland has developed three constructed wetlands: (i) free water surface systems with reeds (ii) systems with underwater flow (iii) systems with vertical flow where the water percolates from the surface and leaves at the bottom of the system. The system requires 3m² surface area per person equivalent. The latter system has been applied in Kunshan Suzhou in China in cooperation with Dehua Eco-Tech.

Rietland has developed aerated where air is blown into the system, which reduces the surface area to 0.75 m² per person equivalent. The wetland systems often require a septic tank as the first treatment step. A new aerated system with no septic tank requires 1m² surface area per person equivalent. Air supply can be intermitted whereby nitrogen removal can be improved.

Closing session of the webinar

Mr. Liam Jia, liam.jia@eusmecentre.org.cn, EU-SME Centre, a project supported by EU, presented the four services which are free of charge to European Small and Medium Sized companies: Knowledge Centre, Advice Centre, Training Centre and SME Advocacy Platform. Mr. Jia informed that they would organize a booth in the coming Aquatech Meeting in Shanghai and that he could be contacted for more information. Mr. Liam Jia informed that due to the Covid situation the Aquatec Meeting in Shanghai had been postponed.

<https://www.eusmecentre.org.cn/>

Mr. Henrik Dissing, hedis@mst.dk, CEWP closed the webinar and thanked RAI Amsterdam for their assistance in organizing the event and the interpreters for their work during the event. The slides from the event and a short report will be made available after the webinar on the CEWP webpage.



European Chamber
中国欧盟商会



He urged the participants to register for the May 24th – Water Quality Management, Groundwater Protection and Ecological Restoration. And to save dates for upcoming CEWP events

- Physical side-event @Aquatech Shanghai, co-organized with the EU SME Centre (postponed due to the covid situation)
- Physical side-event and webinar in connection with the Water Tech Expo in Nanchang, Jiangxi province, co-organized with the Chinese Ministry for Water Resources
- Physical side-event @IWA World Water Congress, Copenhagen, September 11th-15th, co-organized with IWA

<https://www.cewp.eu/waterurban>

Report by Palle Lindgaard-Jørgensen, IN-Water Denmark
Program - Chinese Time/European Time

Setting the Scene

- | | |
|-------------|--|
| 15:00/09:00 | Welcome remarks - Henrik Dissing, CEWP |
| 15:05/09:05 | Wu Xiaomei, IWHR, MWR: Water Management Challenges and 14 th 5-Year Plan Targets |
| 15:20/09:20 | Tia Savolainen, SWECO FIN: White Paper: Small-scale Water Supply and Sanitation in Rural Areas |

Company presentations – Digital Tools for regional water management and monitoring

- | | |
|-------------|---|
| 15:35/09:35 | Dynamic Lake Ecosystem Modelling as supporting tool for drinking water management in lakes and reservoirs (湖库水质水生态管理工具—湖泊生态模型), Fenjuan Hu, NIRAS |
| 15:45/09:45 | Luca Bovo, Sommer: Flow monitoring in wastewater and treatment plants with innovative Non-Contact sensor |
| 15:55/09:55 | Herbert Chan, Uros: Improving operations and functionalities in the most critical points in water management. |

Company presentations – Technologies for small-scale water supply and wastewater infrastructure

- | | |
|-------------|--|
| 16:05/10:05 | Infrastructure solutions for small-medium size cities
Bruno Lhopiteau, Siveco |
| 16:15/10:15 | Rural Water and Ecological restoration design experiences |



Funded by the
European Union



Jingjing Ma, Nordiq Group

Company presentations – Nature-based solutions

- | | |
|-------------|---|
| 16:25/10:25 | Peder Gregersen, Center for Recycling: Natural recycling and sequestration systems for wastewater |
| 16:35/10:35 | Dion van Oirschot, Rietland: Constructed wetlands as natural wastewater treatment plants |
| 16:45/10:45 | Roundtable |
| 17:05/11:05 | Looking forward to Aquatech Shanghai – Liam Jia, EU SME Centre |
| 17:10/11:10 | Closing remarks, next activities - Henrik Dissing CEWP |