

BUILDING LIVEABLE COUNTRYSIDE THROUGH IMPROVED WASTEWATER COLLECTION



Wastewater collection and treatment has been a key component in the green development of rural areas in China since the government set the goal to construct a beautiful countryside in 2015. As the trendsetter in China's modernisation, the city of Shanghai has been at the forefront of improving the environment and living conditions in its rural areas.

To further enhance the ecological environment in the Pudong New District and make its rural areas more liveable, the local government launched a new round of upgrades in treating rural wastewater, with the aim of achieving full coverage of wastewater in all rural areas within the district. Grundfos' Prefabricated Pumping Station (PPS) has played a key role in supporting this objective.

STATUS QUO OF RURAL WASTEWATER COLLECTION

Given the relatively weak infrastructure in rural China, it is not uncommon to discharge wastewater into local rivers without proper treatment. The government has taken a range of measures to fix this issue and improve the rural environment in recent years. However, collection rate of rural wastewater remains low, leaving a negative impact on both the living and water environment.

"We have started a new round of upgrades in wastewater treatment since 2019. In order to improve the water quality in the rivers, the first step is to collect all rural wastewater into the municipal wastewater network or treat on-site. Only when we contain the source of water pollution can we achieve a better water quality," said Ye Xin, Head of the Rural Wastewater Improvement Project in Datuan Town in Pudong New District.

Wastewater pumping stations have two roles to play in rural wastewater collection. One is to lift the wastewater in the midway. When wastewater has been collected from different discharge points into the pipeline, a pumping station helps lift the wastewater in the midway so that the pipelines in the downstream can be built at a shallower level. This reduces the complexity and expense from a pipeline construction perspective. The other role is to pump wastewater at the end of the pipelines into the municipal networks in case there is a gap between the level of both pipelines.

Xi Xujun, Vice President at the Water Utility and Environment Branch of the Shanghai Pudong Architectural Design and Research Institute, said, "Traditionally, we have been using concrete pumping stations to facilitate the collection of rural wastewater. However, concrete pumping stations often occupy a big space. When you use a lot of such pump stations, they can take up a lot of farmland." As land resources are very precious in Shanghai, the site selection and

land acquisition process can be quite complex for concrete pumping stations. “If farmland is used for pumping stations, it is often not well received by local villagers,” added Xi Xujun.

Ye Xin also pointed out, “Due to the design of traditional pumping stations, sludge blockages can easily occur. There are also sludges at the corner, leading to unsmooth flow of the wastewater.”

A FLEXIBLE, SMART AND ENVIRONMENT-FRIENDLY SOLUTION

Grundfos supplied a total of 163 PPS to the Pudong New District in this round of wastewater treatment upgrades. This flexible, smart and environment-friendly solution has contributed to a more liveable environment for approximately 920,000 villagers in six towns.

Thanks to its integrated and underground design, PPS has significant advantages in saving land use. Xi Xujun explained, “Take the new pumping station next to me as an example, it occupies only ten square metres, compared with nearly 100 square metres of a traditional pumping station.” In the meantime, he noted that PPS has led to a great reduction of construction time, complexity in maintenance and construction costs due to its integrated all-in-one design. Grundfos PPS has also brought along more flexibility for rural wastewater collection. Xi Xujun continued, “The size of each village is different and therefore it requires different sized pumps and different input and output capacity. Grundfos has developed tailored solutions for us.”

In terms of the tailored features of the PPS, Xi Xujun added, “PPS can be tailor made to suit the needs of different projects as it is stimulated in the lab and factory. It can also integrate more functions based on the customer’s requirements such as water level control, water quality and flow monitoring.”



The smart technologies applied in the PPS are another highlight. “Advanced functions such as remote control and connectivity with large water utility platforms can be integrated as well,” said Xi Xujun. He also noted that the results were satisfying and have met their design intent.

MORE LIVEABLE RURAL AREAS

Grundfos PPS has brought tangible changes to the villagers’ daily lives.

“The system has little noise and zero odour,” said Ye Xin. This is due to the sludge prevention design at the bottom of Grundfos PPS, which contains very little stagnant water inside, with short retention time, therefore reducing odour effectively. He is also happy about the safety measures of the Grundfos PPS, including its design and the clear guidance for maintenance staff.

Ye Xin concluded, "After the upgrade of the wastewater treatment, the overall wastewater collection rate of Datuan Town can exceed 95%, with some areas achieving 100%." The proper collection and treatment of wastewater will help build a more beautiful and liveable countryside, leading to a happier life for villagers."

