

CONTROLLING EFFLUENT AND RECYCLING INDUSTRIAL PROCESS WATER: WE SPOTLIGHT A SUCCESS STORY IN CHINA

To preserve water resources by using them in a sustainable way: that is the top priority for China today. Increasingly stringent laws are driving industries to take action to solve a two-pronged problem: how to control the release of organic pollutants and how to develop the re-use of effluents in treatment plants at industrial sites. In response to this challenge, SUEZ ENVIRONNEMENT is deploying all its innovative abilities at PetroChina's refinery in Chengdu. We spotlight this partnership with the China's largest oil player.

Chengdu-SUEZ ENVIRONNEMENT or the story of an important meeting

As the capital of the Sichuan province, one of the most fertile parts of the country, Chengdu is ideally situated at the foot of the Tibetan plateau. The nature of this city is totally in step with the significance of its name in Chinese: Chengdu, the "perfect capital". Also called "hibiscus city", Chengdu is considered the centre of western China. With more than 9 million inhabitants, it is, like all respectable Chinese cities, growing fast. And demographic and economic expansion automatically means an explosion in the consumption of natural resources, and water resources in particular. This means that the major challenge that must now be tackled by the country's main policy-makers and economists is to find ways to marry growth and sustainability. From this point of view, SUEZ ENVIRONNEMENT has become a major ally. In China for more than 30 years through its subsidiaries Degrémont, SITA Waste Services and Sino French Water, this global environmental giant has had numerous opportunities to support industries in setting up innovative solutions. And in Chengdu, it will not be outdone. Deploying all its know-how to build the industrial effluent treatment and recycling plant for the PetroChina refinery, the largest oil player in China, Degrémont has turned this facility into a true showcase of its type. Exemplary in terms of innovation and the advanced treatment of industrial effluents from the petrochemical industry, the Chengdu plant is one of the first of its size in China to implement a system for re-using wastewater and stormwater.



Fighting the environmental blues: Oxyblue™

When, in October 2009, Degrémont, a subsidiary of SUEZ ENVIRONNEMENT, was commissioned to build the industrial effluent treatment plant for the PetroChina refinery, the battle was far from won. PetroChina's Sichuan treatment plant had to be designed to ensure that its effluents met stringent environmental standards specific to the petrochemical industry, particularly in terms of Chemical Oxygen Demand (COD)¹. Environmental issues are even more crucial in China as a third of its waterways are heavily polluted² and PetroChina's refinery is on the Tuo, a tributary of the Yangtze River. It has therefore become necessary, before anything else, to reassure the key regional and national players regarding the potential environmental impact of wastewater discharge. But there is another major challenge that has more to do with technology than society: in light of limited water resources, a sewage plant must be able to re-use more than two-thirds of the wastewater coming into it. Once again Degrémont has tackled this challenge by using an advanced technology called Oxyblue™. More energy-efficient than traditional processes, it offers optimal water quality, allowing it to be released into sensitive environments as well as being re-used. It combines two technologies: ozonation, which brings the organic material in contact with ozone; and biofiltration, which completes the biological treatment of the wastewater. This

¹ Chemical oxygen demand (COD) is the consumption of oxygen by strong chemical oxidants to oxidize the organic and mineral substances in water. It measures the pollution load of wastewater. COD is one of the main ways of measuring effluents for discharge standards.

² OECD environmental reviews: China, OECD Publications, 2007.

treatment improves the performance of the processes generally implemented and in a matter of minutes degrades pollutants that are usually difficult to treat. Last but not least, this cutting-edge technology is proving to be economically competitive. It requires far less ozone than competing products that use extensive ozonation technologies, thereby reducing running costs. It also extends the service life of the ultrafiltration membranes. The results are probative and a new page in the story of SUEZ ENVIRONNEMENT in China can now be written.

Complementarity to win the sustainable development battle



Effluent treatment plant at the PetroChina refinery in Chengdu

Operating since late 2013, the Chengdu plant is now a showcase of Degrémont's expertise and know-how. It is one of the most exciting successes resulting from efforts at its Oil & Petrochem Centre of Excellence. Specializing in water treatment for the oil and petrochemical industry, the experts at this centre of excellence fully understand the specific challenges of the Oil & Gas sector and are mobilising their energy to create new advanced techniques to manage risks and reduce operating costs across the entire water cycle. SUEZ ENVIRONNEMENT's success story in China lies in its ability to offer ultra-innovative solutions ranging from processing it in its raw state to reusing industrial effluent safely. And in Chengdu, SUEZ ENVIRONNEMENT has deployed all its know-how. The best technologies available have thus been combined in a single plant (ozonation, biological filtration, ultrafiltration, reverse osmosis and brine treatment). It is the largest ozonation plant ever installed in China (200 kg/hr). Situated on the banks of the Tao River and relying

on local labour and knowledge, Degrémont has created a plant that is now able to treat 60,000 cubic metres of water a day, re-use 70% of its effluents, efficiently remove non-biodegradable COD, and simultaneously reduce concentrations to trace levels, a success the entire world can be pleased with. On the Yin side, Linda Liu, Technical Manager of Degrémont China, observes that *"Degrémont is now highly regarded by most refining and ethylene experts in China"*; on the Yang side, Guillaume Mizon, General Manager of Degrémont Asia, is quick to confirm that *"Sichuan Petro will probably be a future showcase for Degrémont, first in China, but also the world over"*.

Facing the will of the Chinese government to strengthen its environmental regulations to achieve higher standards³, SUEZ ENVIRONNEMENT is undeniably positioned as the complementary partner of choice for Chinese industries to support their sustainable growth. This success fits perfectly with the Chinese thinking according to which complementarity is a fundamental principle of life and the universe.



Aerial view of the effluent treatment plant at the PetroChina refinery in Chengdu

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³ The State Council of the People's Republic of China approved in December 2011 the twelfth "Five-Year Plan of Environmental Protection" which sets out policies to reduce carbon emissions, the pollution control and risk management environment in China for the period 2011-2015.