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International Water Exhibition

Water Business Experiences

WRA Hsinchu 100,000 CMD Seawater Desalination DBO Project, Hsinchu, Taiwan (Design, Build and Operate Project, or DBO)

- **The project is expected to be completed by 2028 and will be the largest desalination plant in Taiwan's public construction record. The plant will produce 30 million tons of desalinated water annually, which will be incorporated into the drinking water system to supply residents' daily consumption and high-tech industrial use in Hsinchu City.**

- **Regarding brine discharge, a public concern, we have implemented an innovative brine reuse technology that reduces brine discharge by 400,000 tons per year, conserving seawater and protecting the ocean ecosystem.**

TSMC Southern Taiwan Science Park Industrial Wastewater Reclamation Plant, Tainan (Design, Build, Own and Operate Project, or DBOO)

- **The world's first industrial wastewater reclamation (IWR) investment project aimed at reclaimed and reusing wastewater from the high tech industry for the semiconductor manufacturing process. The plant reclaims the process wastewater from TSMC fabs as well as the effluents from central wastewater treatment plants inside the Southern Taiwan Science Park (STSP). This is also the first IWR project funded by a private company at STSP, becoming an important sustainable model for science parks.**

- **The plant adopts green engineering methods to help save energy, become eco-friendly, and reduce secondary pollution.**

Kaohsiung City Gov. Fengshan River Water Reclamation Plant, Kaohsiung (Build, Transfer, and Operate Project, or BTO)

- **The first municipal wastewater plant that sets a new milestone for water reclamation in Taiwan.**
- **Certified as an educational facility related to water reclamation. This helps generate people's awareness to cherish valuable water resources.**

Kaohsiung City Gov. Linhai Water Reclamation Plant, Kaohsiung (Build, Transfer, and Operate Project, or BTO)

- **One of the six demonstration plants in the Effluent Recycling and Reuse Promotion Program for Public Sewage Treatment Plants. Construction of sewage treatment plant and reclamation plant is completed in one step. The first phase of this project includes a 55,000 CMD sewage treatment plant that can produce 33,000 CMD of reclaimed water for industries at Linhai Industrial Park.**

Taoyuan City Gov. Northern Water Resources Center & Water Reclamation Plant, Taoyuan (Build, Transfer, and Operate Project, or BTO)

- **Northern Taiwan's first water reclamation plant for industrial use, slated to begin operations in 2025. With a capacity of 40,000 tons per day, the plant will supply reclaimed water to Guanyin Industrial Park and refinery plant in Taoyuan.**

- **If needed, the plant can be expanded in the future to produce 112,000 CMD of reclaimed water per day to meet reclaimed water demand and boost economic growth.**

Taoyuan City Gov. Chungli Sewerage System, Taoyuan (Build, Operate, and Transfer Project, or BOT)

- **Chungli Sewerage System BOT Project consists of a sewerage system 246 km in length that spans across Chungli, Pingjen, and Dayuan, as well as a water reclamation center with 156,800 CMD in capacity. The project serves 200,000 households and promotes the quality of life for people in southern Taoyuan.**

New Taipei City Gov. Danshui Municipal Wastewater Treatment Plant Phase I, New Taipei City (Engineering, Procurement, and Construction Project, or EPC)

- **The second sewerage system BOT project in Taiwan and a national demonstration project recognized by the Construction and Planning Agency, Ministry of the Interior for successful and smooth project execution.**

- **The CTCI and CEC joint venture was responsible for this BOT project, and provided planning and design services for whole phases (56,000 CMD) as well as engineering, procurement, construction and commissioning (EPCC) services for phase I.**

Tainan City Gov. Liuying Municipal Wastewater Treatment Plant, Tainan (Engineering, Procurement, and Construction Project, or EPC)

- **The first municipal wastewater treatment plant project tendered as engineering, procurement, construction and commissioning (EPCC) scheme in Taiwan. A 5-year trial run operation is included to ensure system performance.**

- **The project is also a demonstration tender awarded by the Construction and Planning Agency, Ministry of the Interior based on the most advantageous scheme for proposal evaluation.**

CPC Linyuan Petrochemical Plant Water Treatment and Reclamation Project, Kaohsiung (Engineering, Procurement, and Construction Project, or EPC)

- **This project is the first public work tender for petrochemical wastewater treatment and reclamation, an engineering, procurement, construction and commissioning (EPCC) project.**
- **The project adopts membrane bioreactor (MBR) as pretreatment system, and generates reclaimed water through reverse osmosis system. This project also successfully validates CTCI's MBR system with Sumitomo Electric's PTFE membrane.**

CPC Talin Refinery Plant Wastewater Reclamation Unit Project, Kaohsiung (Engineering, Procurement, and Construction Project, or EPC)

- **After successfully completing the Linyuan Petrochemical Wastewater Treatment and Reclamation engineering, procurement, construction, and commissioning (EPCC) project, CTCI was again awarded a contract to provide professional engineering services to CPC for this project.**

- **The project adopts similar plant configuration (integration of membrane bioreactor (MBR) and reverse osmosis). Due to different tender requirement, CTCI successfully introduced Mitsubishi Rayon's MBR and integrated it to the system to produce reclaimed water.**

Oriental Petrochemical KuanYin PTA Expansion Plant Effluent Treatment Package, Taoyuan (Engineering, Procurement, and Construction Project, or EPC)

- **Based on rich EPCC experiences in PTA plants and their effluent treatment units, CTCI carried out custom-made planning and design that complied with EIA requirement and land restrictions.**

- **In addition to adopting the latest anaerobic treatment technology, the project introduced Clausthal Jet Reactor (CJR), a high performance compact bioreactor, that has the advantages of low initial cost, minimal land requirement, and easy maintenance. The result is a success.**

CHIMEI EDR Wastewater Reclamation Plant, Kaohsiung (Engineering, Procurement, and Construction Project, or EPC)

- **This plant showcases Taiwan's first and the largest industrial wastewater electrodialysis reversal (EDR) system for the petrochemical industry, created by CTCI and the Industrial Technology Research Institute. The system treats wastewater through three processes: submerged filtration (SMF), EDR, and reverse osmosis (RO). The result is 3,000 tons of reclaimed water generated per day that can be used for the production process.**

CAPCO PTA Wastewater Recovery Unit, Kaohsiung (Engineering, Procurement, and Construction Project, or EPC)

- **The nation's first petrochemical wastewater reclamation project, introducing for the first time ultra-filter and reverse osmosis membranes process. Commercial operation began in 1999.**

- **CTCI provided comprehensive engineering, procurement, construction and commissioning (EPCC) service to treat the effluent from PTA wastewater treatment plant and cooling tower blow down. At 73% recovery rate, 6,600 tons of water can be reclaimed each day to be reused in the petrochemical process.**

Ibn Rushd Phase II Grassroots (PTA) effluent treatment plant Project, Kingdom of Saudi Arabia (Engineering, Procurement, and Construction Project, or EPC)

- **The plant is located in Medina Province, Kingdom of Saudi Arabia. The total design flow is 460 m^3/h. Major streams include PTA and aromatic wastewater. Overall process include preliminary sedimentation, cooling system, biological treatment, and final clarifier. Aromatics wastewater, which contains aromatic compounds (such as benzene, toluene, and xylene), needs to be treated with extra BTX Recovery Unit.**

TPC Talin Power Plant's Seawater Desalination Facility Project, Kaohsiung (Engineering, Procurement, and Construction Project, or EPC)

- **Adopting multi-effect distillation method, the seawater demineralization facility includes five sets of seawater distillers, one set of steam compressor, fresh water condenser, and vacuum systems. The design is based on 16~32°C seawater temperature. Maximum conductivity is 10 uS / cm. Daily freshwater production capacity is 2,000 m^3 / day. Net water production ratio is 7 kg (desalinated water) / 1 kg (steam).**

Van Phong Phase 1 Coal Fired Power Plant Seawater Desalination Project, Vietnam (Engineering, Procurement, and Construction Project, or EPC)

- **Van Phong Phase 1 Coal Fired Power Plant is located at the coastal area of Khanh Hoa province, Vietnam. Due to the lack of city water in the local and long dry season, the project uses seawater desalination technology provides service water and fire-fighting water for the plant. At the same time, the permeate water is also as the source of Demineralization system, and will be supplied for eye washer and operators after adding chlorine.**

- **The Desalination plant capacity is 112 m^3/h, the core process units are divided into Pretreatment Multi-Media Filter (MMF), Seawater Reverse Osmosis System (SWRO), Brackish Water Reverse Osmosis System (BWRO) and Clean In Place System (CIP). We successfully use two pass RO (SWRO + BWRO) to produce the permeate water (~12 µS/cm) from the seawater (more than 42,000 µS/cm), bringing clean water to the power plant.**

Industrial Development Bureau Changbin Sludge Incineration Plant Project, Changhua (Build, Operate, and Transfer Project, or BOT)

- **This is the first energy-from-waste plant in Taiwan that specializes in converting sewage, sludge, waste liquids, waste oil, and commercial waste into renewable energy. Once commercial operation begins, the energy generated will be provided to the cement and steelmaking industries.**

Miaoli County Gov. Miaoli Energy-from-Waste Plant Project, Miaoli (Build, Operate, and Transfer Project, or BOT)

- **CTCI is the major concessionaire and the EPCC and O&M contractor for this project. Thanks to novel and efficient design, CTCI was awarded in 2010 the most prestigious prize in public infrastructure, the "Golden Thumb Awards for Private Participation in Infrastructure Projects". Furthermore, this plant is a certified environmental educational center for its contributions to sustainable development.**

Taichung City Gov. Wujih Energy-from-Waste Plant Project, Taichung (Build, Operate, and Transfer Project, or BOT)

- **CTCI's first waste-to-energy BOT project, wholly invested, constructed, and operated by CTCI. Also a winner of the "Golden Thumb Awards for Private Participation in Infrastructure Projects" in 2007, the most prestigious award in public infrastructure.**

Taoyuan City Gov. Taoyuan Biomass Energy Center Project, Taoyuan (Build, Operate, and Transfer Project, or BOT)

- **With over 26% of power generation efficiency, this is the most iconic model in terms of sustainability and circular economy in Taiwan. It is also the first project that provides integrated waste management service for the nation's municipal sector.**

New Taipei City Gov. Linkou Water Resources Center, New Taipei City (Operation and Maintenance Project, or O&M)

- **This is the first secondary treatment plant owned by the New Taipei City Government. Operated and maintained by CTCI Group, the treatment plant has helped improve the environmental and living quality in Linkou.**

- **The entire treatment plant takes advantage of the terrain by treating wastewater with gravity flow, without requiring additional energy input. This helps save energy and reduce carbon emissions.**

New Taipei City Gov. Gravel Facilities and Intercepting Sewer System, New Taipei City (Operation and Maintenance Project, or O&M)

- **The 9 gravel facilities located in New Taipei City were built with ecological engineering methods. Operated and maintained by CTCI Group, the water quality on-site treatment and purification system allows the tributary drainage to be drawn into the gravel room purification system for water purification treatment, so as to reduce the discharge of pollutants into the river. This also helps create a riparian ecological corridor habitat.**

Pingtung County Gov. Pingtung Agricultural Biotechnology Park Sewage Processing Plant, Pingtung (Operation and Maintenance Project, or O&M)

- **Pingtung Agricultural Biotechnology Park is the only state-level agricultural biotechnology park in Taiwan. Operated and maintained by CTCI Group, the sewage processing plant adopts A2O biological nitrogen and phosphorus removal system to treat the wastewater (sewage) generated in the park. This helps the park and its surrounding environment to stay in good condition.**

New Taipei City Gov. Linkou Water Resources Center Sludge Drying Device, New Taipei City (Installation, Operation and Maintenance Project)

- **Installed and operated by CTCI Group, the sludge drying device first condenses and dehumidifies the sludge before carrying out secondary drying with the heat pump recycling method, which effectively saves energy.**
- **12 tons of sludge containing 80% moisture can be treated per day.**

New Taipei City Gov. The Second Phase Expansion of Linkou Area Wastewater Treatment Facility, New Taipei City
(Procurement, Construction, Operation and Maintenance Project)

- **The sewage volume treated by the first phase of treatment plant has already exceeded the original 23,000 CMD design capacity. The second phase expansion project is expected to increase the sewage treatment capacity to 36,500 CMD.**

- **Expected to be completed in 2024.**

The additives for boiler water system

- **This type of special additives can prevent the scaling and corrosion problem in boilers. It can ensure stable operations of the boiler system, extend the operational duration, and cut energy consumption.**
- **Can be applied to the boiler water systems at power plants, refineries, petrochemical plants, and incineration plants.**

Additives for cooling water systems

- **This type of special additives can prevent the corrosion problem in cooling water systems and extend the operational duration. It can also help minimize the cleaning frequency, increase heat exchange efficiency, and reduce heat loss.**
- **Can be applied to the cooling water systems at power plants, refineries, petrochemical plants, and incineration plants.**

Additives for RO systems

- **The anti-scaling agent of RO membrane can help reduce inorganic fouling from occurring. It can also help minimize the cleaning frequency and extend the operational duration.**
- **The RO bactericide can help reduce organic fouling from occurring. It can also help prevent the growth of microorganisms on the RO membrane tubes, which reduces water production efficiency.**
- **Can be applied to the RO system of water reclamation plants, power plants, refineries, petrochemical plants, and incineration plants.**

Additives for water resource treatment

- **The heavy metal chelating agent can effectively help remove harmful heavy metals from wastewater and reduce the dissolution of heavy metals from waste sludge.**
- **Catalase, which is fermented with non-pathogenic bacteria, can consistently and effectively remove H2O2 from wastewater.**
- **Can be applied to wastewater treatment at high-tech facilities, power plants, incineration plants, and metal surface treatment facilities.**

Activated carbon

- **Activated carbon is commonly used to adsorb the organic matter in water, decolorize water, and adsorb COD from wastewater. It is also widely used in the generation process of pure water, ultrapure water, and water purification, as well as wastewater treatment.**
- **Can be applied to the water resource treatment system at high-tech facilities, power plants, incineration plants, and metal surface treatment facilities.**

Mr. Energy, Energy Management System

- **Mr. Energy is a series of products developed by Xinding, which are designed in accordance with the ISO 50001 international standard for energy management.**
- **The product features mainly include energy performance indicator, energy balance diagram analysis, energy usage performance monitoring, etc., and a visual module is used to establish an exclusive energy management page for the enterprise.**


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