ENVIRONMENTAL EQUIPMENT PROVIDERS REVIEW IN JIANGSU, CHINA

Fabian Azofeifa L. (2022)

INTRODUCTION

Yixing County is unexpectedly an unfamous sustainable dream city with many environmental enterprises settled together. From micro, small and medium enterprises located in an “Environmental Protection Supermarket” to laboratories and institutions dedicated to ecological research, city-level projects, sustainable remediation of water in rural places and environmental equipment exhibition centers.

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Contents

1. Environmental Protection Supermarket

The Environmental Protection Supermarket is in China Yixing International Environmental Protection City (National Environmental Protection Equipment/Accessories Trading Center). Its a display center of the environmental protection industry chain.

The supermarket is located in China's environmental protection town of Yixing City, Jiangsu Province, Gaocheng, with a total construction area of about 16,000 square meters. According to the environmental protection industry process, planning accessories, equipment, and technical services cover the whole industry chain. At the same time, it has significant functions for product display, information release, a shared office, and conference reception to provide trading services for settled enterprises and visiting customers.

The environmental protection supermarket is constantly upgrading its functions and improving its services. It is committed to building the most influential "environmental remediation center" in China, providing new sales channels for supply-side enterprises and shaping industry brands. Reduce costs and improve procurement efficiency for procurement enterprises. Integrate industry resources and build a new ecological industry transaction service platform.

2. University of New South Wales Torch Innovation Park (新南威尔士大学火炬创新园区)

2.1. Mobile water purification system

Remote areas are rich in groundwater resources, but often need to be treated before use, while long-distance transmission also greatly limits the full use of this part of the resources, based on this consideration, the University of New South Wales researchers creatively use the car engine to drive the reverse osmosis system, through the optimization of the automotive power system. They have built a mobile water treatment system that can achieve water purification in the process of long-distance transportation of goods, that is, using the car itself to provide the power required for reverse osmosis to travel. At an inlet water pressure of 4-8 bars, the system can produce 6-15 liters of water per hour per square meter of membrane.

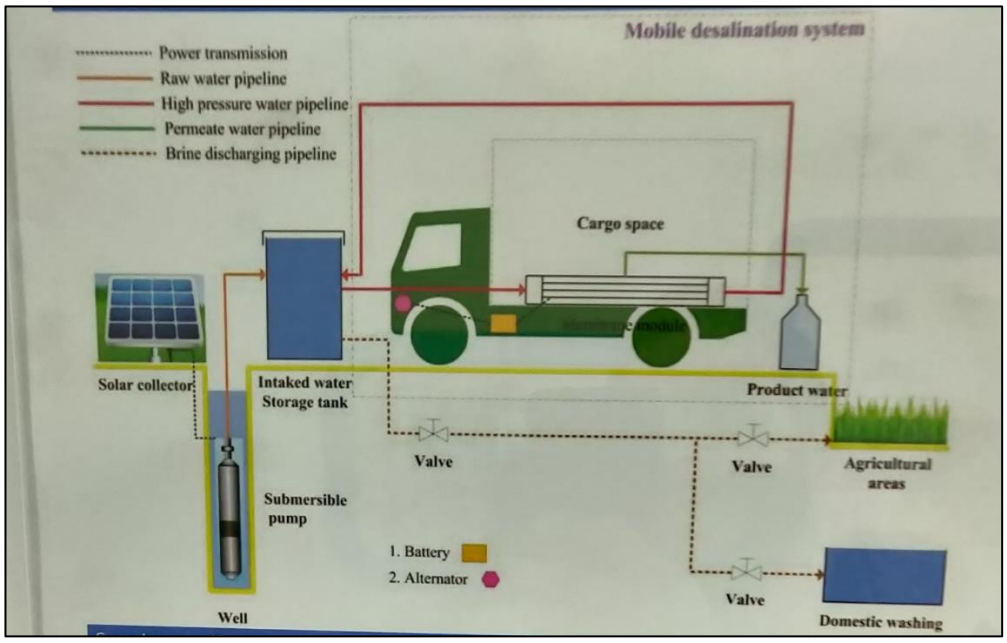

Image 1. Photo shoot from the University of New South Wales Torch Innovation Park.

3. Guohe environment high-end equipment manufacturing base (国合环境高端装备制造基地)

3.1. Sponge City Rainwater Harvesting and Utilization System

Image 2. Photo shoot of a model of a sponge city from the base.

The process in **image 3**. flow chart illustrates as follows: The initial rainwater undergoes multiple pretreatment links to ensure the water quality of the collected rainwater. Using a water storage module such as shown in **image 4**. for water storage effectively provides water treatment while not occupying much space. The construction is simple and convenient, more environmentally friendly, and safe. The pressure control pump and rainwater controller can easily send rainwater to the water point, while the rainwater controller can react to the water level of the rainwater storage tank in real-time to achieve the water point.

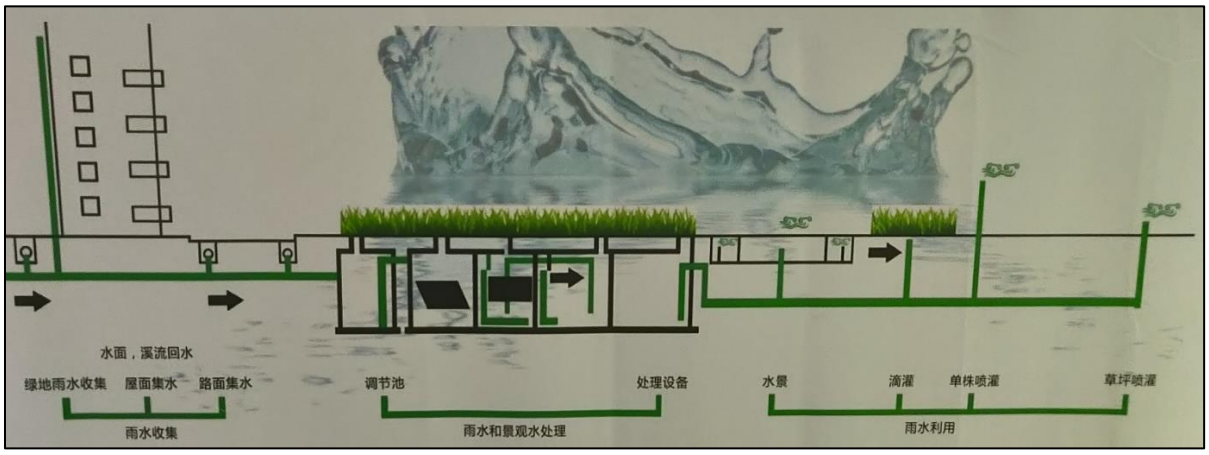

Image 3. Photo of the flow chart of the Sponge City Rainwater Harvesting and Utilization System taken from the Center.

Image 4. Water storage module's implementation, obtained from Chinese website.

3.2. China Water Source Protection System (WEP)

WEP water environment restoration system is an urban water system transformation and water ecological restoration process technology. The use of water pressure to efficiently dissolve oxygen to eliminate the hypoxic water layer. High-concentration dissolved oxygen water is centered on a gas-

liquid dissolving device with a thickness of about 2 m and a radius of about 1000 m for concentric circle horizontal diffusion. It will not produce bubbles or roll up the sediment to achieve reservoir water quality protection.

At the beginning of 2014, the country's first demonstration project of water source protection and water body restoration was completed in Longzhu Reservoir, Taihua Town, Yixing. The technical team of Zhongyi Huanke (中宜环科) investigated the surrounding water system, terrain, and pollution sources. The expert team was organized to prepare a feasible plan with the imported technology to perform the installation of the whole system. After the installation was completed, Zhongyi Huanke (中宜环科) monitored the effect of the reservoir, summarized the operation, and proved that the water body in the Longzhu Reservoir achieved the development of sufficient biological recovery of oxygen under the action of WEP, and successfully completed the restoration of the entire water ecology.

Image 5. Photo shoot of the WEP technology at the base.

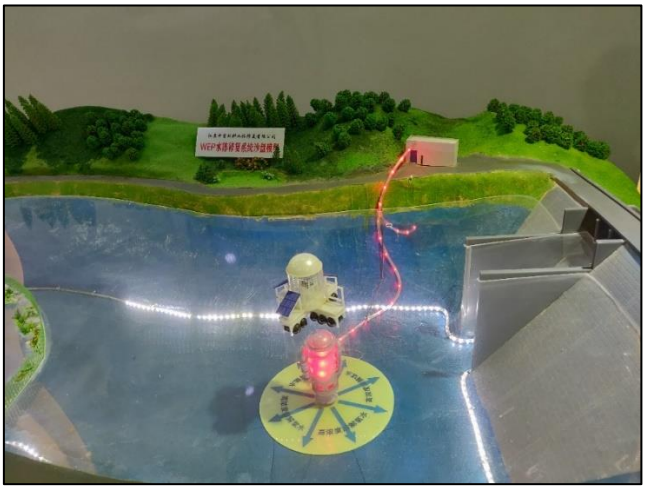

Image 6. Photo shoot of the WEP in a reservoir model at the base.

4. International environmental protection exhibition center (国际环保展示中)

This exhibition Center displays hundreds of environmental protection-related equipment.

4.1. Screw sludge dewatering machine

Image 7. Obtained from the website of a provider in the exhibition center. http://www.benenv.com/

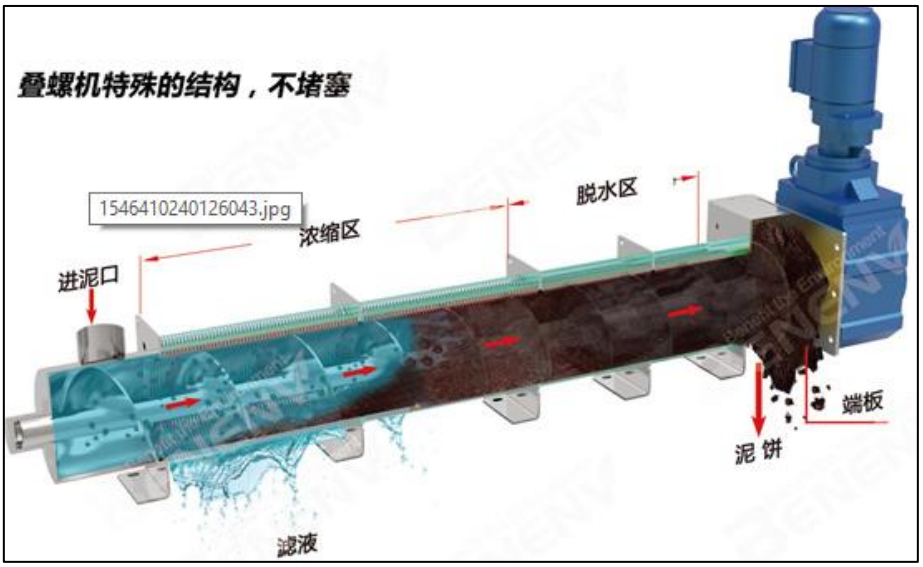

Image 8. Obtained from the website of the before mentioned provider

5. Zhaosheng environmental protection (兆盛环保)

At present, the company's main products are wastewater treatment grilles, conveying and pressing series, scraping mud suction, sewage (mud)compression treatment equipment, water purification treatment series, aeration equipment series, water level control series and other nine series, all equipment can be matched manual, semi-automatic, fully automatic electrical control box.

Image 9. Photo shoot of Waste water treatment Grille Manufacturing in the company

6. Lexus Environmental Protection (凌志环保)

6.1. XE-type purification tank

XE purification tanks can not only treat wastewater such as kitchens, bathrooms, and laundry discharged from homes but also treat toilet drainage. All the complex drainage of life is treated at the same time, and the treated water is discharged after reaching the standard

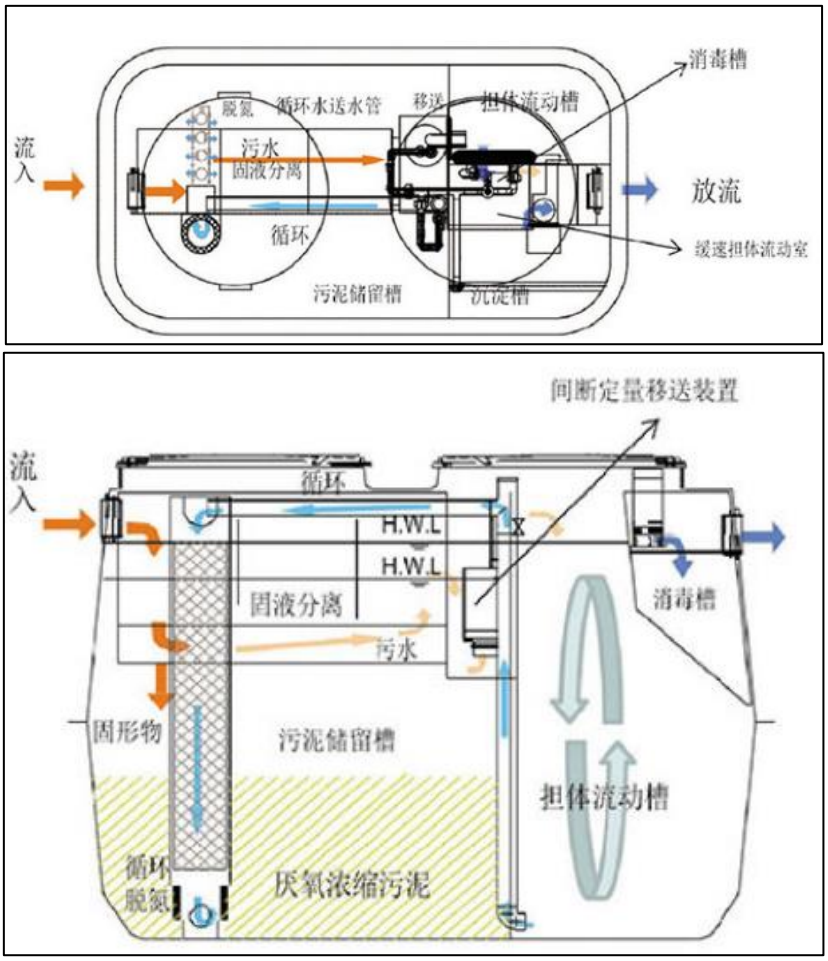

Image 10. Layout of the tank obtained from Chinese website

The top cover of the purification tank adopts a strong plastic cover, which is lighter and easier to open and close. Even if there is no timer on the fan, the air volume can be adjusted by 3 valves. The cleaning work is also limited to sludge storage tanks.

Image 12. Photo shoot of XE type purification tank in a rural city

Image 13. Photo shoot of the site of water protection in the rural city

6.2. PSDEO-MBR integrated wastewater treatment equipment

PSDEO-MBR integrated processing equipment is mainly a bioreactor that uses A2/O+MBR technology to effectively integrate the anaerobic zone, hypoxic zone, aerobic zone and MBR membrane treatment area in the biochemical system.

The "PSDEO-MBR" has a large number of oxygenated and aerobic microorganisms, through the metabolic action of microorganisms, to remove COD, BOD, ammonia nitrogen, total nitrogen, total phosphorus, and other pollutants in the sewage. Through an MBR process, it can achieve complete "slurry water separation", maintain a high activated sludge concentration in the bioreactor, increase the biological treatment load, and reduce the turbidity of the effluent to a very low level, and the entire integrated treatment equipment discharge or reuse the effluent standard.

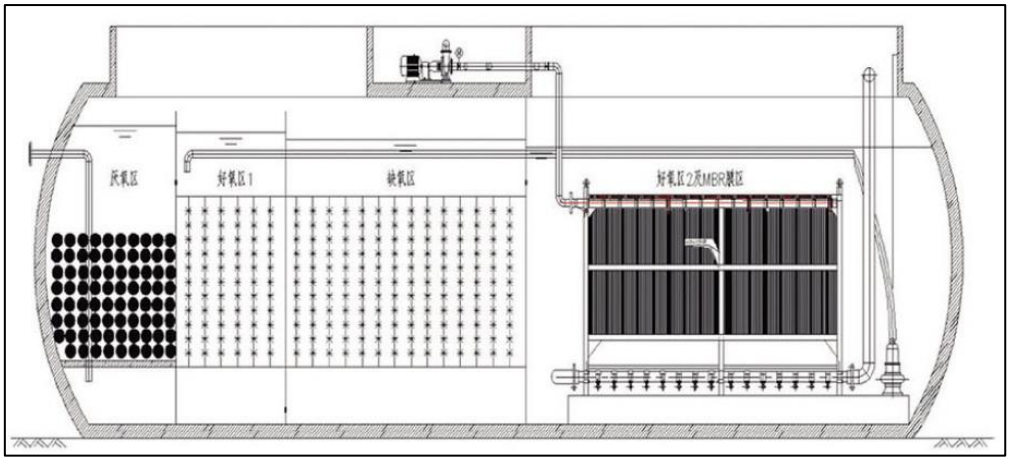

Image 14. PSDEO-MBR layout obtained from a chinese website.

6.3. Guzhuang purification tank treatment system (古庄净化槽处理系统)

A total of 4 Lexus purification tanks are installed here, serving 12 farmers (each household is equipped with a septic tank at the drain). The system is powered by a solar system containing four solar panels, using mains and solar.

Image 15. Photo shoot from the purification tanks installed in a rural area

7. Peng Harrier Environmental Protection Co., Ltd (鹏鹞环保股份有限公司)

7.1. Biological deodorization tower -

Biological deodorization is mainly the use of microbial deodorization..

The self-developed HBC Ring is used as the biological plum interest carrier to provide a stable plum interest environment for microorganisms and improve the survival rate of microorganisms.

Fields of application:

1. sewage treatment plants (pump station odor, pretreatment odor, sludge dewatering odor);
2. Waste treatment plants (odor of collection station, odor of sorting workshop);
3. Sludge fermentation treatment odor;
4. Paint factory deodorization/odor;
5. Deodorization/odor of food, feed, and pharmaceutical plants.

7.2. PLB umbrella-type vertical mixer

PLB is high-tech mixing equipment that their research center independently develops. The hyperbolic structure is suitable for mixing and mixing liquids and liquids, liquids and solids, liquids and gases on various occasions, especially for stirring in sewage treatment projects.

Its characteristic hyperbola and smooth surface have very little resistance when pushing water flow, so its efficiency is also extremely high. The water flow is agitated by the impeller to form a uniform omnidirectional push flow at the bottom of the pool so that the water flow is in a vertical swirling state. At the same time, the fluid generates a swirl in the container with the direction of rotation of the impeller so that it achieves the ideal mixing and stirring effect.

Scope of application:

1. Regulation pool for industrial wastewater treatment plant;

2. SBR, CASS reactor, and MSBR reactor for urban sewage treatment plant;

3. Activated sludge tank (aeration tank) for run-off sewage treatment plant;

4. It is used in activated sludge stabilization processes, such as digesters and sludge storage tanks.

Image 16. PLB umbrella-type vertical mixer obtained from a Chinese source

8. Yixing Huaqi Sewage Treatment Co., Ltd 宜兴市华骐污水处理有限公司

Yixing Huaqi Sewage Treatment Co., Ltd. was established in 2008 as a project invested in and built by Anwei Huaqi Environmental Protection Technology Co., Ltd., located on the northeast side of the intersection of Lihe Qingyun River in Dingshu Town, Yixing City. The plant area is more than 40 acres, the planned construction scale is 50,000 tons/day. The process adopts BAF+A^2O, and the effluent water quality is executed by the pollutant discharge of the sewage treatment plant in the town (GB18918-2002) Class A Standard. The company specializes in sewage treatment operations, has a group of professional talents with excellent technical ability and rich experience in operation, which has greatly improved the quality of the water environment in Dingshu Town and ensured the water ecological safety of the township.

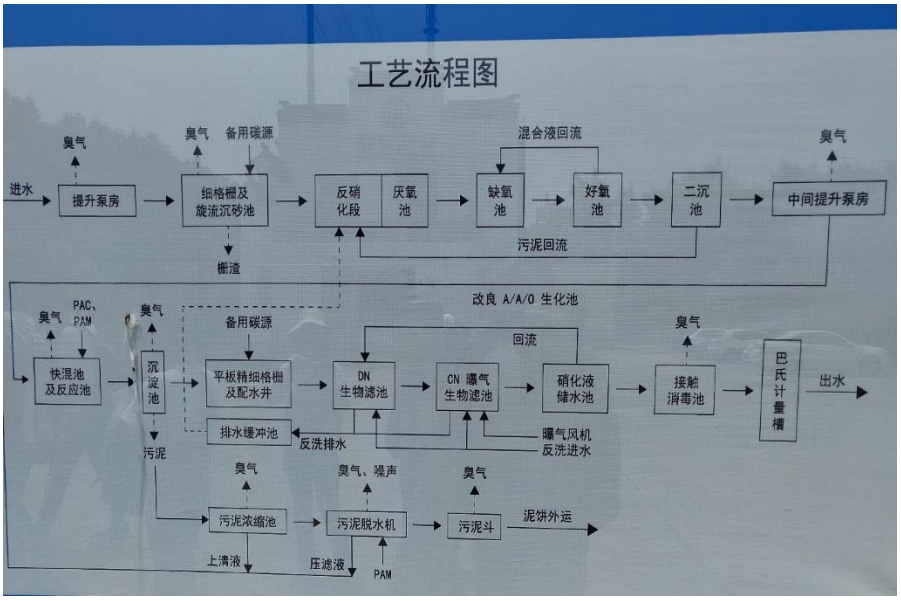

Image 17. Flow chart of the wastewater treatment plant.

8.1. Fine wastewater treatment grill and vortex-type grit

In order to ensure the normal operation of the vortex-type grit, a fine wastewater treatment grill is set at the front seven ends of the sand sedimentation tank, and the vortex-type grit generates hydraulic vortex through mechanical agitation so that the inorganic sand particles are separated from the organic matter for subsequent biological treatment.

Image 18. Photo shoot of the vortex-type grit in the wastewater plant

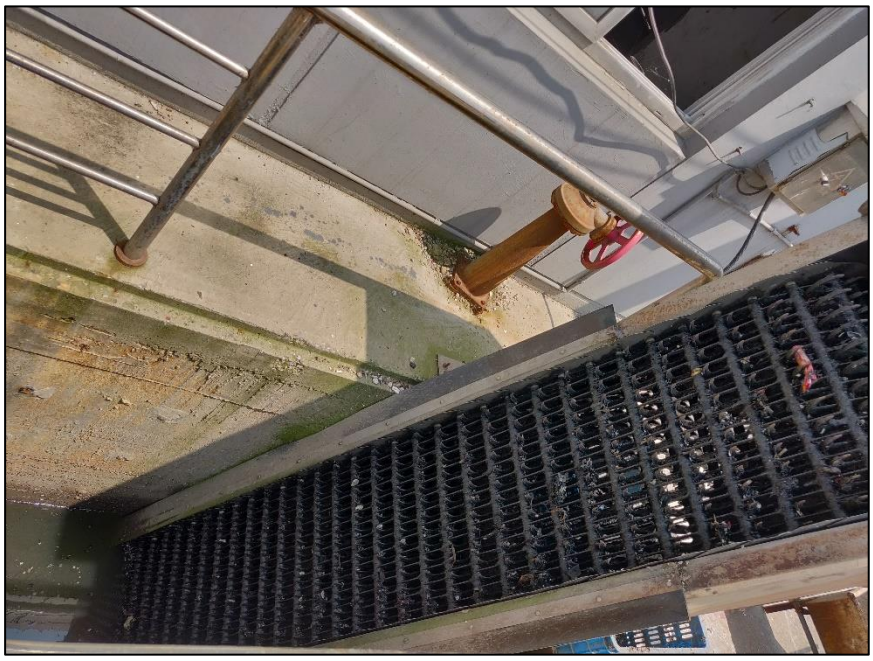

Image 19. Photo shoot of the fine wastewater treatment grill

8.2. A/A/O pool

The modified A2/O biochemical pool is strictly separated by anaerobic, hypoxia and aerobic sections, which is conducive to the reproduction and growth of different microbial strains and has a good denitrification and phosphorus removal effect.

Image 20. Photo shoot of the A/A/O pools.

8.3. Sedimentation ponds

The main role of the two sedimentation tank is to separate the sludge, so that the mixture clarification, concentration and return of activated sludge.

Image 20. Photo shoot of the Sedimentation ponds.

8.4. Biological filters

Which utilizes the Nitrification and Denitrification process.

Image 20. Photo shoot of the biological ponds

9. Eco-toilets (Eco-San).

The ecological toilet is the product of Professor Hoffmann of the California Institute of Technology in the United States in the "Toilet Challenge" organized by the Bill Melinda Gates Foundation. Jointly established by the Gates Foundation, Caltech and Yixing, the Industrialization of Yixing Environmental Science Park.

Product features:

- No external power supply is required: solar powered.
- No need for water replenishment: The electrocatalytic oxidation wastewater treatment system is used to achieve fully closed-circuit recycling and reuse.
- Intelligent control: 24h unmanned operation, fully automatic operation.
- Removable : The cabinet can be integrated and operated easily.

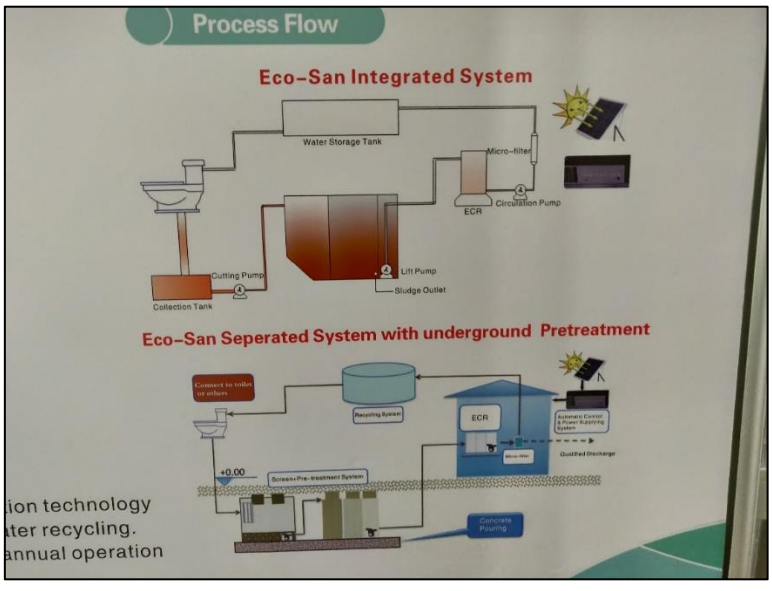

Image 21. Photo shoot from the Ecosan warehouse.