

New-Style Urbanisation in Yangtze River Delta Boosts Demand for Environmental Technology

China's ongoing urbanisation initiative is not only helping propel economic and social development, but also bolstering the construction of supportive facilities for urban living, promoting urban hygiene and establishing sustainable and liveable urban-rural areas. The planning and building of facilities treating refuse and wastewater takes time, and they require substantial investment. If the construction of such facilities cannot maintain pace with the development of the residential projects, urban hygiene problems will arise, inevitably slowing down the overall pace of any region's development.

Hong Kong's environmental industry excels in providing green services, such as refuse and wastewater treatment, pollution control, and resources conservation. Moreover, many Hong Kong companies possess proprietary/patented technology, as well as advanced environmental management experience. They can offer a wide range of services to the development of new areas of the Yangtze River Delta (YRD) region, as well as elsewhere on the Chinese mainland. Crucially, these services include the facility to treat/reuse polluted water at source. They can also reduce the demand by development projects for infrastructural facilities, while maintaining environmental hygiene and conserving resources.

Urban Hygiene: An Integral Part of the Urbanisation Plan

In recent years, China's urban population has grown rapidly, producing extra volumes of solid wastes and wastewater. This poses challenges for the environment and the maintenance of urban hygiene. In a move designed to solve these problems and improve the living environment, the YRD region recently announced new urbanisation plans. These place an emphasis not only on propelling urban-rural construction and economic development, but also on boosting environmental protection. These will see efforts made to strengthen urban management as well as to enhance the capability of waste recovery and wastewater treatment. It is hoped this will promote low-carbon green production and living, while allowing for the construction of sustainable and liveable urban-rural areas.



Dunwell's waste oil treatment facilities
(photograph courtesy of Dunwell)

In an interview conducted by HKTDC Research, Daniel Cheng, Deputy Chairman of the



Federation of Hong Kong Industries and the Managing Director of the Dunwell Group, said: "Due to fast-paced urbanisation across the mainland, for traditional management systems to be relied on to handle the problem of refuse and wastewater, it is necessary to make sure that the existing facilities – including refuse treatment plants and sewer drain pipes – can keep apace with the various development projects. Otherwise, it is likely that a host of environmental problems, such as urban hygiene deficiencies, will occur. Such occurrences would drag down the pace of development of the whole region."

Dunwell is one of the leading companies in Hong Kong's environmental technology sector and provides a wide range of waste oil and wastewater treatment, recovery and recycling/reuse services. Using its proprietary patented VMAT vibrating membrane technology, the company converts waste lubricating oil into highly cost-effective processed oil. Currently, Dunwell's facility in Hong Kong is one of the largest independent waste oil treatment and disposal plants in Asia. Through its constant effort to seek out technological innovations, complemented by the relevant bioengineering technology, Dunwell participates in a variety of wastewater treatment projects. Typically, these see it deploying its vibrating membrane technology, while providing custom-made wastewater treatment services for Hong Kong, the mainland and other markets in Asia.



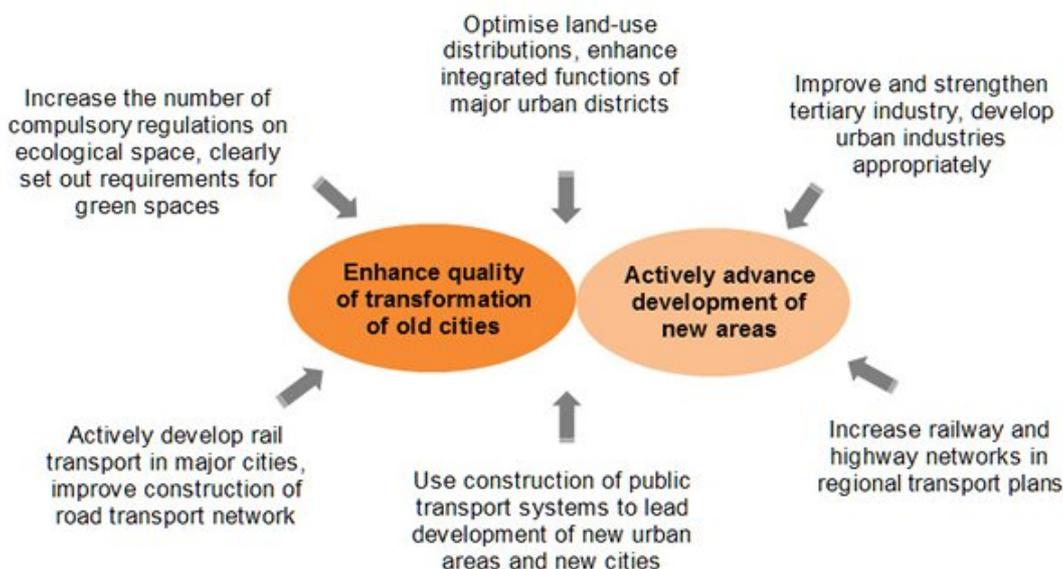
Daniel Cheng says the Chinese mainland has to handle the problem of refuse and wastewater arising in the course of urbanisation (photograph courtesy of Dunwell)

YRD Backs Supporting Facilities for Urban Living

The HKTDC Research recently visited a number of government departments in the YRD region. These included the department of Housing and Urban-rural Development in Jiangsu and Zhejiang, as well as urban planning bureaus in a number of cities in the provinces. All these departments indicated that their regional development plans for expanding the scale of their cities all place emphasis on the planning of green spaces, notably setting an open green space ratio and a minimum green coverage rate. Meanwhile, attention is also being paid to the development of supporting facilities for urban living in the city, and the whole region, including the treatment of garbage and wastewater. This is in order to resolve the urban hygiene problems brought about by a rise in the urban population, while improving the living environment in urban-rural areas.



Directions of Urban Planning in YRD's New Urbanisation Plan



Source: Extracts from overall urbanisation plans of Jiangsu and Zhejiang provinces

In recent years, the YRD region has increased its investment in purchasing the machinery and equipment necessary for improving environmental hygiene. This is in order to meet the rising demand for urban hygiene through clearing and transporting domestic garbage. Additionally, while developing new areas and development zones, drainage pipes have to be laid and the capacity of sewage treatment plants has to be raised to meet increasingly stringent environmental regulations and drainage standards.

Urban Environmental Hygiene Conditions (Selected)

Jiangsu

	2000	2005	2010	2011	2012	2013
Volume of domestic garbage cleared ('000 tons)	5,150	8,350	10,170	11,200	12,100	12,030
Length of drainage pipes (km)	11,097	28,568	46,867	51,735	56,887	62,194
Wastewater treatment rate (%)	61.8	77.7	87.6	89.9	90.7	92.1

Zhejiang

	2000	2005	2010	2011	2012	2013
Volume of domestic garbage cleared ('000 tons)	4,360	7,630	9,550	10,180	10,480	11,230
Length of drainage pipes (km)	7,795	18,607	26,367	28,103	29,786	33,502
Wastewater treatment rate (%)	33.2	59.5	82.7	85.1	87.5	89.3

Source: Jiangsu Statistical Yearbook; Zhejiang Statistical Yearbook

Urban Drainage: Opportunities for Environmental Protection Industry



Commenting on the opportunities in the sector, Cheng said: “Take urban and domestic wastewater as an example. New commercial areas and residential areas in suburban regions often lack an existing drainage system. Hence, it is necessary to lay new drainage pipes connected to large sewage treatment plants nearby for treating the various kinds of wastewater discharged by the new areas every day. However, laying new drainage pipes and increasing the capability of sewage treatment plants not only requires significant government investment, but these facilities also have to come into operation before completion of the new areas, so as to guarantee the urban hygiene and environment of any new site after occupation.

“The planning for these infrastructural facilities takes time and these plans also have to be incorporated into long-term urban strategies so they can maintain pace of development of urban construction. On the mainland, the pace of urbanisation has accelerated in recent years, but, in some cases, the speed of injection of investment funds into infrastructure and facilities construction may not keep up with the development needs of the new areas and new towns. This may give rise to post-development urban and environmental problems.

“The design of drainage pipes must align with the drainage system of the whole region. If the system design lacks careful consideration - or the system design is undesirable due to insufficient capital input - this could lead to quality problems in the overall construction. In the course of catching up with the speed of development of any new area, it is therefore likely that the issue of urban sewage treatment may develop into a considerable environmental hygiene problem. For instance, there may be leakage or a reverse flow of wastewater in the drainage pipes for various reasons, allowing untreated wastewater to contaminate the surrounding environment, something that directly affects resident’s health.

“In particular, in some inland regions where water resources are scarce and in places close to drinking water resources or river basins (such as areas in the YRD along the Yangtze River), across-the-board consideration has to be given to the discharge of refuse and wastewater. While action needs to be taken to resolve environmental hygiene problems and reduce the pollution of the surrounding environment and resources on the one hand, consideration also has to be given to recycling, reusing and conserving water resources on the other.”



Dunwell’s indoor wastewater treatment facilities (1)
(photograph courtesy of Dunwell)



Dunwell’s indoor wastewater treatment facilities (2)
(photograph courtesy of Dunwell)

New Environmental Concepts Help Raise Urbanisation Quality



Urban planning departments in the YRD remain hopeful that developers can bring in advanced technologies and modern management systems in order to reduce the impact that development projects have on the environment, as well as to alleviate the pressure on the public drainage system.

In order to do this, Cheng believes a number of procedures need to be adopted. He says: "When the mainland formulates urbanisation plans, consideration should be given to using new drainage management systems. For instance, in new development zones and development projects, the concept of treatment at source can be introduced, allowing the developer to carry out sewage treatment locally in the newly developed communities. The initiatives here can include setting up small-scale sewage treatment rooms in various commercial buildings and residential areas in order to locally filter and treat the wastewater discharged by the community. The treated water can then be recycled and reused for flushing toilets and irrigating plants. By so doing, the volume of wastewater for draining can be reduced and the demand for infrastructure, such as a dedicated drainage system, can be lowered. This can also help cut back the investment required for constructing drainage infrastructure, while raising the recycling and reuse rate of water resources, ultimately achieving the environmental protection goal of greater resource conservation."

Currently Dunwell is using a number of patented technologies, as well as other approaches, including biochemical treatment and vibrating membrane technology, to deliver waste concentration/recovery on the mainland. The company carries out cost-effective treatment for the recovery and reuse of the high salt content wastewater produced in the course of gas generation in China's first coal-to-gas project in Inner Mongolia. Its service is said to effectively help the coal-to-gas project reduce the need for using the expensive treatment process of distillation-condensation. This makes it possible for the project to reach its goal of reusing wastewater and achieving zero emissions in a cost-effective way.



"Bio-toilet" installed with Dunwell's wastewater treatment system
(photograph courtesy of Dunwell)

Dunwell also provides a wide range of wastewater treatment, recovery, recycling and reuse services both in Hong Kong and on the mainland. For instance, in Hong Kong, the company uses the Membrane Bio-Reactor wastewater reclamation and recycling system it developed to set up "bio-toilets" in the countryside and in places where no public drainage system is available. The wastewater is treated and reused in the same location as the toilet facilities, using membrane and bio-degradation technologies to resolve the hygiene problem caused by dry toilets. Other solutions offered by Dunwell include physio-chemical/biological industrial wastewater treatment systems, wastewater purification and recycling systems, membrane filtration systems, and sludge management systems. It also offers services relating to design, installation, testing to operation and equipment maintenance. Additionally, the company aims to provide highly efficient and cost-effective services to its clients, helping them meet stringent environmental requirements.



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