

Leading **Enterprise** in
Water Helps to
Build a **“Beautiful China”**



— An Interview with

Mr Francis Li

Executive Director and Vice President of BEWG Group

青山綠水永流長

建設「**美麗新中國**」

— 專訪 **北控水務**

執行董事兼副總裁 **李海楓**先生

As a leading water and environmental services provider in Mainland China, Beijing Enterprises Water Group (0371.HK) is committed to assisting China's "ecological civilisation", a term coined by president Xi Jinping. At the 19th National Congress, the Communist Party of China outlined a green policy framework to build and strengthen a low-carbon, circular economy. Since then, various policies have been set in place to encourage the private sector to offer more high-quality ecological products and services to the community.

Against this backdrop, Francis Li, Executive Director and Vice President of BEWG, recognises the requirements for discharge standards, treatment rates and water governance, for example, are becoming more stringent. But the company is committed to sustainable water resources development and management by adopting systematic approaches and smart technologies, he says.

Li believes the BEWG's growth will be predominately fuelled by two business lines: construction of pipe networks and maintenance services. These range from capital-intensive work on the construction of pipes to technical support such as dredging and flaw detection. Outlining the stages of Mainland China's water industry development, Li explains that it was initially about human habitation, which focused on developing ways to dispose of wastewater and meet sanitation needs. The focus then shifted to water conservation, ecological restoration and environmental protection. Currently the industry is working on water resource recovery and reuse. "China's water industry is entering a new era of high-quality development to address the issue of water quality by implementing projects to promote biodiversity restoration," Li says.

With China's continuous advancement in "ecological civilisation", BEWG's strategic goal is to secure a pollution-free and quality water environment for the nation. "Our company takes great care of the environment and looks to preserve natural resources, whether it is rivers, lakes or seaports, while improving the ecological environment and promoting the restoration of biodiversity," Li adds.

Leader in Water Ecological Environment Protection

Listed on the Hong Kong Stock Exchange (HKEX) since 2008, BEWG is a constituent stock of the Hong Kong Hang Seng Composite Index and the Hang Seng Hong Kong Chinese Enterprises Index. The company offers extensive water-related services, such as sewage treatment, water supply, reclaimed water treatment, comprehensive water management, seawater desalination and membrane-based processes for water reuse and environmental control in the treatment of industrial wastewater.

建設健全綠色低碳循環發展經濟體制，是中央政府於十九大提出的發展方針。由此可見，在可見將來，國家政策將傾向鼓勵企業提供更多優質的生態產品，以滿足民衆對美麗生態的需求，讓青山永存，綠水長流，共建美麗中國。

北控水務（0371.HK）作為中國水生態環境保護的龍頭企業，積極配合由國家主席習近平提出的生態文明建設藍圖。面對新格局，北控水務執行董事兼副總裁李海楓在接受本刊採訪時表示，排放標準、處理率、水域治理等各方面的要求越來越高、也越來越嚴。即便如此，集團未來將致力於通過採用系統方法和智能技術，以實現水資源可持續開發和管理。

他認為，管網作為水處理體系中的重要環節，越來越受國家重視。未來圍繞管網方面的發展，無論是通過重資產投資形式的管網建設，還是圍繞管網衍生的清淤服務、探傷服務等技術服務，都會有較大的發展空間。

新中國發展至今，水務行業經歷了四個發展階段，從昔日人居衛生及污廢物處理，到環境與資源節約，到生態修復與保護，最後到資源再生與利用。李海楓認為，中國水務行業正進入高質量的發展新時期。

隨著國家生態文明建設持續推進，集團以「新水務，讓生命充滿活力」為使命，將改善生態環境視為己任，重視水資源保護，促進區域發展和環境發展。李海楓舉例，集團在城市生態管理，河川、湖泊還是海港，促進生物多樣性恢復。

水生態環境保護龍頭企業

北控水務2008年在港交所主板上市，位列香港恆生綜合指數成份股、恆生香港中資企業指數成份股。業務範圍涵蓋城鎮水務（污水、供水、中水處理）、水環境綜合治理、海水淡化、涉膜及工業廢水等領域。



As of the end of 2021, the total capacity of the BEWG's water services reached 4,488.6 tonnes per day, with an operational capability that can process 2,980 tonnes of water per day. The company currently operates 1,370 water plants and township sewage treatment facilities. The company's business operations cover urban black and odorous water treatment, watershed management, smart water management, advisory on urban ecological planning, regional environmental management and rural water infrastructure construction. Beyond Mainland China's borders, BEWG operates in more than 30 cities in Singapore, Malaysia, Australia, New Zealand, Portugal, Angola, Botswana, and other countries or regions.

Located in Adelaide, South Australia, a reliable pipe network is a crucial component of the desalination plant water treatment system. Raw water is treated and purified through these pipes before the public can use it. Part of South Australia's "Water for Good" water security plan, the importance of this system has increased as the population has grown and the demand for clean, drinkable water has increased.

During recent years, BEWG has been exploring the business potential of new and more efficient ways of recycling wastewater and is fully committed to improving urban wastewater treatment, which reduces pollution and makes effective use of resources.

Putting its development goals into practice, by 2021 BEWG had increased the processing capacity of reclaimed water by 761,000 tonnes per day, taking the total capacity to 3.757 million tonnes per day. The upgraded processing capacity covers ecological water replenishment, industrial water reuse and water source heat pumps. Li anticipates that sewage recycling will also continue to bring growth to the sewage treatment industry in the next few years. At the same time, BEWG is actively responding to the nation's "30-60" decarbonisation goal, a catchphrase used to illustrate China's aim to reach peak emissions by 2030 and carbon neutrality by 2060.

Through the use of using solar energy, BEWG already produces about 40% of the electricity required to provide power to some of the plants the company operates. In the future, BEWG will consider using sludge to generate biogas power for sewage treatment plants. At the same time the company is studying the feasibility of participating in carbon trading.

截至2021年底，集團水務總設計能力達4488.6噸/天，每天處理2980噸水務，擁有水廠及鄉鎮污水處理設施達1370座。目前，業務涵蓋城市黑臭水體治理、城市流域綜合治理、智慧環境、生態柔性城市構建、區域環境治理、新農村建設等。在海外業務方面，北控水務的海外版圖業務覆蓋馬來西亞、新加坡、澳洲、新西蘭、葡萄牙、安哥拉、博茨瓦納等國家或地區的30多座城市。

他透露，北控水務自2009年起便開始探索污水資源化業務，致力於提升城鎮污水處理效率，推動污水資源化生態利用。2021年，集團新增再生水規模76.1萬噸/日，在手再生水規模共計375.7萬噸/日，涉及生態補水、工業回用、水源熱泵等多種類型。

未來幾年，污水資源化預期將給污水治理行業帶來更多新的增長點。與此同時，集團積極響應國家的「3060 雙碳目標」。早在幾年前，北控水務就開始嘗試污水處理廠光伏（太陽能）發電。據介紹，北控水務已經有部分項目能夠做到用光伏發電滿足廠區40%的用電。北控水務未來或將考慮將污泥通過技術製造沼氣發電，再重新供給污水處理廠，實現循環利用，北控水務亦正研究參與碳交易的可行性。

培養節約用水文化

他坦言，內地自來水費便宜，間接導致人們對水資源的保護意識不夠，但要提高自來水收費，未必為大眾所接受。可是，由於自來水業務的發展和營運，需要定期維護和更換管網，當前水費收入並未能覆蓋管網維修開支，也由於此，內地許多地區的老舊管網缺乏維修，導致漏損率控制較難，浪費了珍貴的食水。

不過，國家已經逐漸意識到上述問題，2021年年底也陸續出台了《城鎮供水價格管理辦法》和《城鎮供水定價成本監審辦法》等政策文件，容許水價維持「准許成本加合理收益」，將會進一步加強自來水供應運營商的優勢，對集團業務的健康發展，提供了強而有力和可持續的政策保障。



BEWG's desalination plant project in Adelaide, Australia
北控水務位於澳洲阿德萊德的海水化淡廠項目

Cultivating a Culture of Water Conservation

The low cost of tap water in China often leads to indifference towards conserving what has become an increasingly valuable resource. With the current water production system, it is necessary to regularly maintain and replace the pipe network. Yet, the cost of upkeep exceeds what the government generates in water charges. Inadequate maintenance of old pipes often leads to the waste of valuable water resources. However, the public may not react favourably if tap water prices are raised.

Li notes the Chinese government is aware of this problem. Therefore, it issued two policy documents, namely “Measures for the Administration of Urban Water Supply Prices” and “Measures for the Supervision and Examination of the Pricing Cost of Urban Water Supply”. The outcome from these measures has meant by the end of 2021, water charges are being maintained at levels that can cover costs, which still generates reasonable revenue for operators. Li believes the policy will strengthen their advantage in the water supply industry. “In the future, we expect to see more flexible and dynamic water charging schemes that can cover the relevant maintenance expenditure,” he says. However, unlike the water supply business, there are currently no charges imposed on users for water treatment. The funding comes mainly from government subsidies. Furthermore, there is a lack of revenue from user-generated payments.

“Water treatment projects require a significant capital investment and need to follow regulatory requirements,” Li says. For example, a water treatment infrastructure must be designed to last a certain number of years of service in order for it to be cost-effective. As such, it is necessary to find a sustainable user-paid charging model, says Li.

Innovation is the Name of the Game

Innovation is key for BEWG to continue growing and staying ahead in the market, Li says. The company has created an open innovation platform so that employees can openly share their ideas and brainstorm about how to turn innovations into real-world solutions. By the end of 2021 the company held 772 patents (including 646 applications, 115 authorised inventions and 11 designs), 420 software copyrights and six scientific and technological trademarks. Current research focuses on sewage biological treatment technology, overflow pollution control technology, sewage membrane treatment technology, ecological improvement, pollution load reduction technology and low-carbon sewage treatment technology.

Bridging the Talent Gap Through Collaborative Training

A combination of a fast-growing industry and evolving technology has led to a talent shortage across the entire scope of the water management industry. To bridge this talent gap and train the next generation of water professionals, BEWG has established the BEWG



他預計，未來水費核算機制將更加全面，能覆蓋相關維修支出。但與供水業務不同，目前內地水環境綜合治理的收費來源，主要還是政府財政支撐，缺乏類似水務項目的來自使用者付費的收入機制。由於水環境綜合治理項目普遍投資體量較大，而且根據國家政策要求，綜合治理項目需要具備一定的運營期來保證治理效果的可持續，因此需要尋找可持續的、用者自付的收費模式。

科技創新 在競爭中勝出

產業升級離不開科技創新，李海楓認為，對於北控水務這樣的中國企業，如果想要繼續提升影響力，僅擴大規模仍不足夠，必須要有領先行業的技術能力，才能在競爭中真正勝出。據悉，集團已構建開放式科研平台，將研發成果產品化。截至2021年底，集團累計持有專利772項（包括646項實用新型專利，115項授權發明專利，11項外觀設計專利），420項軟件著作權，以及6個科技商標。他透露，污水生物處理技術、溢流污染控制技術、污水膜處理技術、生態提升與污染負荷削減技術、低碳污水處理技術等為目前的研究方向。

產教融合助力解決行業人才缺口

隨著市場規模迅速擴張，行業技術創新要求也不斷提高。他坦言，內地水資源行業人才存在缺口，集團於是與內地高校聯合設立北控水務學院，聯合招生，共同培養水務人才。北控水務將企業中的專家、學者派到校內出任課外講師，按照由北控水務與高校聯合編制的水務教材進行教學，並以水廠作為學生的實習基地。

與此同時，高校在技術研發投入極高，有需要將科研成果轉化成商業產品或服務，因此必須在企業與高校間建起一座橋樑。在此背景下，北控水務於2016年發起成立了中國生態環境產教聯盟，多家高校和200餘家企業在聯盟中有效交流，促進科技創新，產業升級。

Institute. BEWG also collaborates with various universities. For example, BEWG experts visit different universities to deliver lectures based on teaching materials compiled by BEWG and the universities. Students also benefit from onsite visits to BEWG's water plants where they learn by first-hand observation.

With technological research and advancement, Li believes it is imperative to work closely with education institutions to commercialise technologies and develop products and services. In 2016, BEWG established the China Ecological Environment Industry and Education Alliance. Since it was established, more than 200 enterprises, universities, and education entities have joined the alliance and exchanged views. As a supportive and active participant in the industry, in 2021 alone BEWG participated in 130 activities organised by different industry associations and organisations while also serving as the director of the Intelligent Water Professional Committee of the China Water Association.



Beijing Liangshui River ecological restoration project
北京凉水河水生態環境治理項目

Separately, BEWG also contributed to the content and publicity of the "smart water affairs" section of the "Urban Water Affairs 2035 Industry Development Planning Outline", a government-issued work plan for the development of water resources in China.

Strategic Business Development

With its vision firmly focused on the future, Li says BEWG will continue to expand two main business lines – municipal water affairs and comprehensive water-environment management. "Our framework for bringing water management back to a healthy state is based on a three-pronged approach: taking care of water assets, encompassing overall planning and improving efficiency; ultimately this will make the water industry more efficient," Li says.

Known as the water stewardship framework, this concept has been adopted by the Three Gorges Group and is currently being piloted in multiple cities including Kunshan and Shiyuan.

除培育新一代水務人才，北控水務還深度參與行業研究分析、行業評選選和行業論壇，與行業夥伴及科研機構積極交流經驗。2021年，集團便參與130個行業協會和組織，並擔任中國水協智慧水務專業委員會主任單位。另外，北控水務組織了《城鎮水務2035年行業發展規劃綱要》中智慧水務板塊的編制和宣貫，規劃和指引了智慧水務行業的發展。

戰略佈局

展望未來，李海楓透露，集團將積極擴大市政水務和水環境綜合治理兩大主營業務。他說：「首先，我們提出的城市水管家模式，以城市水資產為基礎，以整體籌劃、系統治理、精準投入和效率提升為導向，提升全城水業態的資產效能，最終實現一個區域的生態與產業、支付與治理的統一。這個理念得到三峽集團的充分認可，目前集團正在崑山、十堰等城市積極探索城市水管家模式試點。」

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To expand its strategic deployment, BEWG is also developing smart water systems. With the help of the cloud, IoT monitoring, big data analysis and other technologies, the company can centrally manage around the clock operations such as aeration and upgrading at 347 sewage plants.

Compared with urban areas, Li explains, sewage treatment facilities in rural villages and small townships are insufficient. Currently, the business model, charging standards and payment methods of sewage treatment in rural regions are still not well defined. "Some infrastructure construction is easily abandoned," he says. At the same time, populations centred in villages and rural towns are much smaller than those of urban areas. "There are still many uncertainties about what sort of sewage treatment technologies would be most effective for these areas, and it will take some time to figure it all out," says Li.

Despite such challenges, Li says BEWG would also address inadequate sewage treatment facilities in rural areas in the future, particularly the role of pipes which are vital in maintaining water safety, ecology and resource management. "Pipes are vital to the water industry's supply chain and one of the most important aspects of BEWG," Li notes. BEWG's many years of experience in the world of pipe networks has been put to good use on projects including the rural sewage treatment public-private partnership (PPP) project in Yixing, a prefecture-level city of Wuxi in southern Jiangsu province. **M**

— Jimmy Chow
Journalist

第二個戰略部署是發展智慧水務。集團現已利用雲端平台、物聯網監控、大數據分析等技術，全天候管理污水廠運作，已將347個污水廠站數據實時上載到雲端平台作全智能管控，智能化執行曝氣、提升、加藥等重點工序。

他續稱，村鎮的污水處理仍是一個較為空白的藍海市場。目前，村鎮污水處理的商業模式、收費標準、付費方法等仍然沒有很好的定義，一些基礎設施建設後很容易遭到廢棄。同時，村鎮人口相較城市人口少很多，其技術路線、設備設施都需要反覆的調研、推敲和試錯。北控水務在也會持續開發村鎮污水處理市場和業務。

在管網業務方面，排水管網作為雨水、污水收集設施，對於城市水安全、水生態、水資源有重要作用，是北控水務專業鏈中至關重要的一環。北控水務經過多年發展，積累了大量的管網技術、建設、營運經驗，並擁有包括宜興市城鄉污水管網PPP項目在內的多個管網項目。 **M**

— Jimmy Chow
記者



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