



BEWG
北控水务



2021 | Sustainability Report

Beijing Enterprises Water Group Limited

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This report is a non-financial report issued by Beijing Enterprises Water Group Limited. It aims to respond to the expectations of stakeholders and demonstrate the Group's concept, management, action and performance of environmental, social and governance ("ESG") and sustainable development. This report has been reviewed and approved by the Board of Directors, and there are no false records, misleading statements or major omissions in this report.

Reporting period

The reporting period is from January 1 to December 31, 2021. Information beyond this period is indicated in such sections.

Reporting scope

All information and data are from Beijing Enterprise Water Group Limited and its subsidiaries. The data covers headquarters and subsidiaries as cited in the Annual Report and Consolidated Financial Statements. Data outside of this scope is indicated in such sections.

Abbreviations

For ease of writing and reading, this report refers to Beijing Enterprises Water Group Limited as the "the Company", and Beijing Enterprises Water Group Limited and its subsidiaries as "BEWG", "the Group" or "We".

Data explanation

All information and data are from the Group's internal collection and statistics, and statistical reports provided by subsidiaries. Unless otherwise specified, the currency unit in this report is CNY.

Reporting guidelines

This report is in accordance with the requirements of *Appendix 27 Environmental, Social and Governance Reporting Guide (ESG Reporting Guide)* of the *Rules Governing the Listing of Securities on The Stock Exchange of Hong Kong Limited*, with reference to the *GRI Sustainability Reporting Standards (GRI Standards)* issued by the Global Sustainability Standard Board (GSSB).

Confirmation and approval

After confirmation by management, this report was reviewed and approved by the Board of Directors of the Company (hereinafter "the Board") on March 30, 2022.

Access to this report

This report is available in English and Chinese on the website of the Company (<https://www.bewg.net/en/>). In case of any conflict or inconsistency between the Chinese and English versions, the Chinese version shall prevail; in case of any conflict or inconsistency between this report and the annual report of the Group, the annual report shall prevail.

BEWG pursues corporate sustainability as the ultimate strategic goal. By virtue of building ESG governance framework and formulating ESG institutional system, BEWG has established effective mechanisms for sustainability governance and management, creating environmental, social and corporate value with long-term stability.

The Board is the highest decision-making body for BEWG's ESG matters and assumes full responsibility for ESG strategy and reporting. The Audit Committee under the Board is responsible for implementing the various ESG resolutions of the Board, formulating ESG management systems and strategies, reviewing ESG-related risks and overseeing the implementation of specific ESG matters. In order to ensure the implementation of daily ESG management, BEWG has established an ESG Working Group. Under the authorization of the Board, the ESG Working Group is responsible for coordinating the management and implementation of various functional departments and subordinate units on relevant sustainability issues, and regularly reporting the progress of ESG work to the Audit Committee and the management. Each functional department is assigned with its respective sustainability tasks and responsible for the management and implementation of ESG issues. Each subordinate unit has designated specialized personnel to be responsible for ESG implementation and related data statistics and information collection.

We attach high importance to the identification of ESG material issues and optimize communication approaches of stakeholder engagement. We regularly identify and assess ESG material issues, discuss and approve the assessment results at the Audit Committee meetings, and determine the ESG materiality matrix in the year.

In 2021, we launched the specialized research on climate change, included the responsibility of managing climate-related risks in the existing corporate risk management framework, and clarifies the management procedures for climate-related risks. We identified key climate-related risks and opportunities and put in place corresponding countermeasures. We actively responded to the national "dual carbon" goals by conducting carbon reduction practices and research in multiple areas and formulating detailed carbon reduction pathways. The achievement of relevant goals is overseen and reviewed by the Board.

This report has fully and truly disclosed the ESG progress and achievements of BEWG in 2021. This report, submitted by the Audit Committee, has been reviewed and approved by Board of Directors on March 30, 2022.

Message from the Chairman

The year of 2021 marks the start of the 14th Five-year Plan. The progression of ecological civilization has entered a critical stage where carbon reduction is a key strategic direction, the synergy of pollution and carbon reduction should be promoted, the overall green transformation of economic and social development should be advanced, and the improvement of ecological and environmental quality from quantitative to qualitative change should be achieved. 2021 is also a key year of reform for BEWG. Under the guidance of an asset-light strategy and in the spirit of rectitude and innovation, we followed the business purpose of “customer orientation through innovation capability”, took a swath of innovative measures in market investment system reform and regional reform, and expanded customer connectivity. We continually enhanced delivery and operation capability, served the society with tangible actions, and embarked on the path of high-quality development while steadily promoting asset-light transformation.

In alignment with the sustainability philosophy of “cleanness, good governance and mutual aid”, BEWG holds high standards in water treatment and contributes to the construction of a beautiful China guided by deeply integrating corporate

development and social value. In 2021, BEWG made fruitful achievements, being included in the constituents of the Hang Seng Corporate Sustainability Benchmark Index, BBB ESG rating by MSCI (highest rating in the Chinese water sector), a new record in CDP rating. The sustainability performance of BEWG has been fully recognized by the capital market, further enhancing our influence in the capital market.

In response to the national call for ecological civilization progress as well as scientific and technological development, BEWG sticks to independent innovation and explores development paths of coordinated innovation. BEWG also upgrades scientific and technological innovation systems, delivers scientific and technological results and continually promotes the high-quality development of the water industry. As a state-owned enterprise under Beijing Municipality and leading industry player, BEWG actively responds to the “3060 carbon peak and neutrality” goals, assumes corporate responsibility, explores the pathways of carbon sink in water factories, and constantly enhances economic and social benefits. BEWG adopts multiple measures to boost energy conservation and consumption reduction with technological innovation and streamlined operations, leads industry development and makes due share of contributions to national “dual carbon” goals.

In the historically critical period of fully promoting ecological civilization, BEWG follows the business purpose of “customer orientation through innovation capability”, seizes major strategic opportunities, and lives up to the mission and responsibility. Join hands with customers, employees, member enterprises, and partners, BEWG is faithfully committed to becoming a world-class water environmental service provider deeply trusted and leading the development, making continued efforts to achieve the two centenary goals and national rejuvenation.

Chairman of the Board of BEWG
Mr. Li Yongcheng

Message from the CEO

As a leading enterprise dedicated to water recycling and water protection, BEWG closely follows the path of national ecological civilization progress, upholds the concept of “lucid waters and lush mountains are invaluable assets”, and sets the ultimate goal of protecting and improving ecological environment. In 2021, in line with the business purpose of “customer orientation through innovation capability” and the mid-long term strategic goal of “consistently acquiring and managing assets in large amounts, applying technology and innovative models to new business growth, boosting operational efficiency and realize corporate sustainability”, BEWG has built a customer-oriented and market-based organizational framework. BEWG has built a brand new market expansion system, strengthened delivery teams, and optimized operation and management systems to improve corporate governance.

Climate change has emerged as one of the global primary challenges, so BEWG places weight on climate-related risk prevention and control. The Group fully identified, assessed and analyzed climate-related risks in 2021. To deal with extreme weather events such as extreme rainfall, BEWG strictly implements the approach of “preparation, handling and review”, prioritizes personal safety, water safety, water security and property security, making every effort to ensure water supply with stable quality. BEWG is deeply aware that the “3060 carbon peak and neutrality” goals are intrinsic requirements of sustainable development, so BEWG has voluntarily set up the low-carbon research groups to tapping into the carbon reduction potential of the Group. Targets and pathways relating to carbon reduction have been put in place in all business modules of the Group, in a bid to achieve low-carbon whole-process management ranging from construction to operation.

BEWG always sticks to people-oriented philosophy, emphasizes the development of excellent talents and values talent cultivation. As a strong champion and pioneer for the integration of production and education, BEWG actively deploys industrial academies, promotes resource sharing as well as the integration of production and education, so as to cultivate application-oriented, inter-disciplinary and innovative talents for the industry development. In response to the national science and technology

Chief Executive Officer of BEWG
Mr. Zhou Min

development strategy, BEWG has been increasing investment in science and technology innovation to steadily improve the comprehensive production efficiency and competitiveness of the Group. In the era of big data, BEWG has actively promoted digital transformation. BEWG highly values information security, resolutely safeguards and protects users' privacy rights, and comprehensively implements information security and data security protection by continuously improving information security management

Based on the theory of “lucid waters and lush mountains are invaluable assets”, and adhering to the corporate mission of “vitalizing your life with our new water services”, BEWG firmly follows the path of green development that prioritizes ecological protection. With the basic principle of “providing excellent operational services to our customers”, we insist on technological innovation, value talent cultivation and explore the path of low-carbon development. We are committed to becoming a world-class water environmental service provider deeply trusted and leading the development, contributing to the realization of a modern and beautiful China where people live in perfect harmony with nature.





1

Sustainability overview

About us

To stakeholders

Sustainability management

ESG

About us

BEWG is a comprehensive and leading professional water and environment service provider with business covering industrial investment, design, construction operation, technical services and capital operation in full industrial chain. Focusing on water recycling and water-related environmental protection, BEWG is a top player in the industry in China by total assets and total revenue. BEWG ranks No.1 in Asia and No.2 in the world in terms of water treatment capacity.

The Group dives into water-related environmental protection, strives to consistently acquire and manage assets in large amounts, and applies technology and innovative models to new business growth, boost operational efficiency and realize corporate sustainability. Focusing on sewage treatment, water supply and other fundamental businesses involving assets in large amounts, the Group actively explores and incubates new business sectors including pipeline network construction, transforming sludge, kitchen waste, and wastewater into resources, financial services, specialized services, industrial water, deodorisation, services in villages and towns. We also focus on technology services, financial services, education services, sanitation and hazardous waste treatment and clean energy.

The Group's strategic headquarter is located in Beijing, capital headquarter in Hong Kong, and innovation headquarter in Hangzhou. The Group has a presence in 31 provinces, autonomous regions, municipalities and special administrative regions, covering more than 100 prefecture-level cities¹. Overseas operations cover more than 30 cities in eight countries including Malaysia, Singapore, Australia, New Zealand, Portugal, Angola, Botswana and Sri Lanka, serving over 7 million customers.



The Group has a presence in **31** provinces, autonomous regions, municipalities and special administrative regions



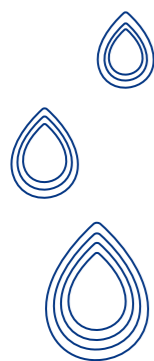
Covering more than **100** prefecture-level cities



Overseas operations cover more than **30** cities in **8** countries including Malaysia, Singapore, Australia, New Zealand, Portugal, Angola, Botswana and Sri Lanka



Serving over **7** million customers



¹ Water plants covers 20 provinces, five autonomous regions and four municipalities in Chinese mainland.

About us

Honors and awards of BEWG in 2021

Included in the Fortune 500 List of China for six consecutive years;

Ranked first in the “Top Ten Influential Enterprises in the Water Sector in China”, selected by the E20 Environmental Platform for 12 consecutive years;

Winner of the “Most Honored Company” in the All-Asia Executive Team rankings, issued by Institutional Investors, for eight consecutive years;

Winner of the “Top 50 Chinese Environmental Enterprises” by the Environmental Chamber of Commerce of the All-China Federation of Industry and Commerce for the third consecutive years;

Granted BBB ESG rating by the world’s largest index company MSCI;

Rated B in the CDP climate change questionnaire;



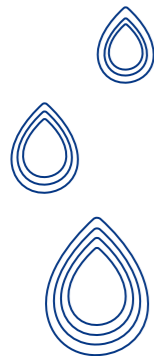
Included in the constituents of the Hang Seng Corporate Sustainability Benchmark Index for the first time;

Winner of the “Best Infrastructure and Public Utilities Company” award at the Golden Hong Kong Stock Awards;

Winner of the “2021 China Industry-University-Research Cooperative Innovation Demonstration Enterprise” by the China Industry-University-Research Institute Collaboration Association supervised by the State-owned Assets Supervision and Administration Commission of the State Council and founded by relevant authorities such as the National Development and Reform Commission, the Ministry of Education, the Ministry of Science and Technology, the Ministry of Ecology and Environment, the Chinese Academy of Sciences, and the Chinese Academy of Engineering, together with numerous universities, research institutes, and enterprises;

Winner of the 2020-2021(12th) China Talent Development Awards-Ecological Empowerment Award by the Training Magazine under Xinhua Daily Media Group;

BEWG Education Center was awarded the 2021 (17th) “Top 100 Education Advanced Units in China”, the “Best Learning Program for China Enterprise Training - China Environmental Industry Senior Manager Seminar”, and “Best Learning Program for China Enterprise Training – National Water Plants (Water Distribution/ Sewage Treatment) Enterprise Management Seminar” by the organizing committee of the China Enterprise Education Top 100 Units.



About us

Business highlights of BEWG in 2021



Total revenue
27.9 billion HKD



Total design capacity for new projects
3,960,221 tons/day



Total design capacity
44,885,962 tons/day



Number of sewage treatment plants and village/town sewage treatment facilities
1,116



Number of water distribution plants
191



Number of reclaimed water treatment plants
61



Number of seawater desalination plants
2

Contributions to the industry

BEWG mobilizes corporate resources, deeply involves in industry research and analysis, industry competitions and forums, actively share experience with industrial partners and scientific institutions, promoting industry prosperity. In 2021, the Group was a member of 130 industry associations and organizations, with a total of RMB 1.57 million annual expenditure. As a director unit of the Smart Water Committee of the China Urban Water Association, BEWG participated in the compilation and publicity of the intelligent water of the *Outline Development Plan for Urban Water Industry by 2035*, planning and guiding the development of the intelligent water sector.

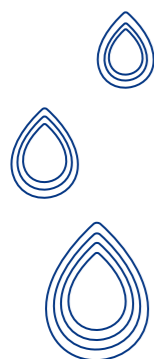


In 2021, the Group was a member of
130 industry associations and organizations

The total annual expenditure was
RMB **1.57** million

BEWG's participation in the compilation of industry standards in 2021

Five national standards	Five group standards
<ul style="list-style-type: none"> • <i>Water Reuse Guidelines -- Wastewater Reclamation Technologies and Processes Evaluation Method</i> (Released) • <i>Water Reuse Guidelines -- Water Quality Management for Water Reclamation Plants</i> (Released) • <i>Technical Requirements for Operation Performance Evaluation of Rural Domestic Sewage Treatment Facilities</i> (Released) • <i>Water Reuse Guidelines -- Guidelines for Benefits Evaluation of Reclaimed Water Use</i> • <i>Technical Guidelines and Management Requirements for Environmental Use of Reclaimed Water</i> 	<ul style="list-style-type: none"> • <i>Technical Guidelines for River -- Lake Ecosystem Conservation and Restoration Engineering</i> (Released) • <i>Technical Manual for Compiling Technical Scheme of Urban Black and Odorous Water Body Treatment</i> (Released) • <i>AOC Test Method Based on Flow Cytometry</i> (Released) • <i>Communication Technical guidelines for Automatic Monitoring System of Water Environment and Water Treatment</i> (Released) • <i>Carbon Source for Wastewater and Sewage Treatment</i> (Released)



About us

Ecological cooperation

Guided by our ecological strategy, BEWG strongly supports multi-party cooperation and external product and technology cooperation to create an industry ecology and achieve mutual benefits. We also play a leading role that helped by the advantages of universities and research institutes in scientific and technological cooperation channels, talents and platforms to explore new models of external scientific and technological cooperation and promote the deep integration of industry, academia and research.

Highlights of product and technology cooperation of BEWG in 2021

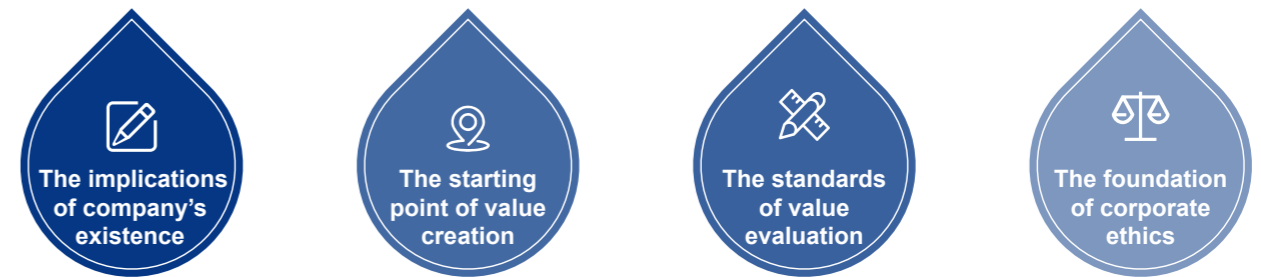
- Engaged in the Research and Development of special water treatment agents together with the Institute of Chemistry, Chinese Academy of Sciences;
- Engaged in the “Research and Development of Media-enhanced Coagulation Technology” together with Harbin Institute of Technology;
- Engaged in the “Research and Development of the OAO Efficient Decarbonization and Denitrification Technology Based on Novel Fillers” together with Shanghai Fanqing Environmental Engineering Co., Ltd and Beijing University of Chemical Technology;
- Carried out the “Water Ecosystem Health Assessment and Ecological and Environmental Benefit Assessment of Yuhangtang River” together with Hangzhou Normal University;
- Engaged in the “Research and Development of LED Spectral Water Quality Sensor” together with Nanjing Tongkai Environmental Protection Technology Co., Ltd;
- Engaged in the “Research and Development of Ultrasonic Sludge Treatment Technology” together with Hangzhou Ruili Acoustic and Electronic Technology Co., Ltd;
- Engaged in the “Research and Development of Ceramic Membrane Water Purification Technology and Equipment” together with Shandong Industrial Ceramic Research & Design Institute Co., Ltd;
- Engaged in the “Development of Belnterceptor™ for Smart Intercepting Well” together with Supumps Environmental Technology Co., Ltd.



Customer orientation

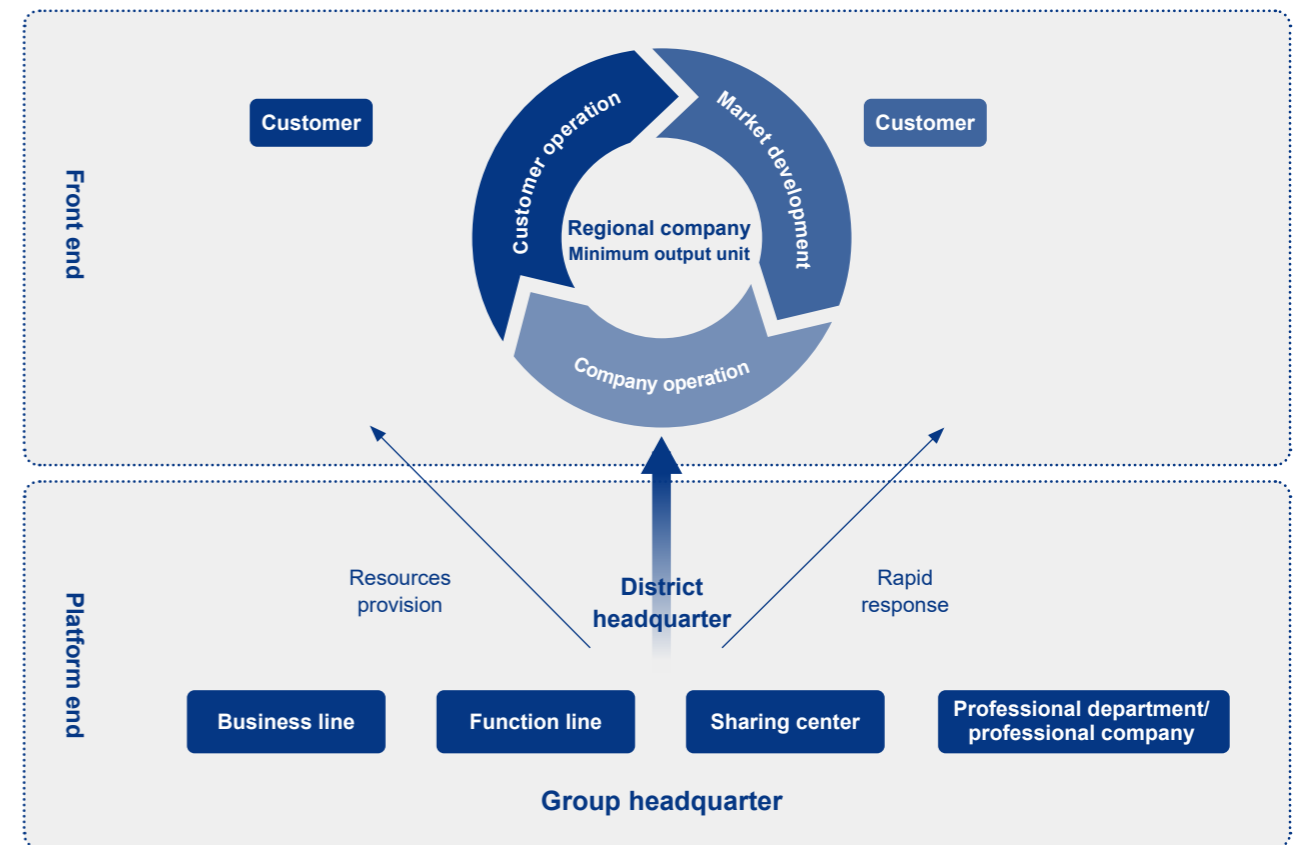
In 2021, BEWG proposed the philosophy of “customer orientation”. The idea of customer orientation starts and ends with meeting customers’ needs, as well as the original aspiration for BEWG to create value. “Customer orientation” is a philosophical business idea, which implies that the purpose of corporate development strategies, vision plans, management models, business processes is to empower customers to create more value.

There are four aspects to interpret “customer orientation”.



We have formed a complete closed-loop which focuses on meeting customer demand from beginning to end.

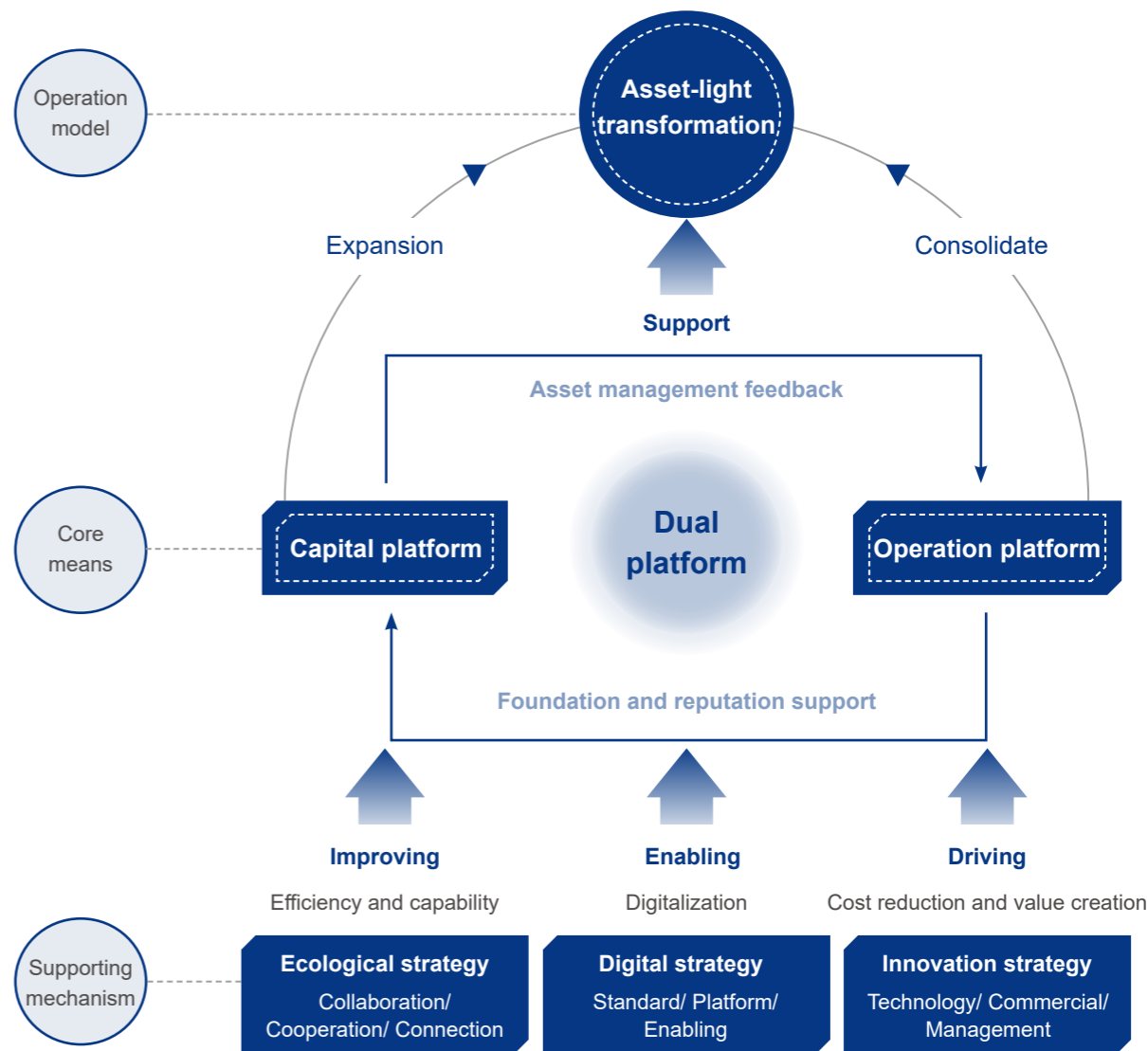
In 2021, the Group initiated the reform aimed at the headquarters and major regions, built a regional organization which is more relevant to the market and customers and formed a three-tier structure of “the Group – District - regional companies”. In addition, we deeply tapped into the stock market, explored customer demand, summarized customer interaction interfaces and processes, addressed customers’ pain points, improved the efficiency of service response, and designed a customer relationship management (CRM) system for the whole process of customer demand and service management.



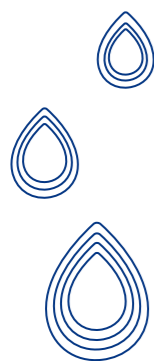
The three-tier structure of “the Group – District - regional companies”

To stakeholders

Facing the unprecedented change in a century, BEWG stays true to environmental protection and water treatment to serve national strategies, contributes efforts to the “Three Critical Battles”, safeguards lucid waters and lush mountains, and contributes to the Beautiful China initiative. In 2021, BEWG continued to improve comprehensive strength, enhance core operation capability, promote “dual-platform” strategy of building an asset management platform and an operation management platform. BEWG worked towards an asset-light enterprise, advancing the transformation from company-based platform to platform-based company.



BEWG, as an integrated professional water services and environmental protection services provider, relentlessly builds the “dual platform” strategic model featuring the asset management platform and operation management platform and firmly promotes the gradual transformation of the asset-heavy operating model to an asset-light one, with the strategic vision of the Group as the starting point, the sustainability concept as the driving force and the ecological strategy, digital strategy and innovation strategy as the support. BEWG is committed to building a pan-centralized community of share future with strong vitality, scale expansion, and consolidating foundation, thus achieving corporate sustainability.



To stakeholders

Sustainability highlights of BEWG in 2021

Environmental



Proportion of star-level water plants

Over **95%** for above one-star-level water plants
 Over **30%** for above three-star water plants

Proportion of water self-supply

2.1%

COD reduction

920,644 tons

Ammonia nitrogen reduction

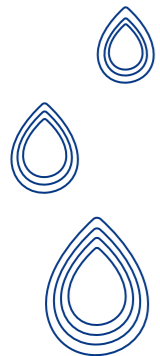
105,157 tons

Total phosphorus reduction

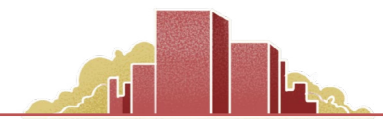
14,801 tons

Suspended solids reduction

683,108 tons



Social



Customer satisfaction

More than **90%** were extremely satisfied and satisfied

A total of

153,034 enrollments in safety training

A cumulative number of

420 software copyrights

A cumulative number of

772 patents

Number of patents relating to sewage and water supply businesses

391

Number of patents relating to new businesses²

38



Governance

No major corruption-related complaint cases

No major concluded legal cases regarding corrupt practices

90% of qualified direct suppliers obtained **ISO 45001/OHSAS 18001** certifications

² New businesses include ten major modules: 1. beautiful countryside; 2. pipe network; 3. sludge; 4. industrial water treatment and industrial park environmental governance; 5. wastewater reclamation and recycling; 6. urban water services or environmental property services; 7. intelligent or digital water services; 8. value-added water supply services; 9. supply chain or material supply services; 10. other specialized services.

Sustainability management



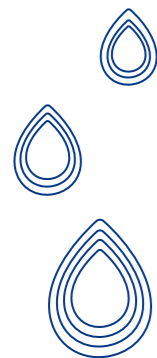
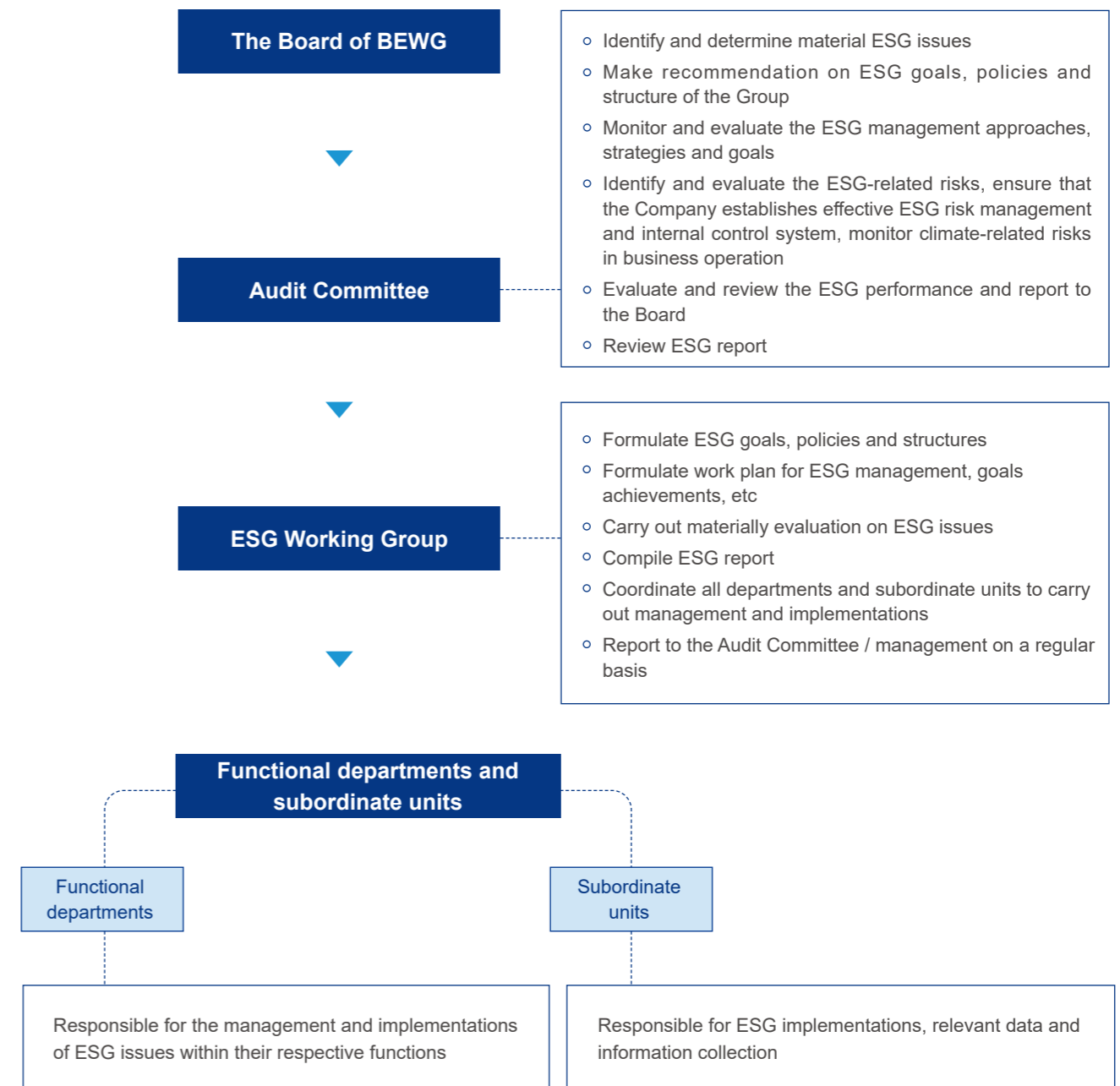
ESG management

For the best interests of all stakeholders, BEWG continues to improve ESG management system and governance structure and adheres to the *Corporate Governance Code* as set out in *Appendix 14 of the Listing Rules of The Stock Exchange of Hong Kong Limited* as well as relevant national and overseas regulatory requirements.

The Board, as the highest decision-making body of BEWG, sets the strategic direction, formulates overall strategic policies, monitors the work of management to actively safeguard the long-term interests of the Group and shareholders, leads the Group's progress. The Audit Committee under the Board is responsible for managing and monitoring ESG-related issues and risks of the Group, and reporting to the Board on a regular basis.² To ensure the deployment and implementation of the Group's daily ESG management, an ESG working group comprising various business and functional departments has been set up to report regularly to the Audit Committee and management on the progress of ESG-related work.

² For detailed responsibility scope, please refer to: <https://www1.hkexnews.hk/listedco/listconews/sehk/2020/04/16/2020041600791.pdf>

BEWG ESG governance framework



Sustainability management

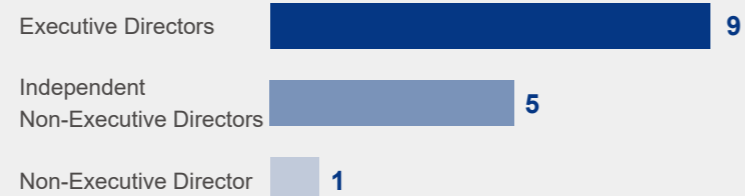
The positions of chairman and chief executive officer of BEWG are held by different individuals to better clarify their roles and duties. The Chairman takes charge of the Board, while the Chief Executive Officer (CEO) is responsible for operation management. In doing this, BEWG can ensure that the operation of the Board is independent from the business and daily management of the Group and that the Group can always operate on the right track. The Group confirms that each independent non-executive director complies with the independence guidelines under Rule 3.13 of the *Listing Rules*.

The Group highly emphasizes and recognizes the importance of board diversity and the Board has developed the *Board Diversity Policy* according to the *Listing Rules*. The board members are appointed based on merit to ensure they provide balanced skills, experience and diverse perspectives required by the Group. When nominating candidates, the Nomination Committee takes multiple factors into consideration, including but not limited to gender, age, cultural and educational background, professional experience, skills, expertise and length of service, and regular reviews on the implementation of board diversity.

As of the date of this report, the Board comprised nine Executive Directors, five Independent Non-executive Directors and one Non-executive Director. Among them, one Independent Non-executive Director possesses professional qualifications in accounting required by the *Listing Rules* of HKEX.



Position



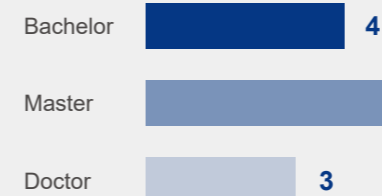
Gender



Age



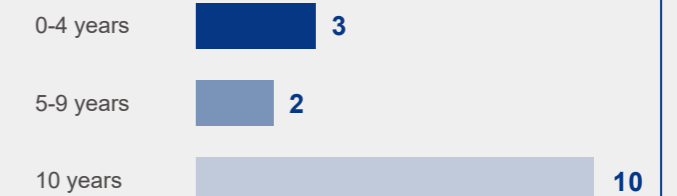
Cultural and educational background



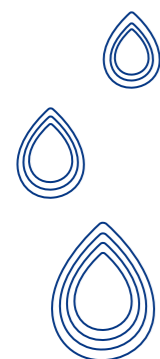
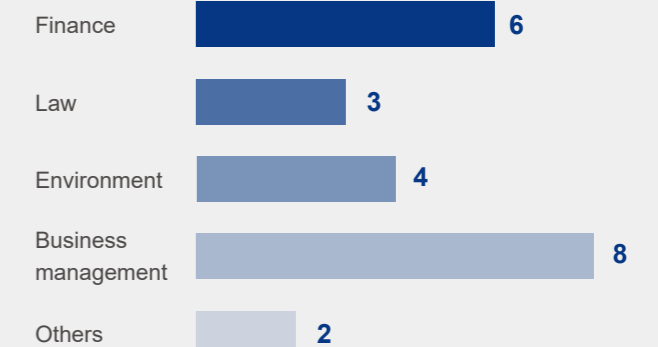
Directorship positions with other listed companies



Years of service



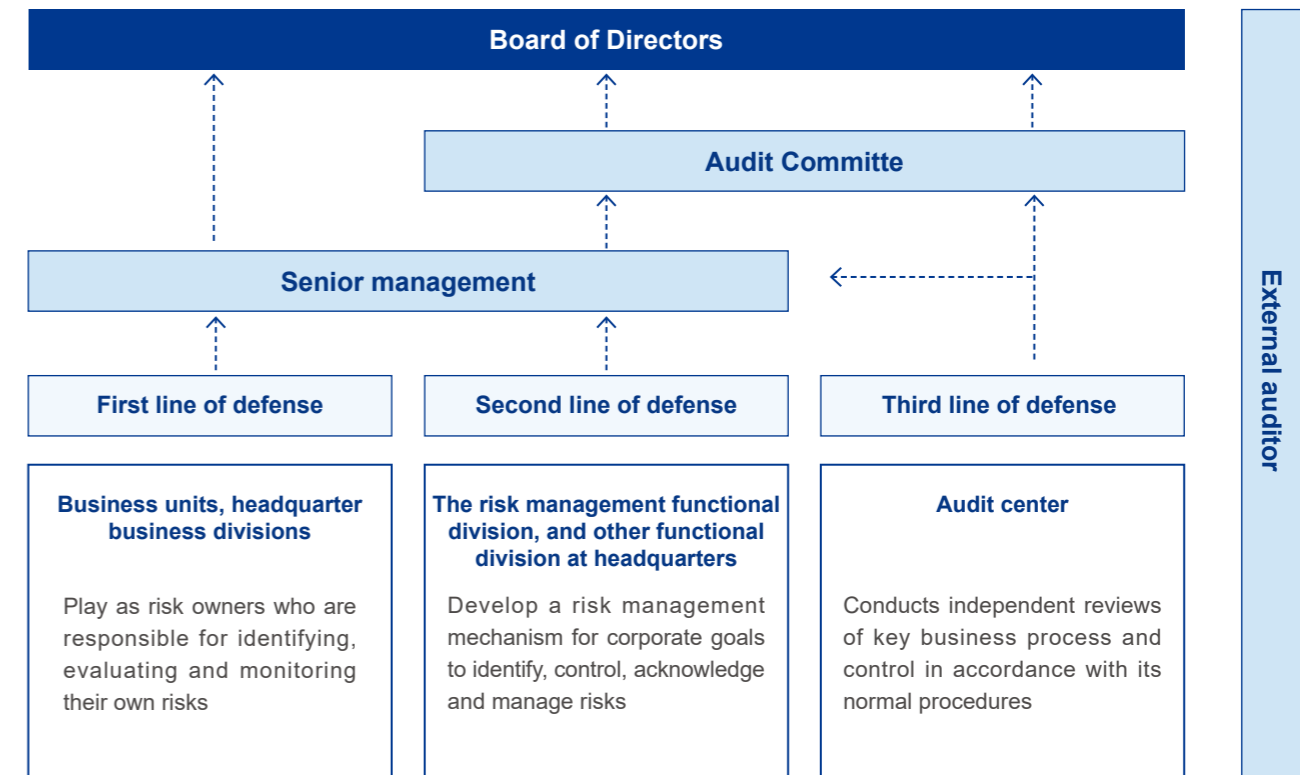
Professional background



Sustainability management

Risk management

A sound risk prevention and control system is the basic guarantee for the long-term stable corporate operation. The Board is fully responsible for assessing the nature and degree of risks that the Group may face and ensuring risk management and internal controls of the Group. The Board delegates to the Audit Committee to oversee the management design and implement the risk management and internal control system. Referring to the enterprise risk management framework formulated by the Committee of Sponsoring Organizations of the Treadway Commission (COSO), BEWG has established the “Three Layers + Three Lines of Defense” structure to clarify risk management procedures such as risk identification, risk assessment and risk handling.



In order to further standardize the Group's risk control, we have formulated the *BEWG Overall Risk Management System*, which specifies risk management processes such as risk information collection, identification, assessment and response, monitoring and early warning, supervision and evaluation.

BEWG places weight on environmental and social risks. To better identify and avoid risks, we have established an evaluation system for sustainability risks, which is led by the Audit Committee. Emerging risks such as environmental and social risks in the construction and operation of our products, services and water plants are identified and dynamically tracked to ensure that risks are effectively controlled. Prior to project investment, BEWG proactively includes local environmental, social and governance risks in risk identification, identifies potential risks that the Group may face in accordance with ESG-related policies and regulations, and adopts targeted contingency plans to avoid risks.

To raise the risk awareness of employees and enhance their capability of daily risks prevention, the Group organized 436 sessions of specialized training on risk in 2021, totaling 1,131 hours.



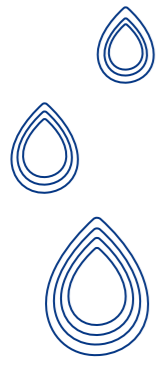
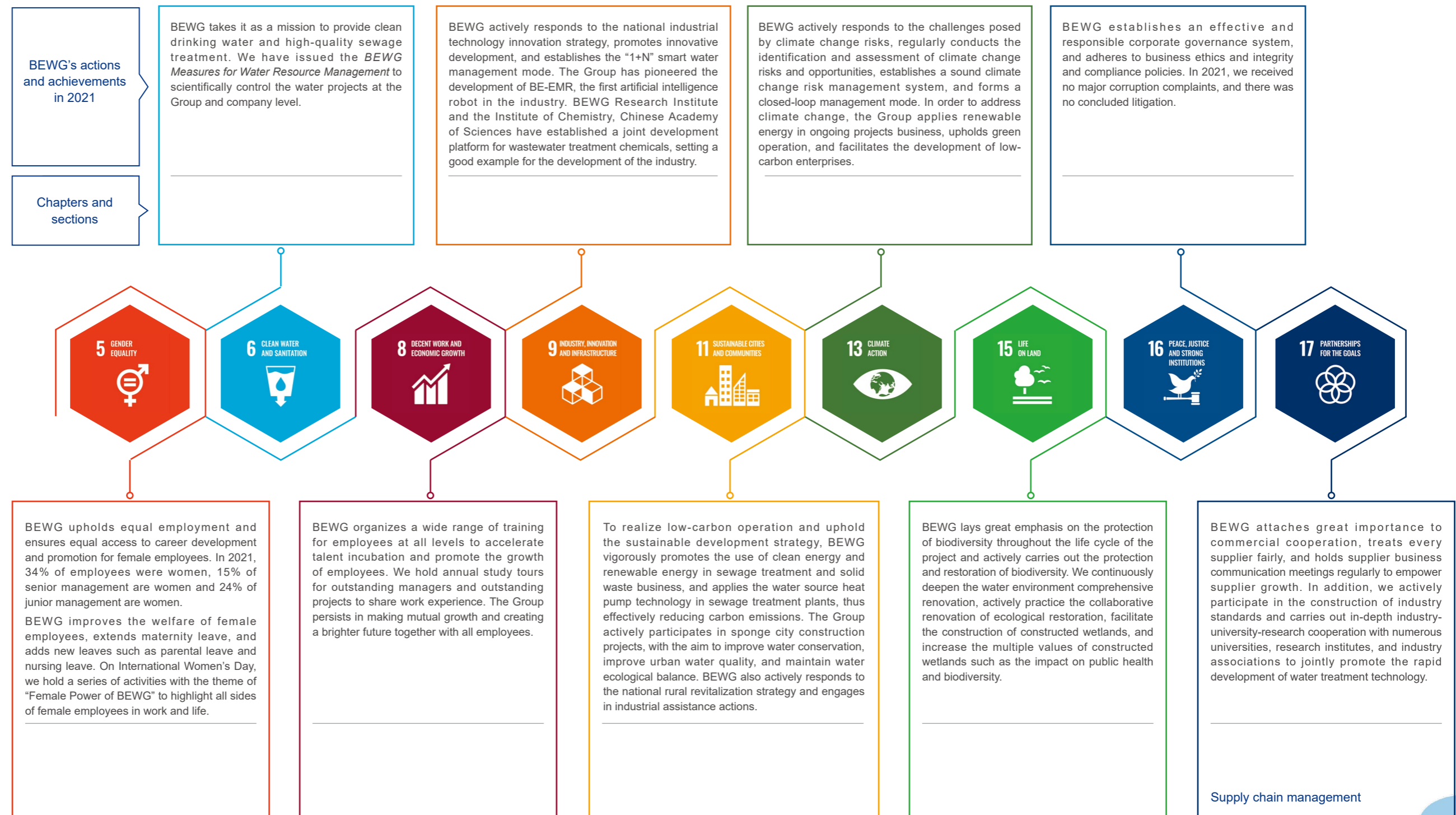
In 2021, the Group organized **436** sessions of specialized training on risk

Totaling **1,131** hours

Sustainability management

Commitment to sustainable development

In line with UN SDGs, BEWG has identified nine most relevant SDGs based on business characteristics and pledged to support and implement SDGs in the pursuit of corporate strategies and business operations.



Sustainability management

Stakeholder engagement

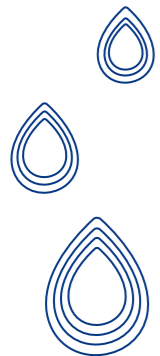
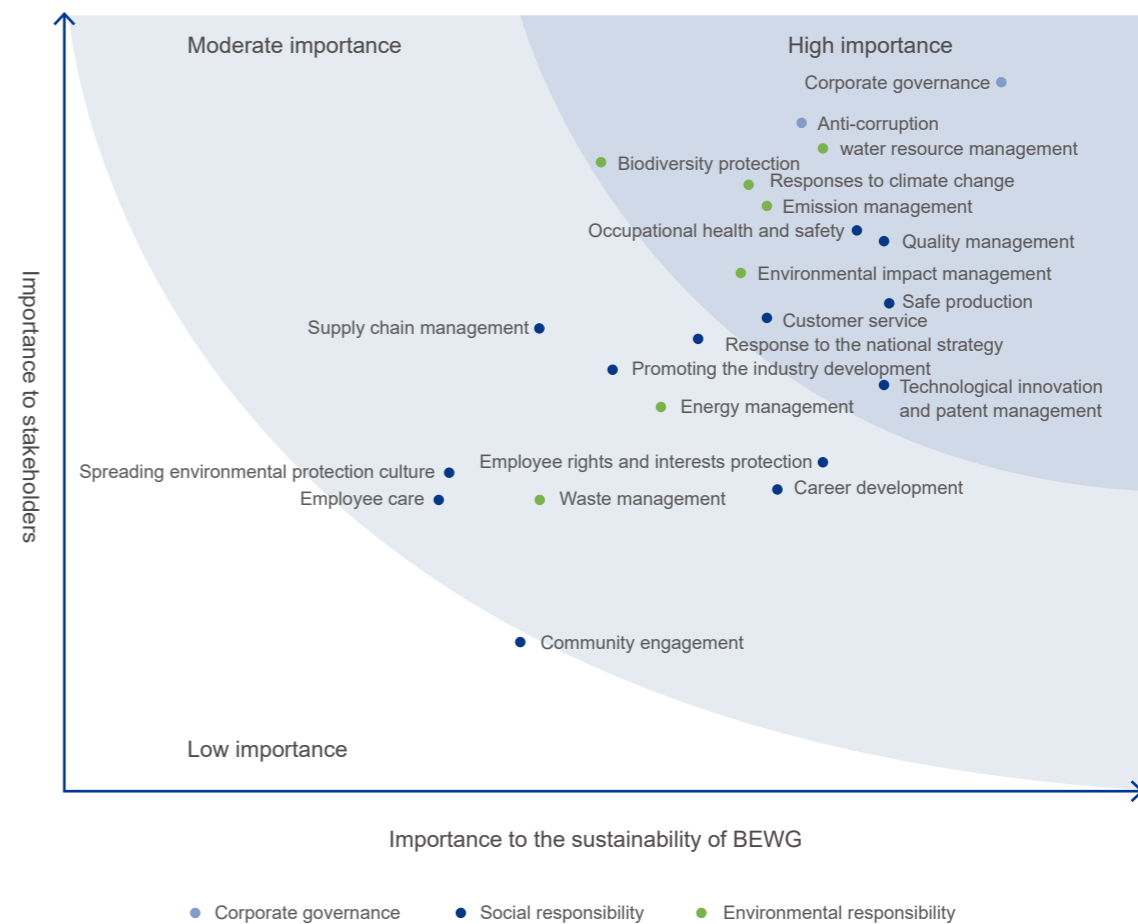
BEWG highly values expectations and requirements of stakeholders, improves the performance of the Group in a targeted manner by listening to opinions and suggestions of government, shareholders, customers, communities, employees and other stakeholder from multiple channels.

Stakeholder	Communication channel	Expectations and requirements	Actions and measures	Sections
Shareholders and investors	<ul style="list-style-type: none"> General meeting of shareholders Periodic reporting and announcements Investor communication meeting 	<ul style="list-style-type: none"> Compliant operations Continuous and stable investment return Enhance product and service quality Risk management Addressing climate change Corporate governance 	<ul style="list-style-type: none"> Accelerate the asset-light service transformation Improve ESG management system and governance structure Build customer service and quality assurance system Establish risk prevention and control system to implement risk control work Conduct climate-related risks identification and response 	<ul style="list-style-type: none"> To stakeholders ESG management Risk management Addressing climate change Quality assurance
Government and regulators	<ul style="list-style-type: none"> Disclosure of information Daily communication and reports On-site investigation Supervision and inspection Visit and reception 	<ul style="list-style-type: none"> Compliant operations Job creation Response to national strategy Enhance product and service quality Production safety and operation compliance Scientific and technological innovation Energy conservation and emission reduction 	<ul style="list-style-type: none"> Set up OKR incentive mechanisms for integrity and compliance Implement industry and employment assistance Respond to "dual carbon" goals to promote ecological civilization progress Safeguard stable production and operation Build intelligent control system Pursue low-carbon operation and develop low-carbon technology 	<ul style="list-style-type: none"> Topic 2: Responding to the national green strategy and contributing to environmental protection Low-carbon action Excellent quality Building a digital technology platform Supporting rural revitalization Code of business conduct
Customers	<ul style="list-style-type: none"> Customer satisfaction survey Visits and communication Customer activities 	<ul style="list-style-type: none"> Enhance product and service quality Disclosure of information Win-win cooperation 	<ul style="list-style-type: none"> Optimize customer relation management and provide 24/7 service hotline Disclose results of satisfaction surveys Carry out external product and technology cooperation 	<ul style="list-style-type: none"> About us Customer service
Employees	<ul style="list-style-type: none"> Labor contracts Asking for opinions Communication channels for career and safety Employee care activities Tailor-made training Anonymous communication channel 	<ul style="list-style-type: none"> Employee rights and interests protection Occupational health and safety Professional training and development Employee care Employee communication 	<ul style="list-style-type: none"> Create an equal and diverse working environment Ensure safety and health of employees Build multi-tier training system Provide competitive salary and non-salary benefits 	<ul style="list-style-type: none"> Talent management Safety and health
Industry	<ul style="list-style-type: none"> Launching and participating in industrial activities Sharing research results Constructing communication platforms Industry cooperation Technical exchanges 	<ul style="list-style-type: none"> Leading industry development Scientific and technological innovation Enhance product and service quality 	<ul style="list-style-type: none"> Undertake major national special projects and key research and development projects Participant in the formulation of national and industrial standards Make industry-leading technological innovations 	<ul style="list-style-type: none"> Topic 1: Building a BE+ technology family through innovative digital dual engines About us Innovation empowerment
Suppliers and partners	<ul style="list-style-type: none"> Public bidding Contracts and agreements Suppliers' meeting Suppliers' training 	<ul style="list-style-type: none"> Contract compliance Mutual benefits and win-win results Supply chain management Ecological cooperation 	<ul style="list-style-type: none"> Strengthen full lifecycle supplier management Adopt strict supplier access evaluation and process evaluation Conduct ESG risk assessment of suppliers 	<ul style="list-style-type: none"> Supply chain management

Community	<ul style="list-style-type: none"> In-person visits Charity activities Charitable donations Volunteer activities Open day event 	<ul style="list-style-type: none"> Community communication Community services Community investment Publicity of environmental protection ideas Compliant operation 	<ul style="list-style-type: none"> Support local community construction Conduct rural sewage treatment Build environment protection bases Conduct industry and donation assistance 	<ul style="list-style-type: none"> Contributing to society
The public	<ul style="list-style-type: none"> Open day event Public services 	<ul style="list-style-type: none"> Providing safe and reliable product Stable employment Publicity of environmental protection ideas 	<ul style="list-style-type: none"> Improve emergency response mechanisms and safeguard stable water supply Cultivate environmental protection talent for society Conduct popularization and education of environmental protection science 	<ul style="list-style-type: none"> Talent development Excellent quality Continuous environmental education
Research and academic institutions	<ul style="list-style-type: none"> Industry-university-research Integration Talent cultivation 	<ul style="list-style-type: none"> Talent cultivation Leading industry development Scientific and technological innovation 	<ul style="list-style-type: none"> Build industrial talent pipeline Build open science and technology innovation platforms and systems Carry out external product and technology cooperation 	<ul style="list-style-type: none"> About us Talent development Innovation empowerment

Materiality assessment

In 2021, BEWG sorted out and analyzed the issues of concern of the Company and in the industry included in mainstream ESG ratings of the capital market, and based on the communication with various stakeholders and the discussion and analysis of the management of BEWG, we reviewed the existing matrix and made no major changes.



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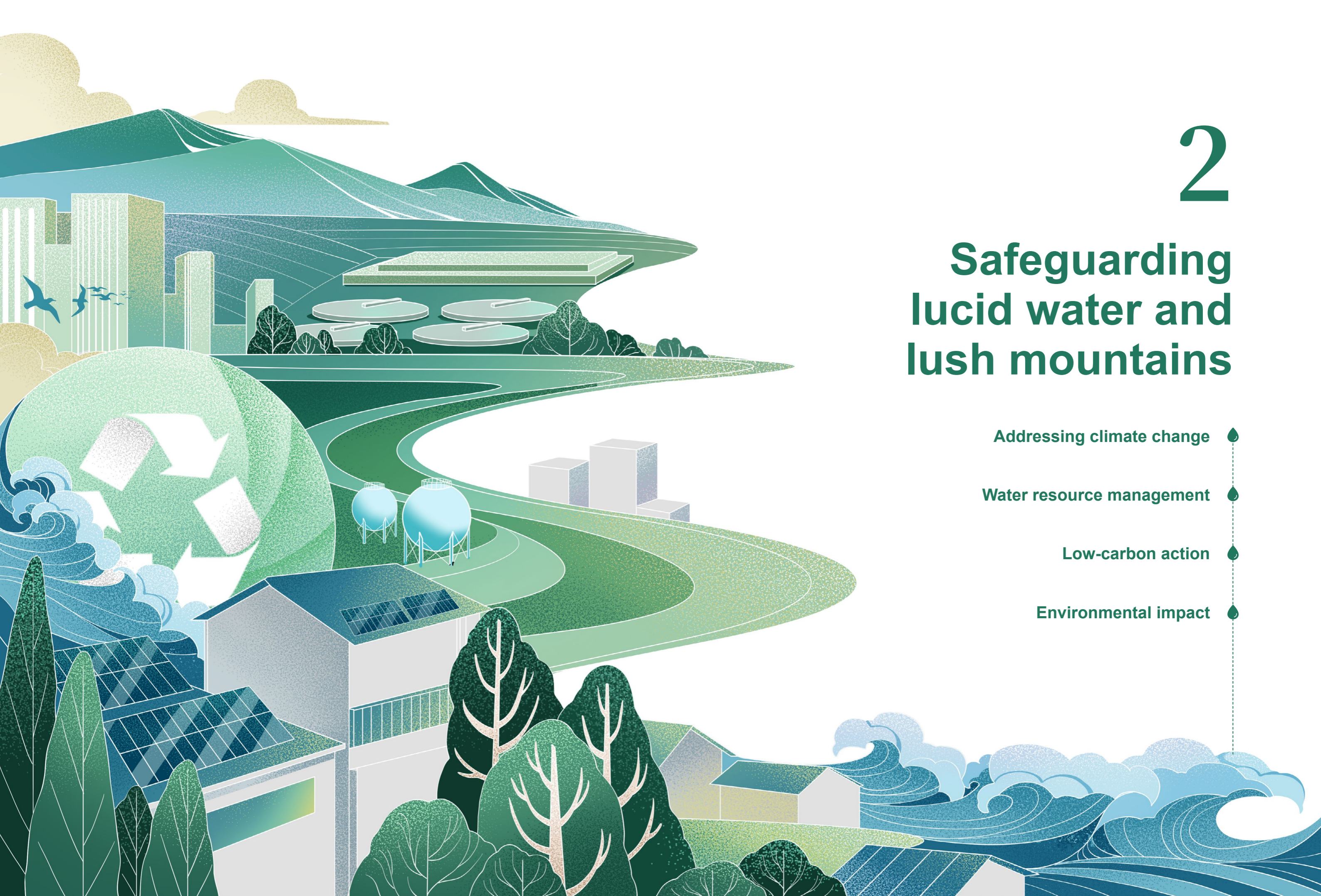
Safeguarding lucid water and lush mountains

Addressing climate change

Water resource management

Low-carbon action

Environmental impact



Addressing climate change

Climate change is a major global challenge facing mankind nowadays. BEWG fully recognizes that various risks posed by climate change will have an inevitable impact on our business operations in the foreseeable future. To address the challenges brought by climate change risks, BEWG has developed a sound climate change risk management mechanism, regularly conducted the identification and assessment of climate change risks and opportunities by referring to the TCFD⁴ guidance, and formulated corresponding risk response plans.

Risk management system

BEWG has integrated climate risk management responsibilities into the existing enterprise risk management framework, and clarified risk management procedures including risk identification, risk assessment, and risk handling (please refer to the section Risk Management for details). Based on the PDCA⁵ principles, we have established a climate change risk assessment and management mechanism, and formed a closed-loop management system covering climate change risk identification, assessment, response, inspection, and update.



Scenario setting

In 2021, BEWG launched a special research program on climate change and selected RCP4.5, a representative concentration pathway⁶ developed by IPCC⁷, as the climate analysis scenario of the Group. Based on the scenario of RCP4.5, we made full use of several international authoritative databases including Aqueduct⁸ to assess the acute and chronic physical climate change risks facing the Group. We also analyzed and assessed the climate transition risk with the recommendations and literature studies by our own experts and independent experts. The impact of all operating assets of BEWG during the reporting period was taken into account for the climate change risk assessment.



⁴ TCFD is short for Task Force on Climate-related Financial Disclosures.

⁵ PDCA: a four-step work cycle consisting of plan, do, check, and act.

⁶ The Representative Concentration Pathways (RCPs) are a toolkit of climate analysis scenarios developed to analyze and evaluate climate change and forecast climate change trends.

⁷ The Intergovernmental Panel on Climate Change (IPCC) is an intergovernmental body established by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) in 1988.

⁸ <https://www.wri.org/aqueduct>






Addressing climate change

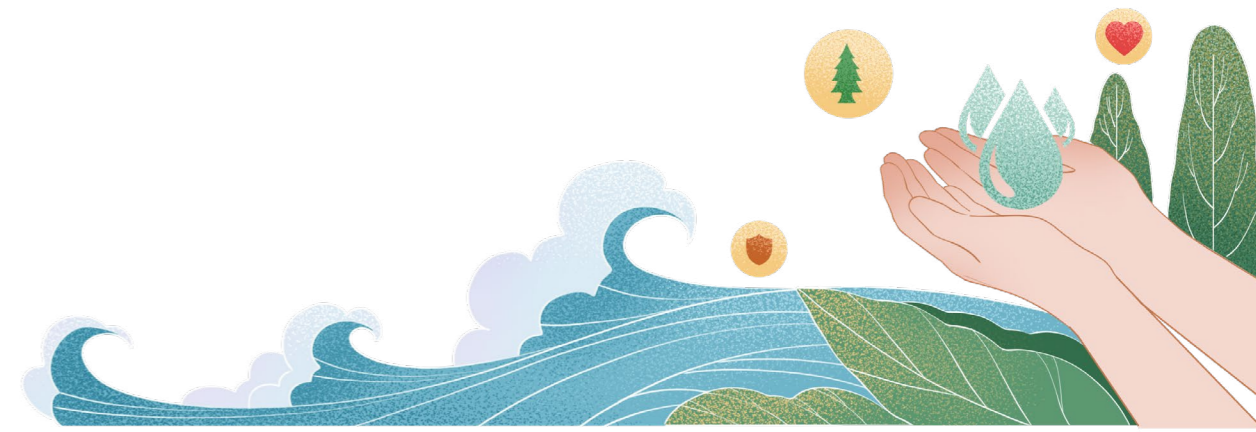





Risk identification and response

Fully considering the impact of climate change on the water sector, national policies, industry development trends, and our development strategies and carbon reduction plans, BEWG has conducted systematic identification and analysis of all climate change risks faced by the Group and the potential opportunities. We have also evaluated the potential impact of such risks and opportunities on the Group from such aspects as economy, compliance, reputation and operation.







Climate physical risks of BEWG

Risk categories	Risk impacts	Response measures	
Acute physical risks	 Flood	<ul style="list-style-type: none"> Negatively affecting the water quality and volume of water distribution plants, and undermining the production capacity of water distribution plants and sewage treatment plants; Causing the water level of the drainage pipe network to rise, and undermining the operation stability of the self-operated pipe network; Interrupting the production and operation of the water plants and increasing the maintenance cost. 	<ul style="list-style-type: none"> Developing and applying technologies with stronger load toughness, adopting the excess water treatment load technology for brown field projects, and formulating emergency plans; Researching and applying intelligent scheduling of pipe network, achieving the maximum drainage capacity, and establishing the forced drainage response capacity of temporary pumps; Developing the plant-pipe network collaboration and forced drainage response capacity.
	 Extremely cold weather	<ul style="list-style-type: none"> Causing the rupture of some water distribution and sewage pipes; Reducing the treatment capacity of the sewage system and increasing the operating cost. 	<ul style="list-style-type: none"> Adopting insulation measures or design for outdoor facilities (recirculating pools, etc); Adding insulation measures to the projects during the operation period; Researching the water purification process in cold regions and improving the water purification efficiency under low-temperature conditions.
	 Extreme precipitation	<ul style="list-style-type: none"> Heavy precipitation has a great impact on the water quality and quantity of water distribution plants, interrupting the production and operation of plants and stations; Increasing the risk of water environment operation and maintenance in compliance with relevant standards; Extreme precipitation easily causes regional waterlogging, leading to the overload of the drainage system; Increasing the flooding risk of water distribution facilities in low-lying areas. 	<ul style="list-style-type: none"> Applying treatment technologies with stronger load toughness to new sewage treatment facilities; Adopting the excess water treatment load technology for brown field projects, and formulating emergency plans; Formulating emergency plans for the prevention and control of overflow pollution for water environment operation and maintenance projects; Researching and applying intelligent scheduling of pipe network, achieving the maximum drainage capacity, and establishing the forced drainage response capacity of temporary pumps; Developing the plant-pipe network collaboration and forced drainage response capacity; Formulating emergency plans for drainage and rescue, and enhancing personnel training and drills.










Risk categories	Risk impacts	Response measures	
Chronic physical risks	 Drought	<ul style="list-style-type: none"> Reducing the reserve of water resources and lowering the guarantee rate of water distribution; Drought may increase the concentration of contaminants in water bodies. 	<ul style="list-style-type: none"> Promoting the alternative water source business to relieve water shortage, such as reclaimed water from wastewater and seawater desalination; Developing and applying intelligent control of the whole-process sewage treatment, leveraging the smart water services of BEWG to offset the rising cost caused by the increase of water quality concentration, promoting external light-asset services, and expanding new business;
	 Deterioration in water quality	<ul style="list-style-type: none"> The concentration of contaminants in water bodies is increasing, making it more difficult to carry out water treatment; Emerging trace contaminants (such as endocrine disruptors, medicines, and personal care products) accumulate in water bodies, increasing water ecological security risks and affecting water distribution quality. 	<ul style="list-style-type: none"> Researching and developing water-saving and water-purifying technologies, and reducing the water consumption rate of self-supply; Researching and developing the enhanced removal technologies for emerging contaminants.
	 Sea level rise	<ul style="list-style-type: none"> Causing the write-off and early retirement of existing assets, particularly the asset value of facilities located in high-risk coastal areas; The deterioration of groundwater aquifers in coastal areas results in salt water intrusion, thus affecting the service life of equipment and facilities; The tidal effects affect river water quality, increasing the operating cost of water environment projects. 	<ul style="list-style-type: none"> Strengthening the control of investment risk and making timely adjustments to investment strategies in areas with foreseeable sea level rise; Researching and applying preventive maintenance technologies of equipment and facilities, conducting the regional intensive management of equipment and facilities, reducing marginal cost, and offsetting the impact of salt water intrusion.

Climate transition risks of BEWG

Transition risks	Risk categories	Risk impacts
Policy and legal risks	 Change of energy policies	<ul style="list-style-type: none"> In response to the national policy for increasing the proportion of clean energy and non-fossil energy, BEWG needs to purchase and apply photovoltaic power generation devices on the roof and other sites within the plants, resulting in additional operating costs.
	 Tightening of carbon emission policies	<ul style="list-style-type: none"> The government is quite likely to impose the carbon tax and expand the coverage of industries that adopt carbon emission quota, affecting the cost of BEWG; If the requirements of carbon trading and carbon tax become increasingly stricter, BEWG may be punished for the inadequate completion and cooperation, which may damage the enterprise reputation.
Technical risks	 Upgrade and maintenance of the pipe network	<ul style="list-style-type: none"> Reducing the leak rate of pipe network is particularly important in areas lacking water resources. More technical manpower, material resources, and financial resources should be devoted to refined pipe network management and smart pipe network construction.
	 Greenhouse gas capture, collection, and monitoring technology	<ul style="list-style-type: none"> As the government and the water sector strengthen control over greenhouse gas management, BEWG will face stricter requirements of greenhouse gas capture, collection, and monitoring.
	 Improved resilience of sewage treatment system	<ul style="list-style-type: none"> The noted variation of the coefficients regarding water quantity and quality between the rainy season and the dry season has a great impact on the original sewage treatment system, which makes it necessary to develop a treatment system with high tolerance, flexibility, and controllability.
Market risks	 The growing awareness of green consumption among users	<ul style="list-style-type: none"> With the increasing emphasis on green consumption in society, water service companies are facing more direct demands from consumers for green transition and low carbon.

We fully recognize that climate change presents unprecedented opportunities as well as these above-mentioned risks. To address the key climate change risks identified, BEWG has planned and implemented a series of adaptive measures to mitigate the negative impact of climate change on the Group's project operations and business development. Amid the efforts toward climate change risk prevention and response, we explore opportunities for business development, management improvement, and product innovation brought by climate change, and incorporate climate change into our business development strategy. For the response measures and plans regarding climate change risks and opportunities, please refer to the sections of this report, namely "[Water resource management](#)", "[Low-carbon action](#)" and "[Environmental impact](#)".

Climate opportunities of BEWG

Transition opportunities	Opportunity categories	Opportunity description
Policy and legal opportunities	 Innovation of mainstream technologies	<ul style="list-style-type: none"> Increasing investment in the Research and Development and operation of new low-carbon technologies such as energy conservation and consumption reduction, energy self-sufficiency, and resource regeneration, actively seeking and applying alternative technologies of clean energy, responding to energy policy requirements, and improving the competitiveness of BEWG.
	 Development of rural water services	<ul style="list-style-type: none"> The Chinese government continuously promotes the improvement of rural sewage treatment standards, policies, and regulations, and emphasizes the improvement of the rural living environment, including sewage treatment. BEWG leverages our leading water treatment technologies to build more high-standard rural water treatment facilities, which will help to increase the business revenue of the Group; Actively responding to national standards and policies, advancing technological innovation, and solving the difficulties of rural sewage treatment will help to enhance the reputation and image of the Group.
Technical opportunities	 Improvement of operational efficiency through smart water services	<ul style="list-style-type: none"> The smart urban water system represents the megatrend of the water industry. The Group should rely on the technical advantages and operating experience of smart water services to improve water treatment efficiency and water resource utilization rate, narrow the gap between production and sale of water distribution, reduce the operating cost, and improve the revenue and industry competitiveness.
	 Development and use of new energy (photovoltaic, sewage source heat pump, biogas power generation, and sludge resource)	<ul style="list-style-type: none"> Implementing national policies, actively deploying the use of new energy, and reducing the cost of low-carbon transition; Diversifying low-carbon business opportunities and business types.
	 Resilient sewage treatment systems	<ul style="list-style-type: none"> Promoting the R&D and application of new technologies with a strong anti-impact load ability, reducing investment costs, and improving operational flexibility and reliability.
Market opportunities	 Green financing	<ul style="list-style-type: none"> With the growing maturity of the green bond issuance market, the advantages of green financing are increasingly prominent. Through green financing, BEWG will continue to promote business expansion and upgrading, which will effectively increase the amount of financing and alleviate financing difficulties.
	 Growing awareness of green consumption among users	<ul style="list-style-type: none"> In the context of the "3060 carbon peak and neutrality goals", the government has put forward stricter requirements for energy conservation and emission reduction in the water industry, and consumers show a growing preference for green and low-carbon products. By carrying out emission reduction throughout the whole life cycle and applying more eco-friendly technologies, BEWG will meet the requirements of more consumers/customers for green transition and low carbon.

Water resource management

Water shortage is a common challenge facing the whole world. Actively responding to the management layout and policy requirements of the government for water resources, BEWG has continuously strengthened the internal water resource management, and formulated the *BEWG Measures for Water Resource Management*⁹. In 2021, regarding the response to water shortage as our highest mission, BEWG set the targets for water efficiency and conducted comprehensive water resource management from such aspects as efficient utilization of water resources, pipe network leak control, alternative water source development, and water conservation and protection. The Group has set up a special working group comprised of senior executives to supervise the work related to water pressure. In addition, we actively organize the publicity and education to enhance the water-saving awareness of employees, and practice water-saving actions in daily operations. On the basis of abiding by the Group's policies on water management, individual water management policy has been developed for overseas businesses according to local regulations.

Efficient utilization of water resource

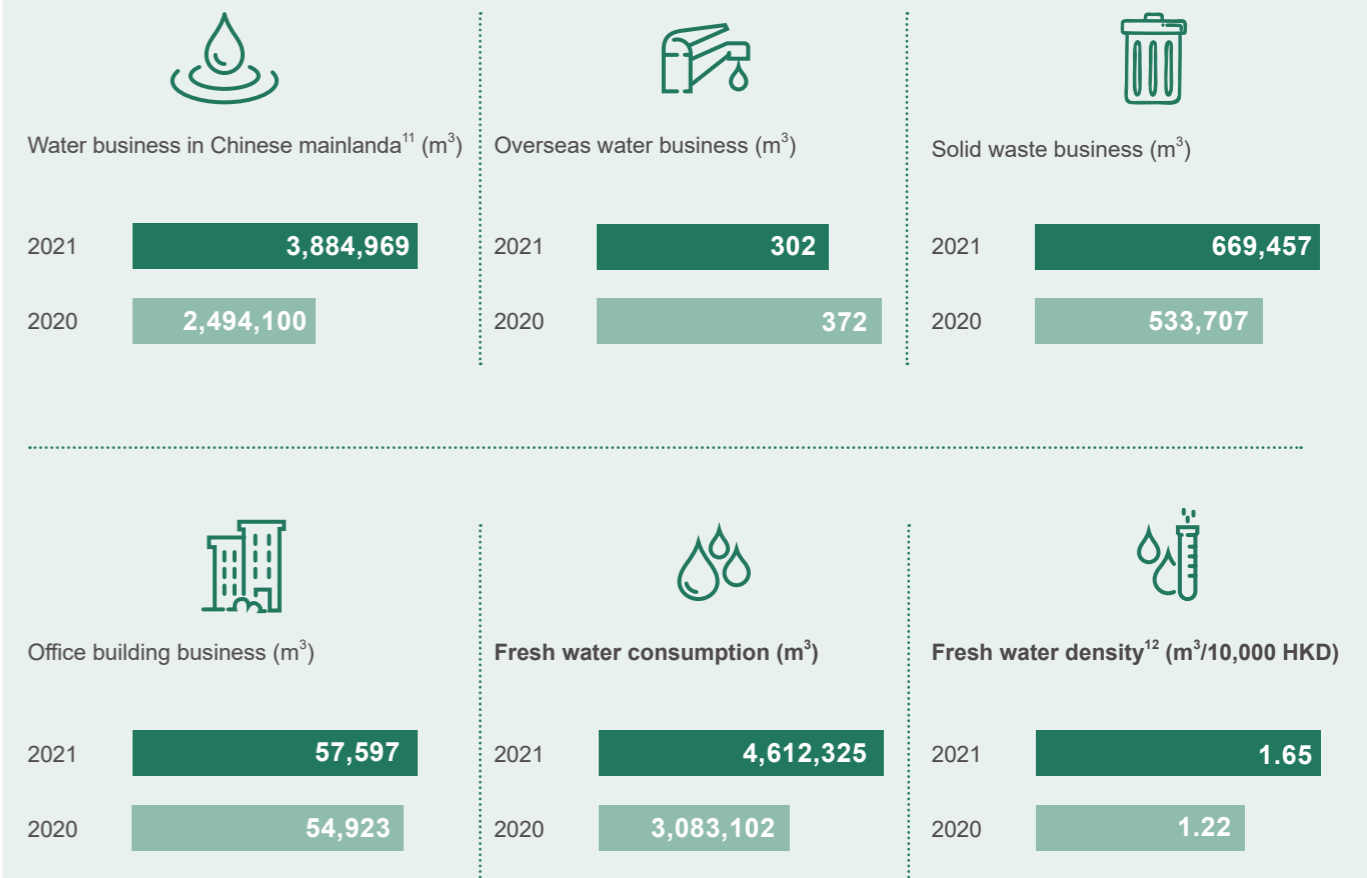
While ensuring water safety and quality, BEWG constantly optimizes the production process and improves the utilization rate of water resources. We strictly control the self-supply water consumption in the production and operation. We have developed the star-level water treatment plant assessment standard, which sets higher requirements for water efficiency than the national *Code for Design of Outdoor Water Supply Engineering*. According to our own standards, the proportion of self-supply water for plants that engage in process water reclamation should be no higher than one percent. The proportion of self-supply water for plants that do not engage in process water reclamation should be no higher than three percent. In addition, all new plants are equipped with water reclamation and reuse systems. We also encourage older plants to add water reclamation and reuse systems and use reclaimed water first in production and operation such as equipment cleaning and plant greening. According to the standard for star-level sewage treatment, the water volume of internal circulation¹⁰ should be no higher than three percent. The consumption of reclaimed water should be controlled, and the efficient utilization of water resources should be realized.



⁹ Public disclosure URL: <https://www.bewg.net/uploadfile/2020/1013/20201013050444485.pdf>.

¹⁰ It refers to reclaimed water used in the plant for recycling purposes (e.g. equipment washing, greening, etc.).

Fresh water consumption of BEWG in 2020-21



The consumption and proportion of water self-supply by the water distribution plants of BEWG in 2020-21



¹¹ Only including wastewater and reclaimed water, no fresh water usage involved in the water supply plant. The same below.

¹² Fresh water density = Total fresh water consumption of the year ÷ Operating revenue of the Group of that year_w

¹³ In 2018, the Code for Design of Outdoor Water distribution Engineering (GB50013-2018) issued by the Ministry of Housing and Urban-Rural Development specifies 5-10% of the designed amount for proportion of water self-supply.

Water resource management

Leak control of pipe network

BEWG always regards the pipe network leak control as one of the important tasks to improve water distribution quality and save water resources. In 2021, BEWG established the leak control evaluation and management strategy, implemented differentiated control for projects with different leak levels from aspects of pipe network operation and maintenance management, project quality control, and metering management, and developed a leak control implementation mode suitable for BEWG.

For the pipe network operation and maintenance

We adopt the Beidou satellite remote sensing technology to locate the pipe network and personnel. We monitor the pressure, flow, and water quality data of pipe networks via the Internet of things (IoT). With the aid of information tools such as geographic information system (GIS), hydraulic models, zoning management systems, and intelligent scheduling, we monitor, control, and analyze the water distribution pipe network, thereby improving the efficiency and effect of pipe network operation and maintenance. We constantly improve the professional skills of leak detection personnel, and identify suspected leaks through technical means such as noise recorders, detection robots, and satellite remote sensing leak detection. By means of zone metering management, we realize the grid and refined management of the water distribution pipe network. We identify the pressure distribution of pipe network, optimize the water distribution pressure of water plants, and implement pressure regulation in the areas with high pressure. Besides evaluating the pipe network on a yearly basis, we also conduct the renewal and renovation of aged pipe networks, the pipe network out of repair or the pipe network with outdated materials through urban renewal, renovation of old residential areas, renovation of secondary water distribution facilities, and renovation of one meter for one household.

As to the pipe network engineering quality control

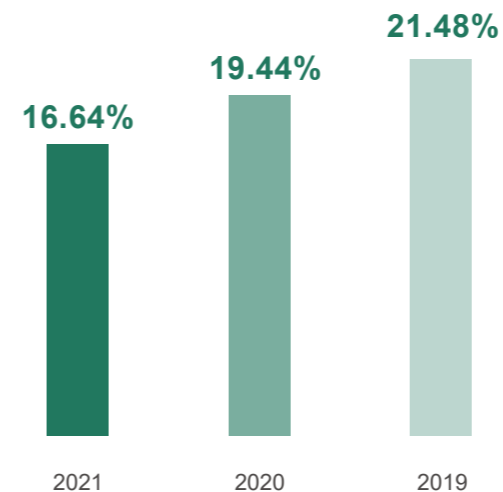
we strictly implement the relevant national and industry standards and specifications in the design stage, and use high-quality pipes and auxiliary facilities after scientific planning and layout. In the construction stage, we strictly control the quality management of concealed works such as pipe network installation and earthwork backfilling.

In terms of metering management

We have developed the *Technical Standard for Water Meter Selection and Installation*, and controlled the loss caused by improper metering from aspects of water meter selection, installation, and evaluation through independently-developed metering and evaluation tools. We also improve the water metering systems for purposes such as municipal projects, greening, fire control, and sanitation, and strengthen user meter reading management, to ensure that all water meters are recorded properly.



Pipe network leak rate of BEWG from 2019 to 2021¹⁴



Case The Phase I Pipe Network Renovation Project at Shiguanzhuang, Nanyang

On June 10, 2021, BEWG renovated the Phase I water distribution pipe network at Shiguanzhuang. By laying new-material pipes, we successfully increased the water pressure and narrowed the gap between production and sales in the urban village of Shiguanzhuang. It is calculated that the water leak amount of pipe networks can be reduced by 3,824 tons per month. Thanks to continuous pipe network improvement, the pipe network leak rate across BEWG's Nanyang Water Group declined by 1.6 percentage points from the prior year.



Case Skill improvement at the leak control training base

The BEWG training base for water distribution network leak control consists of five functional areas, namely pipe network leak detection, pressure control, zone metering, maintenance drill, and water meter test. As one of the distinctive features of the training base, the leak detection area covers five common road surfaces, namely asphalt, cement, brick, gravel, and grass, common pipes, pipe diameters, and leak types, and provides comprehensive training and leak detection assessment. By the end of 2021, the training base had offered training and skill level appraisal for over 150 person-times.

On this basis, BEWG has established a high-end leak detection talent pool. In 2021, we organized teams of 59 members to provide centralized leak detection services for 5 project companies, and identified 248 leaks. It is calculated that about 8.64 million tons of water were saved annually.



The training at the leak control training base



¹⁴ In 2022, Notice on Strengthening Leak Control of Public Water Distribution Pipe Networks jointly issued by the Ministry of Housing and Urban-Rural Development and the National Development and Reform Commission pointed out: by 2025, the leak rate of urban public water distribution networks across China should be controlled below 9 percent.

Water resource management



Alternative water resource development

BEWG makes active arrangements for the development and utilization of unconventional water resources, and promotes various unconventional water resource projects, such as sewage recycling, rainwater resource utilization, and seawater desalination.

Building high-quality reclaimed water or new water plants, launching a new water brand "AQENT®", offering high-quality reclaimed water, and providing consumers with safe and high-quality industrial water, ecological environment landscape water, and supplementary drinking water. In 2021, BEWG produced 296 million tons of reclaimed water.



Promoting the utilization of rainwater resources, supplementing and conserving irrigation water for urban green space and urban groundwater resources through such means as rainwater collection and infiltration facilities, and realizing the direct utilization, indirect utilization, and comprehensive utilization of rainwater.

Exploring the seawater desalination technology, deploying an eco-friendly circular industry chain integrating water, electricity, and salt-based chemical processes, and using desalinated seawater as a supplementary water source to alleviate the water shortage in some areas.



Number of reclaimed water plants

31

Chinese mainland

5

China's Hong Kong, Macao, Taiwan, and overseas

Annual volume of water treated actually

222,130,367 tons

Chinese mainland

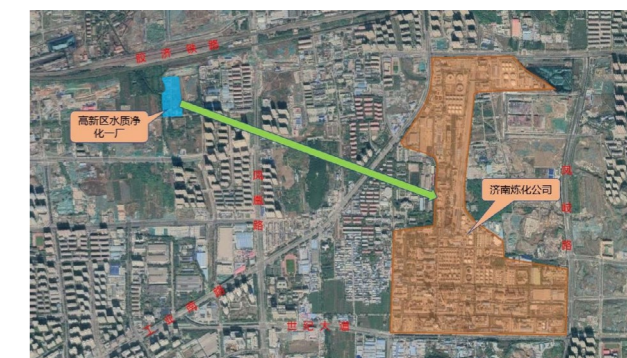
73,806,574 tons

China's Hong Kong, Macao, Taiwan, and overseas

Case

The First Water Purification Plant in Jinan Innovation Zone supplies reclaimed water

Jinan will shut down all underground wells in principle by the end of 2022, according to the *Opinion of the Jinan Municipal People's Government on Strengthening Water Resource Management*. In order to save and protect the city's water resources, the First Water Purification Plant of BEWG in Jinan Innovation Zone has built reclaimed water treatment units to supply the industrial production water for Jinan Branch of Sinopec as a replacement for the existing softened water sources (Yellow River water and underground water). In the short term, the project will supply 15,000 cubic meters of reclaimed water per day, and the reclaimed water quality meets the softened water standard.



The First Water Purification Plant in Jinan Innovation Zone supplies reclaimed water for Jinan Branch of Sinopec



Water resource management

Water source conservation and protection

While emphasizing the efficient utilization of water resources, BEWG actively engages in the conservation and protection of water sources such as surface water and groundwater:



Surface water conservation

Focusing on the water environment capacity, BEWG constantly reduces the pollution load and improves the self-cleaning capacity. We actively explore and develop water ecological health assessment products.

By means of multi-scenario simulation, we develop the water quality and volume allocation and scheduling schemes to systematically solve the problems, such as the limited basic runoffs in the urban river systems and unstable water quality, and maintain the balance of water quality, water volume, and water ecology in target water bodies. To improve the safe use of reclaimed water for the river and lake ecosystems, we actively develop the products and solutions related to reclaimed water and tailwater wetlands, to realize the ecological transition of water resources from social circulation to natural circulation.



Groundwater conservation

BEWG actively gets involved in the construction of the sponge city project and promotes the low-impact development mode in various construction projects.

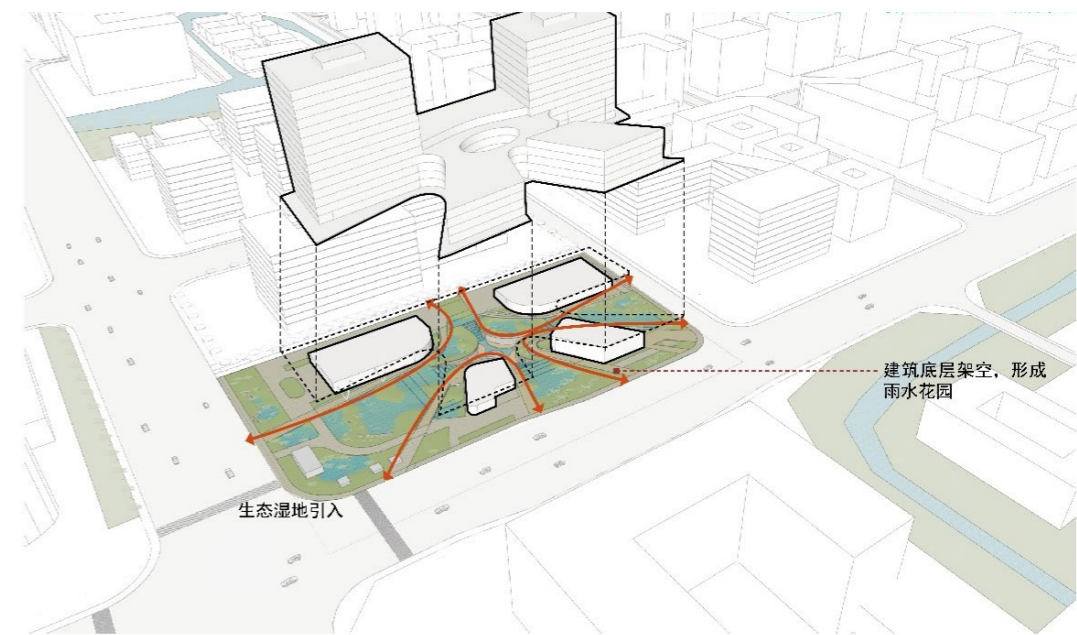
We proactively develop various products and solutions such as reserve rainwater discharge reduction and retention from the source. Through the construction of bio-retention facilities such as rain gardens, we have effectively intercepted, collected, and purified surface water runoffs, enabled more infiltrated water into the local area of cities, conserved the groundwater, reduced the impact of rainwater runoffs and non-point source pollution on surface water, and relieved the waterlogging risk of cities.

Case

Sponge City Project, Plot 196, Future Science City at Yuhang District, Hangzhou

In order to protect the urban water resources, BEWG has adopted the design concept of rain garden and introduced ecological wetlands into the underlying level of the buildings. Based on the characteristics of the water treatment industry, we created a model area for "sponge city", thus forming an ecological and green building environment. The outdoor rain garden is the main place where the water treatment technology is displayed and the concept of environmental protection is promoted to the society.

In addition, we took a range of technical measures to reduce and control the runoffs and the total discharge of residual contamination, so as to restore the block back to the original water environment as soon as possible. We also achieved the target of making the ratio of rainwater collection to storage being not less than 50%.



The rainwater system of BEWG for Plot 196 at Future Science City



In response to the national “3060 carbon peak and neutrality goals”, BEWG is committed to proposing perfect carbon emission reduction targets and pathways. Starting with the work such as technological innovation, operation management, office management, and construction management, BEWG taps into the potential for carbon emission reduction and implements low-carbon management throughout the production process.

Energy consumption of BEWG in 2020-21

Indicator	Unit	2021	2020
Water business in Chinese mainland			
Non-renewable energy substitution	kWh	1,542,694,570	1,407,141,904
Renewable energy substitution	kWh	23,698,836	23,639,137
Gasoline consumption	ton	376	384
Diesel consumption	ton	150	355
Natural gas consumption	m ³	361,111	153,170
Purchased steam for heating	GJ	7,565	714
LPG consumption	ton	335	74
Overseas water business			
Non-renewable energy substitution	kWh	131,938,317	129,402,978
Diesel consumption	ton	365	2

Note:

Comprehensive energy consumption was calculated according to the *General Principles for Calculation of the Comprehensive Energy Consumption* (GB/T 2589-2020) by converting the consumption of gasoline, diesel, natural gas, electricity, and the heat purchased.

Indicator	Unit	2021	2020
Solid waste business			
Non-renewable energy substitution	kWh	19,844,874	16,991,199
Renewable energy substitution	kWh	15,877,260	7,006,520
Gasoline consumption	ton	12	9
Diesel consumption	ton	266	224
Natural gas consumption	m ³	1,658,287	1,105,021
LPG consumption	ton	0.91	0.72
Office building business			
Non-renewable energy substitution	kWh	4,544,184	5,368,748
Gasoline consumption	ton	193	171
Diesel consumption	ton	1	5
Purchased steam for heating	GJ	2,440	3,407
LPG consumption	ton	3.64	4.18
Total			
Comprehensive energy consumption	tons of standard coal	214,414	195,223
Comprehensive energy density ¹⁵	tons of standard coal / 10,000 HKD	0.08	0.08

¹⁵ Comprehensive energy density = Total comprehensive energy consumption of the year ÷ Operating revenue of the Group of the year.



Low-carbon action

GHG emissions of BEWG in 2020-21

Indicator	Unit	2021	2020
Water business in Chinese mainland			
GHG emissions- Scope 1	tCO ₂ e	3,386	2,835
GHG emissions- Scope 2	tCO ₂ e	942,030	858,576
Total GHG emissions	tCO ₂ e	945,416	861,410
Overseas water business			
GHG emissions- Scope 1	tCO ₂ e	1,148	1,148
GHG emissions- Scope 2	tCO ₂ e	83,354	81,682
Total GHG emissions	tCO ₂ e	84,502	82,829
Solid waste business			
GHG emissions- Scope 1	tCO ₂ e	4,461	3,123
GHG emissions- Scope 2	tCO ₂ e	12,107	10,366
Total GHG emissions	tCO ₂ e	16,569	13,490
Office building business			
GHG emissions- Scope 1	tCO ₂ e	603	549
GHG emissions- Scope 2	tCO ₂ e	3,041	3,650
Total GHG emissions	tCO ₂ e	3,644	4,199
Total			
Total GHG emissions ¹⁶	tCO ₂ e	1,050,131	961,929
GHG emissions intensity ¹⁷	tCO ₂ e/10,000 HKD	0.38	0.38

Note:

- GHG emissions - Scope 1 are generated from fixed sources (diesel and natural gas) and fuel consumption (gasoline and diesel) from transport vehicles. Emission factors of natural gas, diesel, and gasoline refer to the *Guidelines for Accounting Methods and Reporting of Greenhouse Gas Emissions from Enterprises in Other Industrial Sectors* issued by the National Development and Reform Commission, PRC on July 6, 2015.
- GHG emissions – Scope 2 are generated from purchased electricity and purchased heat consumption. Emissions factors of purchased electricity refer to the *Guidelines for Accounting Methods and Reporting of Greenhouse Gas Emissions from Industrial Enterprises* issued by the Ministry of Ecology and Environment, PRC in 2015. Emission factors of purchased heat refer to the *Guidelines for Accounting Methods and Reporting of Greenhouse Gas Emissions from Enterprises in Other Industrial Sectors* issued by the National Development and Reform Commission, PRC on July 6, 2015.




¹⁶ There is a change in the data scope of GHG emissions of BEWG in 2021 compared with that in 2020, with GHG emissions in office building added.

¹⁷ GHG emissions intensity = Total GHG emissions in the year ÷ Group's operating revenue in the year.

Low-carbon operation

The core of low-carbon operation is to reduce the energy consumption of each project. We manage to reduce emissions and conserve energy from the source for the purpose of environmental protection. Moreover, the reduction of energy consumption can help to reduce the operating cost of the project. In 2021, BEWG set energy consumption targets, promoted energy conservation from aspects such as production energy conservation, energy substitution, and energy recovery, and continuously reduced the energy consumption of each project.

Production energy conservation

Lean management	Process operation optimization	Equipment efficiency improvement
<p>BEWG has established a complete set of business operation and management standards. Based on the characteristics of each project, we have developed the one-policy-for-one-plant policy and launched it online to support lean operation at the project end. To address common and difficult problems in operation, we offer technical guidance on project operation and production, thus realizing the refined process management.</p> 	<p>BEWG continuously makes new explorations and attempts. According to the factors such as input and season, we select the best operating mode, adjust the optimum process parameters and equipment parameters, and optimize the point, type, and amount of agent application. We also introduce the whole-process analysis, conduct precise control, and improve the process stability and reliability, so as to achieve energy conservation and consumption reduction. In addition, we absorb the mature experience of experts, develop intelligent control tools covering the main process, and guide process control, to minimize energy consumption and material consumption.</p> 	<p>BEWG has established system and equipment evaluation models, judged the state of economic operation, and optimized the equipment operation mode and working time. We also ensure that the equipment remains in a state of high-efficiency operation and reduce energy consumption through such pathways as equipment selection, lean control, structural transformation, and enhanced maintenance.</p> 

Energy substitution

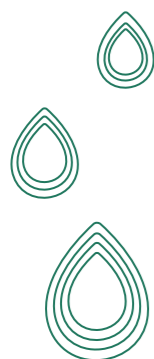
To optimize the energy consumption structure, BEWG proactively promotes the use of clean energy and renewable energy in sewage treatment projects, and replaces electric power with solar energy. We also install photovoltaic power generation units on the rooftop of water plants. By the end of December 2021, the Group had more than 50 water plants using photovoltaic power generation, with a total installed capacity of more than 30 MW.



By the end of December 2021, the Group had more than **50** water plants using photovoltaic power generation



Total installed photovoltaic capacity exceeds **30** MW



Low-carbon action

Case Application of distributed photovoltaic power generation in sewage treatment plants

The distributed photovoltaic power generation project of Jiangsu Yixing Urban Sewage Treatment Plant involves eight sewage treatment plants including Yixing Urban Sewage Treatment Plant. In this project, photovoltaic power stations are built in sewage pools, sedimentation pools, flocculation pools, office building roofs, newly-built plant roads, and other sites of the sewage treatment plant. The mode of “generating power for their own needs and supplying surplus power to the grid” not only effectively saves land resources, but also helps to achieve the goal of energy conservation and emission reduction.



Distributed photovoltaic power generation

Energy recovery

To reduce the consumption of traditional fossil energy, BEWG vigorously promotes the energy recovery technology. We apply the water source heat pump technology in sewage treatment projects, and use the reclaimed water after sewage treatment as the water source for heat pump. In this way, we provide heating and cooling guarantee for office buildings and production and living areas in the plant, thus effectively reducing carbon emissions. In the sludge treatment project, we use the anaerobic digestion technology and the biogas produced to provide heat for production and reduce the consumption of purchased heat for production.

Case Application of water source heat pump in Haigang West District Sewerage Treatment Plant

With the sewage source heat pump technology, Haigang West District Sewerage Treatment Plant takes the raw sewage of the sewage treatment plant or the reclaimed water/effluent after secondary treatment as the heat source. The plant achieves an annual heating output of 327 million kWh and the cooling output of 29 million kWh, effectively reducing the energy consumption.

Case Application of anaerobic digestion technology in Beidaihe New District Sludge Treatment Plant

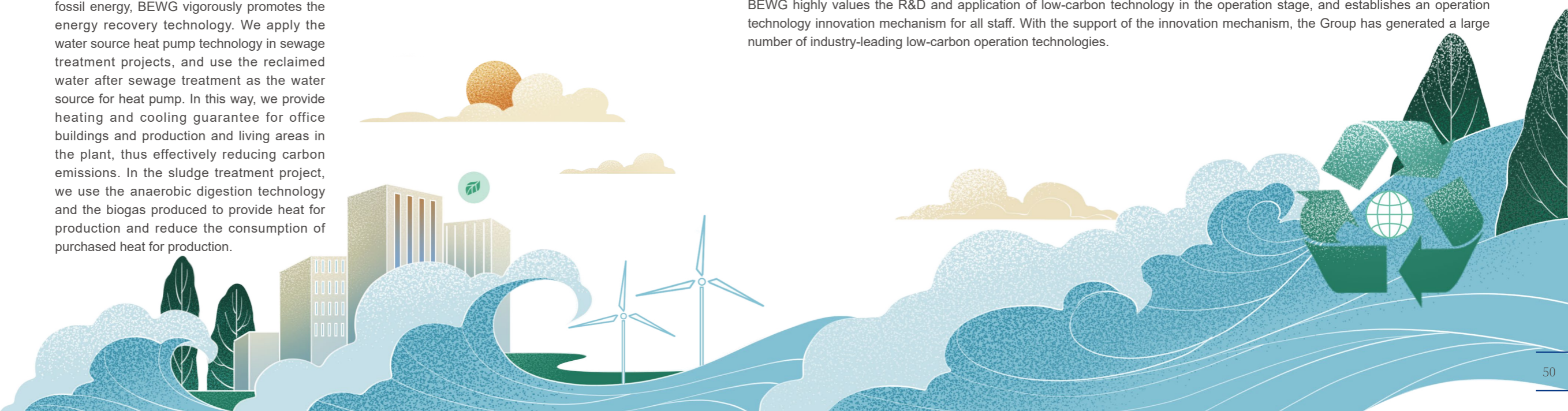
Beidaihe New District Sludge Treatment Plant adopts a hierarchical/phase-separated anaerobic digestion process to deeply dehydrate the biogas residue produced and turns it into nutrient soil that can be used for landscaping, agriculture, and soil improvement. After purification, part of the biogas is used for preheating the raw mud of the pretreatment unit, and the remaining part can be used as vehicle gas, thus realizing the “reduced, stabilized, harmless” treatment and the “resourceful” recycling of sludge.

Low-carbon technology

BEWG has increased investment in the research and development of new low-carbon technology and energy-saving technical improvement to further tap into the Group’s potential for carbon emission reduction.

On the path for promoting carbon emission reduction, BEWG has accumulated a series of new low-carbon technologies, such as Sludge Double Recirculation - Anaerobic/Oxic/Anoxic(AOA) process, and enhanced nitrogen and phosphorus removal, Complete-flow-scheme Fluidizing Biofilm Reactor (BECFBR), Low-carbon and Efficient Bio-process Technology (BELEBC), and anaerobic ammonia oxidation. In 2021, two technologies and two projects declared by BEWG were successfully selected into the *List of 2021 Key Environment-friendly Practical Technologies and Demonstration Projects* published by the China Association of Environmental Protection Industry.

BEWG highly values the R&D and application of low-carbon technology in the operation stage, and establishes an operation technology innovation mechanism for all staff. With the support of the innovation mechanism, the Group has generated a large number of industry-leading low-carbon operation technologies.



Low-carbon action

Low-carbon operation technologies of BEWG

BE-EMR

Engineering Management Robot (EMR) is a biochemical treatment intelligent control overall solution exclusively designed for sewage plants. It has the advantages of energy conservation and consumption reduction, closed-loop automatic control, effluent stability, and excellent adaptability. In August 2021, BEWG officially launched EMR. This technology has been implemented in 37 projects in the Group, reducing the energy cost by more than RMB one million per project annually.

BE-CMR

BE-CMR is a biological treatment process product used in the biological treatment units for municipal and industrial wastewater. The product makes full use of internal carbon sources to achieve an ultra-low carbon/nitrogen ratio. With five technological advantages of stable operation, reaction diversity, timely control, high intelligence and efficiency, as well as low carbon and energy conservation. The technology has been applied in six projects.

BE-Fenton

BE-Fenton is an advanced oxidation process suitable for the treatment of industrial wastewater that is difficult to degrade. As an improvement on the traditional technology Fenton, it can remove over 60% of refractory organic matters. It has the technical advantages of strong operability, stable operation, precise control, low carbon, and energy conservation. The technology has been used in three projects.



Low-carbon office

BEWG promotes green office, proactively explores various measures to save energy and reduce consumption, and minimizes the consumption of energy and materials. On a daily basis, we regularly publicize and enhance the awareness of energy conservation and emission reduction among all employees, post tips on saving water and electricity in offices, conference rooms, and toilets, use energy-efficient office and lighting equipment, and encourage remote video conferencing and paperless office. In addition, we encourage our employees to commute by public transportation and contribute to carbon emission reduction.

Low-carbon construction

BEWG has been actively exploring the feasibility of "plant delivery" ("prefabricated assembly" + "necessary cast-in-place") in the water industry. In 2021, by referring to the practical experience of sustainable construction in developed countries such as the United States and Singapore, we simulated and built the "plant-oriented" low-carbon technology system of municipal water plants through the pathways of "manufacturing + construction", "new material + construction", and "new technology + construction", and planned to put the mode into test in 2022.



BEWG pays particular attention to the impact of the enterprise operation on the environment and ramps up efforts in biodiversity protection, environmental system management, emission management to minimize environmental footprints to the greatest extent.

Biodiversity protection

BEWG actively responds to national calls such as the *Guideline Underpinning the Importance of Further Biodiversity Protection Work* and the *China National Biodiversity Conservation Strategy and Action Plan (2011-2030)*, and strictly abides by relevant laws and regulations such as the *Environmental Impact Assessment Law of the People's Republic of China*, the *Law of the People's Republic of China on Water and Soil Conservation*, and the *Regulations on the Administration of Construction Project Environmental Protection*. We have formulated internal management systems including the *Biodiversity Protection Management Measures of BEWG*¹⁸, and actively participated in the establishment of national, industrial, and organizational standards, such as the *Technical Guidance and Control Requirements for Utilization of Reclaimed Water Ecological Environment*, the *Technical Guidance for Health Operation and Maintenance of River and Lake Ecological Restoration Projects*, and the *Technical Specification for Assessment of Urban Water Ecological Health*. We strictly protect the habitats of animals and plants throughout the life cycle of the project, actively engage in biodiversity protection and ecological restoration, and promote the research and development of biodiversity improvement technology and product. In addition, overseas offices of the Group actively cooperates with local governments to implement biodiversity conservation policies.

Biodiversity protection throughout the life cycle of the project

Planning and design stage

- Conducting ecological basic research, assessing the environmental impact, taking biodiversity conservation as a major consideration in the overall planning, giving priority to the protection of local characteristic species and their habitats, and developing special protection and restoration plans;
- Organizing targeted publicity and education on biodiversity among employees to improve their awareness of biodiversity protection.



Case Ecological assessment conducted before the construction of the Fenghe Wetland Underground Sewage Treatment Plant project

BEWG highly values the function of Fenghe Wetland as a bird habitat. Before the construction of the project, we invited an expert team from the Ocean University of China to conduct a bird survey in 2021. According to the results of the survey, we adjusted the design for the park on the ground and the wetland park, and developed ecological protection and restoration strategies in the process of project construction and operation.



Ecological assessment at Fenghe Wetland

Construction stage

- Conducting regular monitoring, strictly implementing the environmental supervision system, adopting targeted protection measures, doing a good job in keeping protection records and timely restoration;
- Adopting construction methods, materials, and components that facilitate biodiversity protection and improvement;
- Focusing on efforts to prevent and control actions that affect the surrounding area of the site, such as light pollution, noise pollution, environmental pollution, and traffic impacts;
- Carrying out ecological restoration and maintenance of the areas affected during the construction process.

Case Biodiversity protection during the construction of the Huanghua Ditch project

Huanghua ditch is an important ecological corridor in the north of Baoding City. To restore the river ecological environment of Huanghua Ditch suffering from human disturbance, BEWG expanded the river section. While ensuring the safety of flood discharge and waterlogging drainage, we also adopted various measures, such as the construction of ecological vegetation carpet and slope and ecological retaining wall along the river. This project has contributed to creating a natural habitat for benthic animals, forming an excellent water ecological base, and improving the regional ecological environmental health indicators.



Operation and maintenance stage

- Combining the smart water service system to release regional ecological information in real time, conducting real-time monitoring of local ecological indicators, special animal and plant information, and developing risk identification and emergency handling mechanisms;
- Focusing on the protection and monitoring of ecological conservation areas delineated within the scope of project operations;
- Adopting restorative measures, such as creating environments conducive to the survival of animals or plants on the food chain, and enhancing biodiversity on a small scale;
- Prohibiting employees and external personnel from engaging in any fishing activities in the water source protection zone and killing animals under state protection in the water source zone;
- Conducting publicity and education on biodiversity protection to the public.

Case Tracking, monitoring, and evaluation of water ecosystem health in Yuhangtang River

From 2020 to 2021, BEWG monitored the water ecosystem health for the Yuhangtang River water environment comprehensive renovation project, and obtained more than 4,000 sets of data regarding aquatic organisms and hydrologic and water quality indicators, providing a solid basis for the water ecosystem health evaluation, risk identification, and performance assessment in the southern part of Yuhangtang River. The monitoring work is expected to be completed by the end of 2022 and will provide guidance for the continuous improvement of biodiversity and the operation and maintenance of the project.



Water ecosystem health monitoring at Yuhangtang River



¹⁸ Public disclosure URL: <https://www.bewg.net/uploadfile/2020/1020/20201020105644653.pdf>

Environmental impact

Biodiversity protection products and technologies

We focus on water pollution control and comprehensive environmental renovation, proactively practice coordinated ecological restoration and renovation, and innovate ecological restoration technologies, to meet the demands of the government and the public for improving the quality of the ecological environment.



Green infrastructure

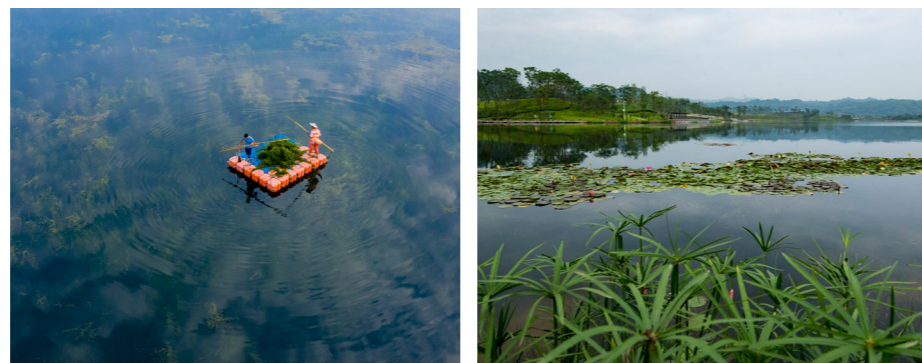
Launching ecological product series, making a layout for the R&D and application of green infrastructure products represented by constructed wetlands, promoting the application of ecological engineering technologies in water pollution control, and achieving the win-win goal of pollution control and biodiversity improvement;

Formulating the *Technical Guide for Constructed Wetlands*, improving the stability of water purification in such links as planning, design, operation, and maintenance, and integrating elements of ecosystem function improvement into the design.

Case

The remarkable water ecological restoration in Yuzixi Ecological Park

BEWG took the initiative to renovate the Yuzixi Wetland Park in Luzhou City. By applying the standardized constructed wetland products, we improved the flood discharge, regulation, and storage functions of rivers and lakes. According to the “biology - ecosystem” restoration approach, we stocked fish and aquatic organisms, built a stable food chain based on submerged plants, and improved the self-purification function of water bodies. Meanwhile, we renovated channelized rivers, restored natural deep pools and shoals, and maximized the ecological function of water conservancy projects. The water quality of the lake meets the standard of surface water level III (lake standard), and the water quality in the middle of the lake is classified as surface water level II. With the underwater visibility of 3 meters, the wetland environment resembling an “underwater forest” attracts a large number of waterbirds for habitation and breeding.



Yuzixi Ecological Park



In-situ ecological restoration

Promoting industry-university-research cooperation, advancing the R&D of in-situ water ecological restoration technologies, and applying relevant technologies to engineering practice;

Rapidly restoring the river water ecosystem in terms of sustainability and stability through the construction of the aquatic biological ecosystem, improving water biodiversity, and creating a high-quality living experience.



Case

In-situ water ecological restoration technology significantly improves biodiversity

By developing the in-situ water ecological restoration technology, BEWG has successfully restored the water environment of the Universal Beijing Resort relocated section of Xiaotaihou River in Beijing, and renovated the black and smelly water in the demonstration section. Due to our unremitting efforts, the water quality indicators of the section is over 20% better than those of the upstream water and the biodiversity of various organisms improves by 2 to 6 times. According to the results of the third-party monitoring and evaluation and the *Technological Regulations for Ecological Health on Aquatic Ecosystem Assessment* (DB11/T 1722-2020) of Beijing, the water ecological health of Xiaotaihou River has met the health standard in 2021.

We applied this technology to the Shaping River basin in Heshan City, Guangdong and the Xinfeng River basin in Daxing District, Beijing, significantly improving the river water quality and biodiversity. The level of biodiversity in Shaping River increased by 143%, and the comprehensive indicator of water ecological health in Xinfeng River increased by 200%.



Some growing representative species in the Xiaotaihou River after the application of the technology



投放后已适应环境的部分底栖动物



Environmental impact

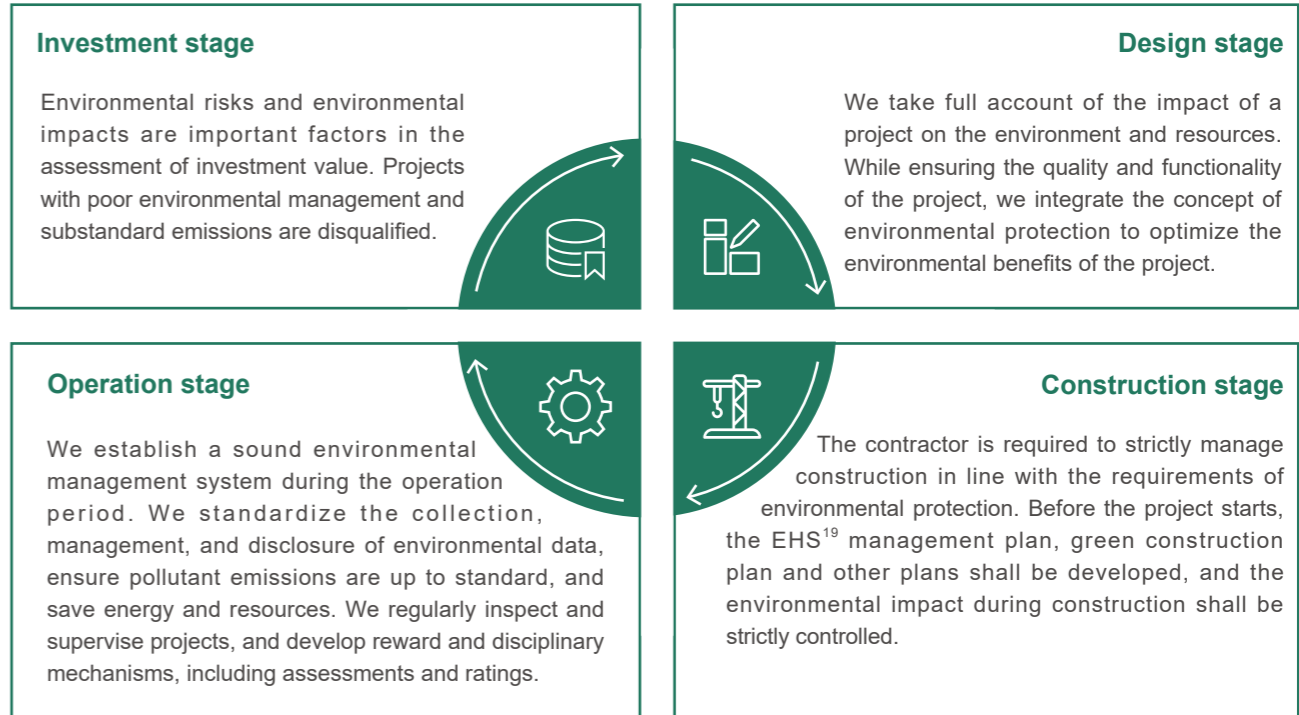
Environmental system management

In accordance with the *Environmental Protection Law of the People's Republic of China* and other laws and regulations as well as the relevant requirements of operation locations, BEWG has formulated the internal management systems such as the *Environmental Index Assessment System* and the *Environmental Factor Identification, Evaluation and Control Procedures*, to constantly improve the environmental management system. BEWG also attaches great importance to the environmental compliance of overseas operations and requires overseas project companies to strictly abide by local environmental laws and regulations and develop corresponding environmental management systems. In 2021, BEWG obtained the ISO 14001:2015 certification and encouraged our subsidiaries in each region to obtain the ISO 14001 certification.

The Group requires each project company to conduct environmental risk control in the whole process of investment, design, construction, and operation, fully considers the scope, degree, and frequency of environmental impact, and takes corresponding safeguard and improvement measures. We adhere to the environmental goals of "saving energy, reducing consumption, reducing pollution, and increasing efficiency", promote the environmental information disclosure in an open and transparent manner, and accept the supervision of all stakeholders.



The whole-process environmental management of BEWG



¹⁹ EHS refers to the environment, health, and safety.



Emission management

In strict accordance with the environmental protection laws and regulations including the *Environmental Protection Law of the People's Republic of China*, the *Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Waste*, the *Law of The People's Republic of China on the Prevention and Control of Water Pollution*, the *Law of The People's Republic of China on the Prevention and Control of Air Pollution*, the *Law of the People's Republic of China on the Prevention and Control of Ambient Noise Pollution*, and the *Notice on Strengthening the Prevention and Control of Sludge Pollution from Urban Sewage Treatment Plants* as well as local regulations of various operation locations, BEWG has formulated internal systems including the *BEWG Management Manual on Quality, Environment, and Occupational Health and Safety* and the *Quality, Environment, and Occupational Health and Safety Procedure Documents*. We strictly manage emissions of solid waste, wastewater, waste gas, and noise during the project construction and operation.

In 2021, the Group did not have any major environmental pollution accidents, and was not involved in any complaints or punishments for major environmental pollution or violation of environmental laws and regulations.



Environmental impact

Construction stage

BEWG cooperates with contractors to reduce emissions to air, water and soil. The Group practices green construction and requires contractors to strictly monitor construction water, construction electricity, and noise indicators, and advocates the recycling of construction by-products (such as construction solid waste and construction waste), so as to maximize resource conservation and reduce the negative impact of construction activities on the environment.

Operation stage

Solid waste

The solid waste generated in the operation of BEWG is mainly the sludge from municipal sewage treatment plants. We focus on promoting the reduction, harmless disposal, and resourceful utilization of sludge. We also strictly regulate the disposal and management of solid wastes such as sludge generated in the daily operation to ensure the stable discharge in compliance with relevant standards and further reduce the environmental impact.

Sludge generated from sewage treatment

In accordance with the guidelines such as the *Technical Specifications for Sludge Treatment and Disposal of Urban Sewage Treatment Plants*, the sludge generated from sewage treatment is subject to the storage, harmless disposal, or transportation to a qualified third-party organization for disposal. In addition, we actively adopt innovative technologies to reduce the sludge from the source, as well as carry out sludge disposal and recycling under the principles of reduction, harmless disposal, and resourceful utilization.

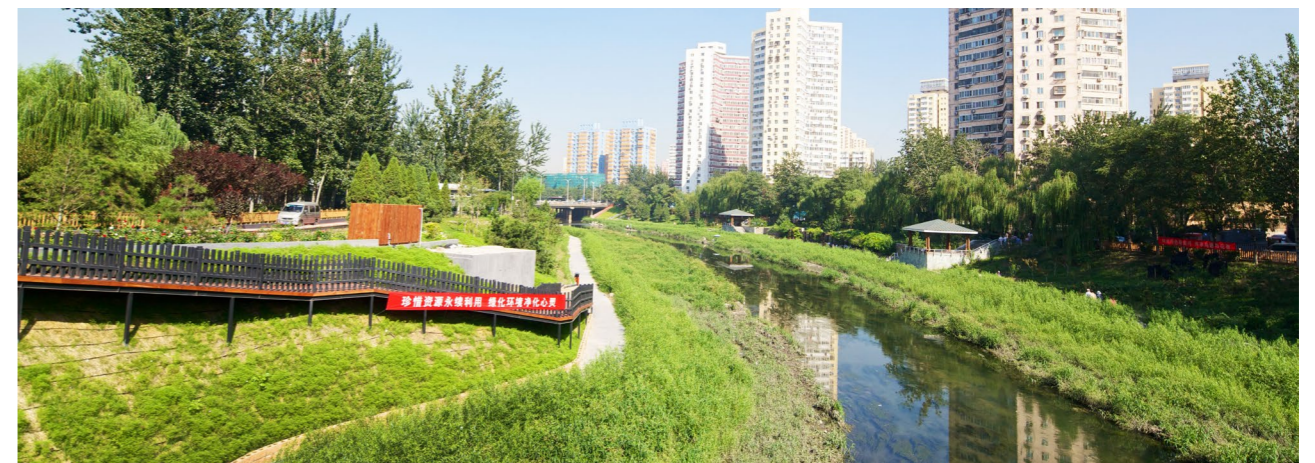
Sludge generated from water distribution and other forms of business

The Group systematically manages the treatment and disposal of the sludge generated from water distribution and other forms of business. According to the requirements of local governments, the Group formulates the sludge treatment and disposal methods to achieve the compliance in treatment and disposal.

Case

Sludge resource utilization through the sludge carbonization treatment and disposal project in Jimo, Qingdao

By adopting the process of "sludge concentration + deep dehydration + thermal drying + pyrolysis carbonization + flue gas purification + sludge carbonization for building materials", the project of the Qingdao Jimo Sludge Treatment and Disposal Center has treated more than 150,000 tons of sludge, reduced sludge weight by more than 85%, and saved more than 100,000 cubic meters of landfill space. The design capacity of the project is 300 ton/day (water content is 80%), and the project was completed and put into trial operation in October 2019. It is the largest sludge carbonization project in China.



Wastewater

BEWG takes the following measures to manage wastewater discharge:

Ensuring that various pipes such as water pipes, rainwater pipes, and process pipes in the plant are separated and operate independently to avoid mutual pollution;

Treating wastewater from the laboratory in strict accordance with the regulations of the laboratory management system, and prohibiting the discharge of wastewater into the sewer pipe without treatment;

Strengthening daily inspection and maintenance of facilities and equipment, avoiding the overflow or discharge of sewage due to the mechanical failure of pipes and gates, which may harm the local natural environment and the drinking water of residents.

Waste gas

In accordance with the relevant laws and regulations and the requirements of local governments, BEWG equips newly-built water plants with waste gas collection and treatment systems in the design and construction stage. The waste gas collection and treatment systems for water plants under operation are further improved.

BEWG installs biological deodorization devices to treat the special gases generated by some structures during the operation of the water plant, and ensures the emission in compliance with relevant standards after harmless disposal. During operation, each project company shall strictly implement the inspection and maintenance of deodorization systems, and reduce the impact of the odor on the staff and residents in surrounding areas.

Noise

The noise during the operation of the water plant mainly includes the noise generated by the operation of large equipment, the noise from the vehicles in the plant, and the noise from the maintenance and construction on site. BEWG makes every effort to minimize the noise pollution of the water plant by adopting low-noise machinery, installing sound insulation facilities, prohibiting the honking of vehicles in the plant, and scheduling maintenance and construction properly.



Waste discharge²⁰ of BEWG in 2020-21

Indicator	Unit	2021	2020
Water business in Chinese mainland			
Hazardous solid waste	ton	198	205
Hazardous solid waste density ²¹	kg/10,000 HKD	0.071	0.080
Non-hazardous solid waste	ton	2,525,025	2,033,760
Non-hazardous solid waste density ²²	ton/10,000 HKD	0.91	0.80
Overseas water business			
Non-hazardous solid waste	ton	30,608	17,517
Non-hazardous solid waste density	ton/10,000 HKD	0.011	0.0069
Solid waste business			
Sulfur oxide emission	ton	37	21
NOx emission	ton	305	194
Soot discharge	ton	8,825	/
Boiler residue discharge	ton	64,723	/
Office building business			
Hazardous solid waste	ton	1.19	0.92
Hazardous solid waste density	kg/10,000 HKD	0.00043	0.00036
Non-hazardous solid waste	ton	54.03	48.31
Non-hazardous solid waste density	ton/10,000 HKD	0.000019	0.000019

²⁰ In 2021, BEWG clarified and revised the statistical caliber of waste, leading to changes in some indicators.

²¹ Hazardous solid waste density = Production of hazardous solid waste of the year ÷ Operating revenue of the Group of the year. The same below.

²² Non-hazardous solid waste density = Production of non-hazardous solid waste of the year ÷ Operating revenue of the Group of the year. The same below.

Pollutant reduction of BEWG in 2020-21

Indicator	Unit	2021	2020
Water business in Chinese mainland			
Suspended solids reduction	ton	683,108	613,211
COD reduction	ton	904,218	774,353
Ammonia nitrogen reduction	ton	104,595	87,261
Total phosphorus reduction	ton	14,717	13,336
Total pollution reduction	ton	1,706,638	1,488,161
Overseas water business			
COD reduction	ton	16,426	22,615
Ammonia nitrogen reduction	ton	562	700
Total phosphorus reduction	ton	84	45
Total pollution reduction	ton	17,072	23,360

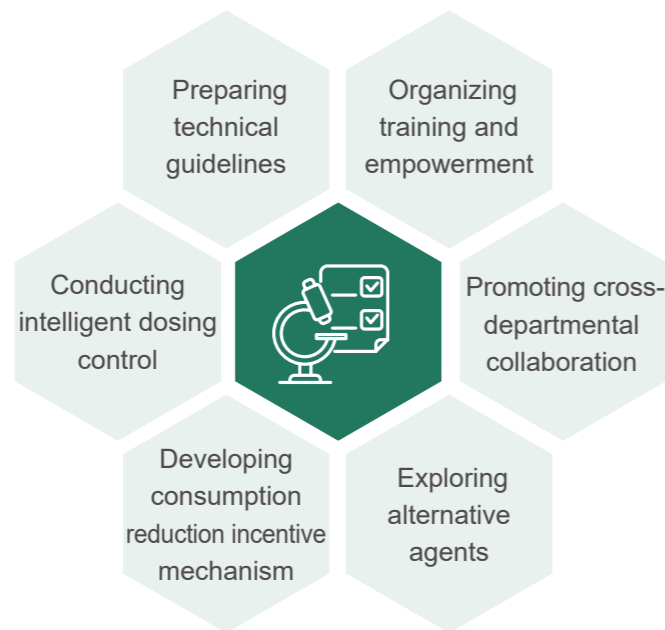


Chemical agent management

In strict accordance with the *Environmental Protection Law of the People's Republic of China* and the *Law of The People's Republic of China on the Prevention and Control of Water Pollution*, and other relevant laws and regulations, BEWG has formulated the systems, such as the *Production and Operation Management Measures* and the *Chemical Agent Management Measures*. We have also developed the corresponding standards related to procurement and supply, implement the whole-process agent management in an efficient, scientific, and refined manner, and improve the utilization efficiency of resources.

In 2021, BEWG set up a special working group responsible for reducing the chemical agent consumption, tapping into the potential of the treatment process, promoting the transition of operation and management of project companies from extensive mode to lean mode, and improving the overall operation and management and business benefits of the Group on the premise of ensuring the safe and normal operation of the water plant.

Main agent management measures of BEWG



Case

Intelligent agent application helps to improve the quality and efficiency of Shandong Guanxian Jiacheng Water Purification Plant

In 2021, Shandong Guanxian Jiacheng Water Purification Plant put into use the intelligent control system of dephosphorization agents independently developed by the Group, and the poly aluminum chloride (PAC) application rate decreased by over 10% from 51 mg/L to 43 mg/L, saving about RMB 150,000 per year.



Consumption of chemical agents²³ of BEWG from 2019 to 2021

Indicator	Unit	2021	2020	2019
Water business in Chinese mainland				
Carbon source consumption	ton	84,386	77,768	67,149
Consumption of dephosphorization agents	ton	224,346	205,973	202,323

²⁰ The statistical scope of the usage of the chemical agents mainly covers sewage treatment plants/reclaimed water plants under the subsidiaries of the Group.



3

Building a harmonious society



Talent management

Safety and health

Quality assurance

Innovation empowerment

Contributing to society

Talent management

The Human Resource Committee of BEWG coordinates employee management and ensures the principles of anti-discrimination, diversity and equality implemented in every link of human resource development. We stick to fair, equitable and open employment, emphasize the development of excellent talent and provide broad growth space for employees. We create equal and diverse working environment and integrate employee care into corporate culture.

We released the Statement on Employee Rights²⁴. We pledge to respect employment diversity, oppose discrimination, prohibit forced or compulsory labor, and standardize and improve the management of employees' rights and interests.

Employment management

BEWG upholds the principle of equal employment, prohibits and opposes any form of child, forced or compulsory labor, offer jobs to talented people and employees based on their competencies, ensures equal pay and respects employment diversity. We have improved the *Recruitment Management System* and formulated *Internal Recruitment Channel Management Methods*, opposing any discrimination on the basis of race, nationality, social class, etc. In 2021, we launched employment programs for disable people and hired 36 people with disabilities.

We strengthen democratic employee management, encourage employees to voice their opinions on building equitable and diverse working environment. BEWG forms labor unions at headquarters of the Group and subordinate subsidiaries, regularly holds employee exchanges, collect their feedback to shorten the communication distance between employees at all levels and senior management. We have built a global business presence, so we respect human rights of labors, comply with labor laws of our overseas operating locations, support international norms and standards concerning human rights such as Universal Declaration of Human Rights. We encourage our employees to safeguard their rights and interests, support them to join independent unions or collective bargain agreements, so as to create a harmoniums workplace.

In 2021, we revised and released systems including the *Management Measures for Campus Recruitment of BEWG* and the *Management Measures for Recruitment of Managers under Direct Management of*

BEWG. We attract, nurture and retain talent by launching programs, such as New Power Trainee Plan 3.0 and Talent Pipeline Building Plan, using tools like competence and capability models.

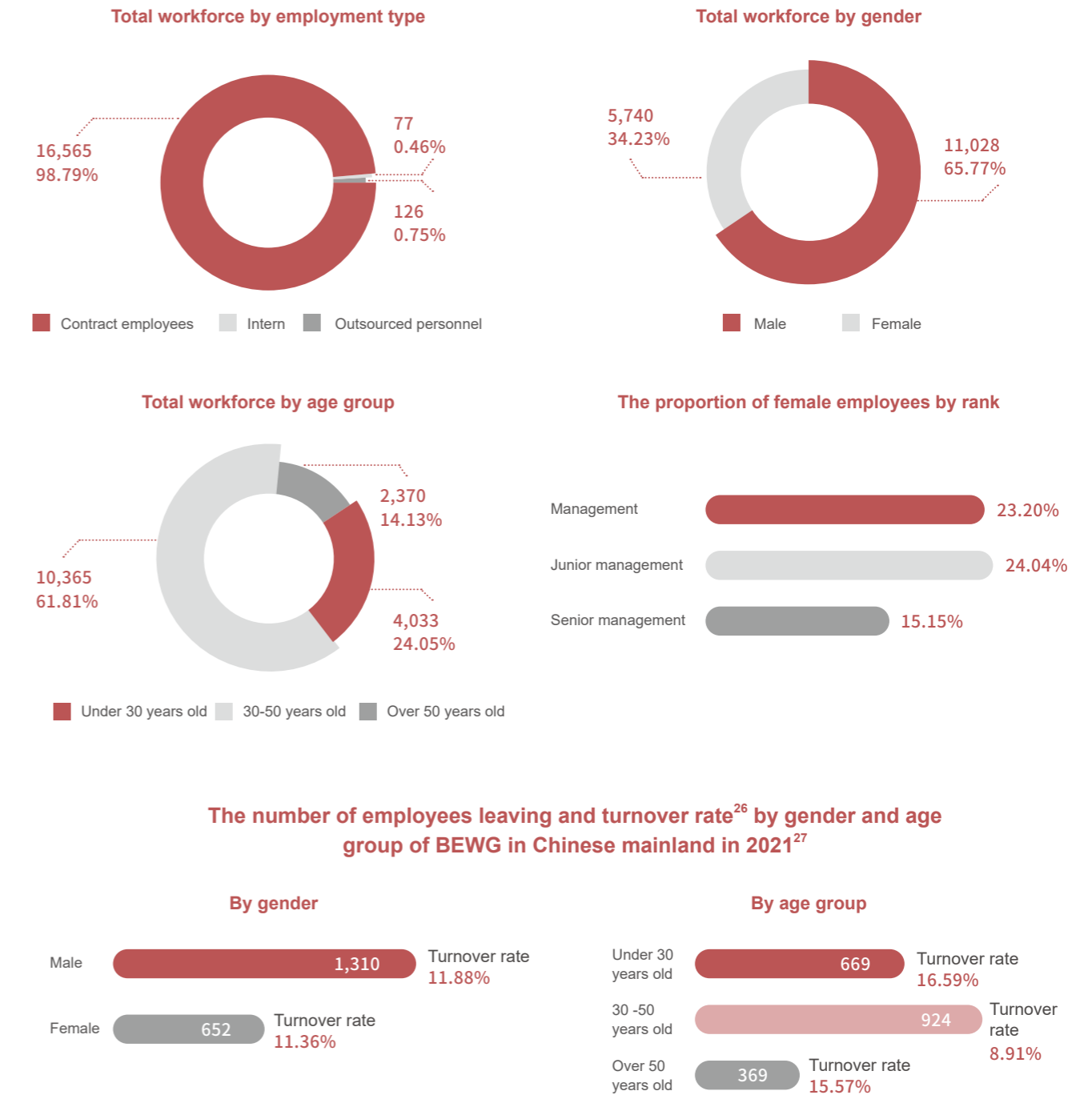
As of December 31, 2021, BEWG had a total of **17,888** employees

Including **16,768** in Chinese mainland

1,120 in China's Hong Kong, Macao, Taiwan and overseas regions

Total number and proportion of BEWG employees by gender and age in Chinese Mainland in 2021²⁵

New contract hires during the year **2,318**

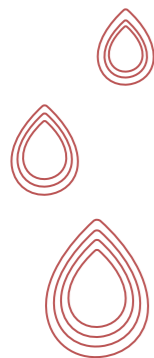


²⁵ Considering that the business of BEWG is mainly concentrated in Chinese mainland, so only the information of employees in Chinese mainland is disclosed.

²⁶ Turnover rate for each category = number of employees in that category leaving / total number of employees in that category * 100

²⁷ Considering that the business of BEWG is mainly concentrated in Chinese mainland, so only the information of employees in Chinese mainland is disclosed.

²⁴ Public disclosure URL: <https://www.bewg.net/uploadfile/2020/1020/20201020105605708.pdf>



Talent management

Talent development

The Group aims to build a learning organization and has prepared a sound training system with category-specific employee cultivation plans. To achieve this, talent cultivation strategies should be developed according to the Group's strategies and industrial development bottlenecks, a strategy-oriented and trainee-centered training system with learning programs should be built, and corresponding training plans should be implemented based on talent types. Key talent cultivation programs in 2021 are as follows:



In 2021, four offline sessions of China Environmental Industry Senior Manager Seminar had been held, with **296** trainees and **144** training hours. The class discovered and selected talent for BEWG and cultivated talent for the environmental protection industry, which significantly strengthened the core competence of the industry and converged new driving force for the future prosperity of the ecological industry.



In September 2021, the first centralized training of the Seminar for General Managers of Regional Companies (Session I), which was sponsored by the Human Resource Center of BEWG, hosted by BEWG Education Center, and co-hosted by the Western Region, was successfully held in Chengdu, Sichuan. The training had **43** enrollments, totaling **40** hours. It was a tangible step to promote customer-oriented region reform, empowering professional force for general managers of regions to support better business operations and customer services of regional companies, thus helping organizational changes by building a strong talent pipeline.



In September 2021, BEWG held the 2021 Internal Lecturer Empowerment Certification Training (lecturer/senior lecturer), engaging **36** trainees from all over the country, totaling **18** hours. In the training session, **22** trainees were certified as senior lecturers, **13** as lecturers.

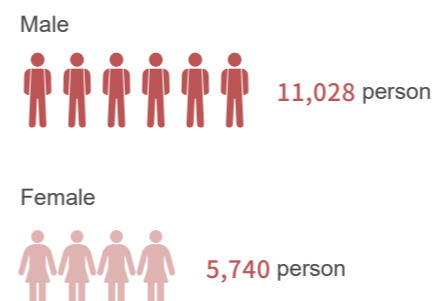


Diversified training schemes of BEWG in 2021

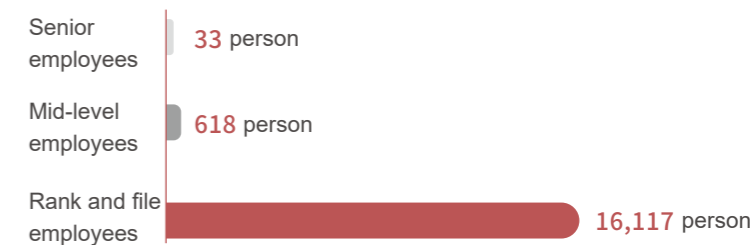
Management	<ul style="list-style-type: none"> China Environmental Industry Senior Manager Seminar Seminar for General Managers of Regional Companies Seminar for Heads of Sewage Water Treatment Plants Seminar for Managers of Water Supply Companies
New hires	<ul style="list-style-type: none"> Growth Enhancement Training for New Hires Trainee Training
Frontline employees	<ul style="list-style-type: none"> Enterprise Self-assessment of Skill Level Certification Skill Assessment Test for Frontline Production Workers
Others	<ul style="list-style-type: none"> Safety Training for all employees Internal Lecturer Training

BEWG training performance in 2021²⁸

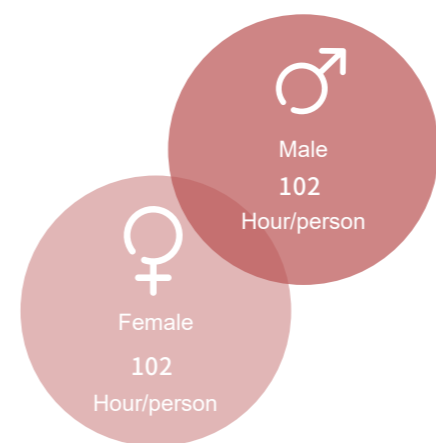
Full-time employees participating in training by gender



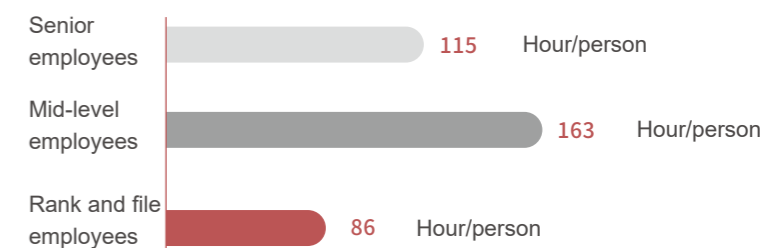
Full-time employees participating in training by employment type



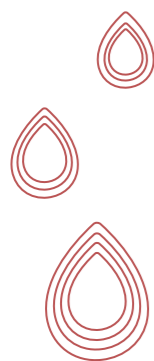
Average training hours of full-time employees by gender



Average training hours of full-time employees by employment type



²⁸ Considering that the business of BEWG is mainly concentrated in Chinese mainland, so only the information of employees in Chinese mainland is disclosed.



Talent management

BEWG builds diversified talent development paths, clarifies promotion channels and steps up the building of talent pipelines with encouragement and incentives. The advancement of measures such as trainee programs, industrial trainee initiatives. From dimensions such as employee performance, length of service and comprehensive departmental evaluation, we carry out annual promotion assessment of talents, comprehensively assess the adaptability of employees to their positions, and set up equity incentives and incentive systems of honors, in order to improve the treatment of talents.



Skill improvement activities for trainees at BEWG

In 2021, BEWG won a series of honors for our efforts toward talent development, such as the 2020-2021(12th) China Talent Development Awards-Ecological Empowerment Award from the *Training Magazine* under Xinhua Daily Media Group, the 2021 Best Employer Award from KNX, and the 2021 Top10 Most Innovative Employers with Digital Intelligence in China from Zhaopin.com.



BEWG won the 2020-2021(12th) China Talent Development Awards-Ecological Empowerment Award

Employee care

BEWG strives to enhance the sense of happiness and belonging of employees, provides comprehensive guarantee for their life and work, enriches their spiritual life. According to the *Headquarters Employee Welfare System*, BEWG provides employees with sound non-salary benefits. We offer benefits and subsidies to employees, including medical insurance, mutual insurance, supplementary pension annuity, meal and transport allowances, summer heat protection allowance, healthy afternoon tea.

In accordance with the *Management Measures for Organization and Implementation of Corporate Culture Activities of BEWG* and other management regulations, BEWG has carried out a series of employee welfare and health care activities, actively implemented the *Decision on Amending the Regulations on Population and Family Planning of Beijing*, improved benefits for female employees, extended maternity leave, provided parental leave and nursing leave for employees and carried out publicity and guidelines. We organize regular medical check-ups, tumor marker screenings, offline and online health lectures, healthy walks, fun games, football and badminton matches, and other cultural and sports activities, and provide employees with various fitness equipment to care for their physical health. We also organize regular and occasional executive luncheons, BEWG Thinking-sharing sessions, offline digital reading spaces, themed photography competitions, staff mental health lectures and psychological counselling to protect the mental health of our staff.

BEWG comprehensively improves employee insurance and extends insurance coverage to their spouses and parents without premium increase. In 2021, we held over 204 employee care activities, attracting more than 13,000 participants.



Brisk walking activity in celebration of CPC centenary



We held over

204 employee care activities,

attracting more than

13,000 participants

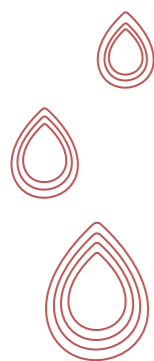
Case

BEWG held a series of "Feminine Power" activities

In March 2021, BEWG launched a series of "Feminine Power" activities to discover the good qualities of outstanding female employees at work and in their family life. In the form of making posters of outstanding employees, BEWG inspires female employees to show their power and glamour in their spare time.



Posts of "Feminine Power" activities



Safety and health

BEWG honors safety responsibility, strengthens safety inspections, hazard hunting and safety culture building, and ensures project companies and contractors to enhance safety management ability of their employees.

Safe production

BEWG comprehensively establishes unified and effective safety management mechanisms, conducts systematic and standardized safety management, sets up safety production committee at headquarters and in first-tier business units. By building consensus, formulating systems, emphasizing training, building brand and other approaches, BEWG deploys safety work of all kinds to strict implement the subject responsibility of safety production.

Based on our operation characteristics, BEWG regularly organizes various activities such as the "Safety Production Month" activities and the "Ankang Cup" competitions. We make full use of various methods such as skill competition, online interaction, and online experience to widely disseminate safety knowledge, improve the safety skills of all employees, build a safety consensus, establish safety concepts, and promote the safety production of the Group.

"Safety Production Month" activities

In June 2021, BEWG organized the safety production month activities with the theme of "Implementing Safety Responsibilities and Promoting Safety Development", such as "Emergency Safety Experience Hall" and "Taking Photos of Hidden Hazards", to improve the staff's capabilities for hazard inspection, risk prevention, and emergency response.



"Emergency Safety Experience Hall" activities organized by BEWG in 2021



BEWG's "Ankang Cup" competitions

In September 2021, the third "Ankang Cup" competition was launched. Helped by safety knowledge assessment, on-site fire drills, limited space operations and emergency rescue drills and safety knowledge competition, it has improved the safety skills of employees. It involved 91 players sent by districts and business divisions after selection.



The third "Ankang Cup" competition of BEWG



In 2021, the headquarters of BEWG passed the

ISO 45001

occupational health and safety system certification

BEWG strictly abides by the *Production Safety Law of the People's Republic of China* and other relevant laws and regulations. With reference to the management systems including the *BEWG Management Regulations to Implement the "Three Simultaneous" Precautions for Occupational Diseases* and the *BEWG Responsibility System for Safety in Production*, we carry out the safety production work, and sign the safety responsibility letters with all staff level by level to clarify safety responsibility objectives, scope, and other aspects and ensure the implementation of safety responsibility at all levels. In 2021, BEWG comprehensively revised and released the *BEWG Management Manual on Quality, Environment, and Occupational Health and Safety* and other guidelines to standardize the safety production process. In 2021, the headquarters of BEWG passed the ISO 45001 occupational health and safety system certification, with a total investment of RMB 22.3 million in safety production.

Total investment in safety production was RMB **22.3** million

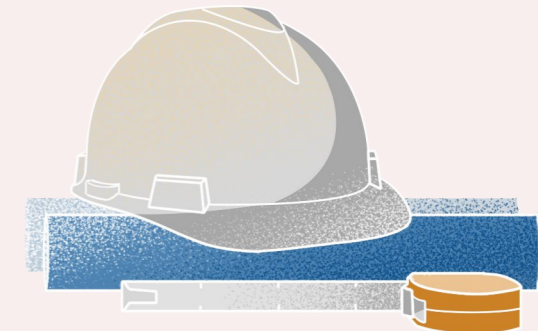
BEWG conducts safety inspections on a regular basis. We collect and analyze the monthly safety production reports of each first-level unit. In 2021, BEWG organized **154,155** inspections covering all business segments of the Group, including special inspections, comprehensive inspections, quarterly inspections, and pre-holiday inspections. The headquarters of BEWG carried out more than **80** random inspections targeting operation and construction safety to identify and eliminate hidden hazards in time. During the pandemic prevention and control period, we organized the point-to-point safety inspection via live stream platforms and offered remote training to on-site personnel after the inspection, so as to improve the effectiveness of safety supervision.



Safety and health



Safety inspection by the Safety Committee of BEWG



BEWG strictly implements the *BEWG Management Regulations for Dangerous Materials Safety* and other relevant systems, specifies the safety specifications for dangerous materials and special operations, regularly evaluates major hazard sources, standardizes the whole-process management of dangerous materials, organizes safety inspection of dangerous operations, and reduces the incidence of safety accidents.

BEWG standardizes the safety emergency response mechanism, establishes a three-level emergency plan system consisting of headquarters, first-level business units, and project companies, improves the ability to respond to and handle various emergency events, and safeguards the health and safety of all employees.

BEWG requires all contractors to have safety production qualifications and sign production safety management agreements with them. In 2021, BEWG issued the *BEWG Manual on Safe and Civilized Construction Standard for Project Delivery* to guide the contractor identification, handle on-site safety production hazards, and systemically improve the safety production management ability. We distribute safety protection equipment and other labor protection supplies to contractors on site and post mandatory safety signs at designated locations. During the operation, we organize tour inspections and irregular unannounced inspections to reduce the incidence of safety hazards and fully protect the construction safety and personal safety of all contractors.



Safety culture

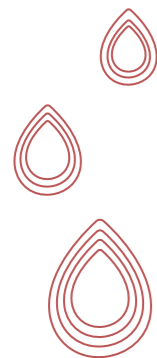
BEWG actively strengthens the publicity and implementation of safety culture, organizes a series of safety activities and safety training, raises the safety awareness of all employees, and enhances their ability to prevent and handle safety accidents. In 2021, BEWG shared the experience of safety management via the *Safety Outlook*, a paper-based quarterly cultural communication platform of the Group aimed to enhance the awareness of safety production of all staff. In addition, BEWG improved the safety response ability of all employees through online safety production lectures and empowerment training for safety management personnel. In line with the relevant requirements of production safety, all overseas project companies of BEWG incorporated relevant indicators into the KPI assessment, and fully motivated all overseas employees to participate in production safety management.



In 2021, BEWG provided safety training for **153,034** person-times



Safety Outlook of BEWG



Safety and health

Training for safety management personnel in major regions

In April 2021, BEWG improved the professional skills of safety management personnel in major regions through instruction, accident analysis, on-site practice, and group discussion.



Empowerment training for safety management personnel by BEWG in 2021

Online safety training for all staff

In June 2021, BEWG launched the three-month "Production Safety Lecture Hall" online. The event hired multiple safety experts to share safety production-related knowledge and help all employees to gain a deeper understanding of fire safety, construction safety, and safety laws. A total of 15,621 participants passed the assessment.



Online safety training for all staff by BEWG in 2021

The 1st "Safety Cloud Classroom" activity

The 1st "Safety Cloud Classroom" activity was held with the theme of "Sharing Opinions on Safety Production", and a total of 146 micro-videos about safety production were collected.

 自吸式长管呼吸器使用佩戴-西部大区-宜宾... 任泽旭 2021-09-09 ★★★★★ 402人学习	 不按规定作业终酿后果短视频-东部大区-周... 任泽旭 2021-09-09 ★★★★★ 401人学习	 心肺复苏术-东部大区-李春亭(山东业务区) 任泽旭 2021-09-09 ★★★★★ 351人学习	 用电安全培训 用电安全事故解析-东部大区-张佳琪(渭南... 任泽旭 2021-09-09 ★★★★★ 405人学习
 易燃易爆物品不能塑料容器来装-东部大区-徐友... 任泽旭 2021-09-09 ★★★★★ 309人学习	 聊聊危险作业-西部大区安全生管理部 任泽旭 2021-09-09 ★★★★★ 323人学习	 有限空间作业操作流程-南部大区朱芸菲+西... 任泽旭 2021-09-09 ★★★★★ 303人学习	 生态环境安全警示教育片-南部大区-张琼 (... 任泽旭 2021-09-09 ★★★★★ 354人学习

The "Safety Cloud Classroom" activity by BEWG in 2021

Occupational health

BEWG strictly complies with the occupational health and safety management regulations, such as the *BEWG Regulations on Occupational Health Management* and the *BEWG Regulations on Labor Protection Articles Management*, to ensure that the occupational health and safety management of all employees is put in place. BEWG has signed a safety responsibility letter with all employees, provided employees with labor protection equipment with suitable protective functions and effects, and constantly updated safety equipment and facilities to comprehensively safeguard the occupational health and safety of all employees. We have also established occupational health files and worker health surveillance files for employees engaging in special operations, organized regular occupational disease physical examinations for employees in relevant positions, and ensured that all new employees complete our health education and training plans.

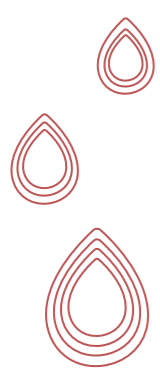
During the pandemic, BEWG strictly followed local regulations on pandemic prevention and control, formed a leading group for pandemic prevention and control at all levels, formulated regular pandemic management rules, and held regular thematic meetings on pandemic prevention and control. In 2021, we regularly provided masks and disinfection products for employees, organized disinfection and temperature monitoring for employees, protected the personal safety of employees, and improved the vaccination rate of employees. Besides, we ensured the implementation of responsibilities by means of pandemic prevention and control commitment. Overseas companies also carried out pandemic prevention and control based on local conditions to safeguard the production safety and personal health of employees.



²⁹ In 2021, BEWG had no production safety accidents above a general accident level in mainland China.

³⁰ Work injury incident rate per million working hours = Number of work injury cases * 1,000,000/Actual total working hours

³¹ Rate of work-related accidents per thousand people = 1,000 * Number of work-related injury cases / Total number of employees



Quality assurance

In 2021, upholding the business principle of “customer orientation through innovation capability”, BEWG has put in place a system for whole-process customer services and quality assurance, made continuous innovations to meet customers’ needs, won their trust by creating value for them.

Customer service

We continued to conduct customer satisfaction survey and expanded the scope and channels of the survey. In 2021, the online text questionnaire was added in the survey, covering customers of 13 regional companies. The survey shows that the proportion of extremely satisfied and satisfied customers was over 90%³² and the satisfaction of existing customers for regional companies was higher than in 2020.

BEWG is committed to providing high-quality service to users. We value the needs of every type of customer and have set up a 24/7 service hotline of water supply company to ensure the circulation rate of water issues on platforms such as the city building platform, mayor’s hotline and social media. In response to customer inquiries, suggestions and complaints, we follow up and provide timely feedback throughout the process to safeguard the customer experience and improve customer satisfaction.

³² The approximately remaining 10% respondents chose the “neither satisfied nor dissatisfied” response.



In 2021, the online text questionnaire was added in the survey, covering customers of **13** regional companies



The survey shows that the proportion of extremely satisfied and satisfied customers was over **90%**



Excellent quality

To further enhance customer satisfaction and strengthen quality control, BEWG has built a standardized management system integrating the full lifecycle of product design, construction delivery and operation services. In 2021, the headquarters of BEWG became ISO 9001 Quality Management System certified.



Product design

In 2021, BEWG promoted the all-round transformation of technological products to facilitate innovation in R&D, and comprehensively improve product performance and product quality.

Based on the standardized development and intelligent design of core product modules, we create differentiated solutions for customers. During the water plant design, we adopted the “modular” product platform and product development concept to design and develop over 400 models of 27 professional modules, which basically meet the requirements of projects with different scales and water quality. This approach has been applied to some projects. In addition, we launched eight product sequences aiming at environmental protection business segments, and released ten comprehensive solutions in advance to make our product design more relevant to the business scenario and achieve the goal of customer-oriented product development.



Eight product sequences of BEWG



“Ten Comprehensive Solutions” and “Eight Product Sequences” of BEWG

Quality assurance

Quality delivery

In 2021, BEWG reshaped the project delivery system and built a quality control system with the standard system, control system, and guarantee system as the core. To this end, we established the *BEWG Manual on Sewage Treatment Plant Delivery Quality Standards*, formulated more than 2,407 qualitative and quantitative quality indicators, and supplemented 591 sets of visual comparison photos. The Group will continuously refine the process quality control modes and renovation methods, and fully cooperate with contractors to deliver "high-quality" water projects.

In line with sound delivery quality standards, we refine and represent a "high quality" and "excellent quality" project profile. Based on traditional construction quality, we also integrate such factors as professional enterprise standards, technology and digital ability, as well as brand and social effects, to improve water plants constantly. While providing sewage treatment services for local residents, we also perform our functions of technological demonstration and social education. Throughout the whole cycle of products, delivery, and operation, we focus on the six dimensions, namely energy conservation and carbon reduction, durable use, excellent functionality, reliable operation, decent plant, and convenient maintenance. Based on standardized product modules and national and industrial standards for project classification and control, we creatively introduce the "internal/external customer sensitivity" indicator. Apart from the professional management dimension, we fully respect the customer vision and take account of the internal and external visions of the system to make a fair, objective and trustful evaluation of the project and facilitate the improvement of delivery quality in the long run.

"高品质" 画像
——区域公司示范项目

- 企标
- 科技
- 品牌效应

实体满足企标 | 科技成果示范 | 品牌效应突出

"优良品质" 画像
——区域公司一般项目

- 国标
- 特色

实体满足国标 | 北控水务特色

BEWG's "high quality" and "excellent quality" project profile



The review and certification meeting for the *BEWG Manual on Sewage Treatment Plant Delivery Quality Standards*

In 2021, BEWG resolutely implemented the national requirements and highly valued quality management. In September, we launched the quality month activity with the theme of "customer as the source and quality as the priority". By organizing various activities such as training exchange, case comparison, and quality and safety upgrading, we cultivated the quality culture of "emphasis on quality among all staff and regular quality control" to enhance the quality awareness of all staff. During the launch meeting, all colleagues engaging in product delivery made a solemn commitment that "top priority should be given to quality from the source". The event was well received within the Group. There was a total of 82 typical cases under construction or application and 312 projects for summary and upgrade. The event themed "Me and Quality" received 68 entries, promoting over ten typical working methods and attracting more than 450 person-times.

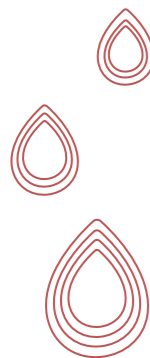


The commitment and speech given by senior executives at the launch meeting of the quality month



<p>巴中公路旁双功能排灌灌溉工程</p> <p>负责人: 杨晓新 学习人数: 1759 ★★★★★ (41)人评价</p>	<p>滇多生活污水处理案例</p> <p>负责人: 魏晓新 学习人数: 2071 ★★★★★ (55)人评价</p>
<p>两带式格栅加药在埋地式污水厂建设中的应用</p> <p>负责人: 魏晓新 学习人数: 1751 ★★★★★ (37)人评价</p>	<p>污水处理厂区电缆沟盖板优化</p> <p>负责人: 魏晓新 学习人数: 1995 ★★★★★ (45)人评价</p>
<p>绿化工程常见问题及措施</p> <p>负责人: 魏晓新 学习人数: 1726 ★★★★★ (35)人评价</p>	<p>污水处理厂工艺池体运行调度的做法</p> <p>负责人: 魏晓新 学习人数: 1935 ★★★★★ (46)人评价</p>
<p>创新型机壳材料组合型材意义和效果</p> <p>负责人: 魏晓新 学习人数: 1723 ★★★★★ (30)人评价</p>	<p>咸淡带式格栅加药施工方法</p> <p>负责人: 魏晓新 学习人数: 1902 ★★★★★ (43)人评价</p>
<p>设备检修规范质量通病防治</p> <p>负责人: 魏晓新 学习人数: 1712 ★★★★★ (30)人评价</p>	<p>活性污泥池清分泵设备施工方法</p> <p>负责人: 魏晓新 学习人数: 1839 ★★★★★ (38)人评价</p>

On-site observation meeting and excellent management cases delivered



Operation service

Focusing on the star-level rating system, BEWG constantly improves the project operation quality. We have built flagship water plants featuring standardized operation, established a standardized operation management system, and realized the rapid promotion and replication of efficient management modes and high-standard management requirements. Besides, we have established a risk management and control system and an emergency response mechanism to ensure safe and stable operations.

Star-level rating operation management

The star-level rating operation enterprise evaluation system of BEWG is the industry's first systematic operation rating standard. The evaluation system comprehensively rates the operation enterprises from the five dimensions, namely process management, operation quality, operation result, personnel ability, and digital operation ability. According to the star-level-rating comprehensive score, the enterprises are classified into five levels of one to five stars.

In 2021, BEWG revised the *Management Measures for Evaluation of Star-level Enterprises* and relevant evaluation criteria and the *Management Measures of Inspection and Acceptance of Star-level Enterprises*, to further improve the project digital operation ability. We also adopted digital means to strengthen regular management, promote transparent supervision, enhance the project operation quality, and facilitate star-level rating and acceptance efficiently. Based on the water operation management standard and the star-level rating acceptance data model of BEWG, we set up the one-policy-for-one-plant system, and designed process control targets for each sewage treatment plant. We also utilized the closed-loop management consisting of indicator setting, indicator monitoring, indicator analysis, and indicator optimization to guide project companies to analyze, diagnose, and optimize the control of the sewage treatment process.

In 2021, all water plants under BEWG completed the star-level rating operation evaluation and acceptance. More than **95%** of them attained a one-star-level rating or above, and more than **30%** of them obtained a three-star-level rating or above, which has been improved greatly. The star-level rating structure was further optimized.

The star-level rating efforts have continuously improved the project operation quality of BEWG and also won a high recognition from the industry. Kunshan North District Sewage Treatment Plant and Wusong River Sewage Treatment Plant were awarded the "Excellent Sewage Treatment Plants in Suzhou City" by the Suzhou Municipal Water Affairs Bureau. At the 19th Water Industry Strategy Forum themed "Historical Leaps over Two Centenary Years", five sewage treatment plants of the Group were selected as the benchmark of sewage treatment plants, namely:

- Kunshan North District Sewage Treatment Plant was awarded the benchmark of operation management;
- Yixing Urban Sewage Treatment Plant was awarded the benchmark of integration of plants and pipe networks;
- Luoyang Chandong Sewage Treatment Plant was awarded the benchmark of energy development and utilization;
- Xintang Yonghe Sewage Treatment Plant was awarded the benchmark of ecological beauty;
- Mianyang Tazi Dam Sewage Treatment Plant was awarded the benchmark of information integration.

Standardized construction of water plants

The standardized construction of water plants is based on the closed-loop management philosophy of ISO 9001 and PDCA and BEWG's years of experience in operation and service.

The standardized construction of water plants can help BEWG to build a whole set of standardized management mode and benchmarking experience that can be copied and promoted. To this end, we adopt various methods, such as forming a special working group and fostering effective incentive strategies, to effectively guarantee the implementation of standardized water plant construction. By the end of 2021, BEWG had implemented the standardized management system for five water plants. Each standardized water plant has gradually achieved refined management in such aspects as production and operation, equipment and facilities, laboratory testing, safety management, and comprehensive management, thereby realizing multiple values such as energy conservation and consumption reduction, reducing operation risks, improving customer services, upgrading operation technologies, and optimizing management efficiency.

Amid the standardized construction and operation of water plants, we start with the five dimensions of work content, management process, production operation, process quality control, and performance assessment, formulate the management documents for standardized water plant construction, and build the on-site production management system.

Based on the standardized construction of a single water plant, BEWG has extended the intensive management to 85 projects through the "1+N" integrated management mode. With the aid of Smart Execution of Drainage (SED), we have launched standardized management online and made 164 cloud deployments for SED.

Emergency response

Under the dual pressure of the regular pandemic prevention and control and heavy rainfall in many places of China, BEWG has made every effort to ensure the normal operation of production and provide the public with a safe water environment. We regularly inspect the safety risks of the project, strengthen water quality monitoring, and require in-service employees to strictly fulfill their duties and eliminate any accident risks. In addition, we have developed an emergency plan for flood control to ensure the orderly, stable, and safe operation of water distribution and drainage facilities in the case of sudden flooding.

In 2021, local governments in China fully recognized our efforts to guarantee water distribution and improve sewage treatment quality and efficiency. Project companies in provinces such as Guangdong, Hainan, Fujian, Shandong, and Henan have received letters of gratitude from local governments.

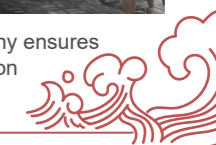
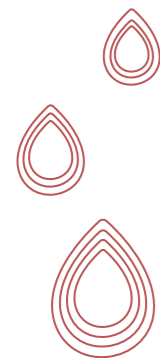
Case

Jiyuan Water Production and Distribution Company ensures the safety and stability of water quality during floods

In 2021, Henan was lashed by heavy rainfall unseen in a century. BEWG Jiyuan Water Production and Distribution Company spared no effort to ensure the safety and stability of local water distribution and made urgent arrangements for various work during flooding. The project company immediately launched the emergency plan for water distribution, made an all-round deployment of the urban water distribution pipe network, strengthened the inspection of the pipe network, repaired various failures in time, and guaranteed the water supply for local residents and enterprises. The project company urgently dispatched 30 water trucks to deliver water to more than 20 communities and villages twice a day to ensure that residents had access to safe water during the special period. Besides, the project company urgently initiated the use of underground water resources to relieve the burden of the urban water supply.



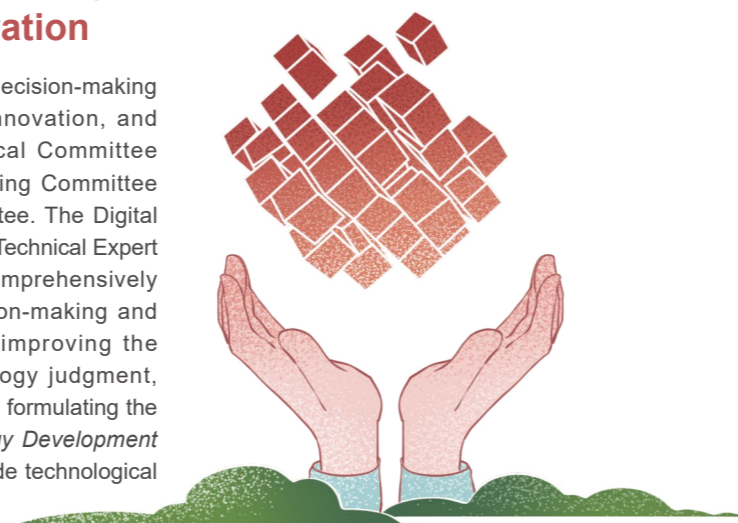
Jiyuan Water Production and Distribution Company ensures the safety and stability of water distribution



In response to the national strategies for ecological civilization construction and science and technology development, BEWG plans and adjusts the top design for technological innovation, improves and innovates the organizational system construction, enriches the technological innovation mechanism, increases investment in technological innovation, integrates and improves technological innovation resources, refines the management of intellectual property, promotes enterprise development through technological innovation, as well as effectively and vigorously supports the Group's overall innovation strategy.

Promoting top-level design for technological innovation

We have adjusted the top-level decision-making mechanism for technological innovation, and reorganized the former Technical Committee into the Technical Decision-making Committee and the Technical Expert Committee. The Digital Professional Committee under the Technical Expert Committee is responsible for comprehensively optimizing the innovation decision-making and advisory system, significantly improving the efficiency of innovation technology judgment, decision-making, and practice, and formulating the *Outline of Science and Technology Development Plan of BEWG (2021-2025)* to guide technological innovation activities.



Part of the *Outline of Science and Technology Development Plan of BEWG (2021-2025)*

Overall goals for science and technology development

The Group independently develops key technologies and products for key business segments in a controllable manner, has the ability to export key technologies, regards technological output as a development engine, and earns a leading position for the competitiveness and influence among global technological brands.

Key areas of science and technology development

6 key areas: Comprehensive renovation of urban sewage and water environment, urban water distribution, rural environment comprehensive renovation, industrial water, and digital construction;

16 directions: Municipal sewage, reclaimed water recycling, sludge treatment and disposal, drainage pipe network construction and operation, river renovation and black and odorous water bodies management, sponge city construction, water quality guarantee, pipe network leak control, high-standard water distribution, rural sewage water distribution, water recycling, industrial wastewater zero emissions, digitalized management and digital business.

Improving the organizational system for innovation

In 2021, BEWG set sight on turning into a technology-driven enterprise in line with the business philosophy of "customer orientation through innovation capability". We set up new entities specializing in technological innovation, such as BEWG Research Institute, Product and Solutions Center, and Digitalization Innovation Center, to facilitate the commercialization of R&D achievements. Hang Shijun Expert Studio and Wang Jianli Expert Studio were established to help independent experts and internal experts play a more significant role in innovation. Through organizational structure reform, we strengthen the spillover of technological innovation, and continuously improve the ability to promote the commercialization of technological achievements.

Enriching the mechanism for technological innovation

BEWG continuously increases investment in technological innovation. In addition to the original investment in independent technological project approval and regional business capacity improvement, BEWG has set up a special project for technological innovation and pilot application, fully motivated the front-line personnel to promote innovation, and stimulated technical innovation among all employees.

We have issued the *Application Guide for the First Set of Self-developed Technological Equipment of BEWG* to facilitate the application of innovative technological achievements, realize the iterative upgrading of industrial technology, and drive the high-quality development of the water industry.

Integrating and upgrading resources for technological innovation

With years of experience in innovation exploration, we have formed a "one-stop" technological management system that covers "university-research-industry-application" and consists of technology identification and verification + characteristic university-enterprise cooperation + transformation of ecological scientific and technological achievements. We have also built an open technological innovation platform system through planning and integration. BEWG has solved the "last mile" problem of the transformation of scientific and technological achievements, thereby improving the transformation rate of scientific and technological achievements and better realizing the value of technological innovation.

Case

Building BEWG 4×(1+N)³³ technological platform system to accelerate the cooperation and transformation of technological achievements

The 4×(1+N) technology platform system of BEWG has been built to conduct overall planning of the Group's R&D bases and verify technological resources on the platform. Qufu Verification Platform, the industry's first "plug and play" agile verification platform, and Danyang Verification Base, the Group's first flexible verification base, can accelerate the verification and transformation of technological achievements.



Panorama of technological platforms

³³ 4 refers to four districts, with each managing "1+N" of science and technology resources. 1 means at least one plug-and-play integrated verification platform should be built in each district, which can carry out multiple R&D verification and laboratory testing. N refers to all water plants in the district, which can provide a variety of application scenarios according to the needs of technology development and verification.

Innovation empowerment

Launching fruitful technological innovation activities

BEWG has formed a wide range of innovation activities facing the industry and the Group. Facing the industry, the BEWG Water Cup of the 4th China “Internet+” Ecological Environment Innovation and Entrepreneurship Competition and the 1st China “Internet+” Technological Venture Capital Competition of Ecological Environment helped the Group identify and capture excellent innovative technological achievements. At the Group level, the 3rd “Beidou Award” innovation appraisal has deeply tapped the innovative potential of all staff and formed an excellent atmosphere for innovation.

Case

BEWG holds the BEWG Water Cup of the 4th China “Internet+” Ecological Environment Innovation and Entrepreneurship Competition and the 1st China “Internet+” Technological Venture Capital Competition of Ecological Environment

To practice openness and innovation in an all-round manner, BEWG is committed to building a platform for the exchange and matchmaking of innovative scientific and technological achievements and industrial resources, promoting the transformation of scientific and technological achievements in the field of ecological environment, and facilitating the transformation and upgrading of the industry. On December 3, 2021, BEWG held the final of the 4th China “Internet+” Ecological Environment Innovation and Entrepreneurship Competition and the 1st China “Internet+” Technological Venture Capital Competition of Ecological Environment, which attracted 246 universities, 97 enterprises, 848 projects, and more than 5,000 participants. The event has attracted a total of 800,000 person-times in society and gained coverage from more than 40 media agencies. This event has widely stimulated the enthusiasm of the ecological environment industry to display the latest technologies and engage in talent exchange, promoted innovation and entrepreneurship, and facilitated over 30 cooperation projects between the industry and investors for innovative technological achievements.



BEWG Water Cup of the 4th China “Internet+” Ecological Environment Innovation and Entrepreneurship Competition and the 1st China “Internet+” Technological Venture Capital Competition of Ecological Environment

Case

The 3rd “Beidou Award” innovation competition of BEWG successfully concluded

BEWG insists on the innovation of all staff, improves the construction of the honor system, and maximizes the value of innovative achievements. On December 10, 2021, BEWG held the 3rd “Beidou Award” for innovation competition with the theme of “Innovation Paints A New Future”. More than 3,300 employees participated in the event, contributing over 540 innovative achievements for appraisal. The event created a strong atmosphere of technological innovation, selected 40 innovative achievements, and presented awards to innovation personnel and related teams.



The 3rd “Beidou Award” with the theme of “Innovation Paints a New Future”

Streamlining intellectual property management

BEWG emphasizes the layout, management, and protection of intellectual property, and has been awarded the “Pilot Unit of Intellectual Property in Beijing”. By the end of 2021, the Group has obtained 772 authorized patents, including 391 patents related to sewage and water distribution business and 381 patents related to new business. The Group has obtained 420 software copyrights, thereby effectively protecting the technological innovation achievements and enhancing our intellectual property advantages.

By the end of 2021,



the Group has obtained **772** authorized patents



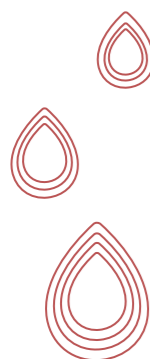
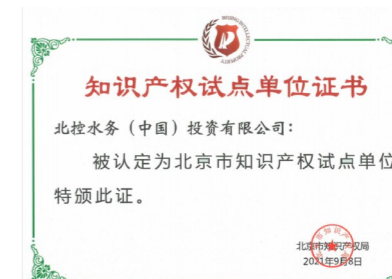
Including **391** patents related to sewage and water distribution business



381 patents related to new business



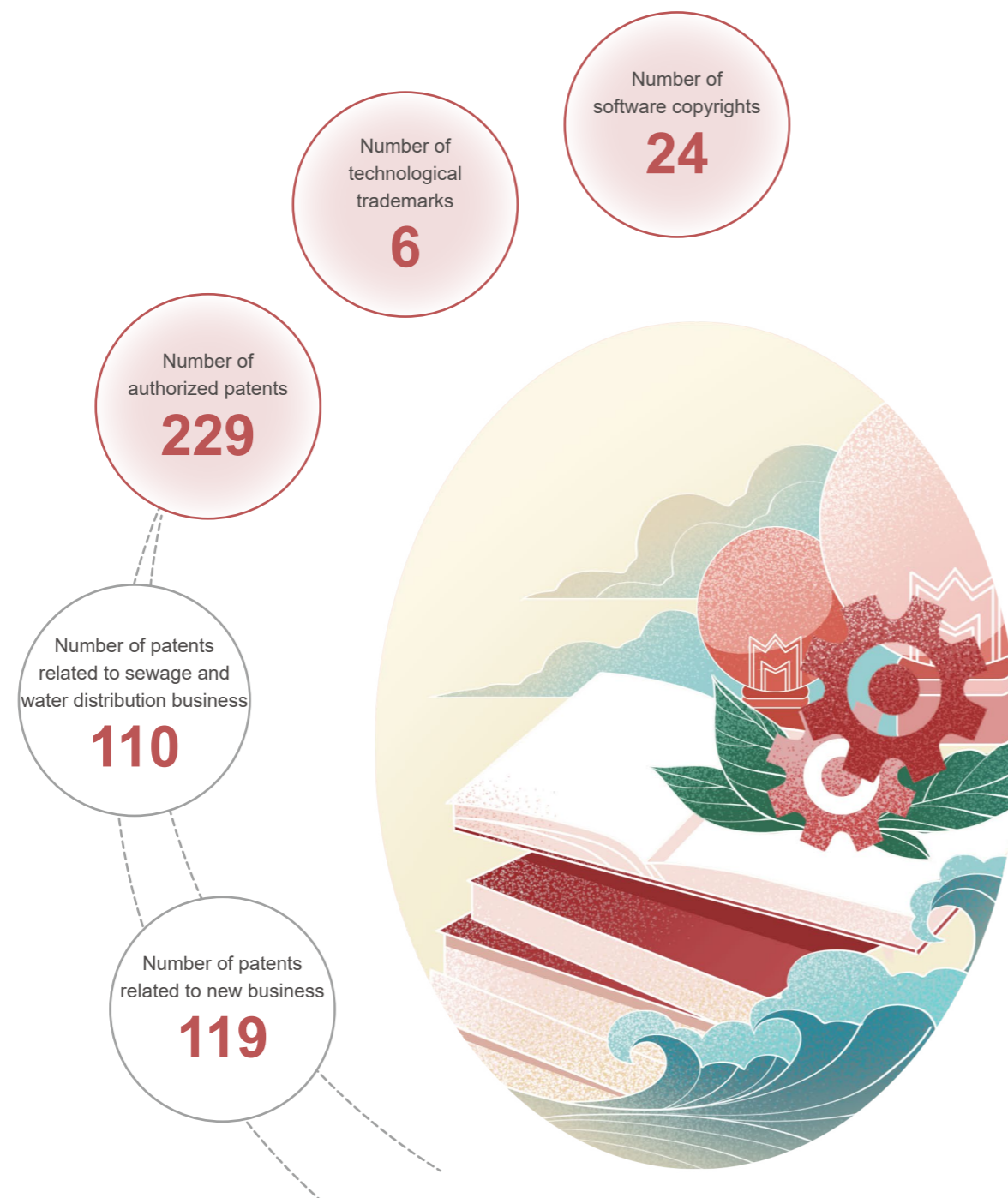
The Group has obtained **420** software copyrights



Innovation empowerment

For four consecutive years, the Group has offered special intellectual property incentives for patents, software copyrights, trademarks, as well as national, industrial, and local standards. In 2021, BEWG rewarded a total of 64 Intellectual property and external standards that fell within the scope of rewards, and the number of authorized patent rewards increased by 1.4 times compared with 2020.

Intellectual property performance³⁴ of BEWG in 2021



³⁴ In 2021, BEWG revised the patent-related indicator collection caliber, leading to changes in some indicators compared with 2020.

Building a digital technology platform

BEWG integrates digital capabilities and resources to build BEWG Yuehui Digital Technology Platform. We enhance the digital professional capabilities at the Group level and provide digital technology product R&D and consulting services in the field of environmental protection infrastructure. By the end of 2021, we had obtained professional qualifications such as ISO 20000, National High-tech Enterprise, CMMI Level III, and ITSS Level III, as well as a number of smart water-related patents and software copyrights.

Relying on the R&D achievements of smart water products, BEWG constantly diversifies the consulting and delivery services of smart water solutions. The black and odour water bodies monitoring platform based on multi-model coupling was successfully delivered. Aiming at 16 rivers and 24 sections of black and odour water bodies in Linyi City, the project built a comprehensive monitoring

system consisting of the “source, network, station, plant and river”, integrated existing water-related monitoring resources, established a smart monitoring platform, facilitated the integration of urban water environment monitoring, and promoted the continuous improvement of the sewage plant, pipe network, river management, and surface water quality. This project also practiced the trinity environmental management idea of “government supervision, enterprise operation, and public supervision”.



Innovating the integration of industry and education

BEWG constantly builds a talent reserve for the Group and the industry, and perfectly combines the transformation of scientific and technological achievements with talent training and innovation. We have signed university-enterprise cooperation agreements with many universities in China, including Hunan University, Dalian University of Technology, and Minzu University of China to promote resource sharing and integration of industry and education. In May 2021, BEWG was included in the first batch of pilot enterprises integrating industry and education in Beijing as the only enterprise from the environmental protection industry. In addition, we brought the excellent topics accumulated in the production line to the innovation and entrepreneurship competition for college students across China, gave full play to our advantages in the training of technical skills, and facilitated

the growth of talents. In October 2021, as an industrial segment proposer, we won the Excellent Enterprise Organization Award of Industrial Segment Proposition during the 7th China International “Internet+” Innovation and Entrepreneurship Competition for College Students co-sponsored by 12 ministries and commissions including the Ministry of Education and local provincial governments.



BEWG won the Excellent Enterprise Organization Award of Industrial Segment Proposition

Contributing to society

BEWG actively fulfill social responsibility by paying continuous attention to and supporting charitable issues including environmental publicity, community building and rural revitalization, injecting energy in improving people's well-being.



In 2021, charitable donations of BEWG totaled RMB

1.8392 million

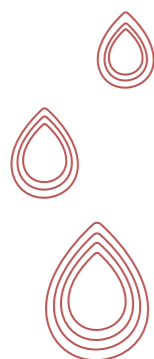


Employees volunteered

63,555 hours

Continuous environmental education

As an environment-friendly enterprise, BEWG gives full play to business advantages to assume environmental responsibility. The Group partners with local communities to sponsor environmental protection publicity and education campaigns in the form of visits, community publicity and cooperation between enterprises and schools. These initiatives aim to raise public awareness of environmental protection and engage them in ecological and environmental protection.



Case

The research course for environmental education of Yuzixi Park Project

In 2021, BEWG joined hands with prestigious children education institutions to work on the Yuzixi Park Project and developed a set of one-day research course titled "The champion of Planet -- treasures of wetlands". The course is popularization of science course involving interactive experience targeting children aged six to eight years old. It includes biodiversity observation, introduction of wetlands' functions and other interactive links.



The research course activity of Yuzixi Park Project

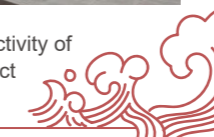
Case

Environmental publicity of Pengjiang Smart Water Exhibition Center

In July 2021, the Pengjiang Smart Water Exhibition Center in Jiangmen, Guangdong was officially opened. The exhibition center serves as a demonstration window of the smart water management of the Group, also an environmental education platform for the public. Visitors can engage in interactions in thematic experience zones such as energy conservation, low carbon and environment protection and gain deeper understanding of water treatment and environment protection through immersive local water treatment achievements.



Activities of popularization of science



Contributing to society

Case

BEWG supports biodiversity-themed activities in Heshan

In 2021, the Heshan sub-bureau of Jiangmen Bureau of Ecological Environment held thematic activities around the International Day for Biological Diversity which falls on May 22 at the BEWG's Ecology Restoration and Water Treatment Project of Shaping River. We have effectively enhanced the understanding and awareness of biodiversity issues among the young people involved in the activities through science promotion and a combination of education and fun.



Group photo of biodiversity-based activity

Engaging in community service

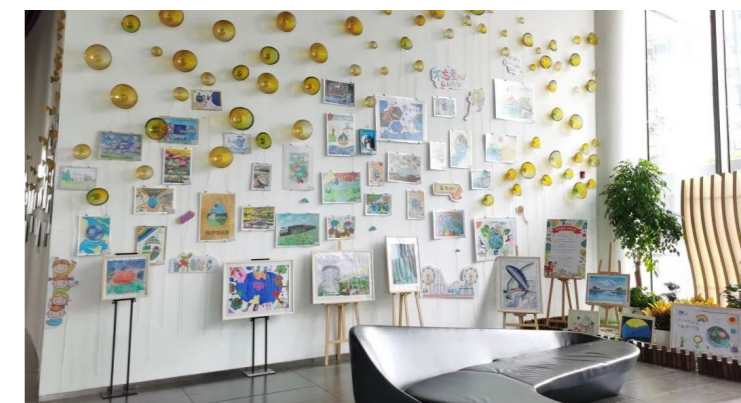
BEWG voluntarily engages in community services, encourages employees to participate in community activities, contributes to building a better planet. In 2021, we were deeply involved in environment protection, charitable donations, social assistance and the fight against the COVID-19 pandemic. We also value relations with communities at overseas locations to promote the preservation of aboriginal culture and care for vulnerable groups in the community.



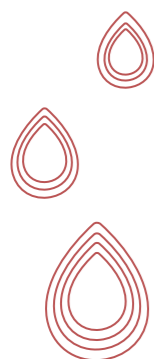
Case

BEWG held art exhibition titled “joining with children to protect lucid waters and lush mountains”

On June 1, 2021, an art exhibition titled “joining with children to protect lucid waters and lush mountains” was held at BEWG’s Beijing headquarters. The exhibition fully showcased children’s creative ideas about environment protection and stimulated and cultivated their awareness of environmental protection.



Art exhibition titled “joining with children to protect lucid waters and lush mountains”



Contributing to society

Case

TRILITY, an Australian company, supported the construction of local indigenous communities

TRILITY, an Australian company, has made donations to the Australian Water Industry Alliance Association to establish the Kwatye³⁵ Cultural Award. This award is designed to protect cultural diversity of indigenous Arrernte people in Australia. In 2021, the Kwatye Cultural Award was presented to the Hayward Water Tower -- Aboriginal War Memorial Mural project in recognition of the project's contribution to the history education and inheritance.



Programs winning the Kwatye Cultural Award in 2021

Case

Be Water, a Portuguese company, held several charitable activities

Be Water, a Portuguese company, united concession projects and local governments to hold diverse charitable activities, against the background of pandemic. In June 2021, BE Water received children from the Portuguese Association of Children Against Cancer and introduced them to the process of supplying water from the tap.

Be Water also donated five electric motorbikes to its concession services in Ourem and Valongo municipalities, in a bid to promote carbon-free travel and support for actions to prevent forest fire.

In 2021, against the background of regular local normal epidemic prevention and control, BEWG subordinate enterprises provided full support for epidemic responses from perspectives of human resources, funds, supplies, and intelligence while ensuring their own safety, according to the arrangements of the Group. On the one hand, multiple regional companies were responsible for medical wastewater treatment in COVID-19 designated hospitals. Chlorine residual testing was conducted to ensure that wastewater is treated and discharged in accordance with standards and to eliminate the risk of environmental pollution associated with the epidemic. On the other hand, we actively build a team of staff volunteers to go into the frontline communities and participate in epidemic mapping and prevention and control management, helping to fight the epidemic on the frontline.

³⁵ Kwatye, an Australian aboriginal word, means water.

Supporting rural revitalization

BEWG actively honors social responsibility as a state-owned enterprise by conducting rural sewage treatment to fully support rural revitalization. Meanwhile, we also consolidate the achievements of national battle against poverty alleviation through industrial assistance, donations and other initiatives.

The governance improvement of rural living environment is a fundamental and essential element of rural revitalization. The Rural Business Unit of BEWG built rural sewage governance demonstration projects in Yixing (Jiangsu Province), Chongming (Shanghai Municipality), Luhe District (Nanjing City), Minning town (Ningxia Hui Autonomous Region), Heshan (Guangdong Province) successively since February 2018, with a view to improving rural living environment.

Case

The rural sewage treatment project for rural revitalization in Yixing City

In 2021, the rural sewage treatment project in Yixing, Jiangsu was officially delivered and put into operation. As the largest rural sewage treatment demonstration project with universe coverability, it serves more than 100,000 households in surrounding 1,545 villages, with governance service covering 2,000 square kilometers of the entire Yixing City. The project supports comprehensive collection and treatment of sewage from farmers' septic tanks, kitchens, washing after operations and the sewage will be discharged when meeting standards. The project was awarded advanced collective by the government several times.

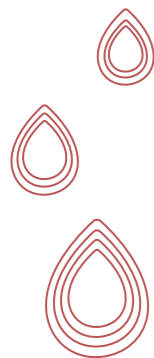


The Baima County station of the rural sewage treatment project in Yixing

Case

BEWG provides industrial assistance

To actively respond to requirements of superior units, BEWG engages in industrial assistance initiatives. As of the end of 2021, we invested 11 industrial assistance projects in Inner Mongolia Autonomous Region, creating jobs for 411 residents with an investment of RMB 12 billion.



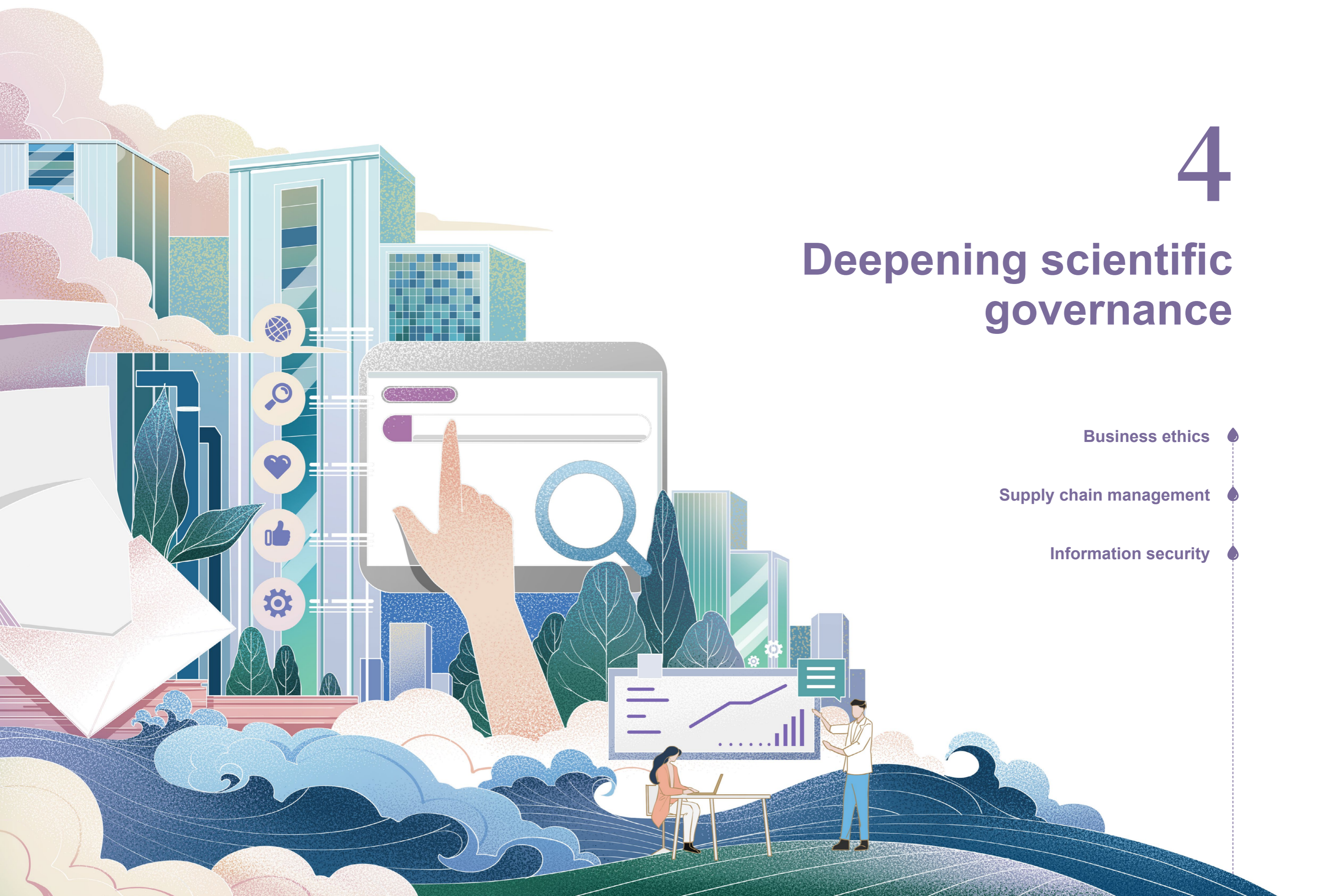
4

Deepening scientific governance

Business ethics

Supply chain management

Information security



Business ethics

BEWG requires employees to uphold the highest business ethics standards, continually improves the integrity system and cultural building, and strengthens the awareness of bottom lines and red lines, in order to maintain brand integrity and honesty.

Code of business conduct

BEWG strictly abides by laws and regulations targeting bribery, extortion, fraud, and money-laundering, follows business ethics standards at overseas operation locations, and has developed the *Code of Business Conduct of BEWG*³⁶ applicable to all employees. This Code regulates employees' behaviors and helps them act in compliance with professional ethics when facing conflicts of interest.

We have set up a Leadership Group for Ethics and Compliance to supervise, inspect and deal with issues concerning the compliance of professional ethics by personnel at all levels and the performance of their duties in accordance with regulations and disciplines. Meanwhile, we have formulated the OKR incentive mechanism³⁷ for integrity compliance by including requirements of the capital market into the compliance appraisal score of the Group. Its overall goals involve no major corruption-related legal cases, the establishment of a new type of cordial and clean government-business relationship, benign mechanisms with suppliers, eco-partners, customers, and other stakeholders, and advocacy for honesty, integrity, compliance, and observance of laws.



Building "BEWG Water Culture Xingtan School", establishing a cordial and clean government-business relationship

Anti-corruption and bribery

BEWG ensures strict observance of the *Law of the People's Republic of China on Supervision*, the *Law of the People's Republic of China on Combating Unfair Competition*, the *United Nations Convention against Corruption*, and other relevant laws and regulations. BEWG has formulated *Anti-bribery and Anti-corruption System*³⁸ and *Overseas Anti-corruption System*³⁹, to eliminate bribery, extortion, and other frauds.

The Group's Discipline Inspection and Supervision Commission, as the specialized authority for implementing anti-corruption requirements, regularly listens to working reports on discipline inspection and supervision, and guides the working agendas based on supervision results. The Commission comprises five members of executives and has a Discipline Inspection and Supervision Department, serving as the executive body for supervision and accountability. The Group has hired 18 dedicated supervisory personnel for integrity to ensure the implementation of supervision. The Group's Discipline Inspection and Supervision Commission signs the *Letter of Commitment to Integrity* with all centers and major regions, holds oath-taking ceremonies of integrity and ensures anti-corruption efforts at the primary level.

³⁶ Public disclosure URL: <http://www.bewg.net/uploadfile/2020/1013/20201013050251742.pdf>

³⁷ Objective and Key Results

³⁸ Public disclosure URL: <https://www.bewg.net/uploadfile/2020/0818/20200818110556650.pdf>

³⁹ Public disclosure URL: https://www.bewg.net/uploadfile/2_haiwai.pdf



Business ethics

We conducted daily inspections at all levels. In 2021, BEWG conducted a total of 38 inspections, with no major corruption-related lawsuits involved and closed.



In 2021, BEWG conducted a total of **38** inspections



北控水务集团廉洁宣誓誓词

我是北控水务人，我为守护绿水青山而来，
“上善若水”、“厚德载物”，
我们与自然相伴，与廉洁同行。
我承诺：
自觉遵守国家法律法规，严格执行公司规章制度，
恪守职业道德操守，维护公司合法权益。
爱岗敬业，廉洁自律；
公私分明，诚实守信；
勤俭节约，遵守底线；
团结互助，开拓进取。
以项目为根本，勇于承担本之责；
以客户为中心，提升服务之心。
我们将以饱满的热情和充沛的干劲，为建设30周年献礼。



The integrity oath and integrity oath-taking ceremony of BEWG

Whistleblowing mechanisms and whistleblower protection

In order to strengthen the confidentiality of reports and accusations and safeguard the lawful rights and interests of the whistleblowers, BEWG has formulated the *Confidentiality System for Whistleblowing and Accusation*⁴⁰, the *Whistleblower Protection System*⁴¹, the *False Accusation Investigation and Punishment System*⁴², in accordance with the *Working Rules for Disciplinary Inspection and Supervision Agencies to Handle Reports and Accusations*, and the *Regulations of the Supreme People's Procuratorate on the Protection of Citizens' Reporting Rights* and other relevant laws and regulations. BEWG encourages units or individuals in real names in accordance with the law to report any violations of rules, disciplines, and laws by the Group's employees.

To improve whistleblowing mechanisms and safeguard the lawful rights and interests of the whistleblowers, BEWG has revised the *Whistleblower Protection System*, requiring all personnel handling reports and accusations to sign the *Confidentiality Commitment*. We also launched the "Instructions for Reporting"⁴³ section under the "Integrity Compliance" column on the Group's official website. This can maximally protect the rights and interests of the whistleblower and person being reported when units and individuals are encouraged to report in name in accordance with the law.

In strict accordance with the principle of separation of incompatible duties, we authorize the three functions of whistleblowing registration, handling, and verification separately to ensure compliance in the whole process of verifying the whistleblowing content. We promise to keep confidential the whistleblower-related information and the whistleblowing content. The rights and interests of any unit or individual who reports violations to the Discipline Inspection and Supervision Commission of the Group shall be protected by law.

⁴⁰ Public disclosure URL: https://www.bewg.net/uploadfile/4_jianju.pdf

⁴¹ Public disclosure URL: https://www.bewg.net/uploadfile/3_baohu.pdf

⁴² Public disclosure URL: https://www.bewg.net/uploadfile/5_wugao.pdf

⁴³ Public disclosure URL: <https://www.bewg.net/gywm/ljhg/>

Business ethics training

BEWG actively promotes a culture of integrity by holding publicity activities for raising business ethics awareness among employees in diversified forms such as science popularization, publicity, education, etc.

In 2021, we conducted integrity training by choosing cases compiled by the National Supervisory Commission from four aspects, embezzlement, offering or accepting bribes, illegal cash-out, and inside jobs. This enables analysis of the integrity and compliance status based on the business characteristics and promotes the integrity education and training among all staff from the chairman of the Group to the employees of project companies through enterprise colleges and offline learning. The online education and training alone recorded more than 56,000 enrollments, achieving full coverage of integrity education.

On the eve of important holidays such as New Year's Day, Spring Festival, Mid-autumn Day, and National Day, we adopt such means as notice, dialogue, and inspections to remind departments, regions, and units under direct governance, to prevent offering and accepting bribes, seeking personal gain through power, using public property for private affairs, in any form.



The integrity culture publicity and compliance education of BEWG

In 2021, the Group organized



4 anti-corruption training sessions for the Board members



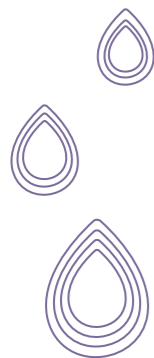
Totalling **16** hours



22 sessions for rank-and-file employees



Totalling **19,860** hours



BEWG is committed to integrating sustainability into the comprehensive management of the supply chain. In the spirit of fairness and justice, we restrain suppliers and employees within the Group to strictly comply with national laws and regulations as well as labor policies by establishing group-wide protocols, supplier access, and process management. We aim to minimize environmental and social impacts, build an efficient, flexible, and reliable supply chain and fulfill the responsibility of transparent procurement. In addition, we actively conduct sustainability risk assessments across the supply chain to review suppliers' environmental and social performance, thereby reducing corresponding risks.

Supplier lifecycle management

We have formulated the *Supplier Management policies of BEWG*⁴⁴, the *Quality Management Rules for Suppliers*, and other internal rules and regulations, covering supplier access, performance appraisal, daily management, and offboarding mechanisms. We have achieved dynamic lifecycle management and fully integrated ESG concepts into supplier management. In daily supplier management, we value communication with them, regularly convene supplier conferences for business cooperation exchanges. We have established sound strategic partnerships with some suppliers. We improve cooperation efficiency through regular feedback collection to achieve win-win results.

In 2021, BEWG updated the evaluation clauses of supplier access and conducted rigorous and fair reviews on suppliers from seven modules, namely operation management, product audit, procurement management, quality management, technology R&D, service capacity, and ESG. Supplier access evaluation and process evaluation were conducted by review panels and the ESG evaluation clauses involved are as follows:

- **ESG system certification:** Suppliers obtain environment, health, and safety system certifications, such as ISO 9001, ISO 14001, ISO 45001 certifications.
- **Institutional constraints:** Suppliers should abide by and formulate protocols covering labor rights, business ethics and other clauses, such as opposing child labor, discrimination, corruption, etc.
- **Identification of hazard sources:** Risks in facilities and processes have been identified by systems and handled, with visible on-site signs and measures for the identification of hazard sources.
- **Corrective and preventive measures:** Measures for health and safety accidents should be prepared and implemented with assessments of their effectiveness, including an analysis of the factors causing accidents.
- **Hazardous waste management:** Inspections on the practices of suppliers in identifying and controlling wastewater, waste gas, and solid waste, including facility and equipment, controlling process, ledger, records, and monitoring reports; inspections on whether management processes of hazardous materials have been formulated or implemented strictly.

On-site ESG audit clauses for suppliers

⁴⁴ Public disclosure URL: <https://www.bewg.net/uploadfile/2020/1020/20201020105719128.pdf>



During access and process evaluation on potential suppliers, major veto items include failure to obtain ISO 9001 certification, hiring child labor and illegal emissions and waste discharge. For unqualified items identified in the on-site evaluation, we require suppliers to submit a "rectification plan for qualified items" 15 days after BEWG issues the rectification notice. We also invite auditors to engage in two-way audits to ensure fair and just tendering. In 2021, the Group achieved 100% evaluation coverage of potential suppliers.



In 2021, the Group achieved
100% evaluation
coverage of potential suppliers

Case

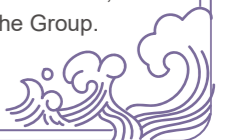
BEWG develops environmental access requirements for pharmaceutical raw materials

The pharmaceutical raw materials used by BEWG should be standard industrial products and hazardous waste products with high environmental impacts, such as unapproved or illegal waste acids and waste alkalis, are prohibited. To this end, we require suppliers to provide proven records for the use of environmentally friendly products, or they shall be deemed to be invalid tenders. The Group also test materials after their acceptance. As of the end of 2021, no environmentally substandard products were found within the Group.



As of December 31, 2021, the
Group has **601** domestic
qualified suppliers

The Group highly values suppliers by requiring all suppliers to comply with the *Code of Conduct for Suppliers* and sign the *Integrity Agreement* when entering into contracts. In daily management, we intensify efforts in anti-corruption awareness education and publicity for suppliers.



Supply chain management



Procurement from direct suppliers of BEWG in 2021

Indicator	Number	Percentage of procurement costs (%)
Total tier-1 suppliers	331	100
Critical tier-1 suppliers	217	98

Number of direct suppliers by location in 2021



Suppliers from Chinese mainland

283



Suppliers from China's HongKong, Macao, Taiwan regions and oversea

48

Note:

1. In 2021, the total number of domestic suppliers refers to qualified suppliers. 601 suppliers included 331 direct suppliers and 270 indirect suppliers. In 2020, 1,257 domestic suppliers were categorized into direct, indirect, and potential suppliers. (Direct procurement: productive procurement, such as green facilities for water treatment; indirect procurement: non-productive procurement, such as administrative procurement; potential suppliers: suppliers that are not included in the qualified supplier pool of BEWG).

2. In 2021, 324 qualified suppliers were direct suppliers. In 2021, a total of 331 tier-1 suppliers were qualified, direct suppliers.

ESG risk assessment of suppliers

BEWG places high weight on the risk management of supply chain sustainability and assesses sustainability risks in access management of potential suppliers and process management of qualified suppliers to review whether they faithfully implement national laws and regulations, policies, and systems, as well as those developed by the Group.

We have integrated ESG concepts into our supply chain management, added ESG risk assessment of suppliers at all stages, and identified high sustainable risk suppliers. The Group conducts sustainability risk assessments for key suppliers and high sustainability risk suppliers annually. In 2021, BEWG developed new evaluation standards for qualified suppliers, with evaluation clauses involving quality systems, production capability, testing capability, and ESG. For suppliers of different categories, we conduct process evaluations of different periods for qualified suppliers based on the importance of category and performance appraisal results and adopt strict inspections on the on-site management of suppliers. ESG evaluation clauses remain consistent with ESG clauses in the access evaluation for potential suppliers.



ISO certifications of suppliers obtained in 2021

ISO 9001

100%

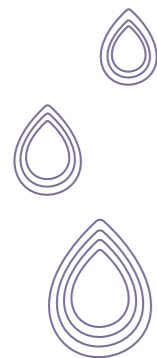
ISO 14001

95%

ISO 45001/OHSAS 18001

90%

Note: In the 2020 Beijing Enterprises Water Group Limited Sustainability Report, "As of December 31, 2020, we had 324 qualified suppliers and all suppliers had obtained ISO 9001 and ISO 14001 certifications in 2020" means that 100% of critical suppliers among qualified suppliers were ISO 9001 and ISO 14001 certified. In 2021, we had 331 qualified suppliers, among which 100% received ISO 9001 certification and 95% became ISO 14001 certified. 100% of critical suppliers achieved ISO 45001/OHSAS 18001 certification.



Information security

Information security is the cornerstone of corporate sustainability. BEWG continually improves the information security management system and ensures information and data security by ramping up efforts in security management, security technology, safe operation, and security awareness, to safeguard users' privacy rights.

Security management

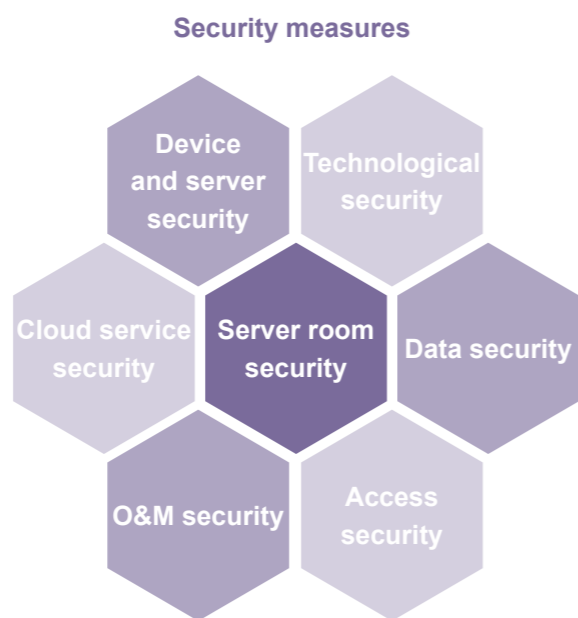
BEWG rigorously complies with the *Law of the People's Republic of China on Network Security*, the *Law of the People's Republic of China on Data Security*, the *Law of the People's Republic of China on the Protection of Personal Information* and other relevant laws and regulations. In 2021, we systematically reviewed management rules and systems concerning digital management and information security of the Group, released the *General Rules for the Construction of Digital System*, the *Management Measures for Digital Framework*, the *Management Measures for Data Assets*, the *BEWG Information Security Management System* and other rules, covering network security, system security, application security, asset security, data security, and terminal security.

We make relentless efforts to improve the information security management system and optimize the information security management framework. Departments in charge of information security management formulate information security guidelines and make decisions on major matters.

In terms of user privacy protection, we fully safeguard user privacy by formulating and updating internal information security policies and systems, only collecting and storing necessary personal information of users in the course of business operations in compliance with strict guidelines, prohibiting unauthorized access and illegal use of personal information.

Security technology and safe operation

We unceasingly improve information security technology and operation management systems, intensify data security management, and protect the data security and user privacy of the Group. We strengthen management for device security, server security, server room security, access permission, and network access control. In 2021, no major information security accidents occurred in the Group and no complaints about user privacy were received.



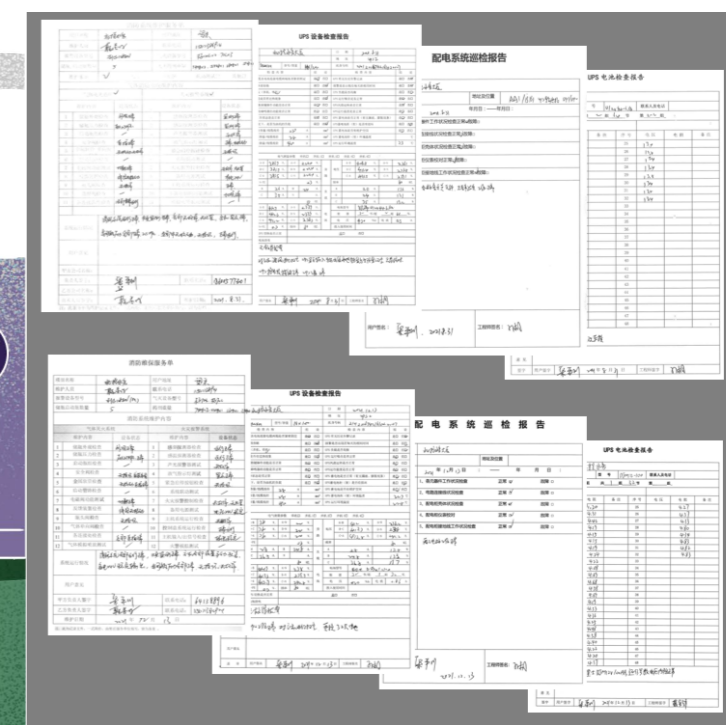
In 2021, we applied for certification in cybersecurity classified protection. The official website of BEWG was graded level 2 and the industry-education alliance system was graded level 3. We conducted self-inspections and security rectifications in alignment with Level 3 requirements.

Safety awareness education for employees

BEWG focuses on enhancing employees' awareness of information protection and issues the *Manual of Information Security* and other internal rules. The Group regularly conducts safety training and safety drills, comprehensively consolidates and enhances employees' awareness, skills and capabilities of information protection, and fully implements privacy protection and data security management.

Case BEWG conducted information security drills

In 2021, the Group organized information security drills including attack simulations, system patrols, and vulnerability scans. During the security drill, the Group applied an X-ray vulnerability scanner developed by Chaitin to scan systems in production areas and deliver monitoring reports of system security with timely rectifications made. With the security drill, we can promptly identify system abnormalities and hazards, conduct risk analysis, and formulate risk countermeasures to strengthen protection for system security.



System security monitoring reports

Innovation is the primary driving force for development. In response to the national innovation-driven development strategy, BEWG advances innovation and digital transformation to promote the sustainable development of the Group. In 2021, with the principle of “customer orientation through innovation capability”, BEWG adjusted the top-level design of technological innovation, improved the construction of innovation organization systems, and upgraded the technological innovation system. (See [“Innovation empowerment”](#) for details). We created a number of technological innovation achievements, innovated smart water services, and effectively improved the comprehensive production efficiency and competitiveness of the Group.



**Building a BE+ technology
family through innovative
digital dual engines**



Topic 1

Achieving the fruitful transformation of scientific and technological achievements through innovation capability

Topic

BEWG persists in independent innovation and continuously explores the development path of collaborative innovation. Through the tracking and incubation of cutting-edge technologies, the iteration and breakthrough of proprietary technologies, and the identification and capture of existing technologies, we have mastered a number of key core technologies and original achievements with independent intellectual property rights, thus facilitating the high-quality development of the water industry.

Case

BEWG undertakes national major projects for environmental protection and wins provincial and ministerial science and technology awards

In response to the national science and technology development strategy in the field of environment, BEWG undertook and completed 9 national major special projects and key R&D projects during the 13th "Five-Year Plan" period (4 projects for comprehensive water environment renovation, three projects for municipal sewage treatment and resourceful utilization, and two projects for smart water services). With the technological achievements for municipal sewage and reclaimed water, we won the second prize of the China Construction Science and Technology Award issued by the Ministry of Housing and Urban-Rural Development and the second prize of the "Beijing Science and Technology Progress Award".



China Construction Science and Technology Award issued by the Ministry of Housing and Urban-Rural Development and the "Beijing Science and Technology Progress Award"

Case

BEWG makes a breakthrough in the first 10,000-ton-level project application of AOA in the industry

In cooperation with Mr. Peng Yongzhen, academician of the Chinese Academy of Engineering, BEWG developed the sludge double recirculation-Ammonia/Oxic/Anoxic (SDR-AOA) and enhanced nitrogen and phosphorus removal (BEAOA) technology. The technology can efficiently recycle the carbon source in the sludge, save the cost of chemical agents, reduce the aeration volume of biochemical treatment and the sludge production, as well as achieve the goals of nitrogen and phosphorus removal, energy conservation, and emission reduction.

In 2021, BEWG succeeded in applying BEAOA in the 10,000-ton-level production test, made a breakthrough in the industry's first AOA technology from a theory to an application in China, and set a record of low-temperature nitrogen removal in winter far exceeding expectations, which laid a solid foundation for the wide application of the technology.



The 10,000-ton-level project application of BEAOA

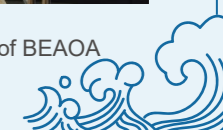
Case

BEWG develops the new-generation BECFBR technology and achieves the 10,000-ton-level project application

To address the pain points of the industry and meet the front-line operation needs, the Group has developed a new-generation enhanced biological mud membrane composite treatment technology—complete-flow-scheme fluidizing biofilm reactor (BECFBR) with independent intellectual property rights. Through independent research and development and the deep combination of equipment and process, we created a low-carbon, high-quality, and high-efficiency comprehensive solution and realized the engineering application of more than 30,000 m²/day in Weifang, Shandong Province.



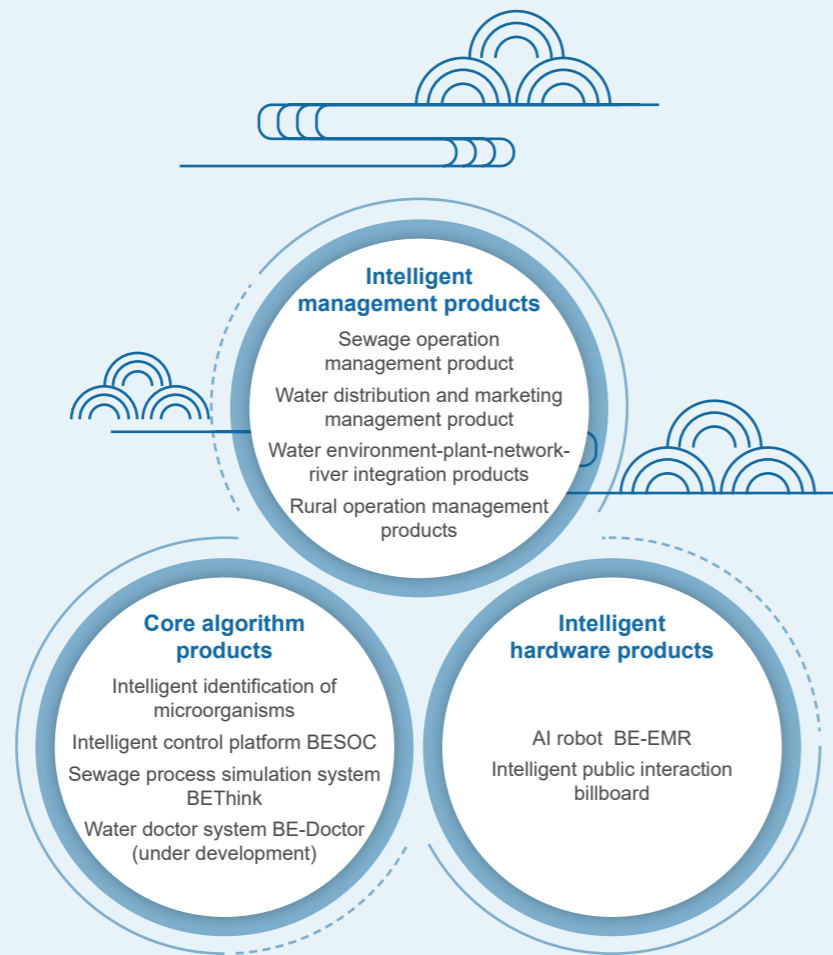
The 10,000-ton-level project application of BECFBR



Opening a new chapter for operation iterations in a smart future

Topic

Under the guidance of the digital strategy, BEWG continuously deepens the layout, promotes the construction of smart water, and engages in research and development iterations of related products based on applications. Through the data resource utilization, precise management, intelligent control, and smart decision-making of the water business system, we upgrade the operation management mode, ensure the safe operation of water facilities, deliver more efficient operation, more scientific management, and better services, and promote the improvement of energy efficiency of the Group's business.



Product lineups of smart water

Case BEWG develops the water doctor system BE-Doctor

In 2021, BEWG planned and developed a water doctor system called BE-Doctor. Through closed-loop management, the system can guide the project companies to analyze, diagnose, optimize and regulate the sewage treatment process, assist the managers to tap into the potential of the process and further conduct energy conservation and consumption reduction, and promote the continuous improvement of sewage operation management. Besides adding the one-policy-for-one-plant system and the online control tool module to the system, the Group has applied BE-Doctor to 287 sewage projects, greatly reducing the raw material cost per ton of water.



Sewage business

Upgrading the sewage operation management capacity with standardized management mode as the core

Case

The "1+N" centralized scheduling project in Taizhou, Zhejiang Province

In 2021, the "1+N" centralized scheduling project in Taizhou, Zhejiang Province was successfully selected into the 2021 Smart Water Typical Case List released by the Science and Technology and Industrialization Development Center of the Ministry of Housing and Urban-Rural Development. Featuring the "1+N" water plant group intelligent operation mode proposed by the Group, this project realizes the intensive management and intelligent production and operation of multiple projects. In this project, various products independently developed by BEWG, such as BETHink for simulating the water treatment process, were put into use, thus saving energy and reducing consumption remarkably. Thanks to the adjustment to the mode, the Group has also cultivated a number of compound application-oriented talents under the background of smart water.



The "1+N" centralized scheduling project in Taizhou, Zhejiang Province



Water distribution business

Building a SaaS system to manage the whole process of production, distribution, and marketing of the water distribution business

Case

The intelligent project for water distribution network leak control in Guigang, Guangxi Province

BEWG built the Group's first comprehensive intelligent water distribution control platform in Guigang, Guangxi Province, thereby realizing the intelligent leak control of the water distribution network. Relying on the data, business, and management standard system, the project realized the rapid identification, positioning, and repair of leaks with the aid of process reengineering and intelligent systems. Without increasing large-scale investment, we have narrowed the gap between production and sales from 23.75% in 2017 to 14.94% in 2021, greatly improving the economic and social benefits.



Comprehensive intelligent water distribution control platform



Opening a new chapter for operation iterations in a smart future

Topic



Water environment | Upgrading the cloud platform integrating the plants, networks, and rivers

Case The black and odour water monitoring platform project in Linyi, Shandong Province

In the black and odour water monitoring platform project in Linyi City, BEWG utilized various systems including water information, water environment warning, water environment operation and maintenance, public water, water environment engineering, water environment decision-making, and water environment assessment, to realize the integrated management of public drainage facilities in central urban areas, form a mechanism consisting of supervision, operation and maintenance, and the mutual feedback and evaluation of the public, and build an integrated demonstration area integrating the plants, networks, rivers, and lakes.



Black and odour water monitoring platform in Linyi City

Rural water services | Using digital technology to drive model transformation and realizing efficient and intelligent control of distributed unmanned stations

Case BEWG develops the intelligent agriculture pollution control system of Heshan

In March 2021, the large-scale distributed smart village management system based on BECloud™ was officially launched to help the agricultural sewage project of Heshan establishing an efficient business flow system and a comprehensive management and control platform for rural sewage facilities. The system fully meets the needs of rural sewage operation management under the new situation, and realizes the resourceful utilization of rural sewage operation data, scientific management, and intelligent decision-making.



Heshan intelligent agricultural sewage control system





Responding to the national green strategy and contributing to environmental protection



Topic 2

Facilitating the realization of the dual-carbon goals through science and technology

Topic

The “3060 carbon peak and neutrality goals” is a solemn commitment made by General Secretary Xi Jinping to the Chinese people and the international community on behalf of the Chinese government. It is also a core part of the vision of building a community with a shared future for mankind. As a state-owned enterprise in Beijing and a leading enterprise in the industry, BEWG actively responds to the national strategy and earnestly shoulders the responsibility of a state-owned enterprise. Through such means as technological innovation and lean operation for energy conservation and consumption reduction, we have effectively reduced the carbon emissions of the plants at the Group level. In addition, BEWG actively participates in the national greenhouse gas emission monitoring pilot project and provides strong support for the scientific formulation of national emission reduction policies. We also explore the pathway of carbon sink generated by the water plants and contribute to increasing economic benefits and social benefits. By taking the dual measures, we will lead the development of the industry, and contribute to the dual-carbon goal.

Case

Luoyang Chandong Sewage Treatment Plant successfully included in the first batch of low-carbon urban sewage treatment cases in 2021

As a key project of the People's Government of Henan Province, Luoyang Chandong Sewage Treatment Plant has a design capacity of 200,000 tons/day and covers a total area of 24 hectares and a service area of about 30 square kilometers. It was awarded the National Quality Engineering Award in 2010. With the guidance of low-carbon mechanisms, the project adopts several measures to optimize technical routes and improve equipment efficiency. Besides the resourceful utilization of aerobic composting sludge, the project also makes use of photovoltaic energy and smart operation platforms to realize resource recycling and provide society with a low-carbon treatment solution which can maintain stable operation in the long term and can be widely used. The sewage treatment plant has become a “low-carbon benchmark water plant”.

From July 13 to 15, 2021, the 2021 Conference on the Innovative Development of the Environmental Protection Industry, sponsored by the China Association of Environmental Protection Industry, was held in Beijing. After 3 months of fierce competition, the Luoyang Chandong Sewage Treatment Plant of BEWG successfully won entry into the national first batch of urban sewage treatment low-carbon operation cases, among only 10 cases across China. Besides, the Chandong Water Sewage Plant is the only project verified by experts on site.



Luoyang Chandong Sewage Treatment Plant

In addition to the efforts towards energy conservation and consumption reduction in the water plant operation, BEWG has adopted the low-carbon technology route, optimized process design, and conducted carbon sequestration and emission reduction simultaneously, thereby realizing the low emission and the balance in the carbon emission generated from the treatment and disposal of sludge. Besides independently researching and developing carbonization technologies and providing a complete range of sludge carbonization solutions, we actively conduct the sludge characteristics research, the design and R&D of the carbonization process, the process-energy balance research, the R&D of dry carbonization equipment, and the resourceful utilization of carbon slag. We have formed a complete sludge carbonization technology framework consisting of five core technology systems and three auxiliary systems, which can meet the national standard of sludge disposal. The combustible gas generated during carbonization pyrolysis can be recycled to reduce energy consumption. A portion of organic carbon is sequestered in carbon residue, reducing greenhouse gas emissions. In addition, sludge carbon slag can also be used as building materials, thus realizing the resourceful utilization of sludge.

Case

The PPP project for sewage sludge treatment in Qinhuangdao City

In the Qinhuangdao City sewage sludge treatment PPP project, the First, Second, and Third sewage treatment plants use reclaimed water from sewage treatment as a heat source for the water source heat pump system. This provides heating and cooling guarantees for the office buildings and production and living areas of the plants. Compared with coal or oil heating, water source heat pumps can effectively save energy consumption and reduce pollutant emissions.

In addition, the design capacity of the Beidaihe New District Sludge Treatment Plant of the project reaches 300 tons/day (water content is 80%). The project adopts a hierarchical/phase-separated anaerobic digestion process to deeply dehydrate the biogas residue produced and turns it into nutrient soil that can be used for landscaping, agriculture, and soil improvement. After purification, part of the biogas is used for preheating the raw mud of the pretreatment unit, and the remaining part can be used as vehicle gas, thus realizing the “reduced, stabilized, harmless” treatment and the “resourceful” recycling of sludge.



Qinhuangdao Sewage Treatment Plant

While maintaining our efforts to reduce carbon emissions, BEWG actively participates in the national carbon emission reduction projects, thereby contributing to the refined carbon monitoring and the formulation of scientific and effective measures for carbon emission reduction.

Case

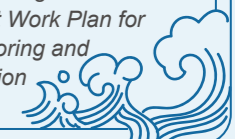
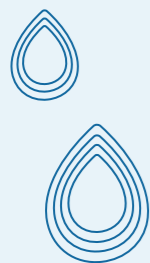
Qinghe Beiyuan Water Co., Ltd and Beijing Daoxiang Water Purification Co., Ltd selected into the first batch of national greenhouse gas emission monitoring pilot projects

In September 2021, the Ministry of Ecology and Environment issued the *Pilot Work Plan for Carbon Monitoring and Evaluation* and approved the first batch of national greenhouse gas emission monitoring pilot projects. Qinghe Beiyuan Water Supply Co., Ltd and Beijing Daoxiang Water Purification Co., Ltd under BEWG were included in the pilot list of carbon monitoring and evaluation in the waste treatment industry.

The greenhouse gas emission monitoring of the waste treatment industry includes CH₄ and N₂O emissions from the waste landfill and sewage treatment, and the CO₂, CH₄, and N₂O emissions from waste incineration. The selection of Qinghe Beiyuan Water Supplies Co., Ltd and Beijing Daoxiang Water Purification Co., Ltd, as an aboveground sewage treatment plant and an underground sewage treatment plant respectively, can fully ensure the universality and applicability of greenhouse gas emission monitoring and facilitate China's carbon monitoring more scientifically and effectively.



Circular on printing and distributing the *Pilot Work Plan for Carbon Monitoring and Evaluation*



Making joint efforts to protect the beauty of the Yangtze River

Topic

As the Yangtze River protection strategy proceeds, BEWG focuses on key cities and key river basins, and strives to provide customers with systematic services with systematic services aiming at the balance between ecological protection and economic development. First, through the continuous exploration and practice of the “water keeper” concept, we offer packaged, customized solutions to help customers solve their concerns about the ecological environment. Second, we actively use advanced environmental protection technologies to keep sufficient momentum for the future development of the locations where the project is carried out through such means as reducing the land occupation.

Case

Integrated management of pipe network, river, and sewage by Wuhan Xinzhou Plant

Wuhan is located in the middle reaches of the Yangtze River. The Yangtze River and its largest tributary, the Han River, meet in the city. With rivers, lakes, and ports densely distributed in Wuhan, a core city of the Yangtze River Economic Belt, the water area accounts for one fourth of the city’s total area. In order to improve the water environment renovation in Xinzhou District, Wuhan and contribute to the protection of the Yangtze River, BEWG and China Three Gorges Corporation started with urban sewage treatment and gradually extended to more fields such as urban water distribution, pipe network, comprehensive water renovation, and solid waste treatment by establishing a systematic, intelligent, and integrated operation and management system. Besides forming a comprehensive renovation model featuring “the integration of drainage, the integration of water distribution and drainage, and the integration of water services and water bodies”, they also systematically sorted out the “venous system” of urban pipe networks, rivers, and lakes, connected important environmental nodes, and gradually shaped a production-oriented, livable, and eco-friendly Yangtze River coastline.



Case

The water environment comprehensive renovation project of Yuanjiang City

Yuanjiang is located in the drainage basin of Dongting Lake, an important tributary in the middle reaches of the Yangtze River. With a vast water area in the city, Yuanjiang has a unique landscape of “rolling mountains, enchanting wetlands, and beautiful lakes”, which has presented a sensitive ecological environment system to the city. In order to improve the carrying capacity of the water ecological environment in Yuanjiang and relieve the pressure of river basin ecological renovation, BEWG and China Three Gorges Corporation carried out the PPP project of comprehensive water environment renovation in the central urban areas of Yuanjiang City. Based on the actual needs of local residents and the status quo of the ecological environment system, the project follows the principle of “overall planning, regional coordination, systematic renovation, and comprehensive treatment”, and adopts the comprehensive measures system including “plant-pipe network transformation, pollution interception from the source, ecological restoration, water quality

improvement, and smart water services”. The successful plant-pipe network integration project helps to build Yuanjiang into a beautiful, harmonious “water city surrounding Dongting Lake”. The completion of the project marks the transfer of BEWG’s water environment renovation projects from prefecture-level city to county-level city, and showcases our determination to fully respond to the Yangtze River protection strategy.



Case

The in-situ expansion of Kunshan North District Sewage Treatment Plant

Kunshan, Suzhou, located in the lower reaches of the Yangtze River, enjoys the reputation for ranking 1st among China’s top 100 counties. Facing the dual pressure of economic development and environmental protection, Kunshan North District Sewage Treatment Plant practices in-situ upgrading and expansion by adopting the semi-underground structure for the Phase III and Phase IV of the sewage treatment plant. The sewage treatment plant also conducts refined management through the intelligent control of the whole process of the energy consumption of aeration, carbon source application, and dephosphorization agent application. The Phase III and Phase IV project of Kunshan North District Sewage Treatment Plant was selected into the *List of 2021 Key Ecological and Environmental Protection Practical Technologies and Demonstration Projects*. The project has promoted the development capacity with environmental capacity, greatly improved the urban water environment, and played a highly important role in pollution control, water quality protection, and ecological balance in the local river basin.



Taking concerted action to protect the mother river

Topic

As the mother river of the Chinese nation, the Yellow River feeds more than 30% of the country's population. There is an old saying that "a clear Yellow River symbolizes peace". Since 2019, the ecological protection and high-quality development of the Yellow River basin have been promoted to an unprecedented height. General Secretary Xi Jinping mapped out a blueprint for the protection of the Yellow River, and proposed a series of important guidelines and key measures, including "boosting benefits for the city, land, people, and production with water". BEWG has made deployments at multiple points in the Yellow River basin and provided professional services tailored to the characteristics of different sections in the upper, middle, and lower reaches of the Yellow River. To tackle the serious water shortage of the upper reaches, BEWG focuses on the recycled water business and gives impetus to the economic sustainable development of Yinchuan City. In the middle reaches, BEWG facilitates the transformation of Taiyuan City as a traditional industrial city through the reclaimed water business, and contributes to the water replenishment of the Fenhe River. Considering the significance of the protection of the tidal flat wetland in the estuary of the Yellow River, BEWG provides ecological water to the estuary wetland through the water plant in Dongying, thereby ensuring the natural activity of the ecological wetland.

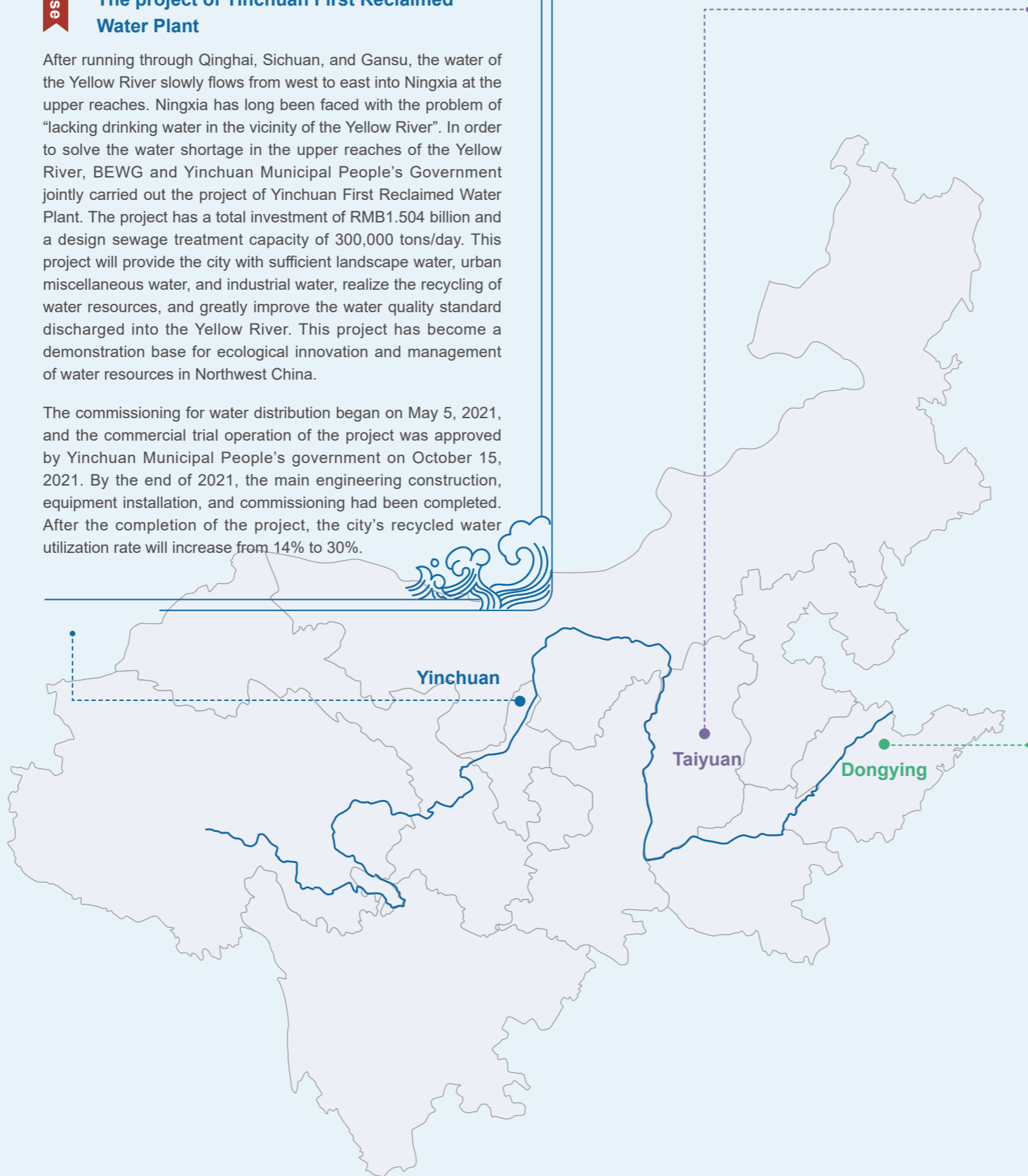


Case

The project of Yinchuan First Reclaimed Water Plant

After running through Qinghai, Sichuan, and Gansu, the water of the Yellow River slowly flows from west to east into Ningxia at the upper reaches. Ningxia has long been faced with the problem of "lacking drinking water in the vicinity of the Yellow River". In order to solve the water shortage in the upper reaches of the Yellow River, BEWG and Yinchuan Municipal People's Government jointly carried out the project of Yinchuan First Reclaimed Water Plant. The project has a total investment of RMB1.504 billion and a design sewage treatment capacity of 300,000 tons/day. This project will provide the city with sufficient landscape water, urban miscellaneous water, and industrial water, realize the recycling of water resources, and greatly improve the water quality standard discharged into the Yellow River. This project has become a demonstration base for ecological innovation and management of water resources in Northwest China.

The commissioning for water distribution began on May 5, 2021, and the commercial trial operation of the project was approved by Yinchuan Municipal People's government on October 15, 2021. By the end of 2021, the main engineering construction, equipment installation, and commissioning had been completed. After the completion of the project, the city's recycled water utilization rate will increase from 14% to 30%.



Case

The reclaimed water project in Taiyuan

The Yellow River flows to the middle reaches of Shanxi Province, which is located on the eastern side of the Loess Plateau. Shanxi is faced with the problems such as water resource shortage, ecological environment water shortage, and serious river basin pollution. Reclaimed water will offer important support for the sustainable development of Taiyuan city in the future, and also provide an effective pathway to promote the ecological transformation of Taiyuan as a heavy industry city.

With a large-scale, high-water quality, high business efficiency, and strong demonstration effect, this project is the largest sewage resource utilization project in Shanxi Province. By the end of 2021, the reclaimed water company had launched 24 reclaimed water projects, completed 21 projects, laid about 140 kilometers of reclaimed water pipes, and built 2 booster pumping stations. The main framework of the reclaimed water distribution network has been formed, with a total of 26.248 million tons of reclaimed water supplied. This project provides an overall and comprehensive solution for sewage resource utilization in Taiyuan, which is of great significance to improving the recycling rate of recycled water, addressing water shortage and water environmental pollution, and facilitating the high-quality transformation and development of the city.



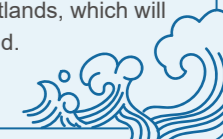
Case

The project of Dongying North District Sewage Treatment Plant

BEWG has actively built a demonstration area for comprehensive ecological restoration and renovation in the lower reaches of the Yellow River and supported Dongying in building an important benchmark city for ecological protection and renovation in the river delta. In Dongying City, where the Yellow River flows into the sea, the tailwater wetland project constructed and operated by Dongying BEWG Co., Ltd. has been put into operation for many years with a design capacity of 40,000 tons/day. This project not only makes great contributions to the water pollution control of the overflowing river, but also becomes an ecological habitat for waterbirds.



In 2021, BEWG undertook the standard-upgrading and scale-expansion tasks and the reclaimed water projects of the Dongying North District Sewage Treatment Plant. For ecological water replenishment, the project provides 80,000 tons of tailwater per day for two-level surface flow wetlands, which will further enhance the ecological value of the watershed wetland.



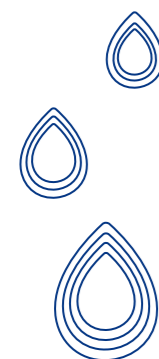
Key ESG performance

Environmental				
Indicator	Unit	2021	2020	
Environmental management				
Major environmental pollution accidents	/	0	0	
Pollutants emissions and discharge				
Total COD abatement in sewage plants	ton	920,644	796,968	
Total ammonia nitrogen abatement in wastewater plants	ton	105,157	87,961	
Total reduction of total phosphorus in wastewater plants	ton	14,801	13,381	
Total suspended solids reduction	ton	683,108	613,211	
Total pollutant abatement	ton	1,723,710	1,511,521	
Total Sulphur Oxide Emissions	ton	37	21	
Total nitrogen oxide emissions	ton	305	194	
Total fly ash emissions	ton	8,825	/	
Total discharge of boiler residues	ton	64,723	/	
Total discharge of hazardous solid waste	ton	199	206	
Density of hazardous solid waste	kg/10,000 HKD	0.071	0.081	
Total discharge of non-hazardous solid waste	ton	2,555,687	2,051,325	
Density of non-hazardous solid waste	ton/10,000 HKD	0.92	0.81	
Resource and energy consumption				
Non-renewable energy substitution	kWh	1,699,021,945	1,558,904,829	
Renewable energy substitution	kWh	39,576,096	30,645,657	
Gasoline consumption	ton	581	564	
Diesel consumption	ton	782	586	
Natural gas consumption	m ³	2,019,398	1,258,191	
Purchased steam for heating	GJ	10,005	4,121	
LPG consumption	ton	340	79	
Total Fresh water consumption	ton	4,612,325	3,083,102	
Fresh water intensity	ton/10,000 HKD	1.65	1.22	
Pipe network leak rate	%	16.64	19.44	
Proportion of self-supply water of water distribution plants	%	2.1	3.0	
Agent consumption ⁴⁵	Total consumption of carbon source	ton	84,386	77,768
	Total consumption of dephosphorization agents	ton	224,346	205,973
Emission comprehensive energy consumption & GHG				
Comprehensive energy consumption	tce	214,414	195,223	
Comprehensive energy consumption intensity	tce/10,000 HKD	0.08	0.08	
Total greenhouse gas emissions	tCO ₂ e	1,050,131	961,929	
Greenhouse gas emission intensity	tCO ₂ e/10,000 HKD	0.38	0.38	

⁴⁵ The statistical scope of the usage of the chemical agents mainly covers sewage treatment plants/ reclaimed water plants under the subsidiaries of the Group.

Social			
Indicator	Unit	2021	2020
Employment⁴⁶			
Total workforce	person	17,888	19,763
New contract employees	person	2,318	/
Number of employees by region			
Chinese mainland	person	16,768	18,694
Overseas, China's Hong Kong, Macao and Taiwan	person	1,120	1,069
Number of employees by employment type			
Contract employees	person	16,565	18,694
Intern	person	77	71
Outsourced personnel	person	126	224
The proportion of employees by employment type			
Contract employees	%	98.79	98.4
Intern	%	0.46	0.4
Outsourced personnel	%	0.75	1.2
Number of employees by gender			
Male employees	person	11,028	12,230
Female employees	person	5,740	6,464
Proportion of employees by gender			
Male employees	%	65.77	65.4
Female employees	%	34.23	34.6
Employee by age group			
Under 30 years old	person	4,033	2,878
30 -50 years old	person	10,365	11,736
Over 50 years old	person	2,370	4,080
Proportion of employees by age group			
Under 30 years old	%	24.05	15.4
30 -50 years old	%	61.81	62.8
Over 50 years old	%	14.13	21.8
Proportion of female employees by rank			
Management	%	23.20	/
Junior management	%	24.04	/
Senior management	%	15.15	/

⁴⁶ Considering that the business of BEWG is mainly concentrated in Chinese mainland, except for the total workforce and number of employees by region, only the information of employee indicators in Chinese mainland is disclosed in the table.



Indicator	Unit	2021	2020
Employee turnover⁴⁷			
Number of employees leaving by gender			
Male employees	person	1,310	1,336
Female employees	person	652	590
Number of employees leaving by age group			
Under 30 years old	person	669	380
30-50 years old	person	924	915
Over 50 years old	person	369	631
Turnover rate by gender			
Male employees	%	11.88	10.9
Female employees	%	11.36	9.1
Turnover rate by age group			
Under 30 years old	%	16.59	13.2
30-50 years old	%	8.91	7.8
Over 50 years old	%	15.57	15.5
Employee development and training⁴⁸			
Total number of employees trained	person	16,768	18,694
Percentage of employees trained in Chinese mainland	%	100	100
Regular employees trained by gender			
Male employees	person	11,028	12,230
Female employees	person	5,740	6,464
Regular employees trained by rank			
Senior employees	person	33	213
Mid-level employees	person	618	5,201
Rank and file employees	person	16,117	13,280
Average training hour of regular employees by gender			
Male employees	hour	102.00	97.64
Female employees	hour	102.00	97.87
Average training hour of regular employees by rank			
Senior employees	hour	115.00	108.03
Mid-level employees	hour	163.00	111.90
Rank and file employees	hour	86.00	84.26

⁴⁷ Considering that the business of BEWG is mainly concentrated in Chinese mainland, so only the information of employee indicators in Chinese mainland is disclosed in the table.

⁴⁸ Considering that the business of BEWG is mainly concentrated in Chinese mainland, so only the information of employee indicators in Chinese mainland is disclosed in the table.

⁴⁹ In 2021, BEWG had no production safety accidents above a general accident level in mainland China.

Indicator	Unit	2021	2020
Employee health and safety			
Employees' work-related injury cases	case	7 ⁴⁹	1
Rate of employee work-related injury rate	%	0.04	0.00006
Number of lost working days due to work	day	659	6,000
Injury rate per million working hours	/	0.21	0.03
Rate of work-related accidents per thousand people	/	0.42	0.06
Cumulative input in safety production	RMB	22,300,000	21,875,628
Enrollments of safety training	person	153,034	115,384
Number work-related fatalities	person	0	1
Supplier management			
The cumulative number of domestic qualified suppliers	/	601	/
The number of suppliers by region			
Chinese mainland	/	283	/
China's Hong Kong, Macao and Taiwan	/	48	/
Procurement from direct suppliers			
Total tier-1 suppliers	/	331	1,257
Critical tier-1 suppliers	/	217	92
Certification of suppliers			
ISO 9001 certified	%	100	100
ISO 14001 certified	%	95	100
ISO 45001/OHSAS 18001 certified	%	90	/
Research and innovation			
The cumulative number of authorized patents	/	772	553
The cumulative number of patents relating to sewage and water supply	/	391	/
The cumulative number of patents relating to new businesses	/	381	/
The cumulative number of software rights	/	420	167
Intellectual property and external standards that fell within the scope of rewards	/	64	29
Number of technological trademarks	/	6	3
Number of authorized patents	/	229	135
Number of software rights	/	24	86
Number of patents relating to sewage and water supply	/	110	/
Number of patents relating to new businesses	/	119	/
Product and customer service			
Customer satisfaction/the proportion of extremely satisfied and satisfied customers	%	90+	84
Community welfare			
Total amount of charitable donations	10,000 RMB	183.92	/
Employee volunteer service	hour	63,555	/



Governance			
Indicator	Unit	2021	2020
Total revenue	1,000 HKD	27,880,147	25,360,587
Profit attributable to shareholders	1,000 HKD	4,195,940	4,183,466
Number of General Meeting of Shareholders	/	2	1
Number of Board meetings	/	4	4
Number of legal cases regarding corrupt practices	/	0	0
Number of concluded legal cases regarding corrupt practices	/	0	0
Anti-corruption training sessions by rank			
Directors	session	4	2
Rank-and-file employees	session	22	66
Anti-corruption training hour by rank			
Total training hours of directors	hour	16	/
Total training hours of rank-and-file employees	hour	19,860	/

List of key ESG policies

Category	Name
Environmental	
Environmental management	<i>Practice and Measures of Key Control Nodes in Traditional Water Construction Projects</i>
	<i>Design of Urban Wastewater Treatment Engineering</i>
	<i>Environmental Yardstick Assessment System</i>
	<i>Environmental Factor Identification, Evaluation and Control Procedures</i>
Emissions	<i>BEWG Management Manual on Quality, Environment, and Occupational Health and Safety</i>
	<i>Quality, Environment, and Occupational Health and Safety Procedure Documents</i>
	<i>Practice and Measures of Key Control Nodes in Traditional Water Construction Projects</i>
	<i>BEWG Water Resource Management Measures</i>
	<i>Guiding Manual for Safe and Civilized Construction of Urban Water Projects</i>
Resource utilization	<i>BEWG Manual for Civilized Construction</i>
	<i>Management System for Water Source Areas</i>
	<i>Technical Standard for Water Meter Selection and Installation</i>
	<i>Control Procedures of Project Operation</i>
Ecological protection	<i>Control Procedures of Performance Monitoring</i>
	<i>Chemical Agent Management Measures</i>
	<i>Biodiversity Protection Management Measures of BEWG</i>
	<i>Technical Guide for Constructed Wetlands</i>

Category	Name
Social	
Employment	<i>Recruitment Management Mechanism</i>
	<i>Internal Recruitment Channel Management Methods of BEWG</i>
	<i>Management Measures for Campus Recruitment of BEWG</i>
	<i>Retirement and Reemployment Mechanism</i>
	<i>Transfer Management Mechanism</i>
Employee rights and benefits	<i>Statement of Employee Rights and Benefits</i>
	<i>Headquarters Employee Welfare System</i>
	<i>BEWG Management Regulations to Implement the "Three Simultaneous" Precautions for Occupational Diseases</i>
Occupational health and safety	<i>BEWG Responsibility System for Safety in Production</i>
	<i>BEWG Management Manual on Quality, Environment, and Occupational Health and Safety</i>
	<i>BEWG Procedure Documents for Quality, Environment, and Occupational Health and Safety</i>
	<i>BEWG Management Regulations for Dangerous Materials Safety</i>
	<i>Supplier Management Policies of BEWG</i>
	<i>BEWG Regulations on Occupational Health Management</i>
	<i>BEWG Regulations on Labor Protection Articles Management</i>
Intellectual property rights protection	<i>BEWG Intellectual Property Management System</i>
	<i>Notice on Declaration for Achievements and Rewards of Intellectual Property and Standard Compilation</i>
	<i>BEWG Purchasing Management System</i>
Supply chain	<i>Supplier Management Policy</i>
	<i>Manual of Information Security</i>
Information and data security	<i>Manual of Information Security</i>
Governance	
Risk management	<i>BEWG Overall Risk Management System</i>
	<i>BEWG Business Code of Conduct</i>
	<i>BEWG Overseas Anti-corruption System</i>
Business ethics	<i>BEWG Anti-bribery and Anti-corruption System</i>
	<i>Integrity Commitment</i>
	<i>BEWG Confidentiality System for Whistleblowing and Accusation</i>
	<i>BEWG Whistleblower Protection System</i>
	<i>BEWG False Accusation Investigation and Punishment System</i>
	<i>Confidentiality Commitment</i>

HKEX ESG Content Index

Disclosure indicators		Page	
Environmental			
Aspect A1: Emissions	General Disclosure Information on: (a) the policies; and (b) compliance with relevant laws and regulations that have a significant impact on the issuer	P58-62	
	A1.1	The types of emissions and respective emissions data	P61-62
	A1.2	Greenhouse gas emissions in total (in tonnes) and, where appropriate, intensity (e.g. per unit of production volume, per facility).	P47
	A1.3	Total hazardous waste produced (in tonnes) and, where appropriate, intensity (e.g. per unit of production volume, per facility).	P61
	A1.4	Total non-hazardous waste produced (in tonnes) and, where appropriate, intensity (e.g. per unit of production volume, per facility).	P61
	A1.5	Description of measures to mitigate emissions and results achieved.	P45-52
	A1.6	Description of how hazardous and non-hazardous wastes are handled, reduction initiatives and results achieved.	P59
Aspect A2: Use of Resources	General Disclosure Policies on the efficient use of resources, including energy, water and other raw materials.	P37-51& P63-64	
	A2.1	Direct and / or indirect energy consumption by type (e.g. electricity, gas or oil) in total (kWh in '000s) and intensity (e.g. per unit of production volume, per facility).	P45-P46
	A2.2	Water consumption in total and intensity (e.g. per unit of production volume, per facility).	P38
	A2.3	Description of energy use efficiency initiatives and results achieved	P48-52
	A2.4	Description of whether there is any issue in sourcing water that is fit for purpose, water efficiency initiatives and	P37&P39-44
	A2.5	Total packaging material used for finished products (in tonnes) and, if applicable, with reference to per unit produced.	No packing material involved
Aspect A3: The Environment and Natural Resources	General Disclosure Policies on minimising the issuer's significant impact on the environment and natural resources.	P53-58	
	A3.1	Description of the significant impacts of activities on the environment and natural resources and the actions taken to manage them.	P53-58
Aspect A4: Climate Change	General Disclosure Policies on identification and mitigation of significant climate-related issues which have impacted, and those which may impact, the issuer.	P31-36	
	A4.1	Description of the significant climate-related issues which have impacted, and those which may impact, the issuer, and the actions taken to manage them.	P31-36

Disclosure indicators		Page	
Social			
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Aspect B1: Employment	General Disclosure Information on: (a) the policies; and (b) compliance with relevant laws and regulations that have a significant impact on the issuer		P67-72
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	B1.2	Employee turnover rate by gender, age group and geographical region.	P68
Aspect B2: Health and Safety	General Disclosure Information on: (a) the policies; and (b) comp		P73-78
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	B2.2	Lost days due to work injury.	P77
	B2.3	Description of occupational health and safety measures adopted, how they are implemented and monitored.	P73-78
Aspect B3: Development and Training	General Disclosure Policies on improving employees' knowledge and skills for discharging duties at work. Description of training activities.		P69-72
	B3.1	The percentage of employees trained by gender and employee category (e.g. senior management, middle management)	P70
	B3.2	The average training hours completed per employee by gender and employee category.	P70
Aspect B4: Labour Standards	General Disclosure Information on: (a) the policies; and (b) compliance with relevant laws and regulations that have a significant impact on the issuer relating to preventing child and forced labour.		P67
	B4.1	Description of measures to review employment practices to avoid child and forced labour	P67
	B4.2	Description of steps taken to eliminate such practices when discovered.	P67
Operating Practices			
Aspect B5: Supply Chain Management	General Disclosure Policies on managing environmental and social risks of the supply chain.		P103-106
	B5.1	Number of suppliers by geographical region.	P105
	B5.2	Description of practices relating to engaging suppliers, number of suppliers where the practices are being implemented, how they are implemented and monitored.	P103-104
	B5.3	Description of practices used to identify environmental and social risks along the supply chain, and how they are implemented and monitored.	P106
	B5.4	Description of practices used to promote environmentally preferable products and services when selecting suppliers, and how they are implemented and monitored.	P104

Disclosure indicators		Page	
Aspect B6: Product Responsibility	General Disclosure Information on: (a) the policies; and (b) compliance with relevant laws and regulations that have a significant impact on the issuer		P79-84& P107-108
	B6.1	Percentage of total products sold or shipped subject to recalls for safety and health reasons	No products sold or shipped subject to recalls for safety and health reasons
	B6.2	Number of products and service-related complaints received and how they are dealt with.	P79
	B6.3	Description of practices relating to observing and protecting intellectual property rights.	P88-89
	B6.4	Description of quality assurance process and recall procedures.	P81-84
	A6.5	Description of consumer data protection and privacy policies, and how they are implemented and monitored.	P107-108
Aspect B7: Anti-corruption	General Disclosure Information on: (a) the policies; and (b) compliance with relevant laws and regulations that have a significant impact on the issuer		P99-102
	B7.1	Number of concluded legal cases regarding corrupt practices brought against the issuer or its employees during the reporting period and the outcomes of the cases.	P101
	B7.2	Description of preventive measures and whistle-blowing procedures, and how they are implemented and monitored.	P100-101
	B7.3	Description of anti-corruption training provided to directors and staff.	P102
Community			
Aspect B8: Community Investment	General Disclosure Policies on community engagement to understand the needs of the communities where the issuer operates and to ensure its activities take into consideration the communities' interests.		P91-96
	B8.1	Focus areas of contribution (e.g. education, environmental concerns, labour needs, health, culture, sport).	P91-96
	B8.2	Resources contributed (e.g. money or time) to the focus area.	P91

GRI Index

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102-4	Location of operations	About us	P07-08
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102-17	Mechanisms for advice and concerns about ethics	Business ethics	P101
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102-24	Nominating and selecting the highest governance body	Sustainability management	P19-22
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302-4	Reduction of energy consumption	Low-carbon action	P48-52
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	103-3 Evaluation of the management approach	Emission management	P59-62
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GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Environmental impact	P57
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GRI 103: Management Approach 2016	103-1 Explanation of the material topic and its Boundary	Talent management	P67
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Reader's Feedback

Dear readers,

Thank you for reading the Beijing Enterprises Water Group Limited Sustainability Report (2021). We expect to listen to your feedback on our report and work. Your opinions and suggestions are the important basis for us to improve our sustainability management and practice.

We are looking forward to your reply.

Optional questions (please mark on your answer)

1. Which of the following stakeholder type your employer belongs to?

- Shareholder Employee Supplier Customer Government
 Community Academic institutions Others (Please specify)

2. Is the information you are concerned about disclosed in the report?

- Yes Maybe No

3. Your comprehensive evaluation on the Beijing Enterprises Water Group Limited Sustainability Report (2021):

· Readability (understandable presentation, attractive design and easy information search)

- Yes Maybe No

· Credibility (true and reliable information)

- Yes Maybe No

· Information integrity (positive and negative information that meet your needs)

- Yes Maybe No

4. Can the information you are concerned about be easily searched in the report?

- Yes Maybe No

5. Do you prefer electronic version or hard-copy version of the future report?

- Electronic Copy Hard Copy

6. Please give your opinions and suggestions on the Beijing Enterprises Water Group Limited Sustainability Report (2021).

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